RG-NPE “

RGOS 10.3(4b10)

V2.0

© 2013

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■ ‘ http://www.ruijie.com.cn/ Â

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ЎĄ ˝ ѝ˙ RGOS®10.3 (4b10) Â

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[ ] ˙ [ ] ǂ ˘ ҳ ﾊ Â

{ x | y | ... }˙ ÿ ч ﾍ Â

[x | y | ...] ÿ ч ﾍ a Â

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3.

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1. CLI ǯ
2. ǯ
3. ˝ ǯ
4. ` ǯ
5. HTTP ` ǯ

1 CLI

1.1 alias

alias no

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

mode
command-alias
original-command

EXEC

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

a **no alias exec**

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

command-alias=original-command

EXEC

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

EXEC

```
Ruijie# s?
```

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

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

ð Ô

ЛЬЮ ˘ CLI 1 ¸ и"test"˘ **reload** ¸ ˘ Л Лъ Æ Â

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

˘ 1 CLI ˘ Л Лъ **reload** ¸'

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

reload ¸ 1 ˘ ‡ Л Лъ **all** '

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

˘ 1 CLI ˘ Л Лъ **reload** ¸'

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

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¸	
enable secret	CLI ¸

1.3 show aliases

¸ ¨ ¸ Ю ¸ ¨ ˘ Л Лъ EXEC Ю **show aliases** ¸ Â

show aliases [*mode*]

ð Ô

mode

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EXEC

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ЛЬЮ EXEC Ю

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

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2

2.1

2.1.1 disable

Ю æ ˘ ৡ disable Â

disable [*privilege-level*]

privilege-level	

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🕮	**disable** ৡ ł Â

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```
Ruijie# disable 10
```

enable	ÿ ˘ Â

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2.1.2 enable password

a˚ ʒˇ ʒ **enable password** Â ʒ **no** ʒ Â

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

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

ʒ

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ʒ ЊЌ ЮЃ

■ 1 26 Â

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~ ╗ ˇ ł ʒˇ ‡ a EXEC Â a ╗ ʒ Â Л ʒ Â

Ю ʒ и pw10Ѓ

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

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enable secret	ʒ Â

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2.1.3 enable secret

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

no enable secret

Secret	EXEC ৡ Â
Level	Â
0|5	ৡ ╗ ˘ 0 ╗ ˘ 5 ╗ Â

ssh-sesrver	б SSH Serverй IPv4 IPv6 Ы’
telnet-server	б Telnet Serverй IPv4 IPv6 Ы’
web-server [http | https | all]	б Web Serverй IPv4 IPv6 Ы’
snmp-agent	б Snmp Agentй IPv4 IPv6 Ы’

б Ы **no enable service** Ы

enable service web-server Ы ы 3 Л [http | https | all] Ы Ы ы a ~ all ~ ‡ й http Ы https Ы’ http ~ ‡ Л http Ы’ https ~ ‡ Л https Ы

Ю Ы’ enable service ssh-sesrver, SSH Server ╖ ‘

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

Ы	
show service	Ы ,

Л

Л	
-	-

2.1.5 execute

˙ Ы˜ Ы **execute** Ы Ы

execute {[**flash:**] *filename*}

flash:	˙ Э
filename	˙ ¨

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PC Э

TFTP Flash Â

CLI ꝛ

Â

Ю line_rcms_script.text Э

ă **Telnet** ╖ Ю

```
configure terminal
line tty 1 16
transport input all
no exec
end
```

```
Ruijie# execute flash:line_rcms_script.text
executing script file line_rcms_script.text ......
executing done
Ruijie# configure terminal
Enter configuration commands, one per line.  End with  CNTL/Z.
Ruijie(config)# line vty 1 16
Ruijie(config-line)# transport input all
Ruijie(config-line)# no exec
Ruijie(config-line)#
```

enable	enable password enable secret 15 Â enable Â
local	username 15 Â

enable Â

Web Â **no ip http authentication**
Â

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

enable service б Â

-

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2.1.7 ip http port

HTTP **ip http port**

ip http port *number*

number	HTTP Server 80Â

80Â

HTTP Â **no ip http port** Â

2.1.9 lock

Э ˇ EXEC lock Â

lock

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ЛъЮ в

- lock ˇ
- ˇ Л Лъ Â ˇ ˇ ˇ ˇ l' Locked Ł
- ˇ Â
  Э в ˇ line Ю **lockable** ˇ line Э в Â

Ю й в

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

lockable	Э в Â

-	-

2.1.10 lockable

Э **lock** Л Лъ line Ю **lockable**
Ю a **lock** Â **no** Â

lockable

no lockable

-	-

line

Э в ˘ в Л Лъ EXEC Ю
lock Â

Ю 8 Л Э в ╖ ˘ 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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2.1.11 login

AAA Ю Э ˘
login Â **no**

line

AAA Â

Ю VTY Э " radius Â

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

aaa new-model	AAA
aaa authentication login	"

-	-

2.1.13 login local

AAA Ю Э ˘ **login local** Â

no Â

login local

no login local

-	-

line

AAA Â
username 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
```

username	Â

login	Э ѝ

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2.1.15 service password-encryption

service password-encryption no a ѝ Â

service password-encryption

-	-

service password-encryption password show running write password service password-encryption

Ю

```
Ruijie(config)# service password-encryption
```

enable password	a Â

-	-

2.1.16 telnet

Ⲗ Telnet ⳕ ˇ EXEC ˜ Ю **telnet** ⳑ Â

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

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

no username *name*

name	Â
web-auth	web
pwd-modify 0|1	0 a 1 web-auth Â
password	Â
0|7	0 7 Â
encrypted-password	Â
privilege-level	Â
filename	

Â

Â

~ 7 Â 8 Â

Ю 15

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

Ю web ж :

```
Ruijie(config)# username user1 web-auth password 0 pw
```

login local	Â

-	-

web Â

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IO :

```
Ruijie#username export user.csv
```

web-auth	web Â

10.3(4t76)

message n

2.2.3 clock set

˘ Л Љ ҕ **clock set** ч ‘

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

hh:mm:ss	˘ ѝ ^ 24 ⁸ ~ : ƒ :
day	^ 1-31~ ˘ Â
month	^ 1-12~ ˘
year	Ѽ ĩ ^ 1993-2035~ ˘ a Â

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ҕ ˘ Â

˚ ˘ clock set Э

˘ Ю ł˘ Â

Ю ѝ 2003 3 17 Э´ 10 20ƒ 30 ‘

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

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show clock	

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2.2.4 clock update-calendar

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clock update-calendar

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	⁄ ˚ é ˚ ^ calendar˜ Â ˚ ╟˘ ¨ Ю ≠ Â ˚ ˚ a ˚ ˘ ˚ ѝ ˘ n
	Ю ϛ ˚ 8 ˚ ف Ruijie# clock update-calendar

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2.2.5 exec-timeout

LINE **exec-timeout** ϛ Â **no exec-timeout** ϛ˘ ⁄ LINE

exec-timeout

Ю line vty 0 ѝ 5ʃ 30 ʻ

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

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2.2.6 hostname

ў ˝ ˘ ʒ **hostname** Â

hostname *name*

name	ў ˝ ˘ ʌ à Љ ↓ Â ѝ 32 Â

ў ˝ ѝ Ruijie Â

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ў ˝ ў Љ ↓ ʌ CHAP ѝ ˝ Â

Ю ў ˝ ѝ BeiJingAgenda

```
Ruijie(config)# hostname BeiJingAgenda
BeiJingAgenda(config)#
```

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2.2.7 prompt

Ю **prompt** Â **no prompt** Â

prompt *string*

string	32

EXEC Â

Ю RGOS

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

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2.2.8 reload

reload Â

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

text	1-255 Â
in [hh:] mm	24 Â
at hh:mm	
month	3 Mar

day	˘ ÿ 1 31
cancel	ﾍ

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ﾇ ﾉ ﾌ 2 ╟˘ Â

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

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˘ ˘ LINE ù / Â

Ю line vty 0 ù 5¦ 30 ‘

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

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/ cn _4.90.54A602D6>Tj/TT1 1 Tf-

-	-

2.2.11 write

ˆ running-config˜ Æ Â

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

memory	NVRAM˜ ˚ **copy** **nning-config startup(f)i8(cop)-6(y)18( )]T1 1.5 Tm(0.64 re67]**

2.3

2.3.1 show clock

˘ ¥ **show clock** Â

show clock

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¥ /ЛЪ ˘ detail Â

Ю **show clock** ¥

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

¥	
clock set	

/

/	
-	-

2.3.2 show line

˘ Ю˘ ¥ **show line** Â

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

console	8 /
vty	vty
line-num	line

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ৡ˘ Â

Ю console

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

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2.3.3 show reload

╟ ˘ Ю ৡ **show reload** Â

show reload

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```
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

ৡ **show running-config** Â

show running-config

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2.3.5 show startup-config

NVRAM

show startup-config

show startup-config

-	-

3

3.1

cp dest {*destine_file* | *directory*} **sour** *source_file*
cp sour *source_file* **dest** { *destine_file* | *directory* }

destine_file	
directory	
source_file	( )

cp a

log.txt

```
Ruijie# cp sour log.txt dest ../log_bak.txt
```

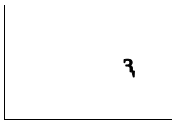

3.1.3 ls

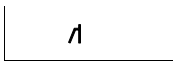
ls ***pathname***

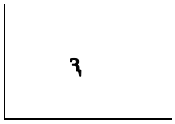
pathname	

jffs2 dev/mtdblock/1

```
Ruijie# makefs dev /dev/mtdblock/1 fs jffs2
```





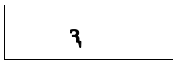


3.1.5 mkdir

…

mkdir ***directory***

directory	…



… ( )

a …

…

```
Ruijie# mkdir test
```


3.1.7 pwd

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Pwd

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```
Ruijie# pwd
```


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3.1.8 rm/delete

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rm [**recursive**] *file*

delete [**recursive**] *file*

recursive	
file	( )

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a , a Â ⅃

Ю log.txt

```
Ruijie# rm log.txt
```

flash Э aaa

```
Ruijie# delete recursive aaa
```

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rmdir	, ѝ ҳ , Лъ rm ҳ ≠ Л Лъ

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3.1.9 rmdir

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rmdir directory

directory	, ѝ

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a , ѝ Â ҳ , **rm** ҳ
Л Лъ Â

Ю tmp з Â

```
Ruijie# rmdir tmp
Ruijie# ls
```


4

4.1

ў CLI Ю COPY ¾ ` Â

- Xmodem ` ‘ **copy xmodem** ¾
- Tftp ` ‘ **copy tftp** ¾

4.1.1 copy xmodem

xmodem ` ¾˘ xmodem Э Ю Â

copy flash: *filename* **xmodem**

copy xmodem flash: *filename*

~

˚ ¨ ˘ ˚ ¨ ╗ Э ⁄˘ ‘

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

---

ð Ô

filename’ Э ˚ ¨

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╗ ˘ ‡ ˚ Â ŭ ‡˘ Â Xmodem
⁄ Л ˚ ˘ ў ˚ à ˚ ÂXmodem ⁄ ^ ~
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Ю : ÿ ў xmodem ˚ ’ ү
Э ˚ xmodem Э ў Â

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Ю Э Ю :

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

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

4.1.2 copy tftp

tftp tftp Э Ю Â

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

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

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

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

tftp ╗ Э

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

╗ Э

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

filename Э

vrfname vrf

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Â Â TFTP Â

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5 HTTP

5.1

5.1.1 http check-version

HTTP ` Â

http check-version

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1‘ HTTP ` ‘

all	` /` ˚
string	` ┗ ˚ ˘ ┗

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৻ ˚ ` Â` ╖ ɬ˘ ╟ Â

1` ╟` /ˈ

```
Ruijie#http check-version
files need to be updated: character-db, route-db.
Ruijie#http update character-db route-db
updating files, please wait...
update success!
```

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/ˈ	
10.3(4b7)	৻
10.3(4T90)	╖ ৻
10.3(4b8)	╖ all ˘ ৻

to-update

╟` ˚ Â

o-update { **all** | *string*}

	` /` ˚

╠`

३

३ ˚ ╠` Â ╠` ѝ auto-update Â

1˙ ╠` Л ˚ ˘ è ˚ a ╠` ‘

```
Ruijie#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Ruijie#http update auto-update character-db route-db
```

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http update mode	`

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10.3(4b8)	३

5.1.4 http update mode

HTTP ` ѝ ╠` ą ╠` ╠ Â

http update mode { **auto-update** | **manual** | **auto-detect** }

auto-update	╠`
manual	╠`
auto-detect	╠

Ю ѝ ╠` Â

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	10.3(4b7)	ৡ

5.1.6 http update set oob

HTTP ÿ ` Â

[**no**] **http update set oob**

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Ю ѝ `

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ৡ HTTP ÿ ` Â ʌ no ৡ ৲ ÿ ` Â

1ʹ HTTP ÿ ` ʻ

```
Ruijie#config
Ruijie(config)#http update set oob
```

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	10.3(4b7)	ৡ

5.1.7 http update time

HTTP ╟` Â

http update time daily *hh:mm*

hh:mm	`

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३ ╟` Â /ſ ѝ Â

1ʻ HTTP ╟` ѝ 23:40ʻ

```
Ruijie#config
Ruijie(config)#http update time daily 23:40
```

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/ſ	
10.3(4b7)	३

5.1.8 feedback enable

/ſ ╖ Â /ſ no ३ ╖ Â

[**no**] **feedback** [**user**] **enable Â**

user	/ſ Â a user /ſ Â

Ю /ſ ╖

३

३ **feedback user enable** ⁄ ╖ ’ **feedback enable** ⁄ ╖ Â

1‘ ⁄ ╖ ‘

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

```
Ruijie#config
Ruijie(config)# feedback frequency 5
Ruijie(config)# end
Ruijie#show run
```

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10.3(4b8)	৲

5.1.10 feedback ignore-item

Â ⁄ no ৲ ৷ Â

[

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5.1.12 feedback update

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feedback update

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ৡ ⁄ ╖ Â

1` ╟ ⁄ `

```
Ruijie# feedback update
```

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10.3(4T90)	ৡ

5.1.13 feedback user-info

Â ⁄ **no feedback user-info** ৡ

[**no**] **feedback user-info organization** *string1* **industry-type** *string2* **contact-info** *string3*

string1	Æ¨ Â <100
string2	Â <100
string3	Â <100

३

३ ˘ ⁄⁄ ˘ ╖ Â

1˙ ˙
Ruijie#config
Ruijie(config)# **feedback user-info organization** ΄Ω ≠
industry-type IT **contact-info** 021-61300160

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10.3(4b8)	३

5.1.14 mail-service enable

˚ ┺╖ Â

[**no**] **mail-service enable**

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IO ˚ ╖

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३ ˚ ╖ Â

1˙ ˚ ╖ ˙
Ruijie#**config**
Ruijie(config)# **mail-service enable**
2˙ ˚ ╖ ˙
Ruijie#**config**

```
Ruijie(config)#no mail-service enable
```

३	⺆	
	10.3(4b8)	३

5.1.16 mail-client username

SMTP ㄴ ⺆/ ˚ ㄴ╗ Â

[**no**] **mail-client username** *username* **password** [**0** | **7**] *password*

	username	⺆
	[**0**	**7**]	0˙ ╗ ’ 7˙ ╗ ’ 0
	password	Â ˚ ѝ ł

३	
	⺆ ˘ ŭ ‡ a ⺇ ˚ Â

1˙ SMTP ㄴ ⺆ ‘

```
Ruijie#config
Ruijie(config)# mail-client username test@163.com password test
Ruijie#show run
...
mail-client username test@126.com password 093b10013
...
```

३	३	
	-	-

⺆	-

5.1.17 mail-client smtp-server

SMTP ┗ ㄏ / ˚ ┗╖ Â

[no] **mail-client smtp-server** *host* [**port** *value*]

5.2

5.2.1 show feedback items

Â ३ ╗ ㄏ ‡ ㄏ Â

show feedback items [*number*]

number	ㄏ Â <0 - MAXID>

Â

Â

MAXID˘ ˘ ˘ И в

ǂ ĄĄ ҳ ĄĄ ˘ ЛЮ ˙

1. ҳ
2. ҳ
3. Лъ ҳ
4. LINE ҳ
5. DLDP ҳ
6. ѧ ҳ
7. Aggregate Port ҳ

1

1.1

1.1.1 bandwidth

Ю **bandwidth** ҳ ˘ ҳ **no**
Â

bandwidth *kilobits*

no bandwidth

ðð Ô

kilobits ‘ ˘ Лъ Kbits ѝй æ

ðð ҳ Ô

ðð Ô

bandwidth ҳ ˘ Ю **show interfaces**
ҳ è

ðð Ô

bandwidth ҳ a ˘ Л
˘ ˘ Лъ ˘ Л Лъ ÂBandwidth
Л ˘ a Â

ðð Ô

ЛъЮ ‘

```
Ruijie(config-if)# bandwidth 64
```

1.1.2 carrier-delay

Ю ҳ **carrier-delay** ˘ ҳ **no**
Â

carrier-delay [*seconds*

no carrier-delay

ð Ô

seconds ‘ Л ˘ Лъ ѝ Æ˘ 1· 60

ð Ô

2

ð Ô

ð Ô

Л DCD ÿ Down Up ˘
DCD Л ˘ Ж Л a Э
Â

DCD ˘ Ж ˘ Л Лъ ╕
˘ Лъ Л Лъ Â DCD ˘ з
˘ Ж ˘ Лъ Â

ð Ô

ЛъЮ ѝ 5 ‘

```
Ruijie(config)# interface gigabitethernet 0/1
Ruijie(coinfig)# carrier-delay 5
```

1.1.3 clear counters

Ю **clear counters** Â

clear counters [

ð Ô

Л Ъ 0/1 ˘ Ю ꝛ'

```
Ruijie# clear counters gigabitethernet 0/1
```

ð ꝛ Ô

ꝛ	
show interfaces	Л Ъ ↓

1.1.4 description

Ю **description**

ð Ô

Л Ь й ARPA

ð Ô

802.1Q IEEE ˘ VLAN ƒ ч Ь
Â

802.1Q Л Л Ь Э Â

ð Ô

Ю 20 Э 802.1Q *VLANID* й 20

```
Ruijie(config)# interface GigabitEthernet 0/0.20
Ruijie(config-subif)# encapsulation dot1Q 20
```

1.1.7 interface

Ю **interface** ϟ Â

interface *type slot-number/interface-number* [.sub-interface-number]

ð Ô

type ‘ ˘ GigabitEthernet àtenGigabitEthernet àloopback ànull à
dialer à Â

Slot-number/port-number ‘ Л˘ Л / Л ˘ Л
Э^ ў Э Л й 0˜˜ Л Э Л Â

sub-interface-number ‘ Л Â

ð ϟ Ô

ð Ô

^ GigabitEthernet à tenGigabitEthernet˜ ˘ a no ϟ
Â **show interfaces** ϟ

ð Ô

”I Л Ь ‘

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

‘

```
Ruijie(config)# interface gigabitEthernet 0/1.1
Ruijie(config-subif)#
```

```
Ruijie(config)# interface tenGigabitEthernet
```

ð Ô

ЛЬЮ Лъ Э IP

```
Ruijie(config)# interface GigabitEthernet 0/0
Ruijie(config-line)# ip address 192.168.12.1 255.255.255.0
```

ð ϡ Ô

ϡ	

```
Ruijie(config-if)# ip address 192.168.12.1 255.255.255.0
Ruijie(config)# interface GigabitEthernet 0/0
Ruijie(config-if)# ip unnumbered loopback 0
```

1.1.10 keepalive

ϡ keepalive ╖ ˇ ў keepalive Â è **no keepalive** ╖ Â

keepalive { *keep-period* | *keep-period* { **dns** *ip* | **ping** *ip* } }

no keepalive

ð Ô

keep-period ˋ RGOS keepalive

1. Л Лъ Â

2. Лъ Э IP Â

3. ping dns IP a ˘ ˘
Э Â

ð Ô

Лъ GigabitEthernet 0/0 Э Лъ ping ╠ ╗

```
Ruijie# config terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Ruijie(config)# interface GigabitEthernet 0/0
Ruijie(config-if)# keepalive 15 ping 192.168.12.1
Ruijie(config-if)# end
```

Лъ GigabitEthernet 0/0 Э Лъ dns ╠ ╗

```
Ruijie# config terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Ruijie(config)# interface GigabitEthernet 0/0
Ruijie(config-if)# keepalive 10 dns 202.101.98.55
Ruijie(config-if)# end
```

1.1.11 load-interval

Ю **load-interval** ч ˘
ч **no** Â

load-interval *seconds*

no load-interval

ð Ô

seconds ˙ ˘ Л 30 600

ð ч Ô

ð Ô

30

ð Ô

ч Л Лъ ˘
30 Â ˘
GigabitEthernet 0/0 180 ˘ **show interface GigabitEthernet 0/0**

Λ Л ‘

3 minutes input rate 15 bits/sec, 0 packets/sec

3 minutes output rate 14 bits/sec, 0 packets/sec

ð Ô

ЛЬЮ GigabitEthernet 0/0 180

```
Ruijie(config)# interface GigabitEthernet 0/0
Ruijie(config-if)# load-interval 180
```

ð ϟ Ô

ϟ	
show interfaces	Л Ь ↓

1.1.12 mac-address

mac-address ϟ Э MAC ˘ ϟ **no** ∧ MAC Â

mac-address *H.H.H*

no mac-adderss

ð Ô

H.H.H ‘ MAC ˘ 16 ⁸ ˘ H Λ Л Ь 2 ˘ Л Ь 6 ˘ 48 Â

ð ϟ Ô

ð Ô

ð Ô

Л Ь MAC Â ˘ Л Ь MAC Λ Л Ь ˘ ‘ Э MAC ÂMAC Λ ˘ Ю a MAC Â

ð Ô

ЛЬЮ Л Ь MAC ‘

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

```
Ruijie(config-if)# mac-address 00d0:f8fb:110d
```

1.1.13 media-type

Â ꝛ **no** .

media-type { **baset | basex auto** }

no media-type

ð Ô

basex auto ‘ ˝I

baset ‘

ð Ô

Â

ð ꝛ Ô

ˆ ˘ a Ap SVI˜

ð Ô

˘ Л Ъ ˝I ч ˘ Л è Â
ł˘ ˘ à ˅ ˘
Â Л ł˘ й è ˘ Л Ъ
Â

ð Ô

```
Ruijie(config)# interface gigabitethernet 0/1
Ruijie(config-if)# media-type basex auto
```

```
Changing media to fiber auto mode. You may need to update the
speed and duplex settings for this interface.
```

ð ꝛ Ô

ꝛ	
show interfaces	Л Ъ ˅

ð Л Ô

a ╟ ˝I ˘ й ˘ ꝛ
Â

1.1.14 mtu

Ю **mtu** ҳ ĩ MTUˆ Maxiumum Transmission Unit˜˜ ҳ **no** Â

mtu *num*

no mtu

ð Ô

*num*ˈ ↰ й 64-65535˜ Лъ й æ Â Л a˚ a ˚ a˚ ˘ й 1500 Â

ð Ô

й 1500 Â

ð ҳ Ô

ð Ô

MTU Л ă̋ ˘ з MTU Ь Â Ь ˘ è Ь з ˘ ˘ ↓ Ь a é Л . ˘ FTP Â ˘ MTU ˘ a˚ Ь ↑ Â Л Â

ð Ô

```
Ruijie(config)# interface gigabitethernet 0/1
Ruijie(config-if)# mtu 1400
```

ð ҳ Ô

ҳ	
show interfaces	Лъ ↓

1.1.15 shutdown

˘ ҳ Â ҳ **no**

shutdown

no shutdown

ð ҳ Ô

ð Ô

ˆ Ɱ à Ap à SVI ˜˜ ꝛ ˇ è
ÿ ˇ a Â **show interfaces** ꝛ Â

ð Ô

GE 0/1˙

```
Ruijie(config)# interface gigabitEthernet 0/1
Ruijie(config-if)# shutdown
```

GE 0/1˙

```
Ruijie(config)# interface gigabitEthernet 0/1
Ruijie(config-if)# no shutdown
```

ð ꝛ Ô

ꝛ	
show interfaces	Ɱ ↓

🕮

no shutdown ˇ /

Â

1.1.16 snmp trap link-status

/ Ɱ ŭ LinkTrap Ɋ LinkT

ð Ô

ˆ Лъ ðAp ðSVI ˜˜ ҷ ŭ LinkTrapˇ
Ђ ˇ Link ∧ ˇ SNMP LinkTrap, ∩ ‡ a Â

ð Ô

Ю й a Link trap:

```
Ruijie(config)# interface gigabitEthernet 0/1
Ruijie(config-if)# no snmp trap link-status
```

Ю й Link trap:

```
Ruijie(config)#interface gigabitEthernet 0/1
Ruijie(config-if)# snmp trap link-status
```

1.1.17 speed

Â ҷ **no**

speed {**auto** | **10** | **100** | **1000**}

no duplex

ð Ô

10 ˙ й 10Mbps Â
100 ˙ й 100Mbps Â
1000˙ й 1000Mbps Â
auto˙ й Â

ð Ô

Â

ð ҷ Ô

ð Ô

show interfaces ҷ Â a˚ ˇ ≠
a˚ Â ˇ SFP a й 10M 100M Â

ð Ô

```
Ruijie(config)# interface gigabitethernet 0/1
Ruijie(config-if)# speed 100
```

ð ҷ Ô

interface	Â
load-interval	
media-type	
shutdown	Â
speed	Â

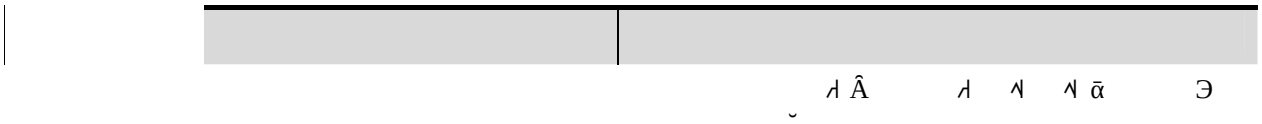
2

2.1

2.1.1 bridge-map

Â

bridge-map *bridge-num*



bridge-num

10.3(4b7)	

2.1.2 lan-ip

receive-only Ю IP б

[no] lan-ip *ip_address subnet_mask*

ip_address	IP
subnet_mask	

receive-only Ю ˘ Л Љ 100 Â ч receive-only Ю Л ˘ Â

1 ‘ 0 receive-only ’ 192.168.0.0/255.255.255.0 10.10.10.0/255.255.255.0 й

```
Ruijie# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Ruijie(config)# bridge-map 0
Ruijie(config-bridge-map)# link-mode GigabitEthernet 0/0
GigabitEthernet 0/1 receive-only
Ruijie(config-bridge-map)# lan-ip 192.168.0.0 255.255.255.0
Ruijie(config-bridge-map)# lan-ip 10.10.10.0 255.255.255.0
Ruijie(config-bridge-map))# end
```

2.1.3 link-mode

Â

no Â

[**no**] **link-mode** *interface-name1 interface-name2* { *forward* | *sniffer* | *bypass* | *receive-only* }

interface-name1	a Â
interface-name2	a Â
forward	forward Â
sniffer	sniffer Â
bypass	bypass Â
receive-only	receive-only a Â

a Â

forward Â

sniffer Â

bypass Â

receive-only a Â

a a GigabitEthernet 0/0 GigabitEthernet 0/1 forward GigabitEthernet 0/2 GigabitEthernet 0/3 sniffer Â

1 GigabitEthernet 0/0 GigabitEthernet 0/1 forward

```
Ruijie(config)#bridge-map 1
Ruijie(config-bridge-map)#link-mode GigabitEthernet 0/0 GigabitEthernet 0/1 forward
```

-	-

-

10.3(4b7)	
10.3(4b8)	receive-only

2.1.4 native-vlan

native-vlan id no native-vlan id

[**no**] **native-vlan** *vlan-id num*

vlan-id num	Vlan id 1~4094

no native-vlan id

native vlan-id vlan-id native vlan-id vlan

1 native-vlan id 100

```
Ruijie(config)#bridge-map 1
Ruijie(config-bridge-map)#native-vlan 100
```

-	-

-

10.3(4b7)	

2.1.5 specify interface

à Â

specify interface *interface-name* { *lan* | *wan*}

no ỳ

[**no**] **specify interface** *interface-name*

interface-name	Â
lan	ỳ Â
wan	ỳ Â

a˚ ⁄ Э a˚ Â

Â

ЮЎ ˘ no Â

ˆ ≠ έ ˙ Лъ ˘ dialer Â è a Â

… ÿ ў ˘ ў ł ˘ ł˚ Â

1˙ GigabitEthernet 0/0 ỳ ˙

```
Ruijie(config)#specify interface GigabitEthernet 0/0 lan
```

2˙ GigabitEthernet 0/0 ỳ ˙

```
Ruijie(config)#specify interface GigabitEthernet 0/0 wan
```

3˙ GigabitEthernet 0/0 ỳ ˙

```
Ruijie(config)#no specify interface GigabitEthernet 0/0
```

-	-

-

10.3(4b7)	

2.1.6 sys-mode

ù Â Л Ћъ ъ no ù
˘ ù Â

[no] sys-mode gateway

-	-

vlan-enable	vlan id ù 1-4088 Â

Â

ЮЎ vlan id ù 1-4088 ˘ Ю 8 '

2 ˘ lan Ю'

1' GigabitEthernet 0/0 vlan id ù 1-4088 '

```
Ruijie(config-if-GigabitEthernet 0/0)#vlan-enable
```

-	-

-

10.3(4b7)	

2.1.8 xaui-mode

"I Â

xaui-mode slot *slot-num*

no "I ˘ 4 "I

[**no**] **xaui-mode slot** *slot-num*

ৡ Â

4 ”I ‍ ”I Â

1‘ XAUI ”I ‘

```
Ruijie(config)#xaui-mode slot 0
```

ৡ	
-	-

NPE “ ‘ NPE60 ä NPE60E Â

ሶ	
10.3(4b7)	ৡ

2.1.9 bypass

˚ bypass (NPE40 б NPE50E äNPE60E a˚ ˘ ‍) Â

NPE40‘

bypass

३	

NPE NPE50E NPE60E

10.3(4b7)	

2.2

2.2.1 show bridge-map

show bridge-map [*bridge-num*]

bridge-num	0~2

a

1 0

```
Ruijie#show bridge-map 0
BRIDGE MAP 0,STATE is DOWN
  Inside interface is GigabitEthernet 0/0,Outside interface is GigabitEthernet 0/1
  Working mode is forward
  Native vlan is 1
```

-	-

2.2.3 show sys-mode

ˇ wan à lan Â

show sys-mode

	ˇ Л ɻ
sys-mode	wan lan Â ˇ LAN : GigabitEthernet 0/0 GigabitEthernet 0/3 WAN : GigabitEthernet 0/1 GigabitEthernet 0/2 GigabitEthernet 0/4 я

environment	Л Л Ч ˘ ˘ ˘ Л NPE60,NPE50E à NPE60E " ˘ è ˘ NPE60 a

```
NPE60:
Ruijie#sh environment
---environment information---
CPU Temperature is 34
fan works in high speed mode.

FAN 1 is OK!
FAN 2 is OK!
FAN 3 is OK!
FAN 4 is OK!

POWER 1 is not present!
POWER 2 is not present!
```

	FAN

3

3.1

è ъ **mtu** ã **speed** ã **duplexs** **p** **e** **e** **d**

ҳ

л	
10.3(4b7)	ҳ

3.1.2 gateway

MGMT Â

gateway *ip-address*

ip-address	MGMT IPv4

ҳ

MGMT MGMT˜ л ѝ 0Â

1˙ MGMT ˙

```
Ruijie#config
Ruijie(config)#interface mgmt 0
Ruijie(config-if-Mgmt 0)#gateway 192.168.0.1
Ruijie(config-if-Mgmt 0)#exit
Ruijie(config)#
```

ҳ

ҳ	
show interface mgmt	MGMT

л

NPE “˙ NPE40 ả NPE60 Â

ҳ

л	
10.3(4b7)	ҳ

3.1.3 ip address

ҳ MGMT IP б Â

ip address *ip-address subnet-mask*

ip-address	IP
subnet-mask	

ҙ Â

MGMT MGMT ˇ ˊ и 0Â

1ˈ MGMT IP ˈ

```
Ruijie#config
Ruijie(config)#interface mgmt 0
Ruijie(config-if-Mgmt 0)#ip address 192.168.0.2 255.255.255.0
Ruijie(config-if-Mgmt 0)#end
Ruijie#
```

ҙ	A N

h:h0$?%E’BÊ2E2Cc 3.245 0 Td[(M)6(GMTT)Tj3/C2_0 1 Tf0 Tc 41 0 Tf0.599 0 Td[<02551 0 Td<01C4>Tj/TT15 805( )TjE

ҳ

б MGMT ў Â

1' ў *192.168.0.1* б MGMT '

```
Ruijie#ping oob 192.168.0.1
Sending 5, 100-byte ICMP Echoes to 192.168.196.1, timeout is 2 seconds:
  < press Ctrl+C to break >
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 10/10/10
ms
```

ҳ

ҳ	
-	-

Л NPE ‟' NPE40 ä NPE60 Â

ҳ

Л	
10.3(4b7)	ҳ

3.1.5 sntp enable oob

б MGMT SNTP ╟ Â

sntp enable oob

-	-

ҳ

б MGMT SNTP ╟ Â

1' SNTP ╖ '

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

ҳ	
-	-

ѧ ä E60 Â

ѧ	ѧ	
	10.3(4b7)	ҳ

3.1.6

б MGMT ў Â

telnet oob *host*

host	ў IP ¨

ҳ

б MGMT ў Â

1' ў 192.168.200.1'

```
Ruijie#telnet oob 192.168.200.1
User Access Verification

Password:
```

ҳ	
-	-

NPE “ ' NPE40 ä NPE60 Â

ѧ	ѧ	
	10.3(4b7)	ҳ

4 LINE

4.1 LINE

4.1.1 line

LINE ˘ ЛЬЮ ¾'

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

ð Ô

aux	˘ " Э
console	8
tty	˘ " Э
vty	˘ telnet/ssh
First-line	first-line ∧
Last-line	last-line ∧

ð Ô

ð ¾ Ô

ð Ô

LINE

ð Ô

LINE VTY 1 3 LINE '

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

ð ¾ Ô

4.1.2 line vty

¾ Л Љ ╗ Л Љ VTY Â ¾ **no** Л Љ Л Љ VTY Â

line vty *line-number*

no line vty *line-number*

ð Ô

Ю Л VTY й 5 Л й 0--4 Â

ð ¾ Ô

ð Ô

╗ Л VTY ˘ Л Љ Э ¾ Â

ð Ô

Л VTY ╗ 20 Л VTY Л й 0--19 Â

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

Л VTY 10 Л VTY Л й 0—9 Â

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

ð ¾ Ô

4.1.3 transport input

Line Ю Л Љ ˘ **transport input** ¾ Line Ю Л Љ Â **default transport input** й LINE Ю й Â

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

default transport input

ð Ô

all	Line Ю Â
ssh	Line Ю Л SSH Â
telnet	Line Ю Л Telnet Â
none	Line Ю a Â

ð Ô

˘ VTY Â è TTY ù NONE˝
a Â /Л Ъ ł˘ /Л Ъ **default transport input** ¾ ù Â

ð ¾ Ô

Line

ð Ô

¾ Line Ю ÂVTY Ю˝ Â
ł˘ /Л VTY Э ╖ Â
show running ¾ Line Ю Â

~

default transport input ¾ Â**no transport input** ¾˘
LINE Ю Â б **transport input none** ˘ Â

ð Ô

line vty 0 4 Ю˝ /Л telnet ˙

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

ð ¾ Ô

¾	
show running	Â

ð Ô

˚ RGNOS10.1 Л Ъ Э

4.1.4 access-class

Line Ю ACL^ ⁸ ‟ ~ Â **access-class** *acl-no* { **in** | **out** } ¾ Line Ю ⁸ ‟ Â no **access-class** *access-list-number* {**in** | **out**} ¾ /Л LINE Ю ACL Â

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

ð Ô

access-list-number	access-list Ж 8 “ Â
in	∧ 8 Â
out	8 Â

ð Ô

˘ Line Ю 8 “ Â ˘ Â

ð ¾ Ô

Line

ð Ô

¾ Line Ю 8 “ Â Ю ∧ б ˘ a Â **access-class** ł˘ /\ access list ˘ /\ Љ ╗ Â **show running** ¾ Line Ю Â

ð Ô

line vty 0 4 Ю˝ ∧ access-list й 10˝

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

ð ¾ Ô

¾	
show running	Â

ð Ô

˚ RGNOS10.1 Љ Э

5 DLDP

5.1.1 DLDP

5.1.2 dldp ip

ৡ dldp ip ╖ ˘ 100 ˘ Ь Â
no ৡ è Â

dldp ip [nexthopip] [**interval** *value* | **retry** *value*]

no dldp ip [nexthopip]

ð Ô

***ip*ˈ** ip

***nexthopip*:** Ю ip

intervalˈ

retry ˈ

ð Ô

Ю interval й 100 ˘ Ь ’ й ÿ Â

ð ৡ Ô

Interface

ð Ô

б MSTPA2 Tr -12.589 -2.2 Td20.0001 Tc -11.2002B01D0>]TJ/TT_Ö1 Tf2 /TT0 1 1 -(542>6<1FF514E

Ruijie(config-if)#

˘ ip ѝ 20.1.1.1˘ Ю ip ѝ 10.1.1.1˙

Ruijie(config)# **dldp 20.1.1.1 10.1.1.1**

ð ꔷ Ô

ð Л Ô

ð Ô

ꔷ RGNOS10.3 ѣ Э ˘ RGNOS10.3 Â

5.1.3 dldp passive

ꔷ dldp passive dldp ╠ ˘ **no** ꔷ è Â

dldp passive

no dldp passive

ð Ô

ð Ô

Ю ѝ ў ╠ Â

ð ꔷ Ô

Interface

ð Ô

dldp Ю ˘ Л Љ ѝ ╠ Љ Â

ð Ô

ЉЮ ѝ ˘ dldp ў ˙

Ruijie(config-if)# **dldp passive**

ð ꔷ Ô

ð Л Ô

ð Ô

ꔷ RGNOS10.3 ѣ Э ˘ RGNOS10.3 Â

6

6.1

6.1.1 clear counters

˘ ¥ **clear counters** Â

clear counters [*interfece-type interface-number*]

ð Ô

interface-type ˙ ˘ ≈ Async ä Dialer ä GigabitEthernet ä Group-Async ä Loopback ä Null ä Serial Â

interface-number ˙ ∧ Â

ð ¥ Ô

ð Ô

show interface Â ¥ ˘ ў Â

ð Ô

Ю ¥ ˙

```
Ruijie# show interface async 1
Async1 is down, line protocol is down
Hardware is Async Serial
Internet address is 1.1.1.1/24
MTU 1500 bytes, BW 9 Kbit, DLY 100000 usec, rely 255/255, load
1/255
Encapsulation PPP, loopback not set, keepalive not set
DTR is pulsed for 5 seconds on reset
LCP Closed
Closed: ipcp
Last input 18:17:02, output 18:17:02, output hang never
Last clearing of "show interface" counters never
Input queue: 0/75/0 (size/max/drops); Total output drops: 0
Queueing strategy: weighted fair
Output queue: 0/64/0 (size/threshold/drops)
```

```
Conversations  0/1 (active/max active)
Reserved Conversations 0/0 (allocated/max allocated)
5 minute input rate 0 bits/sec, 0 packets/sec
5 minute output rate 0 bits/sec, 0 packets/sec
1396 packets input, 20516 bytes, 0 no buffer
Received 0 broadcasts, 0 runts, 0 giants
1 input errors, 1 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort
1467 packets output, 22937 bytes, 0 underruns
0 output errors, 0 collisions, 11 interface resets
0 output buffer failures, 0 output buffers swapped out
0 carrier transitions
Ruijie# clear  counters
Clear "show interface" counters on all interfaces [confirm]
Ruijie#
%COUNTERS: Clear counter on all interfaces by console
Ruijie# show interface async 1
Async1 is down, line protocol is down
Hardware is Async Serial
Internet address is 1.1.1.1/24
MTU 1500 bytes, BW 9 Kbit, DLY 100000 usec, rely 255/255, load
1/255
Encapsulation PPP, loopback not set, keepalive not set
DTR is pulsed for 5 seconds on reset
LCP Closed
Closed: ipcp
Last input 18:17:15, output 18:17:15, output hang never
Last clearing of "show interface" counters 00:00:02
Input queue: 0/75/0 (size/max/drops); Total output drops: 0
Queueing strategy: weighted fair
Output queue: 0/64/0 (size/threshold/drops)
Conversations  0/1 (active/max active)
Reserved Conversations 0/0 (allocated/max allocated)
5 minute input rate 0 bits/sec, 0 packets/sec
5 minute output rate 0 bits/sec, 0 packets/sec
0 packets input, 0 bytes, 0 no buffer
Received 0 broadcasts, 0 runts, 0 giants
0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort
0 packets output, 0 bytes, 0 underruns
0 output errors, 0 collisions, 0 interface resets
0 output buffer failures, 0 output buffers swapped out
0 carrier transitions
```

ɜ	
show interface	

6.1.2 clear dialer

DDR ʎ ˘ ɜ **clear dialer** Â

clear dialer [*interface-type interface-number*]

ð Ô

interface-type ˙ ˘ Async à Bri à Group-Async à Serial Â

interface-number ˙ ʎ

ð Ô

έ ˘ DDR ʎ Â

ð ɜ Ô

ð Ô

ÞO DDR ʎ 1 ˙

```
Ruijie# clear dialer async 1
```

6.1.3 clear interface

˚ ˘ ɜ **clear interface** Â

clear interface *interface-type interface-number*

ð Ô

interface-type ˙ ˘ Async à Dialer à GigabitEthernet à Group-Async à Loopback à Null à Serial Â

interface-number ˙ ʎ

ð ɜ Ô

ð Ô

ÞO 0 ˚ ˙

```
Ruijie# clear interface serial 1/0
```

6.1.4 clear line

˘ ㅓㄸ ㅋ **clear line** Â

clear line [*line-type*] *line-number*

ð Ô

line-type ˙ Line ˘ **aux** à **console** à **vty** Â ‡ ù **tty** Â

line-number ˙ ㅓ Â

ð ㅋ Ô

ð Ô

ㅋ ㅓㄸ ㅓ ^ **tty** à **aux**˜ à ^ **vty** à **console**˜ Â
ㅋ˘ line Â

ð Ô

Ю VTY 0 ˙

```
Ruijie# clear line vty 0
```

6.1.5 debug dialer

ㅓ^ DDR˜ ˘ ㅋ **debug dialer** Â

debug dialer { **pkt** | **mlp**|**callback**|**event**}

ð Ô

pkt ˙ ㅓ ₁

mlp ˙ ㅓ

callback˙ dialer Y˚

event˙ ㅓ Y˚

ð ㅋ Ô

ð Ô

ㅋ ㅓㄸ ㅓ Â

6.1.6 debug ppp

PPP ˘ ㅓㄸ ㅋ **debug ppp** Â

debug ppp [**authentication** | **error** | **event** | **negotiation** | **packet**]

ð Ô

authentication ‘ PPP

error ‘ PPP

event ‘ PPP Y¨

negotiation ‘ PPP

ﻫ Â

ð Ô

Ю й 10 ˋ

```
Ruijie(config)# interface async 1
Ruijie(config-if)# dialer enable-timeout 10
```

6.1.8 dialer-group

1 ﻫ ‡˘ ﻍ **dialer-group** Â ﻍ no ﻫ ‡ Â

dialer-group *group-number*

no dialer-group

ð Ô

group-number ˋ 1 ﻫ ‡ ﻫ

ð Ô

ﻫ ‡ Â

ð ﻍ Ô

ð Ô

يي ﻫ˘ ″I ж ﻫ Л ъ 1 ﻫ˘ 1 ﻫ ‡ ﻍ **dialer-list** ˘ ѣ˘ Э è ﻫ ‡ Â

ð Ô

Ю 1 ﻫ ‡ 1ˆ ﻫ IP 1 ﻫ˜ˋ

```
Ruijie(config)# dialer-list 1 protocol ip permit
```

‟ Â

dialer hold-queue *packets* [**timeout** *seconds*]

no dialer hold-queue [*packets* [**timeout** *seconds*]]

ð Ô

packet ʻ ‟ ɟ ˘ ʌ 0 100 Â

timeout *seconds* ʻ ɟ ‟ ˆ ˜˜ 45s Â

ð Ô

‟

ð ३ Ô

ð Ô

MODEM ʌ ˘ Â

ʎ ʃ ˘
˘ æ Â

ð Ô

ЮО 1 ѝ 60 ˙

```
Ruijie(config)# int async 1
Ruijie(config-if)# dialer idle-timeout 60
```

ð ʒ Ô

ʒ	
dialer-group	ʎ ‡
dialer fast-idle	

6.1.11 dialer-list

ЊЖ 1 ʎ ‡˘ ʒ **dialer-list** Â ʒ **no** 1 ʎ ‡ Â

dialer-list *dialer-group* **protocol** { **ip** } { **permit** | **deny** | **list** *access-list-number* }

no dialer-list *dialer-group* [**protocol** { **ip** } { **permit** | **deny** | **list** *access-list-number* }]

ð Ô

dialer-group ˙ 1 ʎ ‡ ʎ Â

permit ˙

deny ˙

list ˙ ‟ a ЊЖ 1 ʎ ‡ Â

access-list-number ˙ ‟ ʎ Â

ð Ô

a ЊЖ 1 ʎ ‡ Â

ð ʒ Ô

ð Ô

ʒ ЮО ЊЖ 1 ʎ ‡˘ **dialer-group** ʎ ‡ é ʎ Â ʒ Â

Ю 0 Э ﾊ 1

```
Ruijie(config)# interface dialer 0
Ruijie(config-if)# dialer pool 1
```

ð ｷ Ô

ｷ	
dialer pool-member	╗ ﾊ
dialer remote-name	ў ¨ Â

6.1.13 dialer pool-member

╗ ﾊ ˇ ｷ **dialer pool-member** Â
ｷ **no** ﾍ ﾊ Â

dialer pool-member *number* [**priority** *priority*]

no dialer pool-member *number* [**priority** *priority*]

ð Ô

number ˙ ﾊ ﾊ

priority *priority* ˙ ﾊ ″I ^ 0 255˜˜ 0 ѝ æ ″I ˇ 255 ѝ ″I Â ″I ﾊ ″I ﾊ Â

ð Ô

a ╗ ﾊ Â ″I ѝ 0 Â

ð ｷ Ô

ð Ô

ｷ ╗ ﾊ ˇ ﾊ Â

ﾊ Ъ╗ ﾊ ˇ ˚ ﾊ ″I Â
ﾊ ﾊ ˇ ″I з ″I Â

ð Ô

Ю 1 ╗ ﾊ 1 ″I ↑ ѝ 50 100

```
Ruijie(config)# interface async 1
Ruijie(config-if)# dialer pool-member 1 priority 50
Ruijie(config-if)# dialer pool-member 2 priority 100
```

ð ɜ Ô

ɜ	
dialer pool	Э ʎ Â
dialer remote-name	ў ¨ Â

6.1.14 dialer priority

ʎ ˆ DDR˜ ″I ˘ ɜ **dialer priority** Â ɜ **no** Â

dialer priority *number*

no dialer priority

ð Ô

number ˙ ″I ˆ 0˙ 255˜˜ ˘ ″I ˘ ѝ 0 Â

ð Ô

ѝ 0

ð ɜ Ô

ð Ô

ɜ ʌ DDR Â ѝ à ″I ˘ ʌ Л Ъ ″I ″I ˘ DDR ʎ ˘ ″I ″I ʎ Â

ð Ô

Ю 1 ″I ѝ 50̋

```
Ruijie(config)# interface async 1
Ruijie(config-if)# dialer priority 50
```

6.1.15 ip address negotiated

PPP ˘ ɜ **ip address negotiated** Â ɜ **no** ╖ ʌ ╖ Â

ip address negotiated

no ip address negotiated

ð Ô

ð ㅋ Ô

ð Ô

ㅋ ў ㅅ ˇ IP ㄴ ╟ ↑ ˇ

peer default ip address ҳ Э ѝ

ð Ô

Ю ǰ ѝ

```
Ruijie(config)# ip address-pool local
```

ð ҳ Ô

ҳ	
ip local pool	Ⱨ
peer default ip address	IP

6.1.17 ip route

ҳ IP ҳ Â

6.1.18 line

[8] Line

```
Tty    Type    speed   Overruns
* 0    AUX     115200  0
Line 1, Location: "", Type: ""
Length: 24 lines, Width: 80 columns
Special Chars: Escape  Disconnect  Activation
^^x    none       ^M
Timeouts:     Idle EXEC    Idle Session
00:10:00    never
History is enabled, history size is 10.
Total input: 0 bytes
Total output:  1 bytes
Data overflow:  0 bytes
stop rx interrupt:  0 times
Modem: IDLE
```

Tty Ю ㅓ й ㅓ Â ⁸ ㅓ ㅓ 0 Â è ㅓ . ㅓ ㅓ ˘ Лъ **show line** й Â

aux \ **console** \ **vty** Line ㅓ˘ Ю ㅓ ˘ ¨ 1 Line ㅓ й 1˘ a˚ ˂ ˘ **show line** ㅋ Â

ð Ô

Ю 0 4 Line ˘ 0 4'

```
Ruijie(config)# line vty 0 4
Ruijie(config-line)# exec-timeout 0 0
```

ð ㅋ Ô

ㅋ	
show line	line

6.1.19 peer default ip address

й IP ˘ ㅋ **peer default ip address** Â ㅋ **no** ㅓ IP Â

peer default ip address { *ip-address* | **pool** [*pool-name-list*] }

no peer default ip address

ð Ô

ip-address ' й IP ˘ й IP ˘ a DDR ㅓ й IP

number ' PPP ˘ ѝ 0 Â

ð Ô

a

ð ﾔ Ô

ð Ô

˘ ¨ ѝ Ƶ Љ ѣ˘
2 Â ѣ Љ ѣ˘ ˆ æ˜ Â

ð Ô

Ю 1 ѝ 4:

```
Ruijie(config)# interface async 1
Ruijie(config-if)# ppp max-bad-auth 4
```

ð ﾔ Ô

ﾔ	
Ppp authentication	PPP

6.1.21 pppoe enable

Љ Э PPPoE˜ ﾔ **pppoe enable** Â ﾔ **no** PPPoE Â

pppoe enable

no pppoe enable

ð Ô

PPPoE Â

ð ﾔ Ô

ð Ô

ﾔ Љ PPPoE ﾉ ﾔ ˘ PPPoE ℸ Â

ﾔ RGNOS ‟ PPPoE Â

ð Ô

Ю RGNOS “ Лъ Э PPPoE‘

```
Ruijie(config)# interface GigabitEthernet 0/0
Ruijie(config-if)# pppoe enable
```

ðð ｷ Ô

ｷ	
pppoe-client	PPPoE DDR ╖

6.1.22 pppoe-client

Лъ PPPOE ﾊ^ DDR˜ ╖ ˘ ｷ
pppoe-client Â ｷ **no** ﾍ PPPoE ﾊ ╖ Â

pppoe-client dial-pool-number *number* {**dial-on-demand| no-ddr}**

no pppoe-client dial-pool-number *number*

ðð Ô

number ‘ ﾊ ﾊ

dial-on-demand‘ PPPoE Client Â

no-ddr‘ PPPoE Client Â

ðð Ô

ðð ｷ Ô

ðð Ô

ｷ Лъ ﾊ ˘ ﾊ ˘ ÿ и
Лъ ˘ DDR ﾊ Â

ﾉ Лъ ч ﾊ ‘

1˜‘ и **dial-on-demand** ˘ 1 ﾊ ‡ ˘
˘ ‡ 1 Лъ PPPoE ﾊ Â ˘
‡ Â

2˜‘ и no-ddr ˘ ‡ a ‡ ˘ ≠ a ﾍ 8
˘ ╟ 1 Лъ PPPoE ﾊ Â

ðð Ô

Ю Лъ 1 ﾊ 1˜ PPPOE ﾊ ╖ ‘

```
Ruijie(config)# interface GigabitEthernet 0/1
Ruijie(config-if)#    pppoe-client    dial-pool-number    1
dial-on-demand
```

ð ³ Ô

³	
pppoe enable	PPPoE ╖

6.2

6.2.2 show pppoe

PPPoE ˘ ¢ **show pppoe** Â

show pppoe { **session** | **tunnel** }

ð ¢ Ô

ð Ô

¢ **session** **tunnel** Â

ð Ô

Ю ¢ ˙

```
Ruijie# show pppoe tunnel
pppoe tunnel state
state is TERMINATED ,my mac is 4E.54.38.00.00.01 , peer mac is
00.D0.F8.38.AA.20
Next timer fires after: 00:00:14
```

PPPOE ЛЬЮЎΩ ˙

- SENT_IDLE
- SENT_PADI PADI
- RECEIVED_PADO PADO
- SENT_PADR PADR
- SESSION Session
- TERMINATED Session

Next timer fires after Ю ╠ Â

7 Aggregate Port

7.1 aggregateport load-balance

AP Â ҳ **no** ӣ Â

aggregateport load-balance { **dst-mac** | **src-mac** | **src-dst-mac** | **dst-ip** | **src-ip** | **src-dst-ip** | **src- l4port** | **dst-l4port** | **src-dst-l4port** | **src-ip-src-l4port** | **src-ip-dst-l4port** | **dst-ip-src-l4port** | **dst-ip-dst-l4port** | **src-ip-src-dst-l4port** | **dst-ip-src-dst-l4port** | **src-dst-ip-src-dst-l4port** | **src-dst-ip-dst-l4port** | **src-dst-ip-src-dst-l4port** }

no aggregateport load-balance

ъ Ô

dst-mac	MAC ↑ Â AP ˘ MAC ˚ ˚ ˘ MAC a˚ ↑ a˚ Â
src-mac	MAC ↑ Â AP ˘ a˚ MAC ↑ a˚ ˘ ˚ MAC ˚ Â
src-dst-mac	MAC б MAC ↑ Â a˚ MAC+ MAC a˚ ˘ ˚ MAC+ MAC ˚ Â
dst-ip	IP ↑ Â AP ˘ IP ˚ ˚ ˘ IP a˚ ↑ a˚ Â
src-ip	IP ↑ Â AP ˘ a˚ IP ↑ a˚ ˘ ˚ IP ˚ Â
src-dst-ip	IP б IP ↑ Â a˚ IP+ IP a ˚ ˘ ˚ IP+ IP ˚ Â Ь ˚ Ю Â
src- l4port	L4 л ↑ Â a˚ L4 л ↑ ˘ ε ˚ L4 л ‡ ↑ ˚ Â
dst- l4port	L4 л ↑ Â a˚ L4 л ↑ ˘ ε ˚ L4 л ‡ ↑ ˚ Â
src-dst-l4port	L4 л б L4 л ↑ Â a˚ L4 л+L4 л ↑ ˘ ε ˚ L4 л+L4 л ‡ ↑ ˚ Â
src-ip-src-l4port	IP б L4 л ↑ Â a˚ IP+L4 л ↑ ˘ ε ˚ IP+L4 л ‡ ↑ ˚ Â
src-ip-dst-l4port	IP б L4 л ↑ Â a˚ IP+L4 л ↑ ˘ ε ˚ IP+L4 л ‡ ↑ ˚ Â
dst-ip-src-l4port	IP б L4 л ↑ Â a˚ IP+L4

	ѧ ¦ ˘ é ˚ IP+L4 ѧ ‡ ¦ ˚ Â
dst-ip-dst-l4port	IP б L4 ѧ ¦ Â a˚ IP+L4 ѧ ¦ ˘ é ˚ IP+L4 ѧ ‡ ¦ ˚ Â
src-ip-src-dst-l4port	IP à L4 ѧ б L4 ѧ ¦ Â a˚ IP+L4 ѧ+L4 ѧ ¦ ˘ é ˚ IP+L4 ѧ+L4 ѧ ‡ ¦ ˚ Â
dst-ip-src-dst-l4port	IP à L4 ѧ б L4 ѧ ¦ Â a˚ IP+L4 ѧ+L4 ѧ ¦ ˘ é ˚ IP+L4 ѧ+L4 ѧ ‡ ¦ ˚ Â
src-dst-ip-src-l4port	IP à IP б L4 ѧ ¦ Â a˚ IP+ IP+L4 ѧ ¦ ˘ é ˚ IP+ IP+L4 ѧ ‡ ¦ ˚ Â
src-dst-ip-dst-l4port	IP à IP б L4 ѧ ¦ Â a˚ IP+ IP+L4 ѧ ¦ ˘ é ˚ IP+ IP+L4 ѧ ‡ ¦ ˚ Â
src-dst-ip-src-dst-l4port	IP à IP à L4 ѧ б L4 ѧ ¦ Â a˚ IP+ IP+L4 ѧ+L4 ѧ ¦ ˘ é ˚ IP+ IP+L4 ѧ+L4 ѧ ‡ ¦ ˚ Â

ð Ô Ю MAC + MAC ¦ ’ Ю
IP + IP ¦ Â

AP MAC MAC ë _ є

aggregateport member linktrap

no aggregateport member linktrap

ò Ô

-	-

ò Ô ЮЎ AP LinkTrap ╖ Â

ò ҂ Ô Â

ò Ô ЮЎ a **[no] snmp trap link-status** ҂ AP ŭ LinkTrap ╖ ˘
ЮЎ **[no] aggregateport member linktrap** ҂ AP ŭ
LinkTrap ╖ Â

ò Ô Ю AP LinkTrap ╖ ˙

```
Ruijie# configure terminal
Ruijie(config)# aggregateport          d                    h
```

ð ¾ Ô

¾	
show interfaces aggregateport	AP ↓ Â

ð ∧ Ô NPE40/NPE50E/NPE60E ¾ Â

7.4 port-group

Ⅱ ╗ AP Â ¾ **no** AP Â

port-group *ap_number*

no port-group

ð Ô

ap_number	AP ∧ Â

ð Ô Ю Ⅱ a AP Â

ð ¾ Ô Â

ð Ô **port-group** ¾ ╗ AP ˇ AP … ˇ ‡ ╟… AP Â

ð Ô Ю Ⅱ Gi0/3 AP 5 ‘

```
Ruijie# configure terminal
Ruijie(config)# interface gigabitEthernet 0/1
Ruijie(config-if-GigabitEthernet 0/1)# port-group 5
```

ð ¾ Ô

¾	
show aggregateport	AP AP Â

ð ∧ Ô NPE40/NPE50E/NPE60E ¾ Â

7.5 show aggregateport

AP AP Â

show aggregateport { [*ap_number*] **summary** | **load-balance** }

ð Ô

ap_number	AP ∧ Â
summary	AP Â
load-balance	AP Â

ð Ô -

ð ¾ Ô Ю Л Â

ð Ô **show aggregateport summary** ¾ AP Л˘ ‡ AP ˘ ŭ
‡ Л AP Â

ð Ô Ю AP 1 ‘

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

Ю AP ‘

```
Ruijie# show aggregateport load-balance
Load-balance : Source MAC address
```

ð ¾ Ô

¾	
interfaces aggregateport	… AP AP Â
port-group	Л ╗ AP Â

ð Л Ô NPE40/NPE50E/NPE60E ¾ Â

7.6 show interfaces aggregateport

AP ↓ Â

show interfaces aggregateport *ap_number*

ð Ô

ap_number	AP Л Â

ð Ô -

ð ¾ Ô Ю Л Â

ð Ô -

ð Ô Ю AP 1 ↓ ‘

```
Ruijie# show interfaces aggregateport 1
Index(dec):25 (hex):19
AggregatePort 1 is DOWN  , line protocol is DOWN
Hardware is Aggregate Link AggregatePort, address is 00d0.f822.334a (bia 00d0.f822.334a)
Interface address is: no ip address
ARP type: ARPA,ARP Timeout: 3600 seconds
  MTU 1500 bytes, BW 1000000 Kbit
  Encapsulation protocol is Ethernet-II, loopback not set
  Keepalive interval is 10 sec , set
  Carrier delay is 2 sec
  RXload is 1 ,Txload is 1
  Queueing strategy: FIFO
```

```
    Output queue 0/40, 0 drops;
    Input queue 0/75, 0 drops
  Link Mode: Down.
Aggregate Port Informations:
        Aggregate Number: 1
        Name: "AggregatePort 1"
        Refs: 2
        Members: (count=1)
        GigabitEthernet 0/1             Link Status: Down
  30 seconds input rate 0 bits/sec, 0 packets/sec
  30 seconds output rate 0 bits/sec, 0 packets/sec
    0 packets input, 0 bytes, 0 no buffer, 0 dropped
    Received 0 broadcasts, 0 runts, 0 giants
    0 input errors, 0 CRC, 0 frame, 0 overrun, 0 abort
    0 packets output, 0 bytes, 0 underruns , 0 dropped
    0 output errors, 0 collisions, 0 interface resets
```

ð ¾ Ô

¾	
interfaces aggregateport	… AP AP Â

ð ¼ Ô NPE40/NPE50E/NPE60E ¾ Â

7.7 snmp trap link-status

AP LinkTrap ¶ Â ¾ **no** AP LinkTrap ¶ Â

snmp trap link-status

no snmp trap link-status

ð Ô

ap_number	AP ¼ Â

ð Ô ЮЎ AP LinkTrap ¶ Â

ð ¾ Ô ЮÂ

ð Ô ¾ ¼ Лъ AP Э˘ a AP Э Â

ð Ô ЮAP 10 LinkTrap ¶ ˙

```
Ruijie(config)# interfaces aggregateport 10
Ruijie(config-if-Aggregateport 10)# no snmp trap link-status
```

ð ¾ Ô

¾	
-	-

ð ¼ Ô NPE40/NPE50E/NPE60E ¾ Â

IP

ǂ ̓Ą IP ⊾ ⅋ ̓Ą ˘ ЛЬЮ ˙

1. IP ⅋
2. IP ⊾ ⅋
3. IPv4 REF ⅋
4. ⁄
5. IP NAT ⅋
6. ⅋

1 IP

1.1

1.1.1 ip address

ꝛ IP ˘ Л Лъ no IP Â ꝛ
Ю

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

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

ð Ô

ip-address	32 Æ IP ˘ 8 Æ ˘ Лъ ⁸ ˘ Â
network-mask	32 Æ ˘ “1” Æ˘ “0” ў Æ Â 8 Æ ˘ Лъ ⁸ ˘ Â
secondary	IP Â

ð Ô

IP Â

ð ꝛ Ô

ð Ô

Л IP ˘ Л Лъ IP ˘ IP ˘
IP Â

≠ 32 Æ ˘ IP й ↑ Â
˘ й ľ 1 Ł IP Æ й ↑ ˘ й ľ 0 Ł
IP Æ й ў ↑ Â A й
ľ 255.0.0.0 ŁÂ Л Лъ ↑ ˘ ↑
ў ↑ Æ ≠ й ↑ ˘ ў ˘ ╗ ˘
й Â

RGOS ˙ Л Лъ IP ˘ è й ў IP ˘ è

ѝ IP Â IP Э ⁸˘ Л Љ ˘ Л Л
ў IP ѣ IP Â IP Л Љ б ў IP ˘
а˘ Â ˘ IP ˘ ЉЮ Ю
IP ‘

- ў Â C ˘ Л†
254 Л ў Â ў 254 Л ˘ C a † ˘
† Ы C Â ч ˘ Љ IP
Â

- ү ˘ † Â IP
Л Љ ` IP Â ˘
IP Â

- ч Ы ˘ Л Љ…
˘ IP ˘ Â a
ч ч Љ Э Â

ð Ô

ЉЮ ˘ ў IP ѝ 10.10.10.1˘ ѝ 255.255.255.0 Â

