RG-NPE “

RGOS 10.3(4b10)

V2.0

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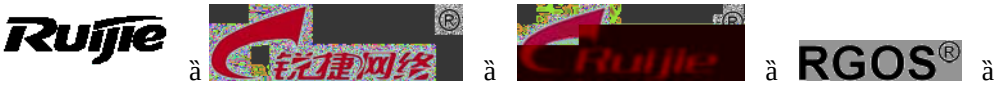

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■ ‘ http://www.ruijie.com.cn/ Â

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1 CLI

1.1 alias

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alias *mode command-alias original-command*
no alias *mode original-command*

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mode ˛ ¨ Ʒ ʒ ʒ Â
command-alias ˛ ʒ ¨ Â
original-command ˛ ¨ Ʒ ʒ Â

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

ʒ ¨ a **no alias exec** ʒ Â
ʒ ¨ ˘ ʌ Ʊ Ʒ ʒ Â ˘ …

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

*command-alias=original-command

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

```
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	
keychain	
keychain-key	
time-range	

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ЉЮ ˘ ʒ ѝ ˘ **reload** ʒ ˘ ⁄ЛЉ Æ Â

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

˘ ˘ ⁄ЛЉ **reload** ʒ ˙

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

ʒ ˘ ‡ ⁄ЛЉ **all** ˙

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

˘ ˘ ⁄ЛЉ **reload** ʒ ˙

```
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	ʒ

1.3 show aliases

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show aliases *mode*

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

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2

2.1

2.1.1 disable

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disable *privilege-level*

privilege-level	

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📖 **disable** ʒ ɨ Â

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Ruijie# **disable** *10*

enable	ÿ ˘ Â

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2.1.2 enable password

enable password level *level password* **0 7** *encrypted-password* **no enable password**

Password	EXEC
Level	
0|7	0 7
encrypted-password	

~ EXEC

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

enable secret

-

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 Serverˇ ʒˇ IPv4 IPv6 ╘’
telnet-server	б Telnet Serverˇ ʒˇ IPv4 IPv6 ╘’
web-server [http | https | all]	б Web Serverˇ ʒˇ IPv4 IPv6 ╘’
snmp-agent	б Snmp Agentˇ ʒˇ IPv4 IPv6 ╘’

ʒ

ʒ	б ╘Â **no enable service** ʒ ╘Â
🕮	enable service web-server ʒ ɨ 3 ⁄ [http | https | all] Â ʒ ɨ a ˘ all ˘ ‡ ˚ http ╘ https ╘’ http ˘ ‡ ⁄ http ╘’ https ˘ ‡ ⁄ https ╘Â

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

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

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show service	╘ ’

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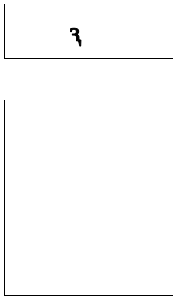
2.1.5 execute

˚ ʒˇ ʒ **execute** ʒ Â

execute **flash:** *filename*

flash:	˚ Э
filename	˚ ¨



TFTP Flash CLI

Ю line_rcms_script.text Э
Telnet

```
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
local	username 15

enable

no ip http authentication

Ю

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

enable service

-

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2.1.7 ip http port

ip http port

ip http port *number*

number	HTTP Server 80

80

HTTP

no ip http port

2.1.9 lock

Э ʒ˘ ʒ **lock** Â

lock

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- ‘ **lock** ʒ˘ ʒ’
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Э в ˥ ˘ line Ю **lockable** ʒ˘ line Э в Â

Ю й в ‘

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

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lockable	Э в Â

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2.1.10 lockable

Э **lock** ʒ˘ ʎ Љ Ю **lockable** ʒ˘ Ю a **lock** ʒ Â **no** ʒ ʌ Â

lockable

no lockable

-	-

ʒ line

ʒ Э в ˘ в ʎ Љ EXEC Ю **lock** ʒ Â

Ю ⁸ ʎ Э в ╖ ˘ в ⁸ ʎ‘

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

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lock	в Â

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2.1.11 login

Ю˘ Э ʒ ˘ ʒ **login** Â ʒ **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	"

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2.1.13 login local

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 й

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2.1.15 service password-encryption

service password-encryption

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

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

enable password	a

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2.1.16 telnet

/ˈ ˈ ˘ ˆ ˜ Ю˘ **telnet** ʒ 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

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

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	web Â
	~
	IO : Ruijie#**username export** *user.csv*

	web-auth	web Â

	10.3(4t76)	

2.2

2.2.1 banner login

IO **banner login** Â

no banner login Â

banner login

2.2.3 clock set

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

hh:mm:ss	˘ й ˆ 24 ⁸ ˜ : ǂ :
day	ˆ 1-31˜ ˘ Â
month	ˆ 1-12˜ ˘
year	ʼΩ ĩ ˆ 1993-2035˜ ˘ a Â

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˘ ˘ clock set Э

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Ю й 2003 3 17 Э´ 10 20ǂ 30 ʿ

```
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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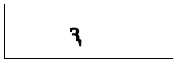

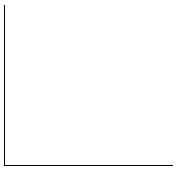

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```
Ruijie# clock update-calendar
```

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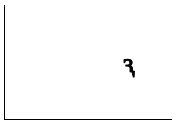

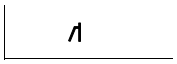

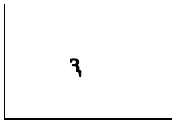

2.2.5 exec-timeout

exec-timeout ʒ Â **no exec-timeout**

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exec-timeout

Ю line vty 0 ѝ 5 30

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

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2.2.6 hostname

ў ⸚ ˘ ꙁ **hostname** Â

hostname *name*

name	ў ⸚ ˘ ⺈ à Ѣ ⺌ Â ѝ 32 Â

ў ⸚ ѝ Ruijie Â

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ў ⸚ ў Ѣ ⺌ ⺈ 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

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	2
month	3 Mar

day	˘ ÿ 1 31
cancel	ʌ

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Ruijie# **reload in** *10*

Router will reload in 600 seconds.

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˘ ˘ LINE ѝ Л Â

Ю line vty 0 ѝ 5¦ 30 ‘

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

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Л cn _4.90.54A602D6>Tj/TT1 1 Tf-

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2.2.11 write

write memory network terminal

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

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2.3

2.3.1 show clock

˘ ʒ **show clock** Â

show clock

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ʒ /l Љ ˘ detail Â

Ю **show clock** ʒ ˛

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

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clock set	

/l

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/l	
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2.3.2 show line

˘ Ю˘ ʒ **show line** Â

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

console	8 /l
vty	vty
line-num	line

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 show reload

show reload

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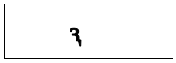

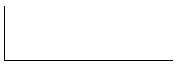

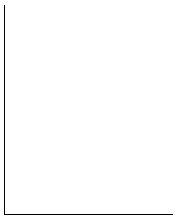

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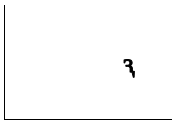
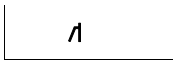
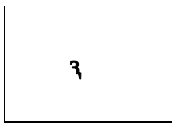
```
Ruijie# show reload
Reload scheduled in 595 seconds.
At 2003-12-29 11:37:42
Reload reason: test.
```







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2.3.4 show running-config

˘ ꝛ **show running-config** Â

show running-config

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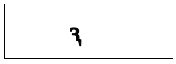

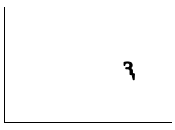

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2.3.5 show startup-config

show startup-config

show startup-config

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3

3.1

cp dest *destine_file directory* **sour** *source_file*
cp sour *source_file* **dest** *destine_file directory*

destine_file	
directory	8
source_file	8 ( )

cp a 8 Â

ЛЬЮ log.txt Э

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


3.1.3 ls

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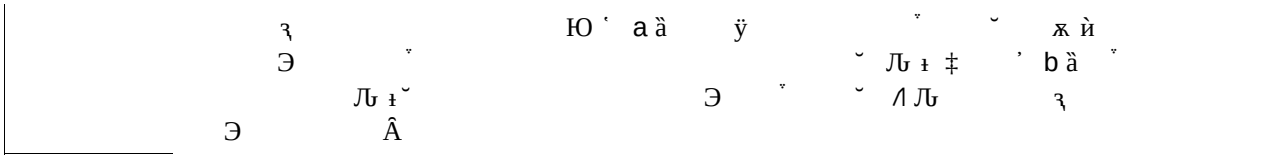
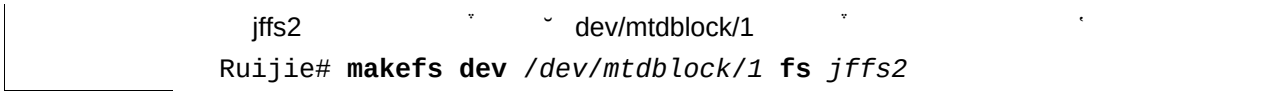
pathname

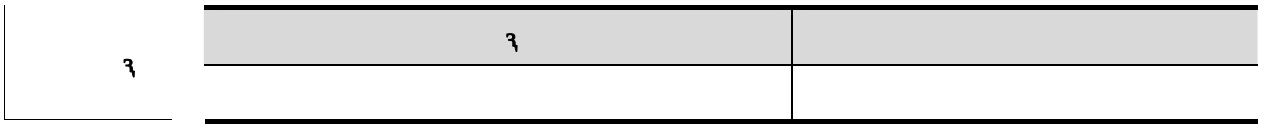
pathname	ù Ю Â

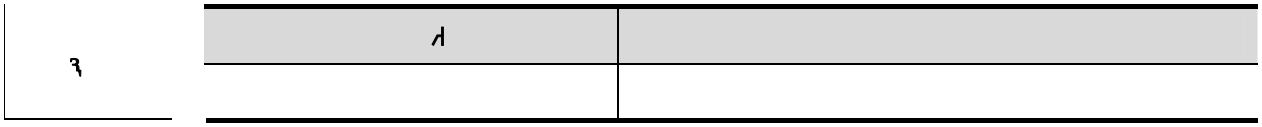




jffs2 dev/mtdblock/1

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

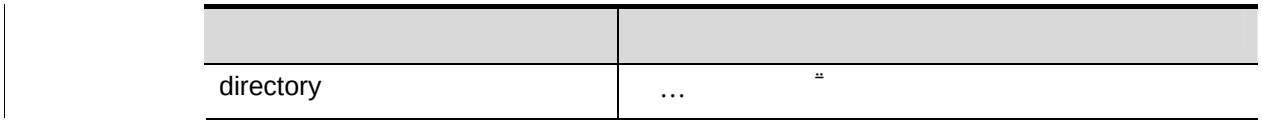




3.1.5 mkdir

…

directory



directory	…

… ( )

a …

… test

```
Ruijie# mkdir test
```


3.1.7 pwd

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Pwd

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	IO Â Ruijie# **pwd**

3.1.8 rm/delete

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rm recursive *file*

delete recursive *file*

recursive	
file	( )

a , a Â
Ю log.txt
```
Ruijie# rm log.txt
```
flash aaa
```
Ruijie# delete recursive aaa
```

rmdir	, , rm

3.1.9 rmdir

Â

rmdir

directory	,

a , , **rm**
Â
Ю tmp з Â

Ruijie# **rmdir** *tmp*
Ruijie# **ls**

4

4.1

ў Ю ҳ ` Â

- ` ‘ **copy xmodem** ҳ
- ` ‘ **copy tftp** ҳ

4.1.1 copy xmodem

` ҳ˘ Э Ю Â

copy flash *filename* **xmodem**

copy xmodem flash *filename*

~

˚ ¨ ˘ ˚ ¨ ╗ Э ⁄˘ ‘

copy xmodeam flash: **copy flash:**

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filenamė Э ˚ ¨

ð Ô

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ð Ô

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⁄ Л˚ ˚ ˘ ў ˚ à ˚ Â ⁄ ^ ~
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Э ˚ Э ў Â

ð Ô

Ю Э Ю

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

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

4.1.2 copy tftp

Э Ю Â

copy flash: *filename* **tftp** *ocation filename*

copy tftp *ocation filename* **flash:** *filename*

copy flash: *filename* **tftp** *ocation filename* **vrf**

copy tftp *ocation filename* **flash:** *filename* **vrf**

~

copy tftp: flash: vrf

copy tftp: flash: vrf

filename Э

vrfname

Â

Â Â Â

5 HTTP

5.1

5.1.1 http check-version

http check-version

-	-

1 HTTP e#.683 0.60 1 Tf40552_0 1 Tfion

all	` ⋀ ` ˇ
string	` ⊾ ˇ ˘ ⊾

ʒ

ʒ ˇ ` Â ` ╗ ɨ ˘ ╟ Â

1ˋ ╟ ` ⋀ ˋ

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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⋀ -

⋀	
	ʒ
	╗ ʒ
	╗ all ˘ ʒ

to-update

╟ ` ˇ Â

-update all *string*

	` ⋀ ` ˇ

╟`

ʒ

ʒ ˇ ╟` Â ╟` ѝ auto-update Â

1ʿ ╟` ⁄ ˇ ˘ ѐ ˇ a ╟` ʿ

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

ʒ

ʒ	
http update mode	`

⁄ -

ʒ

⁄	
	ʒ

5.1.4 http update mode

` ѝ ╟` ȁ ╟` ╟ Â

http update mode auto-update manual auto-detect

auto-update	╟`
manual	╟`
auto-detect	╟

Ю˘ ѝ ╟` Â

ʒ Â

	-	-

-

5.1.6 http update set oob

ÿ ` Â

no http update set oob

-	-	

Ю й `

HTTP ÿ ` Â no ÿ ` Â

1' HTTP ÿ ` '

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

-	-	

-

5.1.7 http update time

Â

http update time daily *hh:mm*

hh:mm	

Â

Â

Â

1 HTTP Â 23:40

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

-	-

-

	Â

5.1.8 feedback enable

Â Â

no feedback user enable

user	Â a user Â

Â

Â

feedback user enable

feedback enable

1.

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

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

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	³

5.1.10 feedback ignore-item

Â ⁄ ³ ⁄ Â

३	

5.1.12 feedback update

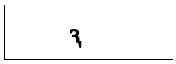
feedback update

5.1.13 feedback user-info

no feedback user-info

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

string1	<100
string2	<100
string3	<100


३

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


5.1.16 mail-client username

no mail-client username *username* **password 0 7** *password*

username	
[**0** | **7**]	0 7 0
password	

1 SMTP

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

-	-

-

5.1.17 mail-client smtp-server

Â

mail-client smtp-server *host* **port** *value*

5.2

5.2.1 show feedback items

Â ʒ ╗ ⅄ ‡ ⅄ Â

show feedback items *number*

number	⅄ Â <0 - MAXID>

Â

ʒ Â

MAXID

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1

1.1

1.1.1 bandwidth

Ю **bandwidth** ҳ ˘ ҳ **no**
Â

bandwidth *kilobits*

no bandwidth

ðð Ô

kilobits ‘ ˘ Лъ ѝ æ

ðð ҳ Ô

ðð Ô

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

ðð Ô

bandwidth ҳ a ˘ /Ѝ
˘ ˘ Лъ ˘ /Ѝ Лъ Â
/Ѝ ˘ 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˘ ·

ð Ô

ð Ô

ð Ô

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Л ˘ ж Л a Э
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˘ Лъ Л Лъ Â ˘ з
˘ ж ˘ Лъ Â

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ЛъЮ ѝ ·

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

1.1.3 clear counters

Ю **clear counters** Â

clear counters

ð Ô

Љ ˘ Ю ʒ ʻ

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

ð ʒ Ô

ʒ	
show interfaces	Љ ˧˩

1.1.4 description

Ю **description**

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/ǀ Љ Э Â

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Ю Э ˘ *VLANID* ѝ ʻ

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

1.1.7 interface

Ю **interface** ҙ Â

interface *type slot-number/interface-number*

ð Ô

type ʻ ˘ ȁ ȁ ȁ ȁ ȁ Â

Slot-number/port-number ʻ ⁄ˇ ⁄ ⁄ ˘ ⁄ Эˆ ў Э ⁄ ѝ ˜˘ ⁄ Э ⁄ Â

sub-interface-number ʻ ⁄ Â

ð ҙ Ô

ð Ô

ˆ ȁ ˜ ˘ a ҙ Â **show interfaces** ҙ

ð Ô

”I Љ ʻ

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

ʻ

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

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

ð Ô

ЛЬЮ Лъ Э

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

ð ৡ Ô

ৡ	

```
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

keepalive

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

no keepalive

keep-period

ʌ Ʊ ʿ

ð Ô

ЛЮ

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

ð ʒ Ô

ʒ	
show interfaces	Ʊ ʌ

1.1.12 mac-address

mac-address ʒ Э ˘ ʒ **no** ʌ Â

mac-address *H.H.H*

no mac-adderss

ð Ô

H.H.H ʿ ˘ ˘ ʌ Ʊ ˘ Ʊ ˘ Â

ð ʒ Ô

ð Ô

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Ʊ Â ˘ Ʊ ʌ Ʊ ˘ ˘ Э Â ʌ ˘ Ю˘ a Â

ð Ô

ЛЮ Ʊ ʿ

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

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

1.1.13 medi}s0ype

Â ʒ **no**

medi}s0ype baset | basex auto

no medi}s0ype

ð Ô

basex auto ʿ ʺI

baset ʿ

ð Ô

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ð ʒ Ô

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Â ⁄ ɨˇ ѝ ὲ ˘ ⁄ Ʌ

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ð Ô

```
Ruijie(config)# interface gigabitethernet 0/1
Ruijie(config-if)# medi}s0ype basex auto
```

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

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show interfaces	Ʌ √

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a ╟ ʺI ˘ ѝ ˘ ʒ

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1.1.14 mtu

Ю **mtu** ʒ ĩ ˆ
˜˘ ʒ **no** Â

mtu *num*

no mtu

ð Ô

num ˋ ˄˥ ѝ ˘ Ѣ ѝ æ Â ˄˥ a ˇ a
ˇ a ˇ ˘ ѝ Â

ð Ô

ѝ Â

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ð Ô

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з ˘ ˘ ˅˩ ᴇ a ἑ ˄˥
. ˘ Â ˘
˘ a ˇ ᴇ ǂ Â ˄˥
Â

ð Ô

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

ð ʒ Ô

ʒ	
show interfaces	Ѣ ˅˩

1.1.15 shutdown

˘ ʒ Â ʒ **no**

shutdown

no shutdown

ð ʒ Ô

ʒ

ð Ô

ˆ Ɱ ȁ ȁ ˜˜ ʒ ˘ ɛ̀
Ÿ ˘ a Â **show interfaces** ʒ Â

ð Ô

ʿ

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

ʿ

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

ð ʒ Ô

ʒ	
show interfaces	Ɱ ˧˩

📖

no shutdown ˘ ˩˥
Â

1.1.16 snmp trap link-status

˩˥ Ɱ ŭ̆ Ɋ LinkT

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˥ ˘ ˧ ˘ ˧ ‡ a Â

ð Ô

Ю ѝ a

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

Ю ѝ

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

1.1.17 speed

Â ʒ **no**

speed auto 10 100 | 1000

no duplex

ð Ô

10 ˙ ѝ Â
100 ˙ ѝ Â
1000˙ ѝ Â
auto˙ ѝ Â

ð Ô

Â

ð ʒ Ô

ð Ô

show interfaces ʒ Â a˘ ˘ ≠
a˘ Â ˘ a ѝ Â

ð Ô

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

ð ʒ Ô

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

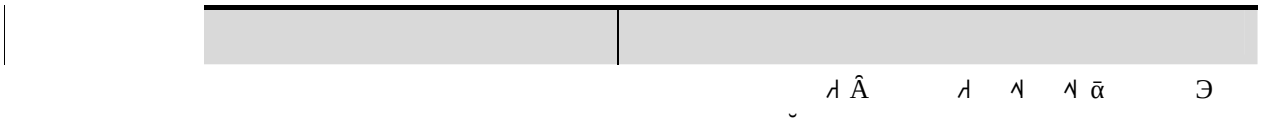
2

2.1

2.1.1 bridge-map

Â

bridge-map *bridge-num*



bridge-num

10.3(4b7)	

2.1.2 lan-ip

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[no] lan-ip *ip_address subnet_mask*

ip_address	IP
subnet_mask	

Ю Â ч
Ю Â

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

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 Â

a Â

Â

Â

Â

Â

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
```

ʒ	
-	-

ʌ	-

ʒ	
10.3(4b7)	ʒ
10.3(4b8)	receive-only

2.1.4 native-vlan

Â ʌ Ʌ ʒ

ѝ Â

no native-vlan *vlan-id num*

vlan-id num	Vlan id ˘ ѝ 1~4094

Ю native-vlan id ѝ 1˘ no ʌ Ʌ native-vlan id ѝ Â

ʒ ʒ

native vlan-id Â vlan-id ѝ native vlan-id vlan† Â

1˙ 1 native-vlan id ѝ 100˙

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

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ʒ	
10.3(4b7)	ʒ

ʒ

2.1.5 specify interface

ȁ Â

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

ʒ ѝ

no specify interface *interface-name*

interface-name	Â
lan	ѝ Â
wan	ѝ Â

a ˘ ʎ Э a ˘ Â

ʒ Â

Ю ˘ ʒ Â

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… ÿ ў ˘ ў ɨ ˘ ɨ ˘ Â

1ʿ GigabitEthernet 0/0 ѝ ʿ

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

2ʿ GigabitEthernet 0/0 ѝ ʿ

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

3ʿ GigabitEthernet 0/0 ѝ ʿ

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

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10.3(4b7)	ʒ

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2.1.6 sys-mode

ѝ Â ⁄ ⅃ Ъ ʒ ѝ

˘ ѝ Â

no sys-mode gateway

-	-

vlan-enable	vlan id ѝ 1-4088 Â

Â

Ю˘ ѝ ˘ ʒ Ю 8 ‘

2˘ /ˈ ʒ˘ з /ˈ Ю’

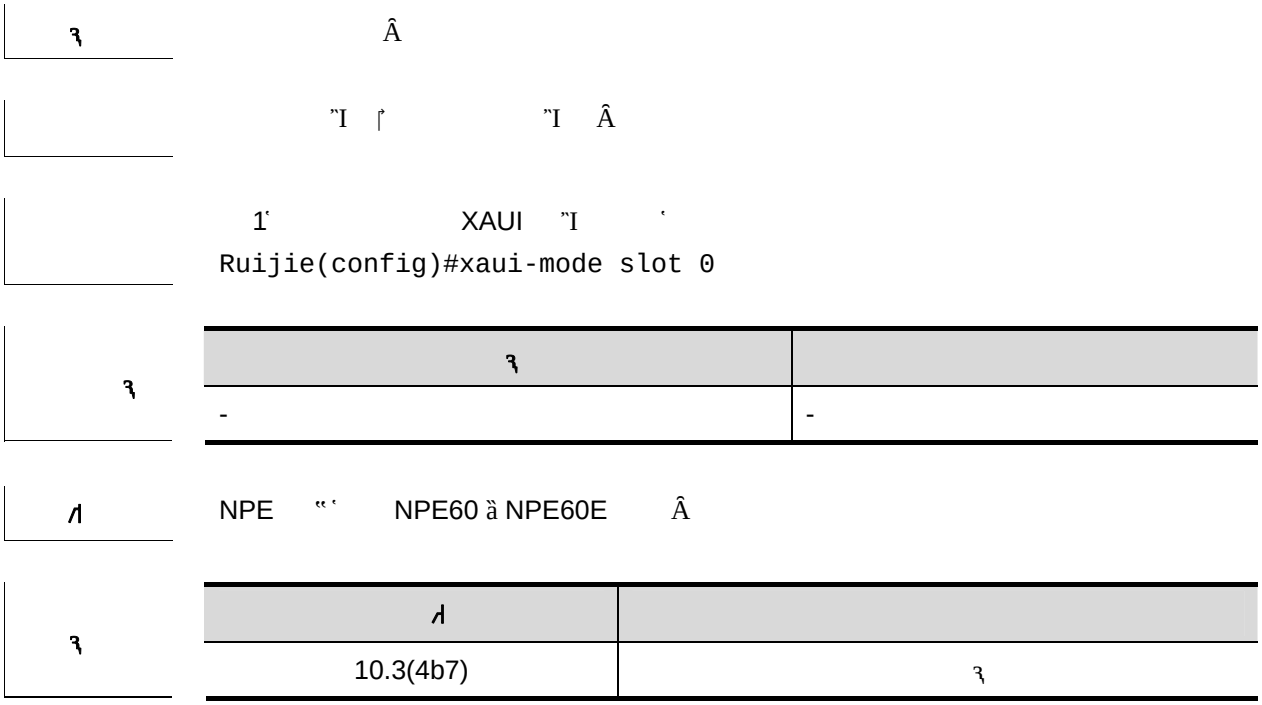
1‘ GigabitEthernet 0/0 vlan id ѝ 1-4088 ‘

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

ʒ	
-	-

-

ʎ	
10.3(4b7)	ʒ



ʒ	Â
	”I ⌈ ”I Â
	1‘ XAUI ”I ‘ Ruijie(config)#xaui-mode slot 0

ʒ	
-	-

⋔	NPE “‘ NPE60 ȁ NPE60E Â

ʒ	
⋔	
10.3(4b7)	ʒ

2.1.9 bypass

˙ б ȁ a˘ ˘ ⌈ Â

‘

bypass

३	

ʒ

ʎ	NPE “ ‘ NPE50E ȁ NPE60E

ʒ	ʎ	
	10.3(4b7)	ʒ

2.2

2.2.1 show bridge-map

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show bridge-map *bridge-num*

bridge-num	ʎ Â ˘ Â ‘ Ь ˘ ‡ ѝ 0~2 Â

ʒ

ʎ˘ Â

a ˘ ‡ Â

1‘ ʎ ѝ 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
```

ʒ	ʒ	
	-	-

2.2.3 show sys-mode

ˇ ȁ Â

show sys-mode

	ˇ Ɲ ˧˩
	wan lan Â
sys-mode	‘ ˇ LAN : GigabitEthernet 0/0 GigabitEthernet 0/3 WAN : GigabitEthernet 0/1 GigabitEthernet 0/2 GigabitEthernet 0/4 **я**

environment	⺈ ⺌ ⺈ ˘ ˘ ˘ ⺈ 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!
```

-	-

3

3.1

è ҳ **mtu** ầ **speed** ầ **duplexs** **p** **e** **e** **d**

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		ҳ

3.1.2 gateway

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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	
		ҳ

3.1.3 ip address

ҳ б Â

ip address *ip-address subnet-mask*

ip-address	IP
subnet-mask	

Â

MGMT MGMT˘ ˊ ѝ 0Â

1ˋ MGMT IP ˋ

```
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#
```

ҳ

б MGMT ў Â

1ˈ ў *192.168.0.1* б MGMT ˈ

```
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
```

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Л NPE ‟ˈ NPE40 ä NPE60 Â

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	ҳ

3.1.5 sntp enable oob

б ╠ Â

sntp enable oob

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ҳ

б MGMT SNTP ╠ Â

1ˈ SNTP ╖ ˈ

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

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ʌ ǎ E60 Â

ʒ	ʌ	
		ʒ

3.1.6

б ў Â

telnet oob *host*

	host	ў IP ¨

ʒ

б MGMT ў Â

1ʻ ў 192.168.200.1ʻ

```
Ruijie#telnet oob 192.168.200.1
User Access Verification

Password:
```

ʒ	ʒ	
	-	-

NPE “ ʻ NPE40 ǎ NPE60 Â

ʒ	ʌ	
		ʒ

4 LINE

4.1 LINE

4.1.1 line

˘ ЉЮ ʒˊ

line aux console tty vty *first-line last-line*

ð Ô

aux	˘ ‟ Э
console	8
tty	˘ ‟ Э
vty	˘
First-line	⅄
Last-line	⅄

ð Ô

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ð Ô

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ˊ

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

ð ʒ Ô

4.1.2 line vty

ʒ ⅄ Ʌ ╗ ⅄ Ʌ Â ʒ **no** ⅄ Ʌ
⅄ Ʌ Â

line vty *line-number*

no line vty *line-number*

ȍ Ô

Ю ⅄ ѝ ˘ ⅄ ѝ Â

ȍ ʒ Ô

ȍ Ô

╗ ⅄ ˘ ⅄ Ʌ Э ʒ Â

ȍ Ô

⅄ ╗ ˘ ⅄ ⅄ ѝ Â

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

⅄ ˘ ⅄ ⅄ ѝ Â

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

ȍ ʒ Ô

4.1.3 transport input

Ю ⅄ Ʌ ˘ **transport input** ʒ Ю ⅄ Ʌ
Â **default transport input** ѝ Ю ѝ Â

transport input all | ssh | telnet | none

default transport input

ȍ Ô

all	Ю Â
ssh	Ю ⅄ Â
telnet	Ю ⅄ Â
none	Ю a Â

ʒ

ð Ô

˘ Â è ѝ ˘
a Â ⅄ Ƨ ɨ˘ ⅄ Ƨ **default transport**
input ʒ ѝ Â

ð ʒ Ô

ð Ô

ʒ Ю Â Ю˘ Â
ɨ˘ ⅄ ⅄ Ƨ Э ╖ Â
show running ʒ Ю Â

~

default transport input ʒ Â**no transport input** ʒ˘
Ю Â б **transport input none** ˘ Â

ð Ô

Ю˘ ⅄ ˛

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

ð ʒ Ô

ʒ	
show running	Â

ð Ô

˘ Ƨ Э

4.1.4 access-class

Ю ˆ ⁸ ‘‘ ˜ Â **access-class** *acl-no*
in | out ʒ Ю ⁸ ‘‘ Â **access-class**
access-list-number **in | out** ʒ ⅄ Ю Â

no access-class *access-list-number* **in | out**

ð Ô

access-list-number	Â
in	Â
out	Â

Â

Â

Â

Â

Â

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

Â

show running	Â

Â

5 DLDP

5.1.1 DLDP

5.1.2 dldp ip

ʒ ╗ ˘ ˘ Ь Â
no ʒ ѐ Â

dldp ip **interval** *value* **retry** *value*

no dldp ip

ȍ Ô

***ip*ʻ**

***nexthopip*:** Ю

intervalʻ

retry ʻ

ȍ Ô

Ю ѝ ˘ Ь ʼ ѝ ÿ Â

ȍ ʒ Ô

ȍ Ô

б !¿/ 0ÐdXE7 E ü $®Ô 1 ʼ U 7G ðPÃ3pÒa õ Ï ð`É ã

