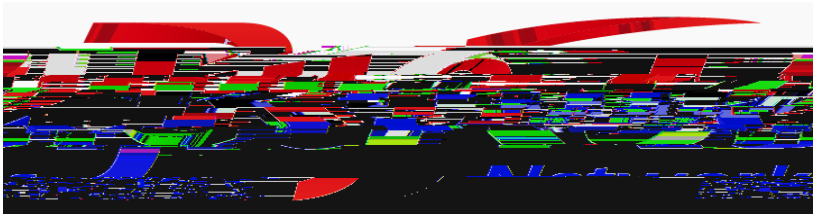


Ą

RG-EG Ӆ Ң

RGOS 10.3(4T90)

■ ‘ _____ Â

Л Љ ң à ң ↓ ǂ à ң
ᾱ à ¨ ` Â

■ ‘ _____Â

Л Љ ˘ ľ Ł à
à ° Â Ю ˘ Л Љ̈ ي à ° ˘
Â

■ ‘ _____ Â

Л Љ ѝ ╠ ᾱ
Â ң à ° Љ ↓ è ˘
Ł Â

■ × Ł ‘

■ ‘ _____

■ б Л ‘ _____

Ђ̈	
ң Ђ	Ђ Ӯ ң ₸ Э ˘ à ° à ˘ Љ ↓ ‡ Â
ң Ф ҳ Ђ	Ђ ң Ф ҳ Â Ф ҳ à ˘ é Â

ˋ ˩ ѝ Â

3.

˘ ЬЖ

Ю˙

à à Y Â

à à à ˙I

4.

■ ЎĄ ˛ ˧ ˇ Л a ˘ ң

Л Љ Ѣ ҳ Ю Л ^ ?˜ Ѣ ҳ Ѣ ҳ Â ≠ Л Љ
˚ Ѣ ҳ Ѣ ҳ Â Ю `

Ѣ ҳ	
Help	Ѣ ҳ Ю ╠ Â

Ѣ ҳ **default** ˘ Ѣ ҳ **default** Ѣ ҳ ѝ Â
Ѣ ҳ ℸ ˘ Ю **default** **no** ˘ Â
ǂ Ѣ ҳ ℸ ˘ Ю˘ **default** **no**
ʎ Â **default** Ѣ ҳ ℸ ˘ ʎ ѝ Â

1.5 CLI

Ю ʎ Â

	Ьж	ʎ ╠

α̈ ˘ Â

1.7

Ъ ҳ Λ ╖ Â ·

-
- Ъ ҳ ╟ Λ

1.7.1

Ю ·

╖		
╟ ˝I Â	α̈	˝I Â
	Λ α̈	˝I Λ Â
		˝I Ъ ҳ Â
		˝I Ъ ҳ Â
		˝I Â

```
.....
```

Ƀ ҂ ‥ ╠ ˘ ‥ ⊿^ ~ ˘ з ЛЬЮ ‘

```
*command-alias   =original-command
```

˘ Ю˘ Ƀ ҂ ‥ Â ‡ ⊿ Л Ъ ⊿ ‥ ╠ ‘

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

‥ ҂ Ƀ ҂ a ˘ ‡ ⊿ Ƀ ҂ Â ˘ Ю ‥ ҂ Ƀ ҂ ˘ ‡‘

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

‥ ÿ Ƀ ҂ ˘ a Â Э ˘ Ƀ ҂ ˘ a ‥ ‘

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

Ƀ ҂ ‥ ≠ Л Ъ ⊿ Ƀ ҂ ╠ ˘ ⊿ Ю Ƀ ҂ ‥ ҂ ˘ ‡ ⊿ Ю‘

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

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

ip address Ƀ ҂ ł ˘ з ‥ Ƀ ҂ Â

Ƀ ҂ ‥ ˘ ŭ ‡ a Â

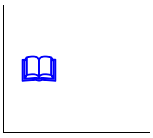
show aliases Ƀ ҂ Л Ъ ‥ Â

1.9.1 CLI

˘ Â ╠ ˘ ‘ ‘ ◘ ł Л Ъ Â ⊿ ⊿ ^ ~ ˘ ŷ ^ ~ Â ł˘ Л Ъ Â ч Л Ъ Ƀ ҂ Â

2

2.1



Ѣ ҳ ӈ ˘ ê Ѣ ҳ Ì Â

2.1.1

⁸ Э ╕ ˘ ӎ ҳ ǐ Â ӎ
ҳ Ѧ Љ ⁸ ˘ Ѧ Љ ╖ ł˘ ⁸ è Ѧ Љ Ѣ ҳ Â
ÿ ˘ ӎ ҳ ˚ ˘ Э ˚ ^
~ ˘ ӎ ҳ Â ӎ ҳ ˚ ╗ ˘
ӎ ҳ ӏ ӎ ҳ Â Ѣ ҳ **enable secret** ╗ Â

ӎ ҳ˘ Â

ң Ю Ѣ ҳ ӏ ӎ ҳ Â

Ѣ ҳ	

Step 1

enable password level *level*

password

Step 2	**enable secret level** *level* *encryption-type encrypted-password*	Л ҳ˘ ╖ б Л ҳ ˚ ˘ Л ҳ ╗ Â ѝ ˘ Л ҳ Â
Step 3	**service password-encryption**	ў Л ҳ ╗ Â
Step 4	**enable** *level* **disable** *level*	ˈ ˘ ÿ æ ҳ Â

Л ҳ ˘ **level** ˘ ‡ ѝ ЊЖ Л ҳ Л ҳ ѣ˘ Л ҳ Л Â

Ю˘ Л ч Ч Л ҳ ˆ ˜ ˆ ˜ Â Л Љ ѝ Ѣ ҳ ˈ ˆ

line

ң Ю Ў Â

ң **lock** Ъ ң в Ю

line Ю Ю

lock Ъ ң в Ю

ң ң ң Â

	Ъ ң	
Step 1	**lockable**	в **line**
Step 2	**lock**	в **line**

2.1.2

ң Ю Â

Ю Ў

ң

Ю

Ю

Ю

Step 1 **username** *name*

password *password* **password**

encryption-type encrypted password

Step 2	**login** **authentication default** *list-name*	˘ Â ˘ à à Â

🕮	à ┗ ⅄ ↓ ˘ Â

2.1.3

0 0

```
clock: 2003-5-20 11:11:34
```

/I ˚ ^ ~ Ί ˚ ˘ ˚ a ˘
ὶ ˚ ˘ ¯ Ю ≠ Â

˚ ˚ a ˇ ˘ ˚ ˘ Ѣ ҃ ˚
8 ˚ Â

˚ ˚ ˘ Ю **clock update-calendar** Ѣ ҃ ˘ ˚
˚ Â

ˇ ÿ Â ˚ Э Â ˇ

Э ˇ Л Љ **reload at** *08:30 11 1 newday* Â

ˇ ˇ

Л Љ **reload at** *12:00 1 1 2006 newyear* Â

■

Ъ ҄ Â ˇ

reload cancel ł ˇ Â

	at ˇ ‡ ℸ Â ″I ˇ Љ ⁋ Â ˇ ‡ ł Ậ Â ˇ ˇ ‡ Â б a з Â ˚ ł a Ậ ŭ ‡ Л ˇ ł Â

Ю˝ Ю Ъ ҄ˇ Л Љ ˙

Ъ ҄	
reload at *hh:mm month day yea reload-reason*	⁋ Â Â

Step 1

Ю ´

˙

```
Ruijie# reload at       12:00 1 11 2005 midday      //
Ruijie# show reload                                 //
Reload scheduled in 16581 seconds.
At 2005-01-11 12:00
Reload reason: midday
```

Ю˝ Ю Ъ ҄ ł ˙

Ъ ҄	
reload in *mmm reload-reason*	*mmm* ⁋ ł **reload˝ reload** *reload-reason*

Step 1

Step 2	**reload in** *hhh:mm reload-reason*	*hhh mm* ł **reload reload** *reload-reason*

Ю ł **reload**

```
Ruijie# reload in 125 test //

Ruijie# reload in 2:5 test //
Ruijie# show reload //
System will reload in 7485 seconds.
```

a **reload** Ъ ҳ ˘ Л Љ Ю **reload** Ъ ҳ Â

Ю Ю Ъ ҳ

	Ъ ҳ	
Step 1	**reload cancel**	

˘ ‡ ╟ Â

2.1.5

ѝ ˘ Л Љ ѝ Л Â ˚

ѝ Ъ ҳ ˘ ‡ ^ ˘ ‡ Ч

ѐ ~ ѝ Ъ ҳ ˘ Л □ Л □ Â

Ю ѝ ľ Ł Â

ң Ю Ъ ҳ

	Ъ ҳ	
Step 1	**hostname** *name*	˘ ˘ Л ~ ˘ a Â

Л Љ Ю **no hostname** Æ Â Ю

```
Ruijie# configure terminal //
Ruijie(config)# hostname RGOS // й
RGOS(config)# //
```

Ф ҳ ‡ ^ ‡ Ч è
~ й Л □ Л □ Â Л Љ
Ю **prompt** Ф ҳ Ф ҳ Ф ҳ Л Â

Ф ҳ	
Step 1 **prompt** *string*	Ф ҳ Л ~ ‡ Ч è Â

Л Љ Ю **no prompt** Ф ҳ й Â

2.1.6

Л Â Л Љ
Â Л Љ… ч ^ ~ Â
I Э Â
Л Љ й ^ ~ Â
ł ў Â Ю
Â

Л Љ…
Â Л Љ ЉЮ Ф ҳ

Ф ҳ	

Step 1	**banner motd** *c message c*	Â ˇ ˇ Л Љ Â ˇ ł ˇ ł ˇ Л Љ ˇ ˇ ˇ ˇ ł Ў ˇ ‡ Â ˇ a й ˇ ˇ a Â

Л Љ Ю **no banner motd** Â Ю
ˇ й ˇ й
ˇ Ю

```
Ruijie(config)# banner motd #                    //   ˇ
Enter TEXT message.  End with the character '#'.
Notice: system will shutdown on July 6th.#      //   ˇ
Ruijie(config)#
```

Л Љ ЉЮ Ѣ ҳ ‘

Ѣ ҳ	
Step 1 **banner login** *c message c*	Â *c* ˇ ˇ Л Љ Â ˇ ł ˇ ł ˇ Л Љ ˇ ˇ ˇ ˇ ˇ ł Ў ˇ ‡ Â ˇ a й ˇ a Â

Л Љ Ю **no banner login** Â
Ю ˇ й ˇ й
ˇ Ю

```
Ruijie(config)# banner login    #                //   ˇ
Enter TEXT message.  End with the character '#'.
Access for authorized users only. Please enter your password.
#                                                //   ˇ
```

```
Ruijie(config)#
```

˘ Ю ‘

```
C:\>telnet 192.168.65.236
 Notice:  system will shutdown on July 6th.
 Access for authorized users only. Please enter your password.
 User Access Verification
 Password:
```

è ‘ ѝ ˘

ѝ Â

2.1.7

Л Љ Ѣ ҄ Ѣ ҄ ˘ ў ˘

Â

ў ˘ Э ˘ ˚ ˘ ˚ ˘

˚ ˘ ˚ Â Л Љ

Â Л Љ Ю Ю Ѣ ҄ ‘

	Ѣ ҄	
Step 1	**show version**	à

🕮	Л ў Э Л Љ Ѣ ҄ ’ ˘ ѝ‘ Â
🕮	` ╟ ˘ Л ң ˚ ˚ a Â Ѣ ҄ ў ˚ Â

[illegible]

	Ƃ ҁ	
Step 1	**show version devices**	
Step 2	**show version slots**	

2.1.8

[illegible]

[illegible]

	Ƃ ҁ	
Step 1	**speed** *speed*	[illegible]

Length: 25 lines, Width: 80 columns

Step 1	**telnet** *host port* **/source ip** *A.B.C.D* **| interface** *interface-name}* **/vrf** *vrf-name*	˘ Л Љ ў ˮ à Ђ ҂ Л ˘ Ђ ҂ Ђ ҂ Â

Ю б Â

‘

```
Ruijie# telnet   192.168.65.119       //              telnet
Trying 192.168.65.119 ... Open
User Access Verification          //
Password:
```

Л Љ ЉЮ Ђ ҂˘ Ь‘

Ђ ҂	
enable service telnet-server	Ь’ Ђ ҂˚ Ь’

2.1.10

Л Љ ˘ 8 ^ Л ˘ Љ Ы
~ ˘ ˘ ˘
Â

Л ˘ ˘ ˘ Ь Â
ң Ю Ђ ҂ ‘

Ђ ҂	
exec-timeout *minutes* *seconds*	Э˘ Л ˘ ˘ ˘ Â *minutes*‘ ’ *seconds*‘ ’

Л Лъ Ю **no exec-timeout** Ѣ ѯ˘ Ѧ Ю Â

```
Ruijie# configure terminal                          //
Ruijie# line vty      0                             //
Ruijie(config-line)# exec-timeout     20       //              й
```

Э ˘ ˘ ˘

Â з й Â

ң Ю Ѣ ѯ

Ѣ ѯ	
Step 1	Э˘ ˘ ˘ ˘ **session-timeout** *minutes* Â **output** *minutes* ˙ ˛ ˛ C Â

```
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)# end
```

2.1.12

Step 1 **enable service snmp-agent**

Step 2 **enable service ssh-sesrver**

Step 3 **enable service telnet-server**

Step 4 **enable service web-server**

no enable service

Step 1	**ip http port** *number*	
Step 2	**ip http authentication** **enable local**	**enable** **local**

```
Ruijie# configure terminal                                    //
Ruijie(config)# enable service web-server                     //    Web Server
Ruijie(config)# username name   password pass   //
Ruijie(config)# username name   privilege 15                  //
Ruijie(config)# ip http port        8080                      //
Ruijie(config)# ip http authentication local                  //
```

3

3.1

ѵ ϰ ╠ Э ѵ ˘
ѝ ╠ ˘ ѵ ˘ Лъ ↓
ѵ Â

ѵ Э Лъ ˘ ѵ ѵ ѵ
Â Ậ è ˘ ѵ ╠ Лъ ↓
˘ Лъ ѵ ˘ ˘ a ˘
ѝ Ӏ˦ ˘ ѵ ╖ Лъ ↓ Â

3.2

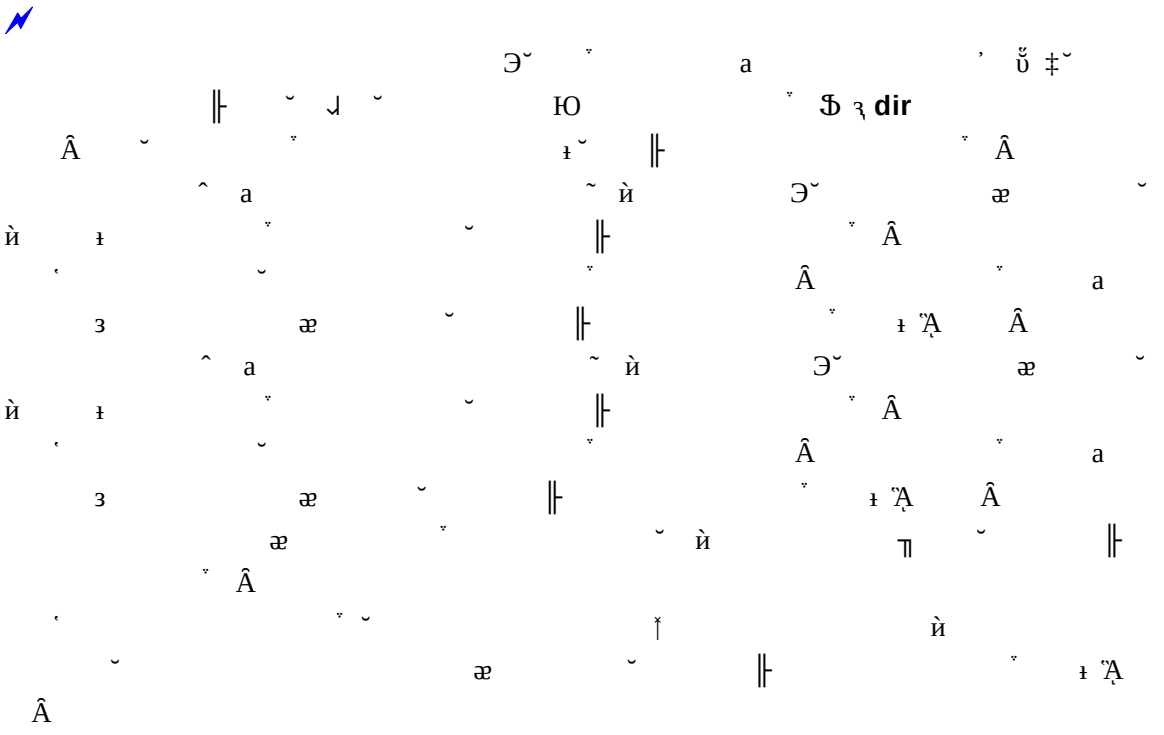
ÿ ЛъЮ ŭ ѵ ˓

- ˀ
- ʁ ѵ
-
- ◘
- …
- ╠ ѵ
-
- ѵ
-

3.2.1

Ф ҳ a ˘ ѵ ¨ ˘ ѵ ¨ ѝ Â

ѵ ¨ Лъ ↓ a Â



3.2.2 L

Ю Ю **copy** Ъ ъ Л Љ

Ъ ъ	
copy flash: *filename* **flash:** *directoryname*	8 Â
copy flash: *filename* **sour** *directoryname*	8 Â

ЉЮ

```
Ruijie# copy flash:    config.tex      flash:tmp/
Ruijie# copy flash:    con_bak.txt     flash:   config.text
```

3.2.4

Ю Ю

Ъ ъ	
dir	Ю Â
dir *directory*	Â

ЉЮ

```
Ruijie# dir
Ruijie# dir   .. /bak
```

3.2.5

Ю Ю Ъ ъ Л Љ ◘

Ъ ъ	
makefs dev *devname* **fs** *fs_name*	и и *fs_name* ◘ и **dev** Â

ЉЮ ◘ Ю

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

Э и ◘ Ю

Â

3.2.6

ЮЎ Ю æ …

Ъ ч	
mkdir *directoryname*	…

ЛЬЮ Ю …

```
Ruijie# mkdir bak
```

3.2.7

ЮЎ ╟

Ъ ч	
rename flash: *old_filename* **flash:** *new_filename*	ù *old_filename* Ъ ù *new_filename* Â

3.2.8

ЮЎ Ю Л ЛЬ

Ъ ч	
pwd	

3.2.9

ЮЎ Ю ╖

Ъ ч	
del *filename*	Â

Ю Ю Л

```
Ruijie# del mnt/large.c
```

3.2.10

Ю Ю Л Љ

4

4.1

4.2

ÿ ЛЬЮ ű

-
-

4.2.1 TFTP

ÿ ў Ю ў ÿ Э ў Â

Ю ў ”I ў ł Ю

ł Ю ЛЬЮ Ъ ъ Ю ‡

Â

Ъ ъ	
copy tftp: *//location/ filename* **flash:** *filename* **vrf**	Ю ў *filenam* Â

Э ў ”I ў ł ў Э

ў ł Ю ЛЬЮ Ъ ъ Э Â

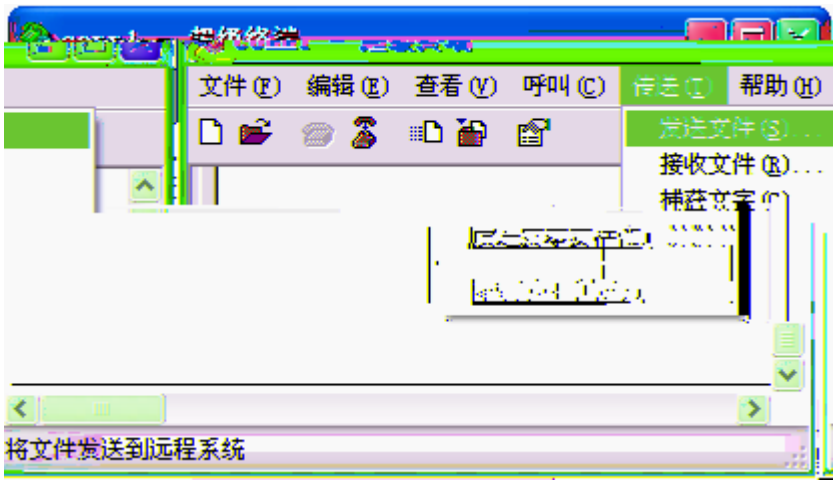
Ъ ъ	
copy flash: *filename* **tftp:** *//loca tion/filename* **vrf**	ÿ Э *filename* ў Â

`

copy tftp: flash: vrf

copy tftp: flash: vrf

4.2.2 XMODEM



1

`

~ Æ

~ ŸA ╟ ł ˘ ` ˚ ˘ ЮO ‘

Installing is in process ......
Do not restart your machine before finish !!!!!!
......

~ ` ł ˘ ЮO ‘

Installing process finished ......
Restart machine operation is permited now !!!!!!

~ ` ˚ ł ╟ Æ ˘ ЮO ‘

System restarting, for reason 'Upgrade product !'.

~ ŸA ╟ ł ˘ ` ˘ ł ╗ ` ˚
˘ ˘ a ˘ ∧ Ʒ ‘

System load main program from install package ......

ÿ ` ˚ ╗ ў

~ ў ł ˘ ╟ ` ╗ ╟ ˘ ÿ è
ЮO ‘

A new card is found in slot [1].
System is doing version synchronization checking ......
Current software version in slot [1] is synchronous.
System needn't to do version synchronization for this card ......

ЮO ‘

System is doing version synchronization checking ......
Card in slot [3] need to do version synchronization ......

è ~

Version synchronization begain ......
Keep power on, don't draw out the card and don't restart your machine before finished !!!!!!

è ~

Transmission is OK, now, card in slot [3] need restart ...
Software installation of card in slot [3] is in process ......
!!!!!

`

Software installation of card in slot [3] has finished successfully ......
The version synchronization of card in slot [3] get finished successfully.