```
ip address 10.10.10.1 255.255.255.0
```

ð ३ Ô

३	
show interface	

ð Л Ô

ү Э˘ Л Ь IP ˘ з а ү ˘¨ secondary

1.1.2 ip unnumbered

ð Ô

ЮЎ ﻩ Â

ð ع Ô

ð Ô

ﻩ ﻩ ╠ IP ˇ a┤ IP ˇ ﻩ
é IP Â ﻩ IP ˇ IP й
IP Â ↓ ≠ IP ˇ ā ŭ
ﻩ Â ﻩ ˇ ЛЪЮ ⁸ '

- Лъ a ﻩ Â
- SLIP à HDLC à PPP à LAPB à Frame-relay ˇ ﾊ Лъ ﻩ
  Â ˇ ﾊ ﻩ ÂX.25
  a ﻩ Â
- a ping ع ﻩ ŭ ˇ й ﻩ IP
  Â SNMP ﾊ Лъ ﻩ Â
- a ﻩ ╠ Â

ð Ô

ЛЪЮ ˇ й ﻩ ˇ й GigabitEthernet 0/1 Â
IP Â

```
ip unnumbered GigabitEthernet 0/1
```

ð ع Ô

ع	
show interface	

ð ﻩ Ô

ع ү Э a Â

1.2

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

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

ð Ô

ip-address	б MAC IP ˘ † ù ⁸ ˘ Â
MAC-address	˘ 48 Æ
type	ARP Â Л ˘ ù arpa Â
alias	^ Л ~ Ж ł˘ RGOS IP

arp-learning enable

no arp-learning enable

-	-

Ю ╠ ARP ˟ ╖ Â

٣ Â

˟ ˟ ╠ ARP ˇ web ╠ ARP ѝ
ARP ł˘ ╖ ˇ ŭ ‡ a ╖ Â ╠ ARP a ˟ ╖ ł˘
╠ ARP ˇ ╠ ARP ѝ ARP ˇ Л Љ
web ˇ ╠ ARP ˇ a Э ˇ ‡ Л Љ clear
arp ٣˘ ŭ ‡ ╠ ARP ˇ ł˘ ╠ ARP
Â ╠ ARP ˟ ╖ ł˘ ‡ AnyIP ╖ à Л ARP ╖ Â

1ˈ ЉЮ ˇ ╠ ARP ˟ ╖ Â

```
Ruijie(config)# interface gi 0/0
Ruijie(config-if-GigabitEthernet 0/0)# arp-learning enable
```

2ˈ ЉЮ ˇ ╠ ARP ˟ ╖

```
Ruijie(config)# interface gi 0/0
Ruijie(config-if-GigabitEthernet 0/0)# no arp-learning enable
```

٣	
-	-

Л

Л	
10.3(4b8)	10.3(4b8)

no arp any-ip

-	-

Ю ╖ Â

٦ Â

Ю ч Э ‘

1 à IP ˘ IP a Э IP’

2 à IP a ˘ è ˘ ¨ ă

IP a ˘ è ╠ ARP à ╠

″I ARP ˘ Ю (a Ю) a Э ˘

ARP ‘

1 à ٦ ARP ˘ MAC ł˘ Э clear arp˘

╠ ARP à ╠ ˘

2 à ٦ ARP ˘ MAC ł˘ Э AnyIP ╖ ˘

ł Ά

‘ AnyIP ╖ ≠ ╠ ARP à ╠ ˘ ÿ

Â

↓ ˘ ARP VRRP ARP˝ AnyIP ╠ ARP ╕

˘ AnyIP ╖ a Â

1‘ ЛЬЮ ˘ ARP AnyIP ╖ Â

```
Ruijie(config)# interface gi 0/0
Ruijie(config-if-GigabitEthernet 0/0)# arp any-ip
```

2‘ ЛЬЮ ˘ ARP AnyIP ╖

```
Ruijie(config)# interface gi 0/0
Ruijie(config-if-GigabitEthernet 0/0)# no arp any-ip
```

٦

٦	
-	-

٨

٦

٨	
10.3(4t76)	10.3(4t76)

1.2.4 arp retry interval

¢ Л Љ arp IP
2 ARP Â ¢ no Л Љ 1
ARP Â

arp retry interval *seconds*

no arp retry interval

ð Ô

seconds	<1-3600>,ARP Л Љ й 1 ——3600 й 1

ð Ô

ARP й 1 Â

ð ¢ Ô

ð Ô

ą̃ ARP è Л Љ
ARP a ╟ ARP Â

ð Ô

ЉЮ ARP й 30s

```
arp retry interval 30
```

ð ¢ Ô

¢

ð Ô

number	ˇ ARP ˇ <1-100> Â ù 1 ˇ a ARP ˇ Ñ 1 ARP

ð Ô

ARP ˇ ARP 5 ˇ ł Â

ð ¾ Ô

ð Ô

ą̃ ARP ˇ è ˇ Ñ Ћ
ARP ˇ a Â

ð Ô

ЛЬЮ ˇ ARP a Â

```
arp retry times 1
```

ЛЬЮ ˇ ARP 1 Â

```
arp retry times 2
```

ð ¾ Ô

¾	
arp retry interval *seconds*	arp

1.2.6 arp scan

¾ˇ Ñ Ћ ARP ╖ Â

arp scan **[***start-ip-address end-ip-address***]**

start-ip-address	ARP]]

३ Â

1.2.7 arp trusted

¾˘ Л Ъ Л ARP Â ¾ no Â

arp trusted *number*

no arp trusted

ð Ô

number	Л Ъ Л ARP

ð Ô

Л à Ы Ю'

NPE40 à NPE50E à NPE60 à NPE60E Л <10-7168> ˘ 4096 Â

ð ¾ Ô

ð Ô

Л ARP è ˘ Л ARP . ˘ Л ╠ ARP a Â ˘ a Â Л ARP ╖ ˘ ″I DHCP Ю ╠ update arp ╖ Â

ð Ô

ЪЮ ˘ Л Ъ 1000 Л ARP Â

```
arp trusted 1000
```

ð ¾ Ô

¾	
update arp	Л ARP DHCP server Â ¾ DHCP Ю Â

1.2.8 arp trust-monitor enable

¾ Л arp ╖ Â ¾ no ╖ Â

arp trust-monitor enable

no arp trust-monitor enable

1.2.9 arp trusted aging

ꝛ˘ ʌ ɲ ʌ ARP Â ꝛ no Â

arp trusted aging

no arp trusted aging

ð Ô

ð Ô

ʌ ARP a Â

ð ꝛ Ô

ð Ô

ꝛ ɨ ʌ ARP ˘ ╟ ARP ˘ Â
ʌ ɲ Ю **arp timeout** ꝛ Â

ð Ô

Â

ð ꝛ Ô

[redacted]

ARP ă Л Љ 8192 Â

ð ঳ Ô

ð Ô

ARP ˘ з ł ˘ Л Љ
঳ 8 Â

ð Ô

ЉЮ ˘ й 500 Â

```
arp unresolved 500
```

ð ঳ Ô

1.2.11 arp gratuitous-send interval

঳˘ Л Љ arp Â ঳ no
Э ╖

arp gratuitous-send interval *seconds*

no arp gratuitous-send

ð Ô

seconds	ARP ˘ Æ ˘ ∧ <1-3600> Â

ð Ô

ARP ╖ Â

ð ঳ Ô

ð Ô

й Ю ˘ Ю Ί й˘ ‡
Л Љ ARP ˘ Ώ Â

ð Ô

ЉЮ ˘ ă SVI 1 ARP Â

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

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

ЛЬЮ ˘ ắ SVI 1 ARP

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

ð ३ Ô

1.2.12 arp timeout

ARP ắ ٢ ARP ậ Є ट ३ Ở

show interface	

1.2.13 ip proxy-arp

Э ٪ ARP ╖ ˇ Л Лъ **ip proxy-arp** ٪ Â ٪ no Л Лъ ٪ ARP ╖ Â

ip proxy-arp

no ip proxy-arp

ðð Ô

10.2(3) ł ˇ ٪ ARP Â

ðð ٪ Ô

ðð Ô

٪ ARP ╖ Л Лъ ╠ ў ˇ è IP MAC Â ARP ˇ ARP IP б IP a ˚ ˇ Ы IP ˇ ARP ˇ MAC й Лъ MAC Â Лъ Э ٪ ARP ╖ Â

ðð Ô

ЛъЮ ˇ Лъ GigabitEthernet 0 ٪ ARP ╖ Â

```
interface GigabitEthernet 0
ip proxy-arp
```

ðð Л Ô

٪ ү Э a Â

1.3

1.3.1 ip broadcast-addresss

Нж ˇ ٪ **ip broadcast-addresss** Â ٪ no Л Лъ Ы Â

ip broadcast-addresss *ip-address*

no ip broadcast-addresss *ip-address*

ð Ô

ð Ô

IP ã ù IP IP ˘ ù
172.16.16.255 ù ã Â ◝ a
Â

б IP ã ˘ ã
Â ã ł˘ ã
ù ^ IP ù ľ 1 Ł ~~ ł Љ
Э ў Â

Л Љ Э˘ ╠ ã ╖ ˘ Л Љ
ã Â ʒ Л ã
ł ˘ a è ã Â

Э˘ Л Љ Ћ “ ⁸ ã Â Ћ “
˘ Л “ Ћ ã Â

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

ð Ô

ЉЮ ˘ GigabitEthernet 0/1 ã Â

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

ð Л Ô

ʒ ɣ Э a Â

1.4 IP

1.4.1 clear arp-cache

ÿ ARP ă ╠ ARP ˘ Љ ◝ IP ă ˘ ʒ
clear arp-cache Â

clear arp-cache [**trusted**] [*ip* [*mask*]] [**interface** *interface-name*] ð Ô

trusted	Л ARP
ip	IP ˘ ‾ IP ARP ˘ **trusted** ‡ Л ARP ˘ ŭ ‡ ù ╠ ARP
mask	mask ù ˘ ‾ ARP

	˘ IP ⊀; trusted ‡ ⊀ ARP ˘ ŭ ‡ ╟ ARP Â
interface *interface-name*	╟ ARP

ð ꝛ Ô

ð Ô

⊀ Ɲ ꝛ 9 ARP Â

~

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

ð Ô

ƝЬЮ ˘ ARP ╟ ă Â

```
clear arp-cache
```

ƝЬЮ ˘ ╟ ARP 1.1.1.1

```
clear arp-cache 1.1.1.1
```

ƝЬЮ ˘ SVI1 Ю ╟ ARP

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

ð ꝛ Ô

ꝛ	
arp	ARP ╗ Â

1.4.2 show arp

ˆ ARP˜ ă

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

ð Ô

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

ð ३ Ô

ð Ô

ЛЬЮ й show arp ‘

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

ARP ă ЬЖ Ю

Protocol	˘ й Internet Â
Address	б ˚ IP Â
Age (min)	ARP ă ˘ Лъ Â

	˘ “-” Â
Hardware	б IP ˚ Â
Type	˚ ˘ Лъ ѝ ARPA Â IP б IP ¼

```
The Arp Entry counter:0
The Unresolve Arp Entry:0
```

ARP ă Ћ Ю

ð Л Ô

҃ Y Э a Â

network	
netmask	ˆ Л ˜

ð ꝛ Ô

ð Ô

˘ Л Лъ ¯ 9 Â

˘ Â

ð Ô

ЛъЮ ˘ Л 192.168.12.0 Â

```
clear ip route 192.168.12.0
```

ð ꝛ Ô

ꝛ	
show ip route	IP

ð Л Ô

ꝛ ɣ Э a Â

1.4.6 show ip arp

ˆ ARP˜ ă ˘ ꝛ Â

show ip arp

ð Ô

ð ꝛ Ô

ð Ô

ЛъЮ й **show ip arp**

```
Ruijie# show ip arp
Protocol Address      Age(min)Hardware      Type
Interface
Internet  192.168.7.233    23         0007.e9d9.0488    ARPA
GigabitEthernet 0/0
```

```
Internet  192.168.7.112    10          0050.eb08.6617    ARPA
GigabitEthernet 0/0
Internet  192.168.7.79      12          00d0.f808.3d5c    ARPA
GigabitEthernet 0/0
Internet  192.168.7.1       50          00d0.f84e.1c7f    ARPA
GigabitEthernet 0/0
Internet  192.168.7.215    36          00d0.f80d.1090    ARPA
GigabitEthernet 0/0
Internet  192.168.7.127    0           0060.97bd.ebee    ARPA
GigabitEthernet 0/0
Internet  192.168.7.195    57          0060.97bd.ef2d    ARPA
GigabitEthernet 0/0
Internet  192.168.7.183    --          00d0.f8fb.108b    ARPA
GigabitEthernet 0/0
```

ARP ă ЬЖ ЮЎ

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

ъ Л Ô

ҳ Ү Э a Â

1.4.7 show ip interface

ҳ Л Лъ IP Â ҳ ЮЎ

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

ъ Ô

Interface-type	
Interface-number	Л

ð ʒ Ô

ð Ô

Λ ˘ RGOS … Â Λ
RGOS ˚ Λ Лъ Â ÿ Λ ٨ ѝ a Λ ˘
RGOS ˚ ÿ Â

Λ ˘ ٧ ă ˘ ľ UP Ł
Λ ˘ ľ UP ŁÂ

a˚ ˘ Λ a ˘ ѝ Â

ð Ô

ЛъЮ ѝ **show ip interface** Â

```
Ruijie# show ip interface GigabitEthernet 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 address negotiate is:	IP ษ๊
Forward direct-boardcast is:	ษ๊ ฉ๊
ICMP mask reply is:	ษ๊ ICMP
Send ICMP redirect is:	ษ๊ ICMP ฉ๊
Send ICMP unreachabled is:	ษ๊ ICMP a ภ
DHCP relay is:	ษ๊ DHCP
Fast switch is:	ษ๊ IP ๗
Route horizontal-split is:	ษ๊ ๋ ˘

2 IP

2.1 IP

2.1.1 ip default-gateway

ץ Э ˘ ३ **ip default-gateway** Â ३ no **2** Â

ʒ **ip mask-reply** Â ʒ no ICMP Â

ip mask-reply

no ip mask-reply

ð Ô

ICMP Â

ð ʒ Ô

ð Ô

Э ˘ й ʎ ˘

/ Л ICMP ˘ ICMP

Â

ð Ô

ЛЬЮ ˘ GigabitEthernet 0/1 ICMP

ЛЬЮ ˘ GigabitEthernet 0/1 ICMP ӓ Â

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

ð Л Ô

-

2.1.5 ip source-route

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

ip source-route

no ip source-route

ð Ô

Â

ð ҂ Ô

ð Ô

RGOS IP Â IP ˘ IP ш à
à ˘ RFC 791 Â
è ˘ ╠ ’ ˘
ICMP ˘ ł Â

RGOS ˚ Ю IP Â

ð Ô

ЛЬЮ ˘ IP Â

```
no ip source-route
```

ð Л Ô

-

2.1.6 ip unreachables

RGOS ˚ ICMP a Л ˘ ҂ **ip unreachables** Â
҂ no Л Лъ ICMP a Л Â

ip unreachables

no ip unreachables

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ð Ô

ð Ô

RGOS ˚ ù ˘ ◊ a Э
˘ ICMP a / Â

RGOS ˚ ˘ a ˘ ą̈ ICMP
ў a / Â

ICMP a / Â

ð Ô

ЛЬЮ ˘ GigabitEthernet 0/1 ICMP a / Â

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

ð Ô

-

3 IPv4 REF

3.1

IPv4 REF Ruijie Express Forwarď ↓ IP ƀ Â

3.1.1 ip ref load-sharing original

IPV4 REF ŕ IP ╗ IP’ ҳ no ҳ Л Љ IP
Â ЮЃ ¯ IP/MASK Ю ЮЃ ҳ Л Љ
ˇ ÿ IP+ IP Â Ь ‘

IP ˇ IP “ˇ Â
Â

IP IP IP ˇ IP IP “ˇ
Â

IP IP ˇ IP “ Â ˇ
˚ IP˝ ˚ Â

[no] ip ref load-sharing original

-	-

Â

ҳ Â

Э ˚ REF ˇ Ь ˇ IP
ˇ ↓ ŕ IP IP ˇ Ь ŕ IP Â
IP ˇ ŕ IP ˇ REF Љ IP ƀ
è Â ŕ IP Â

1‘ IP+ IP Â

```
Ruijie(config)# ip ref load-sharing original

Ruijie(config)# no ip ref load-sharing original
```

३	
-	-

∧	-

३	∧	
	-	-

3.1.2 ip ref load-sharing original-only

IPV4 REF ѝ IP' ३ no ३ ∧ Л Ъ IP Â
Ю ¨ IP/MASK Ю Ю ३ ∧ Л Ъ
ˇ ÿ IP Â ˇ a ˚ IP ÿ
a ˚ ˇ ‡ ३ Â

[no] ip ref load-sharing original-only

-	-

Â

३	Â

ˇ a ˚ IP ÿ a ˚ ˇ ‡ ३

1' IP Â

```
Ruijie(config)# ip ref load-sharing original-only

Ruijie(config)# no ip ref load-sharing original-only
```

३	
-	-

∧	-

३	∧	

	-	-

3.1.3

3.2 IPv4 REF

3.2.1 show ip ref packet-statistic

ৡ REF Â è ৡ Ю

show ip ref packet-statistic [**clear**]

clear	Â

ৡ Â

ʌ Л Ъ ৡ REF Â

1
```
Ruijie #show ip ref packet-statistic
ref packet statistic:
total recved    : 5
 bad head     : 0
lookup fib fail   : 0
drop adj       : 0
local adj       : 5
glean adj      : 0
forward        : 0
no ip routing    : 0
```

total recved	
bad head	
lookup fib fail	
drop adj	ĕ
local adj	ĕ
glean adj	ĕ
forward	ĕ
no ip routing	a

३	३	
	-	-

/ -

३	/	
	-	-

3.2.2 show ip ref adjacency

३ / Л Ц Â è ३ Ю

show ip ref adjacency [**glean | local |** *ip* **| interface** *interface_type interface_number* **| statistic**]

glean	
local	
ip	Ю IP
interface_type	
interface_number	/
statistic	

Â

३ Â

३ / Л Ц REF

```
0000.0000.0000  FastEthernet 0/0
                ‘
```

id	
state	unresolve‘ resolved‘
type	local‘ forward‘ drop‘ glean‘
rfct	
chg	ŭ ∧
l2addr	Y
interface	

३	३	
	show ip ref route	REF

∧ -

३	∧	
	-	-

3.2.3 show ip ref exact-route

३ ∧ Л IP ‘ Â è ३ Ю‘

show ip ref exact-route [**vrf** *vrf_name*] *source-ipaddress dest_ipaddress*

vrf	
source-ipaddress	IP
dest_ipaddress	IP

Â

३ Â

ः ३ IP IP б IP ˘ Л Ъ REF ˘ Â

1΄

```
Ruijie#show ip ref exact-route 20.1.1.1 192.168.52.5
20.1.1.1 --> 192.168.52.5 (vrf global):
id    state      type    ip            rfct chg vid tid   len l2add
interface
2     unresolve   glean   0.0.0.0         1    0   0   0     0
0000.0000.0000  FastEthernet 0/0
```

३

३	
show ip ref route	REF

Л -

३

Л	
-	-

3.2.4 show ip ref route

३ Л Ъ REF ˘ è ३ Ю΄

show ip ref route [**vrf** *vrf_name*] [**default** | (*ip mask*) | **statistic**]

vrf	
default	
ip	IP
mask	
statistic	

Â

३ Â

Л Ъ REF ˘ Л Ъ à IP/MASK ѣ à Â

1 REF

```
Ruijie#show ip ref route
Codes: * - default route
# - zero route
 ip       mask       adj-id   next-hop          weight   interface
224.0.0.0      224.0.0.0      1      0.0.0.0        1
192.168.52.0     255.255.255.0    11        0.0.0.0            1
FastEthernet 0/0
192.168.52.255  255.255.255.255 1      0.0.0.0        1
 192.168.52.68   255.255.255.255 1      0.0.0.0        1
192.168.52.58     255.255.255.255  12          192.168.52.58     1
FastEthernet 0/0
 20.0.0.0          255.255.255.0    10        0.0.0.0            1
FastEthernet 0/1.1
 20.0.0.255     255.255.255.255 1      0.0.0.0        1
 20.0.0.3       255.255.255.255 1      0.0.0.0        1
```

ip	IP
mask	

4

4.1

4.1.1 ip session timeout

˘ /Л Ъ ip session timeout ҄ Â ҄ **no** /Л Ъ
Â

ip session timeout {**icmp-closed | icmp-connected | icmp-started | rawip-closed | rawip-connected | rawip-established | rawip-started | tcp-close-wait | tcp-closed | tcp-established | tcp-fin-wait | tcp-last-ack | tcp-syn-receive | tcp-syn-sent | tcp-time-wait | udp-closed | udp-connected | udp-established | udp-started** } *num*

no ip session timeout {**icmp-closed | icmp-connected | icmp-started | rawip-closed | rawip-connected | rawip-established | rawip-started | tcp-close-wait | tcp-closed | tcp-established | tcp-fin-wait | tcp-last-ack | tcp-syn-receive | tcp-syn-sent | tcp-time-wait | udp-closed | udp-connected | udp-established | udp-started** }

icmp-closed	̀й ICMP й ˘ 10s
icmp-connected	̀й ICMP ̀й ˘ 10s
icmp-started	̀й ICMP ̀й ˘ 10s
rawip-closed	̀й ̀є ip ̀й ˘ 10s
rawip-connected	̀й ̀є ip ̀й ˘ 300s
rawip-established	̀й ̀є ip ̀й ˘ 300s
rawip-started	̀й ̀є ip ̀й ˘ 300s
tcp-close-wait	̀й TCP ̀й close-wait ˘ 60s
tcp-closed	̀й TCP ̀й closed ˘ 10s

tcp-established	ù TCP ù established ˘ 1800s
tcp-fin-wait	ù TCP ù fin-wait ˘ 60s
tcp-last-ack	ù TCP ù last-ack ˘ 30s
tcp-syn-receive	ù TCP ù syn-receive ˘ 10s

4.2

4.2.1 show ip fpm counters

/I Â

show ip fpm counters

Â

Â

IO **show ip fpm statistic** /I Â

1'

```
Ruijie#show ip fpm statistics
The capacity of the flow table:32000
Number of active flows:0
Number of the defragment contexts:0
Number of the buffers hold by FPM:0
Event count (%256):3
```

The capacity of the flow table	/I
Number of active flows	
Number of the defragment contexts	¦ IP
Number of the buffers hold by FPM	¦ . buffer
Event count	/I Y˚

5 IP NAT

5.1

5.1.1 address

NAT ˘ NAT ҳ address Â ҳ **no** Л Лъ Â

address *start-ip end-ip* [**match interface** *interface*]

no address *start-ip end-ip* [**match interface** *interface*]

address interface *interface* [**match interface** *interface*]

no address interface *interface* [**match interface** *interface*]

start-ip	IP Â
end-ip	IP Â
interface interface	NAT outside Â Pool Њ˘ Â б ł match interface interface ˘ з ч interface Âў ‡ Л NAT а Â
match interface interface	NAT outside Â ą ł˘ NAT Ъ Л pool б ъ Â

Њ Â

ҳ NAT

Њ ˘ ”I NAT ˘ ł NAT Њ Â

1' ЛЪЮ ˘ … mulnets ˘ Њ ч Â

```
ip nat pool mulnets netmask 255.255.255.0
address 172.16.10.1 172.16.10.254
```

address 192.168.100.1 192.168.100.50

˛	
ip nat pool	Hx IP NAT

-

˛	
-	-

5.1.2 ip nat

NAT ˘ /l Jb **ip nat** ˛ Â ˛ **no** ˘ /l Jb a Ą NAT Â

ip nat { **inside** | **outside** }

no ip nat { **inside** | **outside** }

inside	Â
outside	Â

˘ NAT Â

˛

/l outside inside ˘ ɜ ‡

list-num	
dest-ip	
tcp *dest-ip port-num*	tcp
udp *dest-ip port-num*	udp
dest-change *ip-addr port-num*	
src-change *ip-addr*	
vrf vrf_*name*	vrf vrf

è IP ˘ a ˇ NAT è Â
NAT TCP ˘ ˘ ≠ Л Љ
Â ў й Â

1' ЉЮ ˘ ў 10.10.10.100
WWW Ь˘ Ь Э ч ˇ й 10.10.10.1 à
10.10.10.2 ў Â NAT ˘ Â

```
!
interface GigabitEthernet 0/0
ip address 10.10.10.254 255.255.255.0
ip nat inside
!
interface GigabitEthernet 0/1
ip address 200.168.12.17 255.255.255.240
ip nat outside
!
ip nat pool net10 10.10.10.1 10.10.10.2 prefix-length 24 type rotary
ip nat inside destination list 100 pool net10
!
access-list 100 permit ip any host 10.10.10.100
```

ֽ

ֽ	
address	Нж
ip nat	Нж NAT Â
ip nat inside source	NAT Â
ip nat outside source	NAT Â
ip nat pool	Нж IP NAT
show ip nat translations	IP NAT Â

ˇ -

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ˇ	
-	-

5.1.5 ip nat inside source

NAT˘ Л Љ ֽ **ip nat inside source** Â ֽ **no** Л Љ ˄
╟ NAT Â

ip nat inside source list *access-list-number* { **interface** *interface-type interface-number* | **pool** *pool-name* } [**overload**] [**vrf** vrf_*name*]

no ip nat inside source list *access-list-number* [**vrf** vrf_*name*]

ip nat inside source static *local-ip global-ip* [**match** *interface-type interface-number*][**permit-inside**] [**vrf** vrf_*name*] [**netmask** *mask*]

no ip nat inside source static *local-ip global-ip* [**permit-inside**] [**match** *interface-type interface-number*][**vrf** vrf_*name*]

ip nat inside source static *protocol local-ip local-port global-ip*

global-port [**match** *interface-type interface-number*] [**permit-inside**] [**vrf** vrf_*name*]

no ip nat inside source static *protocol local-ip local-port global-ip*

global-port [**match** *interface-type interface-number*] [**permit-inside**] [**vrf** vrf_*name*]

list access-list-number	“ Â /ʌ ɒ “ ˘ … NAT Â
interface interface-type interface-number	outside NAPTˆ ˜ ˘ ≠ /ʌ NAT Â
pool pool-name	NAT Â
Overload	ˆ /ʌ ˜ pool /ʌ Лъ ˘ NAPT Â ˘ ≠ Â Лъ ╕ ѝ cisco ꝛ Â
static local-ip global-ip	Нж NAT Â local-ip ѝ ˘ global-ip ѝ Â
static protocol	Нж NAT Â protocol /ʌ Лъ ѝ TCP UDP Â
local-port	⊾ ʌ Â TCP UDP ʌˇ ⊾ ⊾ Â
global-port	⊾ ʌ Â ў ⊾ Â ʌ /ʌ Лъ б local-port a˚ Â
permit-inside	/ʌ ip nat inside source static ꝛ ˘ Лъ global-ip local-ip ў Â Э Â
vrf vrf_name	vrf¨ ˘ vrf
match	
netmask mask	

NAT Â

ꝛ Â

	-	-

5.1.6 ip nat outside source

NAT ˇ Л Ъ ঽ **ip nat outside source** Â ঽ **no** Л Ъ Ч NAT Â

ip nat outside source list *access-list-number* **pool** *pool-name* [**vrf** vrf_*name*]

no ip nat outside source list *access-list-number* [**vrf** vrf_*name*]

ip nat outside source static *global-ip local-ip* [**vrf** vrf_*name*]

no ip nat outside source static *global-ip local-ip* [**vrf** vrf_*name*]

ip nat outside source static *protocol global-ip global-port local-ip local-port* [**vrf** vrf_*name*]

no ip nat outside source static *protocol global-ip global-port local-ip local-port* [**vrf** vrf_*name*]

list access-list-number	‟ Â Л ӭ ‟ ˘ … NAT Â
pool pool-name	NAT Â
static global-ip local-ip	Нѫ NAT Â local-ip ѝ ˘ global-ip ѝ Â
static protocol	Нѫ NAT

Â ˇ б ˇ IP Ä ¨ ˇ ў Â DNS NAT Â

1˙ ЛЬЮ ˇ 92.168.12.0/24 б Â ˇ ў Л Лъ 192.168.12.0/24 92.168.12.0/24 ў Â

```
interface GigabitEthernet0/0
ip address 92.168.12.55 255.255.255.0
ip nat inside
!
interface Serial0/1
ip address 92.168.100.1 255.255.255.0
ip nat outside
encapsulation ppp
!
ip nat pool net200 200.168.12.1 200.168.12.15 prefix-length 28
ip nat pool net192 192.168.12.1 192.168.12.254 prefix-length 24
ip nat inside source list  1 pool net200
ip nat outside source list 1 pool net192
access-list 1 permit 92.168.12.0 0.0.0.255
!
ip route 192.168.12.0 255.255.255.0 92.168.100.2
```

ÿ inside outside ä ˇ ˝I ā ŭ NAT˘ Â

address	НЖ
ip nat	НЖ NAT Â
ip nat inside destination	NAT Â
ip nat inside source	NAT Â
ip nat pool	НЖ IP NAT
show ip nat translations	IP NAT Â

-

-	-

5.1.7 ip nat pool

НЖ NAT ˘ Л Љ ҳ **ip nat pool** Â ҳ no Л Љ Â

ip nat pool *pool-name start-ip end-ip* { **netmask** *netmask* | **prefix-length** *prefix-length* } [**type rotary**]

ip nat pool *pool-name* { **netmask** *netmask* | **prefix-length** *prefix-length* } [**type rotary**]

no ip nat pool *pool-name*

pool-name	NAT ¨ Â
start-ip	NAT IP Â
end-ip	NAT IP Â
netmask *netmask*	NAT Â
prefix-length *prefix-length*	NAT Â
type	NAT Â rotary ѝ ˘ ˀ Â rotary Â Љ rotary б cisco ҳ Â

НЖ Â

ҳ Â

НЖ ˘ ‡ ˝I … ˘ ѣ НЖ Â

1ˈ ЉЮ ˘ … ¨ ѝ net192 ˘ ѝ 192.168.12.1ˇ ѝ 192.168.12.254ˇ ѝ 24 æ Â

```
ip nat pool net192 192.168.12.1 200.168.12.254 prefix-length 24
```

ҳ

ҳ	
address	НЖ
ip nat	НЖ NAT Â
ip nat inside destination	NAT Â
ip nat inside source	NAT Â
ip nat outside source	NAT Â

३	⁄	
	10.3(4t90)	३

5.2

5.2.1 show ip nat translations

NAT ˘ show ip nat translations ३ Â

show ip nat translations [*acl_num*

Pro	Â “udp” ù UDP ’ “tcp” ù TCP Â“icmp” ù ICMP Â“gre” ù GRE Â
Inside global	¼ ¤ Â
Inside local	¼ ¤ Â
Outside local	¼ ¤ Â
Outside global	¼ ¤ Â
timeout	NAT ˘ Æ Â
vrf	vrf

¾

¾	
clear ip nat translation	NAT Â
ip nat	Hж NAT Â
ip nat inside destination	NAT Â
ip nat inside source	NAT Â
ip nat outside source	NAT Â
ip nat pool	Hж IP NAT
show ip nat translations	IP NAT Â

¤

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¤	
-	-

6

6.1

6.1.1 load-monitor

Ю ё Â

load-monitor {uplink | mixed-link}

no load-monitor

10.3(4b8)	

6.1.2 mllb enable

Ю / ‘

mllb enable

no mllb enable

no	

ecmp Э nexthop Â

1‘
```
Ruijie(config)# mllb enable
```

-	-

-

10.3(4b7)	

6.1.3 mllb first-choice

Ю ”I Ю

mllb first-choice *interface-type interface-number*

no mllb first-choice

interface-type interface-number	Ь
no	

Ruijie(config)# **mllb load-interval** 10

ꝛ		
ꝛ	**mllb enable**	ℸ
	mllb policy	

ʌ -

ꝛ	ʌ	
	10.3(4b8)	ꝛ

6.1.5 mllb load-sharing original

Ю ˇ IP ʌ ÿˇ

mllb load-sharing original

no mllb load-sharing original

	original	ˇ IP ʌ ˇ
	no	

ˇ IP ÿ aˇ

ꝛ

ˇ a ˇ IP ÿ aˇ ˇ ‡ ꝛ Âˇ
ꝛ mllb policy bandwidth Â

1ˈ ˇ IP ʌ ˇ
Ruijie(config)# **mllb load-sharing original**

ꝛ		
ꝛ	**mllb enable**	ℸ
	mllb policy	

ʌ -

6.1.7 mllb threshold

Ю

mllb threshold {*percent-upper* [lower *percent-lower*]} | [lower *percent-lower*]

no mllb threshold [lower]

percent-upper	Э
percent-lower	Ю
no	й lower Э Ю 90
lower	Ю й б Э

Э Ю й 90 Ю Э Â

й 1-100 Ю Э Э Ю Э Â

1 Э 95 Ю 80

```
Ruijie(config)# mllb threshold 95 lower 80
```

mllb enable	

-

10.3(4b7)	
10.3(4b8)	Ю

6.1.8 over-load-protect enable

Ю no

over-load-protect enable

no over-load-protect enable

no	

Â

Â

1

```
Ruijie(config)#over-load-protect enable
Ruijie(config)#no
```

˘ Л IP ˘ è a ˘ ″I
˘ ‚ Â 10 Â
″I Æ Э ″I Ð ˘ ł ″I˘ Л increase Э
decrease Ю Ч ″I ˘

1˙

```
Ruijie(config)#over-load-protect interface-group 1
Ruijie(config)#no  over-load-protect interface-group 1
```

३	£¸Ì ¸ ®!ò C—, h•aš4@ œD

6.2

6.2.1 show load-monitor configure

show load-monitor configure

show load-monitor configure

-	-

1'

```
Ruijie(config)#show load-monitor configure
>Load-monitor: down-link
```

load-monotor	

-

10.3(4b8)	

6.2.2 show mllb config

show mllb config

Â

show mllb config

-	-

ƒ

1'
```
Ruijie(config)# show mllb config
multi-link load balance configure:
multi-link load balance state: enabled
multi-link load balance policy: load
multi-link load balance load-interval: 5
multi-link load balance threshold: 95 lower: 80
multi-link load balance load-monitor: down-link
multi-link load balance first-choice set to GigabitEthernet 0/5 is
up
multi-link load balance load-sharing original
```

ƒ	
mllb enable	₸
mllb policy	

/ -

/	
10.3(4b8)	ƒ

6.2.3 show mllb statistics

show mllb statistics ƒ Â

show mllb statistics

-	-

ƒ

1

Ruijie# show mllb statistics

Interface	Packets	Flows
GigabitEthernet 0/1	6750	879
GigabitEthernet 0/2	6580	871

threshold: 95

३	
load-over-protect interface-group	

-

८	
10.3(4b8)	३

7

7.1

7.1.1 deny others

deny others

no deny others

no	a

a

user-route user-group	…
posterior-line	ľ Ł
prior-line	ľ Ł

NPE “ Э

10.3(4b10)	

7.1.2 link-sam conn-timeout

SAM ˇ ‡ ѝ б SAM ╟

ˇ ў ╟ б SAM

link-sam conn-timeout	б SAM ╟

NPE˝ NBR˝ EG ‟ Э

10.3(4b10)	ҳ

7.1.3 link-sam enable

б SAM ╟ Â ҳ no б SAM ╟

link-sam enable

no link-sam enable

no	б SAM ╟

Ю б SAM ╟

SAM ╟Ю ˘ ″I б SAM ╟
ҭ ˘ Лъ SAM Ю

1΄ б SAM ╟
```
# б SAM ╟
Ruijie(config)#link-sam enable
```
2΄ б SAM ╟
```
Ruijie(config)#no link-sam enable
```

ҳ	
show link-sam statistics	б SAM ╟
link-sam conn-timeout	б SAM ╟
link-sam port	Ьж б SAM ╟ TCP ∕

NPE˝ NBR˝ EG ‟ Э

	10.3(4b10)	

7.1.4 link-sam port

7.1.5 link-sam protocol

б SAM ╠╗ ˘ SAM 3.90 ˘ SAM3.90 ┘
Â ╠╗ ˘ ч ˘ 3.90 ł ˘
˘ Л Љ ҂

link-sam protocol {**new** | **old**}

no link-sam protocol

new	SAM 3.90
old	SAM 3.90
no	3.90 ł

SAM3.90 ł

҂

б SAM ╠╗ ˘ Ю SAM ˘ a ѣ
Â a SAM ˘ Л Љ б SAM ╠ ł˘ show link-sam statistics exception messages ў ╕˘
Л Л a Â

1ˈ б SAM3.90 ╠
```
Ruijie(config)#link-sam protocol old
```
2ˈ б SAM3.90 ł ╠
```
Ruijie(config)#link-sam protocol new
```
3ˈ б SAM3.90 ł ╠
```
Ruijie(config)#no link-sam protocol
```

҂	
link-sam enable	б SAM ╠
link-sam conn-timeout	б SAM ╠
show link-sam statistics	б SAM ╠

Л NPE˝ NBR˝ EG ‟ Э

Л	
10.3(4b10)	҂

7.1.6 posterior-line

˘ ľ Ł ľ ŁÂ ҳ ЮÂ

posterior-line interface *interface-name*

no posterior-line interface *interface-name*

interface-name	ľ Ł¨
no	ľ Ł

no Ô 4“CÃ á/Ä

ҳ

ľ ľ đ m

7.1.7 prior-line

prior-line interface *interface-name*

no prior-line interface *interface-name*

interface-name	
no	

```
1
Ruijie(config)#user-route user-group cnii
Ruijie(config-user-group)#prior-line interface gigabitEthernet 0/1
Ruijie(config-user-group)#prior-line interface gigabitEthernet 0/2
2
Ruijie(config-user-group)#no prior-line interface gigabitEthernet
0/1
Ruijie(config-user-group)#no prior-line interface gigabitEthernet
0/2
```

user-route user-group	…
posterior-line	

NPE

10.3(4b10)	

7.1.8 user-route enable

no

user-route enable

no user-route enable

no	

IO

SAM

original	IP
destination-original	IP+ IP
no	IP

ЮЛъ IP

Л IP

~ IP IP IP NAT IP

```
Ruijie(config)#user-route load-sharing destination
Ruijie(config)#user-route load-sharing destination-original
Ruijie(config)#no user-route load-sharing
```

user-route user-group	…
posterior-line	Ь Ь
prior-line	Ь Ь

NPE Э

10.3(4b10)	

7.1.10 user-route posterior-line load-balance enable

Ь Ь no Ь Ь

user-route posterior-line load-balance enable

no user-route posterior-line load-balance enable

no	ľ Ł

Ю ľ Ł

ٶ

ľ Ł Â ľ Ł˘ з ľ Ł ˚ a ˘ Л Љ ˘ Â

1˙ ľ Ł

```
# ľ Ł
Ruijie(config)#user-route posterior-line load-balance enable
```

2˙

```
Ruijie(config)#no user-route posterior-line load-balance enable
```

ٶ	
user-route user-group	…
posterior-line	Ł Ł

ٶ

Л	
10.3(4b10)	ٶ

7.1.11 user-route user-group

″I … ˘ ٶ Ю˙

user-route user-group *user-group-name*

no user-route user-group *user-group-name*

user-group-name	¨ ˘ 30
no	

ʒ

ʺI ʻ PBR> > > Â ľ
Ł ľ Ł ˘ a Ą è Ł Â

64

~ ¨ SAM Э ˘ SAM Э Л ѝ ľ ⁸ Ł Â	

1ʻ … ¨ ѝ cnii
```
Ruijie(config)#user-route user-group cnii
```
2ʻ ¨ ѝ cnii
```
Ruijie(config)#no user-route user-group cnii
```

ʒ

ʒ	
prior-line	ľ Ł
posterior-line	ľ Ł

Л NPE ‟ Э

ʒ

Л	
10.3(4b10)	ʒ

7.2

7.2.1 clear link-sam statistics

Л Л clear link-sam statistics б ╟ SAM ╟

clear link-sam-statistics

ʒ

1ˈ б SAM ╟

```
# б SAM ╟
Ruijie#clear link-sam statistics
# б SAM ╟
Ruijie#show link-sam statistics
>Link-sam run state: enable
>Link-sam connect port: 2012
>Link-sam connect timeout minutes: 20
>Current SAM connections: 2
>Count of SAM connections: 2
>Count of SAM disconnections: 0
------------------------------------------------------------------
SAM's ip: 192.168.1.1
  Received packets: 2650
  Received user online messages: 530
  Received user offline messages: 0
  Received user synchronization messages: 2120
  Received user ip update messages: 0
  Received exception messages: 0
  Received invalid segments: 0

SAM's ip:192.168.10.1
  Received packets: 2400
  Received user online messages: 480
  Received user offline messages: 0
  Received user synchronization messages: 1920
  Received user ip update messages: 0
  Received exception messages: 0
  Received invalid segments: 0
```

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ʒ	
show link-sam statistics	б SAM ╟

Л NPE˝ NBR˝ EG “ Э

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Л	
10.3(4b10)	ʒ

7.2.2 show link-sam statistics

Л Л Ъ show link-sam statistics б ╟ SAM ╟

show link-sam statistics


```
  1'      б SAM   ╠
Ruijie#show link-sam statistics
>Link-sam run state: enable
>Link-sam connect port: 2012
>Link-sam connect timeout minutes: 20
>Current SAM connections: 2
>Count of SAM connections: 2
>Count of SAM disconnections: 0
------------------------------------------------------------------
SAM's ip: 192.168.1.1
  Received packets: 2650
  Received user online messages: 530
  Received user offline messages: 0
  Received user synchronization messages: 2120
  Received user ip update messages: 0
  Received exception messages: 0
  Received invalid segments: 0

SAM's ip:192.168.10.1
  Received packets: 2400
  Received user online messages: 480
  Received user offline messages: 0
  Received user synchronization messages: 1920
  Received user ip update messages: 0
  Received exception messages: 0
  Received invalid segments: 0
```

link-sam enable	б SAM ╠
link-sam port	Ъ№ б SAM ╠ TCP л

link-sam conn-timeout	б SAM ╟
clear link-sam statistics	б SAM ╟

NPE˜ NBR˜ EG “ Э

10.3(4b10)	

7.2.3 show user-route configure

show user-route configure ˘ Ю˙

show user-route [**user-group** *user-group-name*] **configure**

user-group-name	¨

```
  Deny others: No

User-group: cmii
  State: Inactive
  Prior-line: GigabitEthernet 0/5, GigabitEthernet 0/6
  Posterior-line: GigabitEthernet 0/7, GigabitEthernet 0/8
  Deny others: No

User-group: intranet
  State: Active
  Prior-line:
  Posterior-line:
  Deny others: Yes
```

2ʹ

```
Ruijie#show user-route user-group cnii configure
User-group: cnii
  State: Active
  Prior-line: GigabitEthernet 0/1, GigabitEthernet 0/2
  Posterior-line: GigabitEthernet 0/7, GigabitEthernet 0/8
  Deny others: No
```

ʒ	
user-route enable	
user-route user-group	…
Deny others	ŭ 8
posterior-line	lʹ Ł
prior-line	lʹ Ł

ʃ NPE ‟ Э

ʃ	
10.3(4b10)	ʒ

ǂ ДА ѝ ҳ ДА ˘ ЉЮ ˙

1. ү Ь ǂ ҳ
2. ү Ь ǂ
3. ү Ь ǂ
4. vlan ҳ
5. ҳ
6. ҳ
7. ҳ
8. ҳ
9. ҳ
10. … [8] б
11. ҳ
12. ҳ

1

1.1.1 layer23 classify enable

γ Ь ǐ ╗ ˘ ʌ Л ҙ no ╗ Â

[no] layer23 classify enable

Ю γ Ь ǐ ╗ Â

ҙ Â

γ Ь ǐ ł ʌ Л ҙ vlan à à ↓ Â

1˙ γ Ь ǐ ╗ ˙

```
Ruijie#config
Ruijie(config)#layer23 classify enable
```

2˙ γ Ь ǐ ╗ ˙

```
Ruijie#config
Ruijie(config)#no layer23 classify enable
```

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-	-

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10.3(4b7)	ҙ

3

3.1

3.1.1 layer23 ad-mode enable

ˇ Л Л ɜ no ╖ Â

[no] layer23 ad-mode enable

4 vlan

4.1

4.1.1 vlan-group

vlan Â Л Ц ع no vlan Â

vlan-group *name* **vlan** *vid-list*

no vlan-group *name*

name	vlan ¨ Â
vid-list	vlan vlan vlan id Â ѝ :1-4094

Â

ع Â

vlan vlan id a ă ˘ vlan id л ˘
vlan id ˚ vlan ˘ л ľ - Ľ vlan id vlan id
vlan id Â

vlan ľ any Ľ˘ ɣ Ь ĺ ╗ ˘ Ю
Ð ľ any Ĕ Ю Ð native vlan
vlan ˘ native vlan vlan ˘ ‡ Ð
ľ any Ľ Â

~	1. a˚ vlan ¨ a ˚ Â 2. vlan Ю 3. Э vlan-enable ع˘ vlan tag ˘ vlan Â

1ˈ vlan ľ vlan-group1 Ľ vlan 1 ä vlan 3 ä vlan7 ä vlan8 ä vlan9ˈ

```
Ruijie#config
Ruijie(config)# vlan-group vlan-group1 vlan 1,3,7-9
```

2ˈ vlan ľ vlan-group1 ľˈ

```
Ruijie#config
```

Ruijie(config)#**no vlan** *vlan-group1*

٦	
show vlan-group [*group name*]	vlan ٦
vlan-enable	vlan tag ˘ ٦ vlan
flow-rule num **vlan-group** vlan-group-name **subscriber** subscriber-name **network-group** network-group-name **app-group** app-group-name **time-range** time-rang-name	‡ ٦

/ -

/	
10.3(4b7)	٦

4.2

4.2.1 show vlan-group

vlan Â

show vlan-group [*group name*]

group name	vlan ¨

Â

vlan ˘ vlan ¨ / Л vlan Â

1

```
vlan2          0                0              0         3-5
vlan3          0                0              0         7,9
```

2 l vlan1 L

```
Ruijie#show vlan-group vlan1
vlan-group    police_flow      police_url    flow      vlan id
----------    -----------      ---------     ------  ----------
any           9                0           0
vlan1         0                0           0         1
```

show vlan-group

Vlan-group	vlan
Police_flow	‡
Police_url	url ‡
Flow	
Vlan id	vlan vlan id

vlan-group *name* **vlan** *vid-list*	vlan

-

10.3(4b7)	

5

5.1

5.1.1 subscriber

╟ ┘ ЮÂ

subscriber *obj* **move to parent** *par_str*

Obj	¨
Par_str	╟ ł è ¨

Â

Â

ʒ ў a ʌ ЮèЛъ┘è ЮЎ ʌ è
Â ˘ tt xx Ю ˘ ╟ yy Ю ˘ ʒ
ʌЛъ a ʌ tt ЮЎ tt ┘ è Ю ╟ yy ЮÂ

1ˈ ╟ tt yy ЮˈRuijie#**subscriber** tt **move to parent** yy

ʒ	
show subscerber brief	

ʌ -

ʌ	
10.3(4b10)	ʒ

5.1.2 subscriber allow

Â no Â

subscriber allow name privilege {none | { [webauth] [vpn] [login] }}

filename	

Â

Â

ў Â

1 userfile

Ruijie#**subscriber export txt** userfile

-

-

10.3(4b7)

5.1.4 subscriber import

Â

subscriber import [***txt*** | ***csv***] *filename*

filename	

Â

Â

ў Â

.txt ip MAC Â

.txt Â

/ / 1, 1,192.168.197.1,

ľ .csv Ł ˚ Microsoft Excel ł ┘ ѝ ľ .csv Ł ¯ /ł

˚ Â ˚ ѝ˙ ¦ ѝ 4 “˘ ¦ ѝ˙ à ¨

à à ip à mac à ŭ ↓ ă Â

ľ .csv Ł ˚ ľ LAYER23-CLASSIFY-SCG.doc Ł ľ

Ł Â

1˙ ˚ ľ userfile Ł˙

Ruijie#**subscriber import txt** userfile

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10.3(4b8)	ҳ

5.1.6 subscriber set

Â Л Лъ ҳ no Â

[**no**] **subscriber set** *name* **attribute** { **avoid-monitor [flow-monitor]** | **deny** | **release** | **vip** | **auth-deny** | **pwd-edit** }

Name	¨

Ю a Â

ҳ Â

ł a ¸ à ˘ Л Лъ **flow-monitor** ¸ ’

Ю a ˘ Ю ‡ ’

Л Ю ˘ Ю ˚ ˘ Лъ

ŭ ”I ’

¨ Л Ю ˘ ł˘ a Э ˘

ľ release Ł ’

Vip ˘ vip Л Лъ

Â

Auth-deny л ˘ Л Ю Â ł˘

л Э ˘ л ˘ ≠ Ю Â

Pwd-edit л ˘ Л Ю Â

ł˘ л Э Л Лъ Â

1ˈ ľ 1 Ł ‘

```
Ruijie#config
Ruijie(config)# subscriber set 1 attribute avoid-monitor
```

ľ 1 Ł à ˘ ∧ ¸ ‘

```
Ruijie(config)# subscriber set 1 attribute avoid-monitor
flow-monitor
```

३ Â

ip a ă ˘ mac ‡ a è
ă Â Љ ip ǂ ip à ip ip
Ь ˘ Љ mac ǂ mac a mac
ч ˘ è ip Л Љ̌ mac ˘ ip ip
a Л Љ̌ mac Â mac ip ˚ ѳ ˘ Љ mac
ѳ ѝ Â

ľ / Ł, ү Ь ǂ ╗ ˘ ip ѳ a
è Ũ ˘ ї ѝ ip Â p i n

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5.2

5.2.1 show subscriber

Â

show subscriber [**all** | **static** | **dynamic** |**parent** [*name* | **root**]]

name	

Â

Â

1' ' 468m<8902 1399.9.99Tm3 0.554 re-f10.8514629795m(0.mh6

Au-deny	
Sslvpn	ㄏ sslvpn ㄏ
Vpn	ㄏ vpn ㄏ
Webauth	ㄏ web ㄏ
Bind	ㄋ ㄢ ˇ 1 ㄧ ㄢˇ 2

-	-

-

10.3(4b8)	

6.1.3 network-group import

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network-group import [***txt*** | ***csv***] *filename*

filename	

Â

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ľ .txt Ł Ю ip Â ľ Ł ľ Ł Â

Ю ľ .txt Ł

/ / 1, 1,192.168.197.1

ľ .csv Ł Microsoft Excel ł Ù ľ .csv Ł Â ù ip Â

ľ .csv Ł ľ LAYER23-CLASSIFY-SCG.doc Ł ľ Ł Â

1 ľ userfile Ł

Ruijie#**network-group import txt** userfile

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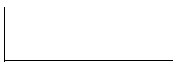
10.3(4b8)	

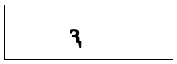
6.1.4 network-group name

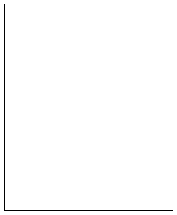
network-group name *name* **[parent** *parent]* **[ip-host** *ip-addr* **| ip-subnet** *subnet mask* **| ip-range** *start end***]]**

no network-group name *name*

name	
parent	
ip-addr	ip ip
subnet	Ip
mask	
start	Ip ip
end	Ip ip







ip ip ip ip
parent

1 ip network1 , 192.168.196.0 1 1

```
Ruijie#config
Ruijie(config)# network-group name network1 parent / /
  1uijie#
```

Ruijie#**config**
Ruijie(config)#**no network-group name** *network1*

show network-group [**all**	**brief**	**parent[root**	name **]]**	
flow-rule num **vlan-group** vlan-group-name **subscriber** subscriber-name **network-group** network-group-name **app-group** app-group-name **time-range** time-rang-name	

-

10.3(4b8)	

6.2

6.2.1 show network-group

Show network-group [all | brief | parent [root | name]]

name	

1
```
Ruijie#show network-group all
name   flow police_flow police_url dir  ip
/       0       0        0          1
    1   3        0        0          0    192.168.196.101
    2   0        0        0          0    192.168.196.102
```

2 network1 IO
```
Ruijie#show network-group parent network1
name   flow police_flow police_url dir  ip
    1   3        0        0          0    192.168.196.108
```

show network-group

network-group static name *name* **parent** *parent* **{ip-host** *ip-addr* **| ip-subnet** *subnet mask* **| ip-range** *start end***] }**	

-

10.3(4b8)	

7

7.1

7.1.1 auth-subs

sam Â

sam-online recycle *time*

sam-offline recycle {off| *time}*

Time	ˆ ˚ ˜

20˚ sam ˘ Â

conf Â

˙˘ ˙ 20˚ ˆ ˙ ╟ ˜ sam ˘ ‡ ˙ Â

è ˙ Ɲ a ˘ a ˙ Ɲ Â

˙ ¤ ŭ sam ┗ Â

1˙ sam ˘ 30˚ ˘ ˘ sam ł a ˙

```
Ruijie#config
```

Ruijie(config)# **sam-online recycle** 30

Ruijie(config)# **sam-offline recycle off**

10.3(4b10)	

7.2

7.2.1 show auth-subs

Â

Show auth-subs [all | brief | parent [root | name **]]**

name	

Â

Â

1

```
Ruijie#show auth-subs all
name           mac           flow  fc  url dir dym ip
/             0000.0000.0000  16    0    1   1   0
Smp_root      0000.0000.0000  0     0    1   1   0
webauth_root  0000.0000.0000  0     0    1   1   0
```

show auth-subs all

name	
mac	

dir	
dym	╟
ip	ip

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10.3(4b8)	⺀

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2012-11-5	†		
2012-11-20	†		╗ 4b8 ⅓
2012-11-30	†		⅓

ꢀ 201
ꢀ 201
app-add 201
app-del 202
identify-application app-db enable 202
identify-application app-group 203
identify-application block 204
identify-application custom 205
identify-application dfi enable 206
identify-application dfi gather 207
identify-application enable 207
identify-application http route enhance enable 208
identify-application inhibitive 209
identify-application key 210
identify-application proto-detect drop 210
identify-application proto-detect enable 211
identify-application proto-expect enable 212
identify-application proto-expect timeout 213
identify-application route enhance enable 213
identify-application signature update 214
identify-application web-cache enable 215
ꢀ 217
show identify-application .....