```
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 ʒ Ô

ð Л Ô

ð Ô

ʒ ɨ Э ˘ Â

5.1.3 dldp passive

ʒ ╟ ˘ **no** ʒ ѐ Â

dldp passive

no dldp passive

ð Ô

ð Ô

Ю ѝ ў ╟ Â

ð ʒ Ô

ð Ô

Ю ˘ Л Љ ѝ ╟ Љ Â

ð Ô

ЉЮ ѝ ˘ dldp ў ˙

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

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ð Л Ô

ð Ô

ʒ ɨ Э ˘ Â

6

6.1

6.1.1 clear counters

clear counters Â

clear counters *interfece-type interface-number*

Async à Dialer à GigabitEthernet à Group-Async à Loopback à Null à Ser Â

Â

Â

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```
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
```

ʒ	
show interface	

6.1.2 clear dialer

ʎ ˘ ʒ **clear dialer** Â

clear dialer *interface-type interface-number*

ð Ô

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

interface-number ˋ ʎ

ð Ô

έ ˘ ʎ Â

ð ʒ Ô

ð Ô

Ю ʎ ˋ

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

6.1.3 clear interface

ˇ ˘ ʒ **clear interface** Â

clear interface *interface-type interface-number*

ð Ô

interface-type ˋ ˘ à à à à à à Â

interface-number ˋ ʎ

ð ʒ Ô

ð Ô

Ю ˇ ˋ

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

6.1.4 clear line

˘ ᛅ Ʊ ᚷ **clear line** Â

clear line *line-type* *line-number*

ð **Ô**

line-type ˙ ˘ **aux** ȁ **console** ȁ **vty** Â ‡ ѝ **tty** Â

line-number ˙ ᛅ Â

ð **ᚷ** **Ô**

ð **Ô**

ᚷ ᛅ Ʊ ᛅ ˆ **tty** ȁ **aux**˜ ȁ ˆ **vty** ȁ **console**˜ Â
ᚷ˘ Â

ð **Ô**

Ю ˙

Ruijie# **clear line vty** *0*

6.1.5 debug dialer

ᛅˆ ˜ ˘ ᚷ **debug dialer** Â

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

ð **Ô**

pkt ˙ ᛅ 1

mlp ˙ ᛅ

callback˙ Y˙

event˙ ᛅ Y˙

ð **ᚷ** **Ô**

ð **Ô**

ᚷ ᛅ Ʊ ᛅ Â

6.1.6 debug ppp

˘ ᛅ Ʊ ᚷ **debug ppp** Â

debug ppp authentication error event negotiation packet

ð Ô

authentication ‘

error ‘

event ‘ Y¨

negotiation ‘

ㅓ Â

ồ Ô

Ю ѝ ˋ

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

6.1.8 dialer-group

1 ㅓ ‡˘ ㅋ **dialer-group** Â ㅋ ㅓ ‡ Â

dialer-group *group-number*

no dialer-group

ồ Ô

group-number ˋ 1 ㅓ ‡ ㅓ

ồ Ô

ㅓ ‡ Â

ồ ㅋ Ô

ồ Ô

يي ㅓ˘ ˝I ж ㅓ Ѫ 1 ㅓ˘ 1 ㅓ ‡ ㅋ **dialer-list** ˘ ɨ˘ Э ѐ ㅓ ‡ Â

ồ Ô

Ю 1 ㅓ ‡ ˆ ㅓ 1 ㅓ˜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 ‘ “ ᄎᆞ ˘ ᄉᆡ Â

timeout *seconds* ‘ ᄎᆞ “ ˆ ˜˘ Â

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

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ᚷ	
dialer-group	ᚢ ‡
dialer fast-idle	

6.1.11 dialer-list

ᚻ 1 ᚢ ‡˘ ᚷ **dialer-list** Â ᚷ **no** 1 ᚢ ‡ 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 ˋ 1 ᚢ ‡ ᚢ Â

permit ˋ

deny ˋ

list ˋ ˝ a ᚻ 1 ᚢ ‡ Â

access-list-number ˋ ˝ ᚢ Â

ð Ô

a ᚻ 1 ᚢ ‡ Â

ð ᚷ Ô

ð Ô

ᚷ Ю ᚻ 1 ᚢ ‡˘ **dialer-group** ᚢ ‡ έ ᚢ Â ᚷ Â

Ю Э ᛋ ˋ

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

ð ᚷ Ô

ᚷ	
dialer pool-member	╗ ᛋ
dialer remote-name	ў ¨ Â

6.1.13 dialer pool-member

╗ ᛋ ˘ ᚷ **dialer pool-member** Â
ᚷ **no** ᛋ ᛋ Â

dialer pool-member *number* **priority** *priority*

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

ð Ô

number ˋ ᛋ ᛋ

priority *priority* ˋ ᛋ ˝I ˆ ˜˘ ѝ æ ˝I ˘
ѝ ˝I Â ˝I ᛋ ˝I
ᛋ Â

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a ╗ ᛋ Â ˝I ѝ Â

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ð Ô

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ᛋ ᛋ ˘ ˝I з ˝I Â

ð Ô

Ю ╗ ᛋ ˘ ˝I ǂ ѝ ˋ

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

ð ᚷ Ô

ᚷ	
dialer pool	Э ᛅ Â
dialer remote-name	ў ¨ Â

6.1.14 dialer priority

ᛅ ˆ ˜ ˝I ˘ ᚷ **dialer priority** Â ᚷ **no** Â

dialer priority *number*

no dialer priority

ð Ô

number ˛ ˝I ˆ ˙ ˜˘ ˘ ˝I ˘ ѝ Â

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ᛅ ˘ ˝I ˝I ᛅ Â

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

6.1.15 ip address negotiated

˘ ᚷ **ip address negotiated** Â ᚷ **no** ᚠ ᛅ ᚠ Â

ip address negotiated

no ip address negotiated

ð Ô

peer default ip address ᄒ Э ѝ ˘

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

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ᄒ	
ip local pool	Ѭ
peer default ip address	

6.1.17 ip route

ᄒ ᄒ Â

6.1.18 line

8

```
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
```

Ю ᐟ ѝ ᐟ Â ⁸ ᐟ ᐟ Â ѐ ᐟ
. ᐟ ᐟ ˘ Ѣ **show line** ѝ Â

aux console vty ᐟ˘ Ю ᐟ ˘
ᐟ ѝ ˘ a ˘ ᐠ ˘ **show line** ᓇ
Â

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

ð ᓇ Ô

ᓇ	
show line	

6.1.19 peer default ip address

ѝ ˘ ᓇ **peer default ip address** Â
ᓇ **no** ᐟ Â

peer default ip address *ip-address* **pool** *pool-name-list*

no peer default ip address

ð Ô

ip-address ʿ ѝ ˘ ѝ
˘ a ᐟ ѝ

number ˘ ˘ ѝ Â

ð Ô

a

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˘ ¨ ѝ ˘ Ѣ ѣ˘

Â ѣ Ѣ ѣ˘ ˆ Æ˜ Â

ð Ô

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

ð ᄒ Ô

ᄒ	
Ppp authentication	

6.1.21 pppoe enable

Ѣ Э ˘ ᄒ **pppoe enable** Â ᄒ **no**

Â

pppoe enable

no pppoe enable

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

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pppoe-client	╖

6.1.22 pppoe-client

Ʊ ᛅ ˆ ˜ ╖ ˘ ᚷ

pppoe-client Â ᚷ **no** ᛋ ᛅ ╖ Â

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

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

ȍ Ô

number ‘ ᛅ ᛅ

dial-on-demandʻ PPPoE Client Â

no-ddrʻ PPPoE Client Â

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ȍ ᚷ Ô

ȍ Ô

ᚷ Ʊ ᛅ ˘ ᛅ ˘ ÿ ѝ Ʊ ˘ ᛅ Â

ᛅ Ʊ ч ᛅ ‘

˜‘ ѝ **dial-on-demand** ˘ 1 ᛅ ‡ ˘ ˘ ‡ 1 Ʊ ᛅ Â ˘ ‡ Â

˜‘ ѝ ˘ ‡ a ‡ ˘ ≠ a ᛋ 8 ˘ ╟ 1 Ʊ ᛅ Â

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

ð ʒ Ô

ʒ	
pppoe enable	╗

6.2

6.2.2 show pppoe

ʒ **show pppoe** Â

show pppoe session tunnel

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ð Ô

ʒ **session tunnel** Â

ð Ô

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```
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
```

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Next timer fires afterʻ Ю ╟ Â

7 Aggregate Port

7.1 aggregateport load-balance

Â ʒ **no** ѝ 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-l4port src-dst-ip-dst-l4port src-dst-ip-src-dst-l4port

no aggregateport load-balance

ȍ Ô

dst-mac	ˇ Â ˘ ˇ ˇ ˘ a˘ ˇ a˘ Â
src-mac	ˇ Â ˘ a˘ ˇ a˘ ˘ ˇ ˇ Â
src-dst-mac	б ˇ Â a˘ a˘ ˘ ˇ ˇ Â
dst-ip	ˇ Â ˘ ˇ ˇ ˘ a˘ ˇ a˘ Â
src-ip	ˇ Â ˘ a˘ ˇ a˘ ˘ ˇ ˇ Â
src-dst-ip	б ˇ Â a˘ a ˇ ˘ ˇ ˇ Â Ь ˇ Ю˘ Â
src- l4port	⅄ ˇ Â a˘ ⅄ ˇ ˘ έ ˇ ⅄ ‡ ˇ ˇ Â
dst- l4port	⅄ ˇ Â a˘ ⅄ ˇ ˘ έ ˇ ⅄ ‡ ˇ ˇ Â
src-dst-l4port	⅄ б ⅄ ˇ Â a˘ ⅄ ⅄ ˇ ˘ έ ˇ ⅄ ⅄ ‡ ˇ ˇ Â
src-ip-src-l4port	б ⅄ ˇ Â a˘ ⅄ ˇ ˘ έ ˇ ⅄ ‡ ˇ ˇ Â
src-ip-dst-l4port	б ⅄ ˇ Â a˘ ⅄ ˇ ˘ έ ˇ ⅄ ‡ ˇ ˇ Â
dst-ip-src-l4port	б ⅄ ˇ Â a˘

	⅄ ⅂ ˘ ɛ́ ˇ ⅄ ‡ ⅂ ˇ Â
dst-ip-dst-l4port	б ⅄ ⅂ Â aˇ ⅄ ⅂ ˘ ɛ́ ˇ ⅄ ‡ ⅂ ˇ Â
src-ip-src-dst-l4port	ȁ ⅄ б ⅄ ⅂ Â aˇ ⅄ ⅄ ⅂ ˘ ɛ́ ˇ ⅄ ⅄ ‡ ⅂ ˇ Â
dst-ip-src-dst-l4port	ȁ ⅄ б ⅄ ⅂ Â aˇ ⅄ ⅄ ⅂ ˘ ɛ́ ˇ ⅄ ⅄ ‡ ⅂ ˇ Â
src-dst-ip-src-l4port	ȁ б ⅄ ⅂ Â aˇ ⅄ ⅂ ˘ ɛ́ ˇ ⅄ ‡ ⅂ ˇ Â
src-dst-ip-dst-l4port	ȁ б ⅄ ⅂ Â aˇ ⅄ ⅂ ˘ ɛ́ ˇ ⅄ ‡ ⅂ ˇ Â
src-dst-ip-src-dst-l4port	ȁ ȁ ⅄ б ⅄ ⅂ Â aˇ ⅄ ⅄ ⅂ ˘ ɛ́ ˇ ⅄ ⅄ ‡ ⅂ ˇ Â

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⅂ Â

📖

aggregateport member linktrap

no aggregateport member linktrap

[no] snmp trap link-status

[no] aggregateport member linktrap

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

ò ʒ Ô

ʒ	
show interfaces aggregateport	⅃ Â

ò ⅄ Ô ʒ Â

7.4 port-group

Ʌ ╗ Â ʒ **no** Â

port-group *ap_number*

no port-group

ò Ô

ap_number	⅄ Â

ò Ô Ю Ʌ a Â

ò ʒ Ô Â

ò Ô **port-group** ʒ ╗ ˘ … ˘ ‡ ╟… Â

ò Ô Ю Ʌ ˛

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

ò ʒ Ô

ʒ	
show aggregateport	Â

ò ⅄ Ô ʒ Â

7.5 show aggregateport

Â

show aggregateport *ap_number* **summary** **load-balance**

ò Ô

ap_number	⅄ Â
summary	Â
load-balance	Â

ò Ô

ð ¾ Ô Ю Л Â

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

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

Ю ‘

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

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interfaces aggregateport	… Â
port-group	Л‰ ╗ Â

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7.6 show interfaces aggregateport

↓ Â

show interfaces aggregateport *ap_number*

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ap_number	Л Â

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```
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
```

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ʒ	
interfaces aggregateport	… Â

ȍ ʎ Ô ʒ Â

7.7 snmp trap link-status

ʒ Â ʒ **no** ʒ Â

snmp trap link-status

no snmp trap link-status

ȍ Ô

ap_number	ʎ Â

ȍ Ô Ю̆ ʒ Â

ȍ ʒ Ô Ю Â

ȍ Ô ʒ ʎ Љ Э̆ a Э Â

ȍ Ô Ю ʒ ʿ

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

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-	

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IP

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1 IP

1.1

1.1.1 ip address

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ip address *ip-address network-mask* **secondary**

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

Â

ip-address	Â
network-mask	Â
secondary	Â

Â

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а˘ Â ˘ ˘ ЛЪЮ Ю
˛

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⁄Л ў Â ў ⁄Л ˘ а † ˘
† ⁄ Â ч ˘ Лъ
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⁄ЛЪ ` Â ˘
Â

- ч ⁄ ˘ ⁄ЛЪ…
˘ ˘ Â а
ч ч ЛЪ Э Â

ð Ô

ЛЪЮ ˘ ў ѝ ˘ ѝ Â

```
ip address 10.10.10.1 255.255.255.0
```

ð ҷ Ô

ҷ	
show interface	

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1.1.2 ip unnumbered

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έ Â ꟼ ˘ ѝ
Â ɺ ≠ ˘ ᾱ ΰ
ꟼ Â ꟼ ˘ ЉЮ ⁸ʿ

- Љ a ꟼ Â
- ȁ ȁ ȁ ȁ ˘ ꟽ Љ ꟼ Â ˘ ꟽ ꟼ Â a ꟼ Â
- a ʅ ꟼ ΰ ˘ ѝ ꟼ Â ꟽ Љ ꟼ Â
- a ꟼ ╟ Â

ȍ Ô

ЉЮ ˘ ѝ ꟼ ˘ ѝ Â
Â

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

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show interface	

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1.2

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

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

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ip-address	б ˘ ↑ ѝ 8 ˘ Â
MAC-address	˘ Æ
type	Â Л ˘ ѝ Â

alias ˆ Л ˜ Ж ł ˘

arp-learning enable

no arp-learning enable

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Ю ╟ ARP ˊ ╖ Â

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ˊ ˊ ╟ ARP ˇ web ╟ ARP ѝ ARP ɨˇ ╖ ˇ ǚ ‡ a ╖ Â ╟ ARP a ˊ ╖ ɨˇ ╟ ARP ˇ ╟ ARP ѝ ARP ˇ ʌ Љ web ˇ ╟ ARP ˇ a Э ˇ ‡ ʌ Љ clear arp ʒˇ ǚ ‡ ╟ ARP ˇ ɨˇ ╟ ARP Â ╟ ARP ˊ ╖ ɨˇ ‡ AnyIP ╖ ȁ ʌ ARP ╖ Â

1ˊ ЉЮ ˇ ╟ ARP ˊ ╖ Â

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

2ˊ ЉЮ ˇ ╟ ARP ˊ ╖

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

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10.3(4b8)	10.3(4b8)

no arp any-ip

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1 ȁ IP ˘ IP a Э IP’

2 ȁ IP a ˘ ὲ ˘ ¯ ᾰ

’

IP a ˘ ὲ ╟ ARP ȁ ╟

”I ARP ˘ Ю (a Ю) a Э ˘

ARP ˝ ‘

1 ȁ Ʒ ARP ˘ ˝ MAC ɨ˘ Э clear arp˘

╟ ARP ȁ ╟ ˘ ’

2 ȁ Ʒ ARP ˘ ˝ MAC ɨ˘ Э AnyIP ╖ ˘

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‘ AnyIP ╖ ≠ ╟ ARP ȁ ╟ ˘ ÿ

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˩ ˘ ARP VRRP ARP˘ AnyIP ╟ ARP ╗

˘ AnyIP ╖ a Â

1‘ ЉЮ ˘ ARP AnyIP ╖ Â

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

2‘ ЉЮ ˘ ARP AnyIP ╖

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

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10.3(4t76)	10.3(4t76)

1.2.4 arp retry interval

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arp retry interval *seconds*

no arp retry interval

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seconds	____

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```
arp retry interval 30
```

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number	˘ ˘ Â ѝ ˘ a ˘ ⁄ı

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arp retry times 1

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arp retry times 2

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ʒ	
arp retry interval *seconds*	

1.2.6 arp scan

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

start-ip-address	ARP ⸗

३ Â

1.2.7 arp trusted

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arp trusted *number*

no arp trusted

ȍ Ô

number	⁄ ⅃ Ʊ ⁄

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1.2.9 arp trusted aging

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arp trusted aging

no arp trusted aging

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Ю **arp timeout** Â

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```
arp unresolved 500
```

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1.2.11 arp gratuitous-send interval

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arp gratuitous-send interval *seconds*

no arp gratuitous-send

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seconds	˘ Æ ˘ ᴧ Â

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

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

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

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1.2.12 arp timeout

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show interface	

1.2.13 ip proxy-arp

Э Ʒ ╗ ˘ ⅄ Ƶ **ip proxy-arp** ʒ Â ʒ ⅄ Ƶ Ʒ ╗ Â

ip proxy-arp

no ip proxy-arp

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ð ʒ Ô

ð Ô

Ʒ ╗ ⅄ Ƶ ╟ ў ˘ ὲ Â ˘ б a ˘ ˘ ⅄ ˘ ˘ ѝ Ƶ Â Ƶ Э Ʒ ╗ Â

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ƵЮ ˘ Ƶ Ʒ ╗ Â

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

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1.3

1.3.1 ip broadcast-addresss

Ƀ ˘ ʒ **ip broadcast-addresss** Â ʒ ⅄ Ƶ ⅄ Â

ip broadcast-addresss *ip-address*

no ip broadcast-addresss *ip-address*

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ѝ ᾶ Â ⅵ a
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Â ᾶ ɨ˘ ᾶ
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Э ў Â

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ᾶ Â ʒ ʌ ᾶ
ɨ ˘ a ὲ ᾶ Â

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˘ ʌ ‟ Ѭ ᾶ Â

Э **no ip directed-broadcast** ˘
ᾶ Â

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

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1.4 IP

1.4.1 clear arp-cache

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

trusted	ʌ
ip	˘ ¯ ˘ **trusted** ‡ ʌ ˘ ὕ ‡ ѝ ╟
mask	ѝ ˘ ¯

	˘ ⅄ ‡ ⅄ ˘ ŭ ‡ ╟ Â
interface *interface-name*	╟

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```
clear arp-cache
```

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```
clear arp-cache 1.1.1.1
```

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

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arp	╗ Â

1.4.2 show arp

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

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trusted	ʌ
ip	˘
ip mask	
mac-address	
static	
complete	╟
incomplete	╟

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```
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
```

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

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network	
netmask	ˆ ʎ ˜

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```
clear ip route 192.168.12.0
```

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show ip route	

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1.4.6 show ip arp

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show ip arp

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ЉЮ ѝ **show ip arp** ˛

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

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1.4.7 show ip interface

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show ip interface *interface-type interface-number*

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Interface-type	
Interface-number	Л

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ЉЮ 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.
```

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2 IP

2.1 IP

2.1.1 ip default-gateway

Y Э ˘ ʒ **ip default-gateway** Â ʒ Â

ᄒᆞ **ip mask-reply** Â ᄒᆞ Â

ip mask-reply

no ip mask-reply

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

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2.1.5 ip source-route

˚ ˘ ᓇ **ip source-route** Â

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ip source-route

no ip source-route

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```
no ip source-route
```

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2.1.6 ip unreachables

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ip unreachables

no ip unreachables

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

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3 IPv4 REF

3.1

3.1.1 ip ref load-sharing original

no ip ref load-sharing original

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Ruijie(config)# ip ref load-sharing original

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

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3.1.2 ip ref load-sharing original-only

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no ip ref load-sharing original-only

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1ʻ IP Â

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

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

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3.1.3

3.2 IPv4 REF

3.2.1 show ip ref packet-statistic

show ip ref packet-statistic clear

clear	

REF

```
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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	
local adj	
glean adj	
forward	
no ip routing	a

	-	-

	-	-

3.2.2 show ip ref adjacency

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

glean	
local	
ip	IP
interface_type	
interface_number	
statistic	

0000.0000.0000 FastEthernet 0/0

id	
state	unresolve resolved
type	local forward drop glean
rfct	
chg	
l2addr	
interface	

show ip ref route	REF

-

-	-

3.2.3 show ip ref exact-route

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

vrf	
source-ipaddress	IP
dest_ipaddress	IP

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ʒ˘ IP IP б IP ˘ ʌ Ʊ REF ˘ Â

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```
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
```

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show ip ref route	REF

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3.2.4 show ip ref route

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show ip ref route vrf *vrf_name* **default** *ip mask* **statistic**

vrf	
default	
ip	IP
mask	
statistic	

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ʌ Ʊ REF ˘ ʌ Ʊ ȁ IP/MASK ɔ̄ ȁ 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

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

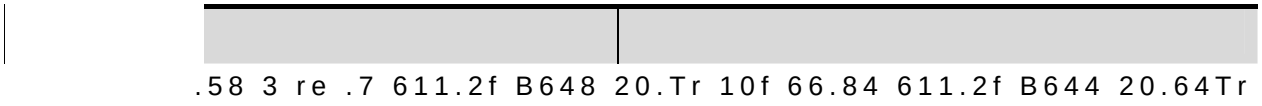
tcp-established	˘ ù TCP ù established 1800s
tcp-fin-wait	ù TCP ù fin-wait ˘ 60s
tcp-last-ack	ù TCP ù last-ack ˘ 30s
tcp-syn-receive	˘ ù TCP ù syn-receive 10s

4.2

4.2.1 show ip fpm counters

/! Â

show ip fpm counters



.58 3 re .7 611.2f B648 20.Tr 10f 66.84 611.2f B644 20.64Tr 10f 66..7

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Ю **show ip fpm statistic** Â

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```
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	
Number of active flows	
Number of the defragment contexts	IP
Number of the buffers hold by FPM	buffer
Event count	Y

5 IP NAT

5.1

5.1.1 address

no Â

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

no address *tart-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 Â match interface interface Â NAT a Â
match interface interface	NAT outside Â pool Â

Â

NAT

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
```

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ip nat pool	Ѭ IP NAT

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5.1.2 ip nat

˘ ʎ Ѣ **ip nat** ʒ Â ʒ **no**

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ip nat inside outside

no ip nat inside outside

inside	Â
outside	Â

˘ NAT Â

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ʎ outside inside ˘ ɜ ‡

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

ѐ IP ˘ a ˅ NAT ѐ Â
NAT TCP ˘ ˅ ⅄ ⅄ ˘ ≠ ˅ ⅄
Â ў ѝ Â

1ʿ ⅄Ю ˘ ў 10.10.10.100˘
WWW ⊾˘ ⊾ Э ч ˅ ѝ 10.10.10.1 ȁ
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
```

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

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5.1.5 ip nat inside source

˘ ˅ ⅄ ʒ **ip nat inside source** Â ʒ **no** ˅ ⅄ ˅ ⊩ Â

ip nat inside source list *access-list-number* **interface** *interface-type interface-number* **pool** *pool-name* **overload** **vrf** *name*

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

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

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

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

global-port **match** *interface-type interface-number* **permit-inside 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** *name*

list access-list-number	NAT
interface interface-type interface-number	outside NAPT NAT
pool pool-name	NAT
Overload	pool NAPT NAT cisco
static local-ip global-ip	NAT local-ip global-ip
static protocol	NAT protocol TCP UDP
local-port	TCP UDP
global-port	local-port
permit-inside	ip nat inside source static global-ip local-ip
vrf vrf_name	vrf vrf
match	
netmask mask	

-	-

5.1.6 ip nat outside source

˘ ⁄ ⅃ ⅂ **ip nat outside source** Â ⅂ **no** ⁄ ⅃ ⅂ Â

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

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

ip nat outside source static *global-ip local-ip* **vrf** *name*

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

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

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

list access-list-number	“ Â ⁄ ⅂ ⅁ “ ˘ … NAT Â
pool pool-name	NAT Â
static global-ip local-ip	Ⅎ NAT Â local-ip ѝ ˘ global-ip ѝ Â
static protocol	Ⅎ NAT

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ǰ ʼĄ IP ˘ б ˘
Â ¨ ў ˘ DNS
NAT Â

1ʻ ЉЮ ˘ 92.168.12.0/24 б Â ɨ˘
ў /ɪ Љ 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 ä̈ ˘ ʼI ā ŭ̈ NAT˘
Â

ʒ

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

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5.1.7 ip nat pool

ЊЖ ˘ Л Љ ʒ **ip nat pool** Â ʒ 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	¨ Â
start-ip	Â
end-ip	Â
netmask *netmask*	Â
prefix-length *prefix-length*	Â
type	Â й ˘ ǂ Â Â Љ б ʒ Â

ЊЖ Â

ʒ Â

ЊЖ ˘ ‡ ”І … ˘ ɨ ЊЖ Â

1˙ ЉЮ ˘ … ¨ й net192 ˘ й 192.168.12.1˘ й 192.168.12.254˘ й 24 æ Â

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

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ʒ	
address	ЊЖ
ip nat	ЊЖ NAT Â
ip nat inside destination	NAT Â
ip nat inside source	NAT Â
ip nat outside source	NAT Â

	1	
	10.3(4t90)	

5.2

5.2.1 show ip nat translations

show ip nat translations *acl_num*

Pro	Â “udp” ѝ UDP ’ “tcp” ѝ TCP Â“icmp” ѝ ICMP Â“gre” ѝ GRE Â
Inside global	⅃ ⅄ Â
Inside local	⅃ ⅄ Â
Outside local	⅃ ⅄ Â
Outside global	⅃ ⅄ Â
timeout	NAT ˘ Æ Â
vrf	vrf

ʒ	
clear ip nat translation	NAT Â
ip nat	ЊЖ NAT Â
ip nat inside destination	NAT Â
ip nat inside source	NAT Â
ip nat outside source	NAT Â
ip nat pool	ЊЖ IP NAT
show ip nat translations	IP NAT Â

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-	-

6

6.1

6.1.1 load-monitor

Ю ă Â

load-monitor

no load-monitor

6.1.2 mllb enable

Ю ‘

mllb enable

no mllb enable

no	

ecmp Э nexthop Â

1‘

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

-	-

-

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

mllb enable	
mllb policy	

-

6.1.5 mllb load-sharing original

mllb load-sharing original

no mllb load-sharing original

original	IP
no	

IP

mllb policy bandwidth

1 IP

Ruijie(config)# **mllb load-sharing original**

mllb enable	
mllb policy	

-

6.1.7 mllb threshold

Ю

mllb threshold {*percent-upper* *percent-lower* | *percent-lower*

no mllb threshold

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	

-

	Ю

6.1.8 over-load-protect enable

Ю

over-load-protect enable

no over-load-protect enable

no	

Â

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1'

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

˘ Лъ IP˝ ˚ è a ˘ ˝I
˘ ˛ Â 10 Â
˝I Æ Э ˝I ѓ ˘ ł ˝I˘ Л Лъ increase Э
decrease Ю Л ˝I ˘

1˙

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

৩	£,Ì ¸ ®!ò C—, h•aš4@ œD

6.2

6.2.1 show load-monitor configure

show load-monitor configure

-	-

1'

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

load-monotor	

-

6.2.2 show mllb config

show mllb config

-	-

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
```

mllb enable	
mllb policy	

-

6.2.3 show mllb statistics

Â

show mllb statistics

-	-

1

Ruijie# show mllb statistics

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

threshold: 95

load-over-protect interface-group	

-

7

7.1

7.1.1 deny others

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deny others

no deny others

no	a

a

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

NPE “ Э

10.3(4b10)	