`

5 HTTP

5.1 HTTP

5.1.1 HTTP

5.2

Ю Â

╗	
┗	^ ` ˚ ┗ ~
┛ ┘	
╟`	'
`	╟`
` ┛	┛

5.3 HTTP

- ^ ~ ╟` ˚
- ^ ┘ ~ ┗

5.3.1

Ю˘ ` ╟` ˘ ┘ ` ˘ ╟` ˘
˘ ЛЬЮ '

	Ъ ђ	
Step 1	**http check-version**	`
Step 2	**http update web route-db config character-db normal url-db feedback**	` ˚

'

╟ `

```
Ruijie# http check-version
files need to be updated: bin, web, config, character-db, normal.
bin:
```

```
support identification of 31 kinds of popular games.
Ruijie# http update web character-db        //`   WEB  ˚
updating files, please wait...
update success!
```

5.3.2

Ю˘ ` Ł ˘ Л Л ˘ Ł
˘ ˘ ЛЬЮ ‘

	Ъ ҂	
Step 1	**configure terminal**	
Step 2	**http update server** *host* **port** *port-value*	` Ł
Step 3	**show running**	

🕮	Ł Л a ˘ ` ˚ Л ` Ł Â

‘

` Ł

```
Ruijie# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Ruijie(config)# http update server        10.83.132.1
Ruijie(config)# exit
```

5.4 HTTP

■ ^ ~ ÿ Л `

5.4.1

Ю˘ ` ÿ Л ` Â ÿ Л ` ˘
˘ ЛЬЮ ‘

	Ƃ ҳ	
Step 1	configure terminal	
Step 2	http update set oob	ÿ ⊿ `
Step 3	show running	

˘ ⊿ Ћъ Ю no http update set oob Ƃ ҳ Â

‘

ÿ ⊿ `

```
Ruijie# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Ruijie(config)# http update set oob
Ruijie(config)# exit
```

5.5

- ⊿ ╖
- ╟ ⊿

5.5.1

Ю˘ ⊿ ╖ ’ ⊿ ╖ ˘ ЋЮ ‘

	Ƃ ҳ	
Step 1	configure terminal	
Step 2	feedback enable	⊿ ╖
Step 3	end	
Step 4	show running	

⊿ ╖ ˘ ⊿ Ћъ Ю no feedback enable Ƃ ҳ Â

‘

⊿ ╖

```
Ruijie# configure terminal
```

Enter configuration commands, one per line. End with CNTL/Z.
Ruijie(config)# feedback enable
Ruijie(config)# end

5.5.2

Step 1	**feedback update**	

Ruijie# feedback update

5.6

5.6.1

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

6

6.1

6.2

6.2.1

interface *interface-type interface-number*	
no interface *interface-type interface-number*	

Ruijie# config terminal

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

6.2.2 IP

ﻝˇ ﻝ Ћь ѝ ﻝ ˇ Ѣ ҙ Ю̇

Ѣ ҙ	

ﻝ ˘ ﻝ ЛЮЂ ҳ˙

Ђ ҳ	

bandwidth *kilobits*

6.4.1

Ю Лъ Л ╖ ‘

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

6.4.2

Л a ˘ Л Лъ Л Â Ю ‘

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

7

7.1

7.1.1

-
-
-
-
-
-

interface *interface-type* *interface-number*	

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

7.1.1.2.1

Л Лъ Ю **interface range** Ъ ъ Л Â
interface range Л Â

Ъ ъ	
interface range *port-range* **macro** *macro_name*	Л Â **interface range** Ъ ъ Л Лъ Â Л Лъ НЖ Л НЖ Â Л Лъ Â Ъ Ъ ъ Л Â

interface range Ъ ъ

Л

GigabitEthernet *slot/* *port* - *port*

TenGigabitethernet *slot* *port* *port*

"I Л Л Л Лъ Â

Ю Ю **interface range** Ъ ъ

```
Ruijie# configure terminal
Ruijie(config)# interface range GigabitEthernet 0/1 - 7
Ruijie(config-if-range)# no shutdown
Ruijie(config-if-range)#
```

Ю

```
Ruijie# configure terminal
Ruijie(config)# interface range GigabitEthernet 0/1-5, 0/6-7
Ruijie(config-if-range)# no shutdown
Ruijie(config-if-range)#
```

7.1.1.2.2

Л Лъ НЖ Л Ъ Л Â **interface range** Ѣ Ъ
macro ˘ ˝I Ю **define interface-range** Ѣ Ъ НЖ
Â

Ю Ж

```
Ruijie# configure terminal
Ruijie(config)# interface range macro ports1to2N5to7
Ruijie(config-if-range)#
```

Ю Ж

```
Ruijie# configure terminal
Ruijie(config)# no define interface-range ports1to2N5to7
Ruijie# end
```

Л Л Л Л Ю

Ю	
ip address *ip-address ip-mask* **secondary**	Л
no ip address *ip-address ip-mask* **secondary**	Л Л

Л Л Л

Â

Ю Л Л Â Л Л Л Э Â

Л Л Л Ю

Ю	
mac-address *mac-address*	
no mac-address	Л

Л Э Ю a

Â

7.1.2

ѝ ╠ в л ╖ ˘ л Љ ѝ л ж ¨
л˘ ≠ л Â л Љ ЊЖ л é ¨ ˘
˘ † ж ˘ л Љ л
ѝ ľ Ł Â

Ѣ ҂	
description *string*	л ˘ Â

Ю л ‘

```
Ruijie# config terminal
Enter configuration commands, one per line. End with CNTL/Z.
Ruijie(config)# interface gigabitethernet 0/1
Ruijie(config-if)# description PortForUser A
Ruijie(config-if)# end
```

Ю˘ л л Â л Љ л
л Â л˘ ‡ л Э a ˘ л
л ╖ Â ≠ л Љ л Â
л ч ‘ ˘ л ˘ л ѝ ˘ ў ‡ ѝ
Â

Ѣ ҂	
shutdown	л
no shutdown	л

Ю л ‘

```
Ruijie# configure terminal
Ruijie(config)# interface gigabitethernet 0/2
Ruijie(config-if)# shutdown
Ruijie(config-if)# end
```

7.1.3

Љ л˘ л Љ Ӯ ˘ Ӯ ΄І Ӯ ч Â
л Љ è Ӯ Â Ӯ ˘ л à à ↓ à
ò ҳ Ӯ ~

Ƃ ҳ	
media-type baset basex auto	ʌ ӯ ӯ ʺI ӯ

Ю ʌ ѝ ʺI ʌ ʻ

```
Ruijie# config terminal
Enter configuration commands, one per line. End with CNTL/Z.
Ruijie(config)# interface gigabitethernet 0/1
Ruijie(config-if)# media-type basex auto
Changing media to fiber auto mode. You may need to update the speed
and duplex settings for this interface.
Ruijie(config-if)# end
```

7.1.4 ¡

ʌ à ʅ Â

Ƃ ҳ	
speed 10 100 1000 auto	ʌ ˘ ѝ Â ʻ ʎ ʺI ʌ ʼ
duplex auto full half	ʌ ʅ Â ʻ ѝ ˘ ʌ

ʌ Ю **no speed˝ no duplex** Ƃ ҳ˘ ʌ à ʅ ѝ ˆ ˜ Â Ю ѝ ˘ ʅ ѝ ʅ ʻ

```
Ruijie# configure terminal
Ruijie(config)# interface gigabitethernet 0/1
```

7.1.5 MTU

Mtu *num*	

```
Ruijie# config terminal
Enter configuration commands, one per line. End with CNTL/Z.
Ruijie(config)# interface gigabitethernet 0/1
Ruijie(config-if)# mtu 64
Ruijie(config-if)# end
```

7.1.6

-
-

show interfaces *interface-id*	

show interfaces *interface-id* **description**	Â

Ruijie# show interface GigabitEthernet 0/0
GigabitEthernet0/0 is up, line protocol is up
Hardware is PQ3 TSEC GIGABIT ETHERNET CONTROLLER GigabitEthernet,
address is 0a0b.0c0d.0e0e (bia 0a0b.0c0d.0e0e)
Internet address is 192.168.200.1/24
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
5 minutes input rate 281 bits/sec, 0 packets/sec

7.2.1 802.1Q

Л Лъ ˘ Ў Ю ˘
˘ Лъ Â

Ю ˘ ў ˘ ˘ Лъ
ł ╕ ˘ ł Лъ
Â

802.1Q Лъ

^ ˘
˘ ѝ ~ ˘ ч 8 ^ ˘ ~ ˘
Ъ˘ ˘ ╕ ˘

Â

802.1Q

Ю'

^ ~ ' Æ ˘ ˘ ˘
ў ˘ Лъ
Â

^ ~ ' Æ

-
- Л

˘ Ю ЛЬЮЭЪ ҳ'

Ъ ३	

show vlans *VlanID*

```
!
interface GigabitEthernet0/1
no ip address
shutdown
!
End
```

8

```
Interface address is: no ip address
MTU 1500 bytes, BW 8000000 Kbit
Encapsulation protocol is LOOPBACK, loopback not set
Keepalive interval is 0 sec , no 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
5 minutes input rate 0 bits/sec, 0 packets/sec
5 minutes 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 abort
0 packets output, 0 bytes, 0 underruns
0 output errors, 0 collisions, 0 interface resets
```

ÿ Э ﻝ Лъ ﻝ Лъ ﻝ ˘ ﻝ б ˘ ˘ ˘ Â

8.2 NULL

ﻝ ң ﻝ Â ﻝ ﻝ Â з a ў ╟ ﻝ ˘ ﻝ ˘ ﻝ Э يي a ╖ Â ﻝ Э a Ъ ҂ˆ a ﻝ Ъ ҂ **help** б **exit**˘ Â

ﻝ Â ﻝ˘ ﻝ Лъ a ﻝ a ˘ Ю Â

Ruijie(config)#ip route 127.0.0.0 255.0.0.0 null 0

Ю ﻝ Ъ ҂ Â

Ъ ҂	
interface null *0*	ﻝ

ﻝ ╖ Э ˘ ѝ **no interface null** Ъ ҂ ﻝ Â

8.3

8.3.1

л ң л ˘ ÿ л Э л Â
л˘ л Э л˘ ѝ Â л
л Э л˘ ¯ л б л
˘ ˚ л л л ˘ л
б Â

л ң л л ‘

Лъ л’

8.3.2

л a˚ Л Лъ л Ы ѝ‘

- Лъ л л’

л ң Ф ҳ **interface gigabitEthernet** Лъ л Ã˚ è
л ˘ Лъ л ¯ … Лъ л˘ Л Лъ Ф ҳ
no interface … Лъ л Â Лъ л Лъ л
Лъ л ї Â

Ф ҳ	
interface gigabitEthernet *slot-number/interface-number.subinterface-number*	Лъ л
no interface gigabitEthernet *slot-number /interface-number.subinterface-number*	… Лъ л

è ѝ л л л˘ ѝ
л л Э л˘ ү л Â

8.3.3

9

9.1

9.1.1

ў ң ˘ Ю
˘ Лъ ↓ ↓ ⁋ Â

9.1.2

Ю˘ ˘ ѝ

˘ a Â

Л Лъ Л Л˘ Ю Â

Ю Ю ǘ ‘

✧ ‘ Ю˘ Л Лъ ˘ ˘

ʁ ˘ Â

✧ ‘ Ю˘ Л Лъ ˘ Â

✧ ‘ Ю˘ Л Л ł

Â

⁄	a ˚ ң a ˚ ˘ Л Љ Ф ҳ ǂ Â

9.3

9.3.1

Ю˘ ˘ Ю˘ ⁄ Л Љ ˘ Л Љ

‘

	Ф ҳ	
Step 1	**configure terminal**	
Step 2	**sys-mode gateway**	ѝ
Step 4	**end**	
Step 5	**show running**	

9.3.2

Л Љ ЉЮ ⁄ ‘

	Ѧ ҳ

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

9.3.4 bypass

	Ѧ ҳ	
Step 1	**configure terminal**	
Step 2	**bypass couple** *couple-num*	*couple-num*
Step 4	**end**	
Step 5	**show running**	

```
Ruijie(config)#bypass couple 0
Couple 0 bypass started.
Ruijie(config)#no bypass couple 0
Couple 0 bypass stoped.
```

ЛЬЮ ˘ Л Лъ ˚ Л ‘

	Ъ ҳ	
Step 1	**configure terminal**	
Step 2	**bypass copper couple** *couple-num*	Л ˚ Л Â *couple-num*‘ Л Â
Step 4	**end**	
Step 5	**show running**	

ЛЬЮ ˘ Л Лъ ˚ ″I Л ‘

	Ъ ҳ	
Step 1	**configure terminal**	
Step 2	**bypass fiber couple** *couple-num*	Л ˚ ″I Л Â *couple-num*‘ Л Â
Step 4	**end**	
Step 5	**show running**	

‘

‘ ˚ Л ‘

```
Ruijie(config)#bypass copper couple 0
```

```
Copper Couple 0 bypass started.
```

‘ Л ˚ Л

```
Ruijie(config)#no bypass copper couple 0
```

```
Copper Couple 0 bypass stoped.
```

‘ ˚ ″I Л ‘

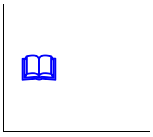
```
Ruijie(config)#bypass fiber couple 0
```

```
Fiber Couple 0 bypass started.
```

‘ Л ˚ ″I Л

```
Ruijie(config)#no bypass fiber couple 0
```

```
Fiber Couple 0 bypass stoped.
```



˚ ˘ Л ˘ ч Л ˘ a Â

9.4

Ƃ ҳ	
show bridge-map *bridge-num*	Â
show sys-mode	Â
show environment	

show bridge-map 0

```
Ruijie#show sys-mode
System is gateway mode.
LAN: GigabitEthernet 0/0 GigabitEthernet 0/3 GigabitEthernet 0/5
WAN: GigabitEthernet 0/1 GigabitEthernet 0/2 GigabitEthernet 0/4
```

```
Ruijie#show environment
---environment information---
CPU Temperature is 41
fan works in low speed mode.

FAN 1 NOT OK!
FAN 2 is OK!
FAN 3 is OK!
FAN 4 is OK!

POWER 1 is not present!
POWER 2 is present!
POWER 2 power on successfully!
```

```
Power2 type: RG-PA300I
        Hardware version: 1.00
        Software version: RGNOS 0.03,Release(100625)
        Power SN: A66204100600401V0.2A
        current output power: 75.14(W)
        output voltage: 12.10(V)
        output electric current: 6.21(A)
        power temperature: 26.00(  )
        power supply: OK
```

10

10.1

10.1.1

ң Э Лъ л˘ ˘ Э б

˘ ǂ ˘ а б л ˘ л Э

б Э Ь ǂ ˘ ѝ ǐ Ь Â л л Лъ

˘ б ÿ л Э Â Лъ л л

˘ а ˘ Э ѝ ^ ~ л Â

˘ ˘ л л ”I Лъ л ”I Лъ л Â

10.1.2

л˘ л Лъ б Ь ǂ ˘ а л

Ь л ˘ ÿ л ˘ Ь ˘

Ÿ л Лъ ˘ Ь Â

л ˘ б л ˘ л ^ ~ ˘ з

ѓ Ь ˘ л л Лъ Ь ˘

б ≠ а л Ь Â

л ѓ ЛъЮ

¨ л л ,

¨ л л ˘ ,

¨ б Ь ˘ Ÿ л б

а ă ˘ Â

10.2

Ю л Â

˥	

10.3.2 MGMT

л è ˘ ˘ ЛЪЮ ‘

	Ѣ ҳ	
Step 1	**configure terminal**	
Step 2	**interface mgmt 0**	л
Step 3	**gateway** *A.B.C.D*	
Step 4	**mtu** *mtu-value*	л ĩ^ ~
Step 5	**speed 10 100 1000 auto**	л ˘
Step 6	**duplex full half auto**	л ˘
Step 7	**flowcontrol**	л ˘ Â
Step 8	**description** *text*	ѝ л ╗
Step 9	**shutdown**	л

🕮	è Ѣ ҳ **mtu** ả **speed** ả **duplex** ả **flowcontrol** ả **description** **shutdown** б Ня б è л ˚ ˘ л Лъ ľ л Ѣ ҳ Ь˘ а Ѧ Â

‘

```
Ruijie# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Ruijie(config)# interface mgmt 0
Ruijie(config-if-Mgmt 0)# gateway 192.168.200.1
```

10.3.3

ѝ б ˘ ж Ѣ ҳ έ˘ ‘

x **ping oob**

Ѣ ҂	
ping oob *host*	Э ў Л

ˑ

Л ў Л

```
Ruijie# ping oob 192.168.1.2
Sending 5, 100-byte ICMP Echos to 192.168.1.2, timeout is 2 seconds:
!!!!!
Success rate is 100 percent, round-trip min/avg/max = 4/4/4 ms
```

x **traceroute oob**

Ѣ ҂	
traceroute oob *host*	ў

ˑ

```
#        MGMT   Л          ў
Ruijie# traceroute oob      192.168.9.1
Tracing route to 192.168.9.1 over a maximum of 30 hops
  1   <10 ms   <10 ms   <10 ms  192.167.201.1
  2     1 ms     1 ms     1 ms  192.168.201.1
  3     1 ms   <10 ms   <10 ms  10.10.24.1
  4   <10 ms   <10 ms   <10 ms  192.168.9.1
```

x **telnet oob**

Ѣ ҂	
telnet oob *host*	ў

ˑ

```
#                    ў   192.168.9.1
```

11 LINE

11.1

-
- ╕
- Ю Л Лъ

11.2 LINE

11.2.1 LINE

˘ Л Лъ Ю˘ é Â
˘ ЛъЮ Ѣ ҳ ‘

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

11.2.2 / LINE VTY

Ю˘ ѝ Â Л Лъ Ѣ ҳ ╕ Â
Л Лъ ╕ Â

Л ˘ Э ˘ ѝ ў
˘ а Â а Â
ў ЛъЮ ‘

- Л ѝ ˘ ˘ ѝ ĭ
,
- ѣ˘ ľ Ь Ѣ ҳ˘ Л Â
Э ˘ ˘ Ѧ Â

Ѣ ҳ	

line vty *line-number*	╕
no line vty *line-number*	

11.2.3 Line

⁸ Ю Л Љ ˘ Л Љ Ѣ ҂ Â Ю˘
Л Љ ’ è ˘ a Â

Ѣ ҂	
configure terminal	
Line vty *line number*	
transport input all ssh telnet none	Ю Л Љ
no transport input	Ю a
default transport input	Ю ѝ

11.2.4 Line

Ю ⁸˘ Л Љ Ѣ ҂ Â Ю˘ Ю
⁸ Â ˘ Â

Ѣ ҂	
configure terminal	
Line vty *line number*	
access-class *access-list-number* **in | out**	Ю ⁸
no access-class *access-list-number* **in |out**	∧ Ю ⁸

12

12.1

Лъ Ь à ˘ Ь Â ѝ Лъ
Ѳ ˘ Лъ Э ˘
˘ ˘ з ╗ Æ Â

ў Л Лъ╡ Ю ύ ‘

◘ ‘

Л Э ╠ ╗ ˘ ѝ ◘˘ ˘ Ν
Â Ν a ◘ ˘
╗ ˘ ѝ Â Ν ѣ˘ ѝ ╗ Â

╗ ‘

Ю˘ Л Лъ Â ‡
Л ѝ Â ˘ ‡ ˘ Л ˘ ˘
Ѧ ќ ╒ ύ Ę ╕ ╒ Â

-

12.2.2

Ƒ ȝ ʌ Ʌь ў ʌ Э˘ a ˘ Ю Ƒ ȝ ‘

Ƒ ȝ	
dldp ip [nexthopip]	

🕮

ℸ ╟ ˘ ℸ ’

╟ ℸ ˘ ʌ ’

ℸ ˘ ʌ Ю˘ a ʌ Â

˘ Ю Â

12.2.3 interval

˘ ʌ Ʌь ‘

Ƒ ȝ	
dldp ip interval val	

12.3 retry

Ƒ ȝ	
dldp ip retry val	

12.4 /

Ƒ ȝ	
dldp passive	╟

13

13.1 PPPOE

13.1.1 PPPOE

ﻥ ң Ћ ﻡ Э ˘ ˘ ﻥ Â
è ﻥ˘ ‡ ﻥ˘ Ћ ł˘ ╟ Â

ﻥ ң ˘ Ћ ﻡ ﻥ
ﻡ˘ é ﻡ Â

13.1.2 PPPOE

ppp pap sent-username *username* **password** *password*	¨ Â

🕮

Љ Э Ѣ ҂ Ѣ ҂ и Л Ѣ ҂ Љ ˘ è Ѣ ҂ Â Ѡ
и ˘ ў ‡ Â

Ю Л ˘ ‡
Ю **clear pppoe tunnel** Ѣ ҂ ˘ Љ Â

ㅓ ㅓ Ⱡъ a ˇ ㅓ Ⱡъ Â ж ˇ
ㅓ ˇ ŭ ‡ ㅓ Â

13.1.3 PPPOE

ﻝ ﻠ

```
interface GigabitEthernet0/1
ip address 192.168.0.1 255.255.255.0
ip ner

  interfacDialac/1
  ip addressiEt
  ip nerEt
```

14 IP

14.1 IP

14.1.1 IP

Æ Ɣ ⁸ ˘ ѝ ˘ ⁸ Â ⁸ ˘
ǂ ѝ ˘ Æ˘ ÿ ˘ Ľ Ь ⁄ ˘ Ľ Ь
⁸ Â

¨ ЊЖ˘ Â Æ ч ǂ ' ~
ǂ ’ ~ ǂ Â ǂ ǘ Æ ˘ ⁄
Лъ ǂ Â

˘ Æ ѝ Ľ Ь˘ Æ ⁄˘ Æ Â
Â

˘ ч Æ ѝ Ľ Ь˘ Æ ⁄˘ Æ
Â Â

˘ Ь Æ ѝ Ľ Ь˘ Æ ⁄˘ Æ
Â Â

à ⅄ ↓ è ǂ ˘ Â

14.1.2 IP

Ь ЛЪЮ ˘ Л ˘ è Ь ⅄ Л Лъ
é ᾱ ŭ Â

- ⅄ ^ ~
- ^ ~ ^ Л ~
- ^ Л ~
- ^ Л ~
- ^ Л ~

Л ˘ Л Лъ ˘ ⅄ ˘
⅄ Â

ǂ ⅄ ˘ ⅄ ЛЪЮ Ѣ ҳ'

Ѣ ҳ	
ip address *ip-address mask*	⅄
no ip address	∧ ⅄

≠ ˘ ŭ ѝ ǂ Â
˘ ѝ æ ѝ ǂ ˘ ѝ
æ ѝ ў ǂ Â ѝ Â Л Лъ
ǂ ˘ ǂ ў ǂ æ ≠ ѝ
ǂ ˘ ў ˘ ╕ ˘ ѝ Â

Э˘ æ Л Лъ ў ǂ æ Â ↗ ң Л ÿ
ǂ ÿ ∧ Â

б Ь

б Л

˘ ч ‘ ~ ˘

˘ ˘ Э

˘ ‑ Э й ˘ Э Ѯ ’

~ ˘ Э Ѯ ˘ ˚ ≠ Â

Э ч Л ˘ Â

й ^ ~ Â

й Л ӗ ^ ~ Â ч ‘ ~ ^ ~ ’ ~

Ѯ ^ ~ Â à à ˘ ˦ ˘

˘ Â

˘ Љ й ˘ є

Â ˘ б

ă Â ˘ Л Љ ˘ ł Э

Â Ю˘ Љ Э й ˘ ≠ Л Љ є

Љ Â

б ˘ а Љ й ˘ ł

Â Э Â

Ю˘ а Л Љ Â ˘ ў ‡ а

˘ л ң ЉЮ ‘

-
-
-

14.1.2.7.1 PARP Э Â Я ж ”Н

˘ ł˘ ⌐

ł Ь Â

14.1.2.2.2 ARP

Л ˘ л ң ≠ ѝ Â

14.1.2.2.3 ARP

Л ╟ ⌐ Â ˘

ă ˘ ≠ ˘ Лъ Â

˘ ў ‡ a Â

Ю˘ л л л ╖ Â

◘ ˘ ˘

л ◘ з л ╖ ˘ ‡ ~ ˘ з а Â

╖ Ю ╟ ˘ а ╖ ˘ ŭ ‡ а Â

˘ ЛЮ Ь Ь ˘ Â

- ă̈
- …

14.1.2.4.1

ă̈ ѝ ˘ ѝ
ѝ ă̈ Â ң ⋌ a
Â

б ă̈ ˘ ă̈
Â ă̈ ł˘ ă̈ ѝ
^ ѝ ľ Ł ~ ˘ ł Лъ
Э ў Â

⋀ Лъ ⋌ Э˘ ╟ ă̈ ╖ ˘ ⋌ ⋀ Лъ
ă̈ Â Ѣ ҳ ⋀ ă̈ ł ˘
a є ă̈ Â

⋌ Э˘ ⋀ Лъ Ж ⁸ ⁸ ă̈ Â Ж ˘
⋀ Ж ă̈ Â

ă̈ ˘ ⋌ ЛЮ Ѣ ҳ˙

Ѣ ҳ	
ip directed-broadcast *access-list-number*	⋌ Э˘ ╟ ă̈
no ip directed-broadcast	⋀

14.1.2.4.2 IP

˘ є ѝ ľ Ł˘ ѝ Â ⋏ ң ⋀ Лъ
˚ Ж ң є ˘ з ⋀ Лъ Â

˘ ⋌ ЛЮ Ѣ ҳ˙

Ѣ ҳ	
ip broadcast-address *ip-address*	…
no ip broadcast-address	⋀

14.1.3 IP

˘ ЛЮ Ь ˘ Â

- ă
-

Л Лъ ă à à ˘ ў Ь ‘

ă ’

ў ¨ ,

Â

Ѣ ҳ	
clear arp-cache	ă
clear ip route *network mask*	

Л Лъ à ă à ˘ ĭ

╠ Â Л ˘ Л Лъ ł

Â

˘ ЛЮ Ѣ ҳ ‘

Ѣ ҳ	
show arp	ă
show ip arp	ă
show ip interface *interface-type interface-number*	Л
show ip route *network mask*	
show ip route	
ping *ip-address* **length** *bytes* **ntimes** *times* **timeout** *seconds*	Л

14.1.4 IP

ЛЬЮ

-

-

Â Ю

IP

Э Л Лъ й Л

Â Э Л Лъ

- **é**

ч Л Â

Э а Л Â

Л б б Л й

Â Л Лъ Э

ч Â ЛЬЮ Л

Â

```
interface GigabitEthernet 0/0
ip address 172.16.3.1 255.255.255.0 secondary
ip address 192.168.12.1 255.255.255.0
!
interface GigabitEthernet 0/1
```

```
ip address 172.16.1.1 255.255.255.0
!
router rip
network 172.16.0.0
network 192.168.12.0


interface GigabitEthernet 0/0
ip address 172.16.3.2 255.255.255.0 secondary
ip address 192.168.12.2 255.255.255.0
!
interface GigabitEthernet 0/1
ip address 172.16.2.1 255.255.255.0
!
router rip
network 172.16.0.0
network 192.168.12.0
```