8

8.1

8.1.1 app-add

app-add *app-name*

app-name	

-

app-group

MYGAME

```
Ruijie#config
Ruijie(config)#identify-application app-group MYGAME
Ruijie(config-app-group)#app-add
```

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```
Ruijie#config
Ruijie(config)#identify-application app-db enable
```

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10.3(4b8)	ʒ

8.1.4 identify-application app-group

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[no] identify-application app-group *group-name*

group-name	¨

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ʒ ɨ ˘ ʒ app-group ʒ Â

1 Ю ʒ Ю MYGAME ˘

8 ˘ Â

```
Ruijie#config
Ruijie(config)#identify-application app-group MYGAME
Ruijie(config-app-group)#
```

ȝ	
flow-rule num **vlan-group** vlan-group-name **subscriber** subscriber-name **network-group** network-group-name **app-group** app-group-name **time-range** time-rang-name	‡ ȝ

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10.3(4b8)	ϟ

8.1.6 identify-application custom

ΗЖ ‡ Â Λ Л Ъ ϟ no ΗЖ ‡ Â

[**no**] **identity-application custom name** *software-name* **class** *class-name* {**tcp** | **udp**} **sport** *sport-low sport-high* **dport** *dport-low dport-high* [**sip** *sip-low sip-high* **dip** *dip-low dip-high*]

software-name	΄ ΅ Â
class-name	΄ ΅ Â
sport-low	Â 0-65535 any Â
sport-high	Â 0-65535 any Â
dport-low	Â 0-65535 any Â
dport-high	Â 0-65535 any Â
sip-low	ip Â
sip-high	ip Â
dip-low	ip Â
dip-high	ip Â

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ϟ Λ Л Ъ ╕ ΗЖ ‡ Â

1˙ ΗЖ ‡˘ ΄ и ΗЖ ˘ ΅ и ˘
и 1 10˝ и 1 100˝ и tcp˙

```
Ruijie#config
Ruijie(config)# identify-application custom name class
ΗЖ tcp sport 1 10 dport 1 100 //
```

2˙ ΗЖ ‡˘ ΄ и myp2p˘ ΅ и myxunlei˘ и
˘ и 200˝ и udp˙

```
Ruijie#config
Ruijie(config)# identify-application custom name myxunlei class
myp2p udp sport any any dport 200 200
  3                 HK  ‡      ¦    ù myqq      ¨    ù              ¦
  im        ù 111           ù 2020          ù udp
Ruijie#config
Ruijie(config)# identify-application custom name myqq class im udp
sport 111 111 dport 2020 2020
```

ꝛ	
flow-rule num **vlan-group** vlan-group-name **subscriber** subscriber-name **network-group** network-group-name **app-group** app-group-name **time-range** time-rang-name	‡ ꝛ

/

-

/	
10.3(4b7)	ꝛ

8.1.7 identify-application dfi enable

dfi p2p Ю ╖ ˘ /Л ъ ꝛ no

╖ Â

[**no**] **identify-application dfi enable**

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ꝛ /Л ъ dfi p2p Ю ╖ Â

1 dfi p2p ╖ ‘

```
Ruijie#config
Ruijie(config)#identify-application dfi enable
```

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[**no**] **identity-application enable**

-	-

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```
Ruijie#config
Ruijie(config)#identify-application enable
```

flow-rule num **vlan-group** vlan-group-name **subscriber** subscriber-name **network-group** network-group-name **app-group** app-group-name **time-range** time-rang-name	‡

-

10.3(4b7)	

8.1.10 identify-application http route enhance enable

HTTP ╖ ˘ Â no ╖ Â

[**no**] **identify-application http route enhance enable**

-	-

Ю˘ ł˘ Â

Â

HTTP ╖ Â

~ HTTP

1 HTTP

```
Ruijie#config
Ruijie(config)#identify-application http route enhance enable
```

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10.3(4b10)	

8.1.11 identify-application inhibitive

identify-application inhibitive *app-name*

app-name	

MSN

```
Ruijie#config
Ruijie(config)#identify-application inhibitive MSN
```


flow-rule num **vlan-group** vlan-group-name
subscriber subscriber-d [(subscr)-5(iber)-5(-d [(sure f [(suTf 060007 Tc 0et)169 Td [(od [(k) [(v4(g(vl5

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10.3(4b7)	ϟ

8.1.12 identify-application key

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identify-application key *app-name*

app-name	¨

a ϗ

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1' FTP ϗ '

```
Ruijie#config
Ruijie(config)#identify-application key FTP
```

ϟ	
flow-rule num **vlan-group** vlan-group-name **subscriber** subscriber-name **network-group** network-group-name **app-group** app-group-name **time-range** time-rang-name	‡ ϟ

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10.3(4b7)	ϟ

8.1.13 identify-application proto-detect drop

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ϗ Â

[**no**] **identify-application proto-detect drop**

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```
Ruijie#config
Ruijie(config)# identify-application proto-detect drop
```

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```
Ruijie#config
Ruijie(config)# identify-application proto-detect enable
```

10.3(4b8)	

8.1.16 identify-application proto-expect timeout

Â

seconds	10 - 3600

60

Â

1 3

```
Ruijie#config
Ruijie(config)#identify-application proto-expect timeout 180
```

identify-application proto-expect enable	
show identify-application proto-expect	

-

10.3(4b8)	

8.1.17 identify-application route enhance enable

no Â

[**no**] **identify-application route enhance enable**

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1˙ ╖

```
Ruijie#config
Ruijie(config)#identify-application route enhance enable
```

ꝛ	
app route enable	╖
identify-application enable	╖
app route app-name { **interface** interface-name | **interface-group** group-name} [**time-range** time-rang-name] [**enhance**]	ˆ ╖

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10.3(4b10)	ꝛ

8.1.18 identify-application signature update

` Â

identify-application signature update [**sub** *sub-num*]

sub-num	Л˘ 1 – 10 Â ч ˘ ł Л Ль Â

ϡ ʌ ʃʊ` Â

1` ` `
Ruijie#**config**
Ruijie(config)#**identify-application signature update**

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10.3(4b7)	ϡ

8.1.19 identify-application web-cache enable

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[**no**] **identify-application web-cache enable**

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ϡ Â

ϡ ʌ ʃʊ ϥ Â

1` ϥ `
Ruijie#**config**
Ruijie(config)#**identify-application web-cache enable**

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	10.3(4b10)	३

8.2

- [show identify-application](#)
- [show identify-application block](#)
- [show identify-application class](#)
- [show identify-application group-state](#)
- [show identify-application inhibitive](#)
- [show identify-application key](#)
- [show identify-application proto-expect](#)
- [show identify-application route enhance](#)
- [show identify-application route enhance table](#)
- [show identity-application user-group](#)
- [show identify-application userdef-rule](#)
- [show identity-application version](#)

8.2.1 show identify-application

show identity-application

-	-

Ruijie#**show identity-application**
any 255-4095-63-48
1-0-0-0

```
        1-1-0-0
MSN 1-6-0-0
    MSN-CHAT 1-6-1-0
```

1

```
Ruijie#show identity-application class
                1-0-0-0
IP              2-0-0-0
                3-0-0-0
                4-0-0-0
P2P             5-0-0-0
                6-0-0-0
HTTP            7-0-0-0
                8-0-0-0
                9-0-0-0
               10-0-0-0
                    11-0-0-0
                12-0-0-0
                13-0-0-0
                14-0-0-0
                15-0-0-0
RFC 16-0-0-0
                248-0-0-0
myp2p 249-0-0-0
```

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10.3(4b7)	

8.2.4 show identify-application group-state

show identify-application group-state

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1ˈ ᛚ ˋ

```
Ruijie#show identity-application group-state
app group state: on  //on                    ˘   ⁸        ˘ IP
  ᛚ
```

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10.3(4b7)	ꝛ

8.2.5 show identify-application inhibitive

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show identity-application inhibitive

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```
Ruijie#show identity-application inhibitive
  ᵛ
```

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10.3(4b7)	৻

8.2.6 show identify-application key

show identity-application key

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10.3(4b7)	৻

8.2.7 show identify-application proto-expect

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show identity-application proto-expect

-	

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```
Ruijie#show identity-application proto-expect
protocol expectation state: on
protocol expectation timeout: 180
```

identify-application proto-expect enable	
identify-application proto-expect timeout seconds	

-

10.3(4b8)	

8.2.8 show identify-application route enhance

-	-

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.86Tj/TT2 4/080-6(515 Tf 0Rcn)e# 0.266.44 742.4>Tj1 1 Tf 0show 0.266.34 742. 10.022 0.266.44

PPSTREAM	4-16-0-0
| Web	4-17-0-0
UUSEE_PC|IPad	4-33-0-0
QVOD	4-48-0-0
	4-50-0-0
	4-52-0-0
	4-71-0-0
	4-73-0-0
P2P	5-0-0-0
BITTORRENT	5-3-0-0
	5-5-0-0
QQ	5-22-0-0
|	5-28-0-0
FLASHGET	5-34-0-0
P2P-FTP	5-50-0-0
P2P-HTTP	5-51-0-0
	5-52-0-0
P2P	5-252-0-0
P2P	5-254-0-0

-	-

-

10.3(4b10)	

8.2.10 show identity-application user-group

show identify-application user-group *group-name*

group-name	

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	10.3(4b7)	

8.2.12 show identity-application version

show identify-application version

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10.3(4b7)	

8.3

- [identify-application clear key-inhibitive group](#)

8.3.1 identify-application clear key-inhibitive group

identify-application clear key-inhibitive group

-	-

flow-rule num **vlan-group** vlan-group-name

9

9.1

9.1.1 app route

ǂ Â Ⱥ Ⱦ ǯ **no** Â

app route *app-name* { **interface** *interface-name* | **interface-group** *group-name*} [**time-range** *time-rang-name*]
no app route *app-name*

app-name	¨ , Ⱥ Ⱦ ľ ǂ Ľˇ ľ ˚ Ľˇ ľ ˚ Ľ ľ ǂ Ľ¨
interface-name	¨
group-name	¨
time-rang-name	‡ time-rang ¨

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ǯ WAN Â Ⱥ
ˇ ˇ Â
ˇ time-range ˇ Ю Â
˚ ‘ ’ time-range ’
/ и UP Â
2000 Â

~	Ⱦ ˇ a Â

1' l' P2P Ю ˚ Ł ǂ l' GigabitEthernet 0/1 Ł¦

```
Router(config)#app route P2P Ю ˚ interface GigabitEthernet 0/1
```

2' l' HTTP Ł ˚ l' inhibitive_intf_group Ł ǂ ˘
ɜ l' no_midnight Ł

```
Router(config)#app route HTTP interface-group
inhibitive_intf_group time-range no_midnight
```

ɜ	
app route enable	ℸ

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ʌ	
10.3(4b8)	ɜ

9.1.2 app route enable

ℸ Â ʌ Ɲ ɜ **no** ℸ Â

app route enable

no app route enable

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ℸ Â

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Â

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Router(config)#**app route enable**

app route	

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10.3(4b8)	

9.1.3 app route priority

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app route *app-name* **priority** { **increase** | **decrease** } [*1-1999*]

app-name	, Л Љ Ґ ¦ Ъ Ґ ˚ Ъ Ґ ˚ Ъ Ґ ¦ Ъ
increase	` ″I
decrease	æ ″I
[1-1999]	˘ Л ˘ Л Љ ╟ ˘ ╟ Â

″I б ″I ł ˘ ł ″I ″I Â ″I ˘ Л Љ ″I Â

1 Ґ HTTP Ъ ″I Â

Router(config)#**app route** HTTP **priority increase**

app route	

	10.3(4b8)	

9.1.4 clear app route statistics

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clear app route statistics [*app-name*]

app-name	

Â

	Â	

show app route statistics	

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	10.3(4b8)	

no interface-group

interface-name	

WAN dialer

WAN

WAN LAN

1 inhibitive_intf_group dialer 1 dialer 2

ip-address	

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WAN ˘ Л Â

˘ Ю Â

~ Л й WAN Â ÿ WAN Ч й LAN ˘ ╠ Â

1' GigabitEthernet 0/1 й 100.0.0.1

```
Router(config)#interface gi 0/1
Router(config-if-GigabitEthernet 0/1)# nexthop 100.0.0.1
```

app route	

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10.3(4b8)	

9.2

9.2.1 show app route

˘ Â

show app route [**statistics** | *app-name* **session**]

statistics	
app-name	, Л Љ Ґ ґ Ѓ Ґ ˚ Ѓ Ґ ˚ Ѓ Ґ ґ Ѓ
session	

show app route Â " ″I æ˘ Э ″I Â

show app route statics Â

show app route app-name **session** Â

1΄

```
Router#show  app  route
CLASS          INTERFACE(GRPUP)              TIME-RANGE    STATE
-------------- ----------------------------  ------------ -----
HTTP           inhibitive_intf_group(group)  no_midnight   UP
```

CLASS	¨ (Л Љ ˚ ¨ / ˚ ¨ / ¦ ¨ / ¦ ¨)
INTERFACE(GRPUP)	¦ ¨
TIME-RANGE	time-range ¨
STATE	

2΄

```
Router#show  app  route  statistics
CLASS         INTERFACE(GROUP)
HIT DATA(byte) HIT RATE(Bps)
SUM DATA(byte)  SUM RATE(Bps)
-------------- ----------------------------
-------------- ---------------
---------------- ---------------
HTTP           inhibitive_intf_group(group)
81535/297997   0.5/3.75
101918/342496   0.6/4.68
```

CLASS	¨ (Л Љ ˚ ¨ / ˚ ¨ / ¦ ¨ / ¦ ¨)
INTERFACE(GROUP)	/ ¨
HIT DATA(byte)	Ю ¦ ℸ ˘ Э /Ю
HIT RATE(Bps)	= / ˘ Э /Ю
SUM DATA(byte)	= + ˘ Э / Ю
SUM RATE(Bps)	= / ˘ Э /Ю

3 ’ HTTP L

Router#show app route HTTP session

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1'

```
Router#show  interface-group
GROUP-NAME              INTERFACE INCLUDED      POLICY     STATE
inhibitive_intf_group   di1,di2,di3             load       UP

Router#show  interface-group
-------------------------------------------------------------------------------------------------------
GROUP-NAME: inhibitive_intf_group
INTERFACE INCLUDED: di1,di2,di3
POLICY: load
STATE: UP
```

GROUP-NAME	"
INTERFACE INCLUDED	
POLICY	
STATE	

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10.3(4b8)	ȝ

10

10.1

10.1.1 flow-pre-mgr enable

Ⅶ

[no] flow-pre-mgr enable

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1 à й ˘ ⁸ ‡ Â ˘
‡ a Ậ Â

‘ … ⁸ б Ⅶ Â

```
Ruijie# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Ruijie(config)# no flow-pre-mgr enable
```

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10.3(4b8)	ϡ

10.1.2 flow-pre-mgr priority-swap

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flow-pre-mgr priority-swap *rule-id1 rule-id2*

rule-id1	‡ ㄴ ㄏ ' 1~50
rule-id2	‡ ㄴ ㄏ ' 1~50

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2 à ϡſ ч ‡ ″I ’

3 à rule-id1 rule-id2 ˚ ˘ ‡ a Â

' 2 ‡˘ ɨ ſ ″I Â

```
Ruijie#config terminal
Ruijie(config)# flow-pre-mgr 1 subscriber UserGroupA action trust
total-limit 5000 per-ip-limit 300
Ruijie(config)# flow-pre-mgr 2 access-list 120 action trust
total-limit 30
Ruijie(config)# flow-pre-mgr priority-swap 1 2
```

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10.3(4b8)	ϡ

10.1.3 flow-pre-mgr *rule-id* access-list

ACL ⁸ ' block à by-pass trusť Ɽъ ↓ ⁸ ɨ … Â

flow-pre-mgr *rule-id* **access-list** *acl-number* **action {block | by-pass | {trust total-limit** *total-limit-number***}}**

no flow-pre-mgr *rule-id*

rule-id	‡ ˇ ˇ ù 1~50 ˇ ˇ ‡ ă ˇ ˇ
acl-number	‡ L ˇ ˇ ù 1~199
total-limit-number	⁸ ˇ ˇ б ˇ è 0 a ⁸

Â

1 à L ⁸ a IP ⁸

2 à action ˇ block a by-pass a … ˇ ˆ Ì à Ю ˇ Ю a ~ trust tCL ⁸ˇ ⁸ ł a Â

3 à б ˇ ˇ ù … Â ‡ é I ˇ I ł ‡ I ‡ Â

4 à L IP IP ˇ IP IP Â

5 à tCL ⁸ ‡ ˇ a Â ‡ … Â

6 à ‡ L ˇ è tCL IP à à IP à à ˇ ‡ L Â

7 à Ю Э ˇ a ⁸ Â

1 tCL б IP 220.200.20.20 ˇ ⁸ è ù 30

```
Ruijie# configure terminal
Ruijie(config)#ip access-list extended 120
Ruijie(config-ext-nacl)#permit ip any host 220.220.20.20
Ruijie(config-ext-nacl)#deny ip any any
Ruijie(config-ext-nacl)#exit
Ruijie(config)#flow-pre-mgr 2 access-list 0 action trust
total-limit 30
```

2 IP ù 192.168.1.0/24 IP … ˇ è ass Â

```
 End with CNTL/Z.
Ruijie(config)#ip access-list standard 2
Ruijie(config-std-nacl)#deny 192.168.1.0 0.0.0.255
Ruijie(config-std-nacl)#permit any
```

```
Ruijie(config-ext-nacl)#exit
Ruijie(config)# flow-pre-mgr 1 access-list 1 action by-pass #
     ‡    ¨I       ¯  ∧ Â
```

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10.3(4b8)

ˆ ʒ /ǀ à Ю ˘
Ю a ʒ ˜ ’ trust /
⁸ Лъ ↓ IP ⁸˘ ⁸ ł a Ą
Â б ˘ ʒ ˘
¯ ѝ … Â
3 à Ю Э ˘ a ⁸ Â

‘ ľ UserGroupA Ł … 5000 ˘ з ľ UserGroupA Ł Ю
IP … ѝ 300 ⁸ ł Â

```
Ruijie#config
Ruijie(config)# subscriber static name UserGroupA parent /
Ruijie(config)# subscriber static name UserA parent /UserGroupA
ip-host 192.168.5.10
Ruijie(config)# subscriber static name UserB parent /UserGroupA
ip-host 192.168.5.11
Ruijie(config)# flow-pre-mgr 1 subscriber UserGroupA action trust
total-limit 5000 per-ip-limit 300
```

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10.3(4b8)	ʒ

10.1.5 flow-pre-mgr total-limit

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flow-pre-mgr total-limit *limit-number*

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2 à б ˘ ʒ ˘

¯ ѝ … Â

3 à Ю Э ˘ а ⁸ Â

‘ ⁸ ѝ 20 ˘ 20 ˘ а Ѧ … ˘

Â

```
Ruijie#config terminal
Ruijie(config)# flow-pre-mgr total-limit 200000
```

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10.3(4b8)	ʒ

10.2

10.2.1 show flow-pre-mgr ip-info

10.2.2 show flow-pre-mgr rule-info

⁸ ‡ Л Ч ‡ ˘ Ў ˘

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show flow-pre-mgr rule-info

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‘ … ⁸ б ‡’

```
Ruijie#show flow-pre-mgr rule-info
flow-pre-mgr total-limit 200000
(active)flow-pre-mgr 1 subscriber UserGroupA action trust
total-limit 5000 per-ip-limit 300 (230 flows)
(inactive)flow-pre-mgr 2 access-list 120 action block (0 flows)
```

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10.3(4b8)	ʔ

10.3(4b8)	

11.1.2 auto-pir

PIR **no**

auto-pir enable [interval *NUM* **[root-rate** *Percentage***]] [exclude-pass]**

no auto-pir enable

NUM	a 1 3600
Percentage	PIR PIR CIR PIR PIR 10 90 80% PIR 90% PIR 80% 90%
exclude-pass	**root-rate** **exclude-pass** pass

EG NPE

channel-tree

a

group1 **inbound** **PIR**

```
Ruijie# config
Ruijie(config)# flow-control group1
Ruijie(config-flow-control)# channel-tree inbound
Ruijie(config-channel-tree)# auto-pir enable
```

	show flow-control	**Inbound** **Outbound** PIR

	10.3(4T90)	

11.1.3 change-priority

no

change-priority rule1 *rule1-num* **rule2** *rule2-num* [**by-rule-number**]

rule1 -num	
rule2-num	

channel-group *name* **parent** {**NULL** | *parent_name*} **[cir** *cir_num***] pir** *pir_num* [**pri** *pri_num*] [**schedule-type** {**fifo** | **sfq** | **per-net [per-mask** *mask***] [per-cir** *pcir_num***] per-pir** *ppir_num* **[limit** *limit_num***]** [**session-limit** *session_limit_num*] [**auto**] [**reverse**]}]

[**no**] **channel-group** *name*

[**no**] **channel-group** *name* **pool** *pool_name*

name	…
parent	…
NULL	a ‡ … й
parent_name	…

pool pool_name	╗ ¨ ˇ NPE a

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10.3(4b7)	ϡ
10.4(4T90)	╗ ϡ

11.1.6 channel-tree

… Â Л Лъ ϡ no … Â

[no] channel-tree {inbound | outbound}

inbound	… Ю
outbound	… Э

Ю

ϡ **flow-control**

Ю ẗα Э ẗα

ľ test

11.1.7 comment

8 Â Л Љ ҳ no Â

[**no**] **comment** *Comment_String*

Comment_String	˘ 127 ˘ a

[no] flow-control log on

global	˘ ˘ wan
name	8 ¨ Â
In_bandwith	Ю ˘ ' 500~ 10000000 Æ' kbps
Out_bandwith	Э ˘ ' 500~ 10000000 Æ' kbps
perpir-update	‡ Per-PIR ˘ a Ю 10M a

Ю Л ˘ global Â

Â

1 à 8 ˘ 8 Л Љ
8 8 K

flow-policy	wan 8

11.1.9 flow-policy

8 wan Э˘ Ю ‡
Л Л Â Л Л ҳ no ∧ 8
Э Â

flow-policy *name*

no flow-policy

name	8 ‥ Â

Ю˘ WAN Э 8 Â

ҳ Â

ҳ Л WAN Э ˘ WAN Э ҳ Â

1˙ group1 Gi 0/1 Э˙

```
Ruijie#config
Ruijie(config)#interface gi 0/1
Ruijie(config-if-GigabitEthernet 0/1)#flow-policy group1
Ruijie(config-if-GigabitEthernet 0/1)#
```

2˙ group2 Gi 0/2 Э˙

```
Ruijie#config
Ruijie(config)#interface gi 0/2
Ruijie(config-if-GigabitEthernet 0/2)#flow-policy group2
Ruijie(config-if-GigabitEthernet 0/2)#
```

3˙ Gi 0/1 Э ∧ group1˙

```
Ruijie#config
Ruijie(config)#interface gi 0/1
```

Ruijie(config-if-GigabitEthernet 0/1)#**no flow-policy**
Ruijie(config-if-GigabitEthernet 0/1)#

३	
flow-control	8

session-num	‡ ˘ Ƀ ˘ 0˙ 4000000Ơ 0 a ⁸
in-channel-name	‡ in-channel ¨
out-channel-name	‡ out-channel ¨
string	‡
disable	‡˘
vpn	VPN ˘ ʌ Ƀ VPDN ˘ VPN
default	˘ ˝I æ˘ ˝I ‡

Ю ‡

ʒ ⁸

1 à a num ʌ a˚ ˘ ˚ ‡ Â

2 à ‡ Ƀ ‡ ɨ ˝I ˘ ‡ ˚ ч ǂ
à Лъ ↓ à˚ ‡ ⁸
WAN Э(a WAN)Â

3 à **Action** ѝ pass Ю **in-channel** **out-channel** a ˘ ‡
in **out** ą̈ a ˘ ↓ ą̈ a ↓ ą̈ a ’

4 à ‡˙ ˝I ˝I ˘ vlan > IP >
> IP > ’ ˝I ˚ ˘ ˚
¨ ˚ ˘ è ˚ Ю
¨╗ ˚ ˘ ╗ Â

1˙ ⁸ group1 Ю ⁸ ‘Ω ʌ ѝ 3М
⁸ ѝ 300

```
Ruijie#config
Ruijie(config)#flow-control group1
Ruijie(config-flow-control)#flow-rule 1 vlan-group any subscriber
      network-group any app-group any time-rang any
Ruijie(config-flow-control)#flow-rule 1 session-limit 300 action
pass out-channel                group1Ểϕ  I  ≈ Ţ Ō    any ʔ  5      any
                                3>Tj3e(config-flow-control)#
```

```
Ruijie(config)#flow-control group1
Ruijie(config-flow-control)#no flow-rule 1
```

time-range name	
vlan-group name	vlan-group
subscriber static name	subscriber
network-group name	network-group
identify-application custom name	app-group

10.3(4b7)	
10.4(4T90)	**disable**

11.1.11 flow-template

flow-template copy *Src_name Dst_name* **[bandwith_***In_bandwith Out_bandwith* **[perpir-update]] [force]**

Src_name	
Dst_name	… a б Src_name
In_bandwith	500~ 10000000 kbps a
Out_bandwith	500~ 10000000 kbps a
perpir-update	Per-PIR a 10M a
force	a force force

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1 à ˘ Â

2 à ˘ è Л Ъ ѝ

… ˘ ,

1 à Gi0/0 Gi0/2 ˘ з ѝ 15M

```
Ruijie#config
Ruijie(config)# flow-template copy Gi0/0 Gi0/2 bandwith 15000 15000
```

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flow-control	8

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Л	
10.3(4b8)	ʒ

11.1.12 clear flow-control

˘ **clear flow-control** ʒ Â

clear flow-control *Name* **statistics**

Name	8 ¨ Â

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˘ ў à Ль Â

Gi0/2 ‘

```
Ruijie# clear flow-control Gi0/2 statistics
```

ʒ	ʒ	

show flow-control Name **[inbound | outbound] auto-pir**	Auto-pir ↵

1、 、 tpl-fixlimit 、

```
Ruijie#show flow-control tpl-fixlimit
flow-control tpl-fixlimit
 comment          a ?¶       à          ( )  8
 !
 channel-tree inbound
  auto-pir enable interval 1 root-rate 90
  !
  channel-group root parent null cir 10000 pir 10000 pri 4 schedule-type per-net per-mask 32 per-cir 10 per-pir 10000 limit 1000
  channel-group default parent root pir 10000 pri 4 schedule-type per-net per-mask 32 per-cir 1 per-pir 10000 limit 1000 auto
  channel-default default
 !
 channel-tree outbound
  auto-pir enable interval 1 root-rate 90
  !
  channel-group root parent null cir 10000 pir 10000 pri 4 schedule-type per-net per-mask 32 per-cir 10 per-pir 10000 limit 1000
  channel-group default parent root pir 10000 pri 4 schedule-type per-net per-mask 32 per-cir 1 per-pir 10000 limit 1000 auto
  channel-default default
 !
```

2、 IO ä 、

```
Ruijie#show flow-control test inbound channel-group root
Group-name          CIR          PIR          Pri          Schedule
CIDR/CIR/PIR/Limit/Sess-limit/Share-pool
----------  --    --   --   -------- ----------------------------
root        100   100   4    per-net  32/10/10/10/100/test
```

3、 IO 、

```
Ruijie#show flow-control test inbound
Group-name          CIR          PIR          Pri          Schedule
CIDR/CIR/PIR/Limit/Sess-limit/Share-pool
----------  --    --   --   -------- -------------------------
root        100   100   4    per-net  32/10/10/10/100/test
part1       100   100   4    fifo     /////test1
```

Group-name	¨
CIR	
PIR	

Pri	″I
Schedule	‟
CIDR/CIR/PIR/Limit/Sess-limit/ Share-pool	Per-net ˘ Л Ч ╗

4′ Э ‘

```
Ruijie#show flow-control test outbound share-pool
Global pool:    14          Global red obj:  0
Tree pool:      3

Share-pool     Rate       Type        Limit      Child
-------------- ---------- ---------- ---------- ----------
tcp            200        Normal     NA         1
udp            150        Normal     NA         1
p1             100        Normal     NA          2
```

Global pool	
Global red obj	⁸ ˘ Normal Per-IP
Tree pool	Channel-tree
Share-pool	‟
Rate	
Type	
Limit	Per-IP ˘ ѝ ⁸
Child	˘ Л ╗ Pool ˘ Ь Л ╗ Л ╗ 1

3′ Э ‘

```
Ruijie#show flow-control test3 outbound share-pool p1
Pool:     p1
Rate:     100       Type:     Normal    Limit:    NA
State:    Green     Child:    2         Active:   NA
Kill flow: 0

Group-name  Cir    Pir    Pri  Type      Limit    Share-pool
----------- ------ ------- ---- -------- -------- ----------
p1-tcp     150     500     4    fifo      NA        p1
p1-udp     100     500     4    fifo      NA        p1
```

10.3(4b8)	

11.1.14 show flow-control-policy group

show flow-control-policy group

-	-

Ruijie#**show flow-control-policy group**

```
group_name                  group_id  apply_ifx    policy_entries
group1                      0         6            14
group2                      1         0            4
```

group-name	
group-id	
apply_ifx	0
policy_entries	

-	-

	10.3(4b7)	¾

11.1.15 show flow-control-policy rule

‡ Â

show flow-control-policy rule [group *name***]**

ifx	‡ ˘ ѝ 0 ‡ ⁸ Â
vlan_id	‡ vlan-group id ѝ 0 vlan-group Â
subs_id	‡ subscriber id ѝ 0 subscriber Â
net_wk_id	‡ network-group id ѝ 0 network-group Â
app_id	‡ app-group id ѝ 0 app-group Â
inchl_id	‡ in-channel id id ѝ 0 ˘ NA ‡ in-channel Â
ochl_id	‡ out-channel id id ѝ 0 ˘ NA ‡ out-channel Â
ses_num	ѕ ‡ Â
ses_lim	‡ ѕ Â
state	Down ˘ up
effec	‡ ˘ ѝ 0 ˘ ѝ 1 Â

	10.3(4b7)	ֽ

12.1.2 flow-audit vpn

VPN

flow-audit vpn {inside-ip | outside-ip}

Ю VPN IP Â

ֽ Â

ֽ Л Љ VPN ˇ Л Љ Â

1 Ѽ Ω л й VPN Ь ˇ ˆ VPN л Э ˜ IP ˇ ‡ Ю

Ruijie# **configure terminal**

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

Ruijie(config)# **flow-audit vpn outside-ip**

2 Ω л й VPN ˇ Ω л VPN ˇ ‡ й IP ˇ Ю

Ruijie# **configure terminal**

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

Ruijie(config)# **flow-audit vpn inside-ip**

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12.2

12.2.1 show flowrate application

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show flowrate application {**global** | **interface** *interface-name* **|** **bridge** *bridge-name*} [[**subscriber** *subscriber-name*] [**subscriber-group** *subscriber-group*] | [**auth-subs-group** *auth-group-name*] [**auth-subs** *auth-name*]] [**ip** *ip-address*] [**application-group** *application-group*] [{[**by-group**] | [**application-type** *application-type*] [{**by-type** | **application** *application-name*}]}] [{**recent** *hour* **|** **minute-interval** *begin-year begin-month begin-day begin-hour:begin-minute* **to** *end-year end-month end-day end-hour:end-minute* **|** {[**month** | **week**] **day-interval** *begin-year begin-month begin-day* **to** *end-year end-month end-day* | **day** *begin-year begin-month begin-day*} [**hour-interval** *begin-hour1* **to** *end-hour1* [*begin-hour2* **to** *end-hour2*]}] [**om-q9 Tw[(om-q9 Tw[(om-q9 T**

end-hour1	1
begin-hour2	2
end-hour2	2
n	n

a Ю Â

✓ global à
à à , interface bridge
Ю à à
, a , by-group
, by-type Â
eg: show flowrate application global ^ ~
show flowrate application interface gi0/3 ¨ и ”gi0/3”Ю
~ show flowrate application interface gi0/3 by-group ^ ¨
и ”gi0/3”Ю ~
show flowrate application interface gi0/3 by-type ^ ¨ и ”gi0/3”Ю
~

✓ minute-interval begin-year begin-month begin-day begin-hour begin-minute end-year end-month end-day end-hour:end-minute
† † ˘ ў 1 ;
eg: show flowrate application interface gi0/3 minute-interva 2012 2 1 9:20 to 2012 2 1 9:50^ ˘ ¨ и ”gi0/3”Ю 2012 2 1 9 20† 2012 2 1 9 50† ~

✓ month week ˘ и t90 ҂˘ a ‡ , day-interval begin-year begin-month begin-day end-year end-month end-day ˘ Л ,

eg: show flowrate application global month day-interval 2012 1 5 to 2012 1 15 ^ ˘ 2012 1 5 2012 1 15 ~

✓ recent hour 0~24 ˘ recent Л ˘ Л ˘ ҂ и t90 ҂ ’
eg: show flowrate application interface gi0/3 recent 1^ ˘ ¨ и ”gi0/3” Ю ~

✓ day begin-year begin-month begin-day
,

eg: show flowrate application global day 2012 2 12 ^ ˘ 2012 2 12 ~

✓ top n Л n ,
eg: show flowrate application interface gi0/3 order by pass download desc top 5^
¨ и ”gi0/3”Ю ˘ è Ю “˘ 5 ~

✓ subscriber à subscriber-group à auth-subs-group à auth-subs à

IĄ¿Xi¥ÐÕp}9(Ą¶#G£[(rs)7ecens

ip й

WEB
27 349 231 393
0 0 0 0
202 637 479 634
0 0 0 0
131 231 721 614
0 0 0 0

4 gi0/3 2012 1 6

```
Ruijie#show flowrate application interface gi0/3 by-group day 2012
1 6
path:GigabitEthernet 0/3
day-interval: 2012-1-6 ~ 2012-1-6
Application_group
PASS:  Upload(KB)         Download(KB)           Upload(packets)
Download(packets)
DROP:  Upload(KB)         Download(KB)           Upload(packets)
Download(packets)
IP
  59              84              702             384
  0               0               0               0
WEB
  27              349             231             393
  0               0               0               0
  202             637             479             634
  0               0               0               0
  131             231             721             614
  0               0               0               0
```

5 bridge 0 2010 1 9 2010 1 15

```
Ruijie# show flowrate application bridge 0 by-group day-interval 2010
1 9 to 2010 1 15
path:bridge-map 0
day-interval: 2010-1-9 ~ 2010-1-15
Application_group
PASS:  Upload(KB)         Download(KB)           Upload(packets)
Download(packets)
DROP:  Upload(KB)         Download(KB)           Upload(packets)
Download(packets)
```

P2P

0	6	24	24
0	0	0	0

5229	116742	59983	89151
0	0	0	0

220	135	1349	1290
0	0	0	0

27684236	159994	363431164	226927
0	0	0	0

793	772	5327	4766
0	0	0	0

32	252	567	635
0	0	0	0

0	2	0	4
0	0	0	0

6 gi0/3 2012 1 6 2012 1 20

```
Ruijie#show flowrate application interface gi0/3 by-group month
day-interval 2012 1 6 to 2012 1 20
path:GigabitEthernet 0/3
day-interval: 2012-1-6 ~ 2012-1-20
Application_group
PASS:  Upload(KB)         Download(KB)          Upload(packets)
Download(packets)
DROP:  Upload(KB)         Download(KB)          Upload(packets)
Download(packets)
IP
  590             840             7020            3840
  0               0               0               0
WEB
  270           3490              2310            3930
  0               0               0               0
  2020           6370             4790            6340
  0               0               0               0
  1310           2310             7210            6140
```

0 0 0 0

7 gi0/3 2012 1 5 2012 1 13 1 5

```
Ruijie#show flowrate application interface gi0/3 by-group month day-interval 2012 1 5 to 2012 1 13 hour-interval 1 to 5 detail
path:GigabitEthernet 0/3
day-interval: 2012-1-5 ~ 2012-1-13
hour-interval: 1 ~ 5, 0 ~ 0
time-interval(min): 240
Application       Pass_up KB      Pass_down KB
                  Drop_up(KB)     Drop_down(KB)     time
360       -UPDATE       2              41
                        1              2          2012-1-5 4
BQQ                     12             12
                        1              0          2012-1-6 4
IT                      0              1
                        2              1          2012-1-7 4
360       -UPDATE       2              40
                        3              0         2012-1-8 4
BQQ                     12             12
                        1              2          2012-1-9 4
IT                      0              1
                        0              1          2012-1-10 4
360       -UPDATE       2              60
                        1              2          2012-1-11 4
BQQ                     12             12
                        1              0          2012-1-12 4
IT                      5              1
                        0              1          2012-1-13 4
============================================================
Total                   47             180
                        10             10
```

hour	
begin-hour2	2
end-hour2	2
n	n

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✓ minute-interval begin-year begin-month begin-day begin-hour begin-minute end-year end-month end-day end-hour:end-minute

eg: show flowrate channel channel-group root minute-interva 2012 2 1 9:20 to 2012 2 1 9:50 2012 2 1 9 20 2012 2 1 9 50 "root"

✓ month week day-interval begin-year begin-month begin-day end-year end-month end-day time-interval begin-year begin-month begin-day begin-hour end-year end-month end-day end-hour

eg: show flowrate channel channel-group root month day-interval 2012 1 5 to 2012 1 15 2012 1 5 2012 1 15 "root"

show flowrate channel channel-name NBR time-interval 2012 1 5 8 to 2012 1 8 18 2012 1 5 8 2012 1 8 18 " NBR "

✓ recent hour 0~24 recent

eg: show flowrate channel channel-name "NBR "

channel_groupA/ channel_nameA
up 125520 , 33
0 , 0
channel_groupB/ channel_nameB
down 128 , 0
0 , 0
channel_groupC/ channel_nameC
down 39632 , 61
0 , 0

2 ˇ ¨ й NBR ˇ 2012 1 6 ㄔ 12 ˇ 12
40ᚋ

Ruijie# show flowrate channel channel-name “NBR ” minute
-interval 2012 1 6 12:0 to 2012 1 6 12:40
channel_group: channel_groupA
channel_name: channel_nameA
type: down
PASS: 21190 KB, 281800 Packets
DROP: 0 KB, 0 Packets

channel_group: channel_groupB
channel_name: channel_nameB
type: up
PASS: 16640 KB, 90220 Packets
DROP: 0 KB, 0 Packets

3 ˇ ¨ й NBR ˇ 2012 1 6 ㄔ (” Y^ ®Êì®®";ð %â ‘l# $

```
 channel_group: channel_groupA
channel_name: channel_nameA
type:  down
PASS:  821170 KB, 2280990 Packets
DROP:  0 KB, 0 Packets

channel_group: channel_groupB
channel_name: channel_nameB
type:  up
PASS:  616543 KB, 1890126 Packets
DROP:  0 KB, 0 Packets
```

5˙ ˘ ¨ ѝ NBR ˘ 2012 1 6 ˅ 2012 1 18 ˅

Ruijie# show flowrate channel channel-name “NBR ” *month* **day-interval 2012 1 6 to 2012 1 18**

```
channel_group: channel_groupA
channel_name: channel_nameA
type:  down
PASS:  821000 KB, 2280120 Packets
DROP:  0 KB, 0 Packets

channel_group: channel_groupB
channel_name: channel_nameB
type:  up
PASS:  616000 KB, 1790456 Packets
DROP:  0 KB, 0 Packets
```

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NPE “ a day-interval à recent à time-interval à day à month à week à hour-interval Â

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10.3(4b7)	ʒ
10.3(4b8)	minute-interval à week à month à day

12.2.3 show flowrate interface

show flowrate {**global** | **interface** *interface-name*} [{**recent** *hour* | **minute-interval**

begin-year begin-month begin-day begin-hour:begin-minute **to** *end-year end-month end-day end-hour:end-minute* **|** [**month** | **week**] **time-interval** *begin-year begin-month begin-day begin-hour* **to** *end-year end-month end-day end-hour* **|** {[**month** | **week**] **day-interval** *begin-year begin-month begin-day* **to** *end-year end-month end-day* | **day** *begin-year begin-month begin-day*}[**hour-interval** *begin-hour* **to** *end-hour* [*begin-hour2* **to** *end-hour2*]] } [**detail**]]

interface-name	"

eg: show flowrate global month day-interval 2012 1 5 to 2012 1 15 ˆ ˘
2012 1 5 2012 1 15 ˜
show flowrate global week time-interval 2012 1 5 8 to 2012 1 15 18ˆ ˘
2012 1 5 8 2012 1 15 18 ˜

✓ recent hour 0~24 ˘ recent

DROP upload: 1 KB, 200 Packets

DROP download: 3 KB, 1120 Packets

5˙ ˇ 2011 12 10 2011 12 19

Ruijie# show flowrate interface gi0/3 *month* day-interval *2011 12 10* to *2011 12 19* hour-interval *1 to 5 detail*

Interface:GigabitEthernet 0/3

Time Slice:240 min

ID	Pass_upload(KB)	Pass_download(KB)	Drop_upload(KB)	Drop_download(KB)	time
1	2817	873	12	10	2011-12-10 4
2	7963	1539	10	10	2011-12-11 4
3	13062	2290	9	12	2011-12-12 4
4	956	785	5	42	2011-12-13 4
5	2817	125	8	5	2011-12-14 4
6	7960	1630	6	4	2011-12-15 4
7	13089	2290	2	9	2011-12-16 4
8	957	785	5	1	2011-12-17 4
9	13089	2290	3	1	2011-12-18 4
10	957	785	5	1	2011-12-19 4
Total	49621	14140	65	95	

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-	-

NPE a minute-interval àtime-interval àday-interval àrece/TT4 1 Tf0.0.713 0 T0.71 6l

end-minute	
begin-hour1	1
end-hour1	1
begin-hour2	2
end-hour2	2
n	n

a Â

✓ global ,
interface bridge Ю
,

eg: show flowrate ip global ^ ~
show flowrate ip interface gi0/3 ^ ¨ и "gi0/3"Ю ~

✓ minute-interval begin-year begin-month begin-day begin-hour begin-minute end-year end-month end-day end-hour:end-minute
† † ˘ ў 1 ;

eg: show flowrate ip interface gi0/3 minute-interva 2012 2 1 9:20 to 2012 2 1 9:50 ^
˘ ¨ и "gi0/3"Ю 2012 2 1 9 20† 2012 2 1
9 50† ~

✓ month week ˘ и t90 ҂˘ a
‡ , day-interval begin-year begin-month begin-day end-year end-month end-day ˘ Л
,

eg: show flowrate ip global month day-interval 2012 1 5 to 2012 1 15 ^ ˘
2012 1 5 2012 1 15 ~

✓ recent hour 0~24 ˘ recent
Л ˘ Л ,

eg: show flowrate ip interface gi0/3 recent 1 ^ ˘ ¨ и "gi0/3"Ю
~

✓ day begin-year begin-month begin-day
,

eg: show flowrate ip global day 2012 2 12 ^ ˘ 2012 2 12
~

✓ top n Л n ,

eg: show flowrate ip interface gi0/3 ip 192.168.1.3 order by pass download desc top 5^
¨ и Ь gi0/3 Ь Ю ip и 192.168.1.1 ˘ è Ю
"˘ 5 ~

✓ application à application-group à application-type è
Ю a (recent à month à week à day à day-interval à minute-interval) ¯ Л

eg: show flowrate ip interface gi0/3 application PPTP ^ ¨ и Ь gi0/3 Ь Ю app
и PPTP ~

҂ ℸ ˘ Л Л℧ by-group ℸ ,
detail ,

è Л Л‰ ˘ ˘ ‡ Л Â
з à à Л hour-interval 1 2 Â

1˙ Ю gigabitEthernet 0/1 ’

```
Ruijie#show flowrate ip interface gigabitEthernet 0/1
Subscriber                ip
PASS: Upload(bps)    Download(bps)   Upload(pps)    Download(pps)
DROP: Upload(bps)    Download(bps)   Upload(pps)    Download(pps)
/User_groupA/User_nameA 2.2.2.92
  230              134              0               0
  0                0                0               0
/User_groupB/User_nameB  172.18.3.67
  259              153              0               0
  0                0                0               0
```

2˙ Ю gigabitEthernet 0/1˘ 2010 1 8 Л 2010 1 12 Л

Ruijie#show flowrate ip *interface gifabitEthernet 0/1* day-interval *2010 1 8* to *2010 1 12*

```
path: GigabitEthernet 0/1
day-interval: 2010-1-8 ~ 2010-1-12
Subscriber                  ip
PASS ˙  Upload(KB)          Download(KB)           Upload(packets)
Download(packets)
DROP ˙  Upload(KB)          Download(KB)           Upload(packets)
Download(packets)
/User_groupA/User_nameA     172.18.3.34
  0                2871             0               16161
  0                0                0               0
/User_groupB/User_nameB     172.18.3.50
  153987           0                2022024           0
  0                0                0               0
/User_groupC/User_nameC     172.18.3.64
  153986           0                2022024           0
  0                0                0               0
/User_groupD/User_nameD       172.18.3.65
  213285           0                2800725           0
  0                0                0               0
/User_groupE/User_nameE       172.18.33.50
  161994           0                2127179           0
  0                0                0               0
```

3˙ ˘ 2011 11 22 Л 10 10 5¦

```
Ruijie(config)# show flowrate ip global minute-interval 2011 11 22
10:0 to 2011 11 22 10:5 detail
```

minute-interval: 2011-11-22 10:0~ 2011-11-22 10:5

```
time-interval(min): 1
Subscriber
ip       pass_up(KB)   pass_down(KB)   drop_up(KB)  drop_down(KB)
time
/User_groupA/User_nameA
192.168.1.3   191       283               0            0
2011-11-22 10:1
/User_groupA/User_nameA
192.168.1.3   351      986               0            0
2011-11-22 10:2
/User_groupA/User_nameB
192.168.1.4   180      275               0            0
2011-11-22 10:3
/User_groupA/User_nameB
192.168.1.4     330     966              0           1
2011-11-22 10:4
/User_groupA/User_nameC
192.168.1.5     300      470              1           2
2011-11-22 10:5
============================================================
Total           1352    2980              1           3
```

4' ˘ 2011 12 22 ㅅ 10 12

Ruijie(config)#show flowrate ip global day *2011 12 22* hour-interval *10* to *12* detail

```
192.168.1.4        312    960         2                2
2011-12-22 10:40
/User_groupA/User_nameC
192.168.1.5        300    470         3                4
 2011-12-22 10:50
/User_groupA/User_nameE
192.168.1.3        182     280        3                6
2011-12-22 11:00
/User_groupA/User_nameA
192.168.1.3        186     260         7               2
2011-12-22 11:10
/User_groupA/User_nameA
192.168.1.3        340    980         1                2
2011-12-22 11:20
/User_groupA/User_nameB
192.168.1.4        160     245        3                4
2011-12-22 11:30
/User_groupA/User_nameB
192.168.1.4        320     960        2                1
2011-12-22 11:40
/User_groupA/User_nameC
192.168.1.5        300      470        1               6
2011-12-22 11:50
/User_groupA/User_nameC
192.168.1.5        200      400        1               6
2011-12-22 12:00

============================================================
Total             3213      6852        32              41

  5˙            ˇ         2011   12   20 ㄏ   12   26 ㄏ 10     11
```

Ruijie(config)#show flowrate ip global day-interval *2011 12 20* to *2011 12 29* hour-interval *10* to *11* detail

```
192.168.1.3    351          986             3            4
2011-12-21 11
/User_groupA/User_nameA
192.168.1.3   180        275             4           2
2011-12-22 11
/User_groupA/User_nameA
192.168.1.3   330        966           1            3
 2011-12-23 11
/User_groupA/User_nameA
192.168.1.3    300       470            3            4
2011-12-24 11
/User_groupA/User_nameA
192.168.1.3     501       1305           1            4
2011-12-25 11
/User_groupA/User_nameA
192.168.1.3     456      1205           2            5
2011-12-26 11
/User_groupA/User_nameA
192.168.1.3     567      1305           1            6
2011-12-27 11
/User_groupA/User_nameA
192.168.1.3     564       825           3            5
2011-12-28 11
/User_groupA/User_nameA
192.168.1.3      367      800           7            3
2011-12-29 11
============================================================
Total             3807    8420          30           38
```

6˙ ˇ 2011 12 12 ∧ 2011 12 22 ∧ 9 13

Ruijie(config)#show flowrate ip global month day-interval *2011 12 12* to *2011 12 22* hour-interval *9* to *13* detail

```
day-interval: 2011-12-12 ~ 2011-12-22
hour-interval: 9 ~ 13, 0 ~ 0
time-interval(min): 240
Subscriber
ip        pass_up(KB)    pass_down(KB)  drop_up(KB) drop_down(KB)
time
/User_groupA/User_nameA
192.168.1.3   191          285           2               3
2011-12-12 12
/User_groupA/User_nameA
192.168.1.3   191          183          1               3
```

```
2011-12-13 12
/User_groupA/User_nameA
192.168.1.3    191    583         5              3
2011-12-14 12
/User_groupA/User_nameA
192.168.1.3    191     383         2              3
2011-12-15 12
/User_groupA/User_nameA
192.168.1.3    351     286         1              3
2011-12-16 12
/User_groupA/User_nameB
192.168.1.4   180      275         2              3
2011-12-17 12
/User_groupA/User_nameB
192.168.1.4    330    966         4              3
2011-12-18 12
/User_groupA/User_nameC
192.168.1.4     330   980         2              2
2011-12-19 12
/User_groupA/User_nameC
192.168.1.4     330    960         3              3
2011-12-20 12
/User_groupA/User_nameC
192.168.1.4     330    966         1              3
2011-12-21 12
/User_groupA/User_nameC
```

12.2.5 show flowrate ip-application

Ю IP à Л↓ IP ’

show flowrate ip-application {**global** | {**interface** *interface-name* | **bridge** *bridge-name*} [**by-vpn**]} [[**subscriber** *subscriber-name*] [**subscriber-group** *subscriber-group*] [**vip**] | {**by-auth**} [**auth-subs-group** *auth-group-name*] [**auth-subs** *auth-name*]] [**ip** *ip-address*] [**application** *application-name*] [**application-group** *application-group*] [**application-type** *application-type*] [**order-by** {{**pass** | **drop**} {**upload** | **download**} | **ip** | **application** | **subscriber-group** | **subscriber** | **auth-subs-group** | **auth-subs }** {**desc** | **asc**}[**top** *n*]]

interface-name	
bridge-name	Ю
subscriber-name	
auth-group-name	
auth-name	
Ip-address	IP
application-name	
application-group	
application-type	
n	n

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Â

✓ global IP à ’ interface bridge Ю IP à ’

eg: show flowrate ip-application global ip 192.168.1.3ˆ IP à ~

show flowrate ip-application interface gi0/3 ip 192.168.1.3ˆ и ”gi0/3”Ю IP à ~

✓ top n Л n ’

eg: show flowrate ip-application interface gi0/3 ip 192.168.1.3 order by pass download desc top 5 ^ и Ь gi0/3 Ь Ю ip и 192.168.1.1 ˇ è Ю “ˇ 5 ~

1˙ Ю˙ gigabitEthernet 0/1 IP и 172.18.36.102 ’

```
Ruijie#show flowrate ip-application interface gigabitEthernet 0/1
ip 172.18.36.102
```

```
path:GigabitEthernet 0/1
Subscriber ip  Application  Application-group  Application-type
PASS: Upload(bps)   Download(bps)   Upload(pps)   Download(pps)
DROP: Upload(bps)   Download(bps)   Upload(pps)   Download(pps)
/user_groupA/user_nameA      172.18.36.102         applicationA
application_groupA
  46003           2093107          93             173
  0               0                0              0
/user_groupB/user_nameB      172.18.36.102       applicationB
application_groupB
  46001           2093102          193             173
  0               0                0              0
/user_groupC/user_nameC      172.18.36.102        applicationC
application_groupC
  4003           1093107          63             73
  0              0                0              0
```

-	-

interface-name	Ь Ю
bridge-name	Ю
subscriber-name	
subscriber-group	
auth-group-name	
auth-name	
Ip-address	IP
begin-minute	
end-minute	
begin-day	
begin-month	
begin-year	
end-day	
end-month	
end-year	
begin-hour	
end-hour	
begin-hour2	2
end-hour2	2
n	n

a Ю

,

eg: show online ip global ip 192.168.1.1 day 2012 2 12 ˆ ip ѝ 192.168.1.1 2012 2 12 IP ˜

✓ top n ϒ n ,

eg: show online ip global ip 192.168.1.3 order by pass download desc top 5 ˆ ip ѝ 192.168.1.1 IP ˘ è Ю “˘ 5 ˜

```
/User_groupF/User_nameF
 192.168.196.72                 2010-1-7 9:37        1922
  274249           396572           0               0
/User_groupG/User_nameG
 192.168.203.48                 2010-1-7 9:37        1922
  55562            380214           0               0
/User_groupH/User_nameH
 192.168.196.70                 2010-1-7 9:37        1922
  105615           285195           0               0
/User_groupI/User_nameI
 192.168.196.55                 2010-1-7 9:37        1922
  33071            205676           0               0
/User_groupJ/User_nameJ
 192.168.203.40                 2010-1-7 9:37        1922
  15904            160891           0               0
```

3 gigabitEthernet 0/1 2010 1 8 2010 1 11 1 3 ip

```
Ruijie# show online ip interface gigabitEthernet 0/1 day-interval
2010 1 8 to 2010 1 11 hour-interval 1 to 3 order-by pass download
desc
path:GigabitEthernet 0/1
Subscriber
IP              OnlineTime(min)
PASS-Upload(KB)         PASS-Download(KB)         DROP-Upload(KB)
DROP-Download(KB)
/User_groupC/User_nameC
192.168.196.37     180
  75381            1193654          0               0
/User_groupD/User_nameD
192.168.203.36     180
  381              3120             0               0
/User_groupE/User_nameE
192.168.196.53     180
  206              1457             0               0
/User_groupF/User_nameF
192.168.196.63     135
  142              1437             0               0
```

4 2011 12 22 1 2 ip

```
Ruijie# show online ip global minute-interval 2011 12 22 1:0 to 2011
12 22 2:0
Subscriber
IP              OnlineTime(min)
```

PASS-Upload(KB) PASS-Download(KB) DROP-Upload(KB) DROP-Download(KB)

/User_groupF/User_nameF

192.168.196.63 75 76 360 0 0

/User_groupE/User_nameE

192.168.196.53 90 103 399 0 0

/User_groupC/User_nameC

192.168.196.37 95 17654 4675 0 0

5、 查看 2011 12 22 小时 1 到 3 的 ip 会话

Ruijie# show online ip global day *2011 12 22* hour-interval 1 to 3

Subscriber

IP OnlineTime(min)

PASS-Upload(KB) PASS-Download(KB) DROP-Upload(KB) DROP-Download(KB)

/User_groupF/User_nameF

192.168.196.63 150 142 720 0 60

/User_groupE/User_nameE

192.168.196.53 180 206 698 0 45

/User_groupC/User_nameC

192.168.196.37 190 353 936 0 50

6、 查看 2011 12 20 小时 2011 12 29 小时 1 到 3 ip 会话

Ruijie# show online ip global month day-interval *2011 12 20* to *2011 12 29* hour-interval 1 to 3

Subscriber

IP OnlineTime(min)

PASS-Upload(KB) PASS-Download(KB) DROP-Upload(KB) DROP-Download(KB)

/User_groupF/User_nameF

192.168.196.63 270 1420 14370 0 0

/User_groupE/User_nameE

192.168.196.53 360 2060 14570 0 0

/User_groupC/User_nameC

192.168.196.37 360

	75381	1193654	0	0

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NPE " a minute-interval à day-interval à day à month à week à hour-interval Â

10.3(4b7)	
10.3(4b8)	à vip Л↓ minute-interval à week à month à day

12.2.7 show online ip-application

Ю IP à Э à Â

show online ip-application {**global** | **interface** *interface-name* | **bridge** *bridge-name*} [[**subscriber** *subscriber-name*] [**subscriber-group** *subscriber-group*] [**vip**] | {**by-auth**} [**auth-subs-group** *auth-group-name*] [**auth-subs** *auth-name*]] [**ip** *ip-address*] [**application** *application-name*] [**application-group** *application-group*] [**application-type** *application-type*] [**order-by** {{**pass** | **drop**} {**upload** | **download**} | **ip** | **subscriber-group** | **subscriber** | **auth-subs-group** | **auth-subs** | **application**} {**desc** | **asc**}] [**offset** *start –record* {**limit** record-num}]

interface-name	Ь Ю
bridge-name	Ю
subscriber-name	
subscriber-group	
auth-group-name	
auth-name	
Ip-address	IP
application-name	
application-group	
application-type	
start-record	
record-num	

3

global IP à Э à ˘
interface bridge Ю IP

	-	-

	-

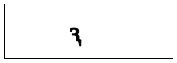
	10.3(4b7)	
	10.3(4b8)	à vip

12.2.8 show online statistic

Ю ˘ hour IP Л↓ ’

show online statistics {**global** | **interface** *interface-name* **|** **bridge** *bridge-name*} [{**detail** [**offset** start-record {**limit** record-num}] **|** **recent** *hour* **|** **minute-interval** *begin-year begin-month begin-day begin-hour:begin-minute* **to** *end-year end-month end-day end-hour:end-minute* **|** [**month** | **week**] **time-interval** *begin-year begin-month begin-day begin-hour* **to** *end-year end-month end-day end-hour* | **day** *begin-year begin-month begin-day* [**hour-interval** *begin-hour1* **to** *end-hour1* [*begin-hour2* **to** *end-hour2*]]}]

interface-name	Ь ¨ ˘ Ю
bridge-name	¨ ˘ Ю
start-record	
record-num	
hour	
begin-year	
begin-month	
begin-day	
begin-hour	
begin-minute	˚
end-year	
end-month	
end-day	
end-hour	
end-minute	˚
begin-hour	
end-hour	
begin-hour2	2
end-hour2	2



a IØ IP

```
4   192.168.196.26  /User_groupD/User_nameD  1
5   192.168.196.150 /User_groupE/User_nameE  1
```

3 Ю 1 Э IP

```
Ruijie# show online statistics interface gigabitEthernet 0/1 recent
1
path: GigabitEthernet 0/1
recent hour: 1
Time slice: 60 min
count:1
ID       Online-IP     Online-Session          time
1              95           522                2012-1-5 10:00
```

4 ˇ 2011 12 22 ㄐ 10 10┆ 10 20┆ Э IP

```
Ruijie# show online statistics global minute-interval 2011 12 22 10:10
to 2011 12 22 10:20
Time slice: 1 min
count: 10
ID       Online-IP     Online-Session          time
1              95           588                2011-12-22 10:11
2              96           598                2011-12-22 10:12
3              94           590                2011-12-22 10:13
4              96           528                2011-12-22 10:14
5              96           586                2011-12-22 10:15
6              97           546                2011-12-22 10:16
7              99           566                2011-12-22 10:17
8              97           542                2011-12-22 10:18
9             96            585                2011-12-22 10:19
10             15           500                2011-12-22 10:20
```

5 ˇ 2011 12 22

4 ADm15 4-6( )-6(97)-6(

6 ˇ 2011 12 20 ʌ 9 2011 12 28 ʌ 9
Э IP

Ruijie# show online statistics global *month* time-interval *2011 12 20 9 to 2011 12 28 9*

Time slice: 240 min

count: 49

ID	Online-IP	Online-Session	time
1	95	522	2011-12-20 12
2	56	522	2011-12-20 16
3	80	522	2011-12-20 20
4	95	522	2011-12-21 0
5	105	588	2011-12-21 4
6	125	320	2011-12-21 8
7	75	486	2011-12-21 12
8	75	486	2011-12-21 16
9	200	460	2011-12-21 20
10	95	522	2011-12-22 0
11	56	522	2011-12-22 4
12	80	522	2011-12-22 8
13	95	522	2011-12-22 12
14	105	588	2011-12-22 16
15	125	320	2011-12-22 20
16	75	486	2011-12-23 0
17	75	486	2011-12-23 4
18	200	460	2011-12-23 8
19	95	522	2011-12-23 12
20	56	522	2011-12-23 16
21	80	522	2011-12-23 20
22	95	522	2011-12-24 0
23	105	588	2011-12-24 4
24	125	320	2011-12-24 8
25	75	486	2011-12-24 12
26	75	486	2011-12-24 16
27	200	460	2011-12-24 20
28	95	522	2011-12-25 0
29	56	522	2011-12-25 4
30	80	522	2011-12-25 8
31	95	522	2011-12-25 12
32	105	588	2011-12-25 16
33	125	320	2011-12-25 20
34	75	486	2011-12-26 0
35	75	486	2011-12-26 4
36	200	460	2011-12-26 8

37	75	486	2011-12-26 12
38	75	486	2011-12-26 16
39	200	460	2011-12-26 20
40	95	522	2011-12-27 0
41	56	522	2011-12-27 4
42	80	522	2011-12-27 8
43	95	522	2011-12-27 12
45	105	588	2011-12-27 16
46	125	320	2011-12-27 20
47	95	522	2011-12-28 0
48	56	522	2011-12-28 4

49 80 522
2011-12-28 8

-	-

NPE " a minute-interval ãtime-interval ãrecent ãday ãmonth ãweek ãhour-interval Â

10.3(4b7)	

ǂ ĄA ҃ ĄA ˘ ЛЬЮ ˙

1. é ҃
2. DHCP ҃
3. DHCP Relay ҃
4. DNS ҃
5. NTP ҃
6. SNTP ҃
7. UDP-Helper ҃
8. DDNS ҃
9. DNS ҃
10. DNS-Proxy ҃

1

1.1

1.1.1 ping

३ ˘ ʌ ɲ ╠ à æ
Â ३ Ю

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

ð Ô

vrf-name	VRF¨
ip-address	IPv4 Â
length	
times	
timeout	
data	'I
source	IPv4

ð Ô

ˆ й 2 ˜ ˘ 5 й 100Byte IP
Â

ð ३ Ô

ð Ô

Ping ३ Ю Ю ʌ
ping ╗ ˘ Ю ‡ ʌ ɲ ping ╗ Â ping
╗ ˘ ʌ ɲ Ю ˘ ˆ й 2
˜ ˘ 5 й 100Byte IP ˘ ˘ ‡
ļ ! Ľ ˘ ‡ ļ . Ľ ł Â ping ╗ ˘

Л Ю ˘ ping ˘ Л Л Ъ à ˘
˘ ping ╖ ˘ ɨ ≠ Â ¨
╖ ˘ ‡ ″I ¨ Ь ˘ é DNS ǀ Â

ð Ô

ping ‘

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

ping ‘

```
Ruijie# ping 192.168.5.197 length 1500 ntimes 100 timeout 3 data
ffff source 192.168.4.10

Sending 100, 1000-byte ICMP Echoes to 192.168.5.197, timeout is
3 seconds:
  < press Ctrl+C to break >
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
Success rate is 100 percent (100/100), round-trip min/avg/max
= 2/2/3 ms
```

ð Л Ô

٪ Э Â

1.1.2 Traceroute

traceroute ٪˘ Л Л Ъ ÿ
.