7.1.2 link-sam conn-timeout

ˇ ‡ ѝ б ╟

ˇ ў ╟ б

link-sam conn-timeout	б SAM ╟

⺈	NPE˜ NBR˜ EG ‟ Э

⺈	
10.3(4b10)	⺈

7.1.3 link-sam enable

б ╟ Â ⺈ б ╟

link-sam enable

no link-sam enable

no	б SAM ╟

Ю б SAM ╟

⺈

SAM ╟Ю ˘ ”I б SAM ╟
╖ ˘ Ѣ SAM Ю

1˙ б SAM ╟
б SAM ╟
Ruijie(config)#**link-sam enable**
2˙ б SAM ╟
Ruijie(config)#**no link-sam enable**

⺈	
show link-sam statistics	б SAM ╟
link-sam conn-timeout	б SAM ╟
link-sam port	ЬЖ б SAM ╟ TCP ⺈

⺈	NPE˜ NBR˜ EG ‟ Э

⺈	

	10.3(4b10)	

7.1.4 link-sam port

7.1.5 link-sam protocol

б ╠╗ ˘ ˘ ⅃
Â ╠╗ ˚ ч ˘ ɨ ˘
˘ ⅄ Ѣ ʒ

link-sam protocol new | old

no link-sam protocol

new	SAM 3.90
old	SAM 3.90
no	3.90 ɨ

SAM3.90 ɨ

ʒ

б SAM ╠╗ ˘ Ю SAM ˘ a Ɔ̄
Â a SAM ˘ ⅄ Ѣ б SAM ╠ ɨ˘ show link-sam statistics exception messages ʊ̆ ╗˘
⅄ ⅄ a Â

1ʿ б SAM3.90 ╠
Ruijie(config)#**link-sam protocol old**
2ʿ б SAM3.90 ɨ ╠
Ruijie(config)#**link-sam protocol new**
3ʿ б SAM3.90 ɨ ╠
Ruijie(config)#**no link-sam protocol**

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

⅄ NPE˘ NBR˘ EG ʻʻ Э

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10.3(4b10)	ʒ

7.1.6 posterior-line

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posterior-line interface *interface-name*

no posterior-line interface *interface-name*

interface-name	l’ Ĕ ̈
no	l’ Ĕ

no Ô 4“CÃ á/Ä

ʒ

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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

user-route enable

no user-route enable

no	

Ю

SAM

original	IP
destination-original	IP+ IP
no	IP

ЮЉ IP

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Љ IP ˘ ˘
˘ Â a ˘ ʌ Љ ѝ IP + IP Â

IP + IP ˘ ʌ ⊾
a ˘ ⊾ ˘ ⊾ ᾱ a˘
~ IP ˘ з IP ʊ̆˘ ˘
NAT˘ ʌ IP a˘ ⊾ ʌ Â ⊾
Э ⊾ Â

1˙ IP
Ruijie(config)#**user-route load-sharing destination**
2˙ + IP
Ruijie(config)#**user-route load-sharing destination-original**
3˙ IP
Ruijie(config)#**no user-route load-sharing**

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

ʌ NPE ˝ Э

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10.3(4b10)	ꝝ

7.1.10 user-route posterior-line load-balance enable

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user-route posterior-line load-balance enable

no user-route posterior-line load-balance enable

no	ľ Ł

Ю ľ Ł

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1˙ ľ Ł

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Ruijie(config)#**user-route posterior-line load-balance enable**

2˙

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

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

ʌ NPE ˝ Э

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10.3(4b10)	ʒ

7.1.11 user-route user-group

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

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

user-group-name	¨ ˘ 30
no	

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Ł ľ Ł ˘ a ʼĄ è ╞ Â

~ ˝ SAM Э ˘ SAM Э ʌ ѝ
ľ ˢ Ł Â

1ʿ … ˝ ѝ cnii
Ruijie(config)#**user-route user-group** cnii
2ʿ ˝ ѝ cnii
Ruijie(config)#**no user-route user-group** cnii

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prior-line	ľ Ł
posterior-line	ľ Ł

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10.3(4b10)	ʒ

7.2

7.2.1 clear link-sam statistics

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clear link-sam-statistics

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1 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
```

show link-sam statistics	б SAM ╟

NPE NBR EG “ Э

10.3(4b10)	

7.2.2 show link-sam statistics

Л Љ б ╟ ╟

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	ЮЖ б SAM ╟ TCP ⅄

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 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

2

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

user-route enable	
user-route user-group	…
Deny others	
posterior-line	
prior-line	

NPE

10.3(4b10)	

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1.1.1 layer23 classify enable

γ Ь ǂ ╥ ˘ ⅄ Ѣ ʒ ╥ Â

[no] layer23 classify enable

Ю γ Ь ǂ ╥ Â

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γ Ь ǂ ɨ ⅄ Ѣ vlan ȁ ȁ ⅃ Â

1ʿ γ Ь ǂ ╥ ʿ

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

2ʿ γ Ь ǂ ╥ ʿ

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

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3

3.1

3.1.1 layer23 ad-mode enable

ˇ ʎ Ʌ ʒ ˥ Â

[no] layer23 ad-mode enable

4 vlan

4.1

4.1.1 vlan-group

Â ʎ Ʊ ʒ 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

ʒ Â

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

vlan ľ any Ľ˘ γ Ь ǂ ╗ ˘ Ю
ɔ̄ ľ any Ľ Ю ɔ̄ native vlan
vlan ˘ native vlan vlan ˘ ‡ ɔ̄
ľ any Ľ Â

~

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

1ʿ vlan ľ vlan-group1 Ľ vlan 1 ȁ vlan 3 ȁ vlan7 ȁ vlan8 ȁ vlan9ʿ

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

2ʿ vlan ľ vlan-group1 ľ ʿ

```
Ruijie#config
```

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

show vlan-group *group name*	vlan
vlan-enable	vlan tag vlan
flow-rule vlan-group subscriber network-group app-group time-range	

-

4.2

4.2.1 show vlan-group

Â

show vlan-group *group name*

group name	vlan

Â

vlan vlan

1

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

2ˆ l' vlan1 Ł ˆ

```
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 ʒ ˆ

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

ʒ

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

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	ʒ

5

5.1

5.1.1 subscriber

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

Obj	¨
Par_str	╟ ɨ ɛ̀ ¨

Â

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ʒ ў a ʅ Ю ɛ̀ Ʊ ⅃ ɛ̀ Ю̆ ʅ ɛ̀
Â ˘ tt xx Ю ˘ ╟ yy Ю ˘ ʒ
ʅ Ʊ a ʅ tt Ю̆ tt ⅃ ɛ̀ Ю ╟ yy Ю Â

1ʿ ╟ tt yy Ю̆

Ruijie#**subscriber** tt **move to parent** yy

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show subscerber brief	

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	ʒ

5.1.2 subscriber allow

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

filename	ˇ ¨

Â

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ʒ ў ˘ ˇ Â

1ʻ ˇ l’ userfile Ł ʻ

Ruijie#**subscriber export txt** userfile

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5.1.4 subscriber import

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subscriber import ***txt*** | ***csv*** *filename*

filename	ˇ ¨

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l’ .txt Ł ˇ Ю ˇ ʒ ˘ ĩ

ʻ à ʎ¨ à à ip à MAC à ŭ ˇ ɑ̃ Â

ĩ l’ ˘ Ł ˘ ʎ Ѣ ˘ l’ ˘ Ł ˘ ʻ ɨ ʻʻ a

˘ ѫ l’ ˘ Ł Â

Ю l’ .txt Ł ˇ ʻ

/ / 1, 1,192.168.197.1,

l' .csv Ł ˇ Microsoft Excel ł ˩ ù l' .csv Ł ¯ /l
ˇ Â ˇ ù ˋ ǀ ù 4 ˋˋ ǀ ù ˋ à ¨
à à ip à mac à ǔ ˧ ǟ Â

l' .csv Ł ˇ l' LAYER23-CLASSIFY-SCG.doc Ł l'
Ł Â

1ˋ ˇ l' userfile Ł ˋ

Ruijie#**subscriber import txt** userfile

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5.1.6 subscriber set

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

Name	¨

Ю a Â

ʒ Â

ɨ a ˢ ȁ ˘ ʎ Љ **flow-monitor** ˢ ’

Ю a ˘ Ю ‡ ’

ʎ Ю ˘ Ю ˚ ˘ Љ ѝ ”I’

¨ ʎ Ю ˘ ɨ˘ a Э ˘ l’ release Ł’

Vip ˘ vip ʎ Љ Â

Auth-deny ʎ ˘ ʎ Ю Â ɨ˘ ʎ Э ˘ ʎ ˘ ≠ Ю Â

Pwd-edit ʎ ˘ ʎ Ю Â ɨ˘ ʎ Э ʎ Љ Â

1‘ l’ 1 Ł ‘

Ruijie#**config**

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

l’ 1 Ł ȁ ˘ ʎ ˢ ‘

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

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ip a ă ˘ mac ‡ a è
ă Â Љ ip ǂ ip ȁ ip ip
Ь ˘ Љ mac ǂ mac a mac
ч ˘ è ip Λ Љ̆ mac ˘ ip ip
a Λ Љ̆ mac Â mac ip ̆ ɔ̄ ˘ Љ mac
ɔ̄ й Â

ľ / Ĺ, ɣ Ь ǂ ╖ ˘ ip ɔ̄ a
è Ũ نم ˘ ì й ip Â p i n

5.2

5.2.1 show subscriber

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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	⁄ sslvpn ⁄
Vpn	⁄ vpn ⁄
Webauth	⁄ web ⁄
Bind	˧ ɑ̈ ˘ 1 ѝ ɑ̈˘ 2

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ʎ	
	ʒ

6.1.4 network-group name

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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	ˆ Ɲ ľ / ľ ˜
ip-addr	ip ip
subnet	Ip
mask	
start	Ip ip
end	Ip ip

Â

ʒ Â

ʎ ip ˘ ǂ ѝ ip ȁip ɥ ip
Ь Â ľ / Ľ ɣ Ь ǂ ˘ ip
ɔ̄ a ɛ̀ ‡ ɔ̄ ľ / Ľ Â parent a ˘
Ю Â

~	a˘ ¨ a ˘ Â

1ʿ ip ľ network1 Ľ , 192.168.196.0 ˘ ɛ̀ ľ
1 Ľ˘ ľ 1 Ľ ľ Ľʿ

```
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]]	
flow-rule vlan-group subscriber network-group app-group time-range	

6.2

6.2.1 show network-group

Â

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

name	

Â

a a Â

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

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

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7

7.1

7.1.1 auth-subs

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sam-online recycle *time*

sam-offline recycle {off| *time}*

Time	ˆ ǂ ˜

20ǂ sam ˘ Â

ʒ conf Â

ʎ˘ ʎ 20ǂ ˆ ʎ ╟ ˜ sam ˘ ‡ ʎ Â

ὲ ʎ Ʌ a ˘ a ʎ Ʌ Â

ʎ ᾱ ὕ sam ╚ Â

1ʿ sam ˘ 30ǂ ˘ ˘ sam ɨ a ʿ

Ruijie#**config**

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

sam-offline recycle off

7.2

7.2.1 show auth-subs

Â

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

name	

Â

Â

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```
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

∧	
	३

2012-11-5	†		
2012-11-20	†		╗ 4b8 ३
2012-11-30	†		३

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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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⁄ Ж 100 Ж Â

ʒ ɨ˘ ʒ app-group ʒ Â

1ʻ Ю ʒ Ж MYGAME ʻ ˘

8 ˘ Â

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

flow-rule num **vlan-group** vlan-group-name **subscriber** subscriber-name **network-group** network-group-name **app-group**	

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10.3(4b8)	ʒ

8.1.6 identify-application custom

ƄƘ ‡ Â ʎ Ʌ ʒ ƄƘ ‡ 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	ˇ ¨ Â
class-name	ǀ ¨ 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

ʒ Â

ʒ ʎ Ʌ ¶ ƄƘ ‡ Â

1ˊ ƄƘ ‡ˇ ǀ ѝ ƄƘ ˇ ¨ ѝ ˇ ѝ 1 10ˇ ѝ 1 100ˇ ѝ tcpˊ

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

a ʔA

2ˊ ƄƘ ‡ˇ ǀ ѝ myp2pˇ ¨ ѝ myxunleǐ ѝ ˇ ѝ 200ˇ ѝ udpˊ

Ruijie#**config**

Ruijie(config)# **identify-application custom name** *myxunlei* **class** *myp2p* **udp sport** *any any* **dport** *200 200*

3ʻ Ѭ ‡ˇ ǂ ѝ myqqˇ ̈ ѝ ǂ imˇ ѝ 111ˇ ѝ 2020ˇ ѝ udpʻ

Ruijie#**config**

Ruijie(config)# **identify-application custom name** *myqq* **class** *im* **udp sport** *111 111* **dport** *2020 2020*

ʒ	
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	‡ ʒ

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10.3(4b7)	ʒ

8.1.7 identify-application dfi enable

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no identify-application dfi enable

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ʒ ʎ Ѣ dfi p2p Ю ╗ Â

1ʻ dfi p2p ╗ ʻ

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
```

ʒ

ʒ	
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	‡ ʒ

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10.3(4b7)	ʒ

8.1.10 identify-application http route enhance enable

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

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ʒ ʎ Љ HTTP ╗ Â

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1ʿ HTTP ╗ ʿ

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

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10.3(4b10)	३

8.1.11 identify-application inhibitive

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identify-application inhibitive *app-name*

app-name	¨

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	10.3(4b7)	

8.1.12 identify-application key

identify-application key *app-name*

app-name	

	1 FTP

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

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	

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	10.3(4b7)	

8.1.13 identify-application proto-detect drop

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

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	seconds	10 - 3600

60

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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

Â

no identify-application route enhance enable

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

ʒ

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

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10.3(4b10)	ʒ

8.1.18 identify-application signature update

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identify-application signature update sub *sub-num*

sub-num	⁄˘ 1 10 Â ч ˘ ɨ ⁄ ⁄Ʊ Â

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

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10.3(4b7)	ʒ

8.1.19 identify-application web-cache enable

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[no] identify-application web-cache enable

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

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	10.3(4b10)	३

8.2

ЛЬЮ ʒ˙

- 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

‡ Â

show identity-application

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```
Ruijie#show identity-application
any 255-4095-63-48
˝ ˇ 1-0-0-0
```

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

```
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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Ruijie#**show identity-application group-state**

app group state: on //on ˘ 8 ˘ IP

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10.3(4b7)	ʒ

8.2.5 show identify-application inhibitive

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show identity-application inhibitive

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Ruijie#**show identity-application inhibitive**

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10.3(4b7)	ʒ

8.2.6 show identify-application key

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show identity-application key

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```
Ruijie#show identity-application key
IP
    QQ
MSN
FTP
```

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10.3(4b7)	ʒ

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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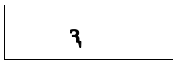

.86Tj/TT2 4/080-6(515 Tf 0Rcn)e# 0.266.44 742.4>Tj1 1 Tf 0show 0.266.34 742. 10.022 0.266.44

PPSTREAM 4-16-0-0

|

8.2.11 show identify-application userdef-rule

show identify-application userdef-rule

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	10.3(4b7)	ʒ

8.2.12 show identity-application version

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show identify-application version

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```
1ʿ ʎ ʿ
Ruijie#show identity-application version
Versionʿ 1.0
Dateʿ 2010-1-8
```

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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

-	-

```
Ruijie#config
Ruijie(config)#identify-application clear key-inhibitive group
```


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

9

9.1

9.1.1 app route

ǂ Â ⁄ ⅃ ⅄ ⅋ **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	¨ , ⁄ ⅃ ⅄ l' ǂ Ł˘ l' ˇ Ł˘ l' ˇ Ł l' ǂ Ł¨
interface-name	¨
group-name	¨
time-rang-name	‡ time-rang ¨

Ю ‡

⅋

⅋ ˘ ὲ ÿ Â ⁄ ⅃ ⅄ l' ǂ Ł˘ l' ˇ Ł˘ l' ˇ Ł l' ǂ Ł Â ⁄ ˘ ⅂ ˘ Â έ Â ⅋ WAN Â ⁄ ˘ ˘ Â ˘ time-range ˘ ⅄ Â ˇ ‘ ’ time-range ’ / ѝ UP Â 2000 Â

~ ⅂ ˘ a Â

1˙ ľ P2P Ю ˇ Ł ˆ ľ GigabitEthernet 0/1 Łˆ

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

2˙ ľ HTTP Ł ˇ ľ inhibitive_intf_group Ł ˆ ˘ ʒ ľ no_midnight Ł

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

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app route enable	╖

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10.3(4b8)	ʒ

9.1.2 app route enable

╖ Â ʌ Ʊ ʒ **no** ╖ Â

app route enable

no app route enable

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~

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

app route	

-

10.3(4b8)	

9.1.3 app route priority

app route *app-name* **priority increase decrease** *1-1999*

app-name	
increase	
decrease	
[1-1999]	

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

app route	

	10.3(4b8)	

9.1.4 clear app route statistics

clear app route statistics *app-name*

app-name	

show app route statistics	

10.3(4b8)	

no interface-group

interface-name	¨

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ʒ ╗ Â WAN ˘ dialer WAN ˘ ⅄ Ⅎ╗ Â

~ ÿ WAN ⅄ ѝ LAN ˘ ╟ Â

1ʿ ľ inhibitive_intf_group Ľ ľ dialer 1 Ľ ľ dialer 2

ip-address	

Â

ʒ

ʒ WAN ˘ ⁄ı Â
˘ Ю Â

~ ⁄ı ѝ WAN Â ÿ WAN ⁄ı ѝ
LAN ˘ ╟ Â

1ʿ GigabitEthernet 0/1 ѝ 100.0.0.1

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

ʒ	
app route	

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⁄ı	
10.3(4b8)	ʒ

9.2

9.2.1 show app route

˘ Â

show app route statistics *app-name* **session**

statistics	
app-name	¨ , ⁄ı Ѣ ľ ǂ Ľ˘ ľ ˇ Ľ˘ ľ ˇ Ľ ľ ǂ Ľ¨
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	¨ (ΛЛЪ ˚ ¨ / ˚ ¨ / ¦ ¨ / ¦ ¨)
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	¨ (ΛЛЪ ˚ ¨ / ˚ ¨ / ¦ ¨ / ¦ ¨)
INTERFACE(GROUP)	/ ¨
HIT DATA(byte)	ЮЎ ¦ ℸ ˘ Э /Ю
HIT RATE(Bps)	= / ˘ Э /Ю
SUM DATA(byte)	= + ˘ Э / Ю
SUM RATE(Bps)	= / ˘ Э /Ю

3 l' HTTP L

Router#show app route HTTP session

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	

-	-

-

10.3(4b8)	

10

10.1

10.1.1 flow-pre-mgr enable

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[no] flow-pre-mgr enable

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

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10.1.2 flow-pre-mgr priority-swap

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

rule-id1	‡ ᓱ˘ ᓴ ‘ 1~50
rule-id2	‡ ᓱ˘ ᓴ ‘ 1~50

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2 ȁ ᔾᒥ ч ‡ ”I ’
3 ȁ rule-id1 rule-id2 ˘ ˘ ‡ a Â

‘ 2 ‡˘ ɨ ᒥ ”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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10.1.3 flow-pre-mgr *rule-id* access-list

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… 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	‡ ⅄˘ ⅄ ѝ 1~50˘ ⅄ ˘ ‡ ᾰ ˘ ╗ ’
acl-number	‡ L ⅄˘ ⅄ ѝ 1~199’
total-limit-number	⁸ ˘ ⅄ б ˘ ὲ 0 a ⁸

ʒ Â

1 ȁ L ⁸ a IP ⁸ ’

2 ȁ action ˘ block a ’ by-pass a … ˘ ˆ ʒ /ǀ ȁ Ю ˘ Ю a ʒ ˜ ’ trust tCL ⁸˘ ⁸ ɨ a ʽĄ Â

3 ȁ б ˘ ʒ ˘ ¯ ѝ … Â ‡ έ ”I ˘ ”I ɨ ‡ ”I ‡ ЖÂ

4 ȁ L IP IP˘ ˘ IP IP˘ Â

5 ȁ tCL ⁸ ‡ ˘ a Â ‡ … ЖÂ ˘ Â

6 ȁ ‡ L ˘ ὲ tCL IP ȁ ȁ IP ȁ ȁ ⅄˘ ὗ ‡ L Â

7 ȁ Ю˘ Э ˘ a ⁸ Â

1˙ tCL ɔ̄ б IP˙ 220.200.20.20 ˘ ⁸ ὲ ѝ 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 ѝ 192.168.1.0/24˘ IP … ˘ ὲ 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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ˆ ʒ /ǀ à Ю ˘
Ю a ʒ ˜ ’ trust /
⁸ Лъ ↓ IP ⁸˘ ⁸ ł a Ą
Â б ˘ ʒ ˘
¯ ѝ … Â
З 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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2 ȁ б ˘ ʒ ˘ ¯ ѝ … Â

3 ȁ Ю˘ Э ˘ а ⁸ Â

‘ ⁸ ѝ 20 ˘ 20 ˘ а ‘Ą … ˘ Â

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

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10.2

10.2.1 show flow-pre-mgr ip-info

10.2.2 show flow-pre-mgr rule-info

⁸ ‡ Л Ч ‡ ˘ Ў ˘

,

show flow-pre-mgr rule-info

ʻ … 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)	

11.1.2 auto-pir

no

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

no auto-pir enable

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

EG NPE

channel-tree

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

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show flow-control	Л Љ ҳ **Inbound** **Outbound** PIR

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10.3(4T90)	ҳ

11.1.3 change-priority

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no ″I ˘ ″I ˘ Ѧ

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

rule1 -num	‡ л˘ ѝ ″I л
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)	ʒ
10.4(4T90)	╗ ʒ

11.1.6 channel-tree

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no channel-tree {inbound | outbound}

inbound	… Ю
outbound	… Э

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ʒ **flow-control**

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ľ test

11.1.7 comment

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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

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1 à 8 ˘ 8 Л Љ
8 8 K

	flow-policy	wan	8

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

flow-control	8

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

Ю ‡

ʒ ⁸

1 ầ a num ˏ a˘ ˘ ˘ ‡ Â

2 ầ ‡ ɔ̄ ‡ ɨ ˝I ˘ ‡ ˘ ч ˆ ầ Љ ˎ ầ˘ ‡ ⁸ WAN Э(a WAN)Â

3 ầ **Action** ѝ pass Ю˝ **in-channel** **out-channel** a ˘ ‡ **in** **out** ɑ̈ a ˘ ˎ ɑ̈ a ˎ ɑ̈ a ˙

4 ầ ‡ˈ ˝I ˝I ˘ vlan > IP > > IP > ˙ ˝I ˘ ˘ ˘ ¨ ˘ ˘ ˘ è ˘ Ю˝ ¨ ˘ ˘ ¶ Â

1ˈ ⁸ group1 Ю˝ ⁸ ˙Ω ˏ ѝ 3M˝ ⁸ ѝ 300ˈ

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** *group1Ể ϕ I ɔ̀ 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 ȁ Gi0/0 Gi0/2 ˘ з ὶ 15Ḿ
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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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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Gi0/2 ˛
Ruijie# **clear flow-control** *Gi0/2* **statistics**

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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 ( ) 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

```
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 ˘ Ль ˧˩ ╗

4ˈ Э ˈ

```
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	˘ /ˈ ╗ Pool ˘ Ь /ˈ ╗ /ˈ ╗ 1

3ˈ Э ˈ

```
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)	ʒ

12.1.2 flow-audit vpn

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

Ю˘ VPN IP Â

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1˙ ʼΩ ⅄ ѝ VPN ⊾ ˘ ↑ ˆ VPN ⅄ Э ˜ IP ˘ ‡ Ю˙

Ruijie# **configure terminal**

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

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

2˙ ↑ ʼΩ ⅄ ѝ VPN ˘ ↑ ʼΩ ⅄ VPN ˘ ‡ ѝ IP ˘ 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**

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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```
 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
```

2ʿ ˘ ¨ ѝ NBR ˘ 2012 1 6 ⅄ 12 ˘ 12 40↑

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
```

3ʿ ˘ ¨ ѝ NBR ˘ 2012 1 6 ⅄ (” 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 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
```

-	-

NPE a day-interval recent time-interval day month week hour-interval

10.3(4b7)	
10.3(4b8)	minute-interval week month 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	

DROP upload: 1 KB, 200 Packets

DROP download: 3 KB, 1120 Packets

5 ˘ 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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end-minute	ǀ
begin-hour1	1
end-hour1	1
begin-hour2	2
end-hour2	2
n	n

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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 ⅄ 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

  5ˆ            ˇ         2011   12   20 ⅄   12   26 ⅄ 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˙           ˘        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 ȁ Љ ⅵ ’

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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1˙ Ю˘ gigabitEthernet 0/1 IP й 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

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```
/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
```

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 2011 12 22 1 3 ip

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 2011 12 20 2011 12 29 1
3 ip

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 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**

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	

	-

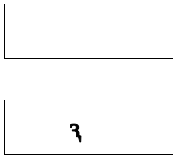
	-

10.3(4b7)	
10.3(4b8)	vip

12.2.8 show online statistic

show online statistics global interface *interface-name* **| bridge** *bridge-name* **detail offset limit | 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	
bridge-name	
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



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```
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˙ ˘ 2011 12 22 ⅄ 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˙ ˘ 2011 12 22

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

6˙ ˘ 2011 12 20 ⅄ 9 2011 12 28 ⅄ 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

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

10.3(4b7)	

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1.1.1 ping

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

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vrf-name	¨
ip-address	Â
length	
times	
data	ʻI
source	

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

‘

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

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

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1.1.2 Traceroute

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

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Ip-address	Â
number	
source-address	
seconds	
minimum maximum	

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

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

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

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

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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

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2 DHCP

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2.1.1 bootfile

bootfile *file-name*

no bootfile

file-name	

2.1.2 client-identifier

client-identifier *unique-identifier*

no client-identifier

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unique-identifier	

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

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hardware-address	Ѭ ˘ Â
host	Ѭ Â Â
ip dhcp pool	Ѭ ¨ ˘ Â

2.1.3 client-name

Ѭ ¨ ˘ ʒ **client-name** Â ʒ ¨ Â

client-name *client-name*

no client-name

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client-name	Ѭ ¨ Â ʎ Ѣ Â¨ a ɨ ¨ ˘ Ѭ ѝ ¨ ˘ a Ѭ ѝ Â

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client-name river

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ʒ	
host	Ѭ Â Â
ip dhcp pool	Ѭ ¨ ˘ Â

2.1.4 default-router

ЊЖ ˘ ʒ **default-router** Â
ʒ **no** ⁄ЛЬ ЊЖ Â

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

no default-router

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ip-address	ЊЖ Â Â
ip-address2…ip-address8	ˆ ⁄ ˜ ⁄ЛЬ Â

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```
default-router 192.168.12.1
```

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ʒ	
ip dhcp pool	ЊЖ ¨ ˘ Â

2.1.5 dns-server

ЊЖ ⊾ ˘ ʒ **dns-server** Â
ʒ **no** ⁄ЛЬ ⊾ ЊЖ Â

dns-server *ip-address*

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ip-address	HX Ł Â
ip-address2…ip-address8	ˆ Ʌ ˜ Ʌ
use-dhcp-client *interface-type* *interface-number*	Ł ˇ Ł Â

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domain-name	Â

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domain-name i-net.com.cn

ð Ô

dns-server	
ip dhcp pool	Â

2.1.7 hardware-address

hardware-address Â

no Â

hardware-address *hardware-address type*

no hardware-address

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hardware-address	Â

type	✧ ✧ ✧ ✧

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

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client-identifier	
host	
ip dhcp pool	
ip dhcp excluded-address	
default-router	

2.1.8 host

host *ip-address netmask*

no host

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ip-address	Ѭ ў Â
netmask	Ѭ ў Â

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host 192.168.12.91 255.255.255.240

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ʒ	
client-identifier	Ѭ ˆ Ѣ ‘Ω 8 ˜ Â
hardware-address	Ѭ ˚ Â
ip dhcp pool	Ѭ ¨ ˘ Â
68.8203 nSAluded-address	ѝ
default-router	Ѭ

2.1.9 update arp

˥ ˘ ʒ **update arp** Â ʒ **no**
⁄ Ѣ ˥ Â

update arp

no update arp

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

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ip dhcp refresh arp	9
ip dhcp pool	ЬЖ ¨ ˘ Â