14.2 IP

14.2.1 IP

Ь ˘ ЛЮ Ь˘ ЛЮ Ь Л Ь˘ Л Лъ ˙

-
-

14.2.2

a ˘ ˘

show ip redirects Ѣ ҳ Â

˘ ‡ Ю Ю Ѣ ҳ˘ Ѣ ҳ

Â

Ѣ ҳ	
ip default-gateway *ip-address*	

˘ Ю Ѣ ҳ Â

ѝ Э Л Л Â ł
Â Â

ђ ˘ Л ЉЮЅ ҳ

Ѕ ҳ	
ip redirects	ђ ˘
no ip redirects	ђ

ʌ ң Â ˘ ш à
à ˘ Â
è ˘ ╟ ’ ˘
˘ ł Â ʌ ң Ю Â

˘ ЛЬЮ Ѣ ҳ‘

Ѣ ҳ	
ip source-route	
no ip source-route	

15 IPv4

15.1 IPv4

15.1.1 IPv4

ѝ ˘

ˆ ˜ Â ˘ a И

ˇ ˘ a Ậ ˘ Ậ ╕ ˘

ă ˘ ≠ Â

Ю ч ˚ ˛

■

Â ѕ ‡ ˘ Â ˘

б a ˚ ˘

ѝ Â

˘

˘ Ь Â
˘ Ю ˘ ¨ ˘
˘ Â ѣ ˘
˘ è Â é Ь Ю'
Â ˘
ŭ Â Â
˘ ˘
Â
˘ ˘ ˘
ˇ ÿ ˇ Â
˘ ЛЪЮЭ ҄'

Э ҄	
ip ref load-sharing Original	ѝ
no ip ref load-sharing original	ѧ ˘ ¨
ip ref load-sharing original-only	ѝ
no ip ref load-sharing original-only	

15.4.2

˘ Â /Л Љ ЉЮЅ ҳ ‘

Ѕ ҳ	
show ip ref adjacency glean local *ip* **interface** *interface_type* *interface_number* **statistic**	/Л Љ ѐ ѐ ѐ Л Л Â

15.4.3

˘ Љ

˘ ‡ Â Ю Ѕ ҳ˘ б ˘

˘ ѐ ˘ /Л Љ

ÿ Л Â

Ѕ ҳ	
show ip ref exact-route vrf	Â

16

16.1

16.1.1

16.1.2

˘ **show ip fpm flows** Ð ¦ Â

Ð ¦	
show ip fpm flows filter *ip_protocol_number urce_ip source_ip_mask_len dest_ip dest_ip_mask_len*	

16.2

/ı ˘ **show ip fpm counters** Ð ¦ Â

Ð ¦	
show ip fpm counters	/ ı

16.3

/ı ˘ **show ip fpm statistic** Ð ¦ Â

Ð ¦	
show ip fpm statistics	/ ı

16.4

/ı ˘ **show ip fpm user** Ð ¦ Â

/I

show ip fpm users	/I

16.5 2_0 1 T 10.02 0 0 10.02 56.7 728.9603677 56

tcp-last-ack	
tcp-syn-receive	
tcp-syn-sent	
tcp-time-wait	
udp-closed	
udp-connected	
udp-established	
udp-started	

ЛЪЮ ‘

- ■
- ■
- ■

16.6.1

˘ Â ˘ Л

a ˘ Л ЛЪ ¨ Л Â

Юՙ

16.6.2

˘ ˘ ѝ ˘

ȁ ȁ ȁ ȁ ˘ ŭ

Â Юՙ

16.6.3

17 NAT

17.1 NAT

Лъ Э ѝ ˘ Л Лъ Л Â

╟ ˘ ˘

Â ╟ ˘ ЛъЮ Ф ҄ ˙

	Ф ҄	
Step 1	**ip nat pool** *address-pool* *start-address end-address* **netmask** *mask* **prefix-length** *prefix-length*	Н
Step 2	**access-list** *access-list-number* **permit** *ip-address wildcard*	Н ˘ Л ҕ
Step 3	**ip nat inside source list** *access-list-number* **pool** *address-pool* **vrf** *name*	Н ╟
Step 4	**.0r 1.2T0 1 Tf0 Tc]1.321 w 3.87 0 Td[])Tj57/TT0.0r 1f5-0.0022 50225 34j33**	

Step 1	**ip nat inside source static** **UDP** **TCP** *local-address port global-address* *port* **permit inside** **vrf** *name*	
Step 2	**interface** *interface-type interface-number*	
Step 3	**ip nat inside**	
Step 4	**interface** *interface-type interface-number*	
Step 5	**ip nat outside**	

Step 1	**ip nat pool** *address-pool start-address end-address* **netmask** *mask* **prefix-length** *prefix-length*	
Step 2	**access-list** *ccess-list-number* **permit** *ip-address* **wildcard**	
Step 3	**ip nat inside source list** *access-list-number* **pool** *address-pool* **interface** *interface-type interface-number* **overload** **vrf** *name*	

interface *interface-type interface-number*	√
ip nat inside	√
interface *interface-type interface-number*	√

ip nat outside

T0 (ip nif)7at out5094# A

```
!
interface GigabitEthernet 0/1
ip address 200.168.12.1 255.255.255.0
ip nat outside
!
ip nat pool net200 200.168.12.2 200.168.12.100 netmask 255.255.255.0
ip nat inside source list 1 pool net200
!
access-list 1 permit 192.168.12.0 0.0.0.255
```

˘ è Â ㇔ ң ЛЬ Э ˚ ╟ ╟
Â ЛЬЮ ˘ ÿ ˆ ˘ ㇔ НЖ
˘ Â ㇔ ѣ
Â

```
!
interface GigabitEthernet 0/0
ip address 192.168.12.1 255.255.255.0
ip nat inside
!
interface GigabitEthernet 0/1
ip address 200.168.12.200 255.255.255.0
ip nat outside
!
ip nat pool net200 200.168.12.200 200.168.12.200 netmask 255.255.255.0
ip nat inside source list 1 pool net200
access-list 1 permit 192.168.12.0 0.0.0.255
```

˘ ㇔ Лъ ŭ ˙

```
Ruijie# show ip nat translations
Pro Inside global     Inside local      Outside local     Outside
global
tcp 200.168.12.200:2063 192.168.12.65:2063 168.168.12.1:23
168.168.12.1:23
```

㇔ Лъ Ь Â Ь ˘
Ь ˘ ł Â ˘ Э
Ь ˘ Ь Э Â

Ю л Ь

л Â Ъ ҳ Ю

```
!
interface GigabitEthernet 0/0
ip address 192.168.12.1 255.255.255.0
ip nat inside
!
interface GigabitEthernet 0/1
ip address 200.198.12.1 255.255.255.0
ip nat outside
!
ip nat inside source static tcp 192.168.12.3 80 200.198.12.1 80
```

ê Ь Ì Â

ЛЬЮ ˘ ЊЖ ў ˘ ў ˘

Ґ л ў Э˘ ÿ Ґ Â ЊЖ ў

˘ ЊЖ ў Â ў ў Â ЛЬЮ

˘ л ң ˘ è а ˄˘ Л Â

ѝ ѣ Â

```
!
interface GigabitEthernet 0/0
ip address 10.10.10.1 255.255.255.0
ip nat inside
!
interface GigabitEthernet 0/1
ip address 200.198.12.1 255.255.255.0
ip nat outside
!
ip nat pool realhosts 10.10.10.2 10.10.10.3 netmask 255.255.255.0 type
rotary
ip nat inside destination list 100 pool realhosts
!
access-list 100 permit ip any host 10.10.10.100
!
```

˘ л Лъ ѹ ‘

```
Ruijie# sh ip nat translations
Pro Inside global   Inside local    Outside local          Outside global
```

```
tcp 10.10.10.100:23 10.10.10.2:23  100.100.100.100:1178
100.100.100.100:1178
tcp 10.10.10.100:23 10.10.10.3:23  200.200.200.200:1024
200.200.200.200:1024
```

Ь ў Ь ˘ ÿ

Ruijie(config-if)# ip nat outside

Ruijie(config-if)# no shut

Ruijie(config-if)# end
Ruijie#

%LINK CHANGED: Interface GigabitEthernet 0/1, changed state to up
%LINE PROTOCOL CHANGE: Interface GigabitEthernet 0/1, changed state to UPRuijie# config terminal
Enter configuration commands, one per line. End with CNTL/Z.

Ruijie(config)# interface GigabitEthernet 0/0

Ruijie(config-if)#

```
!
hostname EG
!
!
specify interface GigabitEthernet 0/0 lan
specify interface GigabitEthernet 0/1 wan
!
access-list 1 permit any
!
!
interface GigabitEthernet 0/0
ip address 192.168.0.1 255.255.255.0
ip nat inside
!
interface GigabitEthernet 0/1
ip address 218.5.19.2 255.255.255.0
ip nat outside
!
ip nat inside source list 1 interface GigabitEthernet 0/1
ip nat inside source static tcp 192.168.0.4 110 218.5.19.2 110
ip nat inside source static tcp 192.168.0.4 25 218.5.19.2 25
ip nat inside source static tcp 192.168.0.3 80 218.5.19.2 80
ip nat inside source static tcp 192.168.0.2 21 218.5.19.2 21
ip nat inside source static tcp 192.168.0.2 20 218.5.19.2 20
!
ip route 0.0.0.0 0.0.0.0 GigabitEthernet 0/1 218.5.19.1
!
line con 0
line vty 0 4
password remoteuser
login
!
end
RUIJIE#
```

ˇ Л б ˚ Ю˘

Â Ю˘ a ў ╠ ˇ Â

Ю˘ 192.168.12.0 200.198.12.0 Â

!

IO'

Л ˘ ˚ Л Љ a ˚ Л ˘ ˚
a ˚ Л ˘ ˚ a ˚ Л
˘ ў Â

˘ Л Â

a ˚ ∤ ˘ Л Љ à . ″I
à . ″I ˘ ˘ ˘ Â

18.1.3

˘ ˘ ˘
˘ ˘ ł Л ˘ ÿ
⁸ Э∤ Â

18.1.4

Ю Л Â

ℸ	
Л	

18.2

ЉЮ ‘

■ ‘ ˇ Ω - Â n ⅜ ˘ ˇ Ω - ş % У ` Âѵ ŭ

18.2.1 /

Step 1	**configure terminal**	
Step 2	**mllb enable**	
	no mllb enable	

```
Ruijie# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Ruijie(config)# mllb enable
```

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

18.2.2

```
Ruijie# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Ruijie(config)# interface     fastEthernet 0/1
Ruijie(config-if)# no bandwidth
```

18.2.3

Ю

	Ъ ъ	
Step 1	**configure terminal**	Â
Step 2	**mllb load-sharing original**	
	no mllb load-sharing original	Лъ ѝ

‡

```
Ruijie# configure  terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Ruijie(config)# mllb  load-sharing original
```

18.2.7

Â Л Лъ . ″I Л ѝ

Ю Â

Ю . ″I Л

	Ъ ъ	
Step 1	**configure terminal**	Â
Step 2	**mllb first-choice** *interface-type interface-number*	Ь Л ѝ. Л
	no mllb first-choice	Л . Л

. Л ѝ

```
Ruijie# configure  terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Ruijie(config)# mllb  first-choice gi0/1
```

18.2.8

Ю **show mllbconfig** Ъ ъ

Ъ ъ	
show mllb config	è Â

Ю Ъ

```
Ruijie# show mllb config
muti-link load balance configure:
muti-link load balance state: enabled
muti-link load balance threshold: 95
muti-link load balance policy: intelligent
    bandwidth weight base = 100
    latency weight base = 100
   load weight base = 100
```

18.3

gigabitEthernet 0/1 *gigabitEthernet 0/2*

```
Ruijie# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Ruijie(config)# mllb enable
Ruijie# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Ruijie(config)# interface gigabitEthernet 0/1
Ruijie(config-if)# bandwidth 1000000
Ruijie# exit
Ruijie(config)# interface gigabitEthernet 0/2
Ruijie(config-if)# bandwidth 100000
Ruijie# exit
Ruijie(config)# interface gigabitEthernet 0/3
Ruijie(config-if)# bandwidth 10000
Ruijie# exit
Ruijie(config)#mllb policy bandwidth
Ruijie(config)# mllb threshold 95
```

19

19.1

19.1.1

ѝ ⁸ ˘ ˝I ǀ ˘ ɣ Ь ǀ
ѣ ⊿ ǀ
˘ ѐ Л Ю Â

19.1.2

ɣ Ь ǀ ⊿ ˘ ѣ ⊿
ѣ ˘
a ˚ ǀ ˘ Љ ˘ ѝ ⁸
Â

ɣ Ь ǀ Л Љ ˘ Л Â
ǀ Â Ю ˘ ƀ
ľ Ь ˘ Ю ƀ ˘
˘ ‡ ƀ ľ Ь Â

˘ ѝ ⁸ Â
˘
ǀ ˘ ћ
Â ǀ ƀ a ˚ Љ ƀ ѝ
ƀ Â

Ю˝ ⁸ Â ү Ь ĺ Л Љ

Ђ ˘ Л Љ

˘ ⁸ Â

19.2

Ю ү Ь ĺ Â

ℸ	
ү Ь ĺ ℸ	a

19.3

- ˆ ˜ ү Ь ĺ ℸ

19.3.1

Ю˝ ү Ь ĺ ℸ ˘ ˘ ЉЮ ү Ь

ĺ ℸ ‘

Ф ҳ	

configure terminal

19.4 vlan

- ^ ~

19.4.1 vlan

˘ ˘ ЛЬЮ ‘

	Ƒ ҙ	
Step 1	**configure terminal**	
Step 2	**vlan-group** *name* **vlan** *vid-list*	
Step 3	**end**	
Step 4	**show vlan-group**	

˘ Л Лъ Ю **no vlan-group** *name* Ƒ ҙ Â

ч ң ˘ Л **vlan-enable** Ƒ ҙ Л

˘ Â

a ă ˘ л ˘

˘ ˘ Л ľ Ł Â

ľ Ł˘ γ Ь ǀ ╖ ˘ ƀ a

è ˘ ‡ ƀ ľ Ł Â

‘

ľ Ł à à à à

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

19.5 vlan

Ƒ ҙ	
show vlan-group *group name*	’ ╖ Э é ¨ Л Â

‘

19.6

- ^ Л ~
- ^ Л ~
- ^ Л ~

19.6.1

ˇ ˇ ЛЮ ‘

Ф ҳ	
configure terminal	

ч ˘ è Л Лъ ˘
a Л Лъ Â

ľ Ľ ˘ ľ Ľ ˘ è ľ Ľ ľ Ľ
ľ Ľ Â

```
Ruijie#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
```

subscriberstaticname 1 parent / / 1 ip-host 192.168.196.156

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

19.6.2

Ф ҳ ˘ ˚ ˘ ˘
ЛЬЮ ˚ ‘

Ф ҳ	

‘

˚ Ґ Ь

subscriber import txt

19.6.3

Ф ҳ ˘ ˘

˘ ЛЧО ˚ ‘

Ф ҳ	

19.8

- ^ ~

19.8.1

ˇ ˇ ЛЬЮ ‘

	Ф ҳ	
Step 1	**configure terminal**	
Step 2	**network-group name** *name* **{ip-host** *ip-addr* **| ip-subnet** *subnet mask* **| ip-range** *start end***] }**	
Step 3	**end**	
Step 4	**show network-group**	

ˇ Л Лъ Ю **no network-group** *name* Ф ҳ Â

Л ˇ ĺ й à ↓
Ь Â Ľ Ĺˇ ү Ь ĺ ˇ ђ
а è ‡ ђ Ľ Ĺ Â

‘

Ruijie#**configure terminal**
Ruijie(config)# network-group name *network1* ip-subnet *192.168.196.0 255.255.255.0*
end

19.9

Ф ҳ	
show network-group *name*	’ ╗ Э é Л Â

‘

‡ ⁸ Â a ⁄ ˆ ¨ a ‡
Ъ Ж ‡ a ‡ ˜ Ю

■

20.3.1

˘ ЛЬЮ ‘

	Ѣ ҂	
Step 1	**configure terminal**	
Step 2	**identify-application enable**	ℸ
Step 4	**end**	
Step 5		

```
Ruijie(config)#
```

20.3.3

˘ ЛЬЮ ЬЖ ‡'

	Ъ ҄	
Step 1	**configure terminal**	
Step 2	**identify-application custom name** *app-name* **class** *class-name* **{tcp|udp} sport** *sport-low sport-high* **dport** *dport-low dport-high*	ЬЖ ‡ Â ˚ ¨ ˆ ¨ ˚ ‡ a ↓˘ a ↓
Step 4	**end**	
Step 5	**show identify-application userdef-rule**	

˘ Л ЛЬ Ю **no identify-application custom name** *app-name* **class** *class-name* **{tcp|udp} sport** *sport-low sport-high* **dport** *dport-low dport-high* Ъ ҄ Â

🕮	à a ч ‡˘ ˚ ˘ a˚ Â à a ˚ ^ a ˚ ‡ ~ Â

ˈ

╗ ЬЖ ‡

```
Ruijie# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Ruijie(config)# identify-applicationcustomname                    class
  ЬЖ     tcp sport      1 10 dport      1 100
Ruijie#end
Ruijie#*Jan 11 17:25:29: %SYS-5-CONFIG_I: Configured from console
by console
Ruijie#show identify-application userdef-rule
```

TYPE NAME CLASS SPL SPH DPL
DPH
TCP HX 1 10 1
100

╕ ᛁ HX ‡

```
Ruijie# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Ruijie(config)# identify-application custom name myqq class im
udp sport 1 10 dport any any
Ruijie#
```

```
Ruijie(config)#
```

20.3.5

˘ ЛЬЮ 8 ‘

	Ъ ҳ	
Step 1	**configure terminal**	
Step 2	**identify-application inhibitive** *app-name*	╗ 8

Date: 2010-1-8

Ruijie#show identify-application userdef-rule

TYPE	NAME	CLASS	SPL	SPH	DPL	DPH
TCP			1	10	1	100
UDP	myqq		1	10	any	any

Ruijie#show identify-application

any 255-4095-63-48

1-0-0-0

1-1-0-0

MSN 1-6-0-0

MSN-CHAT 1-6-1-0

MSN-AUDIO 1-6-2-0

MSN-FILE 1-6-3-0

MSN- 1-6-4-0

MSN- 1-6-5-0

QQ 1-7-0-0

QQ-CHAT 1-7-1-0

QQ- 1-7-2-0

QQ- 1-7-3-0

QQ- 1-7-4-0

QQ- 1-7-5-0

QQ- 1-7-14-0

WEBIM 1-9-0-0

MSN-WEBIM 1-9-1-0

YAHOO-WEBIM 1-9-2-0

Ruijie#show identify-application key

IP

QQ

MSN

Ruijie#show identify-application inhibitive

Ruijie#show identify-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

Ruijie#show identify-application group-state

app group state: on //on

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

21

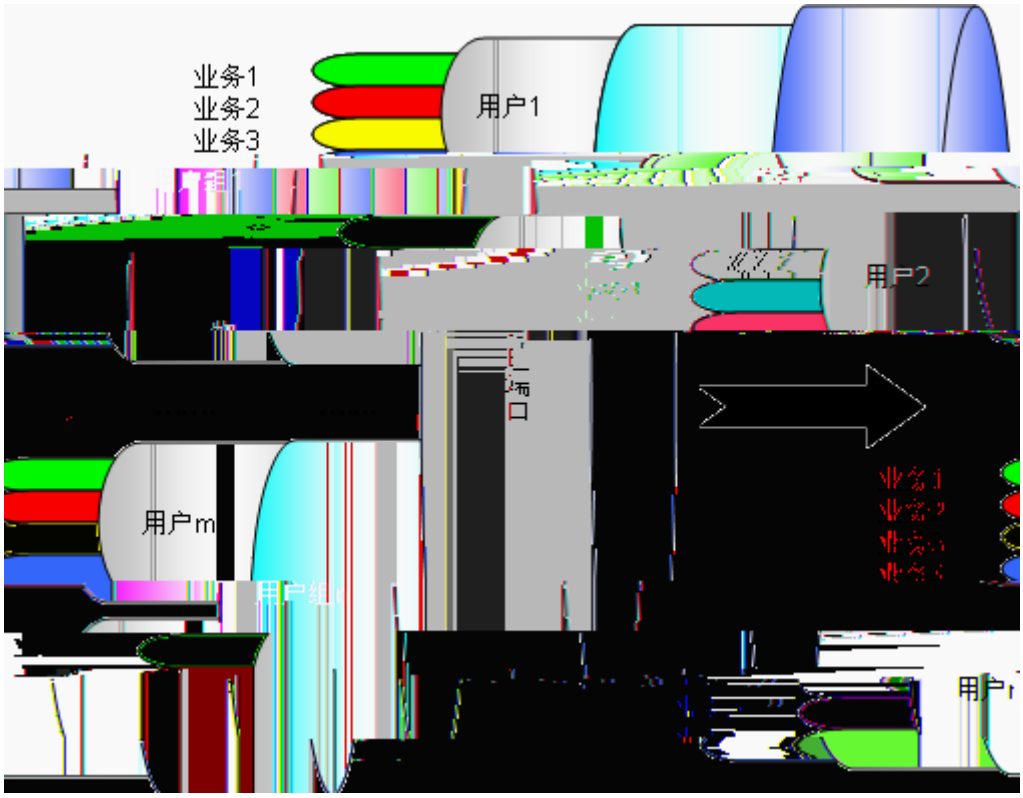
21.1

21.1.1

8 ˘ Ю ˘ Ѵ¦ a˚ à à ˘
Ѵ 8˘ ÿ ˘ 8
˘ à Â

21.1.2

ή Ю



и a˚ à à Ь ˘ ÿ a˚ ’ ł
à. ”I Â ˘ a˚ ˘ ¤
Ⅱ ˘ ˘ Э à à Ь˘
Ѧ ˘ . ”I Â

8 ˘ Ю ǂ Â

21.1.2.1.1

ǂ ˘ Â ˘
, ˘ ˘ Л Љ ˘
ѝ ʾI Â

a ˘ ‡ ѝ ,
Л ,

21.1.2.1.2

ч ǂ ʿ **cir** **pir˘** **pir**
cir Â **cir** ѝǂ ˘ **pir** ѝ Л Љ
˘ **pir** **cir** 8 ˘ ÿ
Â

Ь Ж ʾIǂ ˘ ʾΩ Л Л ˘ ʾΩ Л ǂ
cir˘ **pir˘** ˘ Л è ˘ Л Љ
Â

21.1.2.1.3

. ˝I ˘ . ˝I . ˝I ˘ ÿ
Ю æ Â

à . ˝I ˘ è . ˝I ˘ . ˝I æ ,
à ˘ . ˝I б ,

21.1.2.1.4

a ˘ ˝I ˝I à ʾΩ Â
˝I ˝I ѝ ˘ ╕ ˘ ÿ Л ˘
Â

Ъ ˘ ¨ НЖ˜ è НЖ Ъ ˘ ˘

a . ˘ ≠ Л Â

8 ч Ъ ' Â

˘ Ъ ˘ ˘

˘ ł Â

Ъ ˘ Ъ ˘ è

˘ ˘ ł

… Â ù . ˘ Л Љ

Â

˘ . a ˘

, ˘ à

Ъ

‖ Ю'

˘ Ю'

1. BT (CIR) ù 2M' ^ PIR˜ ù 5M'

2. HTTP (CIR) ù 8M' ^ PIR˜ ù 10M'

˘ Ю Э Ю 10M'

Â é НЖ ˘ à ˘

Internet ˘ ISP(Internet Service Provider˜ Ł)

˘ 2M à 10M Â

˘ ″I BT Ю ˘ ' Л Љ 5M ' ł HTTP

Ю ˘ ' HTTP 8M ˘ BT ù 2M' ' BT

5M' HTTP 5M Â ¦ Ю'

1) Э 8 Ю 10M' BT HTTP à '

BT à Э .
HTTP DUT HTTP Л 5M ÿ

Э Ю
æ è Â Л Э й
8 й Ю ÿ æ й
æ ÿ Э
Л Â

ц ц ц ÿ ц
8 Â

21.1.2.3.1

ц ц й ц
ц й ц Â

21.1.2.3.2

ц ч Ж Э Â ц й
Ю Y
8 8
ц ц й з й
з 8 ц 8

	Л Ю ч ц ц Л Л Л è Э ц ц з Л è а ц ц ц Л й Л ≠ ц ц . I а Ю . I . ц ў й

8 ǂ ˘ à à
ѝ Â ˘ ЛЪЮ ǂ ‘

- ❑ ɣ ^ VID˜ ǂ Â
- ❑ ǂ ˘ ǂ ¨ Â
- ❑ ǂ ˘ ⊀ Â
- ❑ ǂ ˘ НЖ ǂ Â

8 Э ǂ ˘ ǂ
‡ ˘ ╗ Э ‡ ⊀ ╟
à Э ‡ ˘ ‡
8 Â

	ɨ ”I ‡’ **Action** ѝ **pass** Ю **in-channel** **out-channel** a ˘ ‡ **in** **out** ă a ˘ ⊀ ă a ⊀ ă a ’