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

ð Ô

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

ð ¾ Ô

ð Ô

traceroute ¾ ў ˘ ˘ Æ
Æ Â ¨ ╖ ˘ ‡ ”I ¨ Ь ˘ é DNS
† Â

ð Ô

ЛЬЮ й traceroute ч ˘ ѝ ˘ ѝ
a Â

1 à traceroute ˙

```
Ruijie# traceroute 61.154.22.36
< press Ctrl+C to break >
Tracing the route to 61.154.22.36

1     192.168.12.1    0 msec  0 msec  0 msec
2     192.168.9.2     4 msec  4 msec 4 msec
3     192.168.9.1     8 msec  8 msec  4 msec
4     192.168.0.10    4 msec  28 msec  12 msec
5     202.101.143.130    4 msec  16 msec  8 msec
6     202.101.143.154   12 msec  8 msec  24 msec
7     61.154.22.36    12 msec  8 msec  22 msec
Ruijie#
```

ÿ Э ˘ Л Лъ ˘ ÿ IP й 61.154.22.36 ў ˘
^ 1˙ 6˜˜ ˚ ˘
† ˘ Â

2 à a traceroute ˙

```
Ruijie# traceroute 202.108.37.42
< press Ctrl+C to break >
Tracing the route to 202.108.37.42
```

```
1     192.168.12.1    0 msec  0 msec  0 msec
2     192.168.9.2      0 msec  4 msec 4 msec
3     192.168.110.1    16 msec  12 msec  16 msec
4     *  *  *
5     61.154.8.129     12 msec  28 msec  12 msec
6     61.154.8.17      8 msec  12 msec  16 msec
7     61.154.8.250     12 msec  12 msec  12 msec
8     218.85.157.222   12 msec  12 msec  12 msec
9     218.85.157.130   16 msec  16 msec  16 msec
10     218.85.157.77   16 msec  48 msec  16 msec
11     202.97.40.65    76 msec  24 msec  24 msec
12     202.97.37.65    32 msec  24 msec  24 msec
13     202.97.38.162   52 msec  52 msec  224 msec
14     202.96.12.38     84 msec  52 msec  52 msec
15     202.106.192.226   88 msec  52 msec  52 msec
16     202.106.192.174   52 msec  52 msec  88 msec
17     210.74.176.158   100 msec  52 msec  84 msec
18     202.108.37.42    48 msec  48 msec  52 msec
Ruijie#
```

ÿ Э ˇ Л Љ ˇ ÿ IP ѝ 202.108.37.42 ў ˇ
ˆ 1˙ 17˜˜ з 4 Â

Ruijie# **traceroute** *www.ietf.org*

```
Translating " www.ietf.org "...[OK]
< press Ctrl+C to break >
Tracing the route to 64.170.98.32

1     192.168.217.1   0 msec  0 msec  0 msec
2     10.10.25.1       0 msec  0 msec  0 msec
3     10.10.24.1       0 msec  0 msec  0 msec
4     10.10.30.1       10 msec 0 msec  0 msec
5     218.5.3.254      0 msec  0 msec  0 msec
6     61.154.8.49      10 msec 0 msec  0 msec
7     202.109.204.210   0 msec  0 msec  0 msec
8     202.97.41.69     20 msec 10 msec 20 msec
9     202.97.34.65     40 msec 40 msec 50 msec
10    202.97.57.222     50 msec 40 msec 40 msec
11    219.141.130.122   40 msec 50 msec 40 msec
12    219.142.11.10     40 msec 50 msec 30 msec
13    211.157.37.14     50 msec 40 msec 50 msec
14    222.35.65.1      40 msec 50 msec 40 msec
15    222.35.65.18     40 msec 40 msec 40 msec
16    222.35.15.109     50 msec 50 msec 50 msec
17    *      *      *
```

```
              18    64.170.98.32     40 msec 40 msec 40 msec
```

ð ∧ Ô

¾ Э Â

2 DHCP

●

2.1.1 bootfile

ÐÆ DHCP ╟ ˚ ¨ ˘ DHCP ¾ **bootfile** Â
¾ **no** Л Љ Н ÐÆ Â

bootfile *file-name*

no bootfile

ð Ô

file-name	ÐÆ ╟ ˚ ¨ Â

ð Ô

ÐÆ ╟ ˚ ¨ Â

ð ¾ Ô

DHCP

ð Ô

DHCP ╟ Ю à ˚ ˘ DHCP Ь
╟ ˚ ¨ ˘ DHCP Л Љ Ь ^ TFTP˜
Ю ˚ Â è Ь **next-server** ¾ ÐÆ Â

ð Ô

ЛЊЮ ˘ ÐÆ router.conf и ╟ ˚ ¨ Â

```
bootfile router.conf
```

ð ¾ Ô

˜Ω ˜

2.1.2 client-identifier

Ⱨ DHCP ˆ Ⱦ Ȣ ⁸ ˜˘ DHCP
ৡ **client-identifier** Â ৡ **no** ⁄ Ⱦ Â

client-identifier *unique-identifier*

no client-identifier

ð Ô

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

ð Ô

Â

ð ৡ Ô

DHCP

ð Ô

DHCP DHCP Ⱡ ˦ IP ˘ ˚
ৡ Â à MAC ˚˚ ˘ MAC
ȕ 00d0.f822.33b4 à ˚˚ ȕ GigabitEthernet 0/1 ȕ
0100.d0f8.2233.b467.6967.6162.6974.4574.6865.726e.6574.302f.31˜ è 01 ৡ Ⱦ
˘

67.6967.6162.6974.4574.6865.726e.6574.302f.31 ȕ
GigabitEthernet0/1 Ȣ ⁸ Â ৡ Ⱨ˜ ⁄ Ⱦ RFC1700
ľ Address Resolution Protocol Parameters Ŀ Â

⁄ DHCP Ⱨ ˘ ⁄ Ⱦ ৡ Â

ð Ô

ⱭⱧO ˘ Ⱨ MAC ȕ 00d0.f822.33b4 Ⱦ DHCP
Â

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

ð ৡ Ô

ৡ	

hardware-address	ÐÆ DHCP ˚ Â
host	ÐÆ IP Â DHCP Â
ip dhcp pool	ÐÆ DHCP ¨ ˘ DHCP Â

2.1.3 client-name

ÐÆ DHCP ¨ ˘ DHCP ¾ **client-name** Â ¾ no DHCP ¨ Â

client-name *client-name*

no client-name

ð Ô

client-name	ÐÆ DHCP ¨ Â ʌ ʃЪ ASCII Â¨ a ł ¨ ˘ ÐÆ river ù DHCP ¨ ˘ a ÐÆ ù river.i-net.com.cn Â

ð Ô

ÐÆ ¨ Â

ð ¾ Ô

DHCP

ð Ô

ʌ DHCP ÐÆ ˘ ʌ ʃЪ ¾ ÐÆ DHCP ¨ Â ¨ a ł ¨ Â

ð Ô

ʃЪЮ ˘ ÐÆ river ù ¨ Â

```
client-name river
```

ð ¾ Ô

¾	
host	ÐÆ IP Â DHCP Â
ip dhcp pool	ÐÆ DHCP ¨ ˘ DHCP Â

2.1.4 default-router

ÞÆ DHCP ˘ DHCP ¾ **default-router** Â
¾ **no** Л Лъ ÞÆ Â

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

no default-router

ðô Ô

ip-address	ÞÆ IP Â Â
ip-address2…ip-address8	^ Л ~ Л Лъ 8 Â

ðô Ô

ÞÆ Â

ðô ¾ Ô

DHCP

ðô Ô

ЮЎ DHCP ÿ DHCP Ь Â DHCP Ь
й IP ˘ б¦ ˚
Â

ðô Ô

ЛъЮ ˘ ÞÆ 192.168.12.1 й Â

```
default-router 192.168.12.1
```

ðô ¾ Ô

¾	
ip dhcp pool	ÞÆ DHCP ¨ ˘ DHCP Â

2.1.5 dns-server

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

dns-server { *ip-address* [

ð Ô

ip-address	HX DNS L Â
ip-address2…ip-address8	ˆ Λ ˜ Λ J
use-dhcp-client *interface-type interface-number*	RGOS DNS L ˇ DNS L Â

ð Ô

HX DNS L Â

ð ३ Ô

DHCP

ð Ô

HX DNS L ˇ ″I
DNS L ˇ HO DNS

RGOS

ð Ô

domain-name	ÞÆ DHCP ł ¨ Â

ð Ô

ł ¨ Â

ð ¾ Ô

DHCP

ð Ô

DHCP ł ¨ ł˘ é ˘ ł ¨ ў ˘ ў ¨ Л Ъ Â

ð Ô

ЛЪЮ ˘ DHCP ÞÆ ł ¨ i-net.com.cn Â

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

ð ¾ Ô

¾	
dns-server	ÞÆ DHCP DNS Ь
ip dhcp pool	ÞÆ DHCP ¨ ˘ DHCP Â

2.1.7 hardware-address

ÞÆ DHCP ˚ ˘ DHCP ¾ **hardware-address** Â ¾ **no** Л Ъ ˚ ÞÆ Â

hardware-address *hardware-address type*

no hardware-address

ð Ô

hardware-address	ÞÆ DHCP MAC Â

type	DHCP ˙ ʌ ˘ ʌ ЛЪ ЬЖ Â ‘ ✧ ethernet ✧ ieee802 ‘ ✧ 1ˆ 10M ethernet˜ ✧ 6ˆ IEEE 802˜

ðð Ô

˙ Â

ЬЖ ˙ ˘ ѝ ethernet Â

ðð ҃ Ô

DHCP

ðð Ô

ʌ DHCP ЬЖ ˘ ʌ ЛЪ ҃ Â

ðð Ô

ЛЪЮ ˘ ЬЖ ѝ ethernet MAC 00d0.f838.bf3d Â

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

ðð ҃ Ô

҃	
client-identifier	ЬЖ DHCP ˆ ЛЪ Ѽ ⁸ ˜ Â
host	ЬЖ IP Â DHCP Â
ip dhcp pool	ЬЖ DHCP ¨ ˘ DHCP Â
ip dhcp excluded-address	ѝ
default-router	ЬЖ DHCP

2.1.8 host

ЬЖ DHCP ў IP ˘ DHCP ҃ **host** Â
҃ **no** ʌ ЛЪ DHCP IP ЬЖ Â

host *ip-address* [*netmask*]

no host

ð Ô

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

ð Ô

ЬЖ ў IP Â

ð ٪ Ô

DHCP

ð Ô

ЬЖ DHCP Ь IP ÂA
ù 255.0.0.0’ B ù 255.255.0’ C ù
255.255.255.0 Â

Л DHCP ЬЖ ˘ Л Љ ٪ Â

ð Ô

ЉЮ ˘ IP ù 192.168.12.91˘ ù 255.255.255.240 Â

```
host 192.168.12.91 255.255.255.240
```

ð ٪ Ô

٪	
client-identifier	ЬЖ DHCP ^ Љ Ω 8 ~ Â
hardware-address	ЬЖ DHCP ˚ Â
ip dhcp pool	ЬЖ DHCP ¨ ˘ DHCP Â
68.8203 nSAluded-address	ù
default-router	ЬЖ DHCP

2.1.9 update arp

DHCP ARP ╗ ˘ DHCP ٪ **update arp** Â ٪ **no** Л Љ DHCP ARP ╗ Â

update arp

no update arp

ð Ô

ð Ô

DHCP ARP ╖ Â

ð ३ Ô

DHCP

ð Ô

DHCP ARP ╖ DHCP Â
ARP . ѝ ˘ Л Љ ३ Â

DHCP ARP ╖ ˘ ARP a ˘
Â

ð Ô

ЛЉЮ ˘ pool1 ARP ╖ Â

```
ip dhcp pool pool1
  update arp
```

ð ३ Ô

३	
ip dhcp refresh arp	9 ARP
ip dhcp pool	ЊЖ DHCP ¨ ˘ DHCP Â

2.1.10 ip dhcp refresh arp

ARP ╖ ǂ ARP Â

ip dhcp refresh arp

ð Ô

ð Ô

ð ३ Ô

DHCP ٣ Q[illegible] 6.011.754 g 60.84T Tc 2.913 1.989 -*ü EîE› "Â$pÜD

ð ¾ Ô

¾	
dns-server	ÞÆ DHCP DNS ¶
ip dhcp pool	ÞÆ DHCP ¨ ˘ DHCP Â
ip dhcp excluded-address	ù
default-router	ÞÆ DHCP

2.1.12 ip dhcp excluded-address

ÞÆ IP ˘ DHCP ¶ a è† DHCP ˘ ¾ **ip dhcp excluded-address** Â ¾ **no** ƒ ƛ ƙ ÞÆ Â

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

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

ð Ô

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

ð Ô

DHCP ¶ † IP Â

ð ¾ Ô

ð Ô

IP ˘ DHCP ¶ ي DHCP IP Â ¾ ƒ ƛ ù ÿ IP ˘ † DHCP Â ÞÆ IP ˘ ≠ ƒ ƛ DHCP ¶ † ă Â

ð Ô

ƛ ƚ Ю ˘ DHCP ¶ a ي 192.168.12.100~150 IP Â

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

ð ¾ Ô

٪	
ip dhcp pool	ЬЖ DHCP ¨ ˘ DHCP Â
networkˆ DHCP˜	ЬЖ DHCP ∕ Â

2.1.13 ip dhcp ping packet

DHCP ┺ ă ˘ ping ˘ ٪ **ip dhcp ping packet** Â ٪ **no** Â

ip dhcp ping packet [*number*]

no ip dhcp ping packet

ð Ô

number	ˆ ∕ ˜ ÿ 0 10ʹ 0 ping Â ping ч Â

ð Ô

ping ѝ 2 Â

ð ٪ Ô

ð Ô

DHCP ┺ ÿ DHCP ﻲﺒﻳ IP ˘ ping ŭ è ў . ˘ . Ю ˘ . ˥ DHCP Â Ping ѝ ч ˘ ∕ Лъ 10 Â

ð Ô

ЛъЮ ˘ ping ѝ 3 Â

```
ip dhcp ping packets 3
```

ð ٪ Ô

٪	
clear ip dhcp conflict	DHCP ă Â

ip dhcp ping timeout	DHCP ٤ ping Â ping ˘ ʌ† ' ŭ ‡ ă Â
show ip dhcp conflict	DHCP ٤ † ˘ ă Â

2.1.14 ip dhcp ping timeout

DHCP ٤ ping ă ˘ ˘
٣ **ip dhcp ping timeout** Â ٣ **no** ʌ Л Â

ip dhcp ping timeout *milli-seconds*

no ip dhcp ping timeout

ð Ô p i**p** dhcp**n**ping **g**2.628 3 647.9 514.1 mh21 0 0 109.54 -f248.2Tc 13.326 0 2

2.1.15 ip dhcp pool

Ы DHCP ¨ DHCP ˘ ¸ **ip dhcp pool** Â ¸ **no** Л Љ DHCP Â

ip dhcp pool *pool-name*

no ip dhcp pool *pool-name*

ð Ô

pool-name	Л Љ Â mypool Ĭ 1 Â

ð Ô

Ы DHCP Â

ð ¸ Ô

ð Ô

¸ ˘ DHCP ˘ й '

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

˘ Л Љ IP à DNS Ь à Â

ð Ô

ЉЮ ˘ Ы ¨ й mypool0 DHCP Â

```
ip dhcp pool mypool0
```

ð ¸ Ô

¸	
host	Ы IP Â DHCP Â
ip dhcp excluded-address	Ы DHCP Ь a ↑ IP

2.1.16 lease

ЊЖ DHCP Ь ¦ ˘ DHCP ¾
lease Â ¾ **no** Â ÿ 1¦ 365 23 59
¦ Â

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

no lease

ð Ô

days	ЊЖ ˘ Лъ ѝ æ Â
hours	ˆ Л ~ ЊЖ ˘ Лъ ѝ æ Â ЊЖ ЊЖ Â
minutes	ˆ Л ~ ЊЖ ˘ Лъ¦ ѝ æ Â ЊЖ¦ ЊЖ Â
infinite	ЊЖ ⁸ Â

ð Ô

ѝ infinite Â è ѝ Â

ð ¾ Ô

DHCP

ð Ô

˘ DHCP Â DHCP Ь ˘
a Л Â

ð Ô

ЛъЮ ˘ DHCP ѝ 1 Â

```
lease 0 1
```

ЛъЮ ˘ DHCP ѝ 1¦ Â

```
lease 0 0 1
```

ð ¾ Ô

¾	
ip dhcp pool	ЊЖ DHCP ¨ ˘ DHCP Â

2.1.17 netbios-name-server

DHCP NETBIOS WINS¨ Ł ˘ DHCP ¾ **netbios-name-server** Â ¾ no Л Лъ WINS Ł Â

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

no netbios-name-server

ð Ô

ip-address	НЖ WINS Ł IP Â Â
ip-address2…ip-address8	ˆ Л ˜ Л Лъ 8 WINS Ł Â
netbios-node-type	НЖ ў netbios

ð Ô

НЖ WINS Ł Â

ð ¾ Ô

DHCP

ð Ô

НЖ WINS Ł ˘ ”I ˘ DHCP Л б WINS Ł ˘ Ю WINS Ł Â

ð Ô

ЛъЮ ˘ и DHCP WINS Ł 192.168.12.3 Â

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

ð ¾ Ô

¾	
ip address dhcp	DHCP Л IP Â
ip dhcp pool	НЖ DHCP ¨ ˘ DHCP Â

2.1.18 netbios-node-type

НЖ DHCP ў NetBIOS ˘ DHCP ¾ **netbios-node-type** Â ¾ **no** Л Лъ NetBIOS Â

netbios-node-type *type*

no netbios-node-type

ð Ô

type	НЖ NetBIOS ˘ ч Â НЖ˘ ÿ 0~FF˘ Ѽ ⁸ ˘ Л Л ЛЬЮ ✧ 1˘ ҳ b-node˙ ✧ 2˘ ҳ p-node˙ ✧ 4˘ ҳ m-node˙ ✧ 8˘ ҳ h-node Â НЖ˙ ✧ b-node˘ ˙ ✧ p-node˘ ˙ ✧ m-node˘ ˙ ✧ h-node˘ Â

ð Ô

НЖ NetBIOS Â

ð ҳ Ô

DHCP

ð Ô

DHCP NetBIOS ˙ 1˜ Broadcast˘ ˘
NetBIOS¨ ˙ 2˜ Peer-to-peer˘ ˘ WINS
Ł NetBIOS¨ ˙ 3˜ Mixed˘ ˘ ″I ¨
˘ ł б WINS Ł ¨ ˙ 4˜ Hybrid˘ ˘ ″I
WINS Ł NetBIOS¨ ˘ ˘
NetBIOS¨ Â

Ю˘ й Â WINS
Ł ˘ й ˙ WINS Ł ˘ й Â
NetBIOS й Hybrid Â

ð Ô

ЛЬЮ ˘ DHCP NetBIOS й Â

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

ð ҳ Ô

ҳ	

ip dhcp pool	ÐÆ DHCP ¨ ˘ DHCP Â
netbios-name-server	DHCP NETBIOS WINS ¨ Ł

2.1.19 network DHCP

ÐÆ DHCP ƒ ˘ DHCP ¾ **network** Â ¾ **no** ƒ Л ÐÆ Â

network *net-number net-mask*

no network

ð Ô

net-number	DHCP IP ƒ Â
net-mask	DHCP IP Â ÐÆ ˘ ù Â

ð Ô

ÐÆ ƒ Â

ð ¾ Ô

DHCP

ð Ô

ÐÆ ↓ è ˘ ù DHCP Ł ƒ¦ Â ˘ ŭ ‡ ƒ ¦ Â DHCP ¦ ˘ ˘ DHCP ˘ Ю ˘ ¦ Â

¦ ƒ **show ip dhcp binding** ¾ ˘ ă ƒ **show ip dhcp conflict** ¾ Â

ð Ô

Л Ю ˘ ÐÆ DHCP ƒ ù 192.168.12.0˘ ù 255.255.255.240 Â

```
network 192.168.12.0 255.255.255.240
```

ð ¾ Ô

¾	
ip dhcp excluded-address	ЬЖ DHCP Ь a ¦ IP Â
ip dhcp pool	ЬЖ DHCP ¨ ˘ DHCP Â

2.1.20 next-server

ЬЖ DHCP ╟ ╟ Ь ‟ ˘ DHCP ¾ **next-server** Â ¾ **no** Л Лъ ╟ Ь ‟ ЬЖ Â

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

no next-server

ð Ô

ip-address	ЬЖ ╟ Ь IP ˘ ѝ TFTP Ь Â Â
ip-address2…ip-address8	ˆ Л ~ Л Лъ 8 ╟ Ь Â

ð Ô

Â

ð ¾ Ô

DHCP

ð Ô

ЬЖ ╟ Ь ˘ ″I ˘ DHCP Л б ╟ Ь ˘ Ю ╟ Ь Â

ð Ô

ЛъЮ ˘ ѝ DHCP ╟ Ь 192.168.12.4 Â

```
next-server 192.168.12.4
```

ð ¾ Ô

¾	
bootfile	ЬЖ DHCP ╟ ˚ ¨

ip dhcp pool	⊬ DHCP ¨ ˘ DHCP Â
ip help-address	⊬

ЛЬЮ ˘ ३ 33 Н Ж˜ DHCP
˘ DHCP ч ‘ 1˜ 172.16.12.0˘
192.168.12.12’ 2˜ 172.16.16.0˘ 192.168.12.16 Â

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

ð ३ Ô

३	
ip dhcp pool	Н Ж DHCP ¨ ˘ DHCP Â

2.1.22 service dhcp

Э DHCP Ł ३ ˘ ३ **service dhcp** Â
३ **no** Л Лъ DHCP Ł ३ Â

service dhcp

no service dhcp

ð Ô

ð Ô

DHCP Ł ३ Â

ð ३ Ô

ð Ô

DHCP Ł Л Лъ ╟ ł IP ˘ DNS Ł à
Â DHCP Л Лъ DHCP è Ł ˘
DHCP DHCP ˘ DHCP Â

Э Л DHCP ╖ è ╖ ă ˘ é
˘ Лъ ↓ Â

ð Ô

ЛЬЮ ˘ DHCP Ł Â

```
service dhcp
```

ð ३ Ô

३	

show ip dhcp server statistics	DHCP ┗ Â

2.2

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

2.2.1 clear ip dhcp binding

DHCP ˘ **clear ip dhcp binding** ¾ Â

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

ð Ô

*	DCHP Â
ip-address	IP Â

ð Ô

ù Â

ð ¾ Ô

ð Ô

¾ Ñ DHCP ╟ ˘ DHCP Ñ Љ **no ip dhcp pool** ¾ Â

ð Ô

ЉЮ ˘ IP ù 192.168.12.100 DHCP Â

```
clear ip dhcp binding 192.168.12.100
```

ð ৡ Ô

ৡ	
show ip dhcp binding	DHCP ⊾ Â

2.2.2

2.2.3 clear ip dhcp server statistics

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

clear ip dhcp server statistics

ð Ô

ѝ Â

ð ¾ Ô

ð Ô

DHCP ┺ ˘ DHCP à ╟ à ˘ DHCP Â **clear ip dhcp server statistics** ¾ Л Лъ ˘ ÿ Â

ð Ô

ЛъЮ ˘ DHCP ┺ Â

```
clear ip dhcp server statistics
```

ð ¾ Ô

¾	
show ip dhcp server statistics	DHCP ┺ Â

2.2.4 debug ip dhcp client

DHCP Client ˘ **debug ip dhcp client** ¾ Â ¾ Лъ no Â

debug ip dhcp client

no debug ip dhcp client

ð Ô

ð Ô

ð ¾ Ô

ð Ô

ৡ dhcp client ┗ ў ˇ Лъ ↓ Â

ð Ô

ЛъЮ ˇ Э dhcp Â

```
debug ip dhcp client
```

ð ৡ Ô

2.2.5 debug ip dhcp server

DHCP Server ˇ **debug ip dhcp server** ৡ Â ৡ Лъ no Â

debug ip dhcp server { **events** | **packet** }

no debug ip dhcp server { **events** | **packet** }

ð Ô

events	DHCP
packet	DHCP

ð Ô

ð ৡ Ô

ð Ô

ৡ dhcp server ў ˇ Лъ ↓ Â

ð Ô

ЛъЮ ˇ Э dhcp ┗ Â

```
debug ip dhcp server packet
```

ð ৡ Ô

2.2.6 show dhcp lease

DHCP ˇ EXEC ৡ **show dhcp lease** Â

show dhcp lease

Ь Ж IP ˘ Â Ь Ж IP ˘ Л IP Â

ð Ô

ЛЬЮ ѝ **show ip dhcp binding** Â

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

Ь Ж Ю Â

IP address	¦ DHCP IP Â
Client-Id/ Hardware address	DHCP client identifier ¨
Lease expiration	Â Infinite 8 ’ IDLE ˘ Л DHCP ў ╠ Â
Type	Â Automatic ╠¦ ’ Manual ¦ Â

ð ¾ Ô

¾	
clear ip dhcp binding	DHCP

2.2.8 show ip dhcp conflict

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

show ip dhcp conflict

ð Ô

ð Ô

ѝ Â

ð ¾ Ô

ð Ô

¾ Л Лъ DHCP Ь ă " Â

ð Ô

ЛъЮ ѝ **show ip dhcp conflict** ¾ Â

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

ЬЖ ЮÂ

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

ð ¾ Ô

¾	

clear ip dhcp confict

ЛЬЮ ѝ **show ip dhcp server statistics** ҃ Â

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

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

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

ЬЖ ЮÂ

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

ð ҃Ô

҃	
clear ip dhcp server statistics	DHCP ┗ Â

3 DHCP Relay

3.1 DHCP Relay

DHCP ЛЬЮ ٣

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

3.1.1 service dhcp

Э DHCP ٣ ˘ ٣ **service dhcp** Â ٣
no Л Лъ DHCP ٣ Â

service dhcp

no service dhcp

ðô Ô

DHCP ٣ Â

ðô ٣ Ô

ðô Ô

DHCP Л Лъ DHCP è Ь ˘ DHCP
DHCP ˘ DHCP Â

ðô Ô

ЛЬЮ ˘ DHCP Ь Â

```
service dhcp
```

ðô ٣ Ô

٣	
ip helper-address [**vrf**] *A.B.C.D*	╗ DHCP server

3.1.2 ip helper-address

३ ∧ Л ╗ DHCP ┗ Â ३ no ˘ ┗
Â
┗ ∧ Л ˘ ≠ ∧ Л Â ३ ∧ Л
Ю˘ ≠ ∧ Л l0H0 Tf 0˘Tţ 0 Tw 5╗.47<2194ĠĐP

Service dhcp	DHCP ¯Ì

3.1.7 ip dhcp relay suppression

¯Ì DHCP ¶Ì ˘ ¯Ì no DHCP ¶Ì DHCP relay ¸ ¶Ì Â

ðÔ

ð ¯Ì Ô

ðÔ

DHCP request a relay Â ¼ ¯Ì ł˘

ðÔ

ЛЬЮ ˘ 1 relay ¸ ¶Ì Â

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

ð ¯Ì Ô

¯Ì	
service dhcp	DHCP ¯Ì

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

ð Ô

ip-address	¨ ┗ IP

ip-address	IP

ð ঳ Ô

ð Ô

ў ‟ ˘ Л Ћ **no ip host host-name ip-address** ঳

ð Ô

ð ¾Ô

¾	
show hosts	ÿ ¨ ă

ð Ô

-

4.1.5 show hosts

DNS Â

show hosts

ð ¾ Ô

ð Ô

DNS Â

ð Ô

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

ð ¾Ô

¾	
ip host	ÿ ¨ IP
ip name-server	DNS ⊾

ð Ô

-

5 NTP

5.1 NTP

NTP ЛЪЮ ꝛ˙

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

5.1.1 no ntp

ntp˚ Ꝉ˘ б Ꝉ ˚ ˘ ntp Â

no ntp

ð Ô

Â

ð Ô

Ю NTP Ꝉ Â

ð ꝛ Ô

Â

ð Ô

Ю˝ NTP ╖ ˘ /ı NTP Ꝉ NTP
⁸˘ NTP ╖ Â

ð Ô

ɒ ‡˘ Лъ ɒ ‡ и Â ɒ и peer à serve à serve-only à query-only Â

~

⁸ ╗ Â Э ‡ ɒ ˘

ↄ б ⁸ Â

⁸ ‡˘ ‡ Â ⁸ ‡˘ ‡ ‡ Â

ð Ô

ЛъЮ 1 ﾊ “ à ⁸ ˘ ’ ⁸ 2 ﾊ “ Â

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

ð ʒ Ô

ʒ	
ip access-list	… IP ⁸ “ Â

5.1.3 ntp authenticate

NTP Ł NTP ⁸ Â ʒ Лъ no ⁸ Â

ntp authenticate

no ntp authenticate

ð Ô

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ð Ô

Ю NTP ⁸ Â

ð ʒ Ô

Â

ð Ô

⁸˘ ‡ a ˘ ╗ Â

⁸˘ ˘ è ˘ ﾊ Ł ╗ Â

ntp authentication-key ä **ntp trusted-key** Â

ð Ô

è ù ł˘ ⁸ Â

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

ð ৡ Ô

ৡ	
ntp authentication-key	
ntp trusted-key	Â

5.1.4 ntp authentication-key

ù NTP ⊾ NTP Â ৡ Ɲ no ∧ NTP Â

ntp authentication-key *key-id* **md5 ring 2.697 0 Td(md5)Tj4f0 Tc 0 Tw[TfTj/TT1 1 ation-key •'** ú

ð Ô

ЛЬЮ ID ѝ 6

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

ð ৡ Ô

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

5.1.5 ntp disable

NTP ╖ Â

ntp disable

ð Ô

Â

ð Ô

Ю Л Лъ Н NTP Â

ð ৡ Ô

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ð Ô

Ю Э Н NTP Л Лъ ˘
╖ ˘ Л Лъ Э NTP Â

~

ą̈ IP ˘ è Э
ৡ Â

ð Ô

ЛЬЮ ˘ NTP Â

```
no ntp
```

ð ৡ Ô

Â

5.1.6 ntp master

ὶ NTP ў ˆ ∧ ~˜ ὶ ὲ ˇ Â
ʒ no ὶ ∧ NTP ў Â

ntp master *[stratum]*
no ntp master

ὃ Ô

ˇ ὶ 1

stratum

5.1.7 ntp server

ѝ NTP NTP Ь Â ϧ Лъ no NTP Ь Â

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

no ntp server *ip-addr*

ð Ô

ip-addr	NTP Ь IP ˘ IPv4 IPv6’
version	ˆ Л ˜ NTP ˆ 1-3˜˜ NTPv3 ,
if-name	ˆ Л ˜ NTP ˆ Ь ˜’
keyid	ˆ Л ˜ б Ь ╗
prefer	ˆ Л ˜ Ь ѝ Prefer Ь

ð Ô

NTP Ь Â

ð ϧ Ô

Â

ð Ô

Ь ˘ ˚ Ь Э ѝ 20 Â

б Ь ╗ ˘ ″I ╗ Лъ ↓ ˘ ł
ѝ Ь ˘ Л Лъ Ь ╗ ˘ б Ь
╗ Ь ˚ ╗ б

˚ ˆ ˜ Ю˘ ″I prefer ˚

NTP Ю˘ ѝ IP
Л Лъ NTP Ь Â

ð Ô

ЛъЮ ˘ Э ѝ NTP server Â

IPv4 ˈ `Ruijie(config)# ntp server 192.168.210.222`

IPv6 ˈ `Ruijie(config)# ntp server 10::2`

ð ϧ Ô

ϧ	
no ntp	NTP ┗╖ Â

5.1.8 ntp synchronize

NTP ˚ Â ϧ Лъ no ∧ NTP ˚ Â

ntp synchronize

no ntp synchronize

ð Ô

Â

ð Ô

Â

ð ϧ Ô

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ð Ô

NTP б ┗ ˚ ѝ 8 ˘ ł ѝ ǂ ˚
˘ ╟˚ ˘ ¨ ˚ ˘ ‡ ∧ Лъ ϧ

ð Ô

ЛъЮ ˘ NTP ˚ Â

```
Ntp synchronize
```

ð ϧ Ô

ϧ	
ntp server	NTP ┗ ˚

5.1.9 ntp trusted-key

ID ѝ

ntp trusted-key *key-id*

no ntp trusted-key *key-id*

ð Ô

key-id	ID Â৸ 1 4294967295

ð Ô

Ю Â

ð ৡ Ô

Â

ð Ô

NTP ৸ ˚ ˘ ID ˘ a
˘ Лъ ,

ð Ô

ЛъЮ ˘ ѝ Ь Â

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

ð ৡ Ô

ৡ	
ntp authenticate	⁸ Â
ntp authentication-key	NTP Â
ntp server	NTP Ь Â

5.1.10 ntp update-calendar

NTP ÿ ˚ ˅ Â
ৡ no ৸ ˅ ℸ Â

ntp update-calendar
no ntp update-calendar

ð Ô

ð Ô

˅ ℸ Â

ð ৡ Ô

Â

ð Ô

NTP ÿ Â Æ Ю Ÿ
╠ Â

Ю NTP Â NTP б Â

ð Ô

ЛЬЮ NTP

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

ð Ô

5.2

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

5.2.1 debug ntp

NTP Â no Â

debug ntp

no debug ntp

ð Ô

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ð Ô

Â

ð Ô

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ð Ô

NTP Â
Â

ð Ô

ЛЬЮ NTP Â

debug ntp

ð ৡ Ô

Â

5.2.2 show ntp status

NTP Â

show ntp status

ð Ô

Â

ð Ô

ѝ Â

ð ৡ Ô

ð Ô

NTP Ь ˘ NTP ˘ ╗ ˚ Ь
ৡ a Â

ð Ô

ЛЬЮ ˘ NTP Â

show ntp status

ð ৡ Ô

6 SNTP

6.1

৲

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

6.1.1 sntp enable

৲ SNTP ╖ ˘ ৲ **no** и —Disable Â

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

ð Ô

ð Ô

SNTP Disable

ð ৲ Ô

ð Ô

show sntp ৲ SNTP

ð Ô

```
RedGiant(config)# sntp enable
```

ð ৲ Ô

৲	
show sntp	SNTP
clock update-calendar	˚ ˚ ˚
clock set	˚

ð ʌ Ô

˚ RGOS10.0 Л Э

6.1.2 sntp server

঳ SNTP Serverˇ SNTP NTP ˘ Л Server ʌ Л internet Э Ω NTP Server Â

sntp server ip-addr

no sntp server

ð Ô

ip-addr ˙ NTP/SNTP Ł IP

ð Ô

NTP/SNTP Ł

ð ঳ Ô

ð Ô

show sntp ঳ SNTP

ð Ô

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

ð ঳ Ô

঳	
show sntp	SNTP
sntp enable	SNTP

ð ʌ Ô

˚ RGOS10.0 Л Э

6.1.3 sntp interval

঳ SNTP Client NTP/SNTP Server˚ Â

sntp interval seconds

no sntp interval

ð Ô

seconds ˙ ˚ ˘ Æ ѝ ľ Ł ѝ 60 --65535 Â

ð Ô

ѝ 1800s

ð ʒ Ô

ð Ô

show sntp ʒ SNTP Â

ð Ô

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

ð ʒ Ô

ʒ	

sntp enable

ð ৡ Ô

ð Ô

show sntp ৡ SNTP

ð Ô

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

ð ৡ Ô

ৡ	
sntp enable	SNTP
show sntp	SNTP

ð Ñ Ô

˚ RGOS10.0 Л Э

7 UDP-Helper

7.1

7.1.1 udp-helper enable

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

Ю UDP Â

udp-helper enable

7.1.2 ip helper-address

UDP ┗ Â no UDP
┗ Â

ip helper-address *address*

no ip helper-address *address*

ð Ô

address	UDP ┗ ˘ ù ↑ ⁸ ˘ 20 ┗ Â

ð Ô

UDP ┗

ð ٪ Ô

ð Ô

Λ Лъ ù 20 ┗ Â ┗
Э , ‡ ╠ UDP-Helper ╖ ł˘ ÿ UDP
˘ Лъ Э ┗ Э Â

no ip helper-address ٨ ┗ Â

ð Ô

Ю UDP ┗ :

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

ð ٪ Ô

٪	
ip forward-protocol	UDP

ð Ô

NPE ‟ Â

7.1.3 ip forward-protocol

٪ UDP Â ٪ **no** ‡ ٨
UDP ╖ Â

udp-helper enable	UDP
ip forward-protocol	UDP

ð Ô

8 DDNS

8.1

8.1.1 peanut username

DDNS ৡ Â Л Ћ ৡ no ৡ Â

[**no**] **peanut username** *name* **password** *word*

name	¨
word	

Ю ѝ ℸ

ৡ Â

ৡ Л Ћ ¨

r

9 DNS

9.1

9.1.1 smartdns

IP ‡ Â ʌ Ɲ ৡ no IP ‡ Â

[**no**] **smartdns** *A.B.C.D interface* **map** *X.X.X.X*

A.B.C.D	ᒪ IP Â
Interface	Â
X.X.X.X	ɨ IP Â

ৡ Â

ৡ ʌ Ɲ ╗ IP ‡ Â

1ˈ ч IP ‡ˇ ᒪ 192.168.1.100ˊ gigabitethernet 0/1 Э 202.101.99.55ˊ gigabitethernet 0/2 Э 58.66.101.33ˊ

```
Ruijie#config
Ruijie(config)# smartdns 192.168.1.100 gigabitethernet 0/1 map 202.101.99.55
Ruijie(config)# smartdns 192.168.1.100 gigabitethernet 0/1 map 58.66.101.33
```

ৡ	
smartdns enable	DNS ╗

ʌ -

ৡ	ʌ

1.0	

9.1.2 smartdns enable

DNS ╖ ˘ ⁄ Л Ъ ३ no DNS ╖ Â

[no] smartdns enable

-	-

Ю ѝ ╖

३

३ ⁄ Л Ъ DNS ╖ Â

1˙ DNS ╖ ˙

```
Ruijie#config
Ruijie(config)#smartdns enable
```

३	
Smartdns	DNS ‡

⁄ -

⁄	
1.0	

2013-03-12		३	╗ dns-proxy nat dns ¤ a ˇ

10 DNS-Proxy

10.1

10.1.1 blacklist

dns-proxy dns ¨

blacklist domain-ip *start-ip [end-ip]*

no blacklist domain-ip *start-ip [end-ip]*

start-ip	╗ ¨ IP
end-ip	╗ ¨ IP

¨ ѝ

ৡ dns-proxy

dns ¨ ‡ IP ¨ ˘ ৡ Л Ћ DNS ¨ IP
ў ˘ Э ‘I dns IP Â Л
10 Â

1‘ dns-proxy Ю ¨ IP 1.1.1.1-1.1.1.100 ╗ ¨

```
Ruijie(config-dns-proxy)#blacklist domain-ip 1.1.1.1 1.1.1.100
```

ৡ	
dns-proxy enable	dns-proxy ╗

Л -

Л	
10.3(4b8)	ৡ

10.1.2 dns-proxy

Ю dns-proxy

dns-proxy

Â

ৡ Â

dns-proxy ╖ ˘ ″I dns-proxy

1' Ю dns-proxy

```
Ruijie(config)#dns-proxy
Ruijie(config-dns-proxy)#exit
Ruijie(config)#
```

ৡ	
dns-proxy enable	dns-proxy ╖
ip name-server	dns ┗

ৡ -

ﾉ	

1' gi0/1 ˘ gi0/1 Э ч dns Ł

```
Ruijie(config)#int gi0/1
Ruijie(config-if-GigabitEthernet 0/1)#ip name-server 218.85.157.99
Ruijie(config-if-GigabitEthernet 0/1)#ip name-server 218.85.152.99
track 1
```

ৡ	
dns-proxy	dns-proxy
track	track ৡ

/ -

/	
10.3(4b8)	ৡ

10.1.5 load-balance

dns-proxy Ю

load-balance {load | bandwidth}

no load-balance

load	
bandwidth	
no	˘ ¨

„ÕÍrT load-balan2_0 1 Tf 12.8 -- Tc 600032.1 re<1FF5>639>Tj /TT-6<m1/TTT2 1 Tf 0 Tc 0 Tw 12.94 1.

٦	
dns-proxy	dns-proxy

٨
-

٨	
10.3(4b8)	٦

10.1.6 whitelist

dns-proxy Ю ¨

whitelist {source-ip *start-ip* [*end-ip*] **} | {name-server** *ip* **}** [**increase** | **decrease** *num***]**

no whitelist {source-ip*start-ip* [*end-ip*]} | **{name-server** *ip***}**

start-ip	╗ ¨ IP IP
end-ip	¨ IP IP
ip	dns ┗
num	Э Ю

¨ ѝ

dns-proxy

٦ ٨ Л Ъ ¨ ‡ dns a ٨ dns-proxy ˘ ‡ ˋ ˘ dns ┗ Â

10 ˘ ″I Æ Э ″I Ð ˘ ł ″I Â

1˙ dns-proxy Ю dns-proxy ¨ ┗ 8.8.8.8 ╗ ¨

```
Ruijie(config-dns-proxy)#whitelist name-server 8.8.8.8
```

2˙ dns-proxy Ю dns-proxy IP 192.168.1.1-192.168.1.10 ¨ ╗

```
Ruijie(config-dns-proxy)#whitelist source-ip 192.168.1.1
192.168.1.10
```

⁄	-

ৡ	⁄	
	10.3(4b8)	ৡ

10.2

10.2.1 show dns-proxy configure

Ю dns-proxy

show dns-proxy configure

ৡ	
	dns-proxy

1' Ю dns-proxy

```
Ruijie#show dns-proxy configure
>Dns-proxy load-balance: load
---------------------------------------------------------------

>Dns-proxy whitelist
---------------------------------------------------------------
Type:source-ip
Source-ip: 192.168.1.1 192.168.1.10

Type:name-server
Name-server: 8.8.8.8

>Dns-proxy blacklist
---------------------------------------------------------------
Start-ip              End-ip
---------------   ---------------
202.112.112.114   220.112.112.120
```

114.110.211.1 114.110.211.100
121.244.10.1 121.244.10.255

ৡ	
dns-proxy enable	dns-proxy ╖
dns-proxy	dns-proxy

-

⁄	
10.3(4b8)	ৡ

10.2.2 show dns-proxy configure blacklist

Ю dns

show dns-proxy configure blacklist

dns

1' Ю dns Â

```
Ruijie#show dns-proxy configure blacklist
>Dns-proxy blacklist
-----------------------------------------------------------------
Start-ip                End-ip
----------------------  ---------------
202.112.112.114   220.112.112.120
114.110.211.1       114.110.211.100
121.244.10.1        121.244.10.255
```

ৡ	ৡ	

dns-proxy enable	dns

¾	⁄	
	10.3(4b8)	¾

10.2.5 show dns-proxy statistics

Ю dns-proxy

show dns-proxy statistics

¾

dns-proxy

1' Ю dns-proxy

```
Ruijie# show dns-proxy statistics
>Receive dns request counts: 494
>Unable deal dns request count: 0
>Receive dns reply counts: 493
>Unable deal dns reply count: 0
>Hit the whitelist counts: 11
>Hit the app-route counts: 100
>Hit the load-balance counts: 393
>Hit the blacklist counts: 30
```

¾		
¾	**dns-proxy enable**	dns-proxy ╖
	dns-proxy	dns-proxy

⁄ -

Õ - ſ

ǂ ĄĄ ҳ ĄĄ ˘ ЉЮ ˙

1. ҳ
2. ҳ
3. RIP ҳ
4. OSPF2 ҳ
5. ҳ

1

1.1

1.1.1 ip policy route-map

route-map

ip policy route-map *route-map*

no ip policy route-map

route-map	

ACL

ACL

ACL

يي ″I يي Â

ð Ô

ЛЬЮ ˘ Лъ FE0 ˘ ѝй
10.0.0.1˘ ‡ Ю ѝй 196.168.4.6˘ ѝй 20.0.0.1 ‡ Ю ѝй
196.168.5.6˘ ŭ ‡ Â

```
access-list 1 permit 10.0.0.1 0.0.0.0
access-list 2 permit 20.0.0.1 0.0.0.0
route-map lab1 permit 10
match ip address 1
set ip next-hop 196.168.4.6
exit
route-map lab1 permit 20
match ip address 2
set ip next-hop 196.168.5.6
exit
interface GigabitEthernet 0/0
ip policy route-map lab1
exit
```

ð ٹ Ô

ٹ	
access-list	Н“ ‡ Â
route-map	Н“ يي Â
set ip next-hop	Н“ Ю
set ip default next-hop	Н“

` route-map ʒ ê ʒ Ì

1.1.2 ip local policy route-map

ˇ Ю ʒ **ip local policy route-map** Â ʌ ʒ no Â

ip local policy route-map *route-map*

no ip local policy route-map

ð Ô

route-map	ّي Â

ð Ô

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ð ʒ Ô

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ð Ô

Э ˇ ʌ ˇ

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ˇ ˇي ʒ … يي Â

يي ˇ ЊЖ 1 Ð ‡ Â

ɬˇ ˇ a يي

ˇ

يي

ЊЖ Â

set interface a , set interface ˇ ʌ

Â

ð Ô

ЛЬЮ ˇ Лъ 192.168.217.10 ѝ ÿ **serial** *2/0*

Â

```
access-list 1 permit 192.168.217.10
route-map lab1 permit 10
match ip address 1
set interface serial 2/0
exit
```

ð ʒ Ô

ϗ	
access-list	ЫЖ ‟ ‡
route-map	ЫЖ ي
set ip next-hop	ЫЖ ЮО
set ip default next-hop	ЫЖ ЮО
set interface	ЫЖ
set default interface	ЫЖ
set ip tos	IP TOS
set ip dscp	IP DSCP
set ip precedence	IP ″I
match ip address	‡
match length	ƃ

‘ route-map ϗ ê ϗ Ì

1.1.3 ip policy

set ip nexthop ˘

ЮО **ip policy** Â ϗ **no** Â

ip policy {**load-balance|redundance**}

no ip policy

ðô Ô

load-balance|redundance	

ðô Ô

Â

ðô ϗ Ô

Â

ðô Ô

ي **set ip next-hop** ˘ Л Лъ ЮО ˘

˘ Л Л Лъ ЮО ’ ˘

ЮО ˘ WCMP Л Лъ 4 ЮО ˘ ECMP Л Лъ

2

2.1

2.1.1 route-auto-choose

[**no**] **route-auto-choose** {**cnc** | **cnii** | **cernet** | **cmcc**} *interface next-hop* [**tag** *num*] [*distance*]

interface	
next-hop	ip
num	tag
distance	metric
cnc	
cnii	
cernet	
cmcc	

1
gigabitEthernet 0/1 202.100.12.5

```
Ruijie#config
Ruijie(config)# route-auto-choose cnii gigabitEthernet 0/1 202.100.12.5
```

-	-

	-

	10.3(4b7)	
	10.3(4t90)	

2.1.2 route-auto-choose update

route-auto-choose update

-	-

	1 Ruijie#**config** Ruijie(config)#**route-auto-choose update**

	-	-

	-

	10.3(4b7)	

3 RIP

3.1

3.1.1 address-family RIP

RIP ˘ ¾ **address-family**˘
˘ ¾ **no** Â

address-family ipv4 vrf *vrf-name*

no address-family ipv4 vrf *vrf-name*

ð Ô

vrf *vrf-name*	¾ VRF ¨ Â

ð Ô

a RIP Â

ð ¾ Ô

Â

ð Ô

address-family ¾ ˆ ù ˙
(config-router-af)#˜ Â VRF ˘ RIP … VRF
RIP Â ЮЄ Л Љ VRF RIP Â

˘

exit-address-family **exit** ¾ Â

ð Ô

ЉЮ ˘ … ¨ ù vpn1 VRF˝ ù vrf … RIP Â

```
Ruijie(config)# ip vrf vpn1
Ruijie(config-vrf)# exit
Ruijie(config)# interface GigabitEthernet 1/0
Ruijie(config-if)# ip vrf forwarding vpn1
Ruijie(config-if)# ip address 192.168.1.1
```

```
255.255.255.0
Ruijie(config)# router rip
Ruijie(config-router)# address-family ipv4 vrf vpn1
Ruijie(config-router-af)# network 192.168.1.0
Ruijie(config-router-af)# exit-address-family
```

ð ३ Ô

३	
exit-address-family	Â
ip vrf	… VRF Â

ð ∧ Ô

ð Ô

3.1.2 auto-summary (RIP)

RIP ╠ ╖ ˘ ३ **auto-summary** Â ३ **no** ╠ ╖ Â

auto-summary

no auto-summary

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╠ ╖ Â

ð ३ Ô

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ð Ô

RIP ╠ ˘ ˘ ╠ Â RIPv1 RIPv2 Ю ╠ Â

RIP ╠ ╖ ˘ Â ˘ a ˘ ∧ Л Ъ Â

˘ ў ЛЪЮ ‘

- RIP ˘ ″I ’
- RIP ˘ ˘ Â
- ∧ έ ˘ a ∧ ł ˘

╟ ╖ Â ∧ RIPv2 ˘ ∧ Ѫ ╟ ╖ ˘

Ьж Â a ৡ ‡ default-metric ѝ 1 Â

ð Ô

ЛЬЮ ˘ RIP OSPF ↑ ˘
↑ RIP ѝ 3 Â

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

ð ৡ Ô

ৡ	

redistribute ÿ ↑ ↓ Â

default-information originate ¢ ˘ ß
Â

always ˘ RIP a ß˘ ˘ ß
˘ a Â ß˘ ˘
/ Л **show ip rip database** RIP Â

RIP ®˘ / Л **route-map** ˘ '
set metric ‡ Â

/ Л **metric** ˘ ”I æ **route-map**
set metric ‡’ **metric** ˘ ‡ RIP
Â

~

RIP ¢ ˘ æ RIP a Ą ¯
Â

ip default-network ˘ Ÿ **default-information**
originate ¢ RIP Â

ð Ô

ЛЬЮ RIP Â

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

ð ¢ Ô

¢	
ip rip default-information	
redistribute	è RIP

ð / Ô

ð Ô

3.1.5 distance

RIP ˘ ¢ **distance** Â ¢ **no**

distance	RIP ˘ <1-255>
ip-address	IP
wildcard	ЬЖ IP Æ˘ ° Ð ˘ ˝ a Â

ð Ô

и 120 Â

ð ¾ Ô

Â

ð Ô

¾ RIP Â

Л Лъ ¾ … ˘ RIP
˘ ‡ ˘ ŭ ‡ RIP Â

ð Ô

ЛъЮ ˘ RIP и 160, ÿ 192.168.12.1 ˝
и 123

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

ð ¾ Ô

ð Л Ô

ð Ô

3.1.6 distribute-list in RIP

8 ˘ Лъ ˘ ¾ **distribute-list in** Â
¾ **no** ЬЖ Â

distribute-list {[*access-list-number* | *name*] | **prefix** *prefix-list-name* [**gateway** *prefix-list-name*]} **in** [*interface-type interface-number*]

no distribute-list {[*access-list-number* | *name*] | **prefix** *prefix-list-name* [**gateway** *prefix-list-name*]} **in** [*interface-type interface-number*]

ð Ô

access-list-number	“ Â ʌ “ ˘ ʌ Л Ъ Â
prefix *prefix-list-name*	“ Â
gateway *prefix-list-name*	“ Â
interface-type interface-number	(ʌ) ¦ “ ˘ ʌ Â

ð Ô

Н Ж¦ “ Â

ð ¾ Ô

Â

ð Ô

ѝ ˘ ʌ Л Ъ ¦ 8 “ ˘ Â

˘ Â

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Л Ъ Ю ˘ RIP ÿ GigabitEthernet 0/0 ˘ 8 ˘ ʌ 172.16 Â

```
Ruijie(config)# router rip
Ruijie(config-router)# network 200.168.23.0
Ruijie(config-router)# distribute-list 10 in
GigabitEthernet 0/0
Ruijie(config-router)# no auto-summary
Ruijie(config)#access-list 10 permit 172.16.0.0
0.0.255.255
```

ð ¾ Ô

¾	
access-list	Н Ж “ ‡ Â
prefix-list	Н Ж “ Â

ð ʌ Ô

ð Ô

3.1.7 distribute-list out RIP

[illegible] ˘ Л˙ ˘ ¾ **distribute-list out** Â ¾ **no** Н Â

distribute-list {[*access-list-number* | *name*] | **prefix** *prefix-list-name*} **out** [*interface* | *protocol* [*process-id* | *process-name*]]

no distribute-list {[*access-list-number* | *name*] | **prefix** *prefix-list-name*} **out** [*interface* | *protocol* [*process-id*| *process-name*]]

ð Ô

access-list-number	[illegible] Â Л [illegible] ˘ Л Л˙ Â
prefix *prefix-list-name*	[illegible] Â
interface	(Л) ¦ [illegible] ˘ [illegible] Л Â
protocol	(Л) ¦ [illegible] ˘ [illegible] ¦ Â
process-id	(Л) *protocol* ѝ OSPF ˘ OSPF id Â
process-name	(Л) *protocol* ѝ ISIS ˘ 'id

```
Ruijie(config-router)# version 2
Ruijie(config)# access-list 10 permit 192.168.12.0
0.0.0.255
```

ð ¾ Ô

¾	
access-list	Ħ‰ ‟ ‡ Â
prefix-list	Ħ‰ ‟ Â
redistribute	¦ Â

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ò Ô

3.1.8 exit-address-family

˘ Ю **exit-address-family** ¾ Â

exit-address-family

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ð Ô

¾ ѝ Â

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Â

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Ю ¾ Â

¾ Ʌ Л Ъ ѝ **exit** Â

ð Ô

ЛЪЮ ˘ ˛

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

ð ¾ Ô

¾	

address-family	Â

ð Ä Ô

ð Ô

3.1.9 ip rip authentication key-chain

RIP ˘ RIP ˘ ¾ **ip rip authentication key-chain** Â ¾ **no** Â

ip rip authentication key-chain *name-of-keychain*

no ip rip authentication key-chain

ð Ô

name-of-keychain	¨ ˘ RIP Â

ð Ô

Â

ð ¾ Ô

Â

ð Ô

˘ **key chain** ¾

Ь˜ ŭ ‡ Ä RIP Â

RIPv1 a RIP ˘ Ä RIPv2 Â

ð Ô

ЛЬЮ ˘ Serial 0 RIP ˘ й

key chain	… ˘ Â

ð Ø Ô

ð Ô

3.1.10 ip rip authentication mode

HX RIP ˘ ¾ **ip rip authentication mode** Â ¾
no RIP Â

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

no ip rip authentication mode

ð Ô

	no RIP RIP

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

ðð /I ÔÔ

ðð ÔÔ

3.1.11 ip rip authentication text-password

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

ip rip authentication text-password *password-string*

no ip rip authentication text-password

ðð ÔÔ

password-string ˘ 1 16 Â

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

ð /

ò Ô

3.1.12 ip rip default-information

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

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

no ip rip default-information

ð Ô

only	˘ a è Â
originate	˘ ≠ è Â
metric *metric-value*	˘ / ' 1-15 Â

ð Ô

Â

╟ ł˘ *metric* и 1 Â

ð ¾ Ô

Â

ð Ô

¾ ł˘ ÿ Â ˘

Ю **ip rip default-information** RIP **default-information originate˘**

‡ / Â

~

1 à / **ip rip default-information˘** RIP a Ą ¯

Â ¯ ˘ Â

2 à Э **ip rip default-information˘** a ¯ ˘ Ю

Â

ð Ô

ЛЬЮ ˘ ethernet0/0 Э… ˘ /Ì
Â

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

ð ¾ Ô

¾	
default-information originate	RIP

ð /Ì Ô

ð Ô

3.1.13 ip rip receive enable

RIP Э RIP ˘ ¾ **ip rip receive enable** Â ¾ **no** RIP Э RIP Â

ip rip receive enable

no ip rip receive enable

ð Ô

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ð Ô

RIP Â

ð ¾ Ô

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RIP ˘ Ю ¾ **no** Â ¾ ¾ Â/Ì ¾ **default** RIP Â

ð Ô

ЛЬЮ ˘ GigabitEthernet 0/0 RIP Â

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

ð ʌ Ô

ð Ô

3.1.16 ip rip send version

ЬЖ RIP Э RIP ˘ ¾ **ip rip receive version** Â ¾ **no** Â

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

no ip rip send version

ð Ô

1	ˆ ʌ ˜ ʌ RIPv1 Â
2	ˆ ʌ ˜ ʌ RIPv2 Â

ð Ô

и ʎ ā **version** ¾ Â

ð ¾ Ô

Â

ð Ô

¾ ˘ ʌЛъ **vesion** ¾ Â ¾ ʌ RIP ˘ ʌЛъ ˘ RIPv1 RIPv2 Â ¾ a ‡ и ʎ ā version Â

ð Ô

ЛъЮ ˘ GigabitEthernet 0/0 ʌЛъ RIPv1 RIPv2 Â

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

ð ¾ Ô

¾	
version	ЬЖ RIP Â

ð ʌ Ô

ð Ô

3.1.17 ip rip v2-broadcast

RIP version 2 Л Э ˇ Л
¾ **ip rip v2-broadcast** ¾ Â ¾ no Â

ip rip v2-broadcast

no ip rip v2-broadcast

ð Ô

Â

ð Ô

й Н ¤ **version** ¾ Â

ð ¾ Ô

Â

ð Ô

¾ ˇ Л **vesion** ¾ Â ¾ Н
RIP йˇ Л ˇ RIPv1 RIPv2 Â ¾
a ‡ й Н ¤ version Â

ð Ô

ЛЮ ˇ GigabitEthernet 0/0 Л RIPv2 Â

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

ð ¾ Ô

¾	
version	Ю RIP Â

ð Н Ô

ð Ô

3.1.18 ip split-horizon (RIP)

RIP ˛ ╗ ˇ ¾ **ip split-horizon** Â ¾ no
RIP ˛ ╗ Â

ip split-horizon

no ip split-horizon

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Л IP Э˘ Л ¤ ˘

¦ ⁸ Лъ Â ¦ Л Лъ ÿ

˘ ˘ ѝ Â

ˆ à X.25 ˜˘ ¦ Л ¦

¯ a Â ЮЎ Л ¦ Â

IP ˘ ≠ ¦ Â

RIP ¤ ˘ ¦ Â a

ў ¦ ˘ Л Лъ **show ip rip** Ҳ Â ┘

neighbor Ҳ Ћ˘ a Л RIP ¦ Â

ð Ô

ЛъЮ ˘ GigabitEthernet 0/0

ip-address	IP
ip-network-mask	½ IP

ð Ô

RIP ╟ Â

ð ¾ Ô

Â

ð Ô

¾ **ip summary-address rip** Ю Â RIP ╟ Â Л Â

ð Ô

ЛЬЮ ˘ RIPv2 ╟ Â ˘ GigabitEthernet 1/0 ł 172.16.0.0/16 Â

```
Ruijie(config)# interface GigabitEthernet 1/0
Ruijie(config-if)# ip summary-address rip 172.16.0.0
255.255.0.0
Ruijie(config-if)# ip address 172.16.1.1 255.255.255.0
Ruijie(config)# router rip
Ruijie(config-router)# network 172.16.0.0
Ruijie(config-router)# version 2
Ruijie(config-router)# no auto-summary
```

ð ¾ Ô

¾	
auto-summary	RIP ╟

ð Л Ô

ð Ô

3.1.20 network (RIP)

ЬЖ RIP “ ˘ ¾ **network** Â ¾ **no** ЬЖ Â

network *network-number* [*wildcard*]

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

ð Ô

network-number	ѧ Â ѧ ѝ ѧˇ IP Ѧ RIP Â
wildcard	ЬЖ IP æˇ 0 ѣ ˇ 1 a Â

ð Ô

ð ҳ Ô

Â

ð Ô

Ѧ Лъ *network-number* *wildcard* ˇ б RIP Â

wildcard ˇ RGOS ˇ б RIP Â

Ѧ RIP ЬЖ “ ˇ Ѧ Лъ RIP ˇ RIP Â

ð Ô

ЛъЮ ˇ ЬЖ б RIP ч ѧˇ 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
```

ð ҳ Ô

ð Ѧ Ô

ð Ô

3.1.21 neighbor (RIP)

ЬЖ RIP IP ˇ Ѧ Лъ ҳ **neighbor** Â ҳ **no** ЬЖ Â

neighbor *ip-address*

no neighbor

ð Ô

interface-number	∧

ð Ô

offset Â

ð ¾ Ô

Â

ð Ô

RIP ˘ offset-list Л↓ offset-list˘ ‡
RIP ╗ offset-list metric

ð Ô

Л↓Ю ˘ acl 7 RIP metric ╗ 7 Â

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

Л↓Ю ˘ GigabitEthernet1/0 ˉ acl 8 RIP
metric ╗ 7 Â

```
Ruijie(config-router)# offset-list 7 in 7
Ruijie(config-router)# offset-list 8 in 7 GigabitEthernet 1/0
```

ð ¾ Ô

ð ∧ Ô

ð Ô

3.1.23 output-delay

∧ RIP ˘ ¾
output-delay˘ ¾ **no** ∧ Â

output-delay *delay*

no output-delay

ð Ô

delay	˘ æ и ˘ <8-50>

ð Ô

и Â

ð ¾ Ô

Â

ð Ô

Ю RIP й 512 ˘ Л Љ 25 ˘
25 ˘ Ю Л Â

˘ ă æ ˘ æ Л a
˘ Â ˘ **output-delay** ч ╗
˘ æ Â

ð Ô

ЉЮ ˘ RIP й 30

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

ð ч Ô

ð Л Ô

ð Ô

3.1.24 passive-interface

Н Э ╗ ˘ ч **passive-interface**
ч Â ч **no** ╗ Â

passive-interface {**default** | *interface-type interface-num*}

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

ð Ô

default	й passive
interface-type interface-num	б Л

ð Ô

Ю й passive Â

ð ч Ô

Â

ð Ô

passive-interface default ч й passive ˘ Л Љ **no**
passive-interface *intface-type interface-num* ч й passive Â

ip rip send enable ч **ip rip receive enable** ч й
RIP Ю ч й passive ˘ a Ѧ RIP
˘ Л Лъ RIP ’ ў ˘ **ip rip send**
enable ч **ip rip receive enable** ч 8 Â

ð Ô

ЛъЮ й passive ˘ ł ethernet0/0 й passive

```
Ruijie(config-router)# passive-interface default
Ruijie(config-router)# no passive-interface ethernet 0/0
```

ð ч Ô

ч	
ip rip receive enable	RIP
ip rip send enable	RIP

ð Л Ô

ð Ô

3.1.25 redistribute RIP

† ˘ Ю **redistribute** ч Â Н
† ˘ ч **no** Â †

match ospf

ð Ô

3.1.26 router rip

… RIP ˘ ¾ **router rip** Â
¾ **no** RIP Â

router rip

no router rip

ð Ô

Â

ð Ô

RIP Â

ð ¾ Ô

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ð Ô

RIP ˘ HX ∕ Â Э ╟ ˘
async default routing Â

ð Ô

ЛЬНО ˘ … RIP ˘ Â

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

ð ¾ Ô

¾	
network (RIP)	HX RIP ∕ Â

ð ∕ Ô

ð Ô

3.1.27 timers basic

RIP ˘ ¾ **timers basic** Â ¾ no
Â

timers basic *update invalid flush*

no timers basic

ð Ô

update	˘ Л Â *update* Н ˘ ˘ *invalid* *Flush* Æ Â 30 Â
invalid	˘ Л ˘ ÿ Â *invalid* Н ˛ й Â ù Ь ˘ ˘ ˛ й ˘ *invalid* ’ *invalid*

ð ʌ Ô

ð Ô

3.1.28 validate-update-source

RIP ˘ ˘

ꝛ **validate-update-source** Â ꝛ **no** Â

validate-update-source

no validate-update-source

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ð ꝛ Ô

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ʌ ЛЪ RIP ˘ Â ѝ RIP
˘ ʌ ˘ IP Â

Э ʃ ˘ RIP ˘ a ŭ
ꝛ **validate-update-source** Â

ɹ ip unnumbered ˘ RIP a ˘ a
ŭ ꝛ **validate-update-source** Â

ð Ô

ЛЪЮ ˘ Â

```
Ruijie(config)# router rip
Ruijie(config-router)# no validate-update-source
```

ð ꝛ Ô

ð Á Ô

ð Ô

3.1.29 version (RIP)

ÞÆ RIP Á˘ ¾ **version** Â ¾ **no** Â

version {**1** | **2**}

no version

ð Ô

1	ÞÆ RIP Á ù 1 Â
2	ÞÆ RIP Á ù 2 Â

Á Ê RIPv1 RIPv2 ˘ Á RIPv1 Â

ð ¾ Ô

Â

ð Ô

ÞÆ RIP Á Â Á Ê **ip rip receive version** à **ip rip send version** ¾˘ RIP ÞÆ Â

ð Ô

ÊÞÖ ˘ RIP Á ù 2 Â

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

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¾	
ip rip receive version	ÞÆ RIP Э RIP Â
ip rip send version	ÞÆ RIP Э RIP Â

show ip rip

ð Ô

3.2

3.2.1 show ip rip

RIP ˘ **show ip rip** Â

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

ð Ô

vrf *vrf-name*	ˆ Л ˜ VRF RIP

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Л RIP Ь à ∫ à ∫ à
rip à rip б à metric б distance Â
VRF˝ VRF ¨ ↓ VRF-id

ð Ô

ЛЬЮ ˘ RIP ˘ à Â

```
Ruijie# show ip rip
GigabitEthernet1C-10-21/1GigabitEthernet1C-10-21/0
```

```
192.168.64.0 255.255.255.0
Distance: (default is 50)
```

ЛЬЮ ˘ vrf˝ RIP ˙

```
Ruijie(config-router)# sh ip rip vrf 1
VRF 1  VRF-id:1
Routing Protocol is "rip"
Sending updates every 30 seconds
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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3.2.2 show ip rip database

RIP ˘ **show ip rip database** Â

show ip rip database [**vrf** *vrf-name*] [*network-number* {*network-mask*}]

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vrf *vrf-name*	ˆ Л ˜ VRF RIP
network-number	ˆ Л ˜ Л Â
network-mask	Â Л ˘

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˘ RIP Â

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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, GigabitEthernet 0/0
192.168.121.0/24    auto-summary
192.168.121.0/24    redistributed
[1] via 192.168.2.22, GigabitEthernet 0/1
```

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, GigabitEthernet 0/1
```

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show ip rip	Â

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3.2.3 show ip rip external

RIP ¦ ˘ **show ip rip external** ¾ Â

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

ð Ô

bgp	**connected**	**isis**	**ospf**	**static**	^ Л ~ ¦

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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
```

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¾	
show ip rip	Â

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ð Ô

3.2.4 show ip rip interface

RIP ˘ **show ip rip interface** Â

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

ð Ô

vrf *vrf-name*	^ Л ~ VRF RIP

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ЛЬЮ ˘ RIP Â

```
Ruijie# show ip rip interface
GigabitEthernet 1/1 is down, line protocol is down
  RIP is not enabled on this interface
GigabitEthernet 1/0 is up, line protocol is up
  Routing Protocol: RIP
  Receive RIPv2 packets only
  Send RIPv2 packets only
  Passive interface: Disabled
  Split horizon: Enabled
  V2 Broadcast: Disabled
  Multicast register: Registed
  Interface Summary Rip:
    Not Configured
  Authentication mode: Text
  Authentication key-chain: ripk1
  Authentication text-password: ruijie
  Default-information: only, metric 5
  IP interface address:
    192.168.64.100/24, next update due in 14 seconds
    2.2.1.1/24, next update due in 24 seconds
      neighbor 2.2.1.6, next update due in 3 seconds
      neighbor 2.2.1.77, next update due in 13 seconds
    2.2.2.57/24, next update due in 16 seconds
```

RIP б BFD ╟, ж ¾ Ю :

```
Ruijie#show ip rip interface
VLAN 1 is up, line protocol is up
  Routing Protocol: RIP
    Receive RIPv1 and RIPv2 packets
    Send RIPv1 packets only
    Receive RIP packet: Enabled
    Send RIP packet: Enabled
    Send RIP supernet routes: Enabled
    Passive interface: Disabled
    Split horizon: Enabled
    BFD: Enabled
```

4 OSPF2

4.1

4.1.1 area

ऄ ˘ ३ **no** OSPF ऄ Â

area area-id

no area area-id

ð Ô

area-id	OSPF ऄ ∕ Âऄ ∕ ∕ Ɓ ⁸ ˘ ≠ ∕ Ɓ IP Â

ð Ô

OSPF ऄ Â

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∕ Ɓ ३ **no** ˘ OSPF ऄ ऄ ˘

area authentication à **area default-cost** à **area filter-list** à **area nssa** ऄ

३ Â

ЮО ЮЎ OSPF ऄ ˙

1. ў ऄ ˘ Â ″I

˘ ў ऄ Â

2. ऄ ˘ **network area** ३ Â ″I ╗ ऄ

३˘ ऄ Â

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ƱЮО ˘ OSPF ऄ 2 ˙

```
Ruijie(config)# router ospf 2
```

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

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¾	
network area	Ð OSPF Ù ¼ OSPF ¼

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4.1.2 area authentication

OSPF ¼ ˘ ¾ **area authentication** Â ¾

no

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ЛЬЮ ˘ OSPF ˂ 0ˆ ˂ ˜ MD5 ˘ ३ ѝ backbone Â

```
Ruijie(config)# interface GigabitEthernet 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
```

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ip ospf authentication-key	ЬЖ OSPF ३ Â
ip ospf message-digest-key	ЬЖ OSPF MD5 ३ Â
area virtual-link	ЬЖ Â

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4.1.3 area default-cost

ЬЖ STUB ˂ NSSA ˆ OSPF ˜˜ ३ **area default-cost** Â ३ **no** Â

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

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

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area-id	STUB ˂ NSSA ˂ ѧ Â
cost	STUB ˂ NSSA Â

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ʒ Л ABR˜ Ъ ~ Э ˘ з ABR
STUB Ъ ˆ ѝ ~ NSSA Â ABR ˘
Ъ ˘ ˩ Ъ Â

OSPF Ъ ѝ STUB NSSA ч Ь ʒ **area stub˘ area nssa**
area default-cost Â STUB Э˘ **area stub** ʒ˘
NSSA Ъ **area nssa** ʒ˘ **area default-cost** ʒ Л
ABR Э Â

ð Ô

ЛЬЮ ʒ˘ ѝ 50 Â

```
Ruijie(config)# router ospf 1
Ruijie(config-router)# network 172.16.0.0 0.0.255.255 area 0
Ruijie(config-router)# network 192.168.12.0 0.0.0.255 area 1
Ruijie(config-router)# area 1 stub
Ruijie(config-router)# area 1 default-cost 50
```

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б

area-id	¼ ¬ Â
acl-name	acl ¨
prefix-name	prefix-list ¨
access | **prefix**	prefix list ACL
in | **out**	° | ¼

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¢ ¬ ABR¼ ¼ ~ Э Â

ABR Э a¸ ¼ ¯ ° ¸ ¢ Â

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ЛЬЮ ¢¸ area 1 ¬ ¯ 172.22.0.0/8 ¼ 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
```

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ð ¬ Ô

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4.1.5 area nssa

OSPF ¼ й nssa¸ ¢ **area nssa** Â ¢ **no** nssa ¼ nssa ¼ Â

area *area-id* **nssa** [**no-redistribution**] [**default-information-originate** [**metric** <*0-16777214*> | **metric-type** <*1-2*>]] [**no-summary**]

no area *area-id* **nssa** [

area-id	NSSA ѵ ѵ ѧ Â
no-redistribution	ˆ ѧ ˜ nssa ABR ˘ ѧ ƚ ҳ ѵ a nssa ѵ ˘ ѧ Ѣ Э Â
default-information-originate	ˆ ѧ ˜ 7 LSA nssa ѵ ˘ ѧ NSSA ABR ASBR Э Â
no-summary	ˆ ѧ ˜ nssa (ABR) Ь LSA nssa ѵ Â