2.1.10 ip dhcp refresh arp

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ip dhcp refresh arp

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ʒ	
dns-server	Ѭ ⊨
ip dhcp pool	Ѭ ¨ ˘ Â
ip dhcp excluded-address	ѝ
default-router	Ѭ

2.1.12 ip dhcp excluded-address

Ѭ ˘ ⊨ a ѐ ǂ ˘
ʒ **ip dhcp excluded-address** Â ʒ **no** ⋀ Ѫ ⋀ Ѭ Â

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

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

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low-ip-address	˘ Â
high-ip-address	Â

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

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ip dhcp pool	Ѭ ¨ ˘ Â
networkˆ ˜	Ѭ ˩ Â

2.1.13 ip dhcp ping packet

ᒪ ᾰ ˘ ˘ ʒ **ip dhcp ping packet** Â ʒ **no** Â

ip dhcp ping packet *number*

no ip dhcp ping packet

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number	ˆ ˩ ˜ ÿ ˘ Â ч Â

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ip dhcp ping packets 3

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ʒ	
clear ip dhcp conflict	ᾰ Â

ip dhcp ping timeout	⊾ Â ˘ ⅄ǂ ʼ ǖ ‡ ă Â
show ip dhcp conflict	⊾ ǂ ˘ ă Â

2.1.14 ip dhcp ping timeout

⊾ ă ˘ ˘

ʒ **ip dhcp ping timeout** Â ʒ **no** ⅄ Ʌ Â

ip dhcp ping timeout *milli-seconds*

no ip dhcp ping timeout

ȍ Ô p i n g

2.1.15 ip dhcp pool

dhcp pool **no**

ip dhcp pool *pool-name*

no ip dhcp pool *pool-name*

pool-name	

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

```
ip dhcp pool mypool0
```

host	

ip dhcp excluded-address

2.1.16 lease

lease Â **no** Â

lease *days hours minutes* **infinite**

no lease

Ô

days	
hours	
minutes	
infinite	

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```
lease 0 1
```

```
lease 0 0 1
```

Ô

ip dhcp pool	Â

2.1.17 netbios-name-server

netbios-name-server

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

no netbios-name-server

ip-address	
ip-address2…ip-address8	
netbios-node-type	

2.1.18 netbios-node-type

netbios-node-type **no**

netbios-node-type *type*

no netbios-node-type

ð Ô

type	✧ ✧ ✧ ✧

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ð Ô

ð Ô

ip dhcp pool	ⱧѪ ̤ ̆ Â
netbios-name-server	̤ ╘

2.1.19 network DHCP

ⱧѪ ꓷ ̆ ʅ **network** Â ʅ **no** ᐱ Љ ⱧѪ Â

network *net-number net-mask*

no network

ὂ Ô

net-number	ꓷ Â
net-mask	Â ⱧѪ ̆ ѝ Â

ὂ Ô

ⱧѪ ꓷ Â

ὂ ʅ Ô

ὂ Ô

ⱧѪ ꓻ ὲ ̆ ѝ ╘ ᐱ ⱦ Â ̆ ὒ ‡ ᐱ ⱦ Â ⱦ ̆ ̆ ̆ Ю ̆ ⱦ Â

ⱦ ᐱ **show ip dhcp binding** ʅ ̆ ᾰ ᐱ **show ip dhcp conflict** ʅ Â

ὂ Ô

Љ Ю ̆ ⱧѪ ꓷ ѝ ̆ ѝ Â

```
network 192.168.12.0 255.255.255.240
```

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ʒ	
ip dhcp excluded-address	Ѭ ╘ a ǂ Â
ip dhcp pool	Ѭ ¨ ˘ Â

2.1.20 next-server

Ѭ ╟ ╟ ╘ ˘
ʒ **next-server** Â ʒ **no** ⋀ Ѣ ╟ ╘ Ѭ Â

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

no next-server

ð Ô

ip-address	Ѭ ╟ ╘ ˘ ѝ ╘ Â Â
ip-address2…ip-address8	ˆ ⋀ ˜ ⋀ Ѣ ╟ ╘ Â

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ЉЮ ˘ ѝ ╟ ╘ Â

```
next-server 192.168.12.4
```

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ʒ	
bootfile	Ѭ ╟ ˚ ¨

ip dhcp pool	Â
ip help-address	

ЛЬЮ ˘ ʒ ЬЖ˘
˘ ч ˛ ˜ ˘
, ˜ ˘ Â

option 33 ip 172.16.12.0 192.168.12.12 172.16.16.0 192.168.12.16

ð ʒ Ô

ʒ	
ip dhcp pool	ЬЖ ¨ ˘ Â

2.1.22 service dhcp

Э ⊨ ʒ ˘ ʒ **service dhcp** Â
ʒ **no** ⋀ Ль ⊨ ʒ Â

service dhcp

no service dhcp

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⊨ ʒ Â

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⊨ ⋀ Ль ╟ ˇ ˘ ⊨ ȁ
Â ⋀ Ль ὲ ⊨ ˘
˘ Â

Э ⋀ ╖ ὲ ╖ ᾰ ˘ έ
˘ Ль ⋎ Â

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service dhcp

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ʒ	

show ip dhcp server statistics	Ł 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

˘ **clear ip dhcp binding** Â

clear ip dhcp binding * *ip-address*

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*	Â
ip-address	Â

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й Â

ð Ô

ð Ô

Л **no ip dhcp pool**
Â

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ЛЬЮ ˘ й Â

```
clear ip dhcp binding 192.168.12.100
```

show ip dhcp binding	

2.2.2

2.2.3 clear ip dhcp server statistics

clear ip dhcp server statistics

clear ip dhcp server statistics

debug ip dhcp server statistics

clear ip dhcp server statistics

```
clear ip dhcp server statistics
```

show ip dhcp server statistics	

2.2.4 debug ip dhcp client

debug ip dhcp client

debug ip dhcp client

no debug ip dhcp client

debug ip dhcp client

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ʒ ⊾ ў ˘ Ʊ ⅃ Â

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debug ip dhcp client

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2.2.5 debug ip dhcp server

˘ **debug ip dhcp server** ʒ Â ʒ Ʊ Â

debug ip dhcp server events packet

no debug ip dhcp server events packet

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events	
packet	

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debug ip dhcp server packet

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2.2.6 show dhcp lease

˘ ʒ **show dhcp lease** Â

show dhcp lease

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Â

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ЉЮ й **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
```

ЊЖ ЮÂ

	ǂ Â
Client-Id/	˟
	Â 8 ’ ˘ Л ў ╟ Â
	Â ╟ǂ ’ ǂ Â

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ꝛ	
clear ip dhcp binding	

2.2.8 show ip dhcp conflict

ᒪ ᾰ ˘ ꝛ **show ip dhcp conflict** Â

show ip dhcp conflict

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ЛЬЮ ѝ **show ip dhcp conflict** ʒ Â

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

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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
```

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clear ip dhcp server statistics Â

3 DHCP Relay

3.1 DHCP Relay

ЛЬЮ

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

3.1.1 service dhcp

Э **ervice dhcp**Â

Л Лъ Â

service dhcp

no service dhcp

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ЛЬЮ Ь Â

`service dhcp`

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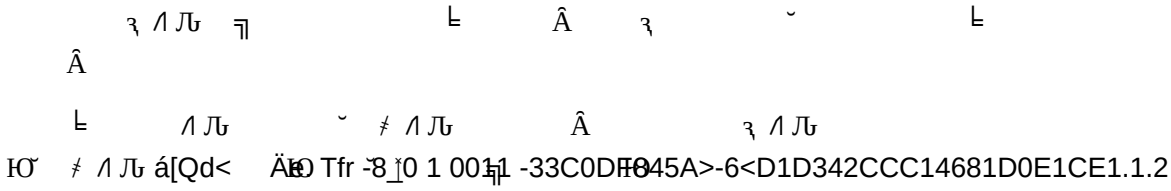
ip helper-address vrf *A.B.C.D*	╗

3.1.2 ip helper-address



Service dhcp	ʒ

3.1.7 ip dhcp relay suppression

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

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service dhcp	ʒ

no ip name-server *ip-address*

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ip-address	¨ ⊾

ip-address	

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ў ‟ ˘ ʎ Ƶ **no ip host host-name ip-address** ʒ

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¶	
show hosts	ÿ ¨ ă

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4.1.5 show hosts

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show hosts

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

ð ¶Ô

¶	
ip host	ÿ ¨
ip name-server	⊾

ð Ô

5 NTP

5.1 NTP

ЛЪЮ

- **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

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no ntp

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

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ʒ	
ip access-list	… ⁸ “ Â

5.1.3 ntp authenticate

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ntp authenticate

no ntp authenticate

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ntp authentication-key ȁ **ntp trusted-key** Â

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ɛ̀ ȉ ɨ˘ ⁸ Â

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

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ʒ	
ntp authentication-key	
ntp trusted-key	Â

5.1.4 ntp authentication-key

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ntp authentication-key *key-id* **md5** *md5* *Ôbr}*ɨ*Ôxǎ ./ǎNÃ@*

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

ð ¶ Ô

¶	
ntp authenticate	8
ntp trusted-key	
ntp server	Ь

5.1.5 ntp disable

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ntp disable

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```
no ntp
```

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5.1.6 ntp master

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ꝛ ѝ ⺆ ў Â

ntp master *[stratum]*
no ntp master

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stratum ˘ ѝ ў

5.1.7 ntp server

й Ь Â ъ Лъ Ь Â

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

no ntp server *ip-addr*

ð Ô

ip-addr	Ь ˘ ,
version	^ Л ~ ^ ~~ ,
if-name	^ Л ~ ^ Ь ~'
keyid	^ Л ~ б Ь ╗
prefer	^ Л ~ Ь й Ь

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б Ь ╗ ˘ ″I ╗ Лъ ↓ ˘ ł
й Ь ˘ Л Лъ Ь ╗ ˘ б Ь
╗ Ь ˚ ╗ б
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```
' Ruijie(config)# ntp server 192.168.210.222
' Ruijie(config)# ntp server 10::2
```

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no ntp	⊾ ╖ Â

5.1.8 ntp synchronize

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ntp synchronize

no ntp synchronize

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б ⊾ ˘ ѝ ˘ ѧ ѝ ⍑ ˘
˘ ╟˘ ˘ ⁼ ˘ ˘ ‡ ⋀ Ѣ ꝛ

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ЉЮ ˘ ˘ Â

Ntp synchronize

ð ꝛ Ô

ꝛ	
ntp server	⊾ ˘

5.1.9 ntp trusted-key

ѝ

ntp trusted-key *key-id*

no ntp trusted-key *key-id*

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key-id	Â

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

ð Ô

ntp authenticate	Â
ntp authentication-key	Â
ntp server	Â

5.1.10 ntp update-calendar

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Â

ntp update-calendar
no ntp update-calendar

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

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5.2

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

5.2.1 debug ntp

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debug ntp

no debug ntp

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```
debug ntp
```

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5.2.2 show ntp status

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show ntp status

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```
show ntp status
```

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6 SNTP

6.1

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

6.1.1 sntp enable

SNTP **no** Disable

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

show sntp SNTP

```
RedGiant(config)# sntp enable
```

show sntp	
clock update-calendar	
clock set	

seconds ˋ ˇ ˘ 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
```

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ʒ	

sntp enable

ð ¸ Ô

ð Ô

show sntp ¸ SNTP

ð Ô

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

ð ¸ Ô

¸	
sntp enable	
show sntp	

ð / Ô

˚ RGOS10.0 Л Э

7 UDP-Helper

7.1

7.1.1 udp-helper enable

udp-helper enable ʒ ╟ ╗ Â **no udp-helper enable** ʒ ╗ Â

Ю Â

udp-helper enable

7.1.2 ip helper-address

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ip helper-address *address*

no ip helper-address *address*

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address	UDP 20 Â

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

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ip forward-protocol	

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7.1.3 ip forward-protocol

Â **no** Â

udp-helper enable	
ip forward-protocol	

ð Ô

8 DDNS

8.1

8.1.1 peanut username

no peanut username *name* **password** *word*

name	
word	

9 DNS

9.1

9.1.1 smartdns

‡ Â ⁄ Ƶ ʒ ‡ Â

no smartdns *A.B.C.D interface* **map** *X.X.X.X*

A.B.C.D	⊾ IP Â
Interface	Â
X.X.X.X	ɨ IP Â

ʒ Â

ʒ ⁄ Ƶ ╗ IP ‡ Â

1˙ ч IP ‡˘ ⊾ 192.168.1.100˝ gigabitethernet 0/1 Э 202.101.99.55˝ gigabitethernet 0/2 Э 58.66.101.33˝

```
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
```

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smartdns enable	DNS ╗

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1.0	

9.1.2 smartdns enable

no smartdns enable

-	-

	1 DNS Ruijie#**config** Ruijie(config)#**smartdns enable**

Smartdns	DNS

	-

1.0	

M .

2013-03-12		ꝛ	╗ dns-proxy nat dns ᾶ a ˇ

10 DNS-Proxy

10.1

10.1.1 blacklist

blacklist domain-ip *start-ip [end-ip]*

no blacklist domain-ip *start-ip [end-ip]*

start-ip	IP
end-ip	IP

dns-proxy

dns IP DNS IP IP dns IP 10

1 dns-proxy IP 1.1.1.1-1.1.1.100

```
Ruijie(config-dns-proxy)#blacklist domain-ip 1.1.1.1 1.1.1.100
```

dns-proxy enable	dns-proxy

-

10.3(4b8)	

10.1.2 dns-proxy

dns-proxy

Â

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dns-proxy dns-proxy

1 IO dns-proxy

```
Ruijie(config)#dns-proxy
Ruijie(config-dns-proxy)#exit
Ruijie(config)#
```

dns-proxy enable	dns-proxy
ip name-server	dns

-

ʒ	
dns-proxy	dns-proxy

ʎ	-

ʎ	
10.3(4b8)	ʒ

10.1.6 whitelist

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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

ʒ	dns-proxy

ʒ ʎ Ѣ ̈ ‡ dns a ʍ dns-proxy ˘ ‡ ‘ ˘ dns ╘ Â

10 ˘ ”I Æ Э ”I ƽ ˘ ɨ ”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
```

	-

	10.3(4b8)	

10.2

10.2.1 show dns-proxy configure

IO

show dns-proxy configure

dns-proxy

1 IO 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

dns-proxy enable	dns-proxy
dns-proxy	dns-proxy

-

10.3(4b8)	

10.2.2 show dns-proxy configure blacklist

show dns-proxy configure blacklist

dns

```
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
```

dns-proxy enable	dns

३	३

10.2.5 show dns-

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3

dns-proxy enable	dns-proxy ╖
dns-proxy	dns-proxy

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1.1

1.1.1 ip policy route-map

ip policy **route-map**

ip policy route-map *route-map*

no ip policy route-map

route-map	

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˘ ‡ Ю ѝ ˘ ѝ ‡ Ю ѝ
˘ ŭ̆ ‡ 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 ʒ Ô

ʒ	
access-list	Ѫ “ ‡ Â
route-map	Ѫ يي Â
set ip next-hop	Ѫ Ю
set ip default next-hop	Ѫ

1.1.2 ip local policy route-map

ip local policy route-map

ip local policy route-map *route-map*

no ip local policy route-map

route-map	

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ʒ	
access-list	Ѭ ‟ ‡
route-map	Ѭ يي
set ip next-hop	Ѭ Ю
set ip default next-hop	Ѭ Ю
set interface	Ѭ
set default interface	Ѭ
set ip tos	
set ip dscp	
set ip precedence	˝I
match ip address	‡
match length	ϧ

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1.1.3 ip policy

set ip nexthop ˘

Ю **ip policy** Â ʒ **no** Â

ip policy load-balance|redundance

no ip policy

ð Ô

load-balance|redundance	

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يي **set ip next-hop** ˘ ⁄ ⅃ Ю ˘

˘ ⁄ ⁄ ⅃ Ю ʼ ˘

Ю ˘ ⁄ ⅃ Ю ˘ ⁄ ⅃

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
```

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10.3(4b7)	ʒ
10.3(4t90)	╗ ╟

2.1.2 route-auto-choose update

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route-auto-choose update

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```
Ruijie#config
Ruijie(config)#route-auto-choose update
```

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10.3(4b7)	ʒ

3 RIP

3.1

3.1.1 address-family RIP

ˇ ʒ **address-family**ˇ
ˇ ʒ **no** Â

address-family ipv4 vrf *vrf-name*

no address-family ipv4 vrf *vrf-name*

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vrf *vrf-name*	ʒ ¨ Â

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address-family ʒ ˆ ѝ ˋ
˜ Â ˇ …
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ˇ

exit-address-family **exit** ʒ Â

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ЉЮ ˇ … ¨ ѝ ˇ ѝ … 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
```

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exit-address-family	Â
ip vrf	… Â

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3.1.2 auto-summary (RIP)

╠ ╖ ˘ ꝛ **auto-summary** Â ꝛ **no** ╠ ╖ Â

auto-summary

no auto-summary

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↑ ѝ Â

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

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redistribute	ÿ ↑ ↓ Â

default-information originate Â

always a Â a Â

show ip rip database Â

route-map **set metric** Â

metric **route-map** **set metric** **metric** Â

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ip default-network **default-information originate** Â

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

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ip rip default-information	
redistribute	è

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3.1.5 distance

distance Â **no**

distance	˘
ip-address	
wildcard	Ѭ Æ˘ ° ɔ̄ ˘ ˝ a Â

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

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3.1.6 distribute-list in RIP

8 ˘ Љ ˘ ʒ **distribute-list in** Â

ʒ **no** Ѭ 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 Л “ ˘ Л Лъ Â
prefix *prefix-list-name*	“ Â
gateway *prefix-list-name*	“ Â
interface-type interface-number	Л ¦ “ ˘ Л Â

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```
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
```

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access-list	ЬЖ “ ‡ Â
prefix-list	ЬЖ “ Â

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3.1.7 distribute-list out RIP

distribute-list *access-list-number name* **prefix** *prefix-list-nam* **out** *interface protocol process-id process-name*

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

access-list-number	
prefix *prefix-list-name*	
interface	
protocol	
process-id	*protocol*
process-name	*protocol*

```
Ruijie(config-router)# version 2
Ruijie(config)# access-list 10 permit 192.168.12.0
0.0.0.255
```

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access-list	Ѭ ‟ ‡ Â
prefix-list	Ѭ ‟ Â
redistribute	↑ Â

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3.1.8 exit-address-family

˘ Ю **exit-address-family** ʒ Â

exit-address-family

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ʒ ʎ Љ ѝ **exit** Â

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

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address-family	Â

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3.1.9 ip rip authentication key-chain

ip rip authentication key-chain Â **no** Â

ip rip authentication key-chain *name-of-keychain*

no ip rip authentication key-chain

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name-of-keychain	Â

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Â

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key chain

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key chain	… ˘ Â

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3.1.10 ip rip authentication mode

ЊЖ ˘ ʒ **ip rip authentication mode** Â ʒ **no** Â

ip rip authentication mode text md5

no ip rip authentication mode

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	no RIP

ip rip authentication key-chain	Â Ñ Â
ip rip authentication text-password	Â

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3.1.11 ip rip authentication text-password

ip rip authentication text-password Â **no** Â

ip rip authentication text-password *password-string*

no ip rip authentication text-password

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password-string Â

ip rip authentication mode	Â
ip rip authentication key-chain	Â

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3.1.12 ip rip default-information

ÿ **ip rip default-information** Â **no** Â

ip rip default-information only originate metric *metric-value*

no ip rip default-information

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only	a è Â
originate	è Â
metric *metric-value*	Â

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Ю **ip rip default-information** **default-information originate**

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ip rip default-information a Â

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ip rip default-information a Ю

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```
Ruijie(config)# interface ethernet 0/0
Ruijie(config-if)# ip rip default-information only
```

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default-information originate	

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3.1.13 ip rip receive enable

Э ˘ ʒ **ip rip receive enable** Â ʒ **no** Э Â

ip rip receive enable

no ip rip receive enable

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˘ Ю ʒ **no** Â ʒ ʒ ÂЛ ʒ **default** Â

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

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3.1.16 ip rip send version

Ѭ Э ˘ ʒ **ip rip receive version** Â ʒ **no** Â

ip rip send version 1 2

no ip rip send version

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1	ˆ ⁄ ˜ ⁄ Â
2	ˆ ⁄ ˜ ⁄ Â

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ѝ ⁄ ᾱ **version** ʒ Â

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

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version	Ѭ Â

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3.1.17 ip rip v2-broadcast

ip rip v2-broadcast

ip rip v2-broadcast

no ip rip v2-broadcast

version

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

version	

3.1.18 ip split-horizon (RIP)

ip split-horizon

ip split-horizon

no ip split-horizon

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ǔ ˥ ˘ ˩ Љ **show ip rip** ʒ Â ˨

neighbor ʒ Ѭ ˘ a ˧ ˥ Â

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ip-address	
ip-network-mask	ѝ

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ʒ **ip summary-address rip** Ю Â
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```
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
```

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auto-summary	╟

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3.1.20 network (RIP)

ЬЖ “ ˘ ʒ **network** Â
ʒ **no** ЬЖ Â

network *network-number wildcard*

no network *network-number wildcard*

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network-number	⅄ Â ⅄ ѝ ⅄˘ ⅄ Â
wildcard	ЊЖ æ˘ ɔ̄ ˘ a Â

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⅄ Љ˘ *network-number* *wildcard* ˘ б Â

wildcard ˘ ˘ б Â

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

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3.1.21 neighbor (RIP)

ЊЖ ˘ ⅄ Љ ҙ **neighbor** Â ҙ **no** ЊЖ Â

neighbor *ip-address*

no neighbor

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interface-number	⅄

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

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Ruijie(config-router)# **offset-list** *7* **in** *7*
Ruijie(config-router)# **offset-list** *8* **in** *7* **GigabitEthernet** *1/0*

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3.1.23 output-delay

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output-delay˘ ʒ **no** ⅄ Â

output-delay *delay*

no output-delay

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delay	˘ æ ѝ ˘

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˘ Â ˘ **output-delay** ʒ ╗
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```
Ruijie(config)# router rip
Ruijie(config-router)# output-delay 30
```

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3.1.24 passive-interface

ʌ Э ╗ ˘ ʒ **passive-interface**
ʒ Â ʒ **no** ╗ Â

passive-interface default *interface-type interface-num*

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

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default	ѝ
interface-type interface-num	б ʌ

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passive-interface default ʒ ѝ ˘ ʌ Љ **no passive-interface** *intface-type interface-num* ʒ ѝ Â

ip rip send enable **ip rip receive enable**

ip rip send enable **ip rip receive enable**

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```
Ruijie(config-router)# passive-interface default
Ruijie(config-router)# no passive-interface ethernet 0/0
```

ip rip receive enable	
ip rip send enable	

3.1.25 redistribute RIP

redistribute **no**

match

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3.1.26 router rip

… ˘ ʒ **router rip** Â ʒ **no** Â

router rip

no router rip

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˘ ЊЖ ⅄ Â Э ╟ ˘ **async default routing** Â

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Ruijie(config)# **router rip**

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network (RIP)	ЊЖ ⅄ Â

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3.1.27 timers basic

˘ ʒ **timers basic** Â ʒ Â

timers basic *update invalid flush*

no timers basic

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update	˘ Љ Â *update* Ѭ ˘ ˘ *invalid* *Flush* Æ Â Â
invalid	˘ Љ ˘ ÿ Â *invalid* Ѭ ⅃ ѝ Â ѝ Ь ˘ ˘ ⅃ ѝ ˘ *invalid* ’ *invalid*

I6-5id6/¦ † 0) (Š ÕâÂ áGBsuF“h’ï ys‰†”X

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3.1.28 validate-update-source

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ʒ **validate-update-source** Â ʒ **no** Â

validate-update-source

no validate-update-source

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ʒ **validate-update-source** Â

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ʊ̆ ʒ **validate-update-source** Â

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```
Ruijie(config)# router rip
Ruijie(config-router)# no validate-update-source
```

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3.1.29 version (RIP)

version **no**

version 1 2

no version

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1	
2	

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ip rip receive version **ip rip send version**

ð Ô

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

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ip rip receive version	
ip rip send version	

show ip rip

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3.2

3.2.1 show ip rip

˘ **show ip rip** Â

show ip rip **vrf** *vrf-name*

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vrf *vrf-name*	ˆ Л ˜

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```
Ruijie# show ip rip
GigabitEthernet1C-10-21/1GigabitEthernet1C-10-21/0
```

```
192.168.64.0 255.255.255.0
Distance: (default is 50)
```

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```
Ruijie(config-router)# sh ip rip vrf 1
VRF 1  VRF-id:1
Routing Protocol is "rip"
Sending updates every 30 seconds
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

˘ **show ip rip database** Â

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

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vrf *vrf-name*	ˆ ˜
network-number	ˆ ˜ Â
network-mask	Â ˘

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```
Ruijie# show ip rip database
192.168.1.0/24   auto-summary
192.168.1.0/30   directly connected, Loopback 3
192.168.1.8/30   directly connected, 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
```

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```
Ruijie# show ip rip database 192.168.121.0 255.255.255.0
192.168.121.0/24   redistributed
[1] via 192.168.2.22, GigabitEthernet 0/1
```

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show ip rip	Â

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3.2.3 show ip rip external

ˉ ˘ **show ip rip external** ʒ Â

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

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bgp | connected | isis | ospf | static	ˆ /ˈ ˜ ˉ

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```
Ruijie# show ip rip external connected
Protocol connected route:
[connected] 1.0.0.0/8 metric=0
nhop=0.0.0.0, if=2
[connected] 3.0.0.0/8 metric=0
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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show ip rip	Â

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3.2.4 show ip rip interface

˘ **show ip rip interface** Â

show ip rip interface vrf *vrf-name*

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vrf *vrf-name*	^ ~

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```
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 ʒ 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

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area

no area

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ᚴ Ɱ ʒ **no** ˘ ᛉ ᛉ ˘

area authentication ȁ **area default-cost** ȁ **area filter-list** ȁ **area nssa** ᛉ

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ᛉ ˘ **network area** ʒ Â ˝I ╗ ᛉ

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```
Ruijie(config)# router ospf 2
```

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

network area	

4.1.2 area authentication

area authentication **no**

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ѝ 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
```

```
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	Ѭ ʒ Â
ip ospf message-digest-key	Ѭ ʒ Â
area virtual-link	Ѭ Â

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4.1.3 area default-cost

Ѭ ⅄ ˆ ˜˘
ʒ **area default-cost** Â ʒ **no** Â

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

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

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area-id	⅄ ⅄ ⅄ Â
cost	⅄ Â

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⸗ ˆ ѝ ˜ Â ˘
⸗ ˘ ⸘ ⸗ Â

⸗ ѝ ч Ь ʒ **area stub˘ area nssa**
area default-cost Â Э˘ **area stub** ʒ˘
⸗ **area nssa** ʒ˘ **area default-cost** ʒ /ǀ
Э Â

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```
Ruijie(config)# router ospf 1
Ruijie(config-router)# network 172.16.0.0 0.0.255.255 area 0
Ruijie(config-router)# network 192.168.12.0 0.0.0.255 area 1
Ruijie(config-router)# area 1 stub
Ruijie(config-router)# area 1 default-cost 50
```

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6 [illegible]

area-id	
acl-name	
prefix-name	
access prefix	
in out	

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```
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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4.1.5 area nssa

area nssa **no**

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	⸗ ⸗ ⸝ Â
no-redistribution	ˆ ⸝ ˜ ˘ ⸝ ⸜ ʒ ⸗ a ⸗ ˘ ⸝ Ѣ Э Â
default-information-originate	ˆ ⸝ ˜ ⸗ ˘ ⸝ Э Â
no-summary	ˆ ⸝ ˜ Ь ⸗ Â

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default-information-originate ˘
Э ˘ Э ȕ ˘
˘ Э ˘ ≠ a ˘
Â

no-redistribution Э ʒ ὲ
a ⸗ Â ⸝
˘ ⸝ Ѣ Â

ѝ ⸗ Ѣ

area default-cost	ˆ ~ Â

4.1.6 area range

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

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

Â

˘ /ˡ Э **area stub** ʒ ˘
Â /ˡ ˂ ˘ Љ ˧˩
Â

˂ ѝ ч ʒ **area stub** **area default-cost** Â
Э˘ **area stub** ʒ˘ **area default-cost** ʒ /ˡ
Э Â **area default-cost** ʒ Ѭ ˆ ˜ Â

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ЉЮ ˘ ˂ ѝ ˘ ˂ 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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area default-cost	Ѭ ˂ ˆ ˜ Â

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4.1.8 area virtual-link

Ѭ ˘ ʒ **area virtual-link** Â ʒ **no**
Ѭ 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

dead-interval *seconds*	ˆ ʎ ˜ Ѭ ˘ Ѫ ѝ æ˘ ѝ Â б Â
hello-interval *seconds*	ˆ ʎ ˜ ˘ Ѫ ѝ æ˘ ѝ Â б Â
retransmit-interval *seconds*	ˆ ʎ ˜ ˆ ˜ ˘ Ѫ ѝ æ˘ ѝ Â Э Â
transmit-delay *seconds*	ˆ ʎ ˜ ˆ ˜ ˘ Ѫ ѝ æ˘ ѝ Â ˘ ╗ ˘ ⁹ Â
authentication-key *key*	ˆ ʎ ˜ Ѭ Â Â ʒ ʎ Ѫ Ѫ╗ Â
message-digest-key *key-id* **md5** *key*	ˆ ʎ ˜ Ѭ Â Â ʒ ʎ Ѫ Ѫ╗ Â
authentication	˘ Â
message-digest	ѝ Â
null	ѝ a Â

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dead-interval ‘ ’

hello-interval ‘ ’

retransmit-interval ‘ ’

transmit-delay ‘ ’

a

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⺀ Â

router-id ѝ ˇ a ˇ **show ip ospf neighbor** ʒ Â ⺀ Ѣ Â

area virtual-link ʒ ⺀ Ѭ ˇ ⺀
ˇ ʒ **area authentication** Â

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```
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 Ѣ⺀ ѝ ⺀ ˇ б Â
⺀ ⺀ ˇ ˇ ѝ 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-digest-key 1 md5 hello
```