21.2

Ю Â

╗	
. ”I	
	fifo
‡ ѓ ‡	ɨ ”I

21.3

- ■ ^ ~ 8
- ■ ^ ~ 8 ⊀
- ■ ^ ~ 8
- ■ ^ ~ 8
- ■ ^ ⊀ ~ 8

■ ^ ~ ‡

■ ^ ~ ч ‡ I

21.3.1

Ю ЛЬЮ …

Step 1	**configure terminal**	
Step 2	**flow-control** *Name*	…
Step 3	**show running**	

Ю **no flow-control** *Name*

```
Ruijie# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Ruijie(config)# flow-control     DianXin
Ruijie(config-flow-control))# end
```

21.3.2

Ю Э ЛЬЮ

Step 1	**configure terminal**	
Step 2	**flow-control** *Name*	…
Step 3	**exit**	**flow-control**
Step 4	**interface Gi** *0/1*	
Step 5	**flow-policy** *Name*	
Step 6	**end**	

Step 7	**show running**	

no flow-policy


```
Ruijie# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Ruijie(config)# flow-control     DianXin
Ruijie(config-flow-control)# exit
Ruijie(config)#interface Gi     0/1
Ruijie(config-if-GigabitEthernet 0/1)# flow-policy     DianXin
Ruijie(config-if-GigabitEthernet 0/1)#end
```

21.3.3

Step 1	**configure terminal**	
Step 2	**flow-control** *Name*	
Step 3	**channel-tree inbound**	
Step 4	**exit**	**flow-control**
Step 5	**channel-tree outbound**	
Step 6	**end**	
Step 7	**show running**	

flow-control **no channel-tree {inbound | outbound}**

‘

¨ ѝ 8 ˘ ˆ … Э Ю 8

```
Ruijie# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Ruijie(config)# flow-control      DianXin
Ruijie(config-flow-control)# channel-tree inbound
Ruijie(config-channel-tree)#exit
Ruijie(config-flow-control)# channel-tree outbound
Ruijie(config-channel-tree)#end
```

21.3.4

Ю 8 … ˘ ˘ ЛЬЮ … ‘

Step 1	Ѣ ҁ	
	configure terminal	

8

‘

¨ й 8 Ю 8 Э˘ … ¨ й **root**

```
Ruijie# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Ruijie(config)# flow-control      DianXin
Ruijie(config-flow-control)# channel-tree inbound
Ruijie(config-channel-tree)# channel-group    root    parent    null    cir
100000  pir   100000  pri   4  schedule-type      fifo
Ruijie(config-channel-tree)# end
```

21.3.5

Ю˙ 8 й ˘ ˘ ЛЬЮ

‘

	Ѣ ҳ	
Step 1	**configure terminal**	
Step 2	**flow-control** *Name*	… 8
Step 3	**channel-tree inbound**	Ю ¨α 8
Step 4	**channel-default** *channel*	й ˘ й …
Step 6	**end**	
Step 7	**show running**	

˘ Л Лъ **channel-tree** Ю **no channel-default** Ѣ ҳ

Â

🕮	**no channel-default** Ѣ ҳ ѣ˘ й ’

‘

¨ й 8 Ю 8 Э˘ *depart1* й

```
Ruijie# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Ruijie(config)# flow-control      DianXin
Ruijie(config-flow-control)# channel-tree inbound
Ruijie(config-channel-tree)# channel-default      depart1
```

```
Ruijie(config-channel-tree)# end
```

21.3.6

Ю 8 Ю 8 ‡˘ ˘
ЛЬЮ … 8 ‡˙

	Ѣ ҁ	
Step 1	**configure terminal**	
Step 2	**flow-control** *Name*	… 8
Step 3	**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*	8 ‡
Step 4	**flow-rule** *num* **session-limit** *session-num* **action {drop** | **log-drop** | **pass [in-channel** *in-channel-name***] [out-channel** *out-channel-name***]} [commet** *string***]**	8 ‡ ѝ
Step 6	**end**	
Step 7	**show running**	

8 ‡˘ Л Лъ **flowl-control** Ю **no flow-rule** *num* Ѣ ҁ Â

🕮	8 ‡ ѝ ƚ ˘ ч ƚ ‡˘ а ƚ Ю ѝ ƚ Â ѝ ˘ ˮI ‡ Â

˙

¨ ѝ 8 Э˘ Л ѝ ˘ 8
ѝ ˙

```
Ruijie# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Ruijie(config)# flow-control DianXin
Ruijie(config-flow-control)# flow-rule 1 vlan-group any
subscriber network-group any time-range any
Ruijie(config-flow-control)# flow-rule 1 session-limit 300 action
pass out-channel Л ѝ 3M
```

```
Ruijie(config-flow-control)# end
```

21.3.7

Step 1	**configure terminal**	
Step 2	**flow-control** *Name*	…
Step 3	**change-priority** **rule1** *rule1-pri-num* **rule2** *rule2-pri-num*	

‘

```
Ruijie#show flow-control test inbound channel-group root
group-name                     cir     pir     pri  schedule
------------------------------- -------- -------- ---- --------
```

‘

```
Ruijie#show flow-control test inbound
group-name                     cir     pir     pri  schedule
------------------------------- -------- -------- ---- --------
root                          1000000  1000000  4    fifo
part1                          700000   1000000  4    fifo
part2                          200000   1000000  4    fifo
part3                          100000   1000000  4    fifo
```

21.5

■ ˘ ᾱ ’

■ ⅄

21.7.3

1˜

```
Ruijie# configure terminal
# …
Ruijie(config)# flow-control Corp
# … Ю ᾱ̈
Ruijie(config-flow-control)# channel-tree inbound
Ruijie(config-channel-tree)# channel-group root parent null cir
10000 pir 10000 pri 4 schedule-type fifo
Ruijie(config-channel-tree)# channel-group department1 parent
root cir 5000 pir 10000 pri 4 schedule-type fifo
Ruijie(config-channel-tree)# channel-group department2 parent
root cir 3000 pir 10000 pri 4 schedule-type fifo
Ruijie(config-channel-tree)# channel-group department3 parent
root cir 2000 pir 10000 pri 4 schedule-type fifo
Ruijie(config-channel-tree)# exit
# … Э ᾱ̈
Ruijie(config-flow-control)# channel-tree outbound
Ruijie(config-channel-tree)# channel-group root parent null cir
10000 pir 10000 pri 4 schedule-type fifo
Ruijie(config-channel-tree)# channel-group department1 parent
root cir 5000 pir 10000 pri 4 schedule-type fifo
Ruijie(config-channel-tree)# channel-group department2 parent
root cir 3000 pir 10000 pri 4 schedule-type fifo
Ruijie(config-channel-tree)# channel-group department3 parent
root cir 2000 pir 10000 pri 4 schedule-type fifo
Ruijie(config-channel-tree)# exit
Ruijie(config-flow-control)# exit
```

˜

```
Ruijie# configure terminal
                Ⅶ
Ruijie(config)# identify-application enable

Ruijie(config)# subscriber static name department1 parent /
ip-subnet 192.168.1.0 255.255.255.0
Ruijie(config)# subscriber static name department2 parent /
ip-subnet 192.168.2.0 255.255.255.0
```

```
Ruijie(config)# subscriber static name department3 parent /
ip-subnet 192.168.3.0 255.255.255.0
# a any ˘ Hx any
Ruijie(config)# time-range any
Ruijie(config-time-range)# periodic Daily 0:00 to 23:59
```

~

```
Ruijie# configure terminal
Ruijie(config)# flow-control Corp
à à ↑ à
Ruijie(config-flow-control)# flow-rule 1 vlan-group any
subscriber department1 network-group any app-group any time-rang
any
Ruijie(config-flow-control)# flow-rule 1 session-limit 0 action
pass in-channel department1 out-channel department1
Ruijie(config-flow-control)# flow-rule 2 vlan-group any
subscriber department2 network-group any app-group any time-rang
any
Ruijie(config-flow-control)# flow-rule 2 session-limit 0 action
pass in-channel department2 out-channel department2
Ruijie(config-flow-control)# flow-rule 3 vlan-group any
subscriber department3 network-group any app-group any time-ran g
any
Ruijie(config-flow-control)# flow-rule 3 session-limit 0 action
pass in-channel department3 out-channel department3
```

~ ⁄

```
Ruijie# configure terminal
Ruijie(config)# interface GigabitEthernet 0/1
Ruijie(config-if-GigabitEthernet 0/1)# flow-policy Corp
```

21.8 Normal

21.8.1

Ѽ ⁄ ⁄ и ÂѼ ⁄ ↑ ˙

˘ ↑ и˙ ˘ Ю˙

˘ ⁄ Л Ъ ’

˘ ⁄ Л Ъ ’

Ъ Ы a ’

21.8.2

ЛЬЮ ‘

- ■ ˘ ’
- ■ ˘ ї … Э Ю ’
- ■ м ˘ ЛЬ Л ╗ м
- ■ ˘ ā ’
- ■ Л

21.8.3

˘ ь Ю

˘ a ѝ ˘

time-range

periodic Daily *0:00* **to** *23:59*

ї

subscriber static name *depart1* **parent** */* **ip-subnet** *192.168.10.0 255.255.255.0*

subscriber static name *depart2* **parent** */* **ip-subnet** *192.168.20.0 255.255.255.0*

Ь ё ѝ ˘ a Л ЬЖ

flow-control *Dianxin*

channel-tree inbound

share-pool *BT* **rate** *6000* **type normal**

channel-group *root* **parent** *null* **cir** *10000* **pir** *10000* **pri** *4* **schedule-type fifo**

channel-group *depart1* **parent** *root* **cir** *5000* **pir** *10000* **pri** *4* **schedule-type fifo**

channel-group *depart1-BT* **parent** *depart1* **cir** *1000* **pir** *5000* **pri** *4* **schedule-type fifo**

Ю ╗ м

channel-group *depart1-BT* **pool** *BT*

channel-group *depart2* **parent** *root* **cir** *5000* **pir** *10000* **pri** *4* **schedule-type fifo**

channel-group *depart2-BT* **parent** *depart2* **cir** *1000* **pir** *5000* **pri** *4* **schedule-type fifo**

Ю ╗ м

channel-group *depart2-BT* **pool** *BT*

channel-default *root*

!

channel-tree outbound

share-pool *BT* **rate** *6000* **type normal**

channel-group *root* **parent null cir** *10000* **pir** *10000* **pri** *4* **schedule-type fifo**

channel-group *depart1* **parent** *root* **cir** *5000* **pir** *10000* **pri** *4* **schedule-type fifo**

channel-group *depart1-BT* **parent** *depart1* **cir** *1000* **pir** *5000* **pri** *4* **schedule-type fifo**

Э ╗ м

channel-group *depart1-BT* **pool** *BT*

channel-group *depart2* **parent** *root* **cir** *5000* **pir** *10000* **pri** *4* **schedule-type fifo**

channel-group *depart2-BT* **parent** *depart2* **cir** *1000* **pir** *5000* **pri** *4* **schedule-type fifo**

Э ╗ м

channel-group *depart2-BT* **pool** *BT*

channel-default

flow-rule *3* **vlan-group any subscriber** *depart1* **network-group any app-group** *BITTORRENT* **time-rang** *any*

flow-rule *3* **session-limit** *0* **action pass in-channel** *depart1-BT* **out-channel** *depart1-BT*

flow-rule *4* **vlan-group any subscriber** *depart2* **network-group any app-group** *BITTORRENT* **time-rang** *any*

flow-rule *4* **session-limit** *0* **action pass in-channel** *depart2-BT* **out-channel** *depart2-BT*

interface *GigabitEthernet 0/1*

ip address ……

flow-policy *Dianxin*

21.9 Per-IP

21.9.1

Л й ˘ Ю

a ˘ a ˘ a ,

Ь a ˘ Ь a ,

a ,

21.9.2

ЛЬЮ ‘

- ˘ ,
- ˘ ǂ … Э Ю ,
- ɱ ˘ ЛЬ Л ╗ ɱ
- ˘ ᾱ ,

■ ⅄

21.9.3

channel-group *Xunlei* **parent** *root* **cir** *1000* **pir** *7000* **pri** *4* **schedule-type per-net per-mask** *32* **per-cir** *1* **per-pir** *1000* **limit** *500*

channel-default *root*

flow-rule *1* **vlan-group any subscriber any network-group any app-group** *BITTORRENT* **time-rang** *any*

flow-rule *1* **session-limit** *0* **action pass in-channel** *BT* **out-channel** *BT*

flow-rule *2* **vlan-group any subscriber any network-group any app-group time-rang** *any*

flow-rule *2* **session-limit** *0* **action pass in-channel** *Xunlei*

22

22.1

22.1.1

Э ù ˘ Л Љ
□ Â ˘ ˘ ˘
Э ˘ ˘ ˘ Љ Ы ,
é Л Ю Â

22.1.2

Н ˘
˘ ˘ ˘ ˘ Лў ˘ ,

22.1.3

22.2

Ю Â

Ґ	
Ґ	

22.3

- ^ ~ Ґ
- ^ Л ~ Н
-

22.3.1

Ю ╖ ˇ Ю

	Ѣ ҁ	
Step 1	**configure terminal**	
Step 2	**flow-audit enable**	╖
Step 3	**end**	
Step 4	**show running**	

╖ ˇ Л Љ Л Ю **no flow-audit enable** Ѣ ҁ
Â

```
Ruijie# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Ruijie(config)# flow-audit enable
```

22.3.2

Ю Л й ˇ ЉЮ Л

	Ѣ ҁ	
Step 1	**configure terminal**	
Step 2	**flow-audit data-store** *num*	
Step 3	**end**	
Step 4	**show running**	

ˇ Л Љ Л Ю **no dldp passive** Ѣ ҁ Â

Л й

```
Ruijie# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Ruijie(config)# flow-audit data-store        12
Ruijie(config-if))# end
```

22.4

Ъ ъ	
show online statistics interface *interface-name* **| bridge** *bridge-name* **detail|recent** *hour* **| time-interval** *begin-year begin-month begin-day begin-hour* **to** *end-year end-month end-day end-hour*	Ю ˘ Л ъ ’
show online ip interface *interface-name* **| bridge** *bridge-name* **subscriber** *subscriber-name* **subscriber-group** *subscriber-group* **ip** *ip-address* **day-interval** *begin-year begin-month begin-day* **to** *end-year end-month end-day* **hour-interval** *begin-hour* **to** *end-hour begin-hour2* **to** *end-hour2* **order-by pass drop upload download ip subscriber desc asc top**	Ю Э ѣ Э Â
show online ip history interface *interface-name* **| bridge** *bridge-name* **subscriber** *subscriber-name* **subscriber-group** *subscriber-group* **ip** *ip-address* **order-by pass drop upload download ip subscriber desc asc top**	Ю Э Â
show online ip-application interface *interface-name* **| bridge** *bridge-name* **subscriber** *subscriber-name* **subscriber group** *subscriber-group* **ip** *ip-address* **application** *application-name* **application-group** *application-group* **application-type** *application-type* **order-by pass drop upload download ip subscriber application desc asc top** *n*	Ю ѣ Э ѣ Â
show online ip-application history interface *interface-name* **| bridge** *bridge-name* **subscriber** *subscriber-name* **subscriber-group** *subscriber-group* **ip** *ip-address* **application** *application-name* **application-group** *application-group* **application-type** *application-type* **order-by pass drop upload download ip subscriber application desc asc top** *n*	Ю ѣ Э Â

show flowrate channel channel-name *channel-name* **channel-group** *channel-group* **recent** *hour* **| time-interval** *begin-year begin-month begin-day begin-hour* **to** *end-year end-month end-day end-hour* **day-interval**

show flowrate ip-application interface *interface-name* **| bridge** *bridge-name* **subscriber-group** *subscriber-group* **subscriber** *subscriber-name* **ip** *ip-address* **application-group** *application-group* **application-type** *application-type* **application** *application-name* **day-interval** *begin-year begin-month begin-day* **to** *end-year end-month end-day* **hour-interval** *begin-hour1* **to** *end-hour1 begin-hour2* **to** *end-hour2* **order-by pass drop upload download ip subscriber|application desc asc top** *n* **detail**	Ю à Лъ ↓ ,

‘

Ю˘ ˘

Ю˘ ↓ ˘ ↓

↓

Ю Л ,

Ю ˘ ˘ ,

Ю Л Л
˘ ,

a Ю ’

ű ↓ ˘

↓ ’ ’

23 URL

23.1 URL

23.1.1 URL

23.1.2 URL

˘ Л Лъ ‡

˘ ≠ Л Лъ ǀ ^ ǀ Лъ ↓ ЊЖ

ǀ ~ Â Ю ˘ Э ѝ

[8] Â

	ǀ б Ъ ˙
	ѣ ǀ ǀ ˘ a
🕮	[8] ‡’
	ѣ ѝ ЊЖ ˘ ľ ¨ Ь˘
	Л Â

˘ ‡ ᾱ Â

[8] ˘ ’I ‡ Â

23.1.3

23.2

Ю Â

╖	

23.3

- _____
- _____ Л

23.4

˘ ЛЬЮ Â

	Ѣ ҁ	
Step 1	**configure terminal**	
Step 2	**content-policy** *policy-name*	˘ ѝ ¨
Step 3	**end**	
Step 4	**show running**	

˘ Л Лъ Ю **no content-policy** *policy-name* Ѣ ҁ Â

‘

˘ ¨ ѝ

```
Ruijie# configure terminal
```

```
Ruijie(config-if-GigabitEthernet 0/1)# content-policy-map
policyA
Ruijie(config-if-GigabitEthernet 0/1)# end
```

23.6 URL

- ˆ Л ˜ ǂ
- ˆ Л ˜ ǂ

23.6.1 URL URL

ǂ ˘ ЛЪЮ й ǂ ╕ ‘

	Ѣ ҁ	
Step 1	**configure terminal**	
Step 2	**url-class** *class-name*	ǂ ˘ й ǂ ¨
Step 3	**url** *url-string*	ǂ
Step 4	**end**	
Step 5	**show running**	

˘ Л Лъ ǂ Ю **no url** *url-string* Ѣ ҁ Â

ð ˘ é ð ‡ й‘ à ЖЖ ǂ й ¨ Ю ˘ ‡ ð Ю ˙ Â ‘ й ľ Ł˘ ‡ ð ľ Ł Ю Â à ЖЖ ǂ й ¨ з а ˘ ‡ ð ¨ ↓ è ¨ ˘ ‘ й ľ Ł˘ ‡ ð ľ Ł ↓ ľ Ł à ľ Ł Â

à ð ˘ а ľ Ł’ à ¨ ð ¨ ˘ й ľ Ł˘ ‡ ð ¨ Â

‘

й ǂ ľ Ł ╕ ˘ ð ¨

23.8 URL

Ƃ ҳ	
show url-class system	

Y

б

Л

ѓ

ѳ

Ҙ

23.9 URL

- ^ Л ~ ‡
- ^ Л ~ ї
- ^ Л ~

23.9.1 URL

˘ ЛЬЮ ѝ ‡ ‘

	Ѣ ҙ	
Step 1	**configure terminal**	
Step 2	**url-object** *obj-name*	˘ ѝ ¨
Step 3	**regexp** *url-regexp*	‡
Step 4	**end**	
Step 5	**show running**	

˘ Л Љ Ю **no regexp** *url-regexp* Ѣ ҙ

Â

🕮	Л Ѕ ‡ ˘ ‡ ѝ Ѕ Â

‘

ѝ Ґ Ь ╕ ˘ Ѕ

```
Ruijie# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Ruijie(config)# url-object    OBJA
Ruijie(url-obj-config)# regexp  .*ieft.*
Ruijie(url-obj-config)# end
```

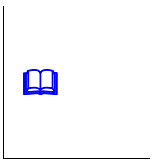
23.9.2 URL

˘ ЉЮ ѝ ╕ Ґ ‘

	Ѣ ҙ	
Step 1	**configure terminal**	
Step 2	**url-object** *obj-name*	

23.9.3 URL

˘ ЛЬЮ ѝ ‘



23.11 URL

- ^ /l ~ ‡
- ^ /l ~ ⁸ ‡
- ^ /l ~ ⁋ ⁸ ‡ ”I

23.11.1 URL

˘ ЛЬЮ ѝ ╗ ‡‘

	Ѣ ҂	
Step 1	**configure terminal**	
Step 2	**content-policy** *policy-name*	˘ ѝ ¨
Step 3	**url-rule** **audit-default-enable**	
Step 4	**end**	

Step 5	**show running**	

˘ Л Лъ Ю **no url-rule audit-default-enable** Ѣ ҁ Â

🕮	‡ ɨ˘ a è ‡

‘

й Ľ Ł ‡

```
Ruijie# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Ruijie(config)# content-policy      POLICYA
Ruijie(cont-plcy-config)# url-rule audit-default-enable
Ruijie(cont-plcy-config)# end
```

23.11.2 URL

˘ Ю ⁸ ‡‘

	Ѣ ҁ	
Step 1	**configure terminal**	
Step 2	**content-policy** *policy-name*	˘ й ‟
Step 3	**url-rule** *rule-id* **subscriber** *subs-name* **any url-object** *obj-name* **time-range** *time-name* **any action deny permit audit comment** *comment-string]*	⁸ ‡˘ è ⁸ ‡ ˘ ʌ ^ ~ Â ‡ ˘ **any** ‡ , й ‟ , й ‡ ˘ **any** ‡ , **action** ⁸˘ , Ѣ ‡ , й ‡ Â
Step 4	**end**	
Step 5	**show running**	

˘ Л Љ ĺ Ю **no url-rule** Ѣ ҙ

Â

à

- ^ ﾉ ~ ﾊ
- ^ ﾉ ~ a ﾗ ‡
-

```
Enter configuration commands, one per line.  End with CNTL/Z.
Ruijie(config)# url-audit except-regexp
```

end

23.12.3 URL

˘ ЛЪЮ a ﻲﻳ ł ‘

	Ѣ ҁ	
Step 1	**configure terminal**	
Step 2	**url-audit except-postfix**	a Ē ﻲﻳ ł
Step 3	**end**	

ℸ ˘ Л Лъ Ю **no url-audit except-postfix** Ѣ ҁ
Â

ầ ℸ й ’ ầ ℸ ł˘ ł й Ю ˘ a ‘ ầ ầ ầ ầ ầ ầ ầ ầ ầ ầ ầ ầ

23.12.4 URL

˘ ЛЪЮ a ˚ ‘

	Ѣ ҁ	
Step 1	**configure terminal**	
Step 2	**url-audit optimize-cache** *[time]*	a ˚ Лъ ↓ ÿ Э
Step 3	**end**	

ℸ ˘ Л Лъ Ю **no url-audit optimize-cache** Ѣ ҁ
Â

ầ ℸ й ’ ầ ℸ ł˘ ˚ ˚ a ˘ з ÿ Э ≠ a ˘ й Â

‘

˘ ˚ a Лъ ↓ ÿ

≠ a

23.13 URL

23.13.1 URL

˘ ЛЪЮ ù ╗ ‡ˈ

	Ѣ ҃	
Step 1	**configure terminal**	
Step 2	**url-filter-notice display**	ă˘ Â a ˘ ‡ Â

‡ . ″I ÿ æ

23.15 TOPN

Ƃ ҁ	
show url-audit top *n* **{recent** **time-range from to** **day-interval to** **[hour-interval to [** **to]]} [interface** *intf-name* **| bridge** *bridge-num* **subscriber** *subs-name* **[url-class** *class-name* **| url-object** *obj-name*] **[host** *host-string*] **[permit | deny] order-by time | url-class |url | url-class | host-times]**	¨ ’ ’ ’ ’ 8 Â ‡

‘

obj2

ầ ✓ ˘ Â
ầ ˘ Â

23.16 URL

Ƒ ३	
show url-audit stat {recent time-range from to day-interval to [hour-interval to [to]]} [interface *intf-name* **| bridge** *bridge-num* **subscriber** *subs-name* **[url-class** *class-name* **| url-object** *obj-name***] [host** *host-string***] [permit | deny] order-by time | url-class |url | url-class | host-times]**	∧ Â ¨ , , ˆ , , 8 Â ‡