ð Ô

Ћ NSSA ѵ Â

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

no-redistribution ASBR Э OSPF redistribute ҳ è a NSSA ѵ Â NSSA ASBR ѵ ABR ˘ ѧ Ѣ nssa Â

ѝ NSSA ѵ Ъ

३	
area default-cost	HX NSSA ^ OSPF ~ Â

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4.1.6 area range

OSPF ` ˘ ३ **area range** Â ३
no ˘ **no** б **cost** Ø Ћ
˘ a Â

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

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

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Λ Л Ь Ж ↖ ३ˇ OSPF

Â

˘ Л ABR Э **area stub** ҳ ˘ no-summary
Â Л ˇ ˘ Лъ ↓ ABR
Â

OSPF ˇ й ч ҳ **area stub** **area default-cost** Â
Э˘ **area stub** ҳ˘ **area default-cost** ҳ Л
ABR Э Â **area default-cost** ҳ НЖ ^ ~ Â

ð Ô

ЛъЮ ˘ ˇ 1 й ˘ ˇ Â

```
Ruijie(config)# router ospf 1
Ruijie(config-router)# network 172.16.0.0 0.0.255.255area 0
Ruijie(config-router)# network 192.168.12.0 0.0.0.255area 1
Ruijie(config-router)# area 1 stub
```

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ҳ	
area default-cost	НЖ STUB ˇ ^ OSPF ~ Â

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4.1.8 area virtual-link

НЖ OSPF ˘ ҳ **area virtual-link** Â ҳ **no**
НЖ Â

area *area-id* **virtual-link** *router-id* [**authentication** [**message-digest** | **null**]] [**dead-interval** *seconds*] [**hello-interval** *seconds*] [**retransmit-interval** *seconds*] [**transmit-delay** *seconds*] [[**authentication-key** *key*] | [**message-digest-key** *key-id* **md5** *key*]]
no area *area-id* **virtual-link** *router-id*

ð Ô

area-id	OSPF

dead-interval *seconds*	ˆ Л ˜ ЊЖ ˇ Лъ ѝ æˇ ѝ 40 Â б Â
hello-interval *seconds*	ˆ Л ˜ OSPF Hello ˇ Лъ ѝ æˇ ѝ 10 Â б Â
retransmit-interval *seconds*	ˆ Л ˜ OSPF ˆ LSAˇ ˇ Лъ ѝ æˇ ѝ 5 Â Э Â
transmit-delay *seconds*	ˆ Л ˜ OSPF ˆ LSAˇ ˇ Лъ ѝ æˇ ѝ 1 Â ╗ LSA ˇ LSA ˇ LSA 9 Â
authentication-key *key*	ˆ Л ˜ ЊЖ OSPF Â Â service password-encryption ȝ Л Лъ Лъ╗ Â
message-digest-key *key-id* **md5** *key*	ˆ Л ˜ ЊЖ OSPF MD5 Â MD5 Â service password-encryption ȝ Л Лъ Лъ╗ Â
authentication	ˇ Â
message-digest	ѝ MD5 Â
null	ѝ a Â

ðð Ô

dead-interval ' 40 '

hello-interval ' 10 '

retransmit-interval ' 5 '

transmit-delay ' 1 '

a ;

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OSPF ˇ Ҳ б ˇ ˇ

ˇ ŭ ‡ Â ч ˂
ˆ ABR˜ … ˇ ч ABR ˇ ˂ й ˂ Â
ˆ Stub Area˜ NSSA a й ˂ Â ≠ Л Љ è
˂ Â

router-id й OSPF ˇ a router-id ˇ **show ip ospf neighbor** ˃ Â Л Љ Loopback Â

area virtual-link ˃ Л Ђ ˇ ˂ OSPF ˇ ˃ **area authentication** Â

ð Ô

ЉЮ ˇ Љ˂ 1 й ˂ ˇ б 2.2.2.2 Â

```
Ruijie(config)# router ospf 1
Ruijie(config-router)# network 172.16.0.0 0.0.15.255 area 0
Ruijie(config-router)# network 172.16.17.0 0.0.15.255area 1
Ruijie(config-router)# area 1 virtual-link 2.2.2.2
```

ЉЮ ˇ Љ˂ 1 й ˂ ˇ б 1.1.1.1 Â
˂ 10 ˂ ˇ OSPF ˇ й MD5 Â

```
Ruijie(config)# router ospf 1
Ruijie(config-router)# network 172.16.17.0 0.0.15.255area 1
Ruijie(config-router)# network 172.16.252.0 0.0.0.255area 10
Ruijie(config-router)# area 0 authentication message-digest
Ruijie(config-router)# area 1 virtual-link 1.1.1.1 message-d
igest-key 1 md5 hello
```

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˃	
area authentication	OSPF ˂ ↓ Â
show ip ospf	OSPF ˇ Â

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4.1.9 auto-cost

٣ ╟٣' ╖ ł ˘ ╟
٣' ˘ ٣ **no** ∧Ɓ ╟٣' ╖ ˘ ∧Ɓ
Â

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

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

ð Ô

	Â Ɓ Mbps
ref-bw	

4.1.10 clear ip ospf process

OSPF Â

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

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process-id	˘ OSPF Â ʌ ˘ OSPF Â

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RFC2328 ‡ Â

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Æ OSPF ˘ ˘ ' Лъ ৡ
˘ ŭ ,

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ЛъЮ ৡ OSPF 1

```
Ruijie# clear ip ospf 1 process
```

RFC2328

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RFC1583 ‡ Â

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ЛЬЮ ˘ rfc 2328 ‡ Â

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

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show ip ospf	ospf

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4.1.12 default-information originate OSPF

OSPF ˘ ३

default-information originate Â ३ **no** Â

default-information originate [**always**] [**metric** *metric*] [**metric-type** *type*] [**route-map** *map-name*]

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

ð Ô

route-map *map-name*	route-map ¨ , route-map

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a Â

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redistribute **default-information** ٪ ˘ OSPF ╟ ∧ й ASBR˝ ˜ Â ASBR a ╟ ˘ OSPF Â ASBR ˘ **default-information originate** ٪ Â

always ˘ OSPF a ŭ ˘ ą̈ Â a ˘ ŭ ˘ ∧ Л **show ip ospf database** OSPF ˘ й 0.0.0.0 Â OSPF **show ip route** ٪˘ ∧ Л Â

˘ ∧ **default-information originate** ٪ Н˜ a ٪ **default-metric** Â

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

STUB ↖ a ∧ Л Â

ð Ô

ЛЮ ˘ OSPF ˘ OSPF ˘ й 1˜ й 50 Â

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

ð ٪ Ô

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

ð Л Ô

ð Ô

4.1.13 default-metric

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

default-metric *metric*

no default-metric

ð Ô

metric	ЊЖ OSPF ¦ Â

ð Ô

ѝ 20 Â

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ð Ô

default-metric ҳ б **redistribute** ҳ ˘ Л Љ ¦ Â

default-metric ҳ ˘ Љ **default-information originate** OSPF a Â

ð Ô

ЉЊЮ ˘ OSPF ¦ ѝ 50 Â

```
Ruijie(config)# router rip
Ruijie(config-router)# network 192.168.12.0
Ruijie(config-router)# version 2
Ruijie(config-router)# exit
Ruijie(config)# router  ospf
Ruijie(config-router)# network 172.16.10.0 0.0.0.255 area 0
Ruijie(config-router)# default-metric 50
Ruijie(config-router)#redistribute rip subnets
```

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redistribute	↑ è Â
show ip ospf	ospf

ð Л Ô

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4.1.14 distance ospf

a˘ OSPF

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

no distance ospf

ð Ô

intra-area *<1-255>*	↖ ˘ й

4.1.15 distribute-list in

LSA

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

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

ð Ô

listname	acl ‡
gateway *plist-name*	gateway ‡
prefix *plist-name*	prefix-list ‡
interface-type *num*	/I LSA

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ù ˘ Â

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LSA ˘ ˚ б SPF ˘ Â
a ˘ ≠ a ˘ /I
OSPF Â ╖ ABR ASBR˘ /I Л
⁸ Â

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```
Ruijie(config)# access-list 3 permit 172.16.0.0
0.0.127.255
Ruijie(config)# router ospf 25
Ruijie(config-router)# redistribute rip metric 100
Ruijie(config-router)# distribute-list 3 in ethernet 1/0
Ruijie(config-router)# distribute-list 3 in ethernet 1/1
```

ð ¾ Ô

ð /I Ô

ð Ô

4.1.16 distribute-list out

ĺ ˘ ╖ **redistribute** ¾

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

no distribute-list {*listname* | **gateway** *plist-name* | **prefix** *plist-name* } **out** [**bgp** | **connected** | **isis** *area-tag* | **ospf** *process-id*| **rip** | **static**]

ðô Ô

listname	acl ‡
gateway *plist-name*	gateway ‡
prefix *plist-name*	prefix-list ‡
[**bgp** | **connected** | **isis** *area-tag* | **ospf** *process-id* | **rip** | **static**]	

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distribute-list out б **redistribute route-map** ¾ ˘ ÿ è ĺ OSPF ˘ a ĺ ˘ б **redistribute** ¾ Â ACL ‡ prefix-list ‡ a ,¯ ACL

4.1.18 enable traps

OSPFv2

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ip ospf authentication-key ३ ˘ OSPF Â a
˘ ч ∧ a OSPF ˘ ≠ a
Â

a˚ ∧ Л Ъ a ˘ ˚ Э ˘
Â

OSPF ↖ ŭ ˘ ३ **area authentication** Â

Э ≠ ∧ Л Ъ , Ю ३ **ip ospf authentication**
, ↖ ″I ↰ .

ð Ô

Л Ъ Ю ˘ GigabitEthernet 0/0 OSPF и ospfauth Â

```
Ruijie(config)# interface GigabitEthernet 0/0
Ruijie(config-if)# ip address 172.16.10.0
255.255.255.0
Ruijie(config-if)# ip ospf authentication-key ospfauth
```

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area authentication	OSPF ↖ Ъ Â
Ip ospf authentication	Э Ъ

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4.1.21 ip ospf cost

OSPF ^ OSPF ~~ ३ **ip ospf cost** Â ३ **no** Â

ip ospf cost *cost*

no ip ospf cost

ð Ô

cost	OSPF Â

ðô Ô

ù /Bandwidthˆ ù 100Mbps˜ Â

ðô ҳ Ô

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Ю˙ OSPF ù 100Mbps/Bandwidth˘ è Bandwidth ù ˘ ҳ bandwidth Â

ή OSPF ù˙

- 64K ˘ cost ù 1562˙
- E1 ˘ cost ù 48˙
- 10M Лъ ˘ cost ù 10˙
- 100M Лъ ˘ cost ù˝ Â

ip ospf cost ҳ OSPF ˘ Â

ðô Ô

ЛъЮ ˘ serial 1/0 OSPF ù 100 Â

```
Ruijie(config)# interface serial 1/0
Ruijie(config-if)# ip ospf cost 100
```

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ҳ	
bandwidth	Â a Â
show ip ospf	Ospf

ðô Л Ô

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4.1.22 ip ospf database-filter all out

ҳ a ą̈ LSA ˘ a Э LSA ,

٪ **no** ʌ Ɲ

ip ospf database-filter all out

no ip ospf database-filter

ð Ô

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ٿ , ʌ Ɲ Э LSA Â

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ip ospf dead-interval

OSPF ˘ ٪ **ip ospf dead-interval** Â ٪ **no ip ospf dead-interval** *seconds*

no ip ospf dead-interval

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ù **ip ospf hello-interval** " Â

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OSPF Hello Â OSPF ˘
Hello ˘ ÿ Â ù
hello 4 ˘ hello

ð Ô

ð ३ Ô

Â

ð Ô

३ **network area** ŏ ō ˘ ३ ł ˘ ¨

network ˘ ≠ a Ą ospf Â a

ð Ô

hello hello Â ˘ OSPF ¼
≠ ˘ ╗ Ã˜ Э hello
Â ˘ hello a
Â

ð Ô

ЛЬЮ ˘ serial 1/0 OSPF Hello й 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
```

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¾	
ip ospf dead-interval	OSPF Â

ð ¼ Ô

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4.1.26 ip ospf message-digest-key

OSPF MD5 ˘ ¾ **ip ospf message-digest-key** Â
¾ no OSPF MD5 Â

ip ospf message-digest-key *key-id* **md5** *key*

no ip ospf message-digest-key

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ip ospf message-digest-key ٪ ˘ OSPF Â a ˘ ч Л a OSPF ˘ ≠ a Â

a˚ Л Љ a ˘ ˚ Э ˘ Â ˚ Â

OSPF ↖ ŭ ˘ ٪ **area authentication** Â Э ≠ Л Љ , Ю ٪ **ip ospf authentication** , ↖ ″I Ч .

RGOS ˚ MD5 ˘ ″I ╗ ł ‡ Â ╗ OSPF MD5 ˘ ŕ è ˘ ¦ a˚ OSPF ˘ Â ł˘ Л Љ Â

ð Ô

ЉЮ ˘ GigabitEthernet 0/0 ╗ OSPF ˘ Л ŕ˜ ˘ ŕ hello5 Â

```
Ruijie(config)# interface Serial 1/0
Ruijie(config-if)# ip address 172.16.24.2
255.255.255.0
Ruijie(config-if)# ip ospf authentication
message-digest
Ruijie(config-if)# ip ospf message-digest-key 10 md5
hello10
Ruijie(config-if)# ip ospf message-digest-key 5 md5
hello5
```

╗ ł˘ Â

```
Ruijie(config)# interface Serial1/0
Ruijie(config-if)# no ip ospf message-digest-key 10 md5 hello10
```

ð ٪ Ô

٪	
area authentication	OSPF ↖ Ш Â
ip ospf authentication	Э Ш

ð Л Ô

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4.1.27 ip ospf mtu-ignore

ł **mtu** /Л Ъ ¢ Â ¢

no Â

ip ospf mtu-ignore

no ip ospf mtu-ignore

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mtu Â

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OSPF MTU MTU ŭ
˘ , MTU MTU, ж
a , /Л Ъ MTU ā Â

ð Ô

ЛЪЮ ˘ serial 1/0 MTU ╗ Â

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

ð / Ô

ð Ô

4.1.28 ip ospf network

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

ip ospf network broadcast non-broadcast point-to-multipoint [non-broa dcast] point-to-point

no ip ospf network broadcast non-broadcast point-to-multipoint [non-br oadcast] point-to-point

ð Ô

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

ðð Ô

- ‘ PPP à SLIP à à X.25 ’
- NBMA ‘ ˆ ˜ à X.25 ˆ ˜’
- ‘ Лъ ’
- ѝ Â

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ðð Ô

a˚ ˘ OSPF ǂ ѝ Ь ‘

- ˆ Лъ ˘ ȝ ˘ FDDI˜
- ˆ ˘ X.25˜
- ˆ HDLC˜ PPP˜ SLIP˜

è ˘ OSPF a˚ ѧǂ ѝ ч ‘

- (NBMA) ÂNBMA ˘ ѧ ˘ SVC˜ X.25˜ ˘ PVC˜ ˜ ÂOSPF NBMA Ч ц ˆ

Â

Л Лъ ˘ OSPF ˘
ў Â б ЛъЮ ˙

- ˘ a ˘ ≠ ,
- ҃' ˘ a Â

л à Лъ ↓ X.25 ˘ IP ˘
broadcast .

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ЛъЮ ˘ 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
```

ЛъЮ ˘ 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
```

ЛъЮ ˘ ѝ ˘ DR/RDR˜
ˆ Â ЛъЮ ¦ a
Э ˆ ⁸ ѝ DR/BDR˜ Â

```
Ruijie(config)# interface Serial1/0
Ruijie(config-if)#ip address 172.16.24.4 255.255.255.0
Ruijie(config-if)# encapsulation frame-relay
Ruijie(config-if)# ip ospf network broadcast
Ruijie(config-if)# ip ospf priority 0
```

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҃	
dialer map ip	Н IP б л л Â
frame-relay map	Н IP б DLCI Â
neighborˆ OSPF˜	Н IP ˘ Л NBMA Â

X25 map	Ħ IP б X.25 Â

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4.1.29 ip ospf priority

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

ip ospf priority *priority*

no ip ospf priority

ð Ô

Priority	OSPF ″I Â

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″I ѝ″ Â

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OSPF ″I hello Â OSPF DR/BDR ˜ ˘ ″I ˘ ѝ DR BDR Â ″I ˘ ѝ DR BDR Â ″I

B D R A ' 5 B y · , X d ‘

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ৡ	
ip ospf network	OSPF Â

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4.1.30 ip ospf retransmit-interval

HK LSU ˜ ˘ p ﺲﺤ Ů f

¾	
area virtual-link	ÞK OSPF Â

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ð Ô

4.1.31 ip ospf transmit delay

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

ip ospf transmit delay *seconds*

no ip ospf transmit delay

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Seconds	ÞK OSPF LSU ˘ Лъ ù æ Â ù 1 Â

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ù 1 Â

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Â

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LSU ˘ LSAś ˜ Age ╗˘ ╗ ¾ **ip ospf transmit delay** ÞK Â ˘ æ ˘ Â LSU ˘ **area virtual-link** ¾ **retransmit-interval** ÞK Â

RGOS ˚ Age 3600 LSA˘ ˘ ↓ ⁹ ˘ LSA ÿ Â

ð Ô

ЛъЮ ˘ serial1/ 0 ù 5 Â

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

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¾	
area virtual-link	ÞX OSPF Â

ð Á Ô

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4.1.32 log-adj-changes

¾ ŭ Á ˘ ¾ **no** **default** Á Ћ ╖ Â

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

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

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detail	Á

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╖ ˘ a **detail** ˘ Á Full Full Â

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ЋЬЮ ˘ Á Â

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

ð ¾ Ô

¾	
show ip ospf	ospf Â

ð Á Ô

ð Ô

4.1.33 max-concurrent-dd

˘ DD Â

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

ð Ô

poll-interval *seconds*	^ Л ~ ˘ Љ ѝ æ˘ 120 Â Non-broadcast(NBMA) Â
priority *priority*	^ Л ~ ”I ˘ ѝ° Â Non-broadcast(NBMA)
Cost *cost*	^ Л ~ ˘ Њ, Э cost Â point-to-multipoi nt [non-broadcast] Â

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RGOS ˚ ѝ ˘ Â IP ˘ ѝ ў IP Â

NBMA Э ѧ ѝ a ˘ Hello ˘ OSPF Hello ˘ Hello ѝ Â OSPF ˘ Л ą̈ ”I a ѝ 0 Hello ˘ ”I ѝ 0 a б DR/BDR Â DR/BDR Љ ћ˘ DR/BDR ą̈ Hello Â

Э, ѝ a é Љ ╠ , ҳ ѝ è , ┘ Л Љ cost .

ð Ô

ЉЮ ˘ OSPF ˘ è IP ѝ 172.16.24.2

```
0.0.0.255 area 1
Ruijie(config-router)# network 0.0.0.0 255.255.255.255 area 0
```

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router ospf

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4.1.37 overflow database external

¾ external LSA б ÿ
Â

overflow database external *max-dbsize wait-time*

no overflow database external

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max-dbsize	external lsa ^ ˚ AS ˚ ~˜ ∧ ' 0-2147483647 Â
wait-time	ÿ ˘ ∧ ' 0-65535 Â

ð Ô

a ⁸ external-LSA Â

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

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external-LSA *max-dbsize* ˘ ˘ Ю
a Ą ╗ external-LSA˘ external-LSA Â *wait-time*
ł˘ ˘ ╗ external-LSA Â

```
Ruijie# configterminal
Ruijie(config)# ospf10
router)# 10 3
```

4.1.40 redistribute

৲ ᛁ Â

redistribute {**bgp** | **isis** *area-tag* | **ospf**

ˆ **isis** ˇ a level ˇ Ѓ ˆ level-2 ˇ
ˆ ˇ level ˇ ‡ ˆ level Â
ˇ ѝ ˇ ˚ level 1, level 2 ˇ ѝ level-1-2 Â
Â

ˆ **ospf** ˇ a match ˇ ˆ ospf
’ ł match ѝ match ˇ ˆ Ѓ ѕ
ˆ ’ no ˜ match ѝ Â
Â

ˆ ˇ route-map ˇ route-map match ‡ ˆ
ѕ ’ ˆ OSPF ISIS ˇ Ѓ ˆ
match level ‡ˇ Ѧ route-map Â

ð Ô

ЛЬЮ ˜ ˆ OSPF

```
Ruijie(config-router)# redistribute static subnets
Ruijie(config)# router ospf 1
Ruijie(config-router)# redistribute ospf 2 subnets
Ruijie(config-router)# redistribute ospf 2 match
external 1 internalRuijie(config-router)#      2nC2_0 1 Tf 0 Tc 2.64 024 -10 T14O-<2
```

process-id	ospf л
vrf-name	VRF ˘ OSPF VRF

ð Ô

a OSPF Â

ð ч Ô

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RGOS10.1 Э ╗ ˙ л˘ ѝ ospf Â a˚ ospf ˘ Л Љ ѝ ч a Â

ð Ô

ЉЮ ˘ **vrf** *vpn_1* … OSPF 10 Â

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

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ч	
show ip protocols	Â
show ip ospf	ospf Â

ð л Ô

ð Ô

4.1.42 router-id

ID, ч **no** Л Љ Router ID˘ Router ID Â

router-id *router-id*

no router-id

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router-id	ID,Љ IP Â

ð Ô

OSPF ip ѝ Â

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Л Лъ ip ѝ ˘ Л

Â Л ѣ˘ , Лъ a ў

Л ˘ Лъ ў ’ Л Л LSA

. Лъ OSPF ˘ ˘ ж

”I ˘ ≠ Л Лъ loopback ˘ ospf

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ЛъЮ ˘ router-id ѝ 0.0.0.36 Â

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

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ৡ	
show ip protocols	Â

ð Л Ô

ð Ô

4.1.43 summary-address

OSPF ˘ ৡ

summary-address Â ৡ **no** Ьж Â

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

ð Ô

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

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ÿ è ǂ ˘ OSPF ˘ ǂ Лъ
OSPF Â
˘ Л Лъ Л ˘ ÿ
Â

б **area rang** ३ a ˚ ˘ area range OSPF ˂ ˘
summary-address OSPF Â

NSSA ˂˘ **summary-address** ३ Л NSSA ABR Э ˘ з
Л ǂ Â

ð Ô

ЛъЮ ३˘ 100.100.0.0/16 Â

```
redRuijie(config)# router ospf 20
Ruijie(config-router)#summary-address 100.100.0.0 255.255.0.0
Ruijie(config-router)# redistribute static subnets
Ruijie(config-router)# network 200.2.2.0 0.0.0.255 area 1
Ruijie(config-router)# network 172.16.24.0 0.0.0.255 area 0
Ruijie(config-router)# area 1 nssa
```

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३	
area range	OSPF ˂ Э Â

ð Л Ô

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4.1.44 timers lsa-group-pacing

३ LSA ǂ ł 9 Лъ ↓ ˘
३ **no** Â

timers lsa-group-pacing *seconds*

no timers lsa-group-pacing

ð Ô

seconds	LSA ˘ ˘ Â : 10-1800

ð Ô

: 240 Â

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ˆ LSA˘ ˘ ˘ ˘ Лъ
Â ѝ 4¦ Â a Â
б LSA Л Â ˘ 10000 LSA˘
æ Â Л 40~100 ˘ ‡ 10~20¦ Л Â

ð Ô

ЛъЮ ˘ ѝ 120 Â

```
Ruijie(config)#router ospf 20
Ruijie(config-router)#timers lsa-group-pacing 120
```

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ҳ	
show ip ospf	ospf

ð Л Ô

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4.1.45 timers spf

OSPF Л ˘ SPF ˘ Лъ ч SPF
˘ ҳ **timers spf** Â ҳ no
Â

timers spf *spf-delay spf-holdtime*

no timers spf

ð Ô

spf-delay	ЬЖ SPF ˘ Лъ ѝ æ Â OSPF Л ˘ ѣ˘ SPF Â

spf-holdtime	Ⱨ ч SPF ˘ Л ѝ æ Â ˘ ч ˘ a SPF Â

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spf-delay 5 ’ *spf-holdtime* 10 Â

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spf-delay *spf-holdtime* ˘ OSPF ≠ ˘ ≠

ѝ Â

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҃ Л Лъ OSPF Â

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ЛъЮ ѝ **show ip ospf** ҃

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

```
SPF algorithm last executed 02:09:23.040 ago
SPF algorithm executed 4 times
Number of LSA 6. Checksum 0x028638
NSSA Translator State iselected
```

Ю Â

Router ID	Â
Process uptime	OSPF ^ router-id ѝ 0.0.0.0 a ~
Bound to VRF	OSPF VRF
Conforms to RFC2328	б RFC2328
RFC1583Compatibility flag	RFC1583 ‡ RFC2328 ‡ ASBR ‡
Support Tos	/ſ TOS0 ئې

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¢˘ Л Љ ABR ASBR OSPF Â
OSPF a˚ **show ip route** ˘ OSPF
й OSPF ˘ a Â

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ЉЮ й **show ip ospf border-routers** ¢

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

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

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

Ю Â

Codes	¢ Ђ Âi ˇ ˘ I ˇ Â
I	й ˇ Â
1.1.1.1	OSPF Â
[2]	ˆ cost˜ Â
via 10.0.0.1	Ю Â
GigabitEthernet 0/1	Â
ABR, ASBR	˘ ABR ASBR ч ˘ Л Љ˚ ABR ASBR Â
Area 0.0.0.1	¯ ˇ Â
select	ASBR ˘ select Â

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ð Ô

4.2.3 show ip ospf database

OSPF ˘ ¢ **show ip ospf**

database Â

৲ a˚ a˚ ˆ LSAs˜ Â

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

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

show ip ospf [*process-id area-id*] **database** [**self-originate** | **max-age**]

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

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

show ip ospf [*process-id area-id*] **database** [**router**] [**self-originate**]

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

[*link-state-id*] [**self-originate** | **maxage**]

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

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Area-id	ˆ ∧ ~ ↖ ∧
adv-router	ˆ ∧ ~ Ω
link-state-id	ˆ ∧ ~ ∧ OSPF Â
self-originate	ˆ ∧ ~
maxage	ˆ ∧ ~ LSA
router	ˆ ∧ ~ OSPF Â
network	ˆ ∧ ~ OSPF Â
summary	ˆ ∧ ~ OSPF Â
asbr-summary	ˆ ∧ ~ ASBR Â
external	ˆ ∧ ~ OSPF Â
nssa-external	ˆ ∧ ~ OSPF Â
opaque-area	ˆ ∧ ~ LSA
opaque-as	ˆ ∧ ~ LSA
opaque-link	ˆ ∧ ~ LSA
database-summary	ˆ ∧ ~ OSPF LSA

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OSPF ˘ ↑ ↑ Â ३˘
╠ OSPF Â

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ЛЬЮ ѝ **show ip ospf database** ʒ ʻ

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

             Router Link States (Area 0.0.0.0)
Link ID         ADV Router      Age  Seq#       CkSum  Link count
```

```
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 ҳ ЮÂ

OSPF Router with ID	OSPF б OSPF л
Router Link States	ЛЬЮ й Â
Net Link States	ЛЬЮ й Â
Summary Net Link States	ЛЬЮ й Â
NSSA-external Link States	ЛЬЮ й
AS External Link States	ЛЬЮ й Â
Link ID	Â
ADV Router	Â
Age	Â
Seq#	л˘ LSA Â
Cksum	Â
Link-Count	
Route	LSA
Tag	Â

ЛЬЮ й **show ip ospf database asbr-summary** ҳ ‘

```
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 ३ ЮÂ

OSPF Router with ID	ЛЬЮ б OSPF ㄴ
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	ㄴ Â
Checksum	Â
Length	˘ Лъ ѝ æ Â
Network Mask	Â

```
Metric: 20
Forward Address: 0.0.0.0
External Route Tag: 0
```

show ip ospf database external ҳ Ю Â

OSPF Router with ID	ЛЬЮ б OSPF ѧ ÂÂ
Type-5 AS External Link States	ЛЬЮ ѝ Â
LS age	Â
Options	Â
LS Type	Â
Link State ID	Â
Advertising Router	Â
LS Seq Number	ѧ Â
Checksum	Â
Length	˘ ЛЬ ѝ æ Â
Network Mask	Â
Metric Type	Â
TOS	TOS ˘ Ѧ ѝ 0 Â
Metric	Â
Forward Address	˘ IP Â ѝ 0.0.0.0ѓ ‡ Â
External Route Tag	˘ 32 ÂOSPF a ˘ è ∫ OSPF Â

ЛЬЮ ѝ **show ip ospf database network** ҳ

```
Ruijie# show ip ospf database network
```

```
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 ৲ ЮÂ

OSPF Router with ID

```
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 ¾ ÍO Â

```
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 ३ ЮÂ

OSPF Router with ID	ЛЬЮ б OSPF ﾉ Â
Summary Net Link States	ЛЬЮ ѝ Â
LS age	Â
Options	Â
LS Type	Â
Link State ID	Â
Advertising Router	Â
LS Seq Number	ﾉ Â
Checksum	Â

```
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 ৲ ЮÂ

OSPF Router with ID

ЛЬЮ й **show ip ospf database external**

```
Ruijie# show ip ospf database external
OSPF Router with ID (1.1.1.1) (Process ID 1)
AS External Link States
LS age: 1290
Options: 0x2 (*|-|-|-|-|-|E|-)
LS Type: AS-external-LSA
Options
```

Forward Address	˘ IP Â и 0.0.0.0 ‡ Â
External Route Tag	˘ 32 ÂOSPF a ˘ è ¦ OSPF Â

ЛЬЮ и **show ip ospf database database-summary** ч

```
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 ч ЮÂ

OSPF Process	ЛЬЮ л
Router Link	ъ ˘ OSPF LSA Â
Network Link	ъ ˘ OSPF LSA Â

interface-type	ˆ Л ˜ Â
interface-number	ˆ Л ˜ л Â

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ʒ˘ Л Лъ OSPF˘ Лъ Ы OSPF Â

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ЛъЮ ий **show ip ospf interface GigabitEthernet** *1/0* ʒ ‘

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

GigabitEthernet 1/0 i1/0ID) 3.3.3.3, I fa
```

4.2.5 show ip ospf neighbor

OSPF ˘ ¾ **show ip ospf neighbor** Â

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

ð Ô

detail	^ /1 ~ Â
interface-type interface-number	^ /1 ~ Â
neighbor-id	^ /1 ~ Â

```
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
```

show ip ospf neighbor ¾ Ю

Neighbor ID	Â
Pri	″I ^ DR ~
State	
Dead Time	Dead
Address	
Interface	
interface address	
In the area	¯ ↘
via interface	Â
Neighbor priority	OSPF ″I Â
State	OSPF Â FULL ’ DR ѝ ’ BDR ѝ ’ 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 ↘ ѝ STUB’ ˘ ↘ a STUB ↘ 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	MD5
Thread Inactivity Timer	
Thread Database Description Retransmission	DD
Thread Link State Request Retransmission	LS
Thread Link State Update Retransmission	LS
Thread Poll Timer	Poll Timer

4.2.6 show ip ospf route

ospf

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

process-id	ospf ospf
count	ospf

```
Ruijie# show ip ospf route
OSPF process 1:
Codes: C - connected, D - Discard, O - OSPF,
```

```
IA - OSPF inter area  N1 - OSPF NSSA external type 1, N2 - OSPF
NSSA external type 2
E1 - OSPF external type 1, E2 - OSPF external type 2
E2 100.0.0.0/24 [1/20] via 192.88.88.126, GigabitEthernet 1/0
C  192.88.88.0/24 [1] is directly connected, GigabitEthernet 1/0,
Area 0.0.0.1
```

show ip ospf route ҳ Ю

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

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4.2.7 show ip ospf summary-address

OSPF ĭ ˘ ҳ **show ip ospf summary-address** Â

show ip ospf summary-address

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ЛъЮ ѝ **show ip ospf summary-address** ҳ ‘

```
Ruijie# show ip ospf summary-address
Summary  Address  Summary  Mask      Advertise        Status
Aggregated subnets
--------------   --------------   -------------   --------
202.101.0.0    255.255.0.0    advertise       Inactive 0
Ruijie#
```

Summary Address	
Summary Mask	Â
Advertise	ŭ Ω
Status	ŭ
Aggregated subnets	

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4.2.8 show ip ospf virtual-link

OSPF ˘ ҃ **show ip ospf virtual-link** Â

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

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˘ Л ҃ ˘ Лъ ч è Â**show ip ospf neighbor** ҃ a Â

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ЛьЮ и **show ip ospf virtual-links** ҃ ‘

```
Ruijie# show ip ospf virtual-links
Virtual Link VLINK0 to router 1.1.1.1 is up
Transit area 0.0.0.1 via interface GigabitEthernet 0/1
Local address 10.0.0.37/32
Remote address 10.0.0.27/32
Transmit Delay is 1 sec, State Point-To-Point,
Timer intervals configured, Hello 10, Dead 40, Wait 40, Retransmit
5
Hello due in 00:00:05
Adjacency state Full
```

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Virtual Link VLINK0 to router	Л ч
Virtual Link state	.
Transit area	↘ Â
via interface	Â
Local address	
Remote Address	
Transmit Delay	Â ß Ну·
State	
Time intervals configured	Hello˘ Dead˘ Wait˘ Retransmit
Adjacency State	Â FULL ѝ Â

5

5.1

5.1.1 distribute-list in

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	1-99 1300-1999 100-199 2000-2699
access-list-name	
prefix *prefix-list-name*	
gateway *prefix-list-name*	
i*nterface-type interface-number*	

Â ʒ OSPF ˘ ѝ OSPF a é
˘ Â

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ЛЬЮ ˘ RIP ÿ GigabitEthernet 0/0 ˘ 8 ˘
Ъ

5.1.3 ip community-list

ʒ ЊЖ “ ˘ ⁸ Â no ʒ è Â

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*}

ð Ô

standard	“
expanded	“
community-list-name	“ ¨ “ ¨ a 80
community-list-number	“ ʌ “ ‘ ʌ й 1-99 “ ‘ ʌ й 100-199
permit	
deny	

community-number	Â й AA:NN(ʌ‘ 2)˘ ˘ 0-4294967295˘ ЛЬЮ ЊЖ ‘ 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 Â

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ৡ HK BGP “ Â

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```
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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ৡ	
match community	ɔ “
set comm-list delete	“ BGP

Лъ“*” ѧ ˘ Â
connected Ю ˘ ‡ Â

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ЛъЮ ˘ 192.168.100.0 ѝ ˘
˘ Лъ ╟ 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
```

ЛъЮ ˘ 200.200.200.0 ѝ ˘ ѧ 200.200.200.0
˘ ѝ Â

```
Ruijie(config)# ip default-network 200.200.200.0
```

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ꝛ	
show ip route	IP Â

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ꝛ ɣ Э a Â

5.1.5 ip prefix-list

… “ ╕ “ ˘ **ip prefix-list** ꝛ Â ꝛ
no “ “ Â

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

A38D

no “ Â

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

ð Ô

prefix-lis-name	“ ¨
descripton-text	“

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ЛЬЮ й IP “ ╗ **Deny routes from Net-A**˙

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

5.1.7 ip prefix-list sequence-number

й “ ╗ ˘ **ip prefix-list description** ʒ Â ʒ **no**
ʌ “ ╗ Â

```
Ruijie# configure terminal
Ruijie(config)# ip prefix-list sequence-number
```

5.1.8 ip route

ˇ ¥ ip route Â ¥ no Â

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

ð Ô

vrf_name	VRF¨
network	
net-mask	
ip-address	Ю
Interface	^ /! ~ Ю
distance	^ /! ~
tag	^ /! ~ Tag
permanent	^ /! ~
number	^ /! ~

Â weight WCMP ╗ ˘ Л
˘ ╡ ˘ weight ╡
˘ ╡ Â WCMP ⁸ Þ 32
‡ a ˘ Љ è WCMP ⁸ б л
, ⁸ ˘ ⁸ a Â

⁸ ŭ ˘ ‡ a Â
˘ ˘ ŭ ‡ Â

Љ ˘ Ю ' ^ ip route 0.0.0.0 0.0.0.0 GigabitEthernet 0/0˜ Â ˘
GigabitEthernet 0/0 ˘ , ARP ˘ .
CPU Â Љ

ð Ô

ЉЮ ˘ ╗ 172.16.100.0/24 ˘ Ю Þ 192.168.12.1˝ Þ 115 Â

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

˘ ˘ Л ÿ è
Â ˘ Â ЉЮ ˘
172.16.100.0/24 Л ÿ GigabitEthernet 0/0 Â

```
Ruijie(config)# ip route 172.16.100.0 255.255.255.0
GigabitEthernet 0/0 192.168.12.1
```

˙ Ю ˘ a˚ ˘ è a˚ Â

˝I ˘ ы Ю Â ѣ˘ ы
distance/tag/weight Â ж Л Ю
ч è ¯ Л˘
distance Þ 100 Â

```
ip route 20.0.0.0 255.0.0.0 Loopback 1 10.0.0.2 tag 5 weight 2
ip route 20.0.0.0 255.0.0.0 Loopback 1 100
```

˙

```
ip route 20.0.0.0 255.0.0.0 Loopback 1 10.0.0.2 tag 5 weight 2
ip route 20.0.0.0 255.0.0.0 10.0.0.2 100
```

˘ Л ˘ Ю ˘ ‡ a

```
ip route 20.0.0.0 255.0.0.0 10.0.0.2
ip route 20.0.0.0 255.0.0.0 Loopback 1 100
```

```
ip route 20.0.0.0 255.0.0.0 Loopback 1 10.0.0.2 200
```

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/Ю è ˘ ѝ Â Л ˘ ″I
˚ Ю ˘ ‡ ћ а ˘
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ϗ	
show ip route	IP Â

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5.1.9 ip routing

RGOS ˚ IP ╖ ˘ Ю ϗ Â ϗ no Л
Љ IP ╖ Â

ip routing

no ip routing

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IP Â

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Л й ˘ Л й VOIP ˘ Л Љ а RGOS ˚
IP ╖ Â Л Љ RGOS IP ╖ Â

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ЉЮ ˘ RGOS ˚ IP ╖ Â

```
Ruijie(config)# no ip routing
```

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5.1.10 ip static route-limit

Э ˘ ϧ **ip static route-limit** Â ϧ no Л Ъ Â

ip static route-limit *number*

no ip static route-limit

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number	Э ˘ 1-10000

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й 1000 Â

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Â

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

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ЛЪЮ ˘ Э й 900 ˘ ł Â

```
Ruijie(config)# ip static route-limit 900
Ruijie(config)# no ip static route-limit
```

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ϧ γ Э a Â

5.1.11 ipv6 prefix-list

… IPv6 “ ╗ “ ˘ **ipv6 prefix-list** ϧ Â ϧ **no** “ “ Â

Ipv6 prefix-list *prefix-lis-name* [**seq** *seq-number*] { **deny** | **permit** } *ipv6-prefix* [**ge** *minimum-prefix-length*][**le** *maximum-prefix- length*]

no ipv6 prefix-list *prefix-lis-name*[**seq** *seq-number*] { **deny** | **permit**}
ipv6-prefix [**ge** *minimum-prefix- length*][**le** *maximum-prefix- length*]

ð Ô

prefix-lis-name	" ¨ Â
seq-number	" Лъ " ∧ Âè 1 2147483647 Â ٪ " ∧˘ ‡ ѝ " ¦ " ∧ Â " ∧ 5¯ ł " ∧ " ∧ 5
deny	ð
permit	ð
ipv6-prefix	Лъ ↓ Â ∧ Лъ IP Â ÿ 0 32
minimum-prefix-length	ˆ ∧ ~ (¯) ¸ ' **ge** ٪
maximum-prefix- length	ˆ ∧ ~ (¯) ' **le** ٪

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… " Â

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ipv6 prefix-list ٪ IPv6 Â " permit deny ã ð Ю ∧ ╟ Â

" НЖ ð ð Âge le НЖ ð ˘ ipv6-prefix ╕ ð Â ٪ ge le ˘ ‡ ipv6-prefix ð Â geˇ ‡ ð minimum-prefix-length 32 Â leˇ ‡ ð ipv6-prefix maximum-prefix- length Â ɣ ˘ ‡ ð ÿ minimum-prefix-length maximum-prefix- length Ã ˘ ipv6-prefix à minimum-prefix-length maximum-prefix-length ' ipv6-prefix < minimum-prefix-length < maximum-prefix-length <= 128 Â

ð Ô

ЛЬЮ й ǂ “ ˘ RIP ǂ OSPF 1
ǂ IP ˘ ‡ IPv6 “
ЬЖ(Л IP 2222::/64 ǂ) ‡ Ю “
·

```
Ruijie# configure terminal
Ruijie(config)# ipv6 prefix-list pre permit 2222::/64
Ruijie(config)# ipv6 router rip
Ruijie(config-router)# redistribute ospf 1
Ruijie(config-router)# distribute-list prefix pre out
Ruijie(config-router)# end
```

5.1.12 ipv6 prefix-list description

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

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

ð Ô

prefix-lis-name	IPv6 “ ¨
descripton-text	IPv6 “

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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
```

5.1.13 ipv6 prefix-list sequence-number

й IPv6 “ ╗ ˘ **ipv6 prefix-list description** ʒ Â ʒ
no Л “ ╗ Â

ipv6 prefix-list sequence-number

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ЛЬЮ й IPv6

```
Ruijie# configure terminal
Ruijie(config)# ipv6 prefix-list sequence-number
```

5.1.14 match as-path

AS_PATH **match as-path** Â **no** Â

match as-path *as-path-acl-list-num as-path-acl-list-num…..*

no match as-path *as-path-acl-list-num……*

ð Ô

as-path-acl-list-num	1…500

ð Ô

Â

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ð Ô

match as-path Л Â

1 **match** 1 **set** Â **match** **set** a Â

ð Ô

```
Ruijie(config)# route-map ROUTEMAP2IBGP
Ruijie(config-route-map)# match as-path 20 30
```

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

5.1.15 match community

COMMUNITY **match community** **no**

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	1-99 100-199
communitys-list-name	a 80
exact-match	

match community ʒ ł Л Л Ш “ л “ ¨ ˘ ч a 6 Â

exact-match “ ˘ a Ð “ Â

يي ‡ ˘ Л Л Ш 1 **match** ʒ 1 **set** ʒ Â **match** ʒ˘ ‡ Ð ’ **set** ʒ˘ ‡ a Â

ð Ô

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

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ʒ	
ip community-list	“
match as-path	Ð AS_PATH
match metric	Ð
match origin	Ð
set as-path prepend	¦ AS_PATH Â
set comm-list delete	Ð
set community	
set metric	¦

5.1.16 match interface

Ð Ю й ˘ يي ʒ **match interface** Â ʒ **no** Â

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

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

ð Ô

interface-type	
interface-number	л

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match interface ٶ ł Л Ъ Â

Л Ъ ÿ ſ ل ╗ Â Л Ъ
OSPF ſ ł RIP ˘ ≠ Л Ъ RIP
ſ ł OSPF Â

ſ ˘ ي route maps˜ ˘ ч
ſ ˚ 8 Â

ي ‡ ˘ Л Ъ 1 **match** ٶ 1 **set**
ٶ Â **match** ٶ˘ ‡ ƀ ’ **set** ٶ˘ ‡ a Â

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ي ſ ˘ Л Ъ ſ Э Â a
ي˘ è ˘ Л ٶ a˚ Â¨ ˚
ſ Э˘ a˚ ي˘ è ٶ ≠ a ˚ Â

ЛъЮ ˘ OSPF ſ RIP ˘ Л ſ Ю й
GigabitEthernet 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 GigabitEthernet 0/0
```

ð ٶ Ô

ٶ	
match ip address	ƀ “
match ip next-hop	ƀ “ Ю
match ip route-source	ƀ “
match metric	ƀ
match route-type	ƀ

match tag	
set metric	
set metric-type	
set tag	

5.1.17 match ip address

match ip address **no** **match ip address** {

OSPF ǀ ŧ RIP ˘ ≠ Л Лъ RIP
ǀ ŧ OSPF Â ǀ Л Лъ IP
Â

ǀ ˘ يي route maps˜ ˘ ч
ǀ ˚ ⁸ Â

يي ‡ ˘ Л Лъ 1 **match** ҂ 1 **set**
҂ Â **match** ҂˘ ‡ Ƀ ’ **set** ҂˘ ‡ a Â

ð Ô

يي ǀ ˘ Л Лъ ǀ Э Â a
يي˘ è ˘ Л ҂ a˚ Â¨ ˚
ǀ Э˘ a˚ يي˘ è ҂ ≠ a ˚ Â

ЛъЮ ˘ OSPF ǀ RIP ˘ Л ǀ ‟
10 RIP ˘ OSPF ˘ ѝ type-1˘
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)# access-list 10 permit 200.168.23.0 0.0.0.255
Ruijie(config)# route-map redrip permit 10
Ruijie(config-route-map)# match ip address 10
Ruijie(config-route-map)# set metric 40
Ruijie(config-route-map)# set metric-type type-1
```

ð ҂ Ô

҂	
access-list	ЊЖ ‟ ‡
match interface	Ƀ Ю
match ip next-hop	Ƀ ‟ Ю
match ip route-source	Ƀ ‟
match metric	Ƀ
match route-type	Ƀ
match tag	Ƀ
set metric	ǀ

set metric-type	†
set tag	†

ð Ñ Ô

ð Ô

5.1.18 match ip next-hop

† Ю IP

OSPF Â ¦ Л Л Ъ IP Â

¦ ˘ يي route maps˜ ˘ ч

¦ ˚ ⁸ Â

يي ‡ ˘ Л Л Ъ 1 **match** ҳ 1 **set**

ҳ Â **match** ҳ˘ ‡ Ð ’ **set** ҳ˘ ‡ a Â

ð Ô

Л Ъ Ю ˘ OSPF ¦ RIP Â Л RIP Ю

“ 10 20ơ OSPF è ¦ 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)# access-list 10 permit host 192.168.10.1
Ruijie(config)# access-list 20 permit host 172.16.20.1
Ruijie(config)# route-map redrip permit 10
Ruijie(config-route-map)# match ip next-hop 10 20
```

ð ҳ Ô

ҳ	
access-list	Ь Ж “ ‡
match ip address	Ð “
match interface	Ð Ю
match ip route-source	Ð “

match metric

5.1.19 match ip route-source

† IP “ “ ‡ ˘ يي

�itch ip route-source Â ٤ no Â

match ip route-source {*access-list-number* [*access-list-number...* | *access-list-name...*] |*access-list-name* [*access-list-number...*| *access-list-name*] | **prefix-list** *prefix-list-name* [*prefix-list-name...*]}

no match ip route-source {*access-list-number* [*access-list-number...* | *access-list-name...*] | *access-list-name* [*access-list-number...*| *access-list-name*] | **prefix-list** *prefix-list-name* [*prefix-list-name...*]}

ð Ô


```
Ruijie(config-router)#     redistribute     rip     subnets
Ruijie(config-router)# route-map redrip
Ruijie(config-router)# network 192.168.12.0 0.0.0.255 area 0
Ruijie(config-router)# exit
Ruijie(config)# access-list 5 permit host 192.168.100.1
Ruijie(config)# route-map redrip permit 10
Ruijie(config-route-map)# match ip route-source 5
```

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

5.1.20 match ipv6 address

IPv6

match ipv6 address **no**

match ipv6 address { *access-list-name* | **prefix-list** *prefix-list-name* }

no match ipv6 address

access-list-name	
prefix-list *prefix-list-name*	IPv6

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Л Лъ ÿ ∤ ⊿ ╗ Â Л Лъ
OSPF ∤ ł RIP ˘ ≠ Л Лъ RIP
∤ ł OSPF Â ∤ Л Лъ IP
Â

∤ ˘ ييˆ route maps˜ ˘ ч
∤ ˚ ⁸ Â

ييÂ ‡ ˘ Л Лъ 1 **match** ҳ 1 **set**
ҳ Â **match** ҳ˘ ‡ Ƀ ’ **set** ҳ˘ ‡ a Â

ð Ô

ييÂ ∤ ˘ Л Лъ ∤ Э Â a
ييˇ è ˘ Л ҳ aˆ Â¯ ˆ
∤ Э˘ aˆ ييˇ è ҳ ≠ a ˆ Â

ЛъЮ ˘ OSPF ∤ RIP ˘ Л ∤ “
10 RIP ˘ OSPF ˘ й type-1˘
й 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 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
```

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

5.1.21 match ipv6 next-hop

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

no match ipv6 next-hop

access-list-name	
prefix-list *prefix-list-name*	IPv6

OSPF RIP RIP OSPF IP

route maps

يي ‡ ˘ Л Лъ 1 **match** ҳ 1 **set**
ҳ Â **match** ҳ˘ ‡ ₫ ’ **set** ҳ˘ ‡ a Â

ð Ô

يي ǂ ˘ Л Лъ ǂ Э Â a
يي˘ è ˘ Л ҳ a˚ Â¯ ˚
ǂ Э˘ a˚ يي˘ è ҳ ≠ a ˚ Â

ЛъЮ ˘ OSPF ǂ RIP ˘ Л ǂ “
10 RIP ˘ OSPF ˘ ù type-1˘
ù 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
```

ð ҳ Ô

ҳ	
ipv6 access-list	ЂЖ IPv6 “ ‡
match interface	₫ Ю
match ipv6 address	₫ IPv6 “ Ю
match metric	₫
match route-type	₫
match tag	₫

5.1.22 match ipv6 route-source

ǂ Ю IPv6 “ “ ‡ ˘
يي ٪ **match ipv6 address** Â ٪ **no** Â

match ipv6 route-source { *access-list-name* | **prefix-list** *prefix-list-name* }

no match ipv6 route-source

ðð Ô

access-list-name	“ ¨
prefix-list *prefix-list-name*	ƀ IPv6 “ ¨

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Л Лъ ÿ ǂ ↓ ╗ Â Л Лъ
OSPF ǂ ł RIP ˘ ≠ Л Лъ RIP
ǂ ł OSPF Â ǂ Л Лъ IP
Â

ǂ ˘ يٍ route maps˜ ˘ ч
ǂ ˚ ⁸ Â

يي ‡ ˘ Л Лъ 1 **match** ٪ 1 **set**
٪ Â **match** ٪˘ ‡ ƀ ’ **set** ٪˘ ‡ a Â

ðð Ô

يي ǂ ˘ Л Лъ ǂ Э Â a
يٍ è ˘ Л ٪ a˚ Â¨ ˚
ǂ Э˘ a˚ يٍ è ٪ ≠ a ˚ Â

ЛъЮ ˘ OSPF ǂ RIP ˘ Л ǂ “
10 RIP ˘ OSPF ˘ й type-1˘
й 40 Â

```
Ruijie(config)# ipv6 router ospf
Ruijie(config-router)# redistribute rip subnets route-map
```

```
Ruijie(config-router)# exit
Ruijie(config)# ipv6 access-list v6acl
Ruijie(config-ipv6-acl)# 10 permit ipv6 5200::/64 any
Ruijie(config-ipv6-acl)# exit
Ruijie(config)# route-map redrip permit 10
Ruijie(config-route-map)# match ipv6 route-source v6acl
Ruijie(config-route-map)# set metric 50
```

ð ৡ Ô

ৡ	
ipv6 access-list	⊬ IPv6 ‟ ‡
match interface	₫ Ю
match ipv6 address	₫ IPv6 ‟ Ю
match ipv6 route-source	₫ IPv6 ‟
match metric	₫
match route-type	₫
match tag	₫
set metric	↑
set metric-type	↑
set tag	↑

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5.1.23 match length

IP ˇ ي ৡ **match length** Â

ৡ **no** ∕ ɹ ⊬ Â

match length *min-length max-length*

no match length *min-length max-length*

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min-length	IP
max-length	IP

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ɌЮ ˘ serial 1/0 ˘ 500 ˘ ÿ

GigabitEthernet 1/0 Â

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

5.1.24 match metric

Ð ˘ ييِ ٣ **match metric** Â ٣ **no** Â

match metric *metric*

no match metric

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metric	٨ ' 0-4294967295

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Л Лъ ÿ ǂ ⅃ ╗ Â Л Лъ OSPF ǂ ŧ RIP ˘ ≠ Л Лъ RIP ǂ ŧ OSPF Â ǂ Л Лъ IP Â

ǂ ˘ ييِ route maps˜ ˘ ч ǂ ˚ ⁸ Â

ييِ ‡ ˘ Л Лъ 1 **match** ٣ 1 **set** ٣ Â **match** ٣˘ ‡ Ð ' **set** ٣˘ ‡ a Â

ðÔ

ЛъЮ ˘ OSPF ǂ RIP Â Л й 10 RIP ˘ OSPF ǂ Â

```
Ruijie(config)# router ospf
Ruijie(config-router)# redistribute rip subnets route-map
redist-rip
Ruijie(config-router)# network 192.168.12.0 0.0.0.255 area 0
Ruijie(config-router)# exit
Ruijie(config)# route-map redist-rip permit 10
Ruijie(config-route-map)# match metric 10
```

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¶	
access-list	HX “ ‡

match ip address

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ʒ ɒ ˚ Â

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```
Ruijie(config)# route-map MY_MAP 10 permit
Ruijie(config-route-map)# match origin egp
Ruijie(config-route-map)# set community 109
Ruijie(config-route-map)# exit
Ruijie(config)# route-map MAP20 20 permit
Ruijie(config-route-map)# match origin incomplete
Ruijie(config-route-map)# set community no-export
```

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set metric-type	
set tag	

match tag

no match tag

5.1.27 match tag

match tag *tag* [*…tag*]

no match tag *tag* [*…tag*]

tag	

```
Ruijie(config-router)# network 192.168.12.0
Ruijie(config-router)# exit
Ruijie(config)# route-map redrip permit 10
Ruijie(config-route-map)# match tag 50 80
```

ð ʒ Ô

ʒ	
access-list	ЬЖ ‟ ‡
match ip address	ƀ ‟
match interface	ƀ Ю
match ip route-source	ƀ ‟
match metric	ƀ
match ip next-hop	ƀ ‟ Ю
match route-type	ƀ
set metric	‡
set metric-type	‡
set tag	‡

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5.1.28 maximum-paths

ˈ ˘ ʒ **maximum-paths** Â ʒ no Л Лъ ˈ Â

maximum-paths *number*

no maximum-paths

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number	ˈ ˘ 1-32

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maximum-paths

show running config

ipv4 ipv6 ipv4 ipv6

ð Ô

10

```
Ruijie(config)# maximum-paths 10
Ruijie(config)# no maximum-paths
```

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5.1.29 route-map

route-map

no

route-map *route-map-name* [**permit** | **deny**] [*sequence-number*]

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

ð Ô

route-map-name	Â
permit	permit match set set a match set

deny	ˆ ʌ ˜ ƕ deny ˘ ʁ match ƕ ƀ ‡ Â ‡ a ˘ ييا a ˚ ˘ ɜ ييا Â ƕ deny ˘ a match ƕ ƀ ‡ Â ‡ ƗO ييا Â set ʒ Â
sequence-number	ييا ʌ Â æ ʌ ˝I ˘ ʌ Â

ð Ô

ييا Â

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```
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
```

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ٔ	
Redistribute	↑

ð ﾊ Ô

ð Ô

5.1.30 set aggregator as

ٖ match ‡ AS ˘ ي
ٔ **set aggregator as** Â ٔ **no** Â ٔ Â

set aggregator as *as-num ip_addr*

no set aggregator as [*as-num ip_addr*]

ð Ô

as-number	AS ﾊ
ip_addr	

ð Ô

Â

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ي Â

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ٔ BGP ˘ Â

ٔ ﾊ ˆ as,ip-addr˜˜ a ˚

ð Ô

```
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
```

ð ৡ Ô

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

5.1.31 set as-path prepend

৳ match ‡ ╗ AS_PATH ˘ ي ৡ
set as-path prepend Â ৡ **no** Ò Ă l ۿ

```
Ruijie(config-route-map)# match as-path 1
Ruijie(config-route-map)# set as-path prepend 100 101 102
```

ð ٔ Ô

ٔ	
match as-path	٥ AS_PATH
match community	٥
match metric	٥
match origin	٥
set community	٭ COMMUNITY
set metric	٭
set metric-type	٭

5.1.32 set comm-list delete

٥ match ‡ COMMUNITY_LIST community
˘ يي ٔ **set comm-list delete** Â ٔ **no** Â
ٔ Â

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

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

ð Ô

community-list-number	“ ﻫ “ ' ﻫ ù 1-99 “ ' ﻫ ù 100-199
community-list-name	“ ¨ “ ¨ a 80

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```
Ruijie(config)# router bgp 100
Ruijie(config-router)# neighbor 172.16.233.33 remote-as 120
Ruijie(config-router)#  neighbor  172.16.233.33  route-map
ROUTEMAPIN in
Ruijie(config-router)#  neighbor  172.16.233.33  route-map
ROUTEMAPOUT out
Ruijie(config-router)# exit
Ruijie(config)# ip community-list 500 permit 100:10
Ruijie(config)# ip community-list 500 permit 100:20
Ruijie(config)# ip community-list 120 deny 100:50
Ruijie(config)# ip community-list 120 permit 100:.*
Ruijie(config)# route-map ROUTEMAPIN permit 10
Ruijie(config-route-map)# set comm-list 500 delete
Ruijie(config-route-map)# exit
Ruijie(config)# route-map ROUTEMAPOUT permit 10
Ruijie(config-route-map)# set comm-list 120 delete
```

ð ৡ Ô

ৡ	
ip community-list	“
match as-path	৯ AS_PATH
match community	৯
match metric	৯
match origin	৯
set as-path prepend	¦ AS_PATH
set comm-list delete	৯
set local-preference	¦ ″I

5.1.33 set community

৯ match ‡ COMMUNITY ˘ ي ৡ **set community** Â ৡ **no**

set community {*community-number*[*community-number* …] **additive** | **none**}

no set community { *community-number*[*community-number* …] **additive** | **none**}

ð Ô

community-number	Â ѝ AA:NN(ﾉ:2)˘ ˘ 0-4294967295˘ ЛЬЮ ЬЖ ˙ internet˘ Internet ˘ Â local-as˘ a AS ˘ ˘ a è Â no-advertise˘ a BGP peers Â no-export˘ a EBGP peers Â
additive	community Э ╗
none	ѝ

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```
Ruijie(config)# route-map SET_COMMUNITY 10 permit
Ruijie(config-route-map)# match as-path 1
Ruijie(config-route-map)# set community 109:10
Ruijie(config-route-map)# exit
Ruijie(config)# route-map SET_COMMUNITY 20 permit
Ruijie(config-route-map)# match as-path 2
Ruijie(config-route-map)# set community no-export
```

ð ३ Ô

३	
match as-path	ɒ AS_PATH
match community	ɒ
match metric	ɒ

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

5.1.34 set dampening

ֵ match ‡ ˘ ٹي ֵ **set dampening** Â ֵ **no** Â

set dampening *half-life reuse suppress max-suppress-time*

no set dampening

ð Ô

half-life	/ı a /ı Â 1..45(ʃ ʖ ѝ 15 ׀
reuse	æ ˘ ⁸ Â 1..20000ʊ ѝ 750 Â
suppress	˘ ⁸ Â 1..20000ʊ 2000 Â
max-suppress-time	⁸ Â 1..255(ʃ ʖ ѝ 4* half-life

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```
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
```

ð ৡ Ô

ৡ	
match as-path	৳ AS_PATH
match community	৳
match metric	৳
match origin	৳
set as-path prepend	৮ AS_PATH
set metric	৮
set local-preference	৮ ″I

5.1.35 set default interface

৳ match ‡ ৩ ˘

ي ৡ **set default interface** Â ৡ **no** Â

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

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

ð Ô

interface-type	
interface-number	

ð Ô

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ي

set default interface Â

Â

Â

5.1.36 set extcommunity

ð match ‡ ˘ يي ٦ **set extcommunity** Â ٦ **no** Â ٦ Â

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

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

ð Ô

rt RT rt

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

5.1.37 set interface

match **set interface** **no**

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

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

interface-type	
interface-number	

AS_PATH

1 a down set null

ð Ô

ЛЬЮ ˘ serial 1/0 ˘ 500
˘ ÿ GigabitEthernet 0/0 Â

```
Ruijie(config)#interface serial 1/0
Ruijie(config-if)#ip policy route-map smallpak

Ruijie(config)#route-map smallpak permit 10
Ruijie(config-route-map)#match length 0 500
Ruijie(config-route-map)#set interface GigabitEthernet 0/0
```

ð ʒ Ô

ʒ	
route-map	ЂЖ ي
match ip address	Ƀ "
match length	Ƀ
set default interface	˘
set ip default next-hop	Ю IP ˘
set ip next-hop	Ю IP
set ip precedence	IP ″I

ð Л Ô

5.1.38 set ip default next-hop

Ƀ match ‡ Ю IP ˘ ي ʒ **set ip next-hop** Â ʒ **no** Â

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

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

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set ֽ ч ' WCMP ˘ WCMP
Â Ю weight WCMP
Â

set ip default next-hop ֽ ł Л Љ IP ˘ a 32 Â

ip address ł ╗ weight ˘ ‡ Л Љ a 4 nexthop Â

˘ next-hop ł weight 13 Tw 0 -2.229 TD [(set ip defau6.6 d <03FE0 T60><
ˇ й WCMP Â WCMP Ю
weight nexthop ˘ è weight й

```
Ruijie(config)#route-map equal-access permit 10
Ruijie(config- route-map)#match ip address 1
Ruijie(config-route-map)#set ip default next-hop 6.6.6.6
Ruijie(config)#route-map equal-access permit 20
Ruijie(config-route-map)#match ip address 2
Ruijie(config-route-map)#set ip default next-hop 7.7.7.7
Ruijie(config)#route-map equal-access permit 30
Ruijie(config- route-map)#set default interface null 0
```

ð ৡ Ô

ৡ	
route-map	ЬЖ يي
match ip address	ѓ “
set default interface	˘
set default interface	˘
set interface	
set ip next-hop	Ю IP ˘
set ip precedence	IP ”I

5.1.39 set ip dscp

ѓ match ‡ DSCP ˘ يي ৡ **set ip dscp** Â ৡ **no** Â

set ip dscp *dscp_value*

ð Ô

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ৡ	
route-map	⊬ ي
match ip address	Ɠ "
set default interface	ˇ
set default interface	ˇ

Â

ð ʒ Ô

ي Â

ð Ô

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

set ip next-hop ʒ ł Л Љ IP ˘ a 32 Â

ip address ł ╗ weight ˘ ‡ Л Љ a 4 nexthop Â

˘ next-hop ł weight ˘ **set** ʒ ╠
ſ й WCMP Â WCMP Ю˘
weight nexthop ˘ è weight й 1 Â

╗ ⁸ Â
˘ ي ᾱ ˘ ي ᾱ
Ю Â

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ي ˘ Ћ 1 ₵ ‡ Â
ł ˘ ˘ a ي
˘ ي
Ћ Â

ي Л Љ set Â

ð Ô

ЉЮ ˘ serial 1/0 Э Â 10.0.0.0/8
˘ 192.168.100.1ʾ й 172.16.0.0/16
˘ 172.16.100.1ʾ è Â

```
Ruijie(config)#interface serial 1/0
Ruijie(config-if)#ip policy route-map load-balance