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area authentication	⺀ ⺀ Â
show ip ospf	ˇ Â

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4.1.9 auto-cost

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ʒ' ˘ ʒ **no** ʌ ⅃ ╟ ʒ' ╖ ˘ ʌ ⅃
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auto-cost reference-bandwidth *ref-bw*

no auto-cost reference-bandwidth

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ref-bw Â ⅃

4.1.10 clear ip ospf process

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clear ip ospf *process-id* **process**

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process-id	˘ Â ʎ ˘ Â

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

RFC2328

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

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show ip ospf	

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4.1.12 default-information originate OSPF

˘

default-information originate Â **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*

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route-map *map-name*	¨

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redistribute **default-information** ꓘ ˘ ╟ ⅃ ѝ
ˆ ˜ Â a ╟ ˘
Â ˘ **default-information originate** ꓘ Â

˘ a ǔ ˘ ǟ
Â a ˘ ǔ
˘ ⅃ Ƚ **show ip ospf database** ˘ ѝ
Â **show ip route** ꓘ˘ ⅃ Ƚ
Â

˘ ⅃ **default-information originate** ꓘ ⅄˘
a ꓘ **default-metric** Â

ч ˘ ⅃˘
a ⅃ Â ч ˘ ˘ ˘
˝I ˘ Ƚ **show ip route** ⅃ Â

ꓘ˂ a ⅃ Ƚ Â

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ѝ ˘ ѝ 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
```

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ꓘ	
show ip ospf database	Â
show ip route	Â

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4.1.13 default-metric

ǂ ˘ ҷ **default-metric** Â

ҷ **no** Â

default-metric *metric*

no default-metric

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metric	Ѭ ǂ Â

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default-metric ҷ б **redistribute** ҷ ˘ Л Љ ǂ Â

default-metric ҷ ˘ Љ **default-information originate** a Â

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```
Ruijie(config)# router rip
Ruijie(config-router)# network 192.168.12.0
Ruijie(config-router)# version 2
Ruijie(config-router)# exit
Ruijie(config)# router  ospf
Ruijie(config-router)# network 172.16.10.0 0.0.0.255 area 0
Ruijie(config-router)# default-metric 50
Ruijie(config-router)#redistribute rip subnets
```

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redistribute	↑ è Â
show ip ospf	

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4.1.14 distance ospf

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distance ospf intra-area *1-255* **inter-area** *1-255* **external** *1-255*

no distance ospf

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intra-area *1-255*	↖ ˘ ѝ

ʒ

4.1.15 distribute-list in

distribute-list *listname* **gateway** *plist-name* **prefix** *plist-name*
in **interface-type** *num*

no distribute-list *listname* **gateway** *plist-name* **prefix** *plist-name*
in **interface-type** *num*

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listname	‡
gateway *plist-name*	‡
prefix *plist-name*	‡
interface-type *num*	ʎ

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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
```

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4.1.16 distribute-list out

ǐ ˘ ╖ **redistribute** ʒ

distribute-list *istname* **gateway** *plist-name* **prefix** *plist-name* **out bgp connected isis** *area-tag* **ospf** *process-id* **rip static**

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

ð Ô

listname	‡
gateway *plist-name*	‡
prefix *plist-name*	‡
bgp connected isis *area-tag* **| ospf** *process-id* **rip static**	

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distribute-list out б **redistribute route-map** ʒ ˘ ÿ ὲ ǐ ˘ a ǐ ˘ б **redistribute** ʒ Â ‡ ‡ a ¯ ą Â

4.1.18 enable traps

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ip ospf authentication-key ʒ ˘ Â a ˘ ч ⋀ a ˘ ≠ a Â

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ᴗ˘ ʊ˘ ˘ ʒ **area authentication** Â

Э ≠ ⋀ Ѣ Ю ʒ **ip ospf authentication** ᴗ˘ ˝I ⋀

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```
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	ᴗ˘ Ѭ Â
Ip ospf authentication	Э Ѭ

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4.1.21 ip ospf cost

ˆ ˜˘ ʒ **ip ospf cost** Â ʒ **no** Â

ip ospf cost *cost*

no ip ospf cost

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ʒ **no** ʌ Ʌ

ip ospf database-filter all out

no ip ospf database-filter

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ip ospf dead-interval

ʒ **ip ospf dead-interval** Â ʒ **no ip ospf dead-interval** Â *seconds*

no ip ospf dead-interval

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ì **ip ospf hello-interval** " Â

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```
Ruijie(config)# interface serial 1/0
Ruijie(config-if)# ip address 172.16.10.1
255.255.255.0
Ruijie(config-if)# encapsulation ppp
Ruijie(config-if)# ip ospf hello-interval 15
```

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ip ospf dead-interval	Â

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4.1.26 ip ospf message-digest-key

˘ ҂ **ip ospf message-digest-key** Â

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ip ospf message-digest-key *key-id* **md5** *key*

no ip ospf message-digest-key

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ip ospf message-digest-key ҙ ˘ Â a ˘ ч ⅄ a ˘ ≠ a Â

a˘ ⅄ Ѣ a ˘ ˘ Э ˘ Â ˘ Â

⅄ ŭ ˘ ҙ **area authentication** Â Э ≠ ⅄ Ѣ Ю ҙ **ip ospf authentication** ⅄ ˝I ⅄

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```
Ruijie(config)# interface Serial 1/0
Ruijie(config-if)# ip address 172.16.24.2
255.255.255.0
Ruijie(config-if)# ip ospf authentication
message-digest
Ruijie(config-if)# ip ospf message-digest-key 10 md5
hello10
Ruijie(config-if)# ip ospf message-digest-key 5 md5
hello5
```

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```
Ruijie(config)# interface Serial1/0
Ruijie(config-if)# no ip ospf message-digest-key 10 md5 hello10
```

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area authentication	⅄ Ѫ Â
ip ospf authentication	Э Ѫ

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4.1.27 ip ospf mtu-ignore

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no Â

ip ospf mtu-ignore

no ip ospf mtu-ignore

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```
Ruijie(config)# interface serial 1/0
Ruijie(config-if)# ip ospf mtu-ignore
```

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4.1.28 ip ospf network

˘ **ip ospf network** Â **no**

Â

ip ospf network broadcast non-broadcast point-to-multipoint non-broadcast point-to-point

no ip ospf network broadcast non-broadcast point-to-multipoint non-broadcast point-to-point

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broadcast	ѝ Â
non-broadcast	ѝ ˘ Â
point-to-multipoint non-broadcast	ѝ Â ѝ Â
point-to-point	ѝ Â

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```
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
```

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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
```

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Э ˆ ⁸ 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
Ruijie(config-if)# ip ospf priority 0
```

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dialer map ip	Ѭ б ⁄ ⁄ Â
frame-relay map	Ѭ б Â
neighborˆ ˜	Ѭ ˘ ⁄ Â

X25 map	Ж б Â

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4.1.29 ip ospf priority

ˮI ˘ ʒ **ip ospf priority** Â ʒ **no** Â

ip ospf priority *priority*

no ip ospf priority

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Priority	ˮI Â

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ip ospf network	Â

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4.1.30 ip ospf retransmit-interval

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area virtual-link	Ѭ Â

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4.1.31 ip ospf transmit delay

Ѭ ˘ ʒ **ip ospf transmit delay** Â ʒ **no** Â

ip ospf transmit delay *seconds*

no ip ospf transmit delay

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Seconds	Ѭ ˘ Љ ѝ æ Â ѝ Â

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˘ ˆ ˜ ╗˘ ╗ ʒ **ip ospf transmit delay** Ѭ Â ˘ æ ˘ Â ˘ **area virtual-link** ʒ **retransmit-interval** Ѭ Â

˚ ˘ ˘ ˛ 9 ˘ ÿ Â

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

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area virtual-link	Â

4.1.32 log-adj-changes

no **default** Â

log-adj-changes detail

no log-adj-changes detail

detail	Â

a **detail** Â

Â

Â

```
Ruijie(config)# router ospf 1
Ruijie(config-router)# log-adj-changes detail
```

show ip ospf	Â

4.1.33 max-concurrent-dd

Â

max-concurrent-dd *1-65535*

poll-interval *seconds*	ˆ ˊ ˜ ˘ Љ ѝ æ˘ Â Â
priority *priority*	ˆ ˊ ˜ ˝I ˘ ѝ˚ Â
Cost *cost*	ˆ ˊ ˜ ˘ Ѭ Э Â Â

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0.0.0.255 **area** *1*
Ruijie(config-router)# **network** *0.0.0.0 255.255.255.255* **area** *0*

router ospf

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4.1.37 overflow database external

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overflow database external *max-dbsize wait-time*

no overflow database external

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max-dbsize	Â
wait-time	ÿ Â

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max-dbsize Ю

a Ą Â *wait-time*

Â

```
Ruijie# configterminal
Ruijie(config)# ospf10
router)# 10 3
```

4.1.40 redistribute

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redistribute **bgp** **isis** *area-tag* **ospf**

ǀ **isis** ˘ a ˘ /ǀ ǀ ˘
ǀ ˘ ˘ ‡ ǀ Â
˘ ѝ ˘ ˘ ˘ ѝ Â
Â

ǀ **ospf** ˘ a ˘ ǀ
ʼ ɨ ѝ ˘ ǀ /ǀ ɔ̄
ǀ ʼ ʒ ѝ Â
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ɔ̄ ʼ ǀ ˘ /ǀ ǀ
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```
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	⅄
vrf-name	˘

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ЉЮ ˘ **vrf** *vpn_1* … Â

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

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ʒ	
show ip protocols	Â
show ip ospf	Â

ð ⅄ Ô

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4.1.42 router-id

ʒ **no** ⅄ Љ ˘

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router-id *router-id*

no router-id

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router-id	Љ Â

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ЉЮ ˘ 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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show ip protocols	Â

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4.1.43 summary-address

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summary-address Â ʒ **no** Ѭ Â

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

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ip-address	Â
net-mask	Â
not-advertise	a ʼΩ ˘ ‡ ѝ ʼΩ Â

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б **area rang** ʒ a ˘ ˘ ˇ ˘

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ˇ˘ **summary-address** ʒ ʌ Э ˘ ɜ

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```
redRuijie(config)# router ospf 20
Ruijie(config-router)# summary-address 100.100.0.0 255.255.0.0
Ruijie(config-router)# redistribute static subnets
Ruijie(config-router)# network 200.2.2.0 0.0.0.255 area 1
Ruijie(config-router)# network 172.16.24.0 0.0.0.255 area 0
Ruijie(config-router)# area 1 nssa
```

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area range	ˇ Э Â

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4.1.44 timers lsa-group-pacing

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ʒ **no** Â

timers lsa-group-pacing *seconds*

no timers lsa-group-pacing

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seconds	˘ ˘ Â

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```
Ruijie(config)#router ospf  20
Ruijie(config-router)#timers lsa-group-pacing 120
```

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show ip ospf	

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4.1.45 timers spf

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˘ ʒ **timers spf** Â ʒ

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timers spf *spf-delay spf-holdtime*

no timers spf

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spf-delay	Ѭ ˘ Љ ѝ æ Â ⁄ ˘ ɨ ˘ Â

spf-holdtime	Ѭ ч ˘ Ѣ й æ Â ˘ ч ˘ a Â

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spf-delay ʻ ʼ *spf-holdtime* ʻ Â

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spf-delay *spf-holdtime* ˘ ⅃ ≠ ˘ ≠

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ЉЮ й **show ip ospf** ʒ ʻ

```
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

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a˚ **show ip route** ˘

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ЛЬЮ ѝ **show ip ospf border-routers** ъ ˙

```
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
```

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4.2.3 show ip ospf database

˘ ъ **show ip ospf**

database Â

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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 ⁄ ˜ ˇ ⁄
adv-router	ˆ ⁄ ˜ ˙Ω
link-state-id	ˆ ⁄ ˜ ⁄ Â
self-originate	ˆ ⁄ ˜
maxage	ˆ ⁄ ˜
router	ˆ ⁄ ˜ Â
network	ˆ ⁄ ˜ Â
summary	ˆ ⁄ ˜ Â
asbr-summary	ˆ ⁄ ˜ Â
external	ˆ ⁄ ˜ Â
nssa-external	ˆ ⁄ ˜ Â
opaque-area	ˆ ⁄ ˜
opaque-as	ˆ ⁄ ˜
opaque-link	ˆ ⁄ ˜
database-summary	ˆ ⁄ ˜

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ЛЬЮ й **show ip ospf database**

```
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



Area 0.0.0.0)
```

```
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

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ЛЬЮ ѝ **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 ʒ ЮÂ

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```
Metric: 20
Forward Address: 0.0.0.0
External Route Tag: 0
```

show ip ospf database external ʒ ЮÂ

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ЉЮ ѝ **show ip ospf database network** ʒ ʻ

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 ꝫ ЮÂ

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 ЮÂ

```
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 ʒ Ю Â

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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

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
     : 1290
      : 0x2 (*|-|-|-|-|-|E|-)
LS Type: AS-external-LSA
Options
```

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ЉЮ ѝ **show ip ospf database database-summary** ҙ ‘

```
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 ҙ ЮÂ

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Router Link	⅄ ˘ Â ⅄ ˘ Â

interface-type	ˆ ⁄ ˜ Â
interface-number	ˆ ⁄ ˜ ⁄ Â

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ЉЮ ѝ **show ip ospf interface GigabitEthernet** *1/0* ʒ ʿ

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

GigabitEthernet 1/0 i1/0ID) 3.3.3.3, I fa
```

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4.2.5 show ip ospf neighbor

ˇ ʒ **show ip ospf neighbor** Â

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

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detail	ˆ /ˆ ˜ Â
interface-type *interface-number*	ˆ /ˆ ˜ Â
neighbor-id	ˆ /ˆ ˜ 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 ʒ Ю˙

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4.2.6 show ip ospf route

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show ip ospf *process-id* **route count**

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process-id	Â
count	Â

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```
Ruijie# show ip ospf route
OSPF process 1:
Codes: C - connected, D - Discard, O - OSPF,
```

```
IA - OSPF inter area  N1 - OSPF NSSA external type 1, N2 - OSPF
NSSA external type 2
E1 - OSPF external type 1, E2 - OSPF external type 2
E2 100.0.0.0/24 [1/20] via 192.88.88.126, 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

4.2.7 show ip ospf summary-address

show ip ospf summary-address

show ip ospf summary-address

```
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#
```

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4.2.8 show ip ospf virtual-link

˘ ʒ **show ip ospf virtual-link** Â

show ip ospf *process-id* **virtual-link**

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˘ /ǀ ʒ ˘ Љ ⅵ ὲ Â **show ip ospf neighbor** ʒ a Â

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ЉЮ ѝ **show ip ospf virtual-links** ʒ ʻ

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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5.1

5.1.1 distribute-list in

distribute-list in

no

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	
access-list-name	
prefix *prefix-list-name*	
gateway *prefix-list-name*	
nterface-type interface-number	

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5.1.3 ip community-list

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ip community-list **standard** **expanded** *community-list-name* *community-list-number* **permit** **deny** *community-number..*

no ip community-list **standard** **expanded** *community-list-name* *community-list-number*

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standard	‘‘
expanded	‘‘
community-list-name	‘‘ ¨ ‘‘ ¨ a
community-list-number	‘‘ ⅄ ‘‘ ‘ ⅄ ѝ ‘‘ ‘ ⅄ ѝ
permit	
deny	

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community-number 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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match community	ɔ̄ “
set comm-list delete	“

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```
Ruijie(config)# ip route 192.168.100.0 255.255.255.0 serial 0/1
Ruijie(config)# ip default-network 192.168.100.0
```

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```
Ruijie(config)# ip default-network 200.200.200.0
```

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show ip route	Â

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5.1.5 ip prefix-list

… ‟ ╗ ‟ ˘ **ip prefix-list** ʒ Â ʒ **no** ‟ ‟ Â

ip prefix-list *prefix-lis-name* **seq** *seq-number* **deny** **permit**

no ‟ Â

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

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prefix-lis-name	‟ ¨
descripton-text	‟

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ЛЬЮ ѝ ‟ ╗ **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

ѝ ‟ ╗ ˘ **ip prefix-list description** ʒ Â ʒ **no**
ᴧ ‟ ╗ Â

```
Ruijie# configure terminal
Ruijie(config)# ip prefix-list sequence-number
```

5.1.8 ip route

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ip route vrf *vrf_name network net-mask ip-address interface ip-address distance* **tag** *tag permanent* **weight** *number disable enable*

vrf_name	
network	
net-mask	
ip-address	Ю
Interface	Ю
distance	
tag	
permanent	
number	

ip route 172.16.100.0 255.255.255.0 192.168.12.1 115

Ruijie(config)# ip route 172.16.100.0 255.255.255.0 GigabitEthernet 0/0 192.168.12.1

distance/tag/weight

distance 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 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

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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show ip route	Â

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5.1.9 ip routing

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ip routing

no ip routing

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```
Ruijie(config)# no ip routing
```

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5.1.10 ip static route-limit

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ip static route-limit *number*

no ip static route-limit

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number	Э ˘

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Э ѝ ⁸ ˘ **ip static route-limit** Э ѣ Ю ˘ а Э Â **show running-config** Л Љ Э Â

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```
Ruijie(config)# ip static route-limit 900
Ruijie(config)# no ip static route-limit
```

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5.1.11 ipv6 prefix-list

… ‟ ╗ ‟ ˘ **ipv6 prefix-list** ҙ Â ҙ **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*

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prefix-lis-name	‟ ¨ Â
seq-number	‟ Љ ‟ ⅄ Âѐ Â ʒ ‟ ⅄˘ ‡ ѝ ‟ ǂ ‟ ⅄ Â ‟ ⅄ ˘ ɨ ‟ ⅄ ‟ ⅄
deny	ɔ̄
permit	ɔ̄
ipv6-prefix	Љ ⅃ Â ⅄ Љ Â ÿ
minimum-prefix-length	ˆ ⅄ ˜ ¨ ˛ ˋ **ge** ʒ
maximum-prefix- length	ˆ ⅄ ˜ ¨ ˋ **le** ʒ

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ipv6 prefix-list ʒ Â ‟
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Ѭ ɔ̄ ˘ ╗ ɔ̄
Â ʒ ˘ ‡ ɔ̄
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ЬЖ /ǀ 2222::/64 ǀ ˘ ‡ 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

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

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

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prefix-lis-name	‟ ¨
descripton-text	‟

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ЛЬЮ ѝ ‟ ╗ **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

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

ipv6 prefix-list sequence-number

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```
Ruijie# configure terminal
Ruijie(config)# ipv6 prefix-list sequence-number
```

5.1.14 match as-path

ǰ “ ˘ يي ʒ **match as-path** Â ʒ **no** Â

match as-path *as-path-acl-list-num* *as-path-acl-list-num…..*

no match as-path *as-path-acl-list-num……*

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as-path-acl-list-num	“ ⅄ Â “ ⅄

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match as-path ʒ ɨ ⅄ Ль “ ⅄ Â

يي ‡ ˘ ⅄ Ль **match** ʒ **set** ʒ Â **match** ʒ˘ ‡ ɔ̄ ’ **set** ʒ˘ ‡ a Â

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```
Ruijie(config)# route-map ROUTEMAP2IBGP
Ruijie(config-route-map)# match as-path 20 30
```

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

5.1.15 match community

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	
communitys-list-name	
exact-match	

match community ʒ ɨ ʎ Ƶ ʻʻ ʎ ʻʻ ¨ ˘ ч a Â

exact-match ʻʻ ˘ a ɔ̄ ʻʻ Â

يي ‡ ˘ ʎ Ƶ **match** ʒ **set** ʒ Â **match** ʒ˘ ‡ ɔ̄ ʼ **set** ʒ˘ ‡ a Â

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```
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	ʻʻ
match as-path	ɔ̄
match metric	ɔ̄
match origin	ɔ̄
set as-path prepend	ǀ Â
set comm-list delete	ɔ̄
set community	
set metric	ǀ

5.1.16 match interface

ɔ̄ 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*

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interface-type	
interface-number	ʎ

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match interface ʒ ɨ ʎ Ʌ Â

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يي ‡ ˘ ʎ Ʌ **match** ʒ **set**

ʒ Â **match** ʒˇ ‡ ɔ̄ ʼ **set** ʒˇ ‡ a Â

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```
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
```

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ʒ	
match ip address	ɔ̄ “
match ip next-hop	ɔ̄ “ Ю
match ip route-source	ɔ̄ “
match metric	ɔ̄
match route-type	ɔ̄

match tag	ɔ̄
set metric	ǀ
set metric-type	ǀ
set tag	ǀ

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5.1.17 match ip address

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match ip address Â ʒ **no** Â

match ip address

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ᛘ ɫ Â ᛘ ᕕ Љ
Â

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ﻳ ‡ ˘ ᕕ Љ **match** ʅ **set**
ʅ Â **match** ʅ˘ ‡ ƽ ’ **set** ʅ˘ ‡ a Â

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ﻳ ᛘ ˘ ᕕ Љ ᛘ Э Â a
ﻳ˘ ɛ̀ ˘ ᕕ ʅ a Â
ᛘ Э˘ a ﻳ˘ ɛ̀ ʅ ≁ a Â

ЉЮ ˘ ᛘ ˘ ᕕ ᛘ ‟
˘ ˘ ѝ ˘
ѝ 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
```

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ʅ	
access-list	ҖЖ ‟ ‡
match interface	ƽ Ю
match ip next-hop	ƽ ‟ Ю
match ip route-source	ƽ ‟
match metric	ƽ
match route-type	ƽ
match tag	ƽ
set metric	ᛘ

set metric-type	↑
set tag	↑

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5.1.18 match ip next-hop

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يي ‡ ˘ ʌ Ʊ **match** ʒ **set**

ʒ Â **match** ʒ˘ ‡ ɔ̄ ʼ **set** ʒ˘ ‡ a Â

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```
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
```

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ʒ	
access-list	ЊЖ “ ‡
match ip address	ɔ̄ “
match interface	ɔ̄ Ю
match ip route-source	ɔ̄ “

match metric

5.1.19 match ip route-source

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ʒ **match ip route-source** Â ʒ **no** Â

match ip route-source *access-list-number access-list-number...* |
access-list-name... |*access-list-name access-list-number...*|
access-list-name | **prefix-list** *prefix-list-name prefix-list-name...*

no match ip route-source *access-list-number access-list-number...* | *access-list-name...*
access-list-name access-list-number...|
access-list-name **prefix-list** *prefix-list-name prefix-list-name...*

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```
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

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*	

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يي ‡ ˘ ʎ Ʌ **match** ʒ **set**
ʒ Â **match** ʒ˘ ‡ ɔ̄ ’ **set** ʒ˘ ‡ a Â

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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	[illegible]
match metric	[illegible]
match route-type	[illegible]
match tag	[illegible]
set metric	[illegible]
set metric-type	[illegible]
set tag	[illegible]

[illegible]

[illegible]

5.1.21 match ipv6 next-hop

[illegible] **match ipv6 address** [illegible] **no** [illegible]

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

no match ipv6 next-hop

[illegible]

access-list-name	[illegible]
prefix-list *prefix-list-name*	[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

يي ‡ ˘ ⁄ Л Ѣ **match** ʒ **set**
ʒ Â **m** ʒ˘ ‡ ɔ̄ ’ **set** ʒ˘ ‡ a Â

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Ruijie(confi **ipv6 router ospf**
Ruijie(confi outer)# **redistribute rip subnets route-map** *redrip*
Ruijie(confi outer)# **exit**
Ruijie(confi **ipv6 access-list** *v6acl*
Ruijie(confi pv6-acl)# *10* **permit ipv6** *2720::/64* **any**
Ruijie(confi pv6-acl)# **exit**
Ruijie(confi **route-map** *redrip* **permit** *10*
Ruijie(confi oute-map)# **match ipv6 next-hop** *v6acl*
Ruijie(confi oute-map)# **set metric** *40*

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ipv6 access-list	ЖЖ “ ‡
match interfac	ɔ̄ Ю
match ipv6 ad	ɔ̄ “ Ю
match ipv6 rou urce	ɔ̄ “
match metric	ɔ̄
match route-ty	ɔ̄
match tag	ɔ̄

5.1.22 match ipv6 route-source

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ييي ʒ **match ipv6 address** Â ʒ **no** Â

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

no match ipv6 route-source

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access-list-name	‟ ¨
prefix-list *prefix-list-name*	ɔ̄ ‟ ¨

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ييي ‡ ˘ ʌ Ʌ **match** ʒ **set**
ʒ Â **match** ʒ˘ ‡ ɔ̄ ’ **set** ʒ˘ ‡ a Â

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```
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
```

ipv6 access-list	
match interface	
match ipv6 address	
match ipv6 route-source	
match metric	
match route-type	
match tag	
set metric	
set metric-type	
set tag	

5.1.23 match length

match length *min-length max-length*

no match length *min-length max-length*

min-length	
max-length	

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Ruijie(config)# **interface**

5.1.24 match metric

match metric Â **no** Â

match metric *metric*

no match metric

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metric	

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match **set** Â **match** ‡ **set** ‡ a Â

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```
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	⊠ ‘‘ ‡

match ip address

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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	ǀ
set tag	ǀ

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5.1.27 match tag

ɒ̃ ˘ يي ʒ **match tag** Â ʒ **no**
Â

match tag *tag* …*tag*

no match tag *tag* …*tag*

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tag	

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match tag ʒ ɨ ʎ Ɲ Â

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```
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
```

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

5.1.28 maximum-paths

maximum-paths *number*

no maximum-paths

number	

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ˈ ɨ Ю ˘ Ю˘ ǂ a
ˈ Â **show running config** ⁄ Ль ˈ Â

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```
Ruijie(config)# maximum-paths 10
Ruijie(config)# no maximum-paths
```

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5.1.29 route-map

ЬЖ ˘يي يي ˘ ʒ **route-map** Â ʒ
no يي ЬЖ Â

route-map *route-map-name* **permit** **deny** *sequence-number*

no route-map *route-map-name* **permit** **deny** *sequence-number*

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route-map-name	يي ЬЖ ¨ Â ǂ ʒ ¨ يي Â يي ⁄ Ль ЬЖ يي ˘ يي ⁄
permit	ˆ ⁄ ˜ ЬЖ ˘ ⁄ ЬЖ ɔ̄ ‡ Â ‡ ʒ ǂ ⁸ ˈ ˘ ʒ ⁸ Â يي Â ЬЖ ˘ a ЬЖ ɔ̄ ‡ Â ‡ ɣ يي Â ʒ

deny	ˆ ⁄ ˜ Ѭ ˘ ⁄ Ѭ ɔ̄ ‡ Â ‡ a ˘ يي a ǀ ˘ ɜ يي Â Ѭ ˘ a Ѭ ɔ̄ ‡ Â ‡ Ю يي Â ʒ Â
sequence-number	يي ⁄ Â æ ⁄ ˝I ˘ ⁄ 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
```

Redistribute	

5.1.30 set aggregator as

set aggregator as Â **no** Â Â

set aggregator as *as-num ip_addr*

no set aggregator as *as-num ip_addr*

as-number	
ip_addr	

Â

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```
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
```

match as-path	
match community	
match metric	
match origin	
set community	
set metric	
set metric-type	

5.1.31 set as-path prepend

set as-path prepend **no**

```
Ruijie(config-route-map)# match as-path 1
Ruijie(config-route-map)# set as-path prepend 100 101 102
```

match as-path	
match community	
match metric	
match origin	
set community	
set metric	
set metric-type	

5.1.32 set comm-list delete

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

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

community-list-number	
community-list-name	

ð Ô

```
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
```

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¸	
ip community-list	“
match as-path	Ð
match community	Ð
match metric	Ð
match origin	Ð
set as-path prepend	¦
set comm-list delete	Ð
set local-preference	¦ ¨I

5.1.33 set community

Ð ‡ ˘ يي ¸ **set community** Â ¸ **no**

set community *community-number community-number …* **additive none**

no set community *community-number community-number …* **additive none**

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community-number	Â ѝ ˅ ˅ ˅ ˅ ЉЮ ЊЖ ˊ Â ˅ a ˅ ˅ a ѐ Â ˅ a Â ˅ a Â
additive	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
```