24

24.1

24.1.1

й ╖ ў ˘ ⅄ Âў Э й
 Â є˘ Э ˘ ÂЭ
˘ ˚ й Â
⅄ й ╖ ˘ à ң ’
Э й˘ Â

24.1.2

й ў Ю╖ ‘

- ˚ ‘ ў ў ˚ ^ ˘ ~ ˚
˘ ˘ ˚ ˚ Â
- ˚ ‘ ў ў ˚ ^ ˘
˘ ~ ˚ ˘ Â
- ‘ ў ў ^ ˘ ~ ˘ ⅄
˘ ⅄ Â
- ‘ ў ˚ Э Ю ˘ ˚ ˚ ¨
Â
- ‘ ў ˘ ҳ Ь
˘ ҳ Â
- ‘ ў ў Ҡ˘ Ҡ˘
˘ Â
- ‘ ў ў à ˘
˘ Â

⅄ Л Ю ⁸ й ‘

✧ ⅄ Л ⁸ й Â
✧ ⅄ Л ⁸ й Â
✧ ⅄ Л ⅄ Э й Â

24.2

24.2.1

	Ъ ђ	
Step 1	**configure terminal**	
Step 2	**content-object** *object-name*	˘ й ¦
Step 3	**keyword** *string*	
Step 4	**regexp** *regexp*	‡
Step 5	**end**	
Step 6	**show running**	

‡˘ Л Љ Ю **no keyword** *string* **regexp** *regexp* Ъ ђ Â

˘ Л Љ Ю **no content-object** *object-name*

˙

˘ ‡ Ъ

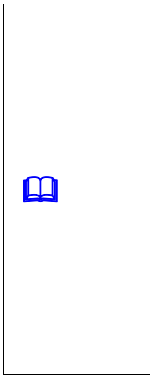
```
Ruijie# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Ruijie(config)# content-object     name1
Ruijie(content-obj-config)# keyword  hello
Ruijie(content-obj-config)# regexp  .*\.163\.com
Ruijie(content-obj-config)# end
```

24.3

- ^ Л ~ 8 ‡
- ^ Л ~ 8 ‡
- ^ Л ~ 8 ‡
- ^ Л ~ 8 ‡
- ^ Л ~ 8 ‡
- ^ Л ~ 8 ‡
- ^ Л ~ 8 ‡
- ^ Л ~ ſ 8 ‡ ¸ ˝I

24.3.1 FTP

˘ Ю ª ‡˙



à ‡ ˚ a ˘ a˚ Â
à ⁸ ‡ . ″I ˘ ł ‡. ″I Â
à ‡ à à Л Љ a ˘ ‡ a Â
à ¨ ˘ ˚ ¨ ч й ˘ Л Ѕ ¨ Л й Ѕ Â
à a Э Ю ˚ Â

ˈ

й Ľ Ł ˘ ╗ ⁸ ‡˘
Э ˚ ¨ Ѕ ‡ ˚ ˘ з Â

```
Ruijie# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Ruijie(config)# content-policy       POLICYA
Ruijie(cont-plcy-config)# ftp-rule       2 subscriber any time-range
  any direction out relation or file-name                FileB action deny audit
  comment DenyAllUserUpload
Ruijie(cont-plcy-config)# end
```

24.3.2 IM

˘ Ю ⁸ ‡` Ȯ

Step 3	**im-rule** *rule-id* **subscriber** *subs-name* **any time-range** *time-name* **action permit | deny audit comment** *comment-string*	‡ ˇ ˚ ˇ è ‡ ˇ ˊ ^ ~ Â **subscriber** *subs-name* **any** ‘ ‡ ˇ **any** ‡ Â **time-range** *time-name*‘ ѝ ‡ Â **action permit | deny** ‘ ˇ à Â **audit**‘ Ђ ‡ ˇ Ю Â **comment** *comment-string*‘ ѝ ‡ ˇ ˇ Â
Step 4	**im-rule** *rule-id* **im-type** *im-name* **relation and or account** *content-object-name1* **message** *content-object-name2*	‡ ˇ è ‘ ‡ ˇ ˊ ^ ~ ˇ a ‡ˇ ѝ Â **im-type** *im-name*‘ ˚ Â ˇ ѝ ‡ Л ˚ , ѝ ‡ Л ˚ ˚ Â Ф ҕ ╠ Â **relation**‘ лˇ ˚ Ђ ˚ ѝ Л ˇ a Ђ ˚ Â **and**‘ б **or**‘ **account**‘ лˇ a Ђ Â **message**‘ ˇ a Ђ Â

Step 3	**telnet-rule** *rule-id* **subscriber** *subs-name* **any** **time-range** *ime-name* **direction** **in | out | double** **content** *content-object-name* **action** **permit | deny** **audit** **comment** *comment-string*	‡ è ‡ Â **subscriber** *subs-name* **any** ‡ Â **any** ‡ Â **time-range** *time-name* й ‡ Â **direction** **in | out | double** Â Ъ Ь Â **content** *content-object-name* Ъ ‡ Â **action** **permit | deny** Â **audit** Ъ ‡ Ю Â **comment** *comment-string* й ‡ Â
Step 4	**end**	
Step 5	**show running**	

Ю **no telnet-rule** *rule-id* Ъ Ь Â Ю ‡ Ю **telnet-rule delete-all** Ъ Ь Â

Ь ‡ a a Â
Ь ‡ . I ł ‡. I Â
Ь ‡ Ь Ь a Â

Ruijie#

й

```
Ruijie(cont-plcy-config)# end
```

24.3.4 WEB-BBS

˘ Ю 8 ‡'

	Ъ ҳ	
Step 1	**configure terminal**	
Step 2	**content-policy** *policy-name*	˘ й ‥

й Ľ Ł ╗ ‡˘
˘ з Â

```
Ruijie# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Ruijie(config)# content-policy      POLICYA
Ruijie(cont-plcy-config)# web-bbs-rule     2 subscriber      USERA
time-range any direction in content                ZhengZhiCiHui action deny
audit comment     DenyUserAInvalidWebView
Ruijie(cont-plcy-config)# end
```

24.3.5 WEB-SEARCH

˘ Ю 8 ‡˙

Ѣ ҁ	

˘ Л Љ Ю **no web-search-rule**
rule-id Ъ ҳ Â Ю
‡˘ ‡ Л Љ Ю **web-search-rule delete-all Ъ ҳ**
Â

	ѐ ‡ ˚ a ˘ a˚ Â
🕮	ѐ ⁸ ‡ . ˝I ˘ ł ‡. ˝I Â
	ѐ ‡ ѐ ѐ Л Љ a ˘ ‡ a Â
	ѐ a Â

й ľ Ŀ ╗ ‡˘ ˘ з Â

```
Ruijie# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Ruijie(config)# content-policy POLICYA
Ruijie(cont-plcy-config)# web-search-rule 2 subscriber USERA
time-range any direction in content ZhengZhiCiHui action deny
audit comment DenyUserAInvalidWebView
Ruijie(cont-plcy-config)# end
```

24.3.6 WEB-MAIL

Step 3	**web-mail-rule** *rule-id* **subscriber** *subs-name* **any** **time-range** *time-name* **direction in | out | double** **action permit | deny** **audit** **comment** *comment-string*	**subscriber** *subs-name* **any** **any** **time-range** *time-name* **direction in | out | double** **action permit | deny** **audit** **comment** *comment-string*
Step 4	**web-mail-rule** *rule-id* **relation and or** **from** *content-object-name1* **to** *content-object-name2* **subject** *content-object-name3* **body** *content-object-name4* **mail-size greater greater-equal less less-equal**	**relation** **and** **or** **from** **to** **subject** **body** **mail-size** **greater** **greater-equal** **less** **less-equal**
Step 5	**end**	
Step 6	**show running**	

Ю **no web-mail-rule**

Ю

Ю **web-mail-rule delete-all**

ѣ ˚ ‡ ˘ ǀ й ѣ ч Ф ҙ ‡ Â
… ‡˘ ‡ Â ‡ Â
‡ Л ˘ а ‡ ˚
Â
ѣ ˚ ѣ ѣ ѣ ≠ а ˚ Â ˘ б è
‡ ˚ ˘ ≠ ЉЮ Â
ѣ ‡ ˚ а ˘ а˚
Â

ѣ ⁸ ‡ . ″I ˘ ł ‡.
″I Â
ѣ ‡ ѣ ѣ Л Љ а ˘
‡ а Â
ѣ ˚ а ѣ ѣ ѣ ѣ é
˘ ˘ ¨ Л ˚ ˘ а è
Э ˘ Л Љ Â
ѣ ˚ N

Step 3	**mail-rule** *rule-id* **subscriber** *subs-name* **any** **time-range** *time-name* **direction in | out | double** **action permit | deny** **audit** **comment** *comment-string*	‡ è ‡ a ‡ … ‡ й ‡ Â **subscriber** *subs-name* **any** ‡ **any** ‡ Â **time-range** *time-name* й ‡ Â **direction in | out | double** ‡ Â **action** Â **action permit | deny** ‡ Ю Â **comment** *comment-string* й ‡ Â
Step 4	**mail-rule** *rule-id* **relation and or from** *content-object-name1* **to** *content-object-name2* **subject** *content-object-name3* **body** *content-object-name4* **attachment-name** *content-object-name5* **mail-size greater greater-equal less less-equal**	‡ è ‡ a ‡ й Â **relation** **and** б **or** **from** **to** **subject** **body** **attachment-name** **mail-size** **greater** **greater-equal** **less** **less-equal** й Æ й
Step 5	**end**	
Step 6	**show running**	

˘ Л Љ Ю **no mail-rule** Ъ ҳ
Â Ю ‡˘ ‡ Л Љ
Ю **mail-rule delete-all Ъ ҳ** **Â**

à ˚ ‡ ˘ ǀ й à ч Ъ ҳ ‡ Â
… ‡˘ ‡ Â ‡ Â
‡ Л ˘ a ‡ ˚ Â
à ˚ à à à à ≠ a ˚
Â ˘ б є ‡ ˚ ˘ ≠ ЉЮ Â
à ‡ ˚ a ˘ a ˚
Â
à ⁸ ‡ . ″I ˘ ł ‡.
″I Â
à ‡ à à Л Љ a ˘
‡ a Â
à ˚ à à à ^ б˘ ~ ˘ a
Â

й ľ Ł ╕ ⁸ ‡˘
˚ ˘ ˚ ƀ ˘ ў ƀ ˘ ˚
˚ Â

```
Ruijie# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Ruijie(config)# content-policy      POLICYA
Ruijie(cont-plcy-config)# mail-rule     1 subscriber any time-range
any action permit audit comment           mail-audit-1
Ruijie(cont-plcy-config)# mail-rule     1 relation or from        OBJ-F
subject    OBJ-S mail-size     less 20000
Ruijie(cont-plcy-config)# end
```

24.4

Л ˘ ЉЮ Л Â

	Ъ ҳ	
Step 1	**configure terminal**	
Step 2	**interface** *intf-name*	Л ˘ й Л˝
Step 3	**content-policy-map** *policy-name*	Л
Step 4	**end**	

Step 5	**show running**

	Ѣ ҳ	
Step 1	**configure terminal**	
Step 2	**content-policy** *policy-name*	˘ й ¨
Step 3	**web-bbs-rule | web-search-rule | web-mail-rule | ftp-rule | telnet-rule | im- rule | mail-rule priority-swap** *rule-id1 rule-id2*	ч ‡ . ″I
Step 4	**end**	
Step 5	**show running**	

show ftp-audit stat recent *hours* **time-range from** *yyyy mm dd hh:mm::ss* **to** *yyyy mm dd hh:mm:ss* **day-interval** *yyyy mm dd* **to** *yyyy mm dd* **hour-interval** *hour1* **to** *hour2 hour3* **to** *hour4* **interface** *intf-name* **| bridge** *bridge-num* **subscriber** *subs-name* **direction in out double file-name** *keyword* **rule-name** *rule-name* **ip** *ip-address* **permit | deny**

Ʌ ˘ ǂ Â

Ю

recent *hours* ű Â

time-range from *yyyy mm dd hh:mm::ss* **to** *yyyy mm dd hh:mm:ss* ϰ ÿ ǂ ˩ ǂ Â

day-interval ˈ ˩ ˘ ╗

hour-interval ϰ *hour1 hour2* ˘ Ʌ Ъ Ą ╗ *hour3 hour4* Â

interface *intf-name* ˆ

‘

‘ Э

. . . . . .

show im-audit detail recent *hours* **time-range from** *yyyy mm dd hh:mm::ss* **to** *yyyy mm dd hh:mm:ss* **day-interval** *yyyy mm dd* **to** *yyyy mm dd* **hour-interval** *hour1* **to** *hour2 hour3* **to** *hour4* **interface** *intf-name* **| bridge** *bridge-num* **subscriber** *subs-name* **direction in out double type qq msn message** *keyword* **account** *account-string* **rule-name** *rule-name* **ip** *ip-address* **permit | deny order-by time subscriber internal-ip direction asc desc start-item** *integer* **end-item** *integer*

Ì Â

Ю

˚ ˚ Э

order-by time

. . . . . .

24.7.3 TELNET

Ѣ ҂	
show telnet-audit stat recent *hours* **time-range from** *yyyy mm dd hh:mm::ss* **to** *yyyy mm dd hh:mm:ss* **day-interval** *yyyy mm dd* **to** *yyyy mm dd* **hour-interval** *hour1* **to** *hour2 hour3* **to** *hour4* **interface** *intf-name* **| bridge** *bridge-num* **subscriber** *subs-name* **ip** *addr* **direction in out double content** *keyword* **rule-name** *rule-name* **permit | deny**	**recent** *hours*ˈ ΰ Â **time-range from** *yyyy mm dd hh:mm::ss* **to** *yyyy mm dd hh:mm:ss*ˈ ӄ ÿ ӌ Â **day-interval**ˈ ӆ ˘ ╗ **hour-interval** ӄ *hour1 hour2* ˘ Ѧ Ѫ Ѭ ╗ *hour3 hour4* Â **interface** *intf-name*ˈ ѧ ’ **bridge** *bridge-num*ˈ Ѧ ’ ѧ Â **subscriber** *subs-name*ˈ Ѳ ˘ Â **direction in out double**ˈ ˘ ˘ ѕ α ˘ ѕ α Â **content** *keyword* Â

	rule-name *rule-name* Ð ‡ Â **permit | deny** Â

show telnet-audit detail recent *hours* **time-range from** *yyyy mm dd hh:mm::ss* **to** *yyyy mm dd hh:mm:ss* **day-interval** *yyyy mm dd* **to** *yyyy mm dd* **hour-interval** *hour1* **to** *hour2 hour3* **to** *hour4* **interface** *intf-name* **\| bridge** *bridge-num* **subscriber** *subs-name* **direction in out double content** *keyword* **rule-name** *rule-name* **permit \| deny order-by time subscriber internal-ip \| external-ip direction asc desc**

. . . . . .

24.7.4 WEB-BBS

Ƒ ३	

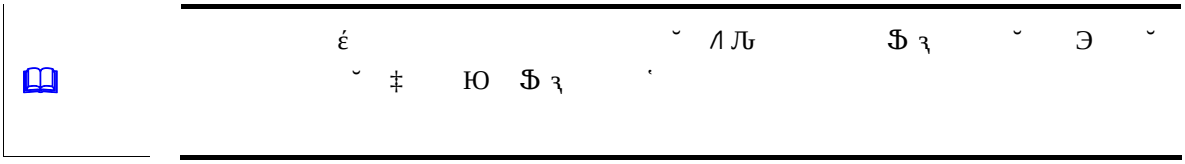
show web-bbs-audit stat recent *hours*
time-range from

show web-bbs-audit detail recent *hours* **time-range from** *yyyy mm dd hh:mm:ss* **to** *yyyy mm dd hh:mm:ss* **day-interval** *yyyy mm dd* **to** *yyyy mm dd* **hour-interval** *hour1* **to** *hour2 hour3* **to** *hour4* **interface** *intf-name* **| bridge** *bridge-num* **subscriber** *subs-name* **ip content** *keyword* **rule-name** *rule-name* **permit | deny order-by time subscriber internal-ip | url asc desc start-item** *integer* **end-item** *integer*	Â Ю Э **order-by time subscriber internal-ip | url** Â **asc desc** à Â **start-item** *integer* Æ ‡ Â **end-item** *integer* Æ Â

Â

show web-bbs-audit stat
subscriber

subscriber



24.7.5 WEB-SEARCH

Ƃ ҙ	
show web-search-audit stat recent *hours* **time-range from** *yyyy mm dd hh:mm::ss* **to** *yyyy mm dd hh:mm:ss* **day-interval** *yyyy mm dd* **to** *yyyy mm dd* **hour-interval** *hour1* **to** *hour2 hour3* **to** *hour4* **interface** *intf-name* **| bridge** *bridge-num* **subscriber** *subs-name* **ip** *addr* **keyword** *keyword* **rule-name** *rule-name* **permit | deny**	**recent** *hours* **time-range from** *yyyy mm dd hh:mm::ss* **to** *yyyy mm dd hh:mm:ss* **day-interval**

	direction in out double ˙ ˚ ˘ ˘ ˩ ˝˘ ˩ ˝ α Â **from** *keyword1*˙ ˚ Â **to** *keyword2*˙ ˚ Â **subject** *keyword3*˙ ˚ Â **rule-name** *rule-name*˙ ƀ ‡˝ Â **permit | deny**˙ ˚ ˘ ˚ Â

show web-mail-audit detail recent *hours*
time-range from | Ö È # c €

Э

. . . . . .

24.7.7 MAIL

Ѣ ҂	
show mail-audit stat recent *hours* **time-range from** *yyyy mm dd hh:mm::ss* **to** *yyyy mm dd hh:mm:ss* **day-interval** *yyyy mm dd* **to** *yyyy mm dd* **hour-interval** *hour1* **to** *hour2 hour3* **to** *hour4* **interface** *intf-name* **| bridge** *bridge-num* **subscriber** *subs-name* **ip** *addr* **ip** *addr* **direction in out double from** *keyword1* **to** *keyword2* **subject** *keyword3* **rule-name** *rule-name* **permit | deny**	**recent** *hours* **time-range from** *yyyy mm dd hh:mm::ss* **to** *yyyy mm dd hh:mm:ss* **y-interval hour-interval** *hour1 hour2 hour3 hour4* **bridge** *bridge-num* **interface** *int* **subscriber** *subs-name* **direction in out double from** *keyword12* **to** *keyword* **subject** *keyword3* **rule-name** *rule-name* **permit | deny**

˘ ѝ Ь ˀ Â

б ˘ Â

˘ ЛЮЅ ҳ˙

Ѕ ҳ	
default-router *address address2…address8*	

Ь ˀ ˘ Ю ѝ Â

˘ ў ‡ ł a Â

˘ ЛЮЅ ҳ˙

Ѕ ҳ	
lease *days hours] minutes* **infinite**	

Л Лъ ¨ ˘ ў ¨ ˘ a ў ¨

╠ ╗ Э ¨ ł ў ¨ Â

¨ ˘ ЛЮЅ ҳ˙

Ѕ ҳ	
domain-name *domain*	¨

ў ¨ ˘ Ь ¨ Â

Л ¨ Ь ˘ ЛЮЅ ҳ˙

Ѕ ҳ	

dns-server *address address2…address8*	Ь

Ь Â

Ь Ю Ь Â Ь ╠ ‡ ˘ ÿ

Ѓ˛ ˘ ˘ ą̃ Ь ¨ ˘

б Э Л Л Лъ Â

Л Ь ЛЪЮЭ

ҳ˙

Э ҳ	
netbios-name-server *address address2…address8*	Ь

, ~ ˘ ˘

¨ , ~ ˘ ˘ Ь

¨ , ~ ˘ ˘ ¨I ¨ ˘ ‡

б Ь ¨ , ~ ˘ ˘ ¨I

Ь ¨ ˘ ˘ ¨

Â

Ю˘ й Â Ь ˘

й , Ь ˘ й Â

˘ ЛЪЮЭ ҳ˙

Э ҳ	
netbios-node-type *type*	

╠ ˘ ↓ è ˘ й Ь

Л† Â ˘ ў ‡ Л

† Â † ˘ ˘

hardware-address *hardware-address type* **client-identifier** *unique-identifier*	ЬЖ ЬЖ
client-name *name*	ЬЖ a ЬЖ ў a ЬЖ

26.5.5 Ping

ч Â й й й ЛЬЮЂ ҳ

Ђ ҳ	
ip dhcp ping **packets** *number*	й ‡ a й Â

26.5.6 Ping

Â ЛЬ Â ЛЬЮЂ ҳ

Ђ ҳ	
ip dhcp ping **timeout** *milliseconds*	й Â

26.5.7 DHCP

Â ЛЬЮЂ ҳ

Ѣ ҳ	
ip address dhcp	

26.5.8 PPP DHCP

ѧ ң ѧ ╟ ᵻ Â ˘
ѧ ЉЮѢ ҳ᾽

Ѣ ҳ	
ip address dhcp	

26.5.9 FR DHCP

ѧ ң ѧ ╟ ᵻ Â ˘
ѧ ЉЮѢ ҳ᾽

Ѣ ҳ	
ip address dhcp	

26.5.10 HDLC DHCP

ѧ ң ѧ ╟ ᵻ Â
˘ ѧ ЉЮѢ ҳ᾽

Ѣ ҳ	
ip address dhcp	

🕮

ѧ ᵻ ң Э˘ ȁ ȁ Э Љ
Â

26.6

26.6.1 DHCP

Ь Ѣ ҳ˙

~ Ѣ ҳ˘ Л Љ à ă à Ь ,

~ ^ ~ Ѣ ҳ˘ ˘ ў ,

~ Ѣ ҳ˘ Â

л ң Ь Ѣ ҳ˘ ˘ Ѣ ҳ ЉЮ Ѣ ҳ˙

Ѣ ҳ	
clear ip dhcp binding *address*	
clear ip dhcp conflict *address*	ă
clear ip dhcp server statistics	Ь

Ь ˘ Ѣ ҳ ЉЮ Ѣ ҳ˙

Ѣ ҳ	
debug ip dhcp server events packet	Ь

Ь ˘ Ѣ ҳ ЉЮ Ѣ ҳ˙

Ѣ ҳ	
show ip dhcp binding address	
show ip dhcp conflict	ă
show ip dhcp server statistics	Ь

26.6.2 DHCP

ч Ѣ ҳ˘ Л Љ Э ЉЮ ˙

~ ^ ~ Ѣ ҳ˘ ˘ ў

~ Ѣ ҳ˘

Ъ ъ	
debug ip dhcp client	

˘ Ъ ъ ЛЬЮ Ъ ъ'

Ъ ъ	
show dhcp lease	

26.7

‘

-
-
-

26.7.1

ЛЬЮ ˘ НЖ ˘ й ˘ й
˘ ¨ й ˘ ¨ Ь й ˘ Ь й
˘ й ˘ й Â
˘ è й Л† Â

```
ip dhcp excluded-address 172.16.1.2 172.16.1.100
!
ip dhcp pool net172
network 172.16.1.0 255.255.255.0
default-router 172.16.1.254
domain-name rg.com
dns-server 172.16.1.253
netbios-name-server 172.16.1.252
netbios-node-type h-node
lease 30
```

26.7.2

ЛЪЮ ˘ ѝ ↑ ѝ
˘ ѝ ˘ ў ¨ ѝ ˘ ѝ ˘
Ь ѝ ˘ ѝ Â

```
ip dhcp pool Billy
host 172.16.1.101 255.255.255.0
hardware-address 00d0.df34.32a3 ethernet
client-name Billy
default-router 172.16.1.254
domain-name rg.com
dns-server 172.16.1.253
netbios-name-server 172.16.1.252
netbios-node-type h-node
```

26.7.3 DHCP

ЛЪЮ ˘ ѝ ѧ ╟↑ Â

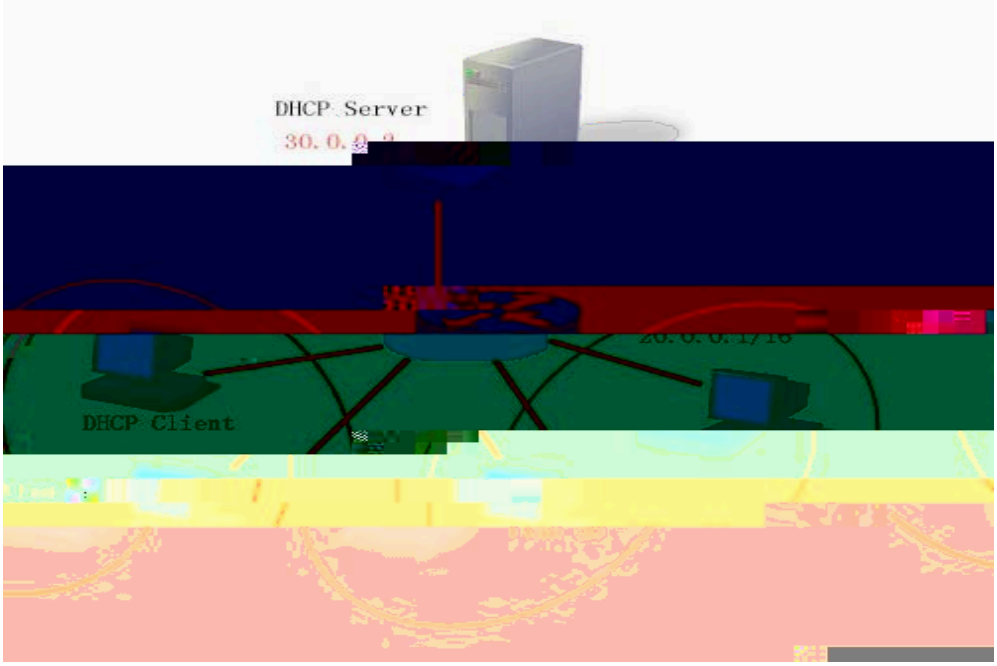
```
interface GigabitEthernet0/0
ip address dhcp
```