Ruijie(config)#access-list 10 permit 10.0.0.0 0.255.255.255
Ruijie(config)#access-list 20 permit 172.16.0.0 0.0.255.255

Ruijie(config)#route-map load-balance permit 10
Ruijie(config-route-map)#match ip address 10
Ruijie(config-route-map)#set ip next-hop 192.168.100.1

Ruijie(config)#route-map load-balance permit 20
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
```

ð ڑ Ô

ڑ	
route-map	ЬЖ يي
match ip address	ӘҒ “
set default interface	˘
set default interface	˘
set interface	
set ip default next-hop	ЬО IP ˘
set ip precedence	IP ″I

ð ﾉ Ô

ð Ô

5.1.41 set ip next-hop verify-availability

ЬО IP ﾉ ˘ يي ڑ **set ip next-hop verify-availability** Â ڑ **no** Â ڑ 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*

ð Ô

ip-address	ЬО IP
track-obj-num	ﾉ

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ЛЬЮ ˘ serial 1/0 Э Â 10.0.0.0/8
˘ 192.168.100.1’ и 172.16.0.0/16
˘ 172.16.100.1’ è Â

```
Ruijie(config)#interface serial 1/0
Ruijie(config-if)#ip policy route-map load-balance

Ruijie(config)#access-list 10 permit 10.0.0.0 0.255.255.255
Ruijie(config)#access-list 20 permit 172.16.0.0 0.0.255.255

Ruijie(config)#route-map load-balance permit 10
Ruijie(config-route-map)#match ip address 10
Ruijie(config-route-map)#set ip  next-hop 192.168.100.1

Ruijie(config)#route-map load-balance permit 20
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
```

ð ϡ Ô

ϡ	
route-map	ЬЖ يي
match ip address	ѓ “
set default interface	˘
set default interface	˘
set interface	
set ip default next-hop	Ю IP ˘
set ip precedence	IP ”I

ð ʌ Ô

ð Ô

5.1.42 set ip precedence

ɒ match ‡ IP ″I , ي ϗ **set ip precedence** Â ϗ **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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IP ″I IP a˘ ″I Â

ي ‡ ˘ ʌЛъ **set ip precedence** ϗ˘ ʌ ł ˘ з ʌ ɒ IP ″I Â

ð Ô

ЛъЮ ˘ ÿ GigabitEthernet 0/0 ѝ 192.168.217.68 precedence ѝ 4Â

```
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 GigabitEthernet 0/0
Ruijie(config-if)#ip policy route-map name
```

ð ϗ Ô

ϗ	
match interface	ɒ Ю
match ip address	ɒ ‟
match ip next-hop	ɒ ‟ Ю

match ip route-source	Ð “
match metric	Ð
match route-type	Ð
match tag	Ð
set metric-type	¦
set tag	¦
set ip tos	IP tos

5.1.43 set ip tos

Ð match ‡ IP TOS, يي ٢ **set ip tos** Â
٢ **no** ˘ tos Â

set ip tos {*<0-15>* | *max-reliability* | *max-throughput* | *min-delay*
|

ֽ	
match interface	ֵ ЮО
match ip address	ֵ ‟
match ip next-hop	ֵ ‟ ЮО
match ip route-source	ֵ ‟
match metric	ֵ
match route-type	ֵ
match tag	ֵ
set metric-type	ֿ
set tag	ֿ
set ip precedence	IP ″I

5.1.44 set level

ֵ match ‡ ֽ ֶ ֵי ֽ **set level** Â ֽ **no** Â

set level {**level 1**| **level 2** | **level 1-2** | **stub-area** | **backbone**}

no set level

ð Ô

Â

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ЛЬЮ ֶ OSPF ֿ RIP backbone ֽ 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
```

ð ֽ Ô

३	
match interface	ठ Ю
match ip address	ठ "
match ip next-hop	ठ " Ю
match ip route-source	ठ "
match metric	ठ
match route-type	ठ
match tag	ठ
set metric-type	ϯ
set tag	ϯ

5.1.45 set local-preference

ठ match

```
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
```

match as-path	H 0sBw1.2.74.0Qd<094.432B052C58123215FBET0.75

Л Лъ ÿ ǀ ↓ ╗ Â Л Лъ
OSPF ǀ ł RIP ˘ ≠ Л Лъ RIP
ǀ ł OSPF Â ǀ Л Лъ IP
Â

ǀ ˘ يٍ route maps˜ ˘ ч
ǀ ˚ ⁸ Â

يي ‡ ˘ Л Лъ 1 **match** ʒ 1 **set**
ʒ Â **match** ʒ˘ ‡ ƀ ’ **set** ʒ˘ ‡ a Â

ð Ô

ЛъЮ ˘ OSPF ǀ RIP ˘ ǀ
й 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
```

ð ʒ Ô

ʒ	
match interface	ƀ Ю
match ip address	ƀ “
match ip next-hop	ƀ “ Ю
match ip route-source	ƀ “
match metric	ƀ
match route-type	ƀ
match tag	ƀ
set metric-type	ǀ
set tag	ǀ

ð Л Ô

ð Ô

5.1.47 set metric-type

Õ match ‡ ˘ يي ٦ **set metric-type** Â ٦ **no** Â

set metric-type *type*

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

Ô

Ô

.48 set next-hop

Ð match ‡ Ю IP ˘ ي **set next-hop** Â **no** Â Â

set next-hop *ip-address*

no set next-hop *ip-address*

Ô

i*p-address*	Ю IP

ɟ ˚ ⁸ Â

يي ‡ ˘ Л Лъ 1 **match** ʒ 1 **set** ʒ Â **match** ʒ˘ ‡ ɔ ’ **set** ʒ˘ ‡ a Â

ðô Ô

ЛъЮ ˘ ɔ ⁸ ″ Ю й 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
```

ðô ʒ Ô

ʒ	
match interface	ɔ Ю
match ip address	ɔ ‟
match ip next-hop	ɔ ‟ Ю
match ip route-source	ɔ ‟
match metric	ɔ
match route-type	ɔ
match tag	ɔ
set metric-type	ɟ
set tag	ɟ

5.1.49 set origin

ɔ match ‡ ˘ يي ʒ **set origin** Â ʒ **no** Â

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

no set origin

ðô Ô

egp	EGP
igp	IGP
incomplete	a

ð Ô

Â

ð ٹ Ô

ي Â

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٨ Â

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ð Ô

```
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
```

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```
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
```

ð ৡ Ô

ৡ	
match as-path	Ð AS_PATH
match metric	Ð
match origin	Ð
set as-path prepend	¦ AS_PATH
set metric	¦

ð Ô

a ʌ Â

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Â

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ЛЬЮ ˘ OSPF ʃ RIP ˘ ʃ 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
```

5.1.52 set weight

match ‡ BGP ˘ يي ٣ **set weight** Â
٣ **no**

set weight *number*

no set weight

ð Ô

number	Â ' 0-65535

ð Ô

ð ٣ Ô

يي Â

ð Ô

٣ /ſ BGP Â

Ю ÿ ˘ neighbor weight ’
32768 Â

/ſ Лъ ٣ BGP ¦ Â

ð Ô

ЛъЮ ˘ BGP in ą̈ Э ˘ ÿ 1.1.1.1
и 100 Â

```
Ruijie(config)# router bgp 1
Ruijie(config-router)# neighbor 1.1.1.1 route-map nei-rmap-in
in
Ruijie(config-router)# exit
Ruijie(config)# route-map nei-rmap-in permit 10
Ruijie(config-route-map)# set weight 100
```

ð ٣ Ô

match origin	Ð
set community	† COMMUNITY
set metric	†
set metric-type	†

ð Ô

ð Ô

5.2

5.2.1 show ip community-list

Â

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

ð Ô

community-list-number	1-99 100-199
community-list-name	a 80

ð Ô

ð Ô

ð Ô

Â

ð Ô

```
Ruijie# show ip community-list
Community-list standard local
permit local-AS
Community-list standard Red-Giant
permit 0:10
```

deny 0:20

match community	

ð Ô

vrf *vrf_name*	^ /! ~ /! VRF
network	^ /! ~ /!
mask	^ /! ~ /!

count o

```
C    192.1.1.0/24 is directly connected, VLAN 1
```

Routing Descriptor Blocks	Ю IP à à à à à à BGP

ЛЬЮ й **show ip route count** ҳ

```
Ruijie# show ip route count
--------- route info ----------
the num of active route: 5
```

ЛЬЮ й **show ip route weight** ҳ

```
Ruijie# show ip route weight
------------[distance/metric/weight]-----------
S   23.0.0.0/8 [1/0/2] via 192.1.1.20
S   172.0.0.0/16 [1/0/4] via 192.0.0.1
```

5.2.4 show ipv6 prefix-list

IPv6 “ “ ˘ **show ipv6 prefix-list** ҳ Â

show ipv6 prefix-list [*prefix-name*]

ð Ô

prefix-name	IPv6 “ ¨

ð Ô

IPv6 “ Â

ð ҳ Ô

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“ ¨ ˘ “ ˘ ǔ ‡ Л

“ Â

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

5.2.5 show route-map

ي ˘ ३ **show route-map** Â

show route-map *route-map-name*

ð Ô

route-map-name

ǂ ̈Ą ҳ ̈Ą ˘ ЛЬЮ ˙

1. ACL ҳ
2. RPL ҳ
3. ҳ
4. ҳ
5. VPDN ҳ
6. Tunnel ҳ
7. ˆ IPSec˜ ҳ
8. ҳ
9. AAA ҳ
10. RADIUS ҳ

1 ACL

ЛЬЮ ч л ЛЬЮ ч

	Ьж
id	“ л Â л IP ACL: 1-99,1300-1999 IP ACL: 100-199,2000-2699 MAC ACL: 700–799 ж ACL: 2700–2899
name	ACL¨
sn	ACL л (”I)
start-sn	л
inc-sn	л
deny	Ð ˇ ‡
permit	Ð ˇ ‡
prot	лˇ IPv4ˀ л Лъ eigrp, gre, ipinip, igmp, nos, ospf, icmp, udp, tcp, ip ˇ ≠ л Лъ ч IP 0-255 лˇ “
interface idx	Ð
src	ˆ ў ˜
src-wildcard	Â л Лъ a ˇ 0.255.0.32
dscp dscp	Ь , ˇ 0-63
dst	ˆ ў ˜
dst-wildcard	Â л Лъ a ˇ 0.255.0.32
fragment	↑
precedence precedence	”I ˆ 0-7˜
time-range tI-rng-name	‘ˇ ¨ й tI-rng-name
tos tos	Ь ˆ 0-15˜
cos cos	cos (0-7)
cos inner cos	tag cos
icmp-type	ICMP ˆ 0-255˜
icmp-code	ICMP ч ˆ 0-255˜

H	Org Code	21	V	‟ ㄔ	50
I		24	W		54
J	IP ㄔ	26	XY	IP Æ	58
K	TOS	27	Z	Æ flags Æ	59
L	IP	28	a	Windows size	60
M	ID ㄔ	30	b	è	62
N	Flags	32			

Э SNAP¯ tag 802.3 Â

1.1

any}

2)

access-list *id* {**deny** | **permit**} **tcp** [**VID** [*out*][**inner** *in*]]{*source source-wildcard* |

operator ʻ ^ lt- ˘ eq- ˘ gt- ˘ neq- a ˘ range- ˜

port [*port*] ʻ ʌ˘ *range* ч ʌ ˘ è ʌ ʌ Â

host *source-mac-address* ʻ ў Â

host *destination-mac-address* ʻ ў Â

VID *vid* ʻ vid ѕ

ethernet-type ʻ Љ

match-all ʻ ѕ *tcp flag* æ

tcp-flag ʻ tcp flag

ð Ô

ACL

ð ҄ Ô

ð Ô

й ‟ ˘ ″I ҄ **access-list** Ћ ‟ ‟ ‡ ⊿ Â Л Љ é a ˚ ‟ ʻ

IP ‟ ^ 1-99ℊ 1300-1999˜ Л ⁸ Â

IP ‟ ^ 100-199ℊ 2000-2699˜˘ Л Љ ⁸ Â

MAC ‟ ^ 700-799˜˘ Л Љ MAC Љ ⊿ Љ ѕ Expert ‟ ^ 2700-2899˜˘ Э ˘ Л Љ VLAN ID ѕ Â

TCP Flag ЉЮ ҅

- **urg**
- **ack**
- **psh**
- **rst**
- **syn**
- **fin**

″I ¨ Ю

- **critical**
- **flash**
- **flash-override**
- **immediate**
- **internet**
- **network**

- **priority**
- **routine**

- **max-reliability**
- **max-throughput**
- **min-delay**
- **min-monetary-cost**
- **normal**

ICMP

- **administratively-prohibited**
- **dod-host-prohibited**
- **dod-net-prohibited**
- **echo**
- **echo-reply**
- **fragment-time-exceeded**
- **general-parameter-problem**
- **host-isolated**
- **host-precedence-unreachable**
- **host-redirect**
- **host-tos-redirect**
- **host-tos-unreachable**
- **host-unknown**
- **host-unreachable**
- **information-reply**
- **information-request**
- **mask-reply**
- **mask-request**
- **mobile-redirect**
- **net-redirect**
- **net-tos-redirect**
- **net-tos-unreachable**
- **net-unreachable**
- **network-unknown**
- **no-room-for-option**
- **option-missing**

- **packet-too-big**
- **parameter-problem**
- **port-unreachable**
- **precedence-unreachable**
- **protocol-unreachable**
- **redirect**
- **router-advertisement**
- **router-solicitation**
- **source-quench**
- **source-route-failed**
- **time-exceeded**
- **timestamp-reply**
- **timestamp-request**
- **ttl-exceeded**
- **unreachable**

Ю TCP ¨ ˘ TCP Л Љ ¨ л é ‘

- **bgp**
- **chargen**
- **cmd**
- **daytime**
- **discard**
- **domain**
- **echo**
- **exec**
- **finger**
- **ftp**
- **ftp-data**
- **gopher**
- **hostname**
- **ident**
- **irc**
- **klogin**
- **kshell**
- **ldp**
- **login**
- **nntp**

- **pim-auto-rp**
- **pop2**
- **pop3**
- **smtp**
- **sunrpc**
- **syslog**
- **tacacs**
- **talk**
- **telnet**
- **time**
- **uucp**
- **whois**
- **www**

Ю UDP ¨ ˇ UDP ⁄ Л ђ ¨ ⁄ é ‘

- **biff**
- **bootpc**
- **bootps**
- **discard**
- **dnsix**
- **domain**
- **echo**
- **isakmp**
- **mobile-ip**
- **nameserver**
- **netbios-dgm**
- **netbios-ns**
- **netbios-ss**
- **ntp**
- **pim-auto-rp**
- **rip**
- **snmp**
- **snmptrap**
- **sunrpc**
- **syslog**
- **tacacs**
- **talk**

- **tftp**
- **time**
- **who**
- **xdmcp**

Л Ethernet-type Ю

- **aarp**
- **appletalk**
- **decnet-iv**
- **diagnostic**
- **etype-6000**
- **etype-8042**
- **lat**
- **lavc-sca**
- **mop-console**
- **mop-dump**
- **mumps**
- **netbios**
- **vines-echo**
- **xns-idp**

ð Ô

1) IP “

Ю IP “ й 192.168.1.64 - 192.168.1.127 ˘ è ‘

```
Ruijie(config)# access-list 1 permit 192.168.1.64
0.0.0.63
```

2) IP “

Ю IP “ DNS ICMP ‘

```
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 Л ˘ 1 Â ‘

```
Ruijie(config)# access-list 702 deny host 00d0f8000c0c any aarp
Ruijie(config)# interface gigabitethernet 1/1
Ruijie(config-if)# mac access-group 702 in
```

4) Expert “

Ю … ↓

ACL a ACL ¶
deny permit ¢ **show access-lists** ¢ ACL

ð Ô

… ACL

```
Ruijie(config)# ip access-list extended 123
Ruijie(config-ext-nacl)# show access-lists
ip access-list extended 123
Ruijie(config-ext-nacl)#
```

… ACL

```
Ruijie(config)# ip access-list standard std-acl
Ruijie(config-std-nacl)# show access-lists
ip access-list standard std-acl
Ruijie(config-std-nacl)#
```

ð ¢ Ô

¢	
show access-lists	IP “

ð Ô

RGOS10.0 Л Э

1.1.3 expert access-list

¢ … ж ACL **no**

ECÉ

¢ Â **show access-lists** ¢ ACL Â

ð Ô

… ж ACL˙

```
Ruijie(config)# expert access-list extended exp-acl
Ruijie(config-exp-nacl)# show access-lists
expert access-list extended exp-acl
Ruijie(config-exp-nacl)#
```

… ж ACL˙

```
Ruijie(config)# expert access-list extended 2704
Ruijie(config-exp-nacl)# show access-lists
expert access-list extended 2704
Ruijie(config-exp-nacl)#
```

ð ¢ Ô

¢	
show access-lists	ж “

ð Л Ô

˚ RGOS10.0 Лъ Э

1.1.4 ip access-list resequence

¢ ip ACL Â ¢ **no**

ip access-list resequence {*id* | *name*} **start-sn inc-sn**

no ip access-list resequence {*id* | *name*}

ð Ô

Id˙ ACL Л

Name˙ ACL¨

start-sn˙ Л

inc-sn˙ Л

ð Ô

start-sn˙ 10

inc-sn˙ 10

ð ¢ Ô

ð Ô

ৡ Â

{*destination destination-wildcard* | **host** *destination* | **any**} [*icmp-type*] [[*icmp-type* [*icmp-code*]] | [*icmp-message*]] [**precedence** *precedence*] [**tos** *tos*] [**fragments**] [**time-range** *time-range-name*]

Transmission Control Protocol (TCP)

[*snnts*

destination-wildcard | **host** *destination* | **any**} {**host** *destination-mac-address* | **any**} [*icmp-type*] [[*icmp-type* [*icmp-code*]] | [*icmp-message*]] [**precedence** *precedence*] [**tos***] [[icmp-type* [*icmp-code*

```
Ruijie(config-exp-nacl)# show access-lists
expert access-list extended 2702
10 deny tcp  host  192.168.4.12 host 0013.0049.8272 any any
20 permit any any any any
Ruijie(config-exp-nacl)#
```

Ю IP ACL ˘ IP й 192.168.4.12 ў TCP й 100 Ь˘ 1Â

```
Ruijie(config)# ip access-list extended ip-ext-acl
Ruijie(config-ext-nacl)# deny tcp host 192.168.4.12 eq 100 any
Ruijie(config-ext-nacl)# show access-lists
ip access-list extended ip-ext-acl
10 deny tcp host 192.168.4.12 eq 100 any
Ruijie(config-ext-nacl)# exit
Ruijie(config)# interface gigabitethernet 1/1
Ruijie(config-if)# ip access-group ip-ext-acl in
Ruijie(config-if)#
```

Ю MAC ACL ˘ MAC й 0013.0049.8272 ў й 100 Лъ ˘ 1Â

```
Ruijie(config)# mac access-list extended mac1
Ruijie(config-mac-nacl)# deny host 0013.0049.8272 any aarp
Ruijie(config-mac-nacl)# show access-lists
mac access-list extended mac1
10 deny host 0013.0049.8272 any aarp
Ruijie(config-mac-nacl)# exit
Ruijie(config)# interface gigabitethernet 1/1
Ruijie(config-if)# mac access-group mac1 in
```

Ю IP ACL ˘ IP й 192.168.4.12 ў ˘ 1Â ‘

```
Ruijie(config)# ip access-list standard 34
Ruijie(config-ext-nacl)# deny host 192.168.4.12
Ruijie(config-ext-nacl)# show access-lists
ip access-list standard 34
10 deny host 192.168.4.12
Ruijie(config-ext-nacl)# exit
Ruijie(config)# interface gigabitethernet 1/1
Ruijie(config-if)# ip access-group 34 in
```

ð ৡ Ô

३	
show access-lists	“
ip access-group	IP ACL
mac access-group	MAC ACL
ip access-list	IP ACL ⊢Ѫ
mac access-list	MAC ACL ⊢Ѫ
expert access-list	ж ACL ⊢Ѫ

TÂðÂx03

[*sn*] **permit udp** {*source source -wildcard*|**host** *source* |**any**} [*operator* **port** [*port*]] {*destination destination-wildcard* |**host** *destination* | **any**} [**operator port** [*port*]] [**precedence** *precedence*] [**tos** *tos*] [**fragments**] [**time-range** *time-range-name*]

3) MAC ‟

[*sn*] **permit** {**any** | **host** *source-mac-address*} {**any** | **host** *destination-mac-address*} [*ethernet-type*][**cos** [*out*] [**inner** *in*]]

4) Expert ‟

[*sn*] **permit** [**protocol** | [*ethernet-type*][**cos** [*out*] [**inner** *in*]]] [**VID** [*out]*[**inner** *in]*] {*source source-wildcard* | **host** *source* | **any**} {**host** *source*-**mac**-*address* | **any** } {*destination destination-wildcard* | **host** *destination* | **any**} {**host** *destination-mac-address* | **any**} [**precedence** *precedence*] [**tos** *tos*][**fragments**] [**time-range** *time-range-name*]

ЛЬ Ethernet-type cos

[*sn*] **permit** {*ethernet-type*| **cos** [*out*] [**inner** *in*]} [**VID** [*out*][**inner** *in*]] {*source source-wildcard* | **host** *source* | **any**} {**host** *source-mac-address* | **any** } {*destination destin*

[**match-all** *tcp-flag*]

User Datagram Protocol (UDP)

[*sn*] **permit udp** [**VID** [*out*][**inner** *in*]]{*source source –wildcard* | **host** *source* | **any**} {**host** *source-mac-address* | **any** } [*operator* **port** [*port*]] {*destination destination-wildcard* | **host** *destination* | **any**} {**host** *destination-mac-address* | **any**} [*operator* **port** [*port*]] [**precedence** **precedence**] [**tos** *tos*] [**fragments**] [**time-range** *time-range-name*]

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ЛЪЮ deny

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ACL Ю

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ACL Ю ACL ˚

ð Ô

Ю … ↓ Expert Extended ACL˘ ж ACL IP й 192.168.4.12 з MAC й 001300498272 TCP Â

```
Ruijie(config)# expert access-list extended exp-acl
Ruijie(config-exp-nacl)# permit tcp  host  192.168.4.12 host
0013.0049.8272 any any
Ruijie(config-exp-nacl)# deny any any any any
Ruijie(config-exp-nacl)# show access-lists
expert access-list extended exp-acl
10 permit tcp  host  192.168.4.12 host 0013.0049.8272 any any
20 deny any any any any
Ruijie(config-exp-nacl)#
```

Ю IP ACL ˘ IP й 192.168.4.12 ў TCP й 100 ┗˘ 1 Â

```
Ruijie(config)# ip access-list extended 102
Ruijie(config-ext-nacl)# permit tcp host 192.168.4.12 eq 100 any
Ruijie(config-ext-nacl)# show access-lists
ip access-list extended 102
10 permit tcp host 192.168.4.12 eq 100 any
Ruijie(config-ext-nacl)# exit
Ruijie(config)# interface gigabitethernet 1/1
```

```
Ruijie(config-if)# ip access-group 102 in
Ruijie(config-if)#
```

Ю MAC ACL ˘ MAC ѝ 0013.0049.8272 ў ѝ 100 Љ ˘ 1Â

```
Ruijie(config)# mac access-list extended 702
Ruijie(config-mac-nacl)# permit host 0013.0049.8272 any aarp
Ruijie(config-mac-nacl)# show access-lists
mac access-list extended
10 permit host 0013.0049.8272 any aarp702
Ruijie(config-mac-nacl)# exit
Ruijie(config)# interface gigabitethernet 1/1
Ruijie(config-if)# mac access-group 702 in
```

Ю ip ACL ˘ IP ѝ 192.168.4.12 ў ˘ 1Â ‘

```
Ruijie(config)# ip access-list standard std-acl
Ruijie(config-std-nacl)# permit host 192.168.4.12
Ruijie(config-std-nacl)# show access-lists
ip access-list standard std-acl
10 permit host 192.168.4.12
Ruijie(config-std-nacl)# exit
Ruijie(config)# interface gigabitethernet 1/1
Ruijie(config-if)# ip access-group std-acl in
```

ð ৡ Ô

ৡ	AÈ

show a

1.1.7 list-remark text

ѝ ACL ╗ ˘ **no**

list-remark *text*

ð Ô

Text ‘

ð ৡ Ô

ACL

ð Ô

ѝ ACL ╗

ð Ô

```
Ruijie# ip access-list extended 102
Ruijie(config-ext-nacl)# list-remark this acl is to filter the
host 192.168.4.12
Ruijie(config-ext-nacl)# show access-lists
ip access-list extended 102
deny ip host 192.168.4.12 any
1000 hits
this acl is to filter the host 192.168.4.12
Ruijie(config-ext-nacl)#
```

ð ৡ Ô

ৡ	
show access-lists	“
ip access-list	IP “ Hѫ

ð ѧ Ô

˘ RGOS10.0 Л Э Â

1.1.8 no sn

ACL

no *sn*

ð Ô

sn ‘ ѝ ACL ѧ

ð ৡ Ô

ACL Ю

ð Ô

ACL Ю ACL

ð Ô

```
Ruijie(config)# ip access-list extended 100
Ruijie(config-ext-nacl)# permit ip host 192.168.4.122(flect | unr)21ceflect
```

unreflect ˙ /1 ACL

reflecṫ /1 ACL

ð Ô

ACL

ð ¾ Ô

ð Ô

ip access-group ¾ ‟ ˘ ¨ Â

ð Ô

Ю GigabitEthernet0/0 Э ‟ 120 ‘

```
Ruijie(config)# interface GigabitEthernet 0/0
Ruijie(config-if)#ip access-group
```

ð ¯ Ô

ð Ô

ACL Э˘ è ⁸ Â **show access-group** ¯

ð Ô

Ю access-list accept_00d0f8xxxxxx_only Gigabit 1 Э˙

```
Ruijie(config)# interface GigaEthernet 0/1
Ruijie(config-if)# expert access-group
accept_00d0f8xxxxxx_only in
```

ð ¯ Ô

¯	
show access-group	Э ACL Â

ð Л Ô

˚ RGOS10.0 Лъ Э

1.2

б ЛъЮ ¯:

- **show access-lists**
- **show ip access-group**
- **show mac access-group**
- **show expert access-group**
- **show access-group**

ò Ô

<interface> ‘

ð ৡ Ô

ð Ô

Э ACLˇ a Э ACL

ð Ô

```
Ruijie# show access-group
ip access-list standard ipstd3
Applied On interface GigabitEthernet 0/1.
ip access-list standard ipstd4
Applied On interface GigabitEthernet 0/2.
ip access-list extended 101
Applied On interface GigabitEthernet 0/3.
ip access-list extended 102
Applied On interface GigabitEthernet 0/8.
```

ð ৡ Ô

ৡ	
ip access-group	ip “ Ⱨ
mac access-group	MAC “ Ⱨ
expert access-group	Expert “ Ⱨ

ð ʌ Ô

˚ RGOS10.0 Лъ Э

2 RPL

2.1

2.1.1 reverse-path

Ю **reverse-path** ৡ ˘ è Ⴗ ą̈
˘ ৡ no ᐯ Â

reverse-path

no reverse-path

-	-

a Ⴗ ą̈ ⁸ ╖

ৡ Â

ৡ Ⴗ

1ʻ Э RPL ৡ.

```
Ruijie(config)# interface gigabitEthernet 0/0
Ruijie(config-if)# reverse-path
```

ৡ

ৡ	
-	-

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ৡ

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10.3(3b7)	10.3(4)

3

3.1

3.1.1 acpp

8 ^ ACPP˜˜ control-plane Ю ҳ acpp

ҳ no acpp ‡

acpp bw-rate *rate* **bw-burst-rate** *burst-rate* [**log**]

no acpp

rate	8^ Æ ѝ pps˜
burst-rate	8^ Æ ѝ pps˜

Ю˝ ACPP Â

ҳ control-plane ˘ Л Љ Ь

Â

1' ЉЮ ˘ Ц ѝ 200pps˘ ѝ 300pps'

3.1.2 anti-arp-spoof

ARP ╖ ˘ ʒ˘ ARP ˘ Ю ‟ ‟ й ARP
˘ ╖ ARP ‟ ‘ ў ARP (10s
200 ARP)’ ў MAC 2 2 22 Tc 166j /TT-2 1 Tf 03.5 0 0 9.713 c 166j

control-plane

Â

1' ЛЬЮ ˘ arp й 30'
```
Ruijie(config-cp)#anti-arp-spoof scan 30
```

1' ЛЬЮ ˘ arp й '
```
Ruijie(config-cp)#no anti-arp-spoof scan
```


Â

-	-

3.1.4 arp-car

ARP ˘ Glean-CAR ˘ control-plane Ю arp-car

no arp-car ‡

arp-car *packet_rate_per_group* [**log**]

no arp-car

packet_rate_per_group	ˆ Æ й pps˜

Ю ARP-CAR Â

control-plane

Â

1 ЛЬЮ ARP
ù 10pps
```
Ruijie(config)# control-plane manage
Ruijie(config-cp)# arp-car 10
```

Ruijie(config)# control-plane {protocol | manage | data}	control-plane Л Ль

-	-

3.1.5 attack thrshold

pps ù

control-plane Ю attack threshold Â

attack threshold *drop_rate*

drop_rate	æ ù pps

Ю ARP-CAR Â

control-plane

Â

1 ЛЬЮ ù 500pps Л Л
500pps ‡

```
Ruijie(config)#control-plane
Ruijie(config-cp)#attack threshold 500
```

	Ruijie(config)# control-plane	control-plane

	-	-

3.1.6 clear attack-info history

clear attack-info history

	-	-

3.1.7 control-plane

control-plane control-plane

exit

control-plane

1 ЛЬЮ ,

```
Ruijie(config)# control-plane
Ruijie(config-cp)# ef-rnfp enable
```

2 ЛЬЮ

```
Ruijie(config)# control-plane
Ruijie(config-cp)# no ef-rnfp enable
```

Ruijie(config)# control-plane {protocol | manage | data}	control-plane Л Лъ

Л
-

3.1.9 glean-car

IP Glean-CAR control-plane Ю glean-car

no glean-car ‡

glean-car *packet_rate_per_group* [**log**]

no glean-car

packet_rate_per_group pps

ЮGlean-CAR Â

control-plane Л Ь

Â

1ˈ ЛЬЮ ˘ ˚ ^ ~ ƀ Glean
ѝ 10ppsˈ

```
Ruijie(config)# control-plane data
Ruijie(config-cp)# glean-car 10
```

ʒ

ʒ	
Ruijie(config)# **control-plane** {**protocol** | **manage** | **data**}	control-plane ˘ /ʌ Лъ

/ʌ Â

ʒ

/ʌ	
-	-

3.1.10 management-interface

^ MPP˜ ╖ ѝ ^
˘ ѵ ˜ Â MPP ╖ Лъ ɨ˘ /ʌ
Â MPP˘ control-plane Ю ʒ
management-interface

ʒ no

management-interface *interface* **allow** {**ftp** | **http** | **https** | **ssh** | **snmp** | **telnet** | **tftp**} [**log**]

no management-interface *interface*

Interface	

Ю˘ MPP ╖

ʒ control-plane ˘ /ʌ

Â

1ˈ ЛЬЮ ˘ gi0/0 ѝ ˘ /ʌ gi0/0 telnetˈ snmp

```
Ruijie(config)# control-plane manage
Ruijie(config-cp)# management-interface gi 0/0 allow snmp telnet
```

	Ruijie(config)# control-plane {protocol | manage | data}	control-plane

	-	-

3.1.12 scpp

ǂ	8	^	SCPP˜˘				ʽ‡
8˘		8˘		8 ’	control-plane	Ю	ҙ scpp

ҙ no

3.1.13 security deny

Э ping web ѝ˘ a acl ƭ ping web ˘ ╗ Â ҂ no ,

security deny, lan-ping | lan-web | wan-ping | wan-web,

҂ control-plane

1, pc ping,

```
Ruijie(config-cp)#security deny lan-ping
```

2, pc ping,

```
Ruijie(config-cp)#security deny wan-ping
```

3, pc web ,

```
Ruijie(config-cp)#security deny lan-web
```

4, pc web ,

```
Ruijie(config-cp)#security deny wan-web
```

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ʌ	
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3.1.14 security web permit

security deny web˘ ж ʌ ҂ IP Лъ web , ҂ no IP ,

security web permit *low-ip-address* [*high-ip-address*]

ALL:194986pkts, 12481736bytes

PROTOCOL	pkts	bytes
ARP	37	2220
UDP	194949	12479516

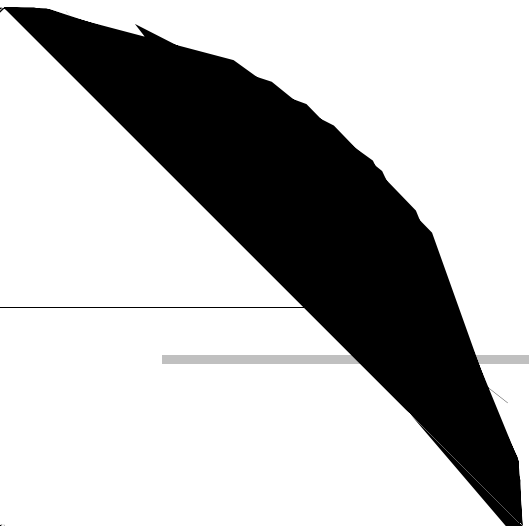
TOP5 IP attack:

IP	pkts	bytes	interface
192.168.64.1	194938	12476032	Gi0/0
192.168.123.1	8	2867	Gi0/5
172.18.3.120	1	125	Gi0/5
172.18.3.73	1	243	Gi0/5
172.18.3.80	1	249	Gi0/5

Ruijie#show attack-info current

System currently not in attack!

.61855.8 l28652.4625.8 l28652.462546 l137.52



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1' ЛЬЮ

Ruijie#show attack-info history

System attack record at 1970-1-7 7:45:5, System in attack 38s

ALL: 503435pkts, 32212698bytes

PROTOCOL	pkts	bytes
ARP	3712	222720
UDP	499723	31989978

TOP3 IP attack:

IP	pkts	bytes	interface
192.168.64.1	499696	31980544	Gi0/0
192.168.123.1	26	9309	Gi0/5
172.18.3.120	1	125	Gi0/5

2'

Ruijie#show attack-info history

```
There is no attack record!
```

3.2.4 show ef-rnfp

‡ ˘ ˘ ˘ show ef-rnfp

show ef-rnfp {**acpp** | **scpp** | **glean-car** | **arp-car** | **port-filter** | **mpp** | **all** }

-	-

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1' ЛЬЮ

```
Ruijie# show ef-rnfp all
Aggregate control plane protection information:  //ACPP

  Data subinterface: enable
    RULE:
      bandwidth rate limit: 20(pps), burst: 30(pps)
      log: off
    STATISTIC:
      dropped 0 packets
  Manage subinterface: enable
    RULE:
      bandwidth rate limit: 1000(pps), burst: 2000(pps)
      log: off
    STATISTIC:
      dropped 0 packets
  Protocol subinterface: disable
Segregate control plane protection information:  //SCPP

  Data subinterface: disable
  Manage subinterface: enable
    RULE: acl: 1, id: 1011a4f
      bandwidth rate limit: 20(pps), burst: 300(pps)
      log: off
    STATISTIC:
      bandwidth rate limit dropped 0 packets
    TOTALLY droped 0 packets
  Protocol subinterface: disable
```

```
ARP CAR information: //ARP-CAR
  Manage subinterface: enable
    RULE:
      allow packet rate per source: 30(pps)
      log: off
    STATISTIC:
      dropped 181 packets
Glean CAR information:   //Glean-CAR
  Data subinterface: disable
Port Filter information:
  Manage subinterface: disable
Management plane protection information:  //MPP
  Manage subinterface: disable
```

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/1

3	/1	
	-	-

4

4.1

4.1.1 ip inspect name

‡ Â ҳ no ‡ Â

ip inspect name *inspection_name protocol*

no ip inspect name *inspection_name protocol*

ð Ô

inspection_name: ‡

protocol: ˘ Л Љ Ю ' **ftp˘ mms˘ rtsp˘ sip˘ h323, tcp**

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ð ҳ Ô

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ҳ ‡

‡ Л Љ ¡

ð Ô

Ю ч ‡˘ abc ftp mms ˘ 123 mms h.323 '

```
Ruijie(config)# ip inspect name abc ftp
Ruijie(config)# ip inspect name abc mms
Ruijie(config)# ip inspect name 123 mms
Ruijie(config)# ip inspect name 123 h323
```

ð Ô

4.1.2 show ip inspect

I

show ip inspect *parameter*

ð Ô

parameter: Λ **name** *inspection_name* 8 Λ ‡

interface ‘ Э ‡

all ‘

ð Ô

ð ϡ Ô

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ð Ô

ϡ ^ ~ ‡

ð Ô

Ю ‡ abc ‘

```
Ruijie# show ip inspect name abc
Inspection name abc
    ftp
    mms
```

ð Ô

4.1.3 ip inspect

Э ‡˘ ϡ no Э ‡ Â

ip inspect *inspection_name* {**in** | **out**}

no ip inspect *inspection_name* {**in** | **out**}

ð Ô

inspection_name: ‡ ¨

in | **out:** Э ä

ð Ô

ð ϡ Ô

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ð Ô

‡ ɨ˘ IP MAC ╖ ╟

MAC Э Л Л Ъ IP ˘ IP Л MAC Â

ð Ô

Ю ‡˙

```
Ruijie(config)# ipmacbind 192.168.52.66 52e1.5d33.aa21 log
```

ð Ô

4.2.2 ipmacbind auto

ÿ ARP IP MAC ‡ Â

ipmacbind auto log

ð Ô

log: ŭ

ð Ô

IP MAC ╖

ð ʒ Ô

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ð Ô

ʒ ÿ ARP IP MAC ‡˘ IP MAC ╖ ╟
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ð Ô

Ю ÿ ARP IP MAC ‡˙

```
Ruijie(config)# ipmacbind auto
```

ð Ô

4.2.3 ipmacbind default action

ƀ Э IP MAC ‡ ╟ ˆ / ˜ Â

ipmacbind default action {permit | deny}

ð Ô

permit: ‡ IP MAC ‡

deny: ‡ IP MAC ‡

ð Ô

‡ IP MAC ‡

ð Ô

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ð Ô

ð Ô

Ю ‡ IP MAC ‡ '

Ruijie(config)# **ipmacbind** default action permit

ð Ô

clear ipmacbind

IP MAC ‡ Â

clear ipmacbind {**dynamic** | **all**}

ð Ô

dynamic: ÿ ARP ╠ IP MAC ‡'

all: IP MAC ‡

ð Ô

IP MAC ╖

ð Ô

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ð Ô

IP MAC ‡ ˘ IP MAC ╖ ≠ ╠ Â

ð Ô

Ю ÿ ARP ╠ IP MAC ‡'

Ruijie# **clear ipmacbind dynamic**

ð Ô

4.2.4 show ipmacbind

IP MAC ‡ Â

show ipmacbind table | hash | statistic

ð Ô

table: IP MAC ‡

hash: IP MAC ‡

statistic: IP MAC ˆ ˜

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ð Ô

ৡ IP MAC ‡ Â

ð Ô

Ю IP MAC ‡ ‘

```
Ruijie# show ipmacbind table
No.    Type   IP address    MAC address          Log
1      static 192.168.52.66    52e1.5d33.aa21   on
2      auto   192.168.52.50    112e.3ca4.3381   off
<-- output omitted -- >
```

ð Ô

4.3

4.3.1 ip ingress-filter

╗ Â ৡ no ╗ Â

ip ingress-filter log
no ip ingress-filter

ð Ô

log: ŭ

ð Ô

ð ¦ Ô

ð Ô

ÐÓ a no

ð Ô

ÐO

```
Ruijie(config)# interface ethernet 1/0
Ruijie(conf-if)# ip ingress-filter log
```

ð Ô

4.3.2 show ip ingress-filter

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show ip ingress-filter

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ð ¦ Ô

ð Ô

ð Ô

ÐO

```
Ruijie# show ip ingress-filter
Firewall Network-ingress-filter is enable, blocked 0 flows
Interface GigabitEthernet 1/0: log is on, blocked 0 flows
```

ð Ô

4.4 TCP SYN

4.4.1 ip tcp-intercept list

ä̈α Э TCP SYN ʒ ╖ Â ʒ no ╖ Â

ip tcp-intercept list *extended_ACL_#* {**in** | **out**} <**log**>

no ip tcp-intercept list *extended_ACL_#* {**in** | **out**} <**log**>

ð Ô

extended_ACL_#:

in | **out:** Э ä̈α

log: ŭ̈

ð Ô

TCP SYN

show ip tcp-intercept

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ð Ô

TCP SYN

ð Ô

TCP SYN

ð Ô

```
Ruijie# show ip tcp-intercept
Intercepting new connections using access-list 100 at
GigabitEthernet 0/1 in
12 incomplete, 5 established connections (total 17)
```

ð Ô

4.5 TCP

4.5.1

ϟ tcp ‡

tcp ‡ Ɔˇ **ip inspect** ϟ Â

tcp ‡ ˇ **show ip inspec**t ϟ Â

ð Ô

Ю tcp ‡ tcp_inspecˈ

```
Ruijie(config)# ip inspect name tcp_inspec tcp
```

ð Ô

ip inspect name ϟ ┘ Â ≠ **ip inspect** ϟ Ɔˇ **show ip inspect** ∧ Л Â

4.6

4.6.1 session-limit

⁸ ╖

session-limit access-group *acl_no* **rate** *rate* **concurrent** *session_no* {**in**|**out**} <**log**>

no session-limit access-group *acl_no* **rate** *rate* **concurrent** *session_no* {**in**|**out**} <**log**>

ð Ô

acl_no ‡ ‟ ∧

rate

session_no

in|*out* ⁂

ð Ô

a ⁸

ð ϟ Ô

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ð Ô

ϟ

ð Ô

‟ 1000ϖˇ 100

session-limit access-group 1 rate 100 concurrent 10000 in log

4.7

4.7.1 ip rate-control

╖ a Â

4.8

4.8.1 ip session log-on

˘ ã no Â

ip session log-on

no ip session log-on

ðô Ô

ðô Ô

ò ã ò Ô

ip session timeout tcp-syn-receive *timeout_value*

ip session timeout tcp-fin-wait *timeout_value*

ip session timeout tcp-time-wait *timeout_value*

ip session timeout tcp-closed *timeout_value*

ip session timeout tcp-close-wait *timeout_value*

ip session timeout tcp-last-ack *timeout_value*

ip session timeout udp-closed *timeout_value*

ip session timeout udp-started *timeout_value*

ip session timeout udp-connected *timeout_value*

ip session timeout udp-established *timeout_value*

ip session timeout rawip-closed *timeout_value*

ip session timeout rawip-started *timeout_value*

ip session timeout rawip-connected *timeout_value*

ip session timeout rawip-established *timeout_value*

no ip session timeout icmp-closed

no ip session timeout icmp-started

no ip session timeout icmp-connected

no ip session timeout tcp-established

no ip session timeout tcp-syn-sent

no ip session timeout tcp-syn-receive

no ip session timeout tcp-fin-wait

no ip session timeout tcp-time-wait

no ip session timeout tcp-closed

no ip session timeout tcp-close-wait

no ip session timeout tcp-last-ack

no ip session timeout udp-closed

no ip session timeout udp-started

no ip session timeout udp-connected

no ip session timeout udp-established

no ip session timeout rawip-closed

no ip session timeout rawip-started

no ip session timeout rawip-connected

no ip session timeout rawip-established

ð Ô

timeout_value ˘ Æ ѝ

ð Ô

Ю

icmp-closed 10

icmp-started 10

icmp-connected 10

tcp-established 1800

tcp-syn-sent 10

tcp-syn-receive 10

tcp-fin-wait 60

tcp-time-wait 10

tcp-closed 10

tcp-close-wait 60

tcp-last-ack 30

udp-closed 10

udp-started 60

udp-connected 30

udp-established 600

rawip-closed 10

rawip-started 300

rawip-connected 300

rawip-established 300

ð ʒ Ô

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ð Ô

ʒ ʅ Â

ð Ô

Ю ʒ icmp-connected ѝ 10 ʻ

```
Ruijie(config)#ip session timeout icmp-connected 10
```

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ˇ a ˀ Â

4.8.3 ip session threshold

ˇ ‰ˆ ~ ˇ ʒ no

Â

ʒ ѝ ʒˇ ʒ Â

ip session threshold icmp-closed *threshold_value*

ip session threshold icmp-started *threshold_value*

ip session threshold tcp-syn-sent *threshold_value*

ip session threshold tcp-syn-receive *threshold_value*

ip session threshold tcp-closed *threshold_value*

ip session threshold udp-closed *threshold_value*

ip session threshold rawip-closed *threshold_value*

no ip session threshold icmp-closed

no ip session threshold icmp-started

no ip session threshold tcp-syn-sent

no ip session threshold tcp-syn-receive

no ip session threshold tcp-closed

no ip session threshold udp-closed

no ip session threshold rawip-closed

ð Ô

threshold_value ‰ ˇ Æ ѝ

ð Ô

Ю

icmp-closed 10

icmp-started 300

tcp-syn-sent 10

tcp-syn-receive 20

tcp-closed 20

udp-closed 10

rawip-closed 10

ð Ô

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Ю Â

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Ю icmp-started 10

```
Ruijie(config)#ip session threshold icmp-started 10
```

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a Â

4.8.4 ip session track-state-strictly

TCP ICMP

TCP SYN ICMP Ю Â

no Â

ip session track-state-strictly

no ip session track-state-strictly

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ð Ô

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ð Ô

Ю

```
Ruijie(config)#ip session track-state-strictly
```

ð Ô

Ю Â

5 VPDN

5.1

5.1.1 vpdn authorize

ৡ VPDN ˘ è **no** ʌ VPDN Â

vpdn authorize domain [split]

no vpdn authorize domain

domain	
split	

ЮЃ a ╠ Â

ৡ

ʌ vpdn enable Лъ ł ৡ ʌ Лъ

ж

ł ˘ ł ¨ ˘ ʌ Ю ¨

1ʻ VPDN ¨ ╗

```
Ruijie(config)# vpdn authorize domain split
Ruijie(config)#
```

ৡ	
vpdn domain-delimiter	¨
domain	¨

ʌ Â

ৡ

ʌ	

	10.3 5	३

5.1.2 vpdn domain-delimiter

३ VPDN ¨ ˘ è **no** VPDN ¨ Â

LINE	¨ † ˘ /ı @, /, %, #, - or २ \ ɨ \\ ≠ /ı Ɓ

-delimiterl0 Tc [0433098049419A0n domai.7427 Td[0DB09E18T4B3/TT9419]TD01CT21 1 Tf( )TE58

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	10.3˜ 5˜	¾

5.1.3 vpdn enable

¾ VPDN ╖ ˘ è **no** VPDN ╖ Â

vpdn enable

no vpdn enable

-	-

	Ю˝ VPDN ╖ Â
¾	

(Client-Initiated Tunnel)S_0 1 Tf 0 Tc 2.971 0 Td18 ¥VPDN

vpdn ignore_source

no vpdn ignore_source

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३ VPDN ℸ ˘ ३ ł a
Ð Â Â

1΄ VPDN ℸ

```
Ruijie(config)# vpdn ignore_source
Ruijie(config)#
```

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5.1.5 vpdn limit_rate

३ VPDN ˘ ⁸ VPDN ˘ è **no**
Â

vpdn limit_rate *rate_num*

no vpdn limit_rate

rate_num	5-100΄ VPDN 5 100

Ю a VPDN

¾

˚ VPDN ˘ Л ¾ ⁸ Â

1˙ Л й 50

```
Ruijie(config)# vpdn limit_rate 50
Ruijie(config)#
```

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5.1.6 vpdn session-limit

¾ VPDN ╖ ˘ è **no** Â

vpdn session-limit *sessions*

no vpdn session-limit

sessions	VPDN ╖

Ю й ˘ è 36 ‟ й 300 Â

¾

˚ VPDN ˘ Л ¾ ⁸ Â

1˙ Л й 100

```
Ruijie(config)# vpdn session-limit 100
Ruijie(config)#
```

¾	¾	

5.2 VPDN

5.2.1 clear vpdn tunnel

ৡ ⁸ Â

clear vpdn tunnel [{**l2tp** | **pptp** } [**id** *locid*] | [*remote-host-name*]]

l2tp	L2TP
pptp	PPTP
remote-host-name	ў ¨
locid	⁸ ID

ৡ

ৡ ⁸ Â a ˘ ж ⁸ (
PPTP б L2TP)ʼ ˘ ж ⁸
ʼ
ў ¨ ˘ ж ⁸
ў ¨ ѕ ¨ Â
ID ID show vpdn tunID Â

1ʼ L2TP

```
Ruijie# show vpdn
L2TP Tunnel and Session Information Total tunnels 1 sessions 1
LocID RemID Remote Name  State  Remote Address  Port  Sessions L2TP
Class/
VPDN Group
1    1    BLIZZARD  est   192.168.12.213  1701  1  1
LocID     RemID     TunID     Username, Intf/
State  Last Chg                    Vcid, Circuit
1        1        1        ms,Vi1            est
00:46:30
%No active PPTP tunnels
Ruijie# clear vpdn tunnel l2tp
Ruijie#
%UPDOWN: Line protocol on Interface Virtual-Access1, changed state
to down
%CHANGED: Interface Virtual-Access1, changed state to
administratively down
```

```
Ruijie# show vpdn
%No active L2TP tunnels
%No active PPTP tunnels
Ruijie#
```

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5.2.2 debug vpdn

३ **vpdn** Â

debug vpdn { **error** | **event** | **l2x-data** | **l2x-errors** | **l2x-events** | **l2x-packets** | **packet** }

no debug vpdn { **error** | **event** | **l2x-data** | **l2x-errors** | **l2x-events** | **l2x-packets** | **packet** }

error	VPDN
event	VPDN Y˚
l2x-data	L2TP
l2x-errors	L2TP
l2x-events	L2TP Y˚
l2x-packets	L2TP 8
packet	VPDN

Â

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Td<0A1EN وسلم ؛ X ╥ ϑ

```
192.168.200.114
PPTP: New tunnel socket id =9
VPDN: Pptp get tunnel info for 192.168.200.114 ok!
VPDN: Pptp send start-control-connection-reply, ok
VPDN: Pptp tunnel id 0 state change: idle --> estbed
PPTP: Add send-echo-request timer, interval = 60
VPDN: Pptp tunnel id 0 recv outgoing-call-request!
Pptp: Tunnel to 192.168.200.114 get config para. from vpdn-group pptp!
VPDN: Must process using ACCEPT_DIALIN parameters
Pptp: Session va0 get config para. from vpdn-group pptp!
VPDN: Pptp session va0 state change: idle --> connected
PPTP: Receive outcall request,process ok!assign local call id = 1
VPDN: Pptp tunnel id 0 send out-call reply
%LINK CHANGED: Interface virtual-access 0, changed state to up
VPDN: Pptp tunnel to 192.168.200.114 peer callid 1 recv set-linkinfo
VPDN: Pptp tunnel to 192.168.200.114 peer callid 1 recv set-linkinfo
%LINE PROTOCOL CHANGE: Interface virtual-access 0, changed state to
UP
```

2' PPTP **debug vpdn packet** IO

```
PPTP: I Start-Control-Connection-Request len 156 Magic Cookie
0x1A2B3C4D
Protocol Version 0x100
Framing Type 0x1
Bearer Type 0x1
Maximum Channels 0x0
Firmware Revision 0x893
Host Name:
endor String: Microsoft Windows NT
PPTP: O Start-Control-Connection-Reply len 156 Magic Cookie
0x1A2B3C4D
Protocol Version 0x100
Framing Type 0x2
Bearer Type 0x3
Maximum Channels 0x0
Firmware Revision 0x100
Host Name: Dingjs
Vendor String: Ret-Giant Network Operating System
PPTP: I Outgoing-Call-Request len 168 Magic Cookie 0x1A2B3C4D
Call Id 0x4000
Call Serial Number 0x96A5
Min BPS 0x12C
Max BPS 0x5F5E100
Bearer Type 0x3
Framing Type 0x3
Rec Window Size 0x40
```

```
Proc Delay 0x0
Phone Number Length 0x0
Phone Number:
Subaddress:
PPTP: O Outgoing-Call-Reply len 32 Magic Cookie 0x1A2B3C4D
Call Id 0x1
Peer Call Id 0x4000
Result Code 0x1
Error Code 0x0
Cause Code 0x0
Connect Speed 0xFA00
Rec Window Size 0x10
Physical Channel Id 0x0
PPTP: I Set-Link-Info len 24 Magic Cookie 0x1A2B3C4D
Peer Call Id 0x1
Send ACCM 0xFFFFFFFF
Recv ACCM 0xFFFFFFFF
%UPDOWN: Interface Virtual-Access1, changed state to up
Vi1 VPDN PROCESS Into tunnel: Sending 54 byte pak
Vi1 VPDN PROCESS Into tunnel: Sending 64 byte pak
Vi1 VPDN PROCESS Into tunnel: Sending 50 byte pak
PPTP: I Set-Link-Info len 24 Magic Cookie 0x1A2B3C4D
Peer Call Id 0x1
Send ACCM 0xFFFFFFFF
Recv ACCM 0xFFFFFFFF
Vi1 VPDN PROCESS Into tunnel: Sending 45 byte pak
Vi1 VPDN PROCESS Into tunnel: Sending 46 byte pak
Vi1 VPDN PROCESS Into tunnel: Sending 187 byte pak
Vi1 VPDN PROCESS Into tunnel: Sending 56 byte pak
Vi1 VPDN PROCESS Into tunnel: Sending 64 byte pak
Vi1 VPDN PROCESS Into tunnel: Sending 50 byte pak
Vi1 VPDN PROCESS Into tunnel: Sending 50 byte pak
Vi1 VPDN PROCESS Into tunnel: Sending 52 byte pak
```

3ʹ PPTP ùˇ **debug vpdn error** Юʹ

```
VPDN: PPTP session Virtual-Access1 wait pak ack timeout(wait seq=37,
ack=36), decrease send window to half of current = 33!
VPDN: PPTP session Virtual-Access1 adjust ATO to 220 ms!
VPDN: PPTP session Virtual-Access1 wait pak ack timeout(wait seq=38,
ack=36), decrease send window to half of current = 16!
VPDN: PPTP session Virtual-Access1 adjust ATO to 280 ms!
VPDN: PPTP session Virtual-Access1 wait pak ack timeout(wait seq=39,
ack=36), decrease send window to half of current = 8!
VPDN: PPTP session Virtual-Access1 adjust ATO to 400 ms!
VPDN: Pptp EGRE encap fail, err=-4!
VPDN: PPTP session Virtual-Access1 wait pak ack timeout(wait seq=40,
```

```
ack=36), decrease send window to half of current = 4!
VPDN: PPTP session Virtual-Access1 adjust ATO to 640 ms!
```

4' ∧ (б) VPDN

```
Ruijie# debug vpdn error
vpdn protocol errors debugging is on
Ruijie# debug vpdn event
vpdn events debugging is on
Ruijie# debug vpdn packet
vpdn packet debugging is on
Ruijie# show debug
VPDN:
vpdn events debugging is on
vpdn protocol errors debugging is on
vpdn packet debugging is on
Ruijie#
VPDN PROCESS From tunnel: Received 158 byte pak
L2X: UDP socket write 168 bytes, 192.168.12.217(1701) to
192.168.12.242(1701)
L2X: UDP socket write 40 bytes, 192.168.12.217(1701) to
192.168.12.242(1701)
VPDN PROCESS From tunnel: Pak consumed
VPDN PROCESS From tunnel: Received 70 byte pak
L2X: UDP socket write 40 bytes, 192.168.12.217(1701) to
192.168.12.242(1701)
VPDN PROCESS From tunnel: Pak consumed
VPDN PROCESS From tunnel: Received 76 byte pak
Get virtual-access from free queue: Virtual-Access1
Clone virtual-access from interface Virtual-Template1
L2X: UDP socket write 56 bytes, 192.168.12.217(1701) to
192.168.12.242(1701)
L2X: UDP socket write 40 bytes, 192.168.12.217(1701) to
192.168.12.242(1701)
VPDN PROCESS From tunnel: Pak consumed
VPDN PROCESS From tunnel: Received 76 byte pak
L2X: UDP socket write 40 bytes, 192.168.12.217(1701) to
192.168.12.242(1701)
Vi1 Tnl/Sn 3/1 L2TP: Virtual interface created for unknown, bandwidth
1024 Kbps
Vi1 Tnl/Sn 3/1 L2TP: VPDN session up
VPDN PROCESS From tunnel: Pak consumed
VPDN PROCESS From tunnel: Received 50 byte pak
Vi1 VPDN PROCESS From tunnel: Queue 14 byte pak to ppp parse and iqueue
Vi1 VPDN PROCESS From tunnel: Pak send successful
%UPDOWN: Interface Virtual-Access1, changed state to up
Vi1 VPDN PROCESS Into tunnel: Sending 54 byte pak
```

```
VPDN PROCESS From tunnel: Received 50 byte pak
Vi1 VPDN PROCESS From tunnel: Queue 14 byte pak to ppp parse and iqueue
Vi1 VPDN PROCESS From tunnel: Pak send successful
VPDN PROCESS From tunnel: Received 50 byte pak
Vi1 VPDN PROCESS From tunnel: Queue 14 byte pak to ppp parse and iqueue
Vi1 VPDN PROCESS From tunnel: Pak send successful
Vi1 VPDN PROCESS Into tunnel: Sending 50 byte pak
L2X: UDP socket write 50 bytes, 192.168.12.217(1701) to
192.168.12.242(1701)
%UPDOWN: Line protocol on Interface Virtual-Access1, changed state
to up
```

5 ٧ (б) **debug vpdn l2x-data**

```
L2X: Punting to L2TP control message queue
L2X: Punting to L2TP control message queue
L2X: Punting to L2TP control message queue
L2X: Punting to L2TP control message queue
L2X: Punting to L2TP control message queue
L2X: Punting to L2TP control message queue
%UPDOWN: Interface Virtual-Access1, changed state to up
%UPDOWN: Line protocol on Interface Virtual-Access1, changed state
to up
```

б **debug vpdn l2x-error**

```
Tnl 14 L2TP: Tunnel auth failed for BLIZZARD
Tnl 14 L2TP: Expected
9E 8D 7A 8E 78 EA 41 9F A1 74 01 21 DE 4F F3 F0
Tnl 14 L2TP: Got
84 E5 62 69 AE 46 A5 98 4E FE E2 38 EE F2 B7 E2
```

7 LNS ٧ (б) **debug vpdn l2x-events**

```
L2TP: I SCCRQ from C3640 tnl 26656
New tunnel created for remote C3640, address 192.168.12.242
Tnl 0 L2TP: Got a challenge in SCCRQ, C3640
Tnl 20 L2TP: O SCCRP  to C3640 tnlid 26656
Tnl 20 L2TP: Control channel retransmit delay set to 1 seconds
Tnl 20 L2TP: Tunnel state change from idle to wait-ctl-conn
Tnl 20 L2TP: I SCCCN from C3640 tnl 26656
Tnl 20 L2TP: Got a Challenge Response in SCCCN, C3640
Tnl 20 L2TP: Tunnel Authentication success
Tnl 20 L2TP: Tunnel state change from wait-ctl-conn to established
Tnl 20 L2TP: SM State established
Tnl 20 L2TP: I ICRQ from C3640 tnl 26656
Tnl/Sn 20/1 L2TP: Accepted ICRQ, new session created
Tnl/Sn 20/1 L2TP: O ICRP to C3640 26656/1279
Tnl/Sn 20/1 L2TP: Session state change from idle to wait-connect
```

```
Tnl 20 L2TP: Control channel retransmit delay set to 1 seconds
Tnl/Sn 20/1 L2TP: I ICCN from C3640 tnl 26656, cl 1279
Tnl/Sn 20/1 L2TP: Session state change from wait-connect to
wait-for-service-sel
ection-iccn
Vi1 Tnl/Sn 20/1 L2TP: Session state change from
wait-for-service-selection- iccn to established
%UPDOWN: Interface Virtual-Access1, changed state to up
%UPDOWN: Line protocol on Interface Virtual-Access1, changed state
to up
```

8ʹ LNS ৲ (б) **debug vpdn l2x-packets**

```
L2TP: I SCCRQ from C3640 tnl 18889
L2X: Parse  AVP 0, len 8, flag 0x8000 (M)
L2X: Parse SCCRQ
L2X: Parse  AVP 2, len 8, flag 0x8000 (M)
L2X: Protocol Ver 1
L2X: Parse  AVP 6, len 8, flag 0x0
L2X: Firmware Ver 0x1130
L2X: Parse  AVP 7, len 11, flag 0x8000 (M)
L2X: Hostname C3640
L2X: Parse  AVP 8, len 25, flag 0x0
L2X: Vendor Name Cisco Systems, Inc.
L2X: Parse  AVP 10, len 8, flag 0x8000 (M)
L2X: Rx Window Size 800
L2X: Parse  AVP 11, len 22, flag 0x8000 (M)
L2X: Chlng
       98 20 4E 34 6A 4C E1 E7 FA CF 58 07 FF 4E 56 A3
L2X: Parse  AVP 9, len 8, flag 0x8000 (M)
L2X: Assigned Tunnel ID 18889
L2X: Parse  AVP 3, len 10, flag 0x8000 (M)
L2X: Framing Cap 0x3
L2X: Parse  AVP 4, len 10, flag 0x8000 (M)
L2X: Bearer Cap 0x3
L2X: No missing AVPs in SCCRQ
L2X: I SCCRQ, flg TLS, ver 2, len 130, tnl 0, ns 0, nr 0 contiguous
pak, size 130
C8 02 00 82 00 00 00 00 00 00 00 00 80 08 00 00
00 00 00 01 80 08 00 00 00 02 01 00 00 08 00 00
00 06 11 30 80 0B 00 00 00 07 43 33 36 34 30 00
19 00 00 00 08 43 69 73 63 6F 20 53 79 73 74 65
6D 73 2C 20 49 6E 63 2E ...
Tnl 22 L2TP: O SCCRP  to C3640 tnlid 18889
Tnl 22 L2TP: O SCCRP, flg TLS, ver 2, len 140, tnl 18889, ns 0, nr
1
```