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ʒ	
match as-path	ɒ̄
match community	ɒ̄
match metric	ɒ̄

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

5.1.34 set dampening

set dampening Â **no** Â

set dampening *half-life reuse suppress max-suppress-time*

no set dampening

half-life	Â a Â
reuse	Â
suppress	Â
max-suppress-time	Â

Â

Â

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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
```

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¦	
match as-path	Ð
match community	Ð
match metric	Ð
match origin	Ð
set as-path prepend	¦
set metric	¦
set local-preference	¦ ”I

5.1.35 set default interface

Ð ‡ ³ ˘

ي ¦ **set default interface** Â ¦ **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

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interface-type	
interface-number	

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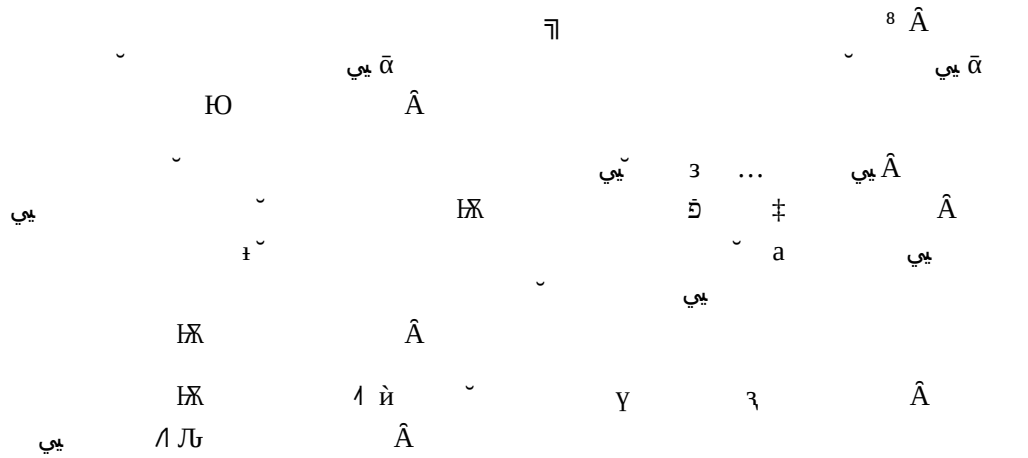
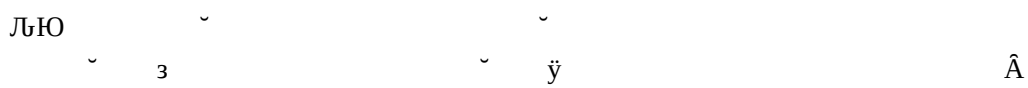
ي

set default interface



ð Ô



```
Ruijie(config)# interface serial 1/0
Ruijie(config-if)# ip policy route-map smallpak
Ruijie(config-if)# exit
Ruijie(config)# route-map smallpak permit 10
Ruijie(config-route-map)# match length 0 500
Ruijie(config-route-map)#set default interface GigabitEthernet
1/0
```

ð Ô

route-map	
match ip address	
match length	

5.1.36 set extcommunity

ð ‡ ˘ يي ʒ **set extcommunity** Â ʒ **no** Â ʒ Â

set extcommunity rt *extend-community-value* **soo** *extend-community-value*

no set extcommunity rt soo

ð Ô

rt

set as-path prepend	
set metric	
set metric-type	

5.1.37 set interface

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	

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```
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	ЊЖ يي
match ip address	ɔ̄ “
match length	ɔ̄
set default interface	˘
set ip default next-hop	Ю ˘
set ip next-hop	Ю
set ip precedence	”I

ð ʌ Ô

5.1.38 set ip default next-hop

ɔ̄ ‡ Ю ˘ يي 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 ip default next-hop ҳ ł Л Љ ˘ a Â

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```
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
```

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ʒ	
route-map	Ѭ يي
match ip address	ɔ̄ “
set default interface	˘
set default interface	˘
set interface	
set ip next-hop	Ю ˘
set ip precedence	”I

5.1.39 set ip dscp

ɔ̄ ‡ ˘ يي ʒ **set ip dscp** Â
ʒ **no** Â

set ip dscp *dscp_value*

ð Ô

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ʒ	
route-map	ⱶ يي
match ip address	ɔ̄ “
set default interface	˘
set default interface	˘

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set ʒ ч ʻ ˘
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set ip next-hop ʒ ɨ ʎ Љ ˘ a Â

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```
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
```

route-map	
match ip address	
set default interface	
set default interface	
set interface	
set ip default next-hop	
set ip precedence	

5.1.41 set ip next-hop verify-availability

set ip next-hop verify-availability **no**

set ip next-hop verify-availability *ip-address* **track** *track-obj-num*

no set ip next-hop verify-availability *ip-address* **track** *track-obj-num*

ip-address	
track-obj-num	

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```
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
```

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ʒ	
route-map	Ѫ يي
match ip address	Ð “
set default interface	˘
set default interface	˘
set interface	
set ip default next-hop	Ю ˘
set ip precedence	”I

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5.1.42 set ip precedence

set ip precedence **no**

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*

ð Ô

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set ip precedence

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```
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 Ô

match interface	
match ip address	
match ip next-hop	

match ip route-source	Ð “
match metric	Ð
match route-type	Ð
match tag	Ð
set metric-type	¦
set tag	¦

set ip tos

٦	
match interface	٥ Ю
match ip address	٥ “
match ip next-hop	٥ “ Ю
match ip route-source	٥ “
match metric	٥
match route-type	٥
match tag	٥
set metric-type	٦
set tag	٦
set ip precedence	”I

5.1.44 set level

٥ ‡ ٧ ˘ يي ٦ **set level** Â ٦ **no** Â

set level level 1 level 2 level 1-2 stub-area backbone

no set level

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```
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 ٦ 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	ϡ
set tag	ϡ

5.1.45 set local-preference

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[redacted]

```
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	

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ي ‡ ˘ ʌ Ʌ **match** ʒ **set**
ʒ Â **match** ʒ˘ ‡ ɔ̄ ʼ **set** ʒ˘ ‡ a Â

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```
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
```

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ʒ	
match interface	ɔ̄ Ю
match ip address	ɔ̄ “
match ip next-hop	ɔ̄ “ Ю
match ip route-source	ɔ̄ “
match metric	ɔ̄
match route-type	ɔ̄
match tag	ɔ̄
set metric-type	ǀ
set tag	ǀ

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5.1.47 set metric-type

ۏ ‡ ˘ يي ʒ **set metric-type** Â ʒ **no** Â

set metric-type *type* no

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	¦

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.48 set next-hop

Ð ‡ Ю ˘ ي **set next-hop** Â **no** Â Â

set next-hop *ip-address*

no set next-hop *ip-address*

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p-address	Ю

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يي ‡ ˘ ʌ Ʌ **match** ʒ **set**
ʒ Â **match** ʒˇ ‡ ɔ̄ ʼ **set** ʒˇ ‡ a Â

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```
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
```

ð ʒ Ô

ʒ	
match interface	ɔ̄ Ю
match ip address	ɔ̄ ‟
match ip next-hop	ɔ̄ ‟ Ю
match ip route-source	ɔ̄ ‟
match metric	ɔ̄
match route-type	ɔ̄
match tag	ɔ̄
set metric-type	ǀ
set tag	ǀ

5.1.49 set origin

ɔ̄ ‡ ˘ يي ʒ **set origin** Â ʒ **no** Â

set origin egp igp incomplete

no set origin

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egp	
igp	
incomplete	a

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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 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
```

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match as-path	
match metric	
match origin	
set as-path prepend	
set metric	

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```
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

‡ ˘ يي ʒ **set weight** Â
ʒ **no**

set weight *number*

no set weight

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number	Â ،

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```
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
```

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match origin	
set community	
set metric	
set metric-type	

5.2

5.2.1 show ip community-list

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

community-list-number	
community-list-name	a

```
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*	^ Ñ ~ Ñ
network	^ Ñ ~ Ñ
mask	^ Ñ ~ Ñ

count o

```
C    192.1.1.0/24 is directly connected, VLAN 1
```

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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

“ “ ˘ **show ipv6 prefix-list** ҳ Â

show ipv6 prefix-list *prefix-name*

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prefix-name	“ ¨

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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

يي ˘ ʒ **show route-map** Â

show route-map *route-map-name*

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route-map-name

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	Â ⅄ Ѣ a ˘
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	Â ⅄ Ѣ a ˘
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any

access-list *id* **deny** **permit** **tcp** **VID** *out* **inner** *in* *source source-wildcard*

operator ʻ ˆ ˘ ˘ ˘ a ˘ ˜

port *port* ʻ ˩˘ *range* ч ˩ ˘ ѐ ˩ ˩ Â

host *source-mac-address* ʻ ў Â

host *destination-mac-address* ʻ ў Â

VID *vid* ʻ ҕ

ethernet-type ʻ Ѣ

match-all ʻ ҕ *tcp flag* Æ

tcp-flag ʻ

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ʻʻ ˆ ˘ ˜˘ ˩ Ѣ ⁸ Â

MAC ʻʻ ˆ 700-799˜˘ ˩ Ѣ MAC Ѣ ˨ Ѣ ҕ Expert ʻʻ ˆ 2700-2899˜˘ Э ˘ ˩ Ѣ VLAN ID ҕ Â

TCP Flag ѢЮ ǂ

- **urg**
- **ack**
- **psh**
- **rst**
- **syn**
- **fin**

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- **critical**
- **flash**
- **flash-override**
- **immediate**
- **internet**
- **network**

- **priority**
- **routine**

- **max-reliability**
- **max-throughput**
- **min-delay**
- **min-monetary-cost**
- **normal**

- **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**

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- **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**

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- **biff**
- **bootpc**
- **bootps**
- **discard**
- **dnsix**
- **domain**
- **echo**
- **isakmp**
- **mobile-ip**
- **nameserver**
- **netbios-dgm**
- **netbios-ns**
- **netbios-ss**
- **ntp**
- **pim-auto-rp**
- **rip**
- **snmp**
- **snmptrap**
- **sunrpc**
- **syslog**
- **tacacs**
- **talk**

- **tftp**
- **time**
- **who**
- **xdmcp**

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- **aarp**
- **appletalk**
- **decnet-iv**
- **diagnostic**
- **etype-6000**
- **etype-8042**
- **lat**
- **lavc-sca**
- **mop-console**
- **mop-dump**
- **mumps**
- **netbios**
- **vines-echo**
- **xns-idp**

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```
Ruijie(config)# access-list 1 permit 192.168.1.64
0.0.0.63
```

“

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```
Ruijie(config)# access-list 102 permit tcp any any eq domain
Ruijie(config)# access-list 102 permit udp any any eq domain
Ruijie(config)# access-list 102 permit icmp any any echo
Ruijie(config)# access-list 102 permit icmp any any echo-reply
```

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```
Ruijie(config)# access-list 702 deny host 00d0f8000c0c any aarp
Ruijie(config)# interface gigabitethernet 1/1
Ruijie(config-if)# mac access-group 702 in
```

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deny permit

show access-lists

```
Ruijie(config)# ip access-list extended 123
Ruijie(config-ext-nacl)# show access-lists
ip access-list extended 123
Ruijie(config-ext-nacl)#
```

```
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)#
```

show access-lists	

1.1.3 expert access-list

no

ʒ Â **show access-lists** ʒ Â

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```
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 ʻ

```
Ruijie(config)# expert access-list extended 2704
Ruijie(config-exp-nacl)# show access-lists
expert access-list extended 2704
Ruijie(config-exp-nacl)#
```

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show access-lists	ж ʻʻ

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1.1.4 ip access-list resequence

ʒ Â ʒ **no**

ip access-list resequence *id name* **start-sn inc-sn**

no ip access-list resequence *id name*

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*Id*ʻ ʎ

*Name*ʻ ¨

*start-sn*ʻ ʎ

*inc-sn*ʻ ʎ

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*start-sn*ʻ

*inc-sn*ʻ

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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

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)#
```

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```
Ruijie(config)# ip access-list extended ip-ext-acl
Ruijie(config-ext-nacl)# deny tcp host 192.168.4.12 eq 100 any
Ruijie(config-ext-nacl)# show access-lists
ip access-list extended ip-ext-acl
10 deny tcp host 192.168.4.12 eq 100 any
Ruijie(config-ext-nacl)# exit
Ruijie(config)# interface gigabitethernet 1/1
Ruijie(config-if)# ip access-group ip-ext-acl in
Ruijie(config-if)#
```

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```
Ruijie(config)# mac access-list extended mac1
Ruijie(config-mac-nacl)# deny host 0013.0049.8272 any aarp
Ruijie(config-mac-nacl)# show access-lists
mac access-list extended mac1
10 deny host 0013.0049.8272 any aarp
Ruijie(config-mac-nacl)# exit
Ruijie(config)# interface gigabitethernet 1/1
Ruijie(config-if)# mac access-group mac1 in
```

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```
Ruijie(config)# ip access-list standard 34
Ruijie(config-ext-nacl)# deny host 192.168.4.12
Ruijie(config-ext-nacl)# show access-lists
ip access-list standard 34
10 deny host 192.168.4.12
Ruijie(config-ext-nacl)# exit
Ruijie(config)# interface gigabitethernet 1/1
Ruijie(config-if)# ip access-group 34 in
```

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show access-lists	“
ip access-group	
mac access-group	
ip access-list	HX
mac access-list	HX
expert access-list	ж HX

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*

“

sn **permit any host** *source-mac-address* **any host** *destination-mac-address ethernet-type* **cos** *out* **inner** *in*

“

sn **permit protocol** *ethernet-type* **cos** *out* **inner** *in* **VID** *out][***inner** *in] source source-wildcard* **host** *source* **any host** *source*-**mac**-*address* **any** *destination destination-wildcard* **host** *destination* **any host** *destination-mac-address* **any precedence** *precedence* **tos** *tos* **fragments time-range** *time-range-name*

Л

sn **permit** *ethernet-type*| **cos** *out* **inner** *in* **VID** *out* **inner** *in source source-wildcard* **host** *source* **any host** *source-mac-address* **any** *destination*

match-all *tcp-flag*

User Datagram Protocol

sn **permit udp VID** *out* **inner** *in source source –wildcard* **host** *source* **any host** *source-mac-address* **any** *operator* **port** *port destination destination-wildcard* **host** *destination* **any host** *destination-mac-address* **any** *operator* **port** *port* **precedence precedence tos** *tos* **fragments time-range** *time-range-name*

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ACL Ю

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```
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)#
```

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```
Ruijie(config)# ip access-list extended 102
Ruijie(config-ext-nacl)# permit tcp host 192.168.4.12 eq 100 any
Ruijie(config-ext-nacl)# show access-lists
ip access-list extended 102
10 permit tcp host 192.168.4.12 eq 100 any
Ruijie(config-ext-nacl)# exit
Ruijie(config)# interface gigabitethernet 1/1
```

```
Ruijie(config-if)# ip access-group 102 in
Ruijie(config-if)#
```

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```
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
```

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```
Ruijie(config)# ip access-list standard std-acl
Ruijie(config-std-nacl)# permit host 192.168.4.12
Ruijie(config-std-nacl)# show access-lists
ip access-list standard std-acl
10 permit host 192.168.4.12
Ruijie(config-std-nacl)# exit
Ruijie(config)# interface gigabitethernet 1/1
Ruijie(config-if)# ip access-group std-acl in
```

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show a

1.1.7 list-remark text

no

list-remark *text*

Text

ACL

```
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)#
```

show access-lists	
ip access-list	

1.1.8 no sn

no *sn*

sn

ACL IO

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IO

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```
Ruijie(config)# ip access-list extended 100
Ruijie(config-ext-nacl)# permit ip host 192.168.4.12
```

unreflect

reflect

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ip access-group Â

ð Ô

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```
Ruijie(config)# interface GigabitEthernet 0/0
Ruijie(config-if)#ip access-group
```

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ð Ô

Э˘ è ⁸ Â **show access-group** ʒ

ð Ô

Ю Э‘

```
Ruijie(config)# interface GigaEthernet 0/1
Ruijie(config-if)# expert access-group
accept_00d0f8xxxxxx_only in
```

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show access-group	Э Â

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1.2

б ЉЮ ʒ

- **show access-lists**
- **show ip access-group**
- **show mac access-group**
- **show expert access-group**
- **show access-group**

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interface

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```
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.
```

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ip access-group	“
mac access-group	“
expert access-group	“

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˚ RGOS10.0 Э

2 RPL

2.1

2.1.1 reverse-path

Ю **reverse-path** ʒ ˘ ὲ ⁄ ἅ
˘ ʒ ⁄ Â

reverse-path

no reverse-path

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1ʿ Э RPL ʒ .

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

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10.3(3b7)	10.3(4)

3

3.1

3.1.1 acpp

8 ^ ~~ Ю ҳ

ҳ ‡

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' Tc 3930 280.

3.1.2 anti-arp-spoof

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
```


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3.1.4 arp-car

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arp-car *packet_rate_per_group* **log**

no arp-car

packet_rate_per_group	^ Æ й ~

Ю ARP-CAR Â

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ʒ control-plane ˘ /ˈ

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1ˈ ЛЬЮ ˘ Э˘ ˚ ˆ ˜ ARP
й 10ppsˈ

```
Ruijie(config)# control-plane manage
Ruijie(config-cp)# arp-car 10
```

ʒ

ʒ	
Ruijie(config)# control-plane {protocol | manage | data}	control-plane ˘ /ˈ Ль

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/ˈ	
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3.1.5 attack thrshold

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drop_rate

drop_rate	ˆ æ й ˜

Ю˘ ARP-CAR Â

ʒ control-plane

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1ˈ ЛЬЮ ˘ й 500pps˘ /ˈ /ˈ
500pps˘ ‡ ˈ

```
Ruijie(config)#control-plane
Ruijie(config-cp)#attack threshold 500
```

ʒ ʒ

	Ruijie(config)# control-plane	control-plane

	-	-

3.1.6 clear attack-info history


```
Ruijie#clear attack-info history
The history attack record has been cleared!
```


	-	-

3.1.7 control-plane

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 ЛЬ

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3.1.9 glean-car

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glean-car *packet_rate_per_group* **log**

no glean-car

packet_rate_per_group	pps

Ю Glean-CAR Â

control-plane ЛЬ

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1ʻ ЛЬЮ ˘ ˚ ˆ ˜ ɔ̄ Glean
ѝ 10ppsʻ

```
Ruijie(config)# control-plane data
Ruijie(config-cp)# glean-car 10
```

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Ruijie(config)# **control-plane** {**protocol** | **manage** | **data**}	control-plane ˘ /l Ль

/l

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/l	
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3.1.10 management-interface

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management-interface *interface* **allow ftp http https ssh snmp telnet tftp log**

no management-interface *interface*

Interface	

Ю˘ MPP ╗

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control-plane ˘ /l

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1ʻ ЛЬЮ ˘ gi0/0 ѝ ˘ /l gi0/0 telnet˘ snmp
ʻ

```
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

-

3.1.11 port-filter

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port-filter log

no port-filter

-

Port-Filter

control-plane

1 Port-Filter

```
Ruijie(config)# control-plane manage
Ruijie(config-cp)# port-filter
```

Ruijie(config)# control-plane {protocol | manage | data}	control-plane

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3.1.12 scpp

3.1.13 security deny

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ʒ control-plane

1ʻ pc pingʻ
```
Ruijie(config-cp)#security deny lan-ping
```

2ʻ pc pingʻ
```
Ruijie(config-cp)#security deny wan-ping
```

3ʻ pc web ʻ
```
Ruijie(config-cp)#security deny lan-web
```

4ʻ pc web ʻ
```
Ruijie(config-cp)#security deny wan-web
```

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3.1.14 security web permit

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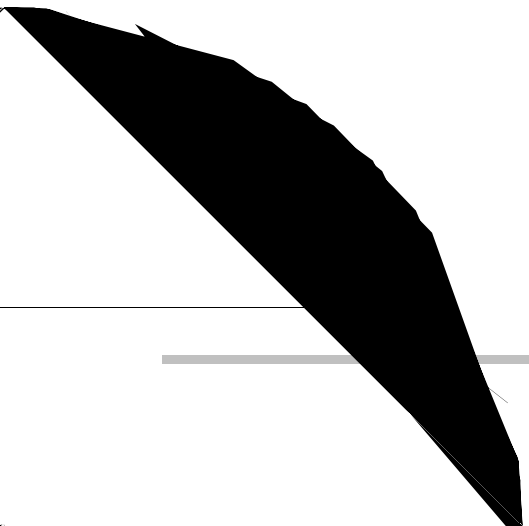
low-ip-address high-ip-address

-

System currently not in attack!

.61855.8 l28652.4625.8 l28652.462546 l137.52



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1 ЛЬЮ

There is no attack record!

3.2.4 show ef-rnfp

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show ef-rnfp acpp scpp glean-car arp-car port-filter mpp | all

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```
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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4

4.1

4.1.1 ip inspect name

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ip inspect name *inspection_name protocol*

no ip inspect name *inspection_name protocol*

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inspection_name ‡

protocol Л Љ Ю **ftp mms rtsp sip h323, tcp**

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```
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
```

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4.1.2 show ip inspect

I

show ip inspect *parameter*

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parameter: /ʌ **name** *inspection_name* ˈ ⁸ /ʌ ‡

interface ˈ Э ‡

all ˈ

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```
Ruijie# show ip inspect name abc
Inspection name abc
    ftp
    mms
```

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4.1.3 ip inspect

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ip inspect *inspection_name* **in out**

no ip inspect *inspection_name* **in out**

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inspection_name ‡ ¨

in out: Э ǟ

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```
Ruijie(config)# ipmacbind 192.168.52.66 52e1.5d33.aa21 log
```

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4.2.2 ipmacbind auto

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ipmacbind auto log

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log ǔ

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```
Ruijie(config)# ipmacbind auto
```

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4.2.3 ipmacbind default action

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ipmacbind default action {permit | deny}

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permit ɒ Э ‡

deny ɒ Э ‡

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

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clear ipmacbind

‡ Â

clear ipmacbind dynamic all

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dynamic ÿ ╟ ‡ˈ

all ‡

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```
Ruijie# clear ipmacbind dynamic
```

4.2.4 show ipmacbind

show ipmacbind table | hash | statistic

table

hash

statistic

```
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 -- >
```

4.3

4.3.1 ip ingress-filter

ip ingress-filter log

no ip ingress-filter

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log ǚ

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interface ethernet 1/0

Ruijie(conf-if) **ip ingress-filter log**

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4.3.2 show ip ingress-filter

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show ip ingress-filter

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Ruijie# **show ip ingress-filter**

Firewall Network-ingress-filter is enable, blocked 0 flows

Interface GigabitEthernet 1/0: log is on, blocked 0 flows

4.4 TCP SYN

4.4.1 ip tcp-intercept list

ip tcp-intercept list *extended_ACL_#* **in out log**

no ip tcp-intercept list *extended_ACL_#* **in out log**

extended_ACL_#

in out:

log:

show ip tcp-intercept

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```
Ruijie# show ip tcp-intercept
Intercepting new connections using access-list 100 at
GigabitEthernet 0/1 in
12 incomplete, 5 established connections (total 17)
```

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4.5 TCP

4.5.1

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‡ Э˘ **ip inspect** ʒ Â

‡ ˘ **show ip inspec** ʒ Â

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Ю ‡ ˋ

Ruijie(config)# **ip inspect name** tcp_inspec **tcp**

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ip inspect name ʒ ˩ Â ≠ **ip inspect** ʒ Э˘ **show ip inspect** ⋀ Ʊ 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**

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acl_no ‡ ˝ ⋀

rate

session_no

in|out ǟ

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session-limit access-group 1 rate 100 concurrent 10000 in log

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4.7

4.7.1 ip rate-control

8

4.8

4.8.1 ip session log-on

ip session log-on

no ip session log-on

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

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timeout value ˘ Æ ѝ

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```
Ruijie(config)#ip session timeout icmp-connected 10
```

4.8.3 ip session threshold

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

threshold_value

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Ruijie(config)#**ip session threshold icmp-started** 10

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4.8.4 ip session track-state-strictly

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ip session track-state-strictly

no ip session track-state-strictly

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Ruijie(config)#**ip session track-state-strictly**

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5 VPDN

5.1

5.1.1 vpdn authorize

no Â

vpdn authorize domain [split]

no vpdn authorize domain

domain	
split	

Ю a ╠ Â

vpdn enable

1 VPDN

```
Ruijie(config)# vpdn authorize domain split
Ruijie(config)#
```


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	10.3 5˜	३

5.1.2 vpdn domain-delimiter

३ ¨ ˘ è **no** ¨ Â

[redacted]

	LINE	¨ ¥ ˘ /ı @, /, %, #, - or ٢ \ ɨ \\ ≠ /ı Ɱ

-delimiterl0 Tc [6433096 04B419AC n domai.7427 Td[6DB09E18Tj4B3/TT9419]TD01/TT21 1 Tf( )TE58

Â

10.3 5	

5.1.3 vpdn enable

no Â

vpdn enable

no vpdn enable

-	-

VPDN Â

(Client-Initiated Tunnel).02 0 0 10.02 209.4 5919.5 t787336D5>1 Tf5.683 2.c -0.0021

vpdn ignore_source

no vpdn ignore_source

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Ю Â

VPDN a Â Â

1 VPDN

```
Ruijie(config)# vpdn ignore_source
Ruijie(config)#
```

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5.1.5 vpdn limit_rate

8 è **no**

Â

vpdn limit_rate *rate_num*

no vpdn limit_rate

rate_num	5-100 VPDN 5 100

Ю a VPDN

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ˇ VPDN ˘ ʎ ʒ ⁸ Â

1ʿ ʌ ѝ 50

```
Ruijie(config)# vpdn limit_rate 50
Ruijie(config)#
```

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5.1.6 vpdn session-limit

ʒ ╖ ˘ ѐ **no** Â

vpdn session-limit *sessions*

no vpdn session-limit

sessions	VPDN ╖

Ю ѝ ˘ ѐ 36 ʻʻ ѝ 300 Â

ʒ

ˇ VPDN ˘ ʎ ʒ ⁸ Â

1ʿ ʌ ѝ 100

```
Ruijie(config)# vpdn session-limit 100
Ruijie(config)#
```

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5.2 VPDN

5.2.1 clear vpdn tunnel

Â

clear vpdn tunnel l2tp pptp id *locid remote-host-name*

l2tp	
pptp	PPTP
remote-host-name	
locid	ID

Â

PPTP б L2TP)

ID ID show vpdn tunID Â

1

```
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#
```

-	

-	-

5.2.2 debug vpdn

vpdn

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
l2x-data	L2TP
l2x-errors	L2TP
l2x-events	L2TP
l2x-packets	L2TP 8
packet	VPDN

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
```

3 PPTP ѝ ˘ **debug vpdn error** Ю

```
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 (6) 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 ( ) **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
```

6 **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 ( ) **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
```

8 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
```

```
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 й        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

ч й л ˘ è **no** Â

accept-dialin

no accept-dialin

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३	vpdn-domain
	⋀ Ⅎ domain ¨ PPP DNS ˘ ╗ ɨ ¨ DNS ɨ˘ DNS Â

1' ruijie.net vrf 1

```
Ruijie(config-vpdn)# domain ruijie.net vrf 1
Ruijie(config-vpdn)#
```


10.3 5	

5.3.4 force-local-chap

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force-local-chap

no force-local-chap

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HO LNS a A Clinet Â

VPDN-Group

Client LAC LAC LNS Client L2TP Client Â LNS 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

ip tos *tos-value* **max-reliability max-throughput min-delay min- monetary-cost normal reflect**

no ip tos

tos-value	TOS 0~15
max-reliability	TOS 2
max-throughput	TOS 4
min-delay	TOS 8
min-monetary-cost	TOS 1
normal	TOS 0
reflect	IP TOS IP TOS

IP TOS

VPDN-Group

TOS

1 TOS **min-delay**

```
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	¨

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ʒ vpdn-domain

Л Ль domain ¨ ˘ ╗ ɨ ¨
ɨ ˘ ǂ Â

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pptp	ɔ̄

Ю ѝ Â

ʒ VPDN-Group

ў ╟ Â

1ʿ 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

ʒ ˘ ὲ **no** Â

source-ip *A.B.C.D*

no source-ip

A.B.C.D	VPDN-Group ( )

Ю ⁸ VPDN-Group ( ) Â

ʒ VPDN-Group

VPDN ╖ ( ) ˘ ѫ VPDN-Group ( ) б Â ʒ ʎ ¯ ў ╟ ⁸ Â

1' VPDN-Group й 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

ў ў ˘ è **no** Â

terminate-from hostname *remote-hostname-string*

no terminate-from

remote-hostname-string	ў

Ю ў Â

VPDN-Group

Л Љ ў ˘ ў ˘ ˘
ж VPDN-Group a ў Â ў
VPDN-Group ў ╠

1' ў й "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

ʒ Â

ʻI LNS HGW˘ … VPDN-Group Â ʌ
Љ ʒ VPDN-Group ÂVPDN-Group
ў ╟ ⁸ Â

1ʻ … ¨ й ”1” vpdn-group

```
Ruijie(config)# vpdn-group 1
Ruijie(config-vpdn)#
```