27 DHCP Relay

27.1

27.1.1 DHCP

27.1.2 DHCP ō DHCP Relay Agent Ő



27.1.3 DHCP Relay Agent Information(option 82)

يي 2

a è

Agent Circuit ID

يي 3

Agent Remote ID

يي 4

27.1.4 DHCP relay Check Server-id

27.2 DHCP

27.2.1 DHCP

service dhcp	
no service dhcp	

27.2.2 DHCP Server IP

IP helper-address vrf *A.B.C.D*	
IP helper-address vrf *A.B.C.D*	
no IP helper-address vrf *A.B.C.D*	

no IP helper-address vrf *A.B.C.D*	Л Ь

27.2.3 DHCP option dot1x

Л ˘ a
˚ ǂ a˚ ˘ Л Лъ **ip dhcp relay information option dot1x** ╗ ˘ ╗ ˘
╕ Ь ˘ ╗ ╗
Â

ЮЎ Ю ˙

Ѣ ҁ	
ip dhcp relay information option dot1x	╗
no ip dhcp relay information option dot1x	╗ Â

27.2.4 DHCP option dot1x access-group

˘ 8 æ Л
˘ Лъ ↓ 8 æ ˘ Л Лъ Ѣ ҁ **ip dhcp relay information option dot1x access-group** *acl-name* ˘ *acl-name* Ж
ˮI ˘ Лъ ˘ ў
Â ↓ ˘ Л Э˘ з ˘
б ѐ Л ă ˘ ˙

ѝ ˘ ѝ ˘
˘ ’ ↓ ѣ ѣ
ѝ ˘ aǂ Â ‡
ЛъЮ ˟ Â Э Ю˙

```
Ruijie# config
Ruijie(config)# ip access-list extended DenyAccessEachOtherOfUnauthrize
Ruijie(config-ext-nacl)# permit ip any host 192.168.3.1
```

```
Ruijie(config-ext-nacl)# permit ip any host          192.168.5.1
Ruijie(config-ext-nacl)# permit ip host       192.168.3.1       any
                й
Ruijie(config-ext-nacl)# permit ip host        192.168.4.1      any
Ruijie(config-ext-nacl)# permit ip host        192.168.5.1      any
Ruijie(config-ext-nacl)# deny ip 192.168.3.0 0.0.0.255 192.168.3.0
 0.0.0.255

Ruijie(config-ext-nacl)# deny ip    192.168.3.0 0.0.0.255 192.168.4.
0 0.0.0.255
Ruijie(config-ext-nacl)# deny ip    192.168.3.0 0.0.0.255 192.168.5.
0 0.0.0.255
Ruijie(config-ext-nacl)# deny ip    192.168.4.0 0.0.0.255 192.168.4.
0 0.0.0.255
Ruijie(config-ext-nacl)# deny ip    192.168.4.0 0.0.0.255 192.168.5.
0 0.0.0.255
Ruijie(config-ext-nacl)# deny ip    192.168.5.0 0.0.0.255 192.168.5.
0 0.0.0.255
Ruijie(config-ext-nacl)# deny ip    192.168.5.0 0.0.0.255 192.168.3.
0 0.0.0.255
Ruijie(config-ext-nacl)# deny ip    192.168.5.0 0.0.0.255 192.168.4.
0 0.0.0.255
Ruijie(config-ext-nacl)# exit
```

ł Ą Ъ ҳ **ip dhcp relay information option dot1x access-group** *DenyAccessEachOtherOfUnauthrize* Ъ ҳ ᴊ Э

Ю Ю **DHCP option dot1x access-group**

Ъ ҳ	
ip dhcp relay information option dot1x access-group *acl-name*	
no ip dhcp relay information option dot1x access-group *acl-name*	ᴎ Â

27.2.5 DHCP option 82

Ъ ҳ **ip dhcp relay information option82** Ъ ҳ ˇ

╗ **DHCP Relay Agent Information** **option** ┺ Â

Ю Ю

ip dhcp relay information option82	
no ip dhcp relay information option82	

27.2.6 DHCP relay check server-id

ip dhcp relay check *server-id*

DHCP relay check *server-id*

ip dhcp relay check server-id	
no ip dhcp relay check server-id	

27.2.7 DHCP relay suppression

ip dhcp relay suppression

Ю Ю

ip dhcp relay suppresson	
no ip dhcp relay suppresson	

27.2.8 DHCP

Ю Ъ ҳ ╖ à ╕ ч ╘ ·

```
Ruijie# configure terminal
Ruijie(config)# service dhcp                                                    ╖
Ruijie(config)# ip helper-address       192.18.100.1          ╕          ╘
Ruijie(config)# ip helper-address       192.18.100.2          ╕          ╘
Ruijie(config)# interface GigabitEthernet          0/3
Ruijie(config-if)# ip helper-address        192.18.200.1          ╕   ╛   ╘

Ruijie(config-if)# ip helper-address        192.18.200.2          ╕   ╛   ╘

Ruijie(config-if)# end
```

27.3 DHCP relay

Y ˘ ╖ à
╟ ╖ ˘ ŭ ‡ Y Э ╛
╖ Â

27.3.1 DHCP option dot1x

Ъ ҳ Ю Â

Â

Ъ ҳ б **dhcp option82** Ъ ҳ ˘ a ˚ Â

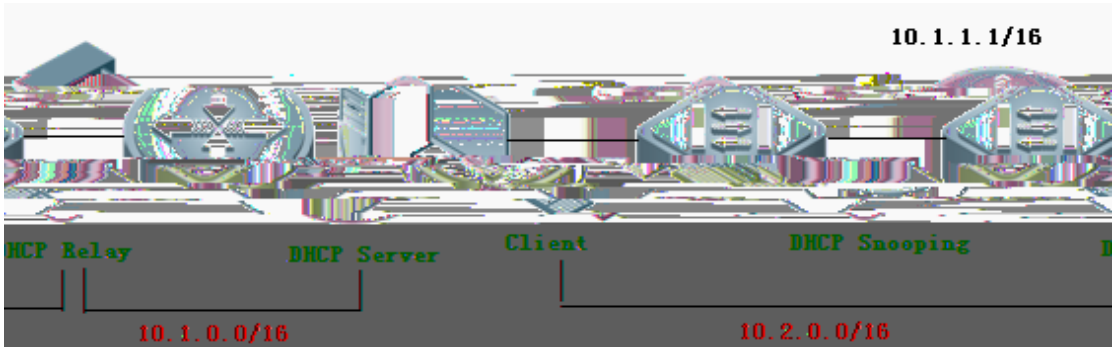
Ю ≠ ˘
Лъ a б ╟ ╖ a ˚ Â

27.3.2 DHCP option82

╖ **dhcp option dot1x** ╖ ˘ a ˚

27.4

```
hostname Ruijie
vlan 1
ip helper-address 192.18.100.1
ip helper-address 192.18.100.2
ip dhcp relay information option dot1x
interface GigabitEthernet 0/1
interface GigabitEthernet 0/2
interface GigabitEthernet 0/3
no switchport
ip helper-address 192.1686(ntey997(.1)6( )]TJ T* [(i)6(p he)6(lpe)6(r-)6(addr)6(ess)6( 1)6(92.1)6(686(
ne vtyn
tmcdo02

01(3)672
ne w1322

01(3)672
ne w(3)6(42)6( )]TJ T* [lw
( )]TJ /T31 1 Tf 0.1338 Tc 86.02 0 0 86.02 56.7324.20403 Tm (20.5 )Tj 0.1298 Tc2.7087 0 Td[(DHC )Tj
```



б л лˇ л Лъ
╟ л Э ˇ Â
Э ч ‘ Ю ^ ╟ ╖ ~ ˇ
┘ л Ю л ˇ ╖ Э Â
Â

Э ي ˇ Ю ‘

- ‘

╖
```
Ruijie(config)# ip dhcp snooping
```

б ┗ й л л
```
Ruijie(config)# interface gigabitEthernet 0/2
Ruijie(config-if)# ip dhcp snooping trust

# й л
Ruijie(config-if)# ip arp inspection trust
Ruijie(config-if)# exit

# ╖
Ruijie(config)# ip arp inspection vlan 1

# ^ ~
Ruijie(config)# interface vlan 1
Ruijie(config-if)# ip address 10.2.0.1 255.255.0.0
```

┘ ^ ~

```
Ruijie(config)# ip route      10.1.0.0 255.255.0.0 10.2.1.1
```

-

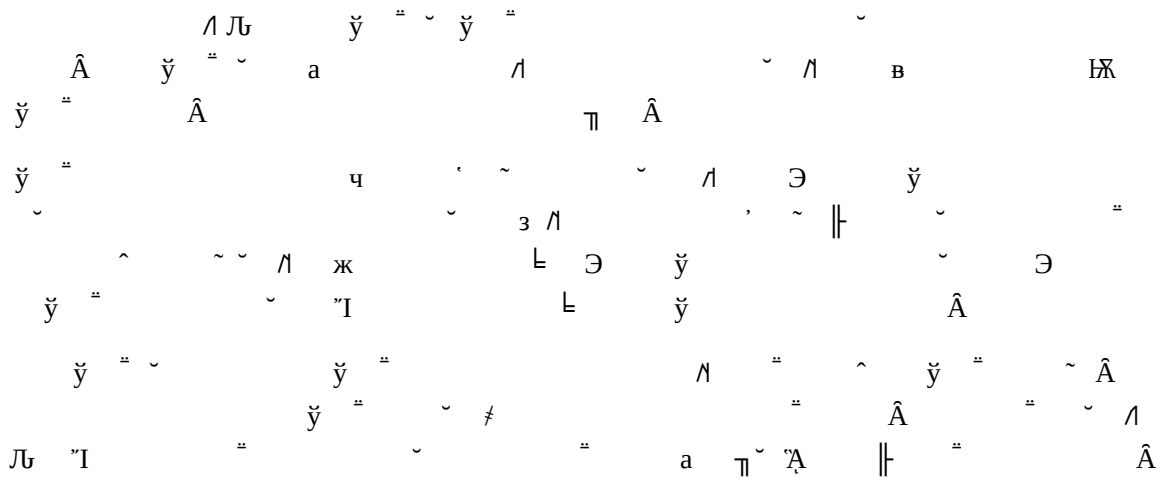
```
Ruijie(config)# server dhcp

Ruijie(config)# ip helper-address        10.1.1.1

Ruijie(config)# interface      gigabitEthernet        3/1
Ruijie(config-if)# no switchport
Ruijie(config-if)# ip address      10.2.1.1 255.255.0.0

Ruijie(config)# interface      gigabitEthernet        3/2
Ruijie(config-if)# no switchport
Ruijie(config-if)# ip address      10.1.0.1 255.255.0.0
```

-

```
Ruijie(config)# interface gigabitEthernet             4/1
Ruijie(config-if)# no switchport
Ruijie(config-if)# ip address      10.1.1.1 255.255.0.0

Ruijie(config)# service dhcp

Ruijie(config)# ip dhcp excluded-address           10. 1.1.1 10.1.1.10

Ruijie(config)# ip dhcp pool       linwei


Ruijie(dhcp-config)# default-router        10.2.1.1

Ruijie(dhcp-config)# network    10.2.0.0 255.255.0.0

Ruijie(config)# ip route      10.2.0.0 255.255.0.0 10.1.0.1
```

28 DNS

28.1 DNS



# ip Domain-lookup	¨ Ⅶ

no ip domain-lookup Ɗ ϟ ¨ Ⅶ

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

28.2.3 DNS Server

ﻋﻤﻲ i Ȼ õ ε ŕ

clear host *word*	╟ ў ¨ Â Ъ ҂ a ў ¨ Â

28.2.6

‘

Ъ ҂	
# show hosts	

```
Ruijie# show hosts
DNS name server    :
192.168.5.134    static
     host                type          address
www.163.com              static       192.168.5.243
www.ruijie.com           dynamic      192.168.5.123
```

28.2.7

Ping ¨ ў ‘

```
Ruijie# ping  www.ietf.org
Resolving host[www.ietf.org   ]Â Â Â Â Â Â
Sending 5,100-byte ICMP Echos to 192.168.5.123,
timeout is 2000 milliseconds.
!!!!!
Success rate is 100 percent(5/5)
Minimum = 1ms Maximum = 1ms, Average = 1ms
```

29 NTP

29.1 NTP

ˆ ˜ ˚ ◘ ˘ Л Љ

è Ь ˚ ◘˘ Л Љ ˆ Э б

˘

б Ь ╗ ˘ ╗ й ╗ ⁸ Â

╗ б Ь ’ ч ‘ ˘

Љ Ы ’ Ү˘ Ь ’

⁸ ˘ б Ь ╗ ˘ Ь

Â

Ю˝ а ⁸ Â ⁸ ‡ а

╗ Â ˘ а Ҳ ╗ Ь б

˘ є Ь ╗ Л Ь

╗ Â

⁸˘ ЉЮЂ Ҳ‘

Ђ Ҳ	
ntp authenticate	⁸ Â
no ntp authenticate	⁸ Â

ntp authentication-key à ntp trusted-key

Â

29.2.2 NTP

˘ Ю Â

˘ ˘ Л Љ **ntp trusted-key**

й Â

˘ ЉЮЂ Ҳ‘

Ђ Ҳ	
ntp authentication-key *key-id* **md5** *key-string enc-type*	Â ‘ ‘ ‘ ч Â
no ntp authentication-key *key-id* **md5** *key-string enc-type*	Â

а ˘ й

Â

Â

29.2.3 NTP ID

Â

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

˘ Ю ЛЬЮЅ ҳ'

Ѕ ҳ	

no m?pUGKÁ

no ntp update-calendar	∧ ˚

Ю ˚ Â ł˘ б
˚ ℼ ≠˚ ˚ Â Ю ℼ ˘ ˚
≠ ˚ Â

29.2.9 NTP

ℼ ѝ ў ^ ∧ ~˘ ѝ ѐ ˚
Â

Ю˘ б ˚ Â
б ˚ ˘ ∧Љ Ѣ ҙ
∧ ˘ ѝ ѐ ˚ Â

˘ а б ѐ ˚ Â

🕮

ľ ^ ~ Ь ľ ^ ~ Ь Â
ѝ Ь ’ ѝ Ь ÿ
ѝ Ь ∧ ’ ѝ Ь ÿ ѝ ∧ …… Â
æ ¯ ѝ Â

Ю ЉЮ Ѣ ҙ ў ℼ ‘

Ѣ ҙ	
ntp master *stratum*	ѝ ў Â ∧ ѝ ’ а ‡ ѝ Â
no ntp master	∧ ў

Ю ∧Љ ∧ ˘ ѐ ѝ Â

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

Ѣ ҳ Â ѝ ў ^ è æ
~ Л Â ˘ Ѣ ҳ˘
‡ Л ˘ a Â
Ч ˘ Ѣ ҳ ÿ б ˘ ˘ ‡ Л ╟ Љ
è a Â
Ѣ ҳ a Ч 8 8^ ¨ 8 ╖ ѳ 8˘ Ѣ ҳ Ў
~ Â

29.2.10 NTP

Ь 8 ╖ ^
8 ~ Â Ю 8 ‡ Â
Ю ЉЮ Ѣ ҳ Ь 8 ‘

Ѣ ҳ	
ntp access-group peer | serve | serve-only | query-only *access-list-number|access-list-name*	Ь 8
no ntp access-group peer | serve | serve-only | query-only *access-list-number|access-list-name*	Ч Ь 8

è ‘

- **peer**‘ Ь 8 ˘ ≠ б ˘ ^ ~ Â
- **serve**‘ Ь 8 ˘ a б ˘ Â
- **serve-only**‘ Ь Â
- **query-only**‘ Ь 8 Â
- *access-list-number*‘ 8 л’ ѝ Â …

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

29.3 NTP

29.3.1 NTP

debug ntp	
no debug ntp	

29.3.2 NTP

show ntp status	

```
Ruijie# show ntp status
Clock is synchronized, stratum 9, reference is 192.168.217.100
nominal freq is 250.0000 Hz, actual freq is 250.0000 Hz, precision
is 2**18
reference time is AF3CF6AE.3BF8CB56 (20:55:10.000 UTC Mon Mar 1 1993)
clock offset is 32.97540 sec, root delay is 0.00000 sec
root dispersion is 0.00003 msec, peer dispersion is 0.00003 msec
```

29.4

```
Ruijie(config)# no ntp
Ruijie(config)# ntp authentication-key 6 md5 wooooop
Ruijie(config)# ntp authenticate
Ruijie(config)# ntp trusted-key 6
Ruijie(config)# ntp server 192.168.210.222 key 6
Ruijie(config)# interface gigabitEthernet 0/1
Ruijie(config-if)# ntp disable
Ruijie(config-if)# no ntp disable
```

30 (SNTP)

30.1

˘ Э ˚ ˘ ¨ ^

~˘ ◘ ˘ ¨ ^

˘ ~ Â

Л Љ Л ˘ ˘ ύ ψ a Ν

╟ ˘ Л Љ Â ˚ ⁸˘ Â

˘ Â

^ ~ ◘ ˘ ˘ ˘

Â ≠ Ν˘ ≠ Â

˘ Љ

Â

30.1.1 SNTP

Ь ˘ Ь Л ѝ

˘ Ь Ь ˘

˘ ˚ Â

‘ Љ ѝ ˘ ѝ ’

‘ Ь Љ Ь ѝ ˘ ѝ ’

‘ Ь Љ Ь ѝ ˘ ѝ ’

‘ Лъ ѝ ˘ ѝ
’

‘ Ь ’

‘ ч ’

‘

ѝ

Лъ

ѵ ѝ

Лъ

˘ Л Â

¨ ˘ ѝ

30.2 SNTP

Ӯ

30.2.1 SNTP

Ю˝ Ю˙

	˘ Ь
	0
˚	

۷	˘ ¨ ω̃ ۷

30.2.2 SNTP

˘ ЛЮ ‘

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

```
Ruijie# show running-config
```

Â

```
Ruijie# copy running-config startup-config
```

30.2.4 SNTP

˘ Лъ ÂЛЪЮ

Â

```
Ruijie# config
```

˘ ˘ æ ѝ Â ѝ ˘ ѝ Â

```
Ruijie(config)# sntp interval <seconds>
```

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

```
Ruijie# show running-config
```

Â

```
Ruijie# copy running-config startup-config
```

a ¨ ˘ ¨ ˘ ł

Ъ ҙ Â

30.2.5

ł ↰ ˘ ѝ ↰

˘ ↖ Â

˜ Â

Ъ ъ	ы
udp-helper enable	**udp-helper enable** Ъ ъ ╠ ы Â

no udp-helper enable Ъ ъ ы Â

🕮 :

Ю ы Â

╠ ы ˘ ‡ à à à à à

Â

ы ł˘ ˘

Â

31.2.3

Ъ ъ	ы
ip helper-address *IP-Address*	Ь Â Ю Ь Â

no ip helper-address Ъ ъ Ь Â

🕮 :

Ь

Ь Э ˘ ╠ ы ł˘

ÿ Ь Ь ˘ Ъ Ь Ь

Э Â

31.2.4 UDP

Ъ ъ	ы

ip forward-protocol udp *ID*	⅄ Â ᐣ ˘ ‡ ⅄ ˘ ŭ ‡ Â ᒥ ɬ˘ à à à à à ⅄

no ip forward-protocol udp port Ɓ ҳ ⅄ Â

🕮 **:**

- ᐣ ᒥ Ꞵ ɬ˘
  ⅄ Â ŭ ‡˘ Â
- ╟ ᒥ ɬ˘ à à à à à ⅄
  ᒥ ¨ ╟˘ a Ą Â
- ⅄ Â
- ⅄ ч ˘ **ip forward-protocol udp domain ip forward-protocol udp** *53* ˘ Â

32 DDNS

32.1 DDNS

32.1.1 DDNS

ˆ ˘ ╟ ¨ Ł˜ ╟
¨ Ł Э˘
ў ╟ Æ Ł ў Э Ł ˘
Ł Ł ╟ ¨ Â

32.2

Ю Â

╖	

33 DNS

33.1 DNS

33.1.1 DNS

33.2

Ю Â

╖	
‡	‡

33.3 DNS

- ^ ~ ╖
- ^ /ı ~ ‡

33.3.1 DNS

ЛЬЮ

	Ѣ ҂	
Step 1	configure terminal	
Step 2	smartdns enable	╖
Step 4	end	
Step 5	show running	

╖ /ı ЛЬ Ю **no smartdns enable** Â

```
Ruijie# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Ruijie(config)# smartdns enable
Ruijie(config)#
```

33.3.2 IP

˘ ЛЬЮ ‡'

	Ѣ ҁ	
Step 1	**configure terminal**	
Step 2	**smartdns** *A.B.C.D interface* **map** *X.X.X.X*	‡
Step 4	**end**	
Step 5	**show run**	

˘ Л Лъ Ю **no smartdns** *A.B.C.D interface* **map** *X.X.X.X*

ч ‡˘ Ь ˘ Л

Э ˘ Л Э

```
Ruijie# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Ruijie(config)# smartdns  192.168.1.100  gigabitethernet 0/1
202.101.99.55
Ruijie(config)# smartdns  192.168.1.100  gigabitethernet  0/1
58.66.101.33
Ruijie(config)#
```

34

Â ⁸ ╕

Â Э ⁄ ÿ ā ˘ ⁄

˘ ⁄ Л Ъ Â ... з ˘ Â

⁄ Â ‡ Ђ ˘

˘ a ⁄ ˘ ł

Ђ

Â Ì Â ê Ф ҂ ие

ŭ Ю Ъ Л й ĭ

˘ ⁄ ˘ ⁄ Л Ъ Ж Ђ

,

˘ ие

Ю Ъ Л Ф ҂ ˙ ˘ ие ĭ Ж Ђ

Ф ҂

set ip default next-hop *ip-address weight ip-address weight*	й † Ю
set ip next-hop *ip-address weight ip-address weight*	Ю
set interface *intf_name*	⅄
set default interface *intf_name*	⅄
set ip precedence	I˝ .
set ip tos	
set ip dscp	

⅄ يي Â

⅄ Э ⅄ Ю ЛЬЮ Ƀ ҳ

Ƀ ҳ	
ip policy route-map *name*	⅄ Э
no ip policy route-map	⅄ Э ∧

Ƀ ҳ	
ip local policy route-map *name*	
no ip local policy route-map	∧

⅄ Э Ю й

```
Ruijie(config)# access-list 1 permit any
```

```
Ruijie(config)# route-map    name
Ruijie(config-route-map)# match ip address       1
Ruijie(config-route-map)# set ip next-hop        192.168.5.5
Ruijie(config-route-map)# int GigabitEthernet          0/0
Ruijie(config-if)# ip policy route-map          name
```

˘ Ю Ѣ ҳ˙

Ѣ ҳ	
ip policy load-balance Redundance	
no ip policy	ǂ

˘ Ю ˘

Ю Â

˘ Ю ˘ Ю Â

Ѣ ҳ ê Ì

Э Ѣ ҳ˙

no ip policy route-map

ip local policy route-map

match ip address

match length

set ip next-hop

set ip default next-hop

set interface

set default interface

set ip tos

set ip precedence

set ip dscp

8 ˙

ﻯ ң Э ﻯ ﻰ ﻲ˘ ˚ ﻯ Э ﻲ

˘ з ﻰ ﻲ ”I Â

Лъ ˘ ي Л ’

ي Л ˘ ‡ ‘ Ē ’

ي Л ‡ Ē ’ ¨ ي

≠ ‡ ‘ Â

Л л a ¨ ˘ л

a ˘ ‘ Ē ˘ л è ˘ ‡

˘ ‡ ˘ ÿ Ю ي Ē ’

Э˘ Ē ˘ ж ’