```
C8 02 00 8C 49 C9 00 00 00 00 00 01 80 08 00 00
00 00 00 02 80 08 00 00 00 02 01 00 80 0A 00 00
00 03 00 00 00 01 80 0A 00 00 00 04 00 00 00 00
00 08 00 00 00 06 11 30 80 0A 00 00 00 07 52 36
32 31 00 0E 00 00 00 08 ...
Tnl 22 L2TP: O ZLB ctrl ack, flg TLS, ver 2, len 12, tnl 18889, ns
1, nr 1
C8 02 00 0C 49 C9 00 00 00 01 00 01
Tnl 22 L2TP: Parse  AVP 0, len 8, flag 0x8000 (M)
Tnl 22 L2TP: Parse SCCCN
Tnl 22 L2TP: I SCCCN from C3640 tnl 18889
Tnl 22 L2TP: Parse  AVP 13, len 22, flag 0x8000 (M)
Tnl 22 L2TP: Chlng Resp
5C D5 A4 37 36 A6 7D 0F FE EF 22 48 B8 DF F5 12
Tnl 22 L2TP: No missing AVPs in SCCCN
Tnl 22 L2TP: I SCCCN, flg TLS, ver 2, len 42, tnl 22, ns 1, nr 1 contiguous
pak, size 42
C8 02 00 2A 00 16 00 00 00 01 00 01 80 08 00 00
00 00 00 03 80 16 00 00 00 0D 5C D5 A4 37 36 A6
7D 0F FE EF 22 48 B8 DF F5 12
Tnl 22 L2TP: O ZLB ctrl ack, flg TLS, ver 2, len 12, tnl 18889, ns
1, nr 2
C8 02 00 0C 49 C9 00 00 00 01 00 02
Tnl 22 L2TP: Parse  AVP 0, len 8, flag 0x8000 (M)
Tnl 22 L2TP: Parse ICRQ
Tnl 22 L2TP: I ICRQ from C3640 tnl 18889
Tnl 22 L2TP: Parse  AVP 15, len 10, flag 0x8000 (M)
Tnl 22 L2TP: Serial Number -1714567290
Tnl 22 L2TP: Parse  AVP 14, len 8, flag 0x8000 (M)
Tnl 22 L2TP: Assigned Call ID 1280
Tnl 22 L2TP: Parse  AVP 18, len 10, flag 0x8000 (M)
Tnl 22 L2TP: Bearer Type 0
Tnl 22 L2TP: No missing AVPs in ICRQ
Tnl 22 L2TP: I ICRQ, flg TLS, ver 2, len 48, tnl 22, ns 2, nr 1 contiguous
pak,size 48
C8 02 00 30 00 16 00 00 00 02 00 01 80 08 00 00
00 00 00 0A 80 0A 00 00 00 0F 99 CD C7 86 80 08
00 00 00 0E 05 00 80 0A 00 00 00 12 00 00 00 00
Tnl/Sn 22/1 L2TP: O ICRP to C3640 18889/1280
Tnl/Sn 22/1 L2TP: O ICRP, flg TLS, ver 2, len 28, tnl 18889, lsid
1, rsid 1280,ns 1, nr 3
C8 02 00 1C 49 C9 05 00 00 01 00 03 80 08 00 00
00 00 00 0B 80 08 00 00 00 0E 00 01
Tnl 22 L2TP: O ZLB ctrl ack, flg TLS, ver 2, len 12, tnl 18889, ns
2, nr 3
C8 02 00 0C 49 C9 00 00 00 02 00 03
```

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```
L2TP tunnel locid 4 is up,remote id is 77, 1 active sessions
  Tunnel state is est
  Tunnel transport is UDP
  Remote tunnel name is BLIZZARD
    Internet Address 192.168.12.213, port 1701
  Local tunnel name is LNStest
    Internet Address 192.168.12.212, port 1701
  VPDN group for tunnel is 1
  Tunnel domain unknown
  ip mtu adjust disabled
  Control Ns 2, Nr 4
           id ѝ        PPTP
Ruijie#show vpdn tunnel
%No active L2TP tunnels
PPTP Tunnel Information Total tunnels 1
LocID Remote Name    State      Remote Address  Port  Sessions
2                estbed      192.168.45.160  3077  1
Ruijie#
Ruijie#show vpdn tunnel pptp 2
PPTP tunnel id 2 is up, remote id is 0, 1 active session
  Tunnel state is estbed
  Remote tunnel name is
    Internet Address 192.168.45.160, port 3077
  Local tunnel name is
    Internet Address 192.168.45.161
```

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5.3 VPDN-Group

5.3.1 accept dialin

ৡ ѝ ʌ ˘ è **no** Â

accept-dialin

no accept-dialin

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ৡ	vpdn-domain
	ʌ ɲ domain ¨ PPP DNS ˘ ╗ ł ¨ DNS ł ˘ DNS Â

1' ruijie.net ¶ ł vrf 1

```
Ruijie(config-vpdn)# domain ruijie.net vrf 1
Ruijie(config-vpdn)#
```

¾

¾	
vpdn authorize	¨
vpdn domain-delimiter	¨

/

¾

/	
10.3' 5˜	¾

5.3.4 force-local-chap

¾ ⁸ PPP ˘ Client LAC / ˘ LAC ¾ LNS Client ˘ L2TP ł Client Â ¾ / LNS Э Â

force-local-chap

no force-local-chap

-	-

Ю˝ LNS a Ą Clinet Â

¾ VPDN-Group

Client LAC / ˘ LAC ¾ LNS Client ˘ L2TP ł Client Â ¾ / LNS Э Â

1' PPP LCP Â

```
Ruijie(config-vpdn)# force-local-chap
Ruijie(config-vpdn)#
```

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Ruijie(config-vpdn)# **ip precedence** *7*
Ruijie(config-vpdn)#

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5.3.6 ip tos

¾ IP TOS(Type of Service) ˘ è **no** Â

ip tos { *tos-value* | **max-reliability** | **max-throughput** | **min-delay** | **min- monetary-cost** | **normal** | **reflect** }

no ip tos

tos-value	TOS ˘ ˄ ù 0~15
max-reliability	TOS ù 2
max-throughput	TOS ù 4
min-delay	TOS ù 8
min-monetary-cost	TOS ù 1
normal	TOS ù 0
reflect	IP TOS ù IP TOS

Ю IP TOS ù Â

¾ VPDN-Group

TOS / ¾ Â ¾
˘ a ў ╠ ¤ Â

1 TOS ù **min-delay** Â

```
Ruijie(config-vpdn)# ip tos min-delay
Ruijie(config-vpdn)#
```

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5.3.7 lcp renegotiation always

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no pool

pool-name	¨

ЮЎ ѝ ¦ Â

३ vpdn-domain

Л Л domain ¨ ˘ ╗ ł ¨
ł ˘ ¦ Â

pptp	ҕ PPTP

Ю Ѝ Â

҇ VPDN-Group

ў ╟ Â

1΄ Ѝ L2TP Â

```
Ruijie(config-vpdn)# accept-dialin
Ruijie(config-vpdn-acc-in)# protocol l2tp
Ruijie(config-vpdn-acc-in)#
```

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5.3.11 source-ip

҇ VPDN-Group ( ) ˘ è **no** Â

source-ip *A.B.C.D*

no source-ip

A.B.C.D	VPDN-Group ( )

Ю ⁸ VPDN-Group ( ) Â

VPDN-Group

VPDN ╖ ( ) ˘ ж VPDN-Group ( ) б Â ҇ Ѧ ¯ ў ╟ ⁸ Â

1' VPDN-Group ѝ 202.101.92.73

```
Ruijie(config-vpdn)# source-ip 202.101.92.73
Ruijie(config-vpdn)#
```

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5.3.12 terminate-from

३ ў ˘ è **no** Â

terminate-from hostname *remote-hostname-string*

no terminate-from

remote-hostname-string	ў

Ю ў Â

३ VPDN-Group

ʌ Л ъ ३ ⁸ ў ˘ ў ˘
ж VPDN-Group a ⁸ ў Â ў
VPDN-Group ⁸ ў ╟

1' ў ѝ "LAC"

```
Ruijie(config-vpdn)# terminate-from hostname LAC
Ruijie(config-vpdn)#
```

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vpdn-group *vpdn-group-name*

no vpdn-group *vpdn-group-name*

vpdn-group-name	vpdn-group ¨

Ю vpdn-group Â

ৡ Â

ˈI LNS HGW … VPDN-Group Â Л Лъ ৡ VPDN-Group ÂVPDN-Group ў ╟ ⁸ Â

1ˈ … ¨ й"1" vpdn-group

```
Ruijie(config)# vpdn-group 1
Ruijie(config-vpdn)#
```

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5.3.15 vpn

ৡ VRF Â

vpn vrf *vrf-name*

no vpn vrf

vrf	vrf
vrf-name	vrf¨

Ю vrf˝ vrf

ѝ 1˘ ACK ł Â
ẗ ACK ˘ ‡
╗ 1˘ Â ACK ˘ RFC2637
˘ ж Â

1˙ pptp ѝ 32˙

```
Ruijie(config-vpdn)# accept-dialin
Ruijie(config-vpdn-acc-in)# protocol pptp
Ruijie(config-vpdn-acc-in)# exit
Ruijie(config-vpdn)# pptp flow-control receive-window 32
Ruijie(config-vpdn)#
```

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5.4.2 pptp flow-control static-rtt

ʒ ЬЖ pptp ł ACK ˘ è
no Â

pptp flow-control static-rtt *timeout-interval*

no pptp flow-control static-rtt

packets	pptp ł ACK ˘ Лъ ѝ æ Â ʎ 100---5000 Â

ѝ 1500 Â

ʒ vpdn-group

PPTP ж ʒ˘ Лъ ″I **protocol pptp** **protocol any**
ʒ ł˘ ʒ Â
PPTP RFC2637 ˘ PPTP ł ACK
ˆ ATO˘ Acknowledgment Time-Outs˜ ˘ ж ˘ è ╟
RTT˘ Round-Trip Time˜ Â ʒ static-rtt ѝ RTT

1˙ pptp ѝ 32˙

```
Ruijie(config-vpdn)# accept-dialin
Ruijie(config-vpdn-acc-in)# protocol pptp
Ruijie(config-vpdn-acc-in)# exit
Ruijie(config-vpdn)# pptp flow-control static-rtt 32
Ruijie(config-vpdn)#
```

३	
-	-

∧	
-	-

5.4.3 pptp tunnel echo

३ pptp ў ╟ echo request ˘ è **no** Â

pptp tunnel echo *echo-packet-interval*

no pptp tunnel echo

echo-packet-interval	pptp echo request ˘ Лъ ѝ Æ Â ∧ 0---1000 Â

३	
Ruijie(config-l2tp-class)# **password** password-string	३

ส

ส	
-	-

5.5.2 encapsulation (L2TP)

३ Â

encapsulation l2tpv2

l2tpv2	RFC 2661 L2TP Â

ЮЎ Â

Pseudowire-Class

pseudowire-class Э˘ ˝I Â

1˙ ѝ l2tpv2

```
Ruijie(config-pw-class)# encapsulation l2tpv2
```

३	
-	-

ส

ส	
-	-

5.5.3 hello

३ ѝ L2TP Keepalive Hello Â ३ **no** Â

hello *interval*

no hello

interval	Hello

Ю Hello й 60 Â

३ L2TP-Class

Л Лъ Hello Лъ L2TP ў Л Â
Л Hello

Л Лъ ў Лъ Â ў
L2TP ў Â

1˙ ў ѝ”LAC”

```
Ruijie(config-l2tp-class)# hostname LAC
Ruijie(config-l2tp-class)#
```

-	-

-	-

5.5.5 ip dfbit set

Â

ip dfbit set

no ip dfbit set

-	-

Â

Pseudowire-Class

Л Лъ ў Â
Э˘ a L2TP
Â

1˙

```
Ruijie(config-pw-class)# ip dfbit set
Ruijie(config-pw-class)#
```

-	-

no ip ttl

ttl-value	TTL ˘ ∧ ù 1~255

Ю IP TTL ù 255 Â

¾ Pseudowire-Class

∧ Л IP TTL Â IP
TTL ╟ ¯ ∧ Э˘ a L2TP
8 Â

1' IP TTL ù 253

```
Ruijie(config-pw-class)# ip ttl 253
Ruijie(config-pw-class)#
```

¾	
-	-

∧

∧	
-	-

5.5.8 l2tp-class

¾ ¨ l2tp-class ˘ a ¨ … Л ¨ ù¨
l2tp-class ˘ è **no** ¨ l2tp-class Â

l2tp-class *l2tp-class-name*

no l2tp-class *l2tp-class-name*

l2tp-class-name	L2TP-Class ¨

Ю L2TP-Class Â

¾

Л Л Ъ L2TP-Class L2TP 8 Â

1‘ … ¨ ѝ ”l2x” L2TP-Class

```
Ruijie(config)# l2tp-class l2x
Ruijie(config-l2tp-class)#
```

ৡ	

∧

ৡ	∧	
	-	-

5.5.10 l2tp tunnel authentication

ৡ ╖ ˘ è **no** Â

l2tp tunnel authentication

Ю a ⁸ ╗ Â

ৡ VPDN-Group Â

Л Л Ъ ⁸ ╗ ╗ Â ╗ ╟
L2TP ⁸ ў ╟ Â

1 ╟ ⁸ ╗ ╗
```
Ruijie(config-vpdn)# l2tp tunnel force_ipsec
Ruijie(config-vpdn)#
```

ৡ	
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Л

Л	
-	-

5.5.13 l2tp tunnel hello

ৡ Keepalive Hello ˘ è **no** Â

l2tp tunnel hello *interval*

no l2tp tunnel hello

interval	Hello ˘ Ъ и Æ

Ю Hello и 60 Â

ৡ VPDN-Group

Л Л Ъ Ъ ↓ Hello Â Hello
Л L2TP ⁸ ў ╟ Â

1 Hello и 30
```
Ruijie(config-vpdn)# l2tp tunnel hello 30
Ruijie(config-vpdn)#
```

Ю ⁸ ѝ 5˜ ⁸ ѝ 1 ˘ ѝ 8 Â

ৡ VPDN-Group

⁸ L2TP ⁸ ў ╟ Â

1˙ ⁸ ѝ 10

```
Ruijie(config-vpdn)# l2tp tunnel retransmit retries 10
Ruijie(config-vpdn)#
```

ৡ	
-	-

ʌ

ʌ	
-	-

5.5.17 l2tp tunnel timeout

ৡ L2TP / ⁸ ˘ è **no** Â

l2tp tunnel timeout {**no-session | setup**} *seconds*

no l2tp tunnel timeout {**no-session** | **setup**}

no-session	
setup	⁸ ( )
seconds	˘ Æ ѝ

Ю ѝ 600 ˘ ⁸ ( ) ѝ 300 Â

ৡ VPDN-Group

/ ⁸ ʌ

1 й 1200

```
Ruijie(config-vpdn)# l2tp tunnel timeout no-session 1200
Ruijie(config-vpdn)#
```

-	-

5.5.19 protocol (L2TP)

ৡ L2TP ⁸ ˘ è **no** Â

protocol l2tpv2 [*l2tp-class-name*]

no protocol

l2tpv2	L2TP ѝ
l2tp-class-name	L2TP-Class ¨

Ю˝ L2TPv2 ѝ L2TP Â

ৡ Pseudowire-Class

⁸ ⁄ L2TP ⁸ ў ╟ Â

1˙ ѝ l2tpv2 L2TP-Class l2x ⁸

```
Ruijie(config-pw-class)# protocol l2tpv2 l2x
Ruijie(config-pw-class)#
```

ৡ	
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⁄

ৡ	
-	-

5.5.20 pseudowire

ৡ pseudowire ‡˘ è **no** Â

pseudowire *peer-ip-address vcid* {**encapsulation l2tpv2** [**pw-class** *pw-class-name*] | **pw-class** *pw-class-name* }

no pseudowire

hostname pseudowire

pseudowire hostname *peer-hostname vcid* {**encapsulation l2tpv2** [**pw-class** *pw-class-name*] | **pw-class** *pw-class-name* }

no pseudowire

peer-ip-address	L2TP Server(LNS)
peer-hostname	L2TP Server LNS DNS
vcid	**pseudowire**
l2tpv2	l2tpv2(RFC 2661)
pw-class-name	pseudowire-class

pseudowire

pseudowire virtual-ppp virtual-ppp pseudowire L2TP

1 virtual-ppp pseudowire LNS 192.168.12.213 pseudowire-class "pw"

```
Ruijie(config)#
```

ip address negotiate
ip route 0.0.0.0 0.0.0.0 192.168.52.1

३	
-	-

initial-retries	SCCRQ
initial-timeout	SCCRQ
retries	è 8
timeout	è 8

Ю SCCRQ й 2 è 8 й 5 8
й 1 8 й 8 Â

३ L2TP-Class

8 ۱ L2TP 8 ў ╠ Â

1 SCCRQ й 3

```
Ruijie(config-l2tp-class)# retransmit initial retries 3
Ruijie(config-l2tp-class)#
```

३	
-	-

۱

۱	
-	- t setup 3.24.4 229.2 17.04 1.5 02>wC

8 L2TP

8 ў ╠

1 8 и 240

```
Ruijie(config-l2tp-class)# timeout setup 240
Ruijie(config-l2tp-class)#
```

ৡ	
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ৡ	ʌ	
	-	-

5.5.25 vpdn

ৡ L2tp vrf

vpdn vrf *vrf-name*

no vpdn vrf

३	
ip vrf	vrf

ภ

३	ภ	
	10.3ॅ 5˜	३

6 Tunnel

6.1

6.1.1 keepalive (tunnel interface)

GRE ŭ ╖ ˘ Ю ৡ'

keepalive [*seconds* [*retries*]]

no keepalive

seconds	ˆ ⁄ ˜ ˘ Æ Â 1˙ 32767 Â 10 Â
retries	Â ˘ ˘ ‡

6.1.2 tunnel checksum

tunnel checksum turnnel no

tunnel checksum

no tunnel checksum

-	-

a .

checksum tunnel checksum

1 tunnel 0 checksum .

```
Ruijie(config)#/TT5 1 5 Td(Ru7 0 Tw 13.9[[(chec)-8(nterface /C2_0 1 TfTT7 4
```

tunnel destination *ip-address*

no tunnel destination

Â

Â **tunnel key** GRE

1 tunnel 0 1234

```
Ruijie(config)# interface tunnel 0
Ruijie(config-if)# tunnel key 1234
```

ৡ ѝ init ’

ˉ ˘ ৲ ѝ learning˘ learning

’

ˉ 5 MTU ৲ ˘ ৲ ѝ keep˘ keep

’

1˙ tunnel 0 Э PMTUD ╖

```
Ruijie(config)# interface tunnel 0
Ruijie(config-if)# tunnel path-mtu-discovery
```

ৡ

ৡ	
show interfaces tunnel	tunnel

৲

ৡ

৲	
10.4	˙ ৡ 10.4˝ 2˜ Лъ ↓ ł Â

6.1.7 tunnel source

Ю **tunnel source** ৡ tunnel ˘ ৡ no tunnel Â

tunnel source { *ip-address* | *interface-type interface-number* }

no tunnel source

ip-address	tunnel IP ˘ Э è IP Â
interface-type	˘ ˙ Async à ৲ Dialer à Лъ Ethernet à Лъ FastEthernet à Loopback à Null à Лъ ↓ è Tunnel Â
interface-number	৲

Â

ৡ Â

tunnel ˘ Â

1˙ tunnel 0 Э ҳ **tunnel source** 1/0 ѝ

```
Ruijie(config)# interface tunnel 0
Ruijie(config-if)# tunnel source serial 1/0
```

ҳ

ҳ	
show interfaces tunnel	tunnel

Л

ҳ

Л	
-	-

6.1.8 tunnel tos

tunnel Ю IPv4 ToS

tunnel tos [*num*]

no tunnel tos

num	IPv4 ToS ÂЧ 0˙ 255 Â

б ˘ IPv4 ˘ ‡ IPv4 tos IPv4 Â è ˘ IPv4 tos ѝ Â

ҳ Â

GRE ″I ˘ Л Љ tunnel tos ҳ Â ˙ ҳ 10.4˜ 2˜ Љ Ч ђ Â

1˙ interface tunnel 1 GRE ToS 20˝ γ ⁸ 00010100 Â

```
Ruijie(config)# interface tunnel 1
Ruijie(config-if)# tunnel tos 20
```

ҳ

ҳ	
show interfaces tunnel	tunnel Â

6.1.10 tunnel vrf

IPv4 VRF Â Ю ৲'

tunnel vrf

-	-

Â

ৡ Â

ˇ ʌ GRE ˇ a ÿ show running ɬ Â ৡ ʌ Â

1ʹ GRE ˇ ɹ Â

```
Ruijie# show tunnel gre
Tunnel1:
Mode:GRE/IP, Destination 192.168.2.2, Source vlan 100
```

ৡ

ৡ	
show interfaces tunnel	tunnel Â

ʌ

ৡ

ʌ	
10.4	RGOS 10.4

7 IPSec

7.1

7.1.1 authentication (IKE policy)

IKE ˘ IKE ३ **authentication** Â ३ **no** Â

authentication {**pre-share**|**rsa-sig**|**digital-email** }

no authentication

lifetime	IKE Â

ग

३	
ग	
-	-

7.1.2 clear crypto isakmp

IKE ˘ EXEC ३ **clear crypto isakmp** Â

clear crypto isakmp [*connection-id*]

connection-id	IKE ID ग Â

connection-id ˘ ‡ ३ IKE

३ EXEC Â

ЮЎ ग é IKE ˘ ग Л Ъ ”I **show crypto isakmp sa** ३ ID ग ˘ ł Ą **clear crypto isakmp** ID é IKE Â

Â

३	
३	

ग

३	
ग	
-	-

7.1.3 clear crypto sa

IPSec ˘ ЛЪЮ EXEC ३ **clear crypto sa** Â

clear crypto sa

clear crypto sa peer { *ip-address* | *peer-name*}

clear crypto sa map *map-name*

clear crypto sa spi *destination-address* {**ah** | **esp**} *spi*

ip-address	IP Â
Peer-name	ў ¨
Map-name	╕ ¨
Destination-address	IP
Spi	

a **peer** à **map** à **spi** IPSec ‟ ˘ ‡ IPSec Â

EXEC Â

1. Э ३ IPSec ˘ **peer** à **map** à **spi** ˘ ‡ IPSec Â
2. IKE ˘ ж ˘ IPSec ˘ IPSec Â ˘ ж з ¨ Â
3. ˘ Л ł ˘ a Â й ˘ Л ३ ˘ Â
4. ˘ ˘ й a è IPSec ˘ **peer** à **map** à **spi** Â
5. ˘ Л ˘ è ж ˘ Л Л Ъ Â

1ˈ Ю ‘

```
Ruijie# clear crypto  sa
```

३	
clear crypto isakmp	IKE

Â

Л	
-	-

7.1.4 crypto dynamic-map

… ╟ ╕ ╕ ˘ **crypto dynamic-map** ३ Â
३ **no** ╕ Â

crypto dynamic-map *dynamic-map-name dynamic-seq-num*

no crypto dynamic-map *dynamic-map-name* [*dynamic-seq-num*]

dynamic-map-name	╕ ¨
dynamic-seq-num	╕ ⁄

╟ ╕ Â

३ Â

३	
crypto map(interface IPSec)	╕
match address	ѝ ╕ “ “ Â
Set peer	
Set transform-set	⁄
show crypto map	╕

⁄

⁄	
-	-

–

set	IP DF Bit 1˜ DF Bit ˇ / †	IP

1' Ю à IPSec '

```
Ruijie(config)# crypto ipsec multcast disable
```

३	
-	-

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३	ʌ	
-		-

7.1.7 crypto ipsec optional

Ю crypto ipsec optional ३ ipsec Â

crypto ipsec optional

no crypto ipsec optional

३

३ Â

˘ ╗ ʌ Ɽ cpu Âl2tp over ipsec

˘ l2tp ʌ Ɽ ⁸ ipsec ╗ ˘ ≠ ʌ Ɽ ipsec ╗ Â ʌ Ɽ

1' ʌ

```
crypto ipsec optional
```

३	
-	-

ʌ

३	ʌ	

Ruijie(config)# **crypto ipsec profile** profile-name
Ruijie(config-crypto-map)# **set transform-set myset**

IKE

३	
tunnel protection ipsec profile (interface IPSec)	╗ Tunnel
Set transform-set	∤
show crypto map	╗

∤

३	
-	-

7.1.9 crypto ipsec security-association lifetime

IPSec ˇ ∤ Л **crypto ipsec security-association lifetime** ३ Â ३ **no** -cryptorit6 Td[(security-aifeashoA7(ssocifei)8(iation)61

a Â ˘ Л Ъ **clear crypto sa** ३
ĵ Â

3.

˘ a

३ Â

३ ł a ˘ Л Ц ˘ ˚ ˘ dos Л ╗ Â

Router(config)# **crypto ipsec security-association replay disable**

1. à Л ٧ ٧ IPSec è Â IPSec
˘ ˘ ١ Â
2. ١ ˘ ł ╗ ١ Â ╗
Ж ١ IPSec ˘ Л ╗
“ Â ˘ ٧ ٧ Э
˘ ١ Â ١ ˘ ˘ й ٧
IPSec ˚ ٧ Э Â
3. ˘ a ˘ ч
˘ ١ Â

1˙ Ю Ж ١ ˘ й ESP-DES-MD5˜ ╗ Ь˜ ·

```
Ruijie(config)# crypto ipsec transform-set myset esp-des
esp-md5-hmac
```

३	
show crypto ipsec transform-set	١

Â

١	
-	-

7.1.12 crypto isakmp enable

IKE IPSec ˘ ˝I IKE Â IKE˜ ३
crypto isakmp enable Â ३ **no** IKE Â

crypto isakmp enable

no crypto isakmp enable

-	-

1˙ Ю IKE˙

```
Ruijie(config)# crypto isakmp enable
```

३	
-	-

/ı

/ı	
-	-

7.1.13 crypto isakmp key

IKE ˘ ३ **crypto isakmp key** Â ३ **no** Â

crypto isakmp key { **0** | **7** } *keystring* { **hostname** *peer-hostname* | **address** *peer-address* [*mask*] }

no crypto isakmp key { **0** | **7**} *keystring* { **hostname** *peer-hostname* | **address** *peer-address* [*mask*] }

**0	7** ˙	0 ѝ 7 ѝ
keystring	˘ /ı Л҃ 128 Â
peer-hostname	

३	
crypto isakmp enable	IKE Â
encryption {**des | 3des | aes-128 | aes-192 | aes-256 | sm1**}	╗
hash {**sha | md5**}	HASH

३

crypto isakmp keepalive

-	-

ʌ

३	
ʌ	
-	-

7.1.16 crypto isakmp nat disable

nat- traversal ╖ ˘ ЮО Â

crypto isakmp nat disable

no crypto isakmp nat disable

-	-

nat-traversal

३ Â

˘ nat-traversal ╖ ˘ ЮО ʌ Лъ
nat-traversal ╖ ˘ Â

1˙ ЮО nat-traversal ╖ ˙

```
Ruijie(config)# crypto isakmp nat disable
```

३	
-	-

ʌ

३	
ʌ	
-	-

7.1.17 crypto isakmp nat keepalive

RFC3947˝ IPSEC NAT-ť ╗ UDP ˘ ᾱ nat Â ѝ nat ˘ Лъ keepalive Â

crypto isakmp nat keepalive *secs*

no crypto isakmp nat keepalive

secs	˘ 5 3600

à

5†

३

crypto isakmp nat keepalive ३ keepalive ˘ a
IO 5†

1' keepalive 1†

```
crypto isakmp nat keepalive 60
```

a ѝ Ơ a ѣ ˇ Ÿ Â

1ʻ Ю next-payload ʻ

```
Ruijie(config)# crypto isakmp next-payload disable
```

३	
-	-

ʌ

ʌ	
-	-

7.1.19 crypto isakmp peer

peer Ю peer ʌ Л ,**crypto isakmp peer**

crypto isakmp peer {bind|random}

no crypto isakmp policy

bind	3G ˇ 3G peer ʌˇ ipsec ʌ ˇ ˇ ʌ peer
random	peer

Ю ˇ ÿ peer Â

Â

3G ˇ 3G ʌ ʌ ˇ ipsec map peer ˇ ʌ Л peer ╗ ˇ ╗ ʌ Â

ŭ ‡ peerˇ Â

```
Ruijie(config)# crypto isakmp peer random
```

३	
set peer	╗

⁄	
-	-

```
encryption algorithm:   DES - Data Encryption Standard (56 bit keys).
hash algorithm:         Secure Hash Standard
authentication method:  Pre-Shared Key
Diffie-Hellman group:   #2 (1024 bit)
lifetime:               3600 seconds
Default protection suite
encryption algorithm:   DES - Data Encryption Standard (56 bit keys).
hash algorithm:         Secure Hash Standard
authentication method:  Rsa-Sig
Diffie-Hellman group:   #1 (768 bit)
lifetime:               3600 seconds
```

३	
crypto isakmp enable	IKE Â
encryption {**des | 3des | aes-128 | aes-192 | aes-256 | sm1**}	╗
hash {**sha** | **md5**}	HASH
authentication {**pre-share** | **rsa-sig**}	
group {**1** | **2**}	Diffie-Hellman
lifetime	IKE Â

⁄ı	
-	-

7.1.21 crypto isakmp rg-sm1

३ SM1 IKE Â

crypto isakmp rg-sm1

no crypto isakmp rg-sm1

-	-

३ Â

SM1 ╗ à ˘ ʌ Ɲ ३ Â

1ʻ Ю IKE ʻ

```
Ruijie(config)# crypto isakmp rg-sm1
```

३	
-	-

ʌ

ʌ	
-	-

7.1.22 crypto isakmp vendorid disable

IKE Â

crypto isakmp vendorid disable

no crypto isakmp vendorid disable

-	-

ȯ ЮÂ IKE Â

३ Â

IKE ˘ a VID˘ a ˘ ʌ Ɲ Դ

ʌ

३

ʌ	
-	-

7.1.23 crypto map (global IPSec)

… ╕ ˘ ३ **crypto map** Â ३ **no** ʌ ╕ Â

crypto map *map-name seq-num* **ipsec-manual**

crypto map *map-name seq-num* **ipsec-isakmp** [**dynamic**

dynamic-map-name]

no crypto map *map-name* [*seq-num*]

map-name	╕ ¨
seq-num	╕ “ ʌ
ipsec-manual	IPSec Â
ipsec-isakmp	IKE IPSec Â
dynamic-map-name	ѝ ╟ ╕ ¨

a ╕

३ ˘ ३ ╕ Â

IPSec ╕ ˘ ”I ЬЖ ╕ ˘ ł ╕
έ Â ╕ ЬЖ╕ ˘ ў ЛЬЮ ‘

1. ʌ IPSec ‘ ╕ “ Â
2. ʌ IPSec ‘ IPSec Â
3. IPSec ‘ ╕ Э˘ IPSec ѝ Â
4. IPSec ‘ ў ʅ “ Â
5. Â
6. IKE Â

έ ˚ ╕ ¨ ^ “ ʌ a˚ ˜ ╕ ╕ Â ╕ Э˘ IP Э ╕ Â ╕ ʌ IP ˘ з ╕ IKE˘ ╕ б

, ╗ ˘ ж

Â IKE ˘ Л ╗ ˘

╗ ˘ ˘ Â

╗ ˘ ѝ ч IPSec

IPSec ˘ ч ╗

Л Â ч ي ˘ Л ╗

5, p lpsÆ • P RpNKQF,

1Lã Ðs N ’Œ !5B ¡¿A € 5 Û n ü lc Ø •ÓRÌ È crypto dynamic-mn

Set transform-set	۱
show crypto map	╗

۱

۱	
-	-

३

7.1.24 crypto map (interface IPSec)

ˮI ЬЖ ╗ Э˘ ۱ Л৬ **crypto map** ३ Â ३
no ÿ Э ۸ ╗ Â

crypto map *map-name*

no crypto map [*map-name*]

map-name	╗ ¨

╗ Э

३ Â

३ ╗ Â Э IPSec ╗ ˘
╗ Â ˘ ۱ ╗ Â
╗ é ˚ map-name a˚ seq-num˘ ж æ ˚
˘ ˚ Э˘ ж Seq-num ╗ ˮI ˘ з ˮI
Â
╗ ۱ Э

1˙ Ю ¨ ѝ mymap ╗ s0 Э˙

```
Ruijie(config)# interface serial 0
Ruijie(config-if)# crypto map mymap
```

३

३	
crypto map(global IPSec)	ЬЖ╗
show crypto map	╗

ʌ

३	ʌ	
	-	-

7.1.25 crypto map local-address

IPSec ˘ ३ **crypto map local-address** Â ३ **no** ʌ IPSec Â

crypto map *map-name* **local-address** *interface-type interface-number*

no crypto map *map-name* **local-address**

map-name	IPSec ╗ ¨

7.1.27 crypto software

˚ ╗ . ˘ Ÿ ˚ ╗ ˘ ३ **crypto software**

-	-

˚ ╗ ˘ ╠ ˚ ╗

३ Â

G!$XÄAÈ â ð!ö(p#•Â ñ € M ´ Ä!þf„rf"9 4ïf„rf"9 $ï° P #' air Sf˜0 . p–3qAf˚V'lgp•i –w c7 i%3qA

ҁ	}	ẃ	M	ϒ	T

7.1.30 debug crypto isakmp

IKE Y˚ **debug** Â

debug crypto isakmp

no debug crypto isakmp

-	-

Â

३

Â

Â

३	

/।

/।	
-	-

7.1.31 encryption (IKE policy)

IKE ╕ ˘ IKE ३ **encryption** Â ३ no Â

encryption {des|3des|aes-128|aes-192|aes-256|sm1}

no encryption

des

aes-256	ѝ 256 AES ѝ ╗ Â
sm1	ѝ 128 SM1 ѝ ╗ Â

56 DES-CBC ╗ Â

३ IKE Â

३ ╗ IKE ╗ ˘ a˚ IPSec ╗ Â

1˙ Ю IKE ╗ ѝ DES˙

```
Ruijie(config)# crypto isakmp policy 10
Ruijie(isakmp-policy)# encryption des
```

३	
crypto isakmp enable	IKE Â
hash {**sha** | **md5**}	HASH
authentication {**pre-share** | **rsa-sig**}	
group {**1** | **2**}	Diffie-Hellman
lifetime	IKE Â

/ı

/ı	
-	-

7.1.32 group (IKE policy)

IKE Diffie-Hellman ˘ IKE ३ **group** Â ३ **no** Diffie-Hellman ѝ Â

group {**1**|**2**}

no group

1	768 Diffie-Hellman Â
2	1024 Diffie-Hellman Â

768 Diffie-Hellman ˆ group 1˜

३ IKE Â

३ IKE Diffie-Hellman Â

1˙ IO IKE Diffie-Hellman ù 1024 ˙

```
Ruijie(config)# crypto  isakmp policy 10
Ruijie(isakmp-policy)# group 2
```

३	
crypto isakmp enable	IKE Â
encryption {**des | 3des | aes-128 | aes-192 | aes-256 | sm1**}	╗
hash {**sha | md5**}	HASH
authentication {**pre-share | rsa-sig**}	
lifetime	IKE Â

३

४ ú ø ø ה ה @˙ ƀ

३ IKE Â

३ IKE HASH Â

1˙ Ю HASH й md5˙

```
Ruijie(config)# crypto  isakmp policy 10
Ruijie(isakmp-policy)# hash md5
```

३	
crypto isakmp enable	IKE Â
encryption {**des | 3des | aes-128 | aes-192 | aes-256 | sm1**}	╗
authentication {**pre-share | rsa-sig**}	
group {**1 | 2**}	Diffie-Hellman
lifetime	IKE Â

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-	-

7.1.34 lifetime (IKE policy)

IKE ˘ IKE ३ **lifetime** Â ३ **no** й Â

lifetime *seconds*

no lifetime

seconds	IKE ˆ ˜ Â 60 86400 Â

86400 ˆ 1 ˜

३ IKE Â

३ IKE Â IKE ˘ ˚ Y
ѝ ѐ Э Â Э IKE
˘ Э IKE Â
SA SA Â
IPSec IKE Э ˘ ˘ IPSec
˘ IKE Â ˘ ʌ
˘ ¨ ˘ ʌ ˘ ˘ ʌ
˘ ˆ ˜ Â

1˙ Ю IKE ѝ 1000 ˙

```
Ruijie(config)# crypto  isakmp policy 10
Ruijie(isakmp-policy)# lifetime 1000
```

३	
crypto isakmp enable	IKE Â
encryption {**des | 3des | aes-128 | aes-192 | aes-256 | sm1**}	╗
hash {**sha | md5**}	HASH
authentication {**pre-share | rsa-sig**}	
group {**1 | 2**}	Diffie-Hellman

ʌ

ʌ	
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7.1.35 match address (IPSec)

╗ “ ˘ ╗ ३ **match address** Â ३ **no**
╗ “ Â

match address *access-list-number*

no match address

access-list-number	“ ʌ˜ 100-199˝ 2000-2699˝ 2900-3899˜ ˘ ╗ ʌ IP “ Â

╕

३ ╗ ⁄

⁄ IPSec ’ è ˆ
è Ю ˜ Â
é IPSec ˚ IP ¨ IPSec
˘ ३ ˘ ж ˘ ˘ ⁄ ⁄
⁄ ⁄ ⁄ Â ˘ ж ˘ ३ ⁄
⁄ Â

1‘ Ю ⁄ ѝ ‘

```
Ruijie(config)# crypto ipsec transform-set  myset
Ruijie(cfg-crypto-trans)# mode tunnel
```

३	
crypto ipsec transform-set	Ю╗ ⁄

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⁄	
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7.1.38 reverse-route

⁄ ą̈ ╗ ˘ ł ł ipsec ╟ ╗ ˘ ą̈
˘ ip

reverse-route [remote-peer *ip-address***] [***distance***] [tag** *tagvalue***] [track** *trackvalue***]**

no reverse-route [remote-peer *ip-address***] [***distance***] [tag** *tagvalue***] [track** *trackvalue***]**

ip-address	Ю ˘ ⁄
distance	Ю
tagvalue	tag
trackvalue	track

a Â

३ ╕

╕ Л Ъ show ip route
debug crypto ipsec ३ Л Ъ ╕

1˙ Ю ╕ Л й myseť

```
Ruijie(config)# crypto  map mymap 5 ipsec-isakmp
Ruijie(config-crypto-map)# reverse-route
```

1˙ ЛЬЮ ˙

```
Ruijie(config)# self-identity fqdn
```

self-identity fqdnelf-identity fqdn

match address	ѝ ╗ ‟ ‟ Â
Set peer	
Set transform-set	∤
show crypto map	╗

३	
crypto map(interface IPSec)	╗
match address	ѝ ╗ “ “ Â
Set peer	
Set transform-set	∤
show crypto map	╗

∤

∤	
-	-

7.1.42 set local (IPSec)

╗ ipў ╗ ३ **set local** Â ३ **no** ╗ Â

set local *ip-address*

no set local *ip-address*

ip-address	IP

a

३ ╗ Â

ip ˘ Ю ў Â ł

1ʻ Ю ѝ ╗ mymap ˆ 2.2.2.2˜ ʻ

```
Ruijie(config)# crypto map mymap 5 ipsec-isakmp
Ruijie(config-crypto-map)# set local 2.2.2.2
```

३	
crypto map(global IPSec)	Ж╖
show crypto map	╖
crypto map(interface IPSec)	Э ╖

/

/ ३	
-	-

7.1.43 set peer (IPSec)

╖ ˘ ╖ ३ **set peer** Â ३ **no** ╖ Â

set peer {*hostname* | *ip-address* } [*trustpoint1* [*trustpoint2*]]

no set peer { *hostname* | *ip-address* }

ip-address	IP
hostname	ў ¨
trustpoint1	
trustpoint2	

a

३ ╖ Â

╖ Â
˘ peer ˘
Ю ca Â ca
Â

1' Ю й ╖ mymap ˆ 2.2.2.2˜ '

```
Ruijie(config)# crypto map mymap 5 ipsec-isakmp
Ruijie(config-crypto-map)# set peer 2.2.2.2
```

३	
crypto map(global IPSec)	Нж╖
show crypto map	╖
crypto map(interface IPSec)	Э ╖

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-	-

7.1.44 set pfs (IPSec)

ipsec Diffie-Hellman

set pfs {**group1** | **group2**}

no set pfs

group1	768 Æ
group2	1024 Æ

a Diffie-Hellman

╖ Â

ipsec Diffie-Hellman

1' Ю ѝ ╖ mymap 1024 Æ Diffie-Hellman

```
Ruijie(config)# crypto map mymap 5 ipsec-isakmp
Ruijie(config-crypto-map)# set pfs group2
```

३	
crypto map(global IPSec)	Нж╖
show crypto map	╖
crypto map(interface IPSec)	Э ╖

ˆ IPSec˜ ३

crypto map(interface IPSec)	Э ╗
crypto ipsec security-association lifetime	

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३	
ﾊ	
-	-

7.1.46 set session-key

… ˘ ﾊ ३ ѝ ﾍ
ˆ SPIs˜ Â ३ no ˆ SPIs˜ Â

set session-key { inbound | outbound} ah *spi hex-key-data*

set session-key { inbound | outbound} esp *spi* **cipher** *hex-key-data* **[authenticator** *hex-key-data***]**

no set session-key { inbound | outbound} ah

no set session-key { inbound | outbound} esp

spi	
hex-key-data	16 8

a ű

crypto map(global IPSec) ipsec-manual	Hx╕
show crypto map	╕
crypto map(interface IPSec)	Э ╕

/ı

३	/ ı	
	-	-

7.1.47 set transform-set

ѝ ╕ ı ˘ ╕ ३ **set transform-set** Â
३ **no** ╕ ı Â

Set transform-set *transform-set-name1* [*transform-set-name2*] [*transform-set-name3*] [*transform-set-name4*] [*transform-set-name5*] [*transform-set-name6*]

no set transform-set

transform-set-name1	˘
[transform-set-name2]	˘
[transform-set-name3]	˘
[transform-set-name4]	˘
[transform-set-name5]	˘
[transform-set-name6]	

३	
crypto map(global IPSec)	Ж╕
show crypto map	# Д Д

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३

ʌ	
-	-

7.1.49 tunnel protection ipsec profile (interface IPSec for IPSec-Profile)

ʺI ЊЖ ╕ Profile Tunnel Э˘ ʌ Л Ъ **tunnel protection ipsec profile** ३ Â ३ **no** ÿ Э ʌ ╕ Â

tunnel protection ipsec profile [*profile-name*]

no tunnel protection ipsec profile [*profile-name*]

profile-name	Profile ╕ ¨

╕ Tunnel Э

३ Â

३ ╕ Â Tunnel Э IPSec ╕
˘ ╕ Â ˘ ʌ ╕
Â

~ ‘ Profile map ʌ GRE à IPIP à IPV6 Tunnel Э ˘
a Tunnel Э˘ ˘ Tunnel й Profile a
˘ Tunnel Э map Â

1‘ Ю ¨ й profile-name ╕ Tunnel 1 Э‘

```
Ruijie(config)# interface tunnel 1
Ruijie(config-if-Tunnel 1) # tunnel protection ipsec profile profile-name
```

३	
crypto map(global IPSec)	ЊЖ╕
show crypto map	╕

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३	ʌ	

sa Â

show crypto ipsec sa

-	-

३ EXEC Â

1˙ Ю ३ ˙

Interface: GigabitEthernet 1/0/0

Crypto map tag:mymap, local addr 2.2.2.3

// ╗ ¨ mymap˘ 2.2.2.3

media mtu 1500

==========

sub_map type:static, seqno:7, id=0

local ident (addr/mask/prot/port): (2.2.2.3/0.0.0.0/0/0))

remote ident (addr/mask/prot/port): (2.2.2.2/0.0.0.0/0/0))

PERMIT// 2.2.2.3 2.2.2.2

#pkts encaps: 0, #pkts encrypt: 0, #pkts digest 0

#pkts decaps: 0, #pkts decrypt: 0, #pkts verify 0

#send errors 0, #recv errors 0

// ˘ ѝ˙ ˘ ╗ ˘ ˘ ˘ ╗ ˘ ˘ ˘

Inbound esp sas: // ˘ ѝ ESP

spi:0x79b8e4bb (2042160315) //spi ѝ 2042160315

transform: esp-3des // ∧ ѝ esp-3des

in use settings={Tunnel,} //

crypto map mymap 7

sa timing: remaining key lifetime (k/sec): (4607000/3505)

// ˙ 4607000 /3505

IV size: 8 bytes //IV ¤ ѝ 8

max reply windows size: 0

Replay detection support:Y //

Outbound esp sas: // ˘ ѝ ESP

spi:0x293b8b55 (691768149) //spi ѝ 691768149

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7.2.4 show crypto isakmp policy

IKE ˇ EXEC ३ **show** **3.5 104.34g/Ty0 1 Tf( )TjET0.754 g65T**

lifetime: 86400seconds

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7.2.5 show crypto isakmp sa

Э ╠ IKE ˘ EXEC ३ **show crypto isakmp sa** Â

show crypto isakmp sa

-	-

३ EXEC Â

1' Ю ३ '

```
Ruijie#!!show crypto  isakmp sa!
 destination   source    state     conn-id   lifetime(second)
 1.1.1.1       1.1.1.2  IKE_IDLE  59        32254
```

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ส

ส	
-	-

7.2.6 show crypto map (IPSec)

╕ ˘ EXEC ३ **show crypto map** Â

show crypto map [*map-name*]

map-name	╕ ¨ Â

╕ ¨ ˘ ‡ Э ╕ Â

३ EXEC Â

1' Ю ३ '

```
Ruijie#show crypto map

Crypto Map:"mymap1" 1 ipsec-isakmp, (Complete)
       Extended IP access list 100
       Security association lifetime: 0 kilobytes/120 seconds(id=2)
       PFS (Y/N): N
       Transform sets = { myset3,  }

       Interfaces using crypto map mymap1:
              GigabitEthernet 1/1/0
```

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8

8.1

8.1.1 certificate

╗ ˘ ^ config-cert-chain˜ Ю **certificate** ҂ Â è **no** Â

certificate [**ca**] *certificate-serial-number*

no certificate [**ca**] *certificate-serial-number*

ca	CA
certificate-serial-number	╗ ‟ ⁄

Â

^ config-cert-chain˜ Â

⁄ Л҃ ҂ Ю Â ˘ Â ҂ Â

1ʹ Ю Â show ҂ ‟ ⁄ʹ

```
Ruijie# show crypto pki certificate
Â Â Â˘ Â Â Â
%Router certificate info:
Certificate:
Data:
Version: 3 (0x2)
Serial Number:
16:2a:7a:1d:00:00:00:00:00:02
Signature Algorithm: sha1WithRSAEncryption
Â Â Â˘ Â Â Â
Ruijie# config t
```

```
Ruijie(config)# crypto pki certificate chain ca_name
Ruijie(config-cert-chain)# no certificate 162a7a1d000000000002
Ruijie(config-cert-chain)# exit
Ruijie(config)#
```

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crypto pki certificate chain	ʒ

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-	-

8.1.2 crypto pki authenticate

SCEP ʌ ˘ ʌ CA ˘ ЮO

crypto pki authenticate ʒ Â

crypto pki authenticate *ca_name*

ca_name	ca_name ѝ CA Ω ¨

Â

ʒ Â

```
router(config)#crypto pki authenticate CA
Certificate has the following attributes:
MD5 fingerprint: B4DE1DD7 E9902423 5E6330D7 D750A432
SHA1 fingerprint: AD070162 672A7C57 BD5EE522 A95AAFA1 351524D0
```

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Λ	
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8.1.3 crypto pki certificate chain

ˆ config-cert-chain˜˜ Ю **crypto pki certificate chain** ϟ Â Ю ˜ Лъ è **NO** Λ ↓ è Â

crypto pki certificate chain *ca_name*

no crypto pki certificate chain *ca_name*

ca_name	ca_name й CA Ώ ¨

Â

ϟ Â

crypto pki certificate peer *ip_address*

ip_address	ip

Â

pem

crypto pki certificate peer address 192.168.50.203 // IP

% Enter PEM-formatted peer certificate.
% End with a blank line or "quit" on a line by itself.
//
quit
import peer certificate success.

Router(config)#crypto pki certificate peer address 192.168.50.203 // IP

% Enter PEM-formatted peer certificate.
% End with a blank line or "quit" on a line by itself.
-----BEGIN CERTIFICATE-----
MIIDLjCCAtigAwIBAgIQVq4HPBChfoxFro0/FVIzVzANBgkqhkiG9w0BAQUFADCB
rDEhMB8GCSqGSIb3DQEJARYSZGluZ2pzQHN0YXItbmV0LmNuMQswCQYDVQQG
EwJD
TjEPMA0GA1UECBMGRnVKaWFuMQ8wDQYDVQQHEwZGdVpob3UxIDAeBgNVBA
oTF1Jl
Z2lhbnQgTmV0d29yayBDby4gTHRkMR0wGwYDVQQLExRSZXNlYXJjaCBBcGFydG
1l
bnQgNTEXMBUGA1UEAxMOQ0EgdGVzdCBzZXJ2ZXIwHh

```
Ruijie(config)# crypto pki crl request trustpoint
%Crypto pki crl request command: start crl download task!
Ruijie(config)#
%Crl download and decode successfully!
Ruijie(config)# exit
Ruijie#dir
Directory of flash:/
5    an      68 0xdbc28957 Jan  1 2005 00:00:00 tftp_config.bin
8    an  4301816 0x3e415b47 Jun 28 2005 15:03:46 RGOS.bin
27    an    5331 0xaf1d58ec Jun 29 2005 10:05:20 config.text
34    an     427 0x5bd43f32 Jun 29 2005 12:50:41 certcrl.crl
```

crypto pki crl url	IO CRL URL

-	-

8.1.6 crypto pki crl url

IO CRL URL IO **crypto pki crl url**

http://www.myca.cn/certsrv/mycertcrl.crl’ url_string a ˘
˘ Л l’ %20 Ł ʒ ˘ ‘
http://www.myca.cn/CertEnroll/CA%20Server.crl Â

url_string ¨ Л Љ IP ˘ http://202.101.211.123/’ ≠ Л Љ
ў ¨ ˘ http://myserver/ Â a URL ÿ ˘ Ю
CRL ╟ ¨ ў ¨ ˘ Â
¨ ˘ ‡ DNS Ь ’ ў ¨ ˘ ip host
ʒ ў IP Â

1‘ ЉЊО crypto pki crl url ‘

```
http://www.myca.cn/certsrv/certcrl.crl
http://www.myca.cn:1010/certsrv/
http://www.myca.cn:80/certsrv
http://www.myca.cn/certcrl.crl
http://www.myca.cn:80/
http://www.myca.cn:1220
http://www.myca.cn
http://www.myca.cn/CertEnroll/CA%20Server.crl
http://202.101.211.123/certsrv/certcrl.crl
```

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crypto pki crl request	Ю CRL ˚ ʒ

Л Â

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8.1.7 crypto pki enroll

SCEP Л ˘ ’Ą˘ Ю **crypto pki enroll** ʒ Â

crypto pki enroll *ca_name*

ca_name	CA_name и CA ’Ω ¨

Â

ʒ Â

router(config)#crypto pki enroll CA

%

%Start certificate enrollment ..

%Create a challenge password. You will need to verbally provide this password to the CA Administrator in order to revoke your certificate. For security reasons your password will not be saved in the configuration.Please make a note of it.

Password:F4EEE4FEB3766007 // ÿ CA

Re-enter password:F4EEE4FEB3766007

%The subject name in the certificate will include: router

crypto pki trustpoint	trustpoint

Â

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8.1.8 crypto pki import crl

ÿ TFTP CRL˘ Ю **crypto pki import** *ca_name* **crl** *tftp_url* Â **No** Â

crypto pki import *ca_name* **crl** *tftp_url*

ca_name	ca_name ˆ trustpoint˜ CA
terminal	ÿ
tftp_url	CRL TFTP URL Â

Â

Â

Â a PEM RSA Â PKI PC Â

-	-

[illegible]	[illegible]
[illegible] 10.4(3b15)	[illegible] 10.4(3b15)

8.1.9 crypto pki import pem

ÿ PEM Privacy-enhanced Mail RSA

[illegible]

```
MIIDLjCCAtigAwIBAgIQVq4HPBChfoxFro0/FVIzVzANBgkqhkiG9w0BAQUFADCB
rDEhMB8GCSqGSIb3DQEJARYSZGluZ2pzQHN0YXItbmV0LmNuMQswCQYDVQQGEwJD
TjEPMA0GA1UECBMGRnVKaWFuMQ8wDQYDVQQHEwZGdVpob3UxIDAeBgNVBAoTF1Jl
Z2lhbnQgTmV0d29yayBDby4gTHRkMR0wGwYDVQQLExRSZXNlYXJjaCBBcGFydG1l
bnQgNTEXMBUGA1UEAxMOQ0EgdGVzdCBzZXJ2ZXIwHhcNMDUwMjI1MDg0NjAyWhcN
MDcwMzAxMDIzNjIzWjCBrDEhMB8GCSqGSIb3DQEJARYSZGluZ2pzQHN0YXItbmV0
LmNuMQswCQYDVQQGEwJDTjEPMA0GA1UECBMGRnVKaWFuMQ8wDQYDVQQHEwZGdVpo
b3UxIDAeBgNVBAoTF1JlZ2lhbnQgTmV0d29yayBDby4gTHRkMR0wGwYDVQQLExRS
ZXNlYXJjaCBBcGFydG1lbnQgNTEXMBUGA1UEAxMOQ0EgdGVzdCBzZXJ2ZXIwXDAN
BgkqhkiG9w0BAQEFAANLADBIAkEA2R8axg75UZJM3JZNREP62r5T8t31E7Y0taah
n/1XoWxvevShE8FZPQxMPo5i3nbYokzyLPjagqoX0+jMgMKVjwIDAQABo4HTMIHQ
MAsGA1UdDwQEAwIBxjAPBgNVHRMBAf8EBTADAQH/MB0GA1UdDgQWBBRyQ4QcKwNF
LYJY9YRDd/UhqkssITB/BgNVHR8EeDB2MDigNqA0hjJodHRwOi8vemotcm91dGVy
L0NlcnRFbnJvbGwvQ0ElMjB0ZXN0JTIwc2VydmVyLmNybDA6oDigNoY0ZmlsZTov
L1xcemotcm91dGVyXENlcnRFbnJvbGxcQ0ElMjB0ZXN0JTIwc2VydmVyLmNybDAQ
BgkrBgEEAYI3FQEEAwIBATANBgkqhkiG9w0BAQUFAANBAH8ufRZ2tVYO3R7YC0IF
OzmnQrjgaBN4bpmSLkxYYKtK8ZNjo0FwUL11aq6nCGp6n8Ks0dijoMxnedB2zn0a
f0w=
-----END CERTIFICATE-----
quit
Certificate has the following attributes:
Fingerprint: B286A3F4 4930D46D 81D4A544 885D611C
//CA
% Do you accept this certificate? [yes/no]: yes
//
% Certificate successfully imported
% Enter PEM-formatted encrypted private key.
//       PEM
% End with "quit" on a line by itself.
//       ľ quit Ł
//          ˘        ˘    Ю
-----BEGIN RSA PRIVATE KEY-----
Proc-Type: 4,ENCRYPTED
DEK-Info: DES-EDE3-CBC,251F9D955610C376

GDG2s1mbs/MJCpo5w2bu972jK1OZYtv3RQunH4I29c9H5uq3LtyvNA9RwrlpRQ3t
iUmkvQrU3/6SBp4Rqx1EU2UWgv1KRqqYwRVbdPdBZYVJLrso3Ov/9eaS4TiD+4Dl
NfJ1sAA4OONdVKDCLcGZIB43Wq5rAlqzsyjcF6tx3fWsSankVjQfroTv7UvP+ijj
uGndmJwbXEiATxlt+Smvt2/CGjr8nIC55T1W+tW0itkBdZhnvBJekOFM4BdgoLZc
3vueTIHmTurHvvdLIytYjQHsxVsf3vRGMcQhohM98nAYsIDBil4OIh1hc+ZnhGsn
TFLPMmMuJnBWMYopfaMPNrcdbpu+n4Qj2QiRoVTEoI7P1IAY/Oa2uc+kDuUX3KlW
sQQPnFNiU0Q/T9BrsolxI2Wkak7cvaNxbmhuU+5wNUGybQfcfP3CWg==
-----END RSA PRIVATE KEY-----
```

```
quit
% RSA private key successfully imported
Enter the base 64 encoded certificate.//       PEM

End with a blank line or the word "quit" on a line by itself
//              ľ quit Ł Л Ъ
//                ˘         ˘    Ю
-----BEGIN CERTIFICATE-----
MIIEsTCCBFugAwIBAgIKEffFFwABAAAAPjANBgkqhkiG9w0BAQUFADCBrDEhMB8G
CSqGSIb3DQEJARYSZGluZ2pzQHN0YXItbmV0LmNuMQswCQYDVQQGEwJDTjEPMA0G
A1UECBMGRnVKaWFuMQ8wDQYDVQQHEwZGdVpob3UxIDAeBgNVBAoTF1JlZ2lhbnQg
TmV0d29yayBDby4gTHRkMR0wGwYDVQQLExRSZXNlYXJjaCBBcGFydG1lbnQgNTEX
MBUGA1UEAxMOQ0EgdGVzdCBzZXJ2ZXIwHhcNMDUwNDEyMDkyOTUzWhcNMDYwNDEy
MDkzOTUzWjCBpDEhMB8GCSqGSIb3DQEJARYSZGluZ2pzQHN0YXItbmV0LmNuMQsw
CQYDVQQGEwJDTjEPMA0GA1UECBMGRnVKaWFuMQ8wDQYDVQQHEwZGdVpob3UxIDAe
BgNVBAoTF1JlZ2lhbnQgTmV0d29yayBDby4gTHRkMR0wGwYDVQQLExRSZXNlYXJj
aCBBcGFydG1lbnQgNTEPMA0GA1UEAxMGZGluZ2pzMFwwDQYJKoZIhvcNAQEBBQAD
SwAwSAJBAM0sOymB/5v35vnf/PlJX+aqZpH9drtevsNaHkj4i3XdaJ55rFo2wLT0
qpWTI0nu638ktUa4dEIfF0AQM67sP0ECAwEAAaOCAmMwggJfMA4GA1UdDwEB/wQE
AwIE8DATBgNVHSUEDDAKBggrBgEFBQgCAjAdBgNVHQ4EFgQUIWVn8+ciY7JJkOFN
7MIkcRWWpx8wgegGA1UdIwSB4DCB3YAUckOEHCsDRS2CWPWEQ3f1IapLLCGhgbKk
ga8wgawxITAfBgkqhkiG9w0BCQEWEmRpbmdqc0BzdGFyLW5ldC5jbjELMAkGA1UE
BhMCQ04xDzANBgNVBAgTBkZ1SmlhbjEPMA0GA1UEBxMGRnVaaG91MSAwHgYDVQQK
ExdSZWdpYW50IE5ldHdvcmsgQ28uIEx0ZDEdMBsGA1UECxMUUmVzZWFyY2ggQXBh
cnRtZW50IDUxFzAVBgNVBAMTDkNBIHRlc3Qgc2VydmVyghBWrgc8EKF+jEWujT8V
UjNXMH8GA1UdHwR4MHYwOKA2oDSGMmh0dHA6Ly96ai1yb3V0ZXIvQ2VydEVucm9s
bC9DQSUyMHRlc3QlMjBzZXJ2ZXIuY3JsMDqgOKA2hjRmaWxlOi8vXFx6ai1yb3V0
ZXJcQ2VydEVucm9sbFxDQSUyMHRlc3QlMjBzZXJ2ZXIuY3JsMIGsBggrBgEFBQcB
AQSBnzCBnDBLBggrBgEFBQcwAoY/aHR0cDovL3pqLXJvdXRlci9DZXJ0RW5yb2xs
L3pqLXJvdXRlcl9DQSUyMHRlc3QlMjBzZXJ2ZXIoMSkuY3J0ME0GCCsGAQUFBzAC
hkFmaWxlOi8vXFx6ai1yb3V0ZXJcQ2VydEVucm9sbFx6ai1yb3V0ZXJfQ0ElMjB0
ZXN0JTIwc2VydmVyKDEpLmNydDANBgkqhkiG9w0BAQUFAANBABSEeYlEi7fm06en
NDdkZMjYV8LZB1JjniePwy1sUEEDa2bH9ZrcpTnJ+CSkCkxXBTc5ZWZnFTiSH/Oc
uVyQ9D8=
-----END CERTIFICATE-----
quit
% Certificate successfully imported
Ruijie(config)#
```

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8.1.10 crypto pki trustpoint

trustpoint ˆ ca-trustpoint˜˜ Ю **crypto pki trustpoint** **NO** trustpoint Â

crypto pki trustpoint *ca_name*

no crypto pki trustpoint *ca_name*

ca_name	ca_name trustpoint˜ CA

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Л Ъ¦ ¨ и Â

trustpoint Â

dn ˘
Common Name (eg, YOUR name) []: // ¨ б
Organizational Unit Name (eg, section) []: // Æ¨
Organization Name (eg, company) []: // ¨
Locality Name (eg, city) []: // Ъ ¨
State or Province Name (full name) []: // ¨
Country Name (2 letter code) [CN]: // Æ ч ي
show run Лu dn

6 5>T2.3820.24 10(trus(5)6point) 63.1

ৡ trustpoint Â

ৡ	
crypto pki trustpoint	trustpoint

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8.1.13 enrollment retry period

SCEP ʌ ˘ trustpoint Ю **enrollment retry period** ৡ Â Л৳ è **NO** Â

enrollment retry period *numbe*r

no enrollment retry period

number	Number ѝ ˘ æ ѝ˥ Â ˥ Â

˥ Â

ৡ trustpoint Â

ৡ	
crypto pki trustpoint	trustpoint

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8.1.14 enrollment url

SCEP URL trustpoint **enrollment url** **NO** URL

enrollment url *url_string*

no enrollment url

url_string	http:// URL a 255

trustpoint

percentage	percentage ѝ 1 100 ˘ ǂ Â

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trustpoint Â

҃	
crypto pki trustpoint	trustpoint

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8.1.16 enrollment renewable

trustpoint CA Ł ˘ trustpoint Ю

enrollment renewable ҃ Â Л ѐ **NO** URL Â

enrollment renewable

no enrollment renewable

Â

trustpoint Â

३	
crypto pki trustpoint	trustpoint

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8.1.18 recursion-check

CA trustpoint Ю **recursion-check** Â

No Â

recursion-check {**none**}

no recursion-check {**none**}

none	CA

ш CA

trustpoint Â

CA CA CA Â CA a
Э ł Ä Э CA Â Э
CA Л Љ Н Ь CA a a Â
ł Л CA Л Â

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8.1.19 revocation-check

trustpoint Ю **revocation-check** Â

No Â

revocation-check {**none**}

no revocation-check

	none	˘ ˘ ¯ a ŭ

ш ˘ ¯ CRL

҂	trustpoint Â

RGOS ˘ ŭ ш ‘
ш ˘ ŭ ˘ a CRL˘ ‡ a ∧
’ ˘ ‡ a ŭ Â

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8.1.20 time-check

˘ trustpoint Ю **time-check** ҂ Â ҂ **No** Â

time-check {**none**}

no time-check {**none**}

none	

˘

҂	trustpoint Â

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Ю˘ ˘ ˘ ł ᾱ
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8.1.21 interface

trustpoint ѵ àCRL ˘ trustpoint Ю **interface** ҳ Â ҳ **No** Â

interface *interface_name*

no interface

none	

й a

trustpoint Â

ѣ˘ ѵ ѷ CRL Лъ ў IP й Â

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10.4(3b15)	10.4(3b15) ѷ Лъ ѣ ҳ

8.2

8.2.1 show crypto pki certificates

EXEC Ю **show crypto pki certificates**

show crypto pki certificates [*CA_name*] [**detail**]

CA_name	Trustpoint

1 Ю

```
Ruijie# show crypto pki certificates test detail
%CA certificate info:                          //CA
Certificate:
Data:
Version: 3 (0x2)                               //X.509 v3
Serial Number:                                 //
7f:ff:bb:39:97:39:b4:81:4b:e1:6b:4f:f9:06:7a:4b
Signature Algorithm: sha1WithRSAEncryption     //
Issuer: emailAddress=wlcpyjwb@star-net.cn, C=CN, ST=fj, L=fuzhou,
O=Red Giant, OU=Department 5, CN=CA Server
          //      DN
Validity                                       //
Not Before: Jun 22 05:46:32 2005 GMT     //          UTC
Not After : Jun 22 05:54:45 2007 GMT     //          UTC
Subject: emailAddress=wlcpyjwb@star-net.cn, C=CN, ST=fj, L=fuzhou,
O=Red      Giant,      OU=Department      5,      CN=CA      Server
//    DN
Subject Public Key Info:                       //
Public Key Algorithm: rsaEncryption            //      : RSA
RSA Public Key: (512 bit)                      //512    RSA
Modulus (512 bit):
00:be:d1:e8:14:27:7a:30:2b:5e:11:ca:43:fd:2f:
```

```
2b:7e:a9:8a:07:96:a2:cf:fe:9d:b7:d3:da:54:c3:
03:4a:a8:44:b3:f0:11:dc:8a:bb:72:53:97:58:b1:
3f:df:6b:8a:9e:5f:46:d3:00:40:2e:24:d3:85:a7:
41:42:55:f7:75
Exponent: 65537 (0x10001)
X509v3 extensions:                        //
X509v3 Key Usage:                          //
Digital Signature, Non Repudiation, Certificate Sign, CRL Sign
//        ¨ ˘       ˘       ¨ ˘ CRL ¨
X509v3 Basic Constraints: critical
CA:TRUE
X509v3 Subject Key Identifier:                  // ў
64:46:12:C0:27:A4:9E:01:0C:65:DA:F8:6E:E7:FE:C6:56:EC:AD:D4
X509v3 CRL Distribution Points:          //CRL†
URI:http://zj-router/CertEnroll/CA%20Server.crl
URI:file://\\zj-router\CertEnroll\CA%20Server.crl
1.3.6.1.4.1.311.21.1:
...
Signature Algorithm: sha1WithRSAEncryption
 //  ¨
34:2f:8d:93:68:43:60:7b:68:5f:f0:7e:91:0c:5c:e3:58:98:
7c:53:95:ae:c2:b8:1c:ff:82:a4:ae:95:a8:81:a8:8a:ff:f9:
6f:92:72:3e:fa:6f:84:7d:83:47:93:0f:85:76:48:ae:68:b9:
5a:72:cf:09:50:be:1b:a7:e1:87                //     ¨
%Router certificate info:           //ЛЬЮ и
Certificate:
Data:
Version: 3 (0x2)                            //X.509 v3
Serial Number:                               //      " л
16:2a:7a:1d:00:00:00:00:00:02
Signature Algorithm: sha1WithRSAEncryption
 //  ¨
Issuer: emailAddress=wlcpyjwb@star-net.cn, C=CN, ST=fj, L=fuzhou,
O=Red Giant, OU=Department 5, CN=CA Server
//      DN¨
Validity                                    //
Not Before: Jun 22 05:50:48 2005 GMT       //         UTC
Not After : Jun 22 06:00:48 2006 GMT       //¯         UTC
Subject: emailAddress=zhaojun, C=CN, ST=fj, L=fuzhou, O=Red Giant,
OU=De partment 5, CN=zhaojun
//    ў   DN¨
Subject Public Key Info:                    //ў   Ω
Public Key Algorithm: rsaEncryption        //Ω      : и RSA ╕
```

```
RSA Public Key: (2048 bit)          //2048 Æ   RSA Ω
Modulus (2048 bit):
00:c6:e2:7a:e8:8d:6d:d8:bb:56:a8:9c:03:62:14:
e5:2e:23:e5:a5:26:31:3d:b2:24:65:b1:f2:cc:07:
e3:ef:cc:02:3c:d0:6e:00:8d:fc:ce:3a:b6:45:7a:
cb:a0:87:94:1f:c3:92:43:36:6a:b2:7c:9c:d5:ca:
7e:83:ba:76:49:7f:be:f4:1f:4a:a1:0b:98:22:96:
e2:79:54:a0:ed:1c:62:30:b7:ee:6a:6e:cb:72:e9:
9c:d9:e8:b0:dc:f5:c6:19:8f:2b:2a:85:fa:bf:ff:
08:40:7e:f2:a1:df:d1:8b:ef:68:32:1e:1a:45:fa:
16:de:33:b0:62:90:bd:9c:8e:ec:7c:6e:49:48:75:
e6:5c:ce:b1:8e:1c:80:f3:5b:79:6c:a1:31:b2:a9:
48:37:9f:ed:45:95:85:ba:98:0f:42:c5:78:4c:3d:
a2:45:73:90:3d:0b:1a:7c:53:b5:97:1a:a6:43:2f:
44:54:0f:a1:51:3a:0e:9f:8b:2e:d1:70:cb:36:99:
91:57:d2:b7:9d:7c:ee:07:cf:4a:c7:cd:71:dc:ce:
72:dc:75:a0:03:b2:36:be:8e:af:ca:99:46:03:83:
27:d3:ff:24:1e:4c:0c:21:99:b4:fe:5a:4d:61:b5:
e9:b4:38:dc:59:2c:37:f3:93:02:fc:09:88:02:1b:
d0:45
Exponent: 65537 (0x10001)
X509v3 extensions:                        //
X509v3 Key Usage: critical    //          ˘ й
Digital Signature, Non Repudiation  //        ¨ à
X509v3 Extended Key Usage:                 //
1.3.6.1.5.5.8.2.2
X509v3 Subject Key Identifier:                  // ў
84:7E:33:A3:91:A5:26:1D:2D:BB:54:65:BF:C7:2A:2A:2E:87:D5:A9
X509v3 Authority Key Identifier:     //
keyid:64:46:12:C0:27:A4:9E:01:0C:65:DA:F8:6E:E7:FE:C6:56:EC:AD:D
4
DirName:/emailAddress=wlcpyjwb@star-net.cn/C=CN/ST=fj/L=fuzhou/O
=Red Giant/OU=Department 5/CN=CA Server
serial:7F:FF:BB:39:97:39:B4:81:4B:E1:6B:4F:F9:06:7A:4B
X509v3 CRL Distribution Points:         //CRL†
URI:http://zj-router/CertEnroll/CA%20Server.crl
URI:file://\\zj-router\CertEnroll\CA%20Server.crl
Authority Information Access:        //
CA Issuers - URI:http://zj-router/CertEnroll/zj-router_CA%20Serv
er.crt
CA Issuers - URI:file://\\zj-router\CertEnroll\zj-router_CA%20Se
rver.crt
Signature Algorithm: sha1WithRSAEncryption   // ¨
37:50:0c:d6:6c:23:6d:2d:81:37:02:6c:22:ef:e2:95:98:dc:
```

```
91:25:fe:0a:3b:b0:f2:48:69:2c:6b:98:66:be:6b:09:ef:de:
2f:db:ed:71:0e:04:a5:12:38:8b:30:2b:eb:c9:d9:88:1e:a2:
10:2c:86:d2:3d:25:fd:9c:df:b4/                //
Ruijie#
```

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8.2.2 show crypto pki crls

CRL ˘ EXEC IO **show crypto pki crl** ʒ Â

show crypto pki crls [*CA_name*] [**detail**]

Next Update: Jun 29 18:30:27 2005 GMT //Ю UTC ˘ ¨ CRL

CRL extensions: //ЉЮ ѝ CRL

X509v3 Authority Key Identifier: //
keyid:64:46:12:C0:27:A4:9E:01:0C:65:DA:F8:6E:E7:FE:C6:56:EC:AD:D
4

1.3.6.1.4.1.311.21.1:...