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5.3.15 vpn

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vpn vrf *vrf-name*

no vpn vrf

vrf	vrf
vrf-name	vrf¨

Ю˘ vrf˘ vrf

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й 1˘ ACK ɨ Â
ǟ ACK ˘ ‡
╗ 1˘ Â ACK ˘ RFC2637
˘ ж Â

1ʿ pptp й 32ʿ

```
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

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no Â

pptp flow-control static-rtt *timeout-interval*

no pptp flow-control static-rtt

packets	pptp ɨ ACK ˘ Љ й æ Â ʌ 100---5000 Â

й 1500 Â

ʒ vpdn-group

PPTP ж ʒ˘ Љ ”I **protocol pptp** **protocol any**
ʒ ɨ˘ ʒ Â
PPTP RFC2637 ˘ PPTP ɨ ACK
ˆ ATO˘ Acknowledgment Time-Outs˜ ˘ ж ˘ ὲ ╟
RTT˜ Round-Trip Time˜ Â ʒ static-rtt й 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)#
```

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5.4.3 pptp tunnel echo

ў ў ў ў **no** Â

pptp tunnel echo *echo-packet-interval*

no pptp tunnel echo

echo-packet-interval	pptp echo request ѝ Æ Â 0---1000 Â

Ruijie(config-l2tp-class)# **password** password-string	

-

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5.5.2 encapsulation (L2TP)

encapsulation l2tpv2

l2tpv2

Pseudowire-Class

pseudowire-class

l2tpv2

```
Ruijie(config-pw-class)# encapsulation l2tpv2
```

-

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5.5.3 hello

no

hello *interval*

no hello

interval	Hello

Ю Hello й 60 Â

L2TP-Class

Л Лъ Hello Лъ L2TP ў Л Â
Л Hello

ʌ Ʌ ў ⁼ Ʌ Â ў
⁼ ʌ L2TP ⁸ ў ╟ Â

1ʿ ў ⁼ ѝ "LAC"

```
Ruijie(config-l2tp-class)# hostname LAC
Ruijie(config-l2tp-class)#
```

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5.5.5 ip dfbit set

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ip dfbit set

no ip dfbit set

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ʒ

Pseudowire-Class

ʌ Ʌ ǚ ǂ Â ǂ ╖
╟ ⁼ ʌ Э˘ a L2TP ⁸
Â

1ʿ ǂ

```
Ruijie(config-pw-class)# ip dfbit set
Ruijie(config-pw-class)#
```

ʒ

ʒ	
-	

३

no ip ttl

ttl-value	TTL ˘ ʌ ѝ 1~255

Ю˘ IP TTL ѝ 255 Â

ʒ Pseudowire-Class

ʌ Љ IP TTL Â IP TTL ╟ ¯ ʌ Э˘ a L2TP ⁸ Â

1˙ IP TTL ѝ 253

```
Ruijie(config-pw-class)# ip ttl 253
Ruijie(config-pw-class)#
```

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-	-

5.5.8 l2tp-class

ʒ ¨ ˘ a ¨ … Љ ¨ ѝ ¨ ˘ ѐ **no** ¨ Â

l2tp-class *l2tp-class-name*

no l2tp-class *l2tp-class-name*

l2tp-class-name	L2TP-Class ¨

Ю˘ L2TP-Class Â

ʒ

	/l Љ	L2TP-Class	L2TP	8 Â

1ʿ … ¨ й ”l2x” L2TP-Class

```
Ruijie(config)# l2tp-class l2x
Ruijie(config-l2tp-class)#
```

ʒ	

	-	-

5.5.10 l2tp tunnel authentication

no

l2tp tunnel authentication

Ю a ⁸ ╗ Â

ʒ VPDN-Group Â

ʌ Ль ⁸ ╗ ╗ Â ╗ ╟ L2TP ⁸ ў ╟ Â

1ʿ ╟ ⁸ ╗ ╗

```
Ruijie(config-vpdn)# l2tp tunnel force_ipsec
Ruijie(config-vpdn)#
```

ʒ

ʒ	
-	-

ʌ

ʒ

ʌ	
-	-

5.5.13 l2tp tunnel hello

ʒ ˘ ὲ **no** Â

l2tp tunnel hello *interval*

no l2tp tunnel hello

interval	Hello ˘ Ль ѝ Æ

Ю Hello ѝ 60 Â

ʒ VPDN-Group

ʌ Ль Ль ˧ Hello Â Hello ʌ L2TP ⁸ ў ╟ Â

1ʿ Hello ѝ 30

```
Ruijie(config-vpdn)# l2tp tunnel hello 30
Ruijie(config-vpdn)#
```

Ю 8 й 5 8 й 1 ˘ й 8
Â

VPDN-Group

8 L2TP 8 ў ╠
Â

1 8 й 10

```
Ruijie(config-vpdn)# l2tp tunnel retransmit retries 10
Ruijie(config-vpdn)#
```

-	

-	-

5.5.17 l2tp tunnel timeout

8 ˘ è **no** Â

l2tp tunnel timeout no-session | setup *seconds*

no l2tp tunnel timeout no-session setup

no-session	
setup	8 ( )
seconds	˘ Æ й

Ю й 600 ˘ 8 (
) й 300 Â

VPDN-Group

/ 8

1' й 1200

```
Ruijie(config-vpdn)# l2tp tunnel timeout no-session 1200
Ruijie(config-vpdn)#
```

-	-

5.5.19 protocol (L2TP)

protocol l2tpv2 *l2tp-class-name*

no protocol

l2tpv2	L2TP
l2tp-class-name	L2TP-Class

Pseudowire-Class

1 l2tpv2 L2TP-Class l2x

```
Ruijie(config-pw-class)# protocol l2tpv2 l2x
Ruijie(config-pw-class)#
```

-	

-	-

5.5.20 pseudowire

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 hostname
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	
-	

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

L2TP-Class

8 1 L2TP 8 ў ╠ Â

1 SCCRQ й 3

```
Ruijie(config-l2tp-class)# retransmit initial retries 3
Ruijie(config-l2tp-class)#
```

-	

-	-

L2TP

1 240

```
Ruijie(config-l2tp-class)# timeout setup 240
Ruijie(config-l2tp-class)#
```

-	

-	-

5.5.25 vpdn

vpdn vrf *vrf-name*

no vpdn vrf

ꓘ	ꓘ	
	ip vrf	

ꓘ	ꓘ	
	10.3ˆ 5˜	ꓘ

6 Tunnel

6.1

6.1.1 keepalive (tunnel interface)

ŭ ˇ Ю ʒʿ

keepalive *seconds retries*

no keepalive

seconds	ˆ ⁄ ˜ ˇ Æ Â 1˙ 32767 Â 10 Â
retries	Â ˇ ˇ ‡

6.1.2 tunnel checksum

Ю **tunnel checksum** Â

tunnel checksum

no tunnel checksum

-	-

a .

Â

GRE Generic Route Encapsulation checksum Â tunnel checksum Â

1 tunnel 0 Э 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 Â

1 tunnel 0 1234

```
Ruijie(config)# interface tunnel 0
Ruijie(config-if)# tunnel key 1234
```


ʒ

ʒ ѝ init ʼ

˜ ˘ ˊ ѝ learning˘ learning

˜ 5 MTU ˊ ˘ ˊ ѝ keep˘ keep

1ˋ tunnel 0 Э PMTUD ╖

```
Ruijie(config)# interface tunnel 0
Ruijie(config-if)# tunnel path-mtu-discovery
```

ʒ

ʒ	
show interfaces tunnel	tunnel

ˊ

ʒ

ˊ	
10.4	ˋ ʒ 10.4ˆ 2˜ Ʊ ˧ ɨ Â

6.1.7 tunnel source

Ю **tunnel source** ʒ ˘ ʒ Â

tunnel source *ip-address interface-type interface-number*

no tunnel source

ip-address	tunnel IP ˘ Э ѐ IP Â
interface-type	˘ ˋ Async ȁ ˊ Dialer ȁ Ʊ Ethernet ȁ Ʊ FastEthernet ȁ Loopback ȁ Null ȁ Ʊ ˧ ѐ Tunnel Â
interface-number	ˊ

Â

ʒ Â

tunnel

1 tunnel 0 **tunnel source** 1/0

```
Ruijie(config)# interface tunnel 0
Ruijie(config-if)# tunnel source serial 1/0
```

show interfaces tunnel	tunnel

-	-

6.1.8 tunnel tos

IP

tunnel tos *num*

no tunnel tos

num	IPv4 ToS 0 255

IPv4 IPv4 tos
IPv4 IPv4 tos

GRE tunnel tos
10.4 2

1 interface tunnel 1 GRE ToS 20 00010100

```
Ruijie(config)# interface tunnel 1
Ruijie(config-if)# tunnel tos 20
```

show interfaces tunnel	tunnel

6.1.10 tunnel vrf

Â Ю ३'

tunnel vrf

-	-

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Â

˘ /ˆ GRE ˘ a ÿ show running ˆ Â ˜ ˆ Â

1ˆ GRE ˘ Ɲ ˅ Â

```
Ruijie# show tunnel gre
Tunnel1:
Mode:GRE/IP, Destination 192.168.2.2, Source vlan 100
```

show interfaces tunnel	tunnel Â

10.4	RGOS 10.4

7 IPSec

7.1

7.1.1 authentication (IKE policy)

ʒ **authentication** Â ʒ **no**

Â

authentication pre-share rsa-sig|digital-email

no authentication

	lifetime	IKE Â

	-	-

7.1.2 clear crypto isakmp

clear crypto isakmp Â

clear crypto isakmp *connection-id*

	connection-id	Â

connection-id IKE

EXEC Â

show crypto isakmp sa IKE Â **clear crypto isakmp** ID IKE Â

Â

	-	-

7.1.3 clear crypto sa

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** ȁ **map** ȁ **spi** IPSec ‟ ˘ ‡ IPSec Â

ʒ EXEC Â

1. Э ʒ IPSec ˘ **peer** ȁ **map** ȁ **spi** ˘ ‡ IPSec Â
2. IKE ˘ ж ˘ IPSec ˘ IPSec Â ˘ ж з ¨ Â
3. ˘ /ǀ ɨ ˘ a Â ѝ ˘ /ǀ ʒ ˘ Â
4. ˘ ˘ ѝ a ѐ IPSec ˘ **peer** ȁ **map** ȁ **spi** Â
5. ˘ /ǀ ˘ ѐ ж ˘ /ǀ Љ Â

1ʻ Ю ʻ

Ruijie# **clear crypto sa**

ʒ

ʒ	
clear crypto isakmp	IKE

/ǀ Â

ʒ

/ǀ	
-	-

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˘	IP
	DF Bit	˘	/l	ˇ

1ˆ Ю ȁ IPSec ˆ

```
Ruijie(config)# crypto ipsec multcast disable
```

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-	-

7.1.7 crypto ipsec optional

Ю ʒ Â

crypto ipsec optional

no crypto ipsec optional

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ʒ Â

˘ ╗ ʌ Ƶ cpu Âl2tp over ipsec ˘ l2tp ʌ Ƶ ⁸ ipsec ╗ ˘ ≠ ʌ Ƶ ipsec ╗ Â ʌ Ƶ

1ˆ ʌ

crypto ipsec optional

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-	

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Ruijie(config)# **crypto ipsec profile** profile-name
Ruijie(config-crypto-map)# **set transform-set myset**
IKE

tunnel protection ipsec profile (interface IPSec)	Tunnel
Set transform-set	
show crypto map	

-

7.1.9 crypto ipsec security-association lifetime

crypto ipsec security-association lifetime **no**

ˆ ˜ ʒ

a Â ˘ ʌ Ʌ **clear crypto sa** ʒ

ʈ Â

3.

a

Â

dos Â

```
Router(config)# crypto ipsec security-association replay disable
```

1. ȁ Љ ⅃ ⅄ IPSec ѐ Â IPSec ˘ ˇ ⅄ Â
2. ⅄ ˘ ɨ ╗ ⅄ Â ╗ ЊЖ ⅄ IPSec ˘ Љ ╗ “ Â ˘ ⅃ ⅃ Э ˇ ⅄ Â ⅄ ˘ ˘ ѝ ⅃ IPSec ǂ ⅄ Э Â
3. ˘ a ˘ ч ˇ ⅄ Â

1ʻ Ю ЊЖ ⅄ ˘ ѝ ESP-DES-MD5ˆ ╗ ╘~ ʻ

Ruijie(config)# **crypto ipsec transform-set myset esp-des esp-md5-hmac**

⅋	
show crypto ipsec transform-set	⅄

⅄ Â

⅋	
-	-

7.1.12 crypto isakmp enable

˘ ”I Â ˘ ⅋

crypto isakmp enable Â ⅋ **no** Â

crypto isakmp enable

no crypto isakmp enable

-	-

1 Ю IKE
Ruijie(config)# **crypto isakmp enable**

-	

-	-

7.1.13 crypto isakmp key

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	
keystring	
peer-hostname	

crypto isakmp enable	IKE Â
encryption {**des | 3des | aes-128 | aes-192 | aes-256 | sm1**}	╗
hash {**sha | md5**}	HASH

crypto isakmp keepalive

	-

-	-

7.1.16 crypto isakmp nat disable

crypto isakmp nat disable

no crypto isakmp nat disable

-	-

nat-traversal

nat-traversal

1 nat-traversal

```
Ruijie(config)# crypto isakmp nat disable
```

-	

-	-

7.1.17 crypto isakmp nat keepalive

crypto isakmp nat keepalive *secs*

no crypto isakmp nat keepalive

secs	

crypto isakmp nat keepalive keepalive a

1 keepalive 1

```
crypto isakmp nat keepalive 60
```

a й Ơ a ɔ̄ ˘ Ÿ Â

1ʿ Ю next-payload ʿ

Ruijie(config)# **crypto isakmp next-payload disable**

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-	-

7.1.19 crypto isakmp peer

Ю Ʌ Ʊ **crypto isakmp peer**

crypto isakmp peer {bind|random}

no crypto isakmp policy

bind	3G ˘ 3Ġ peer ʎ˘ ipsec ʎ ˘ ˘ ʎ peer
random	peer

Ю ˘ ÿ peer Â

ʒ Â

3G ˘ 3G ʎ ʎ ˘ ipsec map peer ˘ Ʌ Ʊ peer ╗ ˘ ╗ ʎ Â ŭ ‡ peer˘ Â

Ruijie(config)# **crypto isakmp peer random**

ʒ

ʒ	
set peer	╗

٣	٨	
	-	-

```
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
```

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

-	-

7.1.21 crypto isakmp rg-sm1

Â

crypto isakmp rg-sm1

no crypto isakmp rg-sm1

-	-

Â

SM1 Â

1 IKE
```
Ruijie(config)# crypto isakmp rg-sm1
```

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-	

-	
-	-

7.1.22 crypto isakmp vendorid disable

Â

crypto isakmp vendorid disable

no crypto isakmp vendorid disable

-	-

IKE Â

Â

IKE a VID a

-	-

7.1.23 crypto map (global IPSec)

… **crypto map** **no**

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	
ipsec-manual	IPSec
ipsec-isakmp	IKE IPSec
dynamic-map-name	

a

IPSec

1.
2. IPSec IPSec
3. IPSec IPSec
4. IPSec
5.
6. IKE

IP IP IKE

, ╗ ˘ ѫ

Â IKE ˘ /ı ╗ ˘

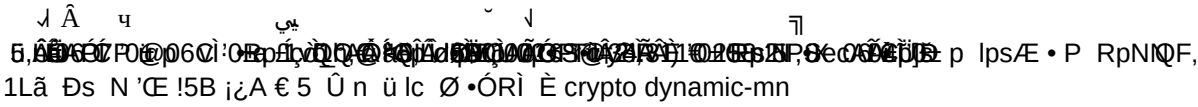
╗ ˘ ˘ Â

╗ ˘ ѝ ч IPSec

IPSec ˘ ч ╗

↓ Â ч يي ˘ ↓ ╗

5,[illegible] p lpsÆ • P RpNNQF,



1Lã Ðs N ’Œ !5B ¡¿A € 5 Û n ü lc Ø •ÓRÌ È crypto dynamic-mn

Set transform-set	
show crypto map	

-	-

7.1.24 crypto map (interface IPSec)

crypto map

no

crypto map *map-name*

no crypto map *map-name*

map-name	

IPSec

map-name seq-num Seq-num

```
Ruijie(config)# interface serial 0
Ruijie(config-if)# crypto map mymap
```

crypto map(global IPSec)	
show crypto map	

-	-

7.1.25 crypto map local-address

crypto map local-address **no**

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–3qAfˆV'Igp•i –w c7 i%3qA

ʒ	}	ẃ	M	ϒ	Ƶ

7.1.30 debug crypto isakmp

Y˚ **debug** Â

debug crypto isakmp

no debug crypto isakmp

-	

Â

Â

Â

-	-

7.1.31 encryption (IKE policy)

˘ **encryption** Â Â

encryption des 3des|aes-128|aes-192|aes-256|sm1

no encryption

des

aes-256	й 256 AES й ╗ Â
sm1	й 128 SM1 й ╗ Â

56 DES-CBC ╗ Â

IKE Â

ъ ╗ IKE ╗ ˇ a˚ IPSec ╗ Â

1' Ю IKE ╗ й DES'

```
Ruijie(config)# crypto isakmp policy 10
Ruijie(isakmp-policy)# encryption des
```

ъ	
crypto isakmp enable	IKE Â
hash {**sha** | **md5**}	HASH
authentication {**pre-share** | **rsa-sig**}	
group {**1** | **2**}	Diffie-Hellman
lifetime	IKE Â

/

/	
-	-

7.1.32 group (IKE policy)

ˇ ъ **group** Â ъ **no** й Â

group 1|2

no group

1	768 Diffie-Hellman Â
2	1024 Diffie-Hellman Â

768 Diffie-Hellman group 1

IKE

IKE Diffie-Hellman

1 IKE Diffie-Hellman 1024

```
Ruijie(config)# crypto isakmp policy 10
Ruijie(isakmp-policy)# group 2
```

crypto isakmp enable	IKE
encryption {**des | 3des | aes-128 | aes-192 | aes-256 | sm1**}	
hash {**sha | md5**}	HASH
authentication {**pre-share | rsa-sig**}	
lifetime	IKE

ʒ IKE Â

ʒ IKE HASH Â

1ˆ Ю HASH ѝ md5ˆ

```
Ruijie(config)# crypto  isakmp policy 10
Ruijie(isakmp-policy)# hash md5
```

ʒ

ʒ	
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

ʎ

ʒ

ʎ	
-	-

7.1.34 lifetime (IKE policy)

˘ ʒ **lifetime** Â ʒ **no** ѝ Â

lifetime *seconds*

no lifetime

seconds	IKE ˆ ˜ Â 60 86400 Â

86400 ˆ 1 ˜

ʒ IKE Â

IKE Â IKE Y
Э Â Э IKE
Э IKE Â
SA SA Â
IPSec IKE Э IPSec
IKE Â
Â

1 Ю IKE 1000
```
Ruijie(config)# crypto isakmp policy 10
Ruijie(isakmp-policy)# lifetime 1000
```

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

-	-

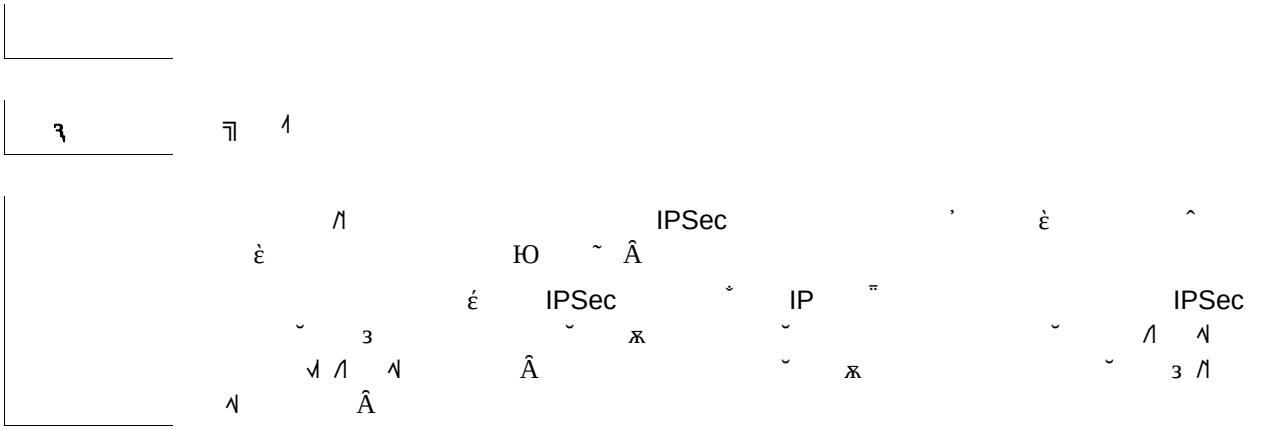
7.1.35 match address (IPSec)

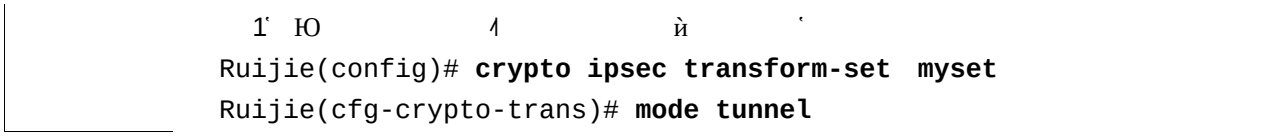
match address Â **no**
Â

match address *access-list-number*

no match address

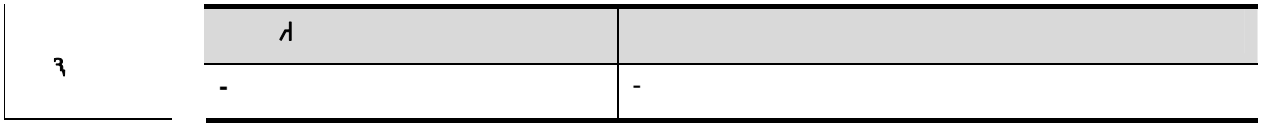
access-list-number	100-199 2000-2699 2900-3899 IP Â





```
Ruijie(config)# crypto ipsec transform-set  myset
Ruijie(cfg-crypto-trans)# mode tunnel
```

crypto ipsec transform-set	

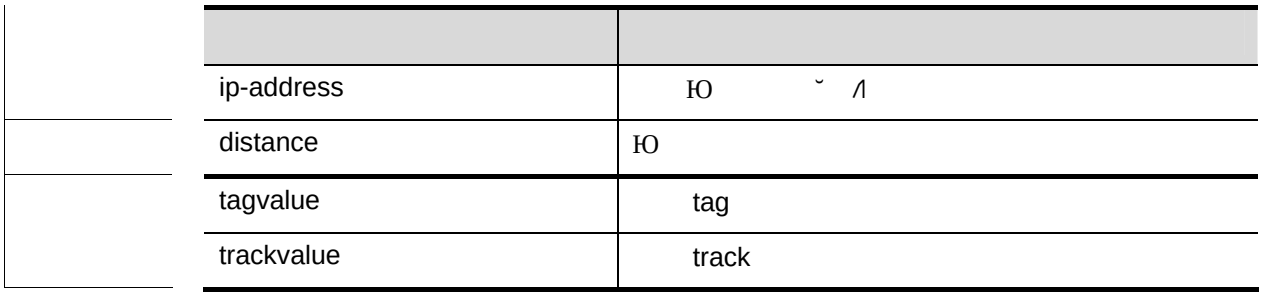


-	-

7.1.38 reverse-route

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	
distance	
tagvalue	tag
trackvalue	track

३ ╗

╗ Л Љ show ip route
debug crypto ipsec ३ Л Љ ╗

1՝ Ю ╗ Л й myseť

```
Ruijie(config)# crypto  map mymap 5 ipsec-isakmp
Ruijie(config-crypto-map)# reverse-route
```

1 ЛЮ

Ruijie(config)# **self-identity fqdn**

self-identity fqdn self-identity fqdn

match address	и ╗ “ “ Â
Set peer	
Set transform-set	⁄
show crypto map	╗

crypto map(interface IPSec)	
match address	
Set peer	
Set transform-set	
show crypto map	

-	-

7.1.42 set local (IPSec)

set local *ip-address*

no set local *ip-address*

ip-address	IP

```
Ruijie(config)# crypto map mymap 5 ipsec-isakmp
Ruijie(config-crypto-map)# set local 2.2.2.2
```

crypto map(global IPSec)	
show crypto map	
crypto map(interface IPSec)	

-	-

7.1.43 set peer (IPSec)

set peer *hostname ip-address trustpoint1 trustpoint2*

no set peer *hostname ip-address*

ip-address	IP
hostname	
trustpoint1	
trustpoint2	

a

```
Ruijie(config)# crypto map mymap 5 ipsec-isakmp
Ruijie(config-crypto-map)# set peer 2.2.2.2
```

crypto map(global IPSec)	
show crypto map	
crypto map(interface IPSec)	

-	-

7.1.44 set pfs (IPSec)

set pfs group1 | group2

no set pfs

group1	768
group2	1024

a Diffie-Hellman

ipsec Diffie-Hellman

1 mymap 1024 Diffie-Hellman

```
Ruijie(config)# crypto map mymap 5 ipsec-isakmp
Ruijie(config-crypto-map)# set pfs group2
```

crypto map(global IPSec)	
show crypto map	
crypto map(interface IPSec)	

crypto map(interface IPSec)	Э ╗
crypto ipsec security-association lifetime	

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7.1.46 set session-key

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ˆ ˜ Â ʒ ˆ ˜ 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	
show crypto map	
crypto map(interface IPSec)	

-	-

7.1.47 set transform-set

set transform-set

no

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

-	-

7.1.49 tunnel protection ipsec profile (interface IPSec for IPSec-Profile)

tunnel protection ipsec profile **no** **tunnel protection ipsec profile**

tunnel protection ipsec profile *profile-name*

no tunnel protection ipsec profile *profile-name*

profile-name	Profile

Tunnel

Tunnel IPSec

Profile map GRE IPIP IPV6 Tunnel Tunnel Profile Tunnel map

1 Tunnel 1

```
Ruijie(config)# interface tunnel 1
Ruijie(config-if-Tunnel 1) # tunnel protection ipsec profile profile-name
```

crypto map(global IPSec)	
show crypto map	

sa Â

show crypto ipsec sa

-	-

EXEC Â

1 Ю

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

//

Inbound esp sas: // ESP

spi:0x79b8e4bb (2042160315) //spi 2042160315

transform: esp-3des // 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 8

max reply windows size: 0

Replay detection support:Y //

Outbound esp sas: // ESP

spi:0x293b8b55 (691768149) //spi 691768149

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7.2.4 show crypto isakmp policy

show 3.5 104.34g/Ty0 1 Tf( )TjET0.754 g65T

lifetime: 86400seconds

-	-

-	-

7.2.5 show crypto isakmp sa

show crypto isakmp sa

show crypto isakmp sa

-	-

EXEC

```
Ruijie#!!show crypto  isakmp sa!
 destination   source    state     conn-id   lifetime(second)
 1.1.1.1       1.1.1.2   IKE_IDLE  59        32254
```

-	-

-	-

7.2.6 show crypto map (IPSec)

show crypto map Â

show crypto map *map-name*

map-name	Â

Â

EXEC Â

```
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
```

-	-

-	-

8

8.1

8.1.1 certificate

╗ ˘ ˆ ˜ Ю **certificate** ҙ Â è **no** Â

certificate ca *certificate-serial-number*

no certificate ca *certificate-serial-number*

ca	CA
certificate-serial-number	╗ ‟ ⅄

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ҙ ˆ config-cert-chain˜ Â

⅄ Ѭ ҙ Ѭ Â ˘ Â ҙ Â

1ʽ Ю Â show ҙ ‟ ⅄ʽ

```
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
```

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```
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

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crypto pki authenticate ʒ Â

crypto pki authenticate *ca_name*

ca_name	ca_name ѝ CA ʼΩ ¨

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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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8.1.3 crypto pki certificate chain

ˆ ˜˜ Ю **crypto pki certificate chain** ʒ Â Ю ˜ Љ ѐ **NO** ʎ ˧˩ ѐ Â

crypto pki certificate chain *ca_name*

no crypto pki certificate chain *ca_name*

	ca_name	ca_name ѝ CA ʼΩ ¨

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crypto pki certificate peer *ip_address*

ip_address	ip

Â

pem

import peer certificate success.