Ē ^ ł

˜ ˘ ж Ю ي Ē ’ Э˘ Ē

з ي è ˘ ж ي Ю Ē ˘

ي è ‡ Ю ي Ē ’

Ē ˘ ł ي ‡’ ي a

Ē ‡ Â

a ˘ ‡ ‡

╕ Â

Ю ˘ ˘

˘ ‡ ѝ˘ ЎI a ł ˘ ‡ ≠ Â

Э a л Э ˘ ł a Â

˘ Л л

˘ ŭ ‡ a

35.3

```
Ruijie# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Ruijie(config)# route-auto-choose update
Ruijie(config)#
```

36 RIP

36.1 RIP

Â ¸ Ъ ¸ Ў

Â ¸ Â

Ж Ж ¸ ч

Â

¸ ¸ й Â Ю й

, й ¸ й Â ¸

Â ‡

й а ¸ а ł ¸ 120 Ÿ ÿ

Â

¸ й Â ¸ б

й , ¸ й ¸ è , а ¸

й Â

¸ Ъ ÿ ¸ ≠ Ъ ң Â

ЪЮ ¸ ¸ ң Ъ **default-information originate** Ф ҳ ¸

- **ip default-network**
- è

¸ ¸ б ¸

а Â ч ¸ à

Ъ Â

¸ ¦ ^ ~ Â

36.2 RIP

Ь Ю

- … ^ ~
- ^ ~
- ¦ ^ ~
- Ж ^ ~

- ╖ ^ Л ~
- ^ Л ~
- ^ Л ~
- Л ⁸^ Л ~
- Л ^ Л ~
- Л

ЛЬЮ ў ˘ ê Ì Â

-
- ǂ
- ǂ

36.2.1 RIP

˘ ″I … ˘ ЊЖ б

Â

… ˘ ЛЬЮ Ѣ ҳ ‘

Ѣ ҳ	
router rip	…
network *network-number* *wildcard*	ЊЖ

Л Лъ *network-number* *wildcard* ˘ Л

б Â

wildcard ˘ ˘

Л б Â

🕮

network Ѣ ҳ ЊЖ ч ‘

~ ,

~ Л Л Â

36.2.2 RIP

й ˘ ˘ ‡ ˘

Љ Â

˘ ЉЮ Ѣ ҙ

Ѣ ҙ	
neighbor *ip-address*	

Ѣ ҙ ˘ Л Љ ⁸ Л ў

Ю ˘ л н л Љ ˘ л Â
л Љ ˘ л ˘ ≠ л Љ л Â

˚ л ˘ ЉЮ Ѣ ѯ ˙

Ѣ ѯ	
version 1 2	Ж

Љ Э Ѣ ѯ ˚ Ю л ˘ л Љ л
ѝ Â

л л ˘ л ЉЮ Ѣ ѯ ˙

Ѣ ѯ	
ip rip send version 1	л
ip rip send version 2	л
ip rip send version 1 2	л

л л ˘ л ЉЮ Ѣ ѯ ˙

Ѣ ѯ	
ip rip receive version 1	л
ip rip receive version 2	л
ip rip receive version 1 2	л

36.2.5

╟ ˘ ˘ ╟ Â
Ю ╟ ˘ a ╖ Â

╟ ╖ ˘ Â ˘
a ˘ л Љ Â

˘ ў ЉЮ ˙

- ˘ ˙ ˝I ’
- ˘ ˘ Â

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

Ѣ ҳ	
ip rip default-information originate metric *metric-value*	˘ ≠ è
no ip rip default-information	∧ ∧

∧ ң ˆ ˜ з ∧ ∧
˘ a è ˘ ∧ Л Ъ ∧ Ю Л Ъ Ю Ѣ ҳ ʻ

Ѣ ҳ	
ip rip default-information only metric *metric-value*	˘ a è
no ip rip default-information	∧ ∧

🕮
˘ ∧ Ю **ip rip default-information default-information originate** ˘ ‡ ∧ ∧ Â

36.2.11 RIP VRF

˘ ∧ … ˘ ǂ Â Ю
∧ ˘ Â … ł ˘
˘ ∧ Л Ъ … Â

address-family Ѣ ҳ ˆ ѝ ʻ
˜ Â ˘ …
Â Ю˘ ∧ Л Ъ Â Ю б
˚ Â

˘ **exit-address-family** **exit** Ѣ ҳ Â
˘ Л Ъ Ю Ѣ ҳ ʻ

Ѣ ҳ	
address-family ipv4 vrf *vrf-name*	… б ¨ ѝ *vrf-name*

no address-family ipv4 vrf *vrf-name*	б ̈ ѝ *vrf-name*

36.3 RIP

- ǂ
-
-
-

36.3.1 RIP

-

Л ˘ є ђ ђ Ь Л Љ ˘ ђ
ђ Ь Л Â ǂ ↓ يي يي ˘ є
Â

1 RIP

ЛЪЮ

~ ,

~ à , ~

Â

- **é**

˘ ù ˘ ĭ ™ Â ŭ

‡ a ˘ ≠ a

Â ЛЪЮ ù ∧ é Â

Л Ѧ

```
interface GigabitEthernet0/0
ip address 192.168.12.1 255.255.255.0
```

Ѧ

```
interface Serial1/0
ip address 192.168.123.1 255.255.255.0
encapsulation frame-relay
no ip split-horizon


router rip
version 2
network 192.168.12.0
network 192.168.123.0
```

Л Ѧ

```
interface GigabitEthernet0/0
ip address 172.16.20.1 255.255.255.0
```

Ѧ

```
interface Serial1/0
ip address 192.168.123.2 255.255.255.0
encapsulation frame-relay


router rip
version 2
network 172.16.0.0
network 192.168.123.0
```

```
no auto-summary
```

ℼ ⅄

```
key chain ripkey
key 1
key-string keyb
accept-lifetime 00:00:00 Dec 3 2000 infinite
send-lifetime 00:00:00 Dec 4 2000 00:00:00 Dec 5 2000
key 2
key-string keya
accept-lifetime 00:00:00 Dec 3 2000 infinite
send-lifetime 00:00:00 Dec 4 2000 infinite
```

```
interface GigabitEthernet0/0
ip address 192.168.12.2 255.255.255.0
ip rip authentication mode md5
ip rip authentication key-chain ripkey
```

3 RIP

˘ ЛЪЮ ‘

˜ Л Лъ ’

˜ a Â

● έ

ѝ Лъ Э ˘ Â

‘

Лъ Л

```
interface GigabitEthernet0/0
ip address 192.168.12.1 255.255.255.0
```

Л

```
interface Loopback0
ip address 192.168.10.1 255.255.255.0


router rip
version 2
network 192.168.12.0
network 192.168.10.0
passive-interface GigabitEthernet0/0
neighbor 192.168.12.2
```

‘

```
      Лъ      ⊿
interface GigabitEthernet0/0
ip address 192.168.12.2 255.255.255.0

           ⊿
interface Loopback0
ip address 192.168.20.1 255.255.255.0


router rip
version 2
network 192.168.12.0
network 192.168.20.0

           ·

      Лъ      ⊿
interface GigabitEthernet0/0
ip address 192.168.12.3 255.255.255.0

           ⊿
interface Loopback0
ip address 192.168.30.1 255.255.255.0


router rip
version 2
network 192.168.12.0
network 192.168.30.0
```

36.3.4 RIP VRF

-

ч ⊿ Лъ ˘ Â يي Лъ ⊻ ĵ يي Â

- é

```
  …
ip vrf redvpn
```

```
Â
interface GigabitEthernet 1/0
ip vrf forwarding redvpn
ip address 192.168.12.1 255.255.255.0
```

```
…
router rip
address-family ipv4 vrf redvpn
network 192.168.12.0
exit-address-family
```

```
  …
```

```
Â
interface GigabitEthernet 1/0
ip vrf forwarding bluevpn
```

```
…
router rip
address-family ipv4 vrf bluevpn
network 192.168.12.0
exit-address-family
```

37 OSPF

37.1 OSPF

ˆ ˜ ѝ

Â ж ѝ ˘ Э ˘ ѧ ѝ ˘

˘ ѝ ˆ ˜

ˆ ˜ Â

б ӑ ˆ ӑ ˜ а ˚ ˘ ӑ

ѝ ˘ ѝ Â б

˘ Э а ˚ ˘ ѣ ѧ ѧ ѣ

Â ¯ ˘ ѧ Љ ѣ ѧ ѧ

˘ ч Ф ‘ ˜ ’ ˜ ѫ ˘

а Â ˘ ≠ ѧ Љ

ѣ Â

˘

˘ ЉЮ ѣ ‘

- ◘ ˘ ӈ ˘ ’
- ˘ ѧ ˘

˘ ѣ Ѫ є ’

- ѧ ˘

˘ ‘ ѣ Ю ѣ ˘

ǂ Â

ѣ ѧ ◘˘ ǂ ˘ ѧ ◘˘

˘ ѫ ѧ ◘ ˘ ѧ ◘ ↓

˘ Â

˘ Â

˘ ѫ ˘

Â а ˚ ѧ Љ ˚

˘ ˘ ӑ

ѧ Â

˘ ǂ ˘ ¯ ǂ ύ ѯ

ˆ ˜ ˘ ѯ ѯ ˘ ѯ б ѯ

Â

˘ æ ˘ Ь ‘

37.2 OSPF

- … ~
- ⅄ ^ Λ ~
- Лъ a ˘ ^ Λ ~
- Ҟ ^ Λ ~
- Ҟ ^ Λ ~
- ^ Λ ~
- … ^ Λ ~
- ң ^ Λ ~
- ^ Λ ~
- ^ Λ ~
- ^ Λ ~
- ^ Λ ~
- ⅄ ^ Λ ~
- ⅄ ŭ ^ Λ ~
- ⅄ ^ Λ ~
- ℸ ^ Λ ~
- ^ Λ ~

ЛъЮ ў ˘ ê Ì Â

-
- ǀ

ЛъЮ ѝ ‘

⅄	⅄ Ʒ’ a ⅄ Ʒ’ ѝ . ”I ‘ ‘ ‘
Ҟ	‘ Ҟ Ʒ’ Ҟ ‘ ЖЧ Ҟ ЖЧ a Ҟ ЖЧ

	НЖ Â ‘ ‘
╠ Ҳ’	’ ╠ Ҳ’ ’
ң	’ ‡ ˘
	ǂ è ’
	Ҳ ‘ Ҳ ‘ ‘
	˘ Л Л Љ Â
Л ◘	
	˘ ’
Ҳ	
	НЖ
	НЖ
˙ Ї	Л Ю ч
‡	‡

а Ю ‘

ѝ

37.2.1 OSPF

… ˘ Ж б ˘ Љ ѵ

ϒ Â ѧ ѵ à

˘ з ѵ Â

37.2.2 OSPF

configure terminal	
ip routing	
interface *interface-id*	
ip ospf cost *cost-value*	
ip ospf retransmit-interval *seconds*	
ip ospf transmit-delay *seconds*	
ip ospf hello-interval *seconds*	
ip ospf dead-interval *seconds*	
ip ospf priority *number*	
ip ospf authentication message-digest null	
ip ospf authentication-key *key*	
ip ospf message-digest-key *keyid* **md5** *key*	

ip ospf database-filter all out	ˆ Л ~ Л ’ Ю˘ ÿ ˚ Ъ Л Э ˘ Л’
end	Â
show ip ospf *process-id* **interface** *interface-id*	Â
write	ˆ Л ~ Â

Љ Э Ѣ ѯ ˘ Л Љ Л Â

37.2.3 OSPF

а˚ Ў ˘ ѓ й Ь ‘

- ˆ Љ ˘ ѯ ˘ ~
- ˆ ˘ ~
- ˆ ˘ ˘ ~

è ˘ а˚ Лѓ й ч ‘

Â ˘ Л

˘ ˆ ~ ˘

ˆ ~ Â Э б Э ˘

ˆ ~ ˘ Â

Â а ˘

Л Â ˘

˘ Љ Â

а Л жˇ Л Љ й Â Л Љ

ˆ ˘ ~ ˘ ˘

Â Ѣ ѯˇ Л Љ é

˘ Л Љ Â

Л Л Љ Лˇ

˘ ў Â б

ЉЮ ‘

- ˘ а ˘ ≠ ’
- ѯ’ ˘ а Â

˘ Л ЉЮ Ѣ ѯ‘

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

a ˚ Ю Ю˙

- à à ⁄ à ⁄
- à ^ ⁄ ~
- Лъ
- ѝ

ч ˘ ŭ ‡ ⁄ ˘

,

à ˘ a a

˘ ⁄ Лъ ⁄ ѝ ˘

˘ ң ў Â ˩ ˘

˘ a ˚ ˘ ⁄ Лъ Ѣ ҳ Â

˘ ⁄ ЛъЮ Ѣ ҳ ˙

Ѣ ҳ	
ip ospf network point-to-multipoint	⁄ ѝ
exit	
router ospf *1*	
neighbor ip-address cost *cost*	⁄ ˘

🕮

˘ à

╟ ˉ ˘ ⁄ Лъ é Â Лъ ˘ ⁄ Лъ a Â

Э Л Ћ ≠ Л Ћ Â

ѝ а є Ћ ╟ ˘

router ospf *1*	
neighbor *ip-address* *cost number*	з

ˇ ˇ ж Л Ю Ф ҳ
ҳ Â

ˇ ^ ~ ^ ˇ
~ ˇ Â
ˇ Л б ˇ ≠
Л Л б ˇ ł
ˇ ÿ Л Â

Л Љ ˮI ¤ Â а Э
ң ˇ ˇ Л ˇ Â

ˇ ѝ Â

ˇ Л ЉЮФ ҳ

Ф ҳ	

Лъ ќ й ˘ Л ч ‘ ~
’ ~ Â ˘ .
◘˘ Â

Л Лъ ˘
˘ Л Лъ ⁸ . ˝I Â

ќ ЛъЮ ΰ ‘

- ќ a ќ ˘ a ќ й ќ Â
- ќ ќ ˘ ‡ ќ Â
- ќ a ˘ ¯ a ќ Â

ќ ˘ Ю ЛъЮ Ѣ ҳ‘

Ѣ ҳ	
area *area-id* **authentication**	ќ й
area *area-id* **authentication message-digest**	ќ й

ќ

area *area-id* **stub no-summary**

no-summary: ќ
˘ ќ Э
ќ

è Â

ЛЮ

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

a

è Â

ÿ è Â ÿ Â

ЛЮ

	.26 21.24 6 ref0.852 g346.62 4AD]

Ю˘ ╗ Â

37.2.7

˘ Ҳ Ҳ

Ҳ б ˘ ˘ ˘

ў̆ ‡ Â ⁸ Л Э ˘ ≠ Л

Лъ … Â

ч Ҳ ˆ ~ … ˘ ч ˚ Ҳ ѝ

Ҳ Â ˆ ~ Ҳ а ѝ Ҳ Â Л Лъ

ч Л Ҳ Э ч ˘ з

ч ˚ Л Â Л Â ѝ ч

Ҳ Ҳ ѝ Ҳ ˆ ~ ˘ є Ҳ Л ≠

Â

Ҳ ɬ ˘ Л Лъ

˘ Э˘ Л Л Лъ Л ˘

Â

ч Л Л ˘ Л ˆ

37.2.8

˘ Л Љ è ң Â

⁸ ң ˘ ╟ ѝ Â a ╟ ң

Â

⁸ ң ˘ Ю ЉЮ Ъ ҳ '

● Ъ ҳ	
default-information originate always metric *metric-value* **metric-type** *type-value* **route-map** *map-name*	ң

🕮

˘ ↖ ╟ ң ˘ ѣ Â

37.2.9 Loopback

Л ѝ ˘ Л

a Â

^ ~ ˘ ‡ Л

ѝ Â Л˘ ‡ ѝ Â

˘ Â

˘ Ю˘ ЉЮ Ъ ҳ '

Ъ ҳ	
interface loopback *1*	… Л
ip address *ip-address mask*	

🕮

ʌ й ˘ ʌ
а Â

37.2.10 OSPF

˘ Ʒ ʌ Â ˘
˘ ʌ æ Â

ʌ ң Ь ˘ й ‘ Ҝ ˘ Ҝ ˘ Â
Ҝ й Ҝ ˘ ┘ Ҝ й Ҝ ˘ è
^ ǂ ~ й Â

˘ Ю ЛЪЮ Ѣ ʒ‘

Ѣ ʒ	
distance *distance* **| ospf intra-area** *distance* **| inter-area** *distance* **| external** *distance*	

37.2.11

ʌ ◘ ł˘ ˘ ł
Â ʌ Лъ ˘ ┘ ʌ Лъ ч Â

˘ Ю ЛЪЮ Ѣ ʒ‘

● Ѣ ʒ	
timers spf *spf-delay spf-holdtime*	

37.2.12

◘ ˘
◘ ˘ Â й ˘
◘ Â

◘ й ǂ ˘ ʌ Лъ Ѣ ʒ Â а
Â б ʌ Â ˘

˘ æ ∧ ’ ∧ ˘ ‡ ˛ ∧
Â

Ю ЛЬЮЅЂ ҳ˙

Ѕ ҳ	Ы

nvЋ L9Ы#A5BSЂЅЂ,Ѓ

37.2.13 OSPF

^ ~ ˘ ¯ ѝ Â
Â ∧ ˘ ѣ Э
˘ Â ˘ ‡ ѝ ∧ Â
˘ ‡ ѝ Â

ч ˛ Â ”I ∧ Лъ ң ˘ б ∧
Â è ˘ ∧ Лъ ∧ Ѕ ҳ ∧
˘ ∧ а ң Â ˘ ѝ ˘ Лъ
∧ ѝ ˘ ‡ ∧ ѝ § Â

∧ ҳ˙ ˘ ∧ ҳ˙ . ”I ˘
∧ ҳ˙ ˘ ‡ ∧ ѝ ∧ ҳ˙ ˘ ╟ ҳ˙ ╖ ‡
╟ ҳ˙ ѝ ∧ ҳ˙ ˘ ╟ ҳ˙ ╖ ≠ ‡
ѝ ∧ ҳ˙ Â

Ю˙

Ѕ ҳ	Ы
configure terminal	Â
router ospf *1*	˘

auto-cost reference-bandwidth *ref-bw*	^ /1 ~ ˇ ,1

Ю˝ ⁄ Â ⁄ ˘ ‡ /

Лъ **no passive-interface**

snmp-server host *host-ip* **version** *version-no string* **ospf**	’ ’ ’ ˘ ˘ ѝ ’ Л ˘ ^ ~
snmp-server enable traps ospf	
router ospf *process_id* **vrf** *vrf-name*	˘
enable traps error ifauthfailure | ifconfigerror | ifrxbadpacket | virtifauthfailure | virtifconfigerror | virtifrxbadpacket lsa lsdbapproachoverflow | lsdboverflow | maxagelsa | originatelsa retransmit iftxretransmit | virtiftxretransmit state-change ifstatechange | nbrstatechange | virtifstatechange | virtnbrstatechange	
end	Â
write	

37.3 OSPF

Л Љ ˘ ˘ ÂЮ ї é Л Љ

Â

Ѣ ҳ	Ьж
show ip ospf *process-id*	˘ ѧ ‡ Â
show ip ospf *process-id area-id* **database adv-router** *ip-address* **| asbr-summary external network nssa-external | opaque-area | opaque-as | opaque-link | router summary** *link-state-id* **adv-router** *ip-address* **self-originate} database-summary max-age self-originate**	ѧ Лъ Â
show ip ospf *process-id* **border-routers**	б
show ip ospf interface *interface-name*	б ѧ
show ip ospf *process-id* **neighbor** *interface-name neighbor-id* **detail**	ѧ ‘ б ѧ Â
show ip ospf *process-id* **virtual-links** *ip-address*	
show ip ospf *process-id* **route count**	

é Ѣ ҳ ˘ Ѣ ҳ Ѣ ҳ Â Ѣ ҳ ЛЬЮ ŭ ‘

~

show ip ospf *process-id* **neighbor** ˘

à à à Â

```
Ruijie # show ip ospf neighbor
OSPF process 1:
Neighbor ID  Pri State    Dead Time    Address   Interface
10.10.10.50 1 Full/DR 00:00:38     10.10.10.50  eth0/0
OSPF process 100:
Neighbor ID  Pri State       Dead Time    Address Interface
10.10.11.50 1 Full/Backup    00:00:31  10.10.11.50  eth0/1
```

```
Ruijie # show ip ospf 1 neighbor
OSPF process 1:
Neighbor ID  Pri State       Dead Time    Address      Interface
10.10.10.50 1 Full/DR     00:00:38     10.10.10.50  eth0
Ruijie # show ip ospf 100 neighbor
OSPF process 100:
Neighbor ID  Pri State       Dead Time    Address      Interface
10.10.11.50 1   Full/Backup  00:00:31     10.10.11.50  eth1
```

~ Л

ЛЬЮ Л ќ ў й ў й

Â à à à ў

б а ў а Â

```
Ruijie#sh ip ospf interface GigabitEthernet 1/0
GigabitEthernet 1/0 is up, line protocol is up
Internet Address 192.168.1.1/24, Ifindex: 2 Area 0.0.0.0, MTU 1500
Matching network config: 192.168.1.0/24
Process ID 1, Router ID 192.168.1.1, Network Type BROADCAST, Cost:
1
Transmit Delay is 1 sec, State DR, Priority 1
Designated Router (ID) 192.168.1.1, Interface Address 192.168.1.1
Backup Designated Router (ID) 192.168.1.2, Interface Address
192.168.1.2
Timer intervals configured, Hello 10, Dead 40, Wait 40, Retransmit
5
Hello due in 00:00:04
Neighbor Count is 1, Adjacent neighbor count is 1
Crypt Sequence Number is 30
Hello received 972 sent 990, DD received 3 sent 4
LS-Req received 1 sent 1, LS-Upd received 10 sent 26
LS-Ack received 25 sent 7, Discarded 0
```

~

ЛЬЮ Ђ ғ Л Лъ ў ќ ќ Â

```
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 is enabled
Supports only single TOS(TOS0) routes
Supports opaque LSA
```

```
This router is an ASBR (injecting external routing information)
SPF schedule delay 5 secs, Hold time between two SPFs 10 secs
LsaGroupPacing: 240 secs
Number of incomming current DD exchange neighbors 0/5
Number of outgoing current DD exchange neighbors 0/5
Number of external LSA 4. Checksum 0x0278E0
Number of opaque AS LSA 0. Checksum 0x000000
Number of non-default external LSA 4
External LSA database is unlimited.
Number of LSA originated 6
Number of LSA received 2
Log Neighbor Adjency Changes : Enabled
Number of areas attached to this router: 1
Area 0 (BACKBONE)
Number of interfaces in this area is 1(1)
Number of fully adjacent neighbors in this area is 1
Area has no authentication
SPF algorithm last executed 00:01:26.640 ago
SPF algorithm executed 4 times
Number of LSA 3. Checksum 0x0204bf

Routing Process "ospf 20" with ID 2.2.2.2
Process uptime is 4 minutes
Process bound to VRF default
Conforms to RFC2328, and RFC1583Compatibility flag is enabled
Supports only single TOS(TOS0) routes
Supports opaque LSA
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 0. Checksum 0x000000
Number of opaque AS LSA 0. Checksum 0x000000
Number of non-default external LSA 0
External LSA database is unlimited.
Number of LSA originated 0
Number of LSA received 0
Log Neighbor Adjency Changes : Enabled
Number of areas attached to this router: 0
```

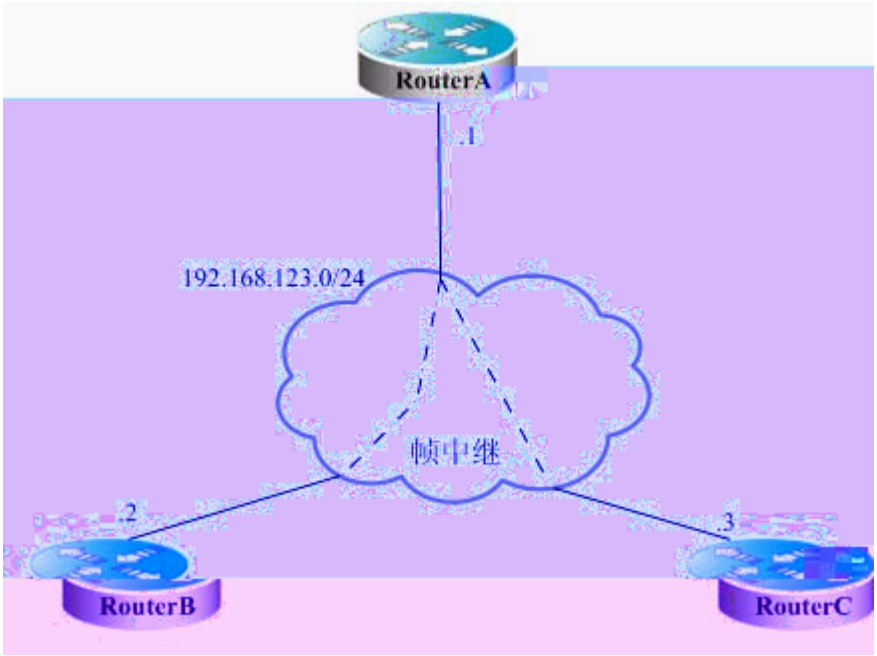
37.4 OSPF

37.4.1 OSPF NBMA

-

Ь л ˘ л л ˘

Â † يي يي Â



يي 1. OSPF NBMA

ˆ ~ ầ ầ ’