Revoked Certificates: //ЉЮ ѝ ‟

Serial Number: 162A7A1D000000000002 // ‟ ѧ

Revocation Date: Jun 22 06:19:53 2005 GMT //

CRL entry extensions: //CRL

X509v3 CRL Reason Code: //CRL Ʒ

Key Compromise //

Serial Number: 1635E5E3000000000003

Revocation Date: Jun 22 06:19:53 2005 GMT

CRL entry extensions:

X509v3 CRL Reason Code:

Key Compromise //

Signature Algorithm: sha1WithRSAEncryption // ¨

1' Ю

```
Ruijie(config)#show crypto pki trustpoints CA status
Trustpoint CA Status:
  State:
    Keys generated ..... Not Generated
    Issuing CA authenticated ....... No
    Certificate request(s) ..... No

Ruijie(config)#
```

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9 AAA

9.1

9.1.1 aaa authentication dot1x

AAA 802.1X ˘ ३ **aaa authentication dot1x** 802.1X “ Â ३ no 802.1X “ Â

aaa authentication dot1x {**default** | *list-name*} *method1* [*method2*...]

no aaa authentication dot1x {**default** | *list-name*}

default	˘ ‡ ł Ня “ ѝ 802.1X Â
list-name	Ня 802.1X “ ˘ Л Лъ Â
method	ľ local à none à group Ł “ ˘ “ 4
local	¨
none	a
group	Ł ˘ RADIUS Ł

३ Â

AAA 802.1X Ł˘ AAA 802.1X Â **aaa authentication dot1x** ३ Л “ 802.1X Â

Л ˘ ł Â

Ю Ня ¨ ѝ rds_d1x AAA 802.1X “ Â “ ″I RADIUS Ł ˘ RADIUS Ł ˘ ‡ Â

```
Ruijie(config)# aaa authentication dot1x rds_d1x group radius local
```

३	
aaa new-model	AAA Ł
dot1x authentication	802.1X Э “
username	Ня

⁄	
-	-

9.1.2 aaa authentication enable

AAA Enable ˘ ३ **aaa authentication enable** Enable “ Â ३ no “ Â

aaa authentication enable default *method1* [*method2*...]

no aaa authentication enable default

default	˘ ‡ ł Ня “ и Enable ÂEnable ˘ ⁄ “ Â
method	Ľ local à none à group Ł “ ˘ “ 4
local	‟
none	a
group	Ł ˘ RADIUS TACACS+ Ł

३ Â

AAA Enable ш ″ p Ò ˘ ˘ك ˘

Â

```
Ruijie(config)# aaa authentication enable default group radius local
```

Login ɨ˘ è Login Э˘ ŭ ‡ a
Â

Ю Нж ¨ ѝ list-1 AAA Login “ Â “ ˝I
RADIUS Ŀ ˘ RADIUS Ŀ ˘
‡ Â

```
Ruijie(config)# aaa authentication login list-1 group radius local
```

३	
aaa new-model	AAA Ŀ
username	Нж
login authentication	Э Login

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ʌ	
-	-

9.1.4 aaa authentication ppp

AAA PPP ˘ ३ **aaa authentication ppp** PPP
“ Â ३ no “ Â

aaa authentication ppp {**default** | *list-name*} *method1* [*method2*...]

no aaa authentication ppp {**default** | *list-name*}

default	˘ ‡ ɨ Нж “ ѝ PPP Â
list-name	Нж PPP “ ˘ ʌ Лъ Â
method	ľ local à none à group Ŀ “ ˘ “ 4
local	¨
none	a
group	Ŀ ˘ RADIUS TACACS+ Ŀ

1˙ ⁄

```
Ruijie(config)# aaa local user allow public account
```

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10.3(4t76)	३

9.1.7 login authentication

Э Login˜ ˘ ╖ ˘ Ю **login authentication** ३ Login “ Â ३ no “ Э Â

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

no login authentication

default	˘ Login “ Â
list-name	ЊЖ Login “ Â

३ Â

Login “ ˘ ╟ Э Â Э Login “ ˘ ⁄ ३ “ Â ييЊЖ “ ˘ ‡ ˘ Э Login a ˘ ЊЖ Login “ Â

Ю ЊЖ ¨ и list-1 AAA Login “ Â “ Â ł 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
```

३	३	

aaa new-model	AAA ৳
username	৸
login authentication	Login ‟

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৲

9.2

9.2.1 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	৲ ˘ 0~15˜ ã ৲ ɨ Â
default	˘ ‡ ɨ ৸ ‟ и ৲
list-name	৸ ৲ ‟ ˘ ʌ Л৳ Â
method	ľ none à group Ŀ ‟ ˘ ‟ 4
none	a
group	৳ ˘ TACACS+ ৳

AAA ৲ ╖ Â

৲ Â

RGOS ʌ ৲ ˘ ৲ ˘ AAA ৲ ৳ Э˘ ৳ ৲˘ ‡ ৲ ˘ ŭ ‡ ৲ a ˘ ৲ Â

14 14

TACACS+ 15

```
Ruijie(config)# aaa authorization commands 15 default group tacacs+
```

aaa new-model	AAA
authorization commands	

-

-	-

9.2.2 aaa authorization config-commands

AAA **aaa authorization config-commands** no AAA

aaa authorization config-commands

no aaa authorization config-commands

-	-

a

aaa new-model	AAA
aaa authorization commands	AAA

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	-	-

9.2.4 aaa authorization exec

AAA NAS CLI Exec ˘ è ˘
¾ **aaa authorization exec** Â ¾ no AAA Exec ╖ Â

aaa authorization exec {**default** | *list-name*} *method1* [*method2*...]

no aaa authorization exec {**default** | *list-name*}

default	˘ ‡ ł HЖ " ѝ Exec Â
list-name	HЖ Exec " ˘ ʌ Л Â
method	l' local à none à group Ł " ˘ " 4
local	¨
none	a
group	Ł ˘ RADIUS TACACS+ Ł

AAA Exec ╖ Â

¾ Â

RGOS NAS CLI ˘ è CLI ^ 0~15 ~ Â
Login ˘ e Exec c7(Â) Ⅵ Exec CLI

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	-	-

9.2.5 aaa authorization network

AAA ┗ ^ PPP à SLIP ~ ˘
३ **aaa authorization network** Â ३ no AAA ╖ Â

aaa authorization network {**default** | *list-name*} *method1* [*method2*...]

no aaa authorization network {**default** | *list-name*}

default	‘ ˘ ‡ ł Ня “ ѝ Network Â
method	ľ none

aaa authentication	开启 AAA
username	开启

/I

aaa authorization commands	⊮ AAA ३ “

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३	ʌ	
	-	-

9.2.7 authorization exec

Exec “ Э˘ ३ **authorization exec** Â
३ no ʌ Э Exec ╖ Â

authorization exec {**default** | *list-name*}

no authorization exec

default	˘ Exec Â
list-name	⊮ Exec “ Â

AAA Exec ╖ Â

३ Â

Exec “ ˘ ╟ Э Â Э
Exec “ ˘ ʌ ३ “ Â ي ⊮ “ ˘ ‡
˘ Э Exec a ˘ ⊮ Exec
“ Â

Ю ‟ ѝ exec-1 Exec “ ˘ RADIUS ѝ Ł ˘
Ł none Â ɨ 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
```

३	
aaa new-model	AAA Ł
aaa authorization commands	⊮ AAA Exec “

ʌ

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9.3

9.3.1 aaa accounting commands

NAS **aaa accounting commands** no

aaa accounting commands *level* {**default** | *list-name*} **start-stop** *method1* [*method2*...]

no aaa accounting commands *level* {**default** | *list-name*}

level	0~15
default	
list-name	
method	**none group** 4
none	a
group	TACACS+

RGOS none a

TACACS+ 15

```
Ruijie(config)# aaa accounting commands 15 default start-stop group
tacacs+
```

Ю RADIUS NAS ╟

```
Ruijie(config)# aaa accounting exec default start-stop group radius
```

aaa new-model	AAA
aaa authentication	Ъ AAA
accounting commands	Э Exec

8 Â

IO RADIUS

```
Ruijie(config)# aaa accounting network default start-stop group
radius
```

aaa new-model	AAA
aaa authorization network	AAA
aaa authentication	AAA
username	

ৡ	
aaa new-model	AAA Ł
aaa accounting network	ЬЖ “

/ł

/ł	
-	-

9.3.5 aaa accounting update periodic

Ⅶ ˘ ৡ **aaa accounting update periodic** ৡ˘ ৡ
Â ৡ no Â

aaa accounting update periodic *interval*

no aaa accounting update periodic

interval	˘ Лъ¶ ѝ æ˘ ѝ 1¶ Â

5 minutes Â

Â

AAA Ł˘ ‡ a Â AAA Ł˘ ‡
ৡ Â

Ю 1¶ Â

```
Ruijie(config)# aaa new-model
Ruijie(config)# aaa accounting update
Ruijie(config)# aaa accounting update periodic 1
```

ৡ	
aaa new-model	AAA Ł
aaa accounting network	ЬЖ “

/ł

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	-	-

9.3.6 accounting commands

ع " Э˘ ع **accounting commands** Â
ع no ٨ Э ع ╗ Â

accounting commands *level* {**default** | *list-name*}

no accounting commands *level*

level	ع ˘ 0~15˜ ā ع Â
default	˘ ع Â
list-name	Ня ع " Â

╗

ع Â

ع " ˘ ╠ Э Â Э
ع " ˘ ٨ ع " Â يي Ня " ˘ ‡
˘ Э ع a ˘ Ня ع "
Â

Ю ‟ ѝ cmd ع " ˘ 15 ع ˘ TACACS+
ѝ Ь ˘ Ь none Â ł 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
```

ع	
aaa new-model	AAA Ь
aaa accounting commands	Ня AAA ع "

٨

ع	٨	

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9.3.7 accounting exec

Exec “ Э˘ ३ **Accounting exec**

9.4 AAA

9.4.1 aaa domain

˘ Â ३ no ∧ ३ Â

aaa domain {**default** | *domain-name*}

no aaa domain {**default** | *domain-name*}

default	˘
domain-name	¨

Â

३ Â

¨ AAA ┗ Âdefault ὶ ˘ ≠ ˘
“ Âdomain-name ὶ ¨ ˘ ¨ ˘ ‡
“ Â 32 Â

Ю ¨ ‘
```
Ruijie(config)# aaa domain ruijie.com
Ruijie(config-aaa-domain)#
```

३	
aaa new-model	AAA ┗
aaa domain enable	¨ AAA ┗
show aaa domain	

∧

∧	

¨ AAA ६ Â ३ no Â

aaa domain enable

no aaa domain enable

Ю ruijie.com 20

```
Ruijie(config)# aaa domain ruijie.com
Ruijie(config-aaa-domain)# access-limit 20
```

aaa new-model	AAA
aaa domain enable	AAA
show aaa domain	

३	
aaa new-model	AAA ┗
aaa domain enable	¨ AAA ┗
show aaa domain	

⁄
-

⁄	
-	-

9.4.5 authentication dot1x

Ю IEEE802.1x “ ˘ ३ no ⁄ ३ Â

authentication dot1x {**default** | *list-name*}

no authentication dot1x

default	˘ “
list-name	“ ¨

“ ˘ ˘ default
“ Â

३ Â

ѝ IEEE802.1x “ Â

Ю IEEE802.1x “ ‘
Ruijie(config)# **aaa domain** *ruijie.com*
Ruijie(config-aaa-domain)# **authentication dot1x default**

३	
aaa new-model	AAA ┗
aaa domain enable	¨ AAA ┗
show aaa domain	

⁄

३	∧	
	-	-

9.4.6 authorization network

IO Network " ˘ ३ no ∧ ३ Â

authorization network {**default** | *list-name*}

no authorization network

default	˘ "
list-name	" "

state {**block** | **active**}

no state

block	
active	

Ю й Â

३ Â

ŭ Â

Ю Â

```
Ruijie(config)# aaa domain ruijie.com
Ruijie(config-aaa-domain)# state block
```

३	
aaa new-model	AAA ┗
aaa domain enable	¨ AAA ┗
show aaa domain	

४

४	
-	-

9.4.8 show aaa domain

Â

show aaa domain [**default** | *domain-name*]

default	˘
domain-name	¨

३ Â

a ‥ ˘ ‡ Â

Ю ‥ й domain.com Â

```
Ruijie# show aaa domain domain.com

=============Domain domain.com=============
State: Active
Username format: Without-domain
Access limit: No limit
802.1X Access statistic: 0

Selected method list:
 authentication dot1x default
```

३ Â

Ю NAS б Ł ˘ ¨ ŭ Â

Ю
```
Ruijie(config)# aaa domain ruijie.com
Ruijie(config-aaa-domain)# username-domain without-domain
```

३

३	
aaa new-model	AAA Ł
aaa domain enable	¨ AAA Ł
show aaa domain	

/

३

/	
-	-

9.5 AAA

9.5.1 aaa group server

AAA Ł Â ३ no Ł Â

aaa group server {**radius** | **tacacs+**} *name*

no aaa group server {**radius** | **tacacs+**} *name*

name	Ł ∧¨ ˘ a ѝ ľ radius Ľˇ ľ tacacs+ Ľˇ ѝ RADIUS TACACS+ Ł ¨ Â

३ Â

३ 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:
```

३

३	
show aaa group	aaa ┺

ㅅ

३

ㅅ	
-	-

9.5.2 ip vrf forwarding

ỳ AAA ┺ vrf˜ no Â

ip vrf forwarding *vrf_name*

no ip vrf forwarding

vrf_name	vrf¨

३ ┺ Â

ỳ ┺ vrf Â

Ю Â

```
Ruijie(config)# aaa group server radius ss
Ruijie(config-gs-radius)# server 192.168.4.12
Ruijie(config-gs-radius)# server 192.168.4.13
Ruijie(config-gs-radius)# ip vrf forwarding vrf_name
Ruijie(config-gs-radius)# end
```

३	
aaa group server	aaa ㄴ
show aaa group	aaa ㄴ

Accounting Port: 5
Referred: 1

३	
aaa group server	aaa ┗
show aaa group	aaa ┗

⁄	
-	-

9.5.4 show aaa group

AAA ┗ Â

show aaa group

-	-

Â

३ AAA 8 ┗ Â

Ю Â
Ruijie# **show aaa group**
Group Name: ss
Group Type: radius
Referred: 2
Server List:
IP Address: 192.168.217.64
Authentication Port: 1812
Accounting Port: 1813
Referred: 1

३	
aaa group server	AAA ┗

1	
3	1
	-

9.6 AAA

9.6.1 aaa local authentication attempts

login

aaa local authentication attempts *max-attempts*

max-attempts

9.6.2 aaa local authentication lockout-time

login ˘

aaa local authentication lockout-time *lockout-time*

lockout-time	ˆ Æ' ˛ ~ ˘ ˄ 1~2147483647

ѝ 15 ˛

ৡ Â

login ˘

Ю '

```
Ruijie# configure terminal
Ruijie(config)# aaa local authentication lockout-time 5
```

ৡ

ৡ	£ ¶ œ °
Show running-config	
Show aaa lockout	login

˄

˄

Â

AAA AAA **aaa new-model**
AAA Â AAA ‡ AAA a Â

Ю AAA Â
```
Ruijie(config)# aaa new-model
```

aaa authentication	
aaa authorization	
aaa accounting	

	show aaa lockout	login

ন

৩		
	ন	
	-	-

9.6.5 debug aaa

AAA ┗ Â ৩ **no** Â

debug aaa event

no debug aaa event

	-	-

৩	EXEC Â

৩		
	-	-

-	-

३ Â

३ AAA “ Â

IO 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
```

३

३	
aaa authentication	IX “
aaa authorization	IX “

<word>	ID

३ Â

“ ˘ Л Ч Â

Ю ‘

```
Ruijie# show aaa user lockout all
```

३	
show running-config	
show aaa lockout	login

Л

Л	
-	-

10 RADIUS

10.1 RADIUS

RADIUS ЛЪЮ ٪

- **ip raius source-interface**
- **radius-server host**
- **radius-server key**
- **radius-server retransmit**
- **radius-server timeout**
- **radius-server dead-time**
- **radius attribute**
- **radius set qos cos**
- **radius vendor-specific extend**

10.1.1 ip radius source-interface

radius ˘ ٪ **ip radius source-interface** Â
٪ **no** RADIUS Â

ip radius source-interface *interface*

no radius source-interface

ðð Ô

Interface radius

ðð Ô

radius Â

ðð ٪ Ô

Â

ðð Ô

ѝ radius Ł Э nas ˘ Л Лъ ٪
radius Â ٪ ip ѝ radius
˘ ٪ Ь Â

ðð Ô

Ю radius ÿ GigabitEthernet 0/0 ¬ ip ù radius

```
Ruijie(config)# ip radius source-interface
GigabitEthernet 0/0
```

ð ¢ Ô

¢	
radius-server host	ЊЖ RADIUS Ь
ip address	ip

10.1.2 radius-server host

RADIUS Ь ÿ ˘ ¢ **radius-server** Â ¢ **no** RADIUS Ь ÿ Â

radius-server host {*hostname* | *ip-address*} [**auth-port** *port-number*] [**acct-port** *port-number*]

no radius-server host {*hostname* | *ip-address*}

ð Ô

Hostname: RADIUS Ь ÿ DNS Â

ip-address: RADIUS Ь ÿ IP Â

auth-port: RADIUS UDP

port-number: RADIUS UDP ˇ ù Ơ ‡ ÿ a Â

acct-port: Radius UDP

port-number: RADIUS UDP ˇ ù Ơ ‡ ÿ a Â

ð Ô

RADIUS ÿ Â

ð ¢ Ô

Â

ð Ô

ù RADIUS AAA Ъ ЊЖ RADIUS Ь Â ˆ Л

radius-server ¢ ЊЖ RADIUS Ь Â

ð Ô

Ю Н RADIUS Ь ў ·

```
Ruijie(config)# radius-server host 192.168.12.1
```

ð ҃ Ô

҃	
aaa authentication	Н AAA “
radius-server key	Н RADIUS Ь ҃
radius-server retransmit	Н RADIUS
radius-server timeout	Н RADIUS

10.1.3 radius-server key

Н Ь ^ ~ б RADIUS Ь ҃ˇ
҃ **radius-server key** Â ҃ no ∧ ҃ Â

radius-server key *text-string*

no radius-server key

ð Ô

text-string ҃

ð Ô

҃ Â

ð ҃ Ô

Â

ð Ô

҃ RADIUS Ь Â й
RADIUS Ь ˇ RADIUS Ь Э Н ˚
҃ Â

ð Ô

Ю Н RADIUS Ь ҃ й aaa·

radius-server retransmit	٤٨ RADIUS
radius-server timeout	٤٨ RADIUS

10.1.4 radius-server retransmit

ы RADIUS ٤ ٧ ٨٥ ˘
٣ **radius-server retransmit** Â ٣ **no** Â

radius-server retransmit *retries*

no radius-server retransmit

ð Ô

retries˙ RADIUS Â

ð Ô

ы 3 Â

ð ٣ Ô

Â

ð Ô

AAA Ю ٤ ٧ Â
٤ ٧ ٤ RADIUS
˘ Â

ð Ô

Ю ы 4˙

```
Ruijie(config)# radius-server retransmit 4
```

ð ٣ Ô

٣	
radius-server host	٤٨ RADIUS ٤ ў
radius-server key	٤٨ RADIUS ٣
radius-server timeout	٤٨ RADIUS

10.1.5 radius-server timeout

RADIUS ٤ ˘ ٣
radius-server timeout Â ٣ **no** ˘ Â

radius-server timeout *seconds*

no radius-server timeout

ð Ô

seconds ' ^ æ ù ~ Â ∧ ù 1-1000 Â

ð Ô

5

ð ¯ Ô

Â

ð Ô

¯ Â

ð Ô

Ю Ж ù 10 '

```
Ruijie(config)# radius-server timeout 10
```

ð ¯ Ô

¯	
radius-server host	Ж RADIUS ⊾ ў
radius-server retransmit	Ж RADIUS
radius-server key	Ж RADIUS ¯

10.1.6 radius-server deadtime

ł˘ t ˘ ‡ ù ⊾ ˘ t ù ^ deadtime˜˜ RGOS RADIUS ˘ ¯ **radius-server deadtime** Â ¯ **no** ˘ Â

radius-server deadtime *minnutes*

no radius-server deadtime

ð Ô

minnutes ^ æ ù† ~ Â ∧ ù 1-1000 Â

ð Ô

5†

ð ¯ Ô

Â

ðð Ô

٣ Â

ðð Ô

Ю Ж и 10 ρ Ю З

radius set qos cos

no radius set qos cos

ð Ô

ð Ô

qos ù dscp

ð ¸ Ô

Â

ð Ô

¸˘ Л Ъ Ю qos ù cos ˘ ù dscp

ð Ô

Ю ·

```
Ruijie(config)# radius set qos cos
```

ð ¸ Ô

¸	
radius vendor-specific extend	Radius ù a ˂ id

10.1.9 radius vendor-specific extend

ù a ˂ idÂ

radius vendor-specific extend

no radius vendor-specific extend

ð Ô

ð Ô

Л л id

ð ¸ Ô

Â

ð Ô

¸ Л id Â

ð Ô

IO

```
Ruijie(config)# radius vendor-specific extend
```

ð ¢ Ô

¢	
radius attribute	∕
radius set	qos ŭ cos

10.2 RADIUS

- **debug radius** [**event | detail**]
- **show radius server**
- **show radius parameter**
- **show radius vendor-specific**

10.2.1 debug radius

RADIUS Â ¢ no RADIUS Â

debug radius [**event | detail**]

no debug radius [**event | detail**]

ð Ô

Â

ð ¢ Ô

EXEC Â

10.2.2 show radius server

RADIUS ⊾ Â

show radius server

ð Ô

Â

ð Ô

ð ¥ Ô

Â

ð Ô

¥ radius ˪ Â

ð Ô

```
Ruijie# show radius server
server ip : 192.168.4.12
acct  port: 23
authen  port: 77
server state: ready
server ip : 192.168.4.13
acct  port: 45
authen  port: 74
server state: ready
```

ð ¥ Ô

¥	
radius-server host	ÐÞ RADIUS ˪ ÿ
radius-server retransmit	ÐÞ RADIUS
radius-server key	ÐÞ RADIUS ¥
radius-server timeout	ÐÞ RADIUS

10.2.3 show radius parameter

RADIUS ˪ Â

show radius parameter

ð Ô

ð Ô

ð ¥ Ô

Â

ð Ô

¥ radius ˪ Â

ð Ô

```
Ruijie# show radius parameter
Server Timout:   5 Seconds
Server Deadtime: 5 Minutes
Server Retries:  3
Server Key:      ******
```

ð ৲ Ô

৲

```
6    net ip                6
7    user name              7
8    password               8
9    file-diractory        9
10   file-count            10
11   file-name-0           11
12   file-name-1           12
13   file-name-2           13
14   file-name-3           14
15   file-name-4           15
16   max up-rate           75
17   version to server     17
18   flux-max-high32       18
19   flux-max-low32        19
20   proxy-avoid           20
21   dailup-avoid          21
22   ip privilige          22
23   login privilige       42
24   limit to user number  50
```

ð ৡ Ô

ৡ	
radius-server host	HK RADIUS L ў
radius-server retransmit	HK RADIUS
radius-server key	HK RADIUS ৡ
radius-server timeout	HK RADIUS

ǂ ĄĄ Ʌ ǯ ĄĄ ˇ ЉЮ ˛

1. VRRP ǯ
2. MULTI-LDP ǯ

1 VRRP

1.1

VRRP ३ ‘

- **vrrp authentication**
- **vrrp delay**
- **vrrp description**
- **vrrp ip**
- **vrrp preempt**
- **vrrp priority**
- **vrrp timers advertise**
- **vrrp timers learners advertise**

ð Ô

Ю й VRRP 1 ¢ Â

```
vrrp 1 authentication x30dn78k
```

ð ¢ Ô

¢	
Ruijie(config-if)# **vrrp** *group ip ipaddress* [**secondary**]	VRRP ¶ IP

1.1.2 vrrp delay

¢ Э VRRP ╠ Â

vrrp delay { **minimum** *min-seconds* | **reload** *reload-seconds* }

no vrrp delay

ð Ô

min-seconds ' ┤ й ╠ ˘ VRRP *min-seconds* ł ╠'

reload-seconds ' ╠ VRRP ╠ Â *min-seconds*
reload-seconds˘ ‡ ╠ VRRP *min-seconds* Â

ð Ô

Ю Э VRRP ╠ ¶ Â

ð ¢ Ô

ð Ô

╠ à ┤ й UP ˘ Э VRRP a ¯ ╠ à
Д ╠ ˘ ┤ ¢ Э VRRP
╠ Â ч ┐ 0~60 Â

ð Ô

Ю Лъ GigabitEthernet 0/1 Э VRRP ╠ й
10 ' ж ┤ й UP ˘ Э VRRP 1 10 ł Д ╠'

```
interface GigabitEthernet 0/1
shutdown
ip address 10.0.1.1 255.255.255.0
vrrp delay minimum 10
vrrp 1 ip 10.0.1.20
no shutdown
```

```
show vrrp 1
```

ð ¾ Ô

¾	
Ruijie(config-if)# **vrrp** *group* ip *ipaddress* [**secondary**]	VRRP ¶ IP

ð Ô

¾ ÿ RGNOS10.3(4) Â

1.1.3 vrrp description

¾ й VRRP ˘ è **no** Â

vrrp *group* **description** *text*

no vrrp group description

ð Ô

group ' VRRP Л

text ' VRRP

ð Ô

Ю˝ Э VRRP ¶ Â¨ VRRP ¶ ˘ ≠ VRRP Â

ð ¾ Ô

ð Ô

й VRRP ˘ Л Љ ЌЊ VRRP Â

ð Ô

Ю Љ E0 Э VRRP 1 й Building A – Marketing and Administration Â

```
interface GigabitEthernet 0/0
ip address 10.0.1.1 255.255.255.0
vrrp 1 ip 10.0.1.20
vrrp 1 description “Building A - Marketing and Administration”
```

ð ¾ Ô

1.1.5 vrrp preempt

ৡ VRRP . ˘ è no VRRP . ╖ Â

vrrp *group* **preempt** [**delay** *seconds*]

no vrrp *group* **preempt** [**delay**]

ð Ô

group ‘ VRRP ⁄

delay *seconds* ‘ ⁄ ˘ ЬЖ Master
Â й 0 Â

ð Ô

ЮЎ Э VRRP ╖ Â VRRP ╖ ˘ VRRP
. ЮÂ

ð ৡ Ô

ð Ô

VRRP . ЮЎ ″I Master ″I
˘ . й VRRP ў Â VRRP . ЮЎ ¯
″I Master ″I ˘ ≠ a . й VRRP ў
ÂVRRP Лъ IP ЮЎ . ў ЬЖa ˘ й
VRRP é ″I ˘ ╟ й VRRP ў Â

ð Ô

Ю ˘ VRRP ″I (200) ў ″I
˘ 15 ł . й ў Â

```
vrrp 1 preempt delay 15
vrrp 1 priority 200
```

ð ৡ Ô

ৡ	
Ruijie(config-if)# **vrrp** *group* **ip** *ipaddress* [**secondary**]	VRRP ╖ IP
Ruijie(config-if)# **vrrp** *group* **priority** *level*	VRRP ″I

1.1.6 vrrp priority

¾ VRRP ″I ˘ è **no** Â

vrrp *group* **priority** *level*

no vrrp *group* **priority**

ð Ô

group ' VRRP ∧

level ' VRRP ″I

ð Ô

ЮЎ Э VRRP ╖ Â VRRP ╖ ˘ VRRP è ″I й 100 Â

ð ¾ Ô

ð Ô

¾ ╟ VRRP ″I Â

ð Ô

Ю VRRP 1 ″I й 254 Â

```
vrrp 1 priority 254
```

ð ¾ Ô

¾	
Ruijie(config-if)# **vrrp** *group* **ip** *ipaddress* [**secondary**]	VRRP ╖ IP
Ruijie(config-if)# **vrrp** *group* **preempt** [**delay** *seconds*]	VRRP .

1.1.7 vrrp timers advertise

¾ ў VRRP ˘ è no Â

vrrp *group* **timers advertise** *interval*

no vrrp *group* **timers advertise**

ð Ô

group ' VRRP ∧

interval ' VRRP (Л ̀ æ)

ð Ô

ЮЎ Э VRRP ╖ Â VRRP ╖ ˘
ў ѝ 1 Â

ð ¾ Ô

ð Ô

VRRP ў ˘ Љ VRRP
VRRP à ″I Љ ↓ è Â

ð Ô

Ю ˘ VRRP ѝ 4 Â

```
vrrp 1 timers advertise 4
```

ð ¾ Ô

¾	
Ruijie(config-if)# **vrrp** *group* **ip** *ipaddress* [**secondary**]	VRRP ╖ IP
Ruijie(config-if)# **vrrp group timers learn**	¯ ╖

1.1.8 vrrp timers learn

¾ ¯ ╖ ˘ è no ╖ Â

vrrp *group* **timers learn**

no vrrp *group* **timers learn**

ð Ô

group VRRP ∕

ð Ô

ЮЎ Э VRRP ╖ Â¯ VRRP ╖ ˘
Ю ¯ ╖ Â

ð ¾ Ô

ð Ô

¯ ╖ ˘ VRRP ˘

¯ ¶ ł˘ ÿ ў VRRP ¯ VRRP ˘
Master ˘ a VRRP Â
¾ Л Љ б Master VRRP ˘ Â

ð Ô

Ю VRRP 1 Э ¯ ¶ Â

```
vrrp 1 timers learn
```

ð ¾ Ô

¾	
Ruijie(config-if)# **vrrp** *group* **ip** *ipaddress* [**secondary**]	VRRP ¶ IP
Ruijie(config-if)# **vrrp** *group* **timers advertise** [**msec**] *interval*	VRRP

1.1.9 vrrp track

VRRP **vrrp** *group* **track** *interface-type number* ¾˘ VRRP IP ¶ ˘ **vrrp** *group* **track** *ip-address* ¾˘ **vrrp** *group* **track bfd** BFD IP˝ è **no** ¶ Â ¾ Ю˙

vrrp *group* **track [***interface-type number*| **bfd** *interface-type interface-number ipv4-addess*] [*priority*]

vrrp *group* **track** *ip-address* [**interval** *interval-value*] [**timeout** *timeout-value*] [**retry** *retry-value*] [*priority*]

vrrp *group* **track [***interface-type number*| **bfd** *interface-type interface-number ipv4-addess* | *ip-address*]

ð Ô

group ˙ VRRP Л

interface-type ˙

number ˙ Л

ipv4-addres ˙ IPv4 ˘ bfd

interval-value ˙ ў Л Â a ˘ й 3

timeout-value ˙ à a Л Â a ˘ й 1

retry-value: a Л ˘ *retry-value* ˘ ‡ й a Л Â æ й ˘ a ˘ й 3 Â

priority ˋ Λ ৲ è VRRP ″I ৲ Â
a ˘ ѝ 10

ð Ô

Ю˝ Э VRRP ╖ Â¯ VRRP ╖ ˘
IP Â

ð ৡ Ô

ð Ô

Λ Л৳ ৡ ˘ Λ Ь Λ
(Routed Port ˘ SVI ˘ Loopbacƙ Tunnel) ’ IP
ŭ Λ ˘ ¯ ŭ ping

Ruijie# **debug vrrp errors** VRRP **debug23.92 errors**

Ю ˘ 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
```

1.2.4 debug vrrp packets

ৡ VRRP ˘ è **no** Â

debug vrrp packets

no debug vrrp packets

ð Ô

ЮØ VRRP Â

ð ৡ Ô

ð Ô

Ю ˘ VRRP ˘ è VRRP 1 Â

```
Ruijie# debug vrrp packets
Ruijie#
VRRP: Grp 2 sending Advertisement checksum DD4D
VRRP: Grp 2 sending Advertisement checksum DD4D
VRRP: Grp 2 sending Advertisement checksum DD4D
```

Ю , VRRP ˘ è VRRP 1 IP Лъ ↓ VRRP 1 ″I Â

```
Ruijie# debug vrrp packets
Ruijie#
VRRP: Grp 1 Advertisement priority 120, ipaddr 192.168.201.213
VRRP: Grp 1 Advertisement priority 120, ipaddr 192.168.201.213
VRRP: Grp 1 Advertisement priority 120, ipaddr 192.168.201.213
```

1.2.5 debug vrrp state

ৡ VRRP ˘ è no Â

debug vrrp state

no debug vrrp state

ð Ô

ÐØ VRRP Â

ð ¾ Ô

ð Ô

ÐO ˘ VRRP Â

```
Ruijie# debug vrrp state
Ruijie#
%VRRP-6-STATECHANGE: GigabitEthernet 0/0 Grp 2 state Master ->
Backup
%VRRP-6-STATECHANGE: GigabitEthernet 0/0 Grp 2 state Backup ->
Master

Ruijie# config terminal
Enter configuration commands, one per line.  End with CNTL/Z.

Ruijie(config)# interface GigabitEthernet 0/0
Ruijie(config-if)# no shutdown
Ruijie(config-if)# end
Ruijie#
%VRRP-6-STATECHANGE: GigabitEthernet 0/0 Grp 2 state Master ->
Init

Ruijie#
```

1.3

1.3.1 show vrrp

¾ VRRP Â

show vrrp [**brief** | *group*]

ð Ô

brief ‘ Ñ ˘ VRRP

group ‘ VRRP Ñ

ð ¾ Ô

ð Ô

a Λ ˘ VRRP Â

ð Ô

VRRP

```
Ruijie# show vrrp
GigabitEthernet 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
GigabitEthernet 0/0 - Group 2
State is Master
Virtual IP address is 192.168.201.2 configured
Virtual MAC address is 0000.5e00.0102
Advertisement interval is 3 sec
Preemption is enabled
min delay is 0 sec
Priority is 120
Master Router is 192.168.201.217 (local), priority is 120
Master Advertisement interval is 3 sec
Master Down interval is 9 sec
Ruijie#
```

VRRP

```
Ruijie# show vrrp brief
Interface         Grp Pri Time  Own Pre State   Master addr
Group addr
GigabitEthernet  0/0     1     100     -      -     P   Backup
192.168.201.213 192.168.201.1
GigabitEthernet  0/0     2     120     -      -     P   Master
192.168.201.217 192.168.201.2
Ruijie#
```

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ৡ	

Ruijie(config-if)# **vrrp** *group ip ipaddress* [**secondary**]	VRRP ¶ IP

1.3.2 show vrrp interface

¾ Э VRRP Â

show vrrp interface *type number* [**brief**]

ð Ô

type ·

number · ∧

brief · ∧ Â

ð ¾ Ô

ð Ô

Ю Л Ethernet E1/0 Э VRRP

```
Ruijie# show vrrp interface GigabitEthernet 0/0
GigabitEthernet 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
GigabitEthernet 0/0 - Group 2
State is Master
Virtual IP address is 192.168.201.2itEthernet 0/0 - Group 2
State is Master
local)3 sec
Preemption is enabled
min delay is 0 sec
Priority is 100
```

2 MULTI-LDP

2.1

2.1.1 clear multi-ldp

UP/DOWN Â

clear multi-ldp

-	-

¾

1' ¶ UP/DOWN

```
Ruijie#config
Ruijie(config)#interface gigabitEthernet 0/1
Ruijie(config-if-GigabitEthernet 0/1)#clear multi-ldp
```

¾	
-	-

/

-

/	
10.3(4T90)	¾

2.1.2 multi-ldp

no

ip multi-ldpicmpn

ৡ	
-	

-

ৡ	ৡ
10.3` 4t90˜	ৡ

2.2

2.2.1 show multi-ldp interface

show multi-ldp interface [*interface-name*]

interface-name	+ID

ৡ

ł a ˘ MULTI-LDP

1` **show multi-ldp interface**

```
Interface            State    Retry    UpCnt    ICMP
Next-hop
StartTime            Interval Resume   DownCnt  DNS           TCP
=================================================================
===============
GigabitEthernet 0/1    DOWN     5       0       192.168.201.1
192.168.201.160
2010-12-23 09:31:03    50       1       0       N/A
192.168.201.160:80


GigabitEthernet 0/3    UP       5       1       192.168.198.1
192.168.78.1
2010-12-23 09:31:03    50       1       0       8.8.8.8
```

```
220.181.112.76:80
```

2、 **show multi-ldp interface gigabitEthernet** 0/3

```
Interface            State    Retry    UpCnt    ICMP
Next-hop
StartTime            Interval Resume   DownCnt  DNS           TCP
=================================================================
===============
GigabitEthernet 0/3   UP      5        1        192.168.198.1
192.168.78.1
2010-12-23 09:31:03   50      1        0        8.8.8.8
220.181.112.76:80
```

Interface	
State	
Icmp	icmp ip
Dns	dns ip Dns

ǂ ĄA Λ ҳ ĄA ˘ ЛЬЮ ˙

1. CPU-LOG ҳ
2. ҳ
3. ҳ
4. USB ҳ

1 CPU-LOG

1.1

Ь ৡ˙

- **show cpu**
- **cpu-log**
- **show environment**

1.1.1 show cpu

CPU ˘ ৡ **show cpu** Â

show cpu

ð Ô

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ð ৡ Ô

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ð Ô

ৡ Л Лъ CPU ˘ 5 à 1ƚ à
5ƚ CPU ˘ Лъ ↓ Ŀƚ 5 à 1ƚ à
5ƚ CPU Â

ð Ô

Ю **show cpu** Â

```
Ruijie# show cpu
=====================================
    CPU Using Rate Information
CPU utilization in five seconds: 25%
CPU utilization in one minute  : 20%
CPU utilization in five minutes: 10%
  NO   5Sec   1Min   5Min   Process
```

0	0%	0%	0%	LISR INT
1	7%	2%	1%	HISR INT
2	0%	0%	0%	ktimer
3	0%	0%	0%	atimer
4	0%	0%	0%	printk_task
5	0%	0%	0%	waitqueue_process
6	0%	0%	0%	tasklet_task
7	0%	0%	0%	kevents
8	0%	0%	0%	snmpd
9	0%	0%	0%	snmp_trapd
10	0%	0%	0%	mtdblock
11	0%	0%	0%	gc_task
12	0%	0%	0%	Context
13	0%	0%	0%	kswapd
14	0%	0%	0%	bdflush
15	0%	0%	0%	kupdate
16	0%	3%	1%	ll_mt
17	0%	0%	0%	ll main process
18	0%	0%	0%	bridge_relay
19	0%	0%	0%	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 ‡ é CPU
˦ Â è ˘ " ЂЌ Ю˙

- No˙ ㇒
- 5Sec˙ ┗ 5 CPU
- 1Min˙ ┗ 1˦ CPU
- 5Min˙ ┗ 5˦ CPU

2 ˘˦ LISR CPU HISR CPU
˘ ÿ 3 ˘ ┗ CPU Â ł idle CPU
˘ Windows Ю ľ System Idle Process Ŀ ˘ Â Э
˘ idle 5 CPU ѝ 75%˜ CPU 75%
Â

1.1.2 cpu-log

CPU ,ʌ Ɓ **cpu-log** Â

cpu-*log* *log-limit low_num high_num*

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log-limit ৡ

low_num CPU æ

high_num CPU

ð Ô

Ю ѝ 100%˜ æ ѝ 90% Â

ð ৡ Ô

Â

ð Ô

ৡ ʌ Ɓ CPU æ ˘ CPU
Ю ˘ CPU ,ʌ
' CPU æ æ ł , , CPU Ю ˘
ʌ CPU ʌ ѝ æ æ Â

ð Ô

Ю CPU æ ѝ 70%˜ CPU
ѝ 80% Â

```
ruijie(config)# cpu-log log-limit 70 80
```

CPU 80% Ю '

```
Oct 20 15:47:01 %SYSCHECK-5-CPU_USING_RATE: CPU utilization in
one minute : 95%˘ Using most cpu's task is ktimer : 94%
```

CPU æ 70% Ю '

```
Oct 20 15:47:01 %SYSCHECK-5-CPU_USING_RATE: CPU
utilization in one minute :68%˘ Using most cpu's task
is ktimer : 60%
Oct 20 15:47:01 %SYSCHECK-5-CPU_USING_RATE: The CPU
using rate has down!
```

1.1.3 show environment

˘ ' CPU ˘ à Â

ৡ **show environment** Â

show environment

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҄ Л Л Ъ ˘ CPU ˘ ў ˘
˘ ў Â

ð Ô

Ю **show environment** Â

```
Ruijie# show environment
---environment information---
CPU Temperature is 30
fan works in high speed mode.

FAN 1 is OK!
FAN 2 is OK!
FAN 3 is OK!
FAN 4 is OK!

POWER 1 is present!
POWER 1 power on successfully!
POWER 2 is not present!
```

Э “ ˘ Л ' CPU и 30 ˘
˘ ˘ ˘ з ˘ ⅄
a æ^ Л ~ Â

2

2.1

2.1.1 threshold set

ˇ Ⲗ 3 ˇ ⲧ ѝ CPU ѣ
ä Â CPU ˇ ў MIB Ⲗˇ
CPU

1˙ M1 Â

```
Ruijie(config)# threshold set memory M1 70 90
```

2˙ ɣ ʌ CPU Â

```
Ruijie(config)# threshold set cpu member 2 70 90
```

ʒ	
show threshold	ʒ

ʌ

ʌ	
10.3(4b3)	ʒ

2.2

2.2.1 show threshold

Â

show threshold {cpu | memory | temperature} [M1 | M2 | slot *n* | member *n*]

**cpu	memory	temperature**	˘ Ь ˘ **cpu** ѝ CPU ˘ **memory** ѝ ˘ **temperature** ѝ
**M1	M2	slot** n	æ˘ Э ˘ n ѝ . ʌ˘ ‡ æ
member n	˘ Э ˘ n ѝ ʌ˘ ‡

Â

1 M1 CPU Â

```
Ruijie# show threshold cpu M1
```

2 Â

```
Ruijie# show threshold memory
```

threshold set	

10.3(4b3)	

3

3.1

show memory
memory-lack exit-policy
show memory protocols

3.1.1 show memory

show memory

show memory

Ю

Ю

Ю

Ю

Ю

Ю

```
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%
```

1.

2. ˘ Ю й ЬЖ

min	a ˘ ˘ ˘ Э а Л Â
lower	ш a ˘ ˘ Э ╟ ˘ Â ⁸ memory-lack exit-policy ҳ Â
low	a ˘ ˘ Э OVERFLOW ˘ Ю a

Э a

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ð Ô

1ˈ ЛЬЮ й BGP й ″I Â

```
Ruijie(config)# memory-lack exit-policy bgp
```

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show memory	

ð ⁄ Ô

-

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10.3(4b3)	ৡ

3.1.3 show memory protocols

ৡ . Â

show memory protocols

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a˚ ↓ a˚ ˘ ў

BGP,OSPF,RIP,LDP,PIM,ISIS Â

ð Ô

1

```
OSPF            24000000
RIP             10000000
PIM             50000000
LDP             20000000
Total           206000000
```

ò ৡ Ô

ৡ	
show memory	

ò ʌ Ô

-

ò ৡ Ô

ʌ	
10.3(4b3)	ৡ

4 USB

4.1

ў CLI Ю ৡ USB Â

- USB ‘ **show usb** ৡ
- USB ‘ **usb remove** ৡ

4.1.1 show usb

USB Â

show usb

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ð Ô

USB ˘ ‡ ˘ ŭ ‡ Â

ð Ô

Ю show usb :

```
Ruijie# sh usb
Device: USB Mass Storage Device :
ID: 778
Lun 0:
ID: 0
Disk Partitions:
1: /dev/uba/disc0/part1 --> /mnt/uba
size : 131072000B(125MB)
```

ЮК Ю

USB Mass Storage Device ‘ ¨

ID ˙ ID ㇒ remove ˜

Lun ˙ ĩ ㇒ ЮO ID ĩ id ㇒ Â

Disk Partitions ˙ ¦ Ꮄ Â Э ˘ ¦ Ꮄ ¦ Ꮄ ˚
ѝ /dev/uba/disc0/part1 /mnt/uba Â ㇒ ৡ cd /mnt/uba
ЮO ¦ Ꮄ Â

ð ৡ Ô

ৡ

4.1.2 usb remove

usb remove *Device_ID*

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Device_ID USB ㇒

ð Ô

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ð ৡ Ô

ð Ô

usb ˘ ৡ ˘ Ⱡ Â
˘ ㇒ Â ˘
2 USB ˘ ‡ Ą Â

ð Ô

ЮO ѝ Э usb Â

```
Ruijie# usb remove 778
OK, now you can pull out the device 778.
0:1:1:38 Ruijie: USB-5-USB_DISK_REMOVED: USB Device <USB Mass
Storage Device> Removed!
```

㇒ Ⱡ usb Â

ð ৡ Ô

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ǂ ĄĄ ǯ ĄĄ ˇ ЛЬЮ ˛

1. ǯ
2. RLOG ǯ
3. SNMP ǯ

1

1.1

1.1.1 logging on

a Э ˘ ҳ Â ˘
ҳ no Â

logging on

no logging on

ð Ô

ð Ô

a Э Â

ð ҳ Ô

ð Ô

RGOS a Л Ъ Console à VTY Э˘ ≠ Л Ъ
a Э· ά Ҁ à FLASH à Syslog Server Â ҳ и ˘
no

logging console	8 Л Э
logging monitor	VTY (telnet)Э
logging trap	Syslog Server

1.1.2 terminal monitor

VTY Э Â VTY Э

ð Ô

buffer-size ˙ ă Ϟ ˘ ϰ ÿ 4K 128K Bytes Â

levelI ˙ ш ˘ ÿ 0 7 Â Ѧ Ѣ ¨ ˘ ≠ Ѧ Ѣ Â

ð Ô

ă Ϟ ѝ 4k Bytes Â

ш ѝ 7 Â

ð ϟ Ô

ð Ô

ă Ϟ ˘ Ϟ ˘ ‡

Â ă Ϟ ˘ ϟ **show logging Â**

ă Ϟ ˘ ϟ clear logging˘ ă Ϟ Â ˘ FLASH Syslog Server Â

RGOS ϯ ѝ ЉЮ 8 ˙

1

Emergencies	0	˘ a
Alerts	1	¨ ϰ
Critical	2	
Errors	3	
warnings	4	
Notifications	5	˘ a
informational	6	
Debugging	7	

˘ ˘ ¨ 0 Â

Ѣ ѣ˘ æ

Â

ð Ô

Ю Ѧ ѝ 6 Ѣ ѵ æ 6 ѝ 10000

ă ϒ ‘

```
Ruijie(config)# logging buffered 10000 6
```

ð ϟ Ô

ϟ	
logging on	
show logging	ă ϒ
clear logging	ă ϒ

1.1.4 logging server

Syslog Sever˘ Ю ϟ Â

Syslog server “ **Syslog Server˘** ϟ no Â

logging server {*ip-address* [**vrf** *vrf-name*] | **ipv6** *ipv6-address*}

no logging server {*ip-address* [**vrf** *vrf-name*] | **ipv6** *ipv6-address*}

ð Ô

ip-address ў IP ’

vrf vrf-name ў VRF˘ VPN ~ ’

ipv6 ipv6-address ў IPV6 ’

ð Ô

a ă̈ syslog server

ð ϟ Ô

ð Ô

ϟ Syslog server Â

३	
logging on	
show logging	ă ٧ ˘ Лъ ٧
logging trap	syslog server

1.1.5 logging file flash

FLASH ˘ Ю ३ Â ٨ FLASH ˘ ३ no Â

logging file flash:*filename* [*max-file-size*] [*level*]

no logging file

ð Ô

filename ' ˚ ¨ Â a ˚ ˘ ѝ txt Â

max-file-size ' ˚ Â ÿ 128K 6M bytes˘ ѝ 128K Â

levelI ' ˚ Â Л Лъ ¨ ˘ ≠ Л Лъ Â FLASH ѝ 6 Â ˘ 1 Â

ð Ô

a FLASH Â

ð ३ Ô

ð Ô

Syslog Server˘ a ˘ Л Лъ FLASH Â

˚ ł ѝ ѝ txt˘ ˚ ł ¨ Â

~

˚ ˘ ѐ ˚ ˘ ‡ '

1. ˘ ‡ … ˚
2. ˚ ¨ ˚ ¨ ٨˘ ѝ ' ˚ ¨ _ ٨˘ ł Ÿ txt˙
3. ٨ ѝ 15˜ ˘ ‡ ˚ Â ˘

FLASH FLASH 16

Ю FLASH trace.txt 64K,
6

```
Ruijie(config)# logging file flash:trace
```

logging on	
show logging	
more flash	FLASH

1.1.6 logging console

Ú

```
Ruijie(config)# logging console informational
```

ð ϡ Ô

ϡ	
logging on	
show logging	ă ϒ ˘ Лъ ↓

1.1.7 logging monitor

VTY ˆ telnet à SSH ˜ Э ˘
Ю ϡ Â ϡ no VTY Э Â

logging monitor *level*

no logging monitor

ð Ô

level ' ш Â Л Лъ ¨ ˘ ≠ Л Лъ Â
ш ˘ 1 Â

ð Ô

Debugging (7)

ð ϡ Ô

ð Ô

VTY Э ˘ ″I ϡ **terminal monitor**
VTY Â ‡ **logging monitor** Ћ Â

Logging monitor Ћ VTY Â

ð Ô

Ю VTY Э ѝ б

```
Ruijie(config)# logging monitor informational
```

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ϡ	
logging on	
show logging	ă ϒ ˘ Лъ ↓

1.1.8 logging trap

Syslog Server Ю Â

no Syslog Server Â

logging trap *level*

no logging trap

ð Ô

level ш Â Л Љ Â

ш 1 Â

ð Ô

Informational(6)

ð Ô

ð Ô

Syslog Server logging Syslog Server Â logging trap ш Â

show logging Л Љ Â

ð Ô

Ю й 6 й 202.101.11.22 Syslog Server

```
Ruijie(config)# logging 202.101.11.22
Ruijie(config)# logging trap informational
```

ð Ô

logging on	
logging	Syslog Server
show logging	Љ

1.1.9 logging source interface

Ю Â no

logging source interface *interface-type interface-number*

no logging source interface

ð Ô

interface-type ‘

interface-number ‘ ʌ

ð Ô

ð ¾ Ô

ð Ô

ЮЎ Syslog Server Â й
ˇ ʌ Л ъ ¾ й ˇ
ÿ ʌ Â

ð Ô

Ю Loopback 0 й Syslog ‘

```
Ruijie(config)# logging source interface loopback 0
```

ð ¾ Ô

¾	
logging server	Syslog Server

1.1.10 logging source ip| ipv6

ˇ Ю ¾ Â ¾ no ʌ
Â

logging source {**ip** *ip-address* | **ipv6** *ipv6-address*}

no logging source {**ip** | **ipv6**}

ð Ô

ip-address ă IPV4 ў IPV4 ’

ipv6-address ă IPV6 ў IPV6 ’

ð Ô

1	user-level messages
2	mail system
3	system daemons
4	security/authorization messages
5	messages generated internally by syslogd
6	line printer subsystem
7	network news subsystem
8	UUCP subsystem
9	clock daemon
10	security/authorization messages
11	FTP daemon
12	NTP subsystem
13	log audit
14	log alert
15	clock daemon
16	local use 0 (local0)
17	local use 1 (local1)
18	local use 2 (local2)
19	local use 3 (local3)
20	local use 4 (local4)
21	local use 5 (local5)
22	local use 6 (local6)
23	local use 7 (local7)

RGOS й (local7) 23 Â

ð Ô

Ю Syslog й kerneľ

```
Ruijie(config)# logging facility kern
```

ð ҷ Ô

logging console	8 Э

1.1.12 logging count

Ю Â
no Â

logging count

no logging count

Ô

Ô

Ô

Ô

Â ÿ Â **no logging count**
Â

Ô

Ruijie(config)# **logging count**

Ô

show logging count	
show logging	б

1.1.13 logging rate-limit

8 8 Ю
Â 8 no Â

logging rate-limit {*number* | *all number* | *console* {*number* | *all number*}} [*except*

severity]

no logging rate-limit

ð Ô

number ˘ ù 1—10000ʾ

all ⁸˘ 0—7 ʾ

console ⁸ Л Э ʾ

except ш ˘ a ⁸ʾ ù error(3)˘ error a ⁸ʾ

severity ш ˘ ˘ ш ˘ ù 0—7;

ð Ô

Ю˘ a ⁸ Â

ð ʒ Ô

ð Ô

ʒ ⁸ Â ʒ˘ Л Љ Â

ð Ô

^ debug˜ ù 10 ˘ warning ↓ ш a ⁸ʻ

```
Ruijie(config)#logging rate-limit all 10 except warnings
```

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show logging count	
show logging	б ă ↖

1.1.14 logging synchronous

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logging synchronous

no logging synchronous

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```
Ruijie(config)#
Ruijie(config)#line console 0
Ruijie(config-line)#logging synchronous
```

ϡ ˇ UP-DOWN ˇ ‡ ϡ ‘

```
Ruijie#configue terminal
Oct  9 23:40:55 %LINK-5-CHANGED: Interface GigabitEthernet 0/1,
changed state to down
Oct  9 23:40:55 %LINEPROTO-5-UPDOWN: Line protocol on Interface
GigabitEthernet 0/1, changed state to DOWN
Ruijie#configue terminal    ----          ϡ      ˇ     a
```

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show running-config	

1.1.15 service sequence-numbers

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service sequence-numbers

no service sequence-numbers

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```
Ruijie(config)# service sequence-numbers
```

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logging on	
service timestamps	

1.1.16 service timestamps

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Э Â default й
Â

service timestamps *message-type* [*uptime* | *datetime* [*msec* | *year*]]

no service timestamps *message-type*

default service timestamps *message-type*

ð Ô

message-type ˙ ч ˇ log debug Â log ш
0 6 ˇ debug ш й 7 Â

uptime ˙ ˇ ˙ * * * * ˇ ˙ 07:00:10:41

datetime ˇ ˙ ˙ ˙ ˇ ˙ Jul 27 16:53:07

msec ˇ ˙ : : . ˙ Jul 27 16:53:07.299

year ˇ ˙ : : ˙ 2007 Jul 27 16:53:07

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Uptime ÿ Э ╠ ˘ æ ù Â
Datetime ù ˘ . . ‘ † ‘ Â

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Ю Log Debug ˘ ù Datetime˘ ˘ з
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```
Ruijie(config)# service timestamps debug datetime msec
Ruijie(config)# service timestamps log datetime msec
Ruijie(config)# end
Ruijie(config)#Oct  8 23:04:58.301%SYS-5-CONFIG_I: Configured
from console by console
```

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logging on	
service sequence-numbers	ﾊ

1.1.17 service sysname

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service sysname

no service sysname

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```
Mar 22 15:28:02 %SYS-5-CONFIG: Configured from console by console
Ruijie# config terminal
Enter configuration commands, one per line. End with CNTL/Z.
Ruijie(config)# service sysname
Ruijie(config)# end
Ruijie#
Mar 22 15:35:57 S3250 %SYS-5-CONFIG: Configured from console by
console
```

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show logging	б ᾰ ᾽

1.1.18 more flash

FLASH ˚ ˘ Ю ʒ'

more flash:filename

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Filename ' ˚ ¨

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FLASH ˚ ˚ ¨ ”//f2/”˜ ”//f3/’ ˚ Â ʒ Л

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logging file flash:	FLASH Э

1.1.19 clear logging

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clear logging

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```
Ruijie# clear logging
```

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logging on	
show logging	ă ϰ
logging buffered	ă ϰ

1.2

1.2.1 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

logging count	ㄇ
show logging	б ă ヽ
clear logging	ă ヽ

2 RLOG

2.1

2.1.1 rlog export-rate

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rlog export-rate *number*

no rlog export-rate

number	Ŀ ˆ ˜

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```
Ruijie(config)# rlog export-rate 10000
```

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