-----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	Ю CRL URL

-	-

8.1.6 crypto pki crl url

Ю Ю **crypto pki crl url**

http://www.myca.cn/certsrv/mycertcrl.crl url_string a

http://www.myca.cn/CertEnroll/CA%20Server.crl

url_string IP

ʒ

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

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crypto pki trustpoint	trustpoint

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8.1.8 crypto pki import crl

ÿ ˘ Ю **crypto pki import** *ca_name* **crl** *tftp_url* ʒ Â ʒ **No** Â

crypto pki import *ca_name* **crl** *tftp_url*

ca_name	ca_name ѝ ˆ trustpoint˜ CA ʼΩ ¨
terminal	ÿ ⁸ ʎ
tftp_url	CRL ˇ TFTP URL Â

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ʒ a ʎ Â ʎ ʒ ÿ PEM ˇ RSA Â ˇ ʎ ѐ PKI ˘ PC Â

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[illegible] 10.4(3b15)	10.4(3b15)

8.1.9 crypto pki import pem

[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 Љ
//                ˘         ˘    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

Ю **crypto pki trustpoint** **NO**

crypto pki trustpoint *ca_name*

no crypto pki trustpoint *ca_name*

ca_name	ca_name trustpoint CA

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crypto pki trustpoint	trustpoint

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8.1.13 enrollment retry period

ʎ ˘ Ю **enrollment retry period** ʒ Â Љ ѐ **NO** Â

enrollment retry period *numbe*

no enrollment retry period

number	Number ѝ ˘ æ ѝ† Â † Â

† Â

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crypto pki trustpoint	trustpoint

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8.1.14 enrollment url

ꓱ ˘ Ю **enrollment url** ꝛ Â Ѫ ѐ **NO** Â

enrollment url *url_string*

no enrollment url

	url_string	Ѫ http:// URL ˘ a 255

Â

ꝛ trustpoint Â

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percentage	percentage ѝ 1 100 ˘ ǀ Â

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crypto pki trustpoint	trustpoint

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8.1.16 enrollment renewable

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enrollment renewable ʒ Â Ɲ ὲ **NO** Â

enrollment renewable

no enrollment renewable

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ʒ trustpoint Â

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crypto pki trustpoint	trustpoint

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8.1.18 recursion-check

Ю **recursion-check** Â

No Â

recursion-check none

no recursion-check none

none	CA

ш CA

trustpoint Â

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CA Л Љ Н Ь CA a a Â
ł Л CA Л Â

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8.1.19 revocation-check

Ю **revocation-check** Â

No Â

revocation-check none

no revocation-check

none	˘ ˘ ¯ a ŭ̆

ш ˘ ¯ CRL

ʒ trustpoint Â

RGOS ˘ ŭ̆ ш ‘
ш ˘ ŭ̆ ˘ a CRL˘ ‡ a ⅄
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8.1.20 time-check

˘ Ю **time-check** ʒ Â ʒ **No**
Â

time-check none

no time-check none

none	

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8.1.21 interface

ʎ ȁ ˘ Ю **interface** ʒ Â ʒ **No** Â

interface *interface_name*

no interface

none	

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10.4(3b15)	10.4(3b15) ˧˩ Ƚ ɨ ʒ

8.2

8.2.1 show crypto pki certificates

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#

-	-

8.2.2 show crypto pki crls

show crypto pki crls *CA_name* **detail**

Next Update: Jun 29 18:30:27 2005 GMT //Ю UTC CRL

CRL extensions: //ЛЬЮ й 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: //ЛЬЮ й "

Serial Number: 162A7A1D000000000002 // " л

Revocation Date: Jun 22 06:19:53 2005 GMT //

CRL entry extensions: //CRL

X509v3 CRL Reason Code: //CRL Ъ

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)#
```

-	-

Â

-	-

9 AAA

9.1

9.1.1 aaa authentication dot1x

˘ ३ **aaa authentication dot1x**
“ Â ३ “ Â

aaa authentication dot1x default *list-name method1 method2*

no aaa authentication dot1x default *list-name*

default	˘ ‡ ł ЊЖ “ ѝ 802.1X Â
list-name	ЊЖ 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 ЊЖ ¨ ѝ rds_d1x AAA 802.1X “ Â “ ″I RADIUS Ł ˘ RADIUS Ł ˘ ‡ Â

```
Ruijie(config)# aaa authentication dot1x rds_d1x group radius local
```

aaa new-model	AAA
dot1x authentication	802.1X
username	

-	-

9.1.2 aaa authentication enable

aaa authentication enable default *method1 method2*

no aaa authentication enable default

default	Enable Enable
method	local none group 4
local	
none	a
group	RADIUS TACACS+

AAA Enable

Â

```
Ruijie(config)# aaa authentication enable default group radius local
```

Login ł˘ è Login Э˘ ŭ ‡ a
Â

Ю НЖ ¨ ѝ list-1 AAA Login “ Â “ ˝I
RADIUS Ь ˘ RADIUS Ь ˘
‡ Â

```
Ruijie(config)# aaa authentication login list-1 group radius local
```

҂	
aaa new-model	AAA Ь
username	НЖ
login authentication	Э Login

ѧ	
-	-

9.1.4 aaa authentication ppp

˘ ҂ **aaa authentication ppp**
“ Â ҂ “ Â

aaa authentication ppp default *list-name method1 method2*

no aaa authentication ppp default *list-name*

default	˘ ‡ ł НЖ “ ѝ PPP Â
list-name	НЖ PPP “ ˘ Л Љ Â
method	ľ local à none à group Ł “ ˘ “ 4
local	¨
none	a
group	Ь ˘ RADIUS TACACS+ Ь

ꓘ

1ʿ ⅄

```
Ruijie(config)# aaa local user allow public account
```

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-	

⅄ -

ꓘ

⅄	
10.3(4t76)	ꓘ

9.1.7 login authentication

Э ˆ ˜ ╗ ˘ Ю **login authentication** ꓘ ‟ Â ꓘ ‟ Э Â

login authentication default *list-name*

no login authentication

default	˘ Login ‟ Â
list-name	⅄ Login ‟ Â

ꓘ Â

Login ‟ ˘ ╟ Э Â Э Login ‟ ˘ ⅄ ꓘ ‟ Â يي ⅄ ‟ ˘ ‡ ˘ Э Login a ˘ ⅄ Login ‟ Â

Ю ⅄ ⁼ ѝ list-1 AAA Login ‟ Â ‟ Â ɨ 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
```

ꓘ

ꓘ	

aaa new-model	AAA
username	
login authentication	Login

-	-

9.2

9.2.1 aaa authorization commands

aaa authorization commands Â

aaa authorization commands *level* **default** *list-name method1 method2*

no aaa authorization commands *level* **default** *list-name*

level	0~15
default	
list-name	
method	none group
none	a
group	TACACS+

AAA Â

Â

RGOS AAA Â

ʒ ʒ ˘ ʒ ˆ ˘ ʒ
14 ЛЬЭ Л ˘ ‡ ʒ 14 ˜ Â
ʒ ɨ˘ ὲ ʒ Э˘ ὕ ‡ a
Â

Ю TACACS+ ╘ 15 ʒ ˛
Ruijie(config)# **aaa authorization commands** *15* **default group tacacs+**

ʒ

ʒ	
aaa new-model	AAA ╘
authorization commands	Э ʒ

Л

ʒ

Л	
-	-

9.2.2 aaa authorization config-commands

ˆ ↓ ὲ ˜ Ю ʒ ˘
ʒ **aaa authorization config-commands** Â ʒ Ю
ʒ ╖ Â

aaa authorization config-commands

no aaa authorization config-commands

-	-

a Ю ʒ Â

ʒ Â

Л ˆ ˜ Ю ʒ ˘ ЛЬ ʒ no
╖ ˘ ‡ ↓ ὲ Ю ʒ a ʒ ЛЬ Â

aaa new-model	AAA
aaa authorization commands	AAA

-	-

9.2.4 aaa authorization exec

aaa authorization exec **default** *list-name method1 method2*

no aaa authorization exec **default** *list-name*

default	Exec
list-name	Exec
method	local none group 4
local	
none	
group	RADIUS TACACS+

AAA Exec

RGOS NAS

-	-

9.2.5 aaa authorization network

aaa authorization network Â

aaa authorization network default *list-name method1 method2*

no aaa authorization network default *list-name*

default	Network Â
method	none

aaa authentication	启用 AAA
username	创建

aaa authorization commands	AAA

-	-

9.2.7 authorization exec

authorization exec

authorization exec default *list-name*

no authorization exec

default	Exec
list-name	Exec

AAA Exec

exec-1 Exec RADIUS none VTY 0 – 4

```
Ruijie(config)# aaa authorization exec exec-1 group radius none
Ruijie(config)# line vty 0 4
Ruijie(config-line)# authorization exec exec-1
```

aaa new-model	AAA
aaa authorization commands	AAA Exec

-	-

9.3

9.3.1 aaa accounting commands

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**

ʒ	
aaa new-model	AAA ╘
aaa authentication	ЮЖ 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	

aaa new-model	AAA ╘
aaa accounting network	ЮЖ “

-	-

9.3.5 aaa accounting update periodic

╗ ˘ ३ **aaa accounting update periodic** ३˘ ३ Â ३ Â

aaa accounting update periodic *interval*

no aaa accounting update periodic

interval	˘ Лѣ¶ ѝ Æ˘ ѝ 1¶ Â

5 minutes Â

Â

AAA ╘˘ ‡ a Â AAA ╘˘ ‡ ३ Â

Ю 1¶ Â

```
Ruijie(config)# aaa new-model
Ruijie(config)# aaa accounting update
Ruijie(config)# aaa accounting update periodic 1
```

aaa new-model	AAA ╘
aaa accounting network	ЮЖ “

-	-

9.3.6 accounting commands

accounting commands *level* **default** *list-name*

no accounting commands *level*

level	0~15
default	
list-name	

TACACS+ none VTY 0 – 4

```
Ruijie(config)# aaa accounting commands 15 cmd group tacacs+ none
Ruijie(config)# line vty 0 4
Ruijie(config-line)# accounting commands 15 cmd
```

aaa new-model	AAA
aaa accounting commands	AAA

	-	-

9.3.7 accounting exec

9.4 AAA

9.4.1 aaa domain

˘ Â ३ ∧ ३ Â

aaa domain default *domain-name*

no aaa domain default *domain-name*

default	˘
domain-name	¨

Â

३ Â

¨ AAA Ł Âdefault ù ˘ ≠ ˘
“ Âdomain-name ù ¨ ˘ ¨ ˘ ‡
“ Â 32 Â

Ю ¨ ‘

```
Ruijie(config)# aaa domain ruijie.com
Ruijie(config-aaa-domain)#
```

३	
aaa new-model	Ł
aaa domain enable	¨ Ł
show aaa domain	

∧

∧	

¨ ⊾ Â ʒ Â

aaa domain enable

no aaa domain enable

ᚷ ᚻ Â

Ю ᚨ ѝ ruijie.com ѝ 20ᚠ

```
Ruijie(config)# aaa domain ruijie.com
Ruijie(config-aaa-domain)# access-limit 20
```

ᚷ	
aaa new-model	ᚳ
aaa domain enable	ᚨ ᚳ
show aaa domain	

ᛏ

ᛏ	

aaa new-model	
aaa domain enable	
show aaa domain	

-	-

9.4.5 authentication dot1x

authentication dot1x default *list-name*

no authentication dot1x

default	
list-name	

default

IEEE802.1x

```
Ruijie(config)# aaa domain ruijie.com
Ruijie(config-aaa-domain)# authentication dot1x default
```

aaa new-model	
aaa domain enable	
show aaa domain	

-	-

9.4.6 authorization network

Ю

authorization network default *list-name*

no authorization network

default	
list-name	

state block active

no state

block	
active	

Ю й Â

Â

ŭ Â

Ю Â

```
Ruijie(config)# aaa domain ruijie.com
Ruijie(config-aaa-domain)# state block
```

aaa new-model	Ł
aaa domain enable	Ł
show aaa domain	

-	-

9.4.8 show aaa domain

Â

show aaa domain default *domain-name*

default	
domain-name	

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
```

ʒ Â

Ю NAS б ╘ ˘ ¨ ǚ Â

Ю ˙
Ruijie(config)# **aaa domain** *ruijie.com*
Ruijie(config-aaa-domain)# **username-domain without-domain**

ʒ

ʒ	
aaa new-model	╘
aaa domain enable	¨ ╘
show aaa domain	

ʌ

ʒ

ʌ	
-	-

9.5 AAA

9.5.1 aaa group server

╘ Â ʒ ╘ Â

aaa group server radius tacacs+ *name*

no aaa group server radius tacacs+ *name*

name	╘ ʌ¨ ˘ a ѝ l' radius Ł˘ l' tacacs+ Ł˘ ѝ RADIUS TACACS+ ╘ ¨ Â

ʒ Â

ʒ AAA ╘ ˘ RADIUS TACACS+ ╘ Â

Ю Â

```
Ruijie(config)# aaa group server radius ss
Ruijie(config-gs-radius)# end
Ruijie# show aaa group
Group Name:  ss
Group Type:  radius
Referred:   1
Server List:
```

show aaa group	aaa

-	-

9.5.2 ip vrf forwarding

й Ł ˘ Â

ip vrf forwarding *vrf_name*

no ip vrf forwarding

vrf_name	vrf¨

Ł Â

й Ł 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
```

aaa group server	aaa
show aaa group	aaa

Accounting Port: 5
Referred: 1

aaa group server	aaa
show aaa group	aaa

-	-

9.5.4 show aaa group

show aaa group

-	-

IO
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

aaa group server	AAA

-	-

9.6 AAA

9.6.1 aaa local authentication attempts

aaa local authentication attempts *max-attempts*

max-attempts	

9.6.2 aaa local authentication lockout-time

aaa local authentication lockout-time *lockout-time*

lockout-time	1~2147483647

15

login

```
Ruijie# configure terminal
Ruijie(config)# aaa local authentication lockout-time 5
```

Show running-config	
Show aaa lockout	login

ʒ	Â

ʒ AAA ʒ˘ AAA ⊨˘ **aaa new-model**
AAA ⊨Â AAA˘ ‡ AAA ʒ a ⋀ Â

Ю AAA ⊨Â
Ruijie(config)# **aaa new-model**

ʒ	
aaa authentication	Ѭ “
aaa authorization	Ѭ “
aaa accounting	Ѭ “

⋀ ℵ Λ § ⁻ ⊞ ⓖ ⌞ S

	show aaa lockout	login

	-	-

9.6.5 debug aaa

no Â

debug aaa event

no debug aaa event

	-	-

EXEC Â

	-	-

-	-

Â

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
```

aaa authentication	HX “
aaa authorization	HX “

<word>	ID

Â

Ю

```
Ruijie# show aaa user lockout all
```

show running-config	
show aaa lockout	login

-	-

10 RADIUS

10.1 RADIUS

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- **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

ip radius source-interface Â

no Â

ip radius source-interface *interface*

no radius source-interface

ð Ô

Interface

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Â

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```
Ruijie(config)# ip radius source-interface
GigabitEthernet 0/0
```

ð ¾ Ô

¾	
radius-server host	ЊЖ Ь
ip address	

10.1.2 radius-server host

Ь ў ˘ ¾ **radius-server** Â ¾ **no** Ь ў 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: Ь ў ¨ Â

ip-address Ь ў Â

auth-port

port-number ʌ˘ ѝ ˘ ‡ ў a Â

acct-port:

port-number: ʌ˘ ѝ ˘ ‡ ў a Â

ð Ô

ў Â

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ѝ Ь˘ ЊЖ Ь Â Л Љ **radius-server** ¾ ЊЖ Ь Â

ð Ô

Ю ЖЖ ⊨ ў ˋ

Ruijie(config)# **radius-server host** *192.168.12.1*

ð ʒ Ô

ʒ	
aaa authentication	ЖЖ ˝
radius-server key	ЖЖ ⊨ ʒ
radius-server retransmit	ЖЖ
radius-server timeout	ЖЖ

10.1.3 radius-server key

ЖЖ ⊨ ˆ ˜ б ⊨ ʒˇ

ʒ **radius-server key** Â ʒ ˎ ʒ Â

radius-server key *text-string*

no radius-server key

ð Ô

text-string ʒ

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⊨ ˇ ⊨ Э ЖЖ ˇ

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Ю ЖЖ ⊨ ʒ ѝ ˋ

radius-server retransmit	Ѭ
radius-server timeout	Ѭ

10.1.4 radius-server retransmit

ѝ ⊾ ⅂ Ѣ ˘

ʒ **radius-server retransmit** Â ʒ **no** Â

radius-server retransmit *retries*

no radius-server retransmit

ð Ô

*retries*ʻ Â

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ð ʒ Ô

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⊾ ⅂ ⊾

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Ю ѝ ʻ

radius-server timeout *seconds*

no radius-server timeout

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seconds ˙ ˆ Æ ѝ ˜ Â ⁄ ѝ Â

ð Ô

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ð Ô

Ю Ѭ ѝ ˙

Ruijie(config)# **radius-server timeout** *10*

ð ʒ Ô

ʒ	
radius-server host	Ѭ ⊾ ў
radius-server retransmit	Ѭ
radius-server key	Ѭ ʒ

10.1.6 radius-server deadtime

ɨ˘ ˘ ‡ ѝ ⊾ ˘ ѝ
ˆ ˜˘ ˘

ʒ **radius-server deadtime** Â ʒ **no** ˘ Â

radius-server deadtime *minnutes*

no radius-server deadtime

ð Ô

minnutes˙ ˆ Æ ѝ† ˜ Â ⁄ ѝ Â

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ð ʒ Ô

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ꝛ Â Ǯ Ǯ

ȍ Ô

Ю Ѫ ѝ ρ Ю З

radius set qos cos

no radius set qos cos

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```
Ruijie(config)# radius set qos cos
```

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radius vendor-specific extend	ì a

10.1.9 radius vendor-specific extend

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radius vendor-specific extend

no radius vendor-specific extend

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ð Ô

IO

```
Ruijie(config)# radius vendor-specific extend
```

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radius attribute	
radius set	

10.2 RADIUS

- **debug radius event | detail**
- **show radius server**
- **show radius parameter**
- **show radius vendor-specific**

10.2.1 debug radius

Â Â

debug radius event | detail

no debug radius event | detail

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10.2.2 show radius server

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show radius server

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```
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 ʒ Ô

ʒ	
radius-server host	⊾ ǰ
radius-server retransmit	⊾
radius-server key	⊾ ʒ
radius-server timeout	⊾

10.2.3 show radius parameter

⊾ Â

show radius parameter

ð Ô

ð Ô

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ð Ô

ʒ ⊾ 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
```

radius-server host	
radius-server retransmit	
radius-server key	
radius-server timeout	

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1 VRRP

1.1

- **vrrp authentication**
- **vrrp delay**
- **vrrp description**
- **vrrp ip**
- **vrrp preempt**
- **vrrp priority**
- **vrrp timers advertise**
- **vrrp timers learners advertise**

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```
vrrp 1 authentication x30dn78k
```

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vrrp *group ip ipaddress* **secondary**	╖

1.1.2 vrrp delay

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vrrp delay **minimum** *min-seconds* **reload** *reload-seconds*

no vrrp delay

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min-seconds ʻ ˧ й ╟ ˘ *min-seconds* ɨ ╟’

reload-seconds ʻ ╟ ╟ Â *min-seconds*
reload-secondsˇ ‡ ╟ *min-seconds*

```
show vrrp 1
```

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vrrp *group* *ipaddress* **secondary**	╖

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1.1.3 vrrp description

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vrrp *group* **description** *text*

no vrrp group description

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group ʻ ⅄

text ʻ

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```
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”
```

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1.1.5 vrrp preempt

vrrp *group* **preempt delay** *seconds*

no vrrp *group* **preempt delay**

group

delay *seconds*

```
vrrp 1 preempt delay 15
vrrp 1 priority 200
```

vrrp *group* **ip** *ipaddress* **secondary**	
vrrp *group* **priority** *level*	

1.1.6 vrrp priority

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vrrp *group* **priority** *level*

no vrrp *group* **priority**

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group ʿ ⅄

level ʿ ˝I

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vrrp 1 priority 254

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vrrp *group* **ip** *ipaddress* **secondary**	╖
vrrp *group* **preempt delay** *seconds*	.

1.1.7 vrrp timers advertise

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vrrp *group* **timers advertise** *interval*

no vrrp *group* **timers advertise**

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group ʿ ⅄

interval ʿ Ѣ ѝ Æ

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```
vrrp 1 timers advertise 4
```

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vrrp *group* **ip** *ipaddress* **secondary**	╖
vrrp group timers learn	ˊ ╖

1.1.8 vrrp timers learn

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vrrp *group* **timers learn**

no vrrp *group* **timers learn**

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group ∧

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vrrp 1 timers learn

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vrrp *group* **ip** *ipaddress* **secondary**	╥
vrrp *group* **timers** **advertise** **msec** *interval*	

1.1.9 vrrp track

vrrp *group* **track** *interface-type number* ʒ˘
╥ ˘ **vrrp** *group* **track** *ip-address* ʒ˘ **vrrp** *group* **track bfd**
˘ ὲ **no** ╥ Â ʒ 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 ˙ ʌ

interface-type ˙

number ˙ ʌ

ipv4-addres ˙ ˘

interval-value ˙ ǖ ʌ Â a ˘
ѝ

timeout-value ˙ ȁ a ʌ Â a ˘ ѝ

a ʌ ˘ *retry-value* ˘ ‡ ѝ
a ʌ Â æ ѝ ˘ a ˘ ѝ Â

priority ʿ ⅄ ⅄ ὲ ”I ⅄ Â
a ˘ ѝ

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debug vrrp errors

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```
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

ʒ ˘ ὲ **no** Â

debug vrrp packets

no debug vrrp packets

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```
Ruijie# debug vrrp packets
Ruijie#
VRRP: Grp 2 sending Advertisement checksum DD4D
VRRP: Grp 2 sending Advertisement checksum DD4D
VRRP: Grp 2 sending Advertisement checksum DD4D
```

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```
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

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debug vrrp state

no debug vrrp state

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```
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

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show vrrp **brief** *grou*

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brief ˋ /ˈ ˘

group ˋ ˈ

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```
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#
```

```
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#
```


vrrp *group ip ipaddress* **secondary**	

1.3.2 show vrrp interface

show vrrp interface *type number* **brief**

type

number

brief

```
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

Â

clear multi-ldp

-	-

UP/DOWN

```
Ruijie#config
Ruijie(config)#interface gigabitEthernet 0/1
Ruijie(config-if-GigabitEthernet 0/1)#clear multi-ldp
```

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10.3(4T90)	

2.1.2 multi-ldp

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multi-ldpicmpn

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2.2

2.2.1 show multi-ldp interface

show multi-ldp interface *interface-name*

interface-name	+ID

a

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

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1 CPU-LOG

1.1

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- **show cpu**
- **cpu-log**
- **show environment**

1.1.1 show cpu

show cpu

show cpu

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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
```

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1.1.2 cpu-log

Л Љ **cpu-log** Â

cpu-*log* *log-limit low_num high_num*

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log-limit

low_num æ

high_num

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```
ruijie(config)# cpu-log log-limit 70 80
```

Ю

```
Oct 20 15:47:01 %SYSCHECK-5-CPU_USING_RATE: CPU utilization in
one minute : 95%˘ Using most cpu's task is ktimer : 94%
```

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```
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

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show environment Â

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show environment

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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!
```

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2

2.1

2.1.1 threshold set

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1˙ M1 Â

```
Ruijie(config)# threshold set memory M1 70 90
```

2˙ γ ⁄ CPU Â

```
Ruijie(config)# threshold set cpu member 2 70 90
```

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ʒ	
show threshold	ʒ

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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 . ⁄˘ ‡ æ
member n	˘ Э ˘ n ѝ ⁄˘ ‡

ʒ 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 **show memory**

```
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%
```

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1ʿ ЛЬЮ ѝ BGP ѝ ˝I Â

```
Ruijie(config)# memory-lack exit-policy bgp
```

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show memory	

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3.1.3 show memory protocols

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show memory protocols

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📖	a˘ ˇ˧ a˘ ˘ ў BGP,OSPF,RIP,LDP,PIM,ISIS Â

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OSPF 24000000
RIP 10000000
PIM 50000000
LDP 20000000
Total 206000000

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show memory	

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-

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4 USB

4.1

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- **show usb**
- **usb remove**

4.1.1 show usb

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show usb

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```
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)
```

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4.1.2 usb remove

usb remove *Device_ID*

Device_ID

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1.1

1.1.1 logging on

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logging on

no logging on

config)#2_0 1 TT4 0 0 9 .6no

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a Э Â

logging console	8 Л Э
logging monitor	Э
logging trap	

1.1.2 terminal monitor

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buffer-size ʿ ă ⸗ ˘ ⸝ ÿ Â

levelI ʿ ш ˘ ÿ Â ⸝ Ѣ ¨ ˘ ≠ ⸝ Ѣ Â

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Â ă ⸗ ˘ ʒ **show logging Â**

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```
Ruijie(config)# logging buffered 10000 6
```

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logging on	
show logging	ă ˇ
clear logging	ă ˇ

1.1.4 logging server

Syslog Sever˘ Ю ʒ Â

Syslog server ˝ **Syslog Server˘** ʒ Â

logging server *ip-address* **vrf** *vrf-name* **ipv6** *ipv6-address*

no logging server *ip-address* **vrf** *vrf-name* **ipv6** *ipv6-address*

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ip-address ў ʼ

vrf vrf-name ў ˆ ˜ ʼ

ipv6 ipv6-address ў ʼ

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ʒ	
logging on	
show logging	ă ˋ˂ ˘ Ƶ ˧˩
logging trap	

1.1.5 logging file flash

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logging file flash:*filename max-file-size level*

no logging file

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filename ˊ ˇ ¨ Â a ˇ ˘ ѝ Â

max-file-size ˊ ˇ Â ÿ ˘ ѝ Â

ˊ ˇ Â ˄˥ ¨ ˘ ≠ ˄˥ Â ѝ Â ˘ Â

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```
Ruijie(config)# logging console informational
```

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ʒ	
logging on	
show logging	ă ˇ˂ ˘ Ƚ ˧˩

1.1.7 logging monitor

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logging monitor *level*

no logging monitor

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level ˋ ш Â ʌ Ƚ ¨ ˘ ≠ ʌ Ƚ Â
ш ˘ Â

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Э ˘ ˝I ʒ **terminal monitor**
Â ‡ **logging monitor** ЊЖ Â

Logging monitor ЊЖ Â

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```
Ruijie(config)# logging monitor informational
```

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logging on	
show logging	ă ˇ˂ ˘ Ƚ ˧˩

1.1.8 logging trap

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logging trap *level*

no logging trap

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level ш Â Л Љ Â

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show logging Л Љ Â

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```
Ruijie(config)# logging 202.101.11.22
Ruijie(config)# logging trap informational
```

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logging on	
logging	
show logging	Љ

1.1.9 logging source interface

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logging source interface *interface-type interface-number*

no logging source interface

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interface-type ʻ

interface-number ʻ ʎ

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Ruijie(config)# **logging source interface loopback** *0*

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logging server	

1.1.10 logging source ip| ipv6

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Â

logging source ip *ip-address* **ipv6** *ipv6-address*

no logging source ip ipv6

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ip-address ǟ ў ʼ

ipv6-address ǟ ў ʼ

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ѝ Â

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Ю ѝ ʻ

Ruijie(config)# **logging facility kern**

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logging console	8 Э

1.1.12 logging count

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logging count

no logging count

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Â ÿ Â **no logging count**

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```
Ruijie(config)# logging count
```

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show logging count	
show logging	б

1.1.13 logging rate-limit

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logging rate-limit *number all number console number all number except*

severity

no logging rate-limit

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number ˘ ѝ ’

all ⁸˘ ’

console ⁸ ⁄ Э ’

except ш ˘ а ⁸’ ѝ ˘ а ⁸’

severity ш ˘ ˘ ш ˘ ѝ

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ˆ ˜ ѝ ˘ ⁄ ш а ⁸‘

Ruijie(config)#**logging rate-limit all** *10* **except warnings**

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ʒ	
show logging count	
show logging	б ᾰ ⁄

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
```

```
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    ----          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 й
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service timestamps *message-type uptime datetime msec year*

no service timestamps *message-type*

default service timestamps *message-type*

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message-type ʿ ч ˘ ǂ Â ш
˙ ˘ ш й Â

uptime ʿ ╟ ˘ ʿ ǂ ˘ ʿ

datetime ʿ ˘ ʿ ʿ ǂ ʿ ˘ ʿ

msec ˘ ʿ ǂ ʿ

year ˘ ʿ ǂ ʿ

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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	⅄

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

1.1.18 more flash

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more flash:filename

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Filename

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logging file 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 ˂
logging buffered	ă ˂

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
                           57:21  Ruijie: %7:%LINK CHANGED: Interface
                           anged state to down
                           57:41  Ruijie: %7:%LINK CHANGED: Interface
                           anged state to administratively down
                           57:43  Ruijie: %7:%LINK CHANGED: Interface
                           anged state to down
```


logging count	╗
show logging	б ǎ ⺀
clear logging	ǎ ⺀

2 RLOG

2.1

2.1.1 rlog export-rate

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rlog export-rate *number*

no rlog export-rate

number	ᒪ ˆ ˜

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```
Ruijie(config)# rlog export-rate 10000
```

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