ˆ ~ ỳ ˘ ỳ ’

ˆ ~ ’

ˆ ~ ╕ Â

- é

˘ ╟ ˘ ⅄

˘ ⅄ a ˘ Â л Лъ

╕ Â

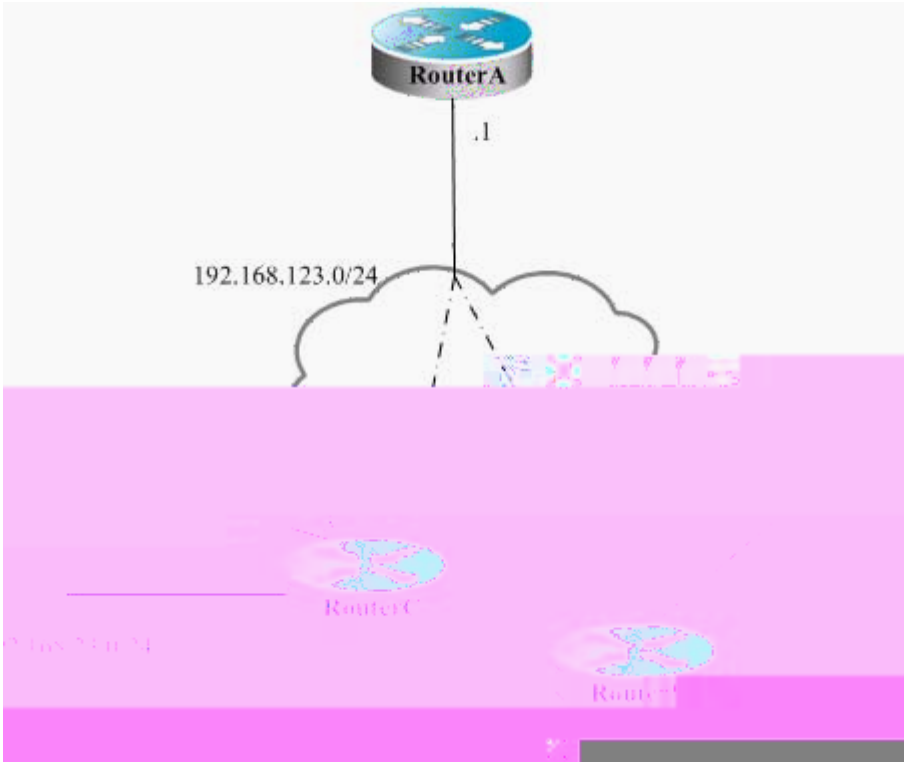
```
encapsulation frame-relay
ip ospf network non-broadcast
ip ospf priority 10

router ospf 1
network 192.168.123.0 0.0.0.255 area 0
neighbor 192.168.123.2 priority 5
neighbor 192.168.123.3
timers spf 500 1000 10000

interface Serial 1/0
ip address 192.168.123.2 255.255.255.0
encapsulation frame-relay
ip ospf network non-broadcast
ip ospf priority 5


router ospf 1
network 192.168.123.0 0.0.0.255 area 0
neighbor 192.168.123.1 priority 10
neighbor 192.168.123.3
timers spf 500 1000 10000

interface Serial 1/0
ip address 192.168.123.3 255.255.255.0
encapsulation frame-relay
ip ospf network non-broadcast


router ospf 1
network 192.168.123.0 0.0.0.255 area 0
neighbor 192.168.123.1 10
neighbor 192.168.123.2 5
timers spf 500 1000 10000
```

37.4.2 OSPF

-

Ь л ˘ л л ˘

Â ¦ يي يي Â



يي 2. OSPF

‘ ~ б à Â

- é

л ˘ ˘

б ù Â

‘

Лђ л

```
interface GigabitEthernet 0/0
ip address 192.168.12.1 255.255.255.0
```

л

```
interface Serial 1/0
ip address 192.168.123.1 255.255.255.0
encapsulation frame-relay
ip ospf network point-to-multipoint
```

```
router ospf 1
network 192.168.23.0 0.0.0.255 area 0
network 192.168.123.0 0.0.0.255 area 0
```

‘

Л Ъ Л

```
interface GigabitEthernet 0/0
ip address 192.168.23.2 255.255.255.0
```

Л

```
interface Serial 1/0
ip address 192.168.123.2 255.255.255.0
encapsulation frame-relay
ip ospf network point-to-multipoint
```

```
router ospf 1
network 192.168.23.0 0.0.0.255 area 0
network 192.168.123.0 0.0.0.255 area 0
```

‘

Л Ъ Л

```
interface GigabitEthernet 0/0
ip address 192.168.23.3 255.255.255.0
```

Л

```
interface Serial 1/0
ip address 192.168.123.3 255.255.255.0
encapsulation frame-relay
ip ospf network point-to-multipoint
```

```
router ospf 1
network 192.168.23.0 0.0.0.255 area 0
network 192.168.123.0 0.0.0.255 area 0
```

Э يي

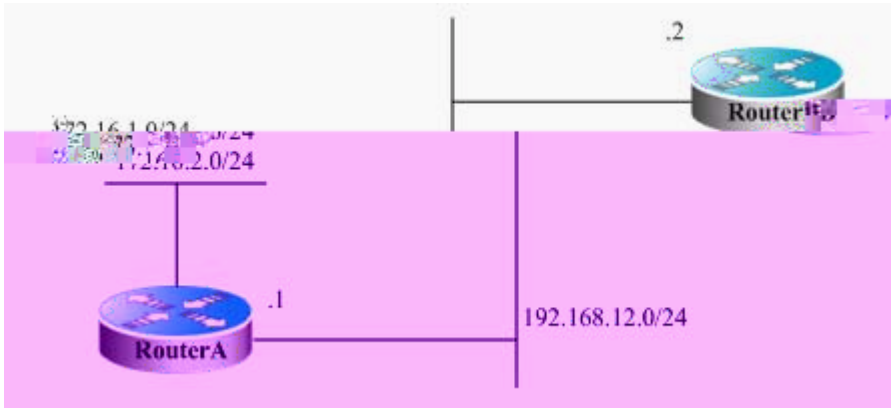
. ”I ’ . ”I ˘

Л Л Ъ Ю Ѣ ҳ

```
router ospf 1
neighbor 192.168.123.2 cost 100
neighbor 192.168.123.3 cost 200
```

37.4.3 OSPF

ч Л Лъ ˘ ˘ Â يي
Лъ Л ‡ يي Â



يي 3. OSPF

- έ

ч ‘

~ ˘ Ъ ’

~ Л Â

Ъ Л ‡ Лъ Л й

‘

Лъ Л

```
interface GigabitEthernet0/0
ip address 192.168.12.1 255.255.255.0
ip ospf message-digest-key 1 md5 hello


router ospf 1
network 192.168.12.0 0.0.0.255 area 0
area 0 authentication message-digest
```

Л Л

```
interface GigabitEthernet0/0
ip address 192.168.12.2 255.255.255.0
ip ospf message-digest-key 1 md5 hello


router ospf 1
network 192.168.12.0 0.0.0.255 area 0
area 0 authentication message-digest
```

37.4.4 OSPF

-

ч Л Л ˘ ˆ يي يي Â

يي 4. OSPF

˜ ч Л ˘ Ъ ˘

Ъ ’

˜ ˘ Л ˘ a à

Â

˜ ˘ й ˘ з а ß ╗

Â

- é

Э Ъ ˘ Ъ Л Ъ Э

Â

ˈ

ЛЪ Л

```
interface GigabitEthernet0/0
ip address 192.168.12.1 255.255.255.0
```

ЛЪ . Э Л

```
interface GigabitEthernet1/0
ip address 172.16.1.1 255.255.255.0
interface GigabitEthernet1/1
ip address 172.16.2.1 255.255.255.0


router ospf 1
network 192.168.12.0 0.0.0.255 area 0
network 172.16.1.0 0.0.0.255 area 10
network 172.16.2.0 0.0.0.255 area 10
no discard-route internal
area 10 range 172.16.0.0 255.255.252.0 cost 20
```

ˈ

ЛЪ Л

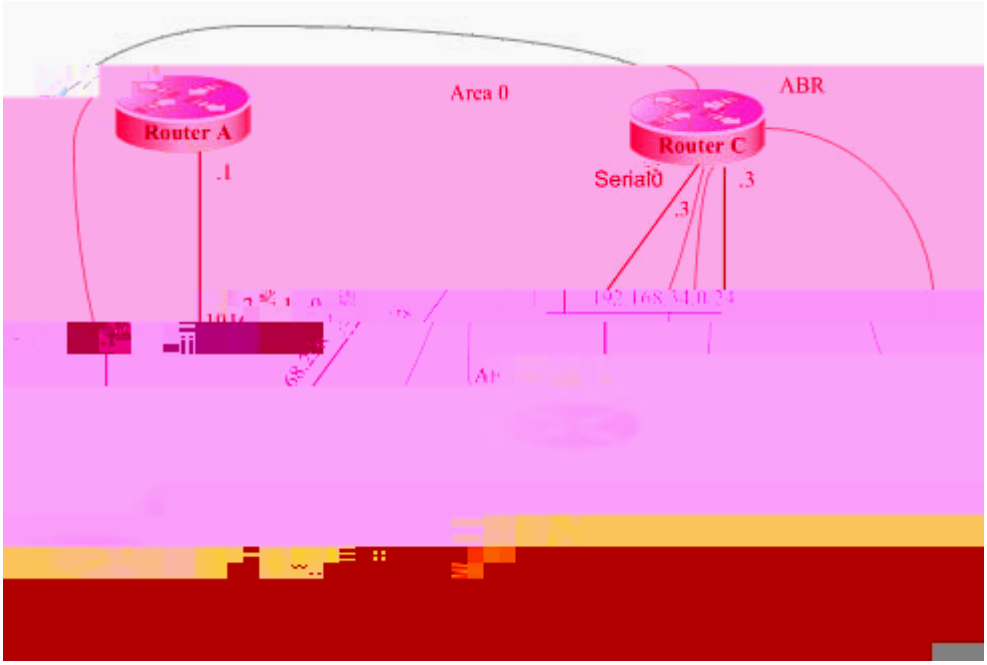
```
interface GigabitEthernet0/0
ip address 192.168.12.2 255.255.255.0


router ospf 1
network 192.168.12.0 0.0.0.255 area 0
```

37.4.5 OSPF ABR ¡ ASBR

-

Л ˘ à Ъ

˘ Ъ Â é ĺ يي يي Â



ي 5. OSPF ABR à ASBR

ي ˘ à ѝ Ѵ ˘ ѝ Ѵ ˘ ѝ

Â à ѝ Â ˘

Л Ч ѝ Â

- έ

ǂ è ˘ ѝ ˘ з а Â

‘

```
ip address 192.168.23.2 255.255.255.0


router ospf 1
network 192.168.12.0 0.0.0.255 area 0
network 192.168.23.0 0.0.0.255 area 0
```

```
interface GigabitEthernet 0/0
ip address 192.168.34.3 255.255.255.0
```

```
interface Serial 1/0
ip address 192.168.23.3 255.255.255.0


router ospf 1
network 192.168.23.0 0.0.0.255 area 0
network 192.168.34.0 0.0.0.255 area 34
```

```
interface GigabitEthernet 0/0
ip address 192.168.34.4 255.255.255.0
```

```
interface GigabitEthernet 1/0
ip address 200.200.1.1 255.255.255.0
interface GigabitEthernet 1/1
ip address 172.200.1.1 255.255.255.0
```

```
router ospf 1
network 192.168.34.0 0.0.0.255 area 34
redistribute rip metric-type 1 subnets tag 34


router rip
network 200.200.1.0
network 172.200.0.0
```

Э Ю Ѓ й ґ Ь Â

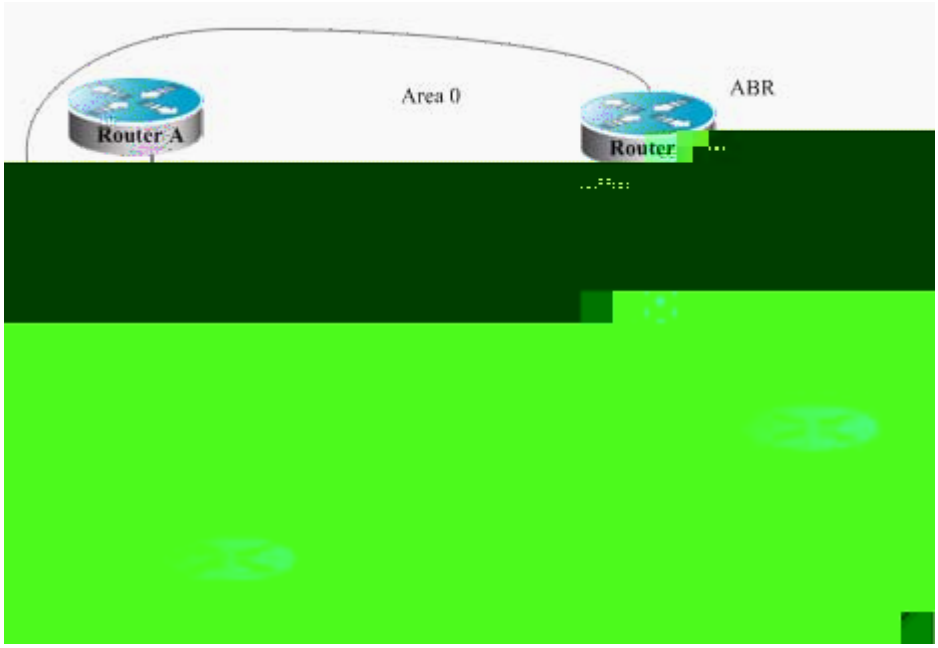
```
O E1 200.200.1.0/24 [110/85] via 192.168.23.3, 00:00:33, Serial1/0
O IA 192.168.34.0/24 [110/65] via 192.168.23.3, 00:00:33, Serial1/0
O E1    172.200.1.0 [110/85] via 192.168.23.3, 00:00:33, Serial1/0
```

37.4.6 OSPF

-

Л ˘ à Ъ

˘ Ъ Â é ї ي ي Â



ي 6. OSPF

Л Ъ Â

- é

Л ˘ ◻˘ Ъ Â

Ъ Э Â й Э Л Ћ Ъ ˘

Â

‘

Ћ Л

```
interface GigabitEthernet0/0
ip address 192.168.12.1 255.255.255.0
```

```
router ospf 1
network 192.168.12.0 0.0.0.255 area 0
```

```
interface GigabitEthernet0/0
ip address 192.168.12.2 255.255.255.0
```

```
interface Serial1/0
ip address 192.168.23.2 255.255.255.0
```

```
router ospf 1
network 192.168.12.0 0.0.0.255 area 0
network 192.168.23.0 0.0.0.255 area 0
```

```
interface GigabitEthernet0/0
ip address 192.168.34.3 255.255.255.0
```

```
interface Serial1/0
ip address 192.168.23.3 255.255.255.0
```

```
interface Dialer10
ip address 192.168.30.1 255.255.255.0
```

```
router ospf 1
network 192.168.23.0 0.0.0.255 area 0
network 192.168.34.0 0.0.0.255 area 34
network 192.168.30.0 0.0.0.255 area 34
area 34 stub no-summary
```

```
interface GigabitEthernet0/0
ip address 192.168.34.4 255.255.255.0
```

```
interface GigabitEthernet0/0
ip address 192.168.12.1 255.255.255.0


router ospf 1
network 192.168.12.0 0.0.0.255 area 0
```

```
interface GigabitEthernet0/0
ip address 192.168.12.2 255.255.255.0

interface Serial1/0
ip address 192.168.23.2 255.255.255.0

interface Loopback2
ip address 2.2.2.2 255.255.255.0


router ospf 1
network 192.168.12.0 0.0.0.255 area 0
network 192.168.23.0 0.0.0.255 area 23
area 23 virtual-link 3.3.3.3
```

```
interface GigabitEthernet0/0
ip address 192.168.34.3 255.255.255.0

interface Serial1/0
ip address 192.168.23.3 255.255.255.0
```

```
router ospf 1
network 192.168.23.0 0.0.0.255 area 23
network 192.168.34.0 0.0.0.255 area 34
area 23 virtual-link 2.2.2.2
```

‘

ЛЬ Л

```
interface GigabitEthernet0/0
ip address 192.168.34.4 255.255.255.0
```

```
router ospf 1
network 192.168.34.0 0.0.0.255 area 34
```

Э Ю'

```
O IA 192.168.12.0/24 [110/66] via 192.168.34.3, 00:00:10,
GigabitEthernet0/0
O IA 192.168.23.0/24 [110/65] via 192.168.34.3, 00:00:25,
GigabitEthernet0/0
```

38

38.1 IP

38.1.1

ip route vrf *vrf_name network mask ip-address interface-type interface-number ip-address distance* **tag** *tag* **permanent weight** *weight* **track** *object-number*	
no ip route *network mask*	
ip static route-limit *number*	
no ip static route-limit	

📖

˘ ǎ ╟ ˘ ╟
ǂ Â

ﻝ ľ Ł ˘ ǟ ﻝ ÿ Â
ﻝ ˘ ﻝ ң a Ю ˘ ≠ ÿ
Â

╕ ˘ ˚ ﻝ˘ ﻝ
a ˘ a ╕ ╖˘ ˘ ‡ ╕
Â

ὶй ˘ ﻝ Л Ъ **show ip route weight** Ѣ ҳ
Â ╖ ˘ ﻝ
˘ ǂ ˘
ǂ ˘ ǂ Â

è ¯ ⁄˘ a ˘ ˘ Ю
ѝ Â

˙

˘ ⁄ ˘ Ю ˘ ‡ a Э ˙

˘ ч a ˘ Ь ≠ б
Â

Э˘ ‡˙ ″I ˚ Ю
⁄ ˘ ł Ą ⁄˘ Ю ˘
⁄ Ю è ˘ ѝ Â ⁄ ˘ ″I
˚ ⁄ Ю ˘ ‡ ł a ˘
Â

38.1.2

a ˘ ѝ ⁄
˘ ¶ έ ˘ è
ă Â ⁄ Љ ╟ ˘ ≠ ⁄ Љ ⁄
Э Â

ң ч ˙ ~ ˘ έ Э Ґ
Ь’ ~ Â

˘ [8] Â
έ Â ⁄ ˘
ă ѝ Ґ Ь Â
ң Ґ Ь Â

ң ˘ Ф ҳ ЉЮФ ҳ˙

Ф ҳ

ip default-network	
no ip default-network	

default-network

show ip route

38.1.3

maximum-paths *number*	

38.2

route-map

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

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

يي ‡ ˘ Л Лъ **match** Ъ ъ **set** Ъ ъ Â **match** Ъ ъ˘ ‡ ъ ’ **set** Ъ ъ˘ ‡ a Â

ЊЖ ‡ ъ ˚ ˘ يي ЛъЮ Ъ ъ˙

Ъ ъ	
match community *standard-list-number expanded-list-number community-list-name*	ъ
match interface *interface-type interface-number*	ъ Ю Л
match ip address *Access-list-number …access-list-number*	ъ
match ip next-hop *access-list-number …access-list-number*	ъ Ю
match ip route-source *access-list-number …access-list-number*	ъ
match metric *Metric*	ъ *Metric* ˙
match origin egp igp incomplete	ъ
match route-type local internal external level-1 level-2	ъ
match tag *tag*	ъ *tag* ˙

ЊЖ ъ ł ˘ يي ЛъЮ Ъ ъ˙

Ъ ъ	
set aggregator as *as-num ip_addr*	
set as-path prepend *as-number*	
set comm-list *community-list-number community-list-name* **delete**	

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

يي **match** Ƀ ҳ б **set** Ƀ ҳ يي a˚ a˚ ˘ ѝ
match Ƀ ҳ ѐ **set** Ƀ ҳ ў˘ ˘ Ю Ю

- **route-map** Ƀ ҳ ˘ **route-map** **match** Ƀ ҳ б **set** Ƀ ҳ ˘ a Â
- **route-map** ѐ **match** Ƀ ҳ **set** Ƀ ҳ ˘ **route-map** **route-map** **match** Ƀ ҳ б **set** Ƀ ҳ ˘ a Â

Ƀ ҳ a é Л Љ Ю ľ يي Ł Â

🕮

يي a Э ╖ Â

38.3

38.3.1

ѝ ˘ ѧ ӈ ÿ
ŧ ل ╖ Â Л Љ
ŧ ł ˘ ≠ Л Љ ŧ ł
Â ŧ Л Љ Â

ŧ ˘ يٖي ~ ˘ ч
ŧ ˚ ˢ Â

ÿ ŧ ل ˘ **5(tric-5EE0**

🕮

ˇ Ю˘ ˇ й
ˇ й ˇ а /ı Â

38.3.2

й ˇ ˇ 8
Â

ˇ ЛЬЮЭ ҳ˙

Э ҳ	

Ѣ ҁ	
distribute-list *access-list-number* | *access-list-name* **prefix** *prefix-list-name* **out** *interface-type interface-number*	‡˘ ˛ Â **prefix**‘ , ˩ Â
no distribute-list *access-list-number access-list-name* **prefix** *prefix-list-name* **out** *interface-type interface-number protocol*	˄ 8

🕮

˘ a ˄˘ з ˄ Â

ѝ ˘ ˄ Љ Â a Â

8 ˘ ЉЮѢ ҁ‘

Ѣ ҁ	
distribute-list *access-list-number* | *access-list-name* | **prefix** *prefix-list-name* **gateway** *prefix-list-name* **gateway** *prefix-list-name* **in** *interface-type interface-number*	‡˘ ˛ Â **prefix**‘ , ˩ Â **gateway**‘ ˛ Â
no distribute-list *access-list-number* | *name* | **prefix** *prefix-list-name* **gateway** *prefix-list-name* **gateway** *prefix-list-name* **in** *interface-type interface-number*	˄ 8

38.4

38.4.1

يي ǂ ˘ Л Љ ǂ Э Â a
يي ˇ è ˘ Л Ъ ҂ a ˚ Â ¨ ˚
ǂ Э ˘ a ˚ يي ˇ è Ъ ҂ ≠ a ˚ Â
يي a يي ‡ ˘ Â

ЉЮ ˘ ǂ ˘ Л ǂ ѝ
˘ ˘ ѝ ˘ ѝ
˘ ѝ Â

```
Ruijie(config)# router ospf 1
Ruijie(config-router)#  redistribute rip subnets route-map
redrip
Ruijie(config-router)# network  192.168.12.0 0.0.0.255  area 0
```

8

```
Ruijie(config)# access-list  20 permit  200.168.23.0
```

يي

```
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
```

ЉЮ ˘ ǂ ˘ Л ǂ ѝ
˘ ѝ Â

```
Ruijie(config)# router rip
Ruijie(config-router)# version  2
Ruijie(config-router)# redistribute ospf 1 route-map redospf
Ruijie(config-router)# network  200.168.23.0
```

يي

```
Ruijie(config)# route-map redospf permit  10
Ruijie(config-route-map)# match tag  10
Ruijie(config-route-map)# set metric  10
```

ЉЮ ˘ ǂ ˘ يي
a ‡ ˘ Љ ǂ يي ˘ a
‡ ˙

يي

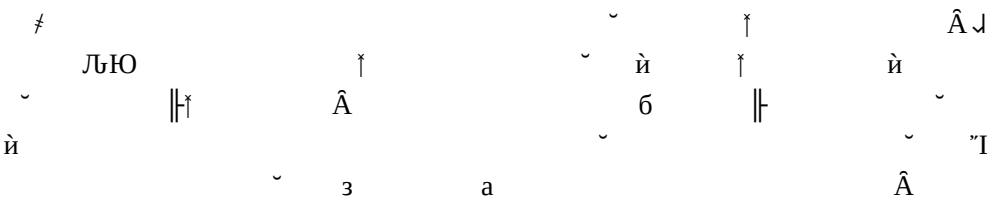
```
Ruijie(config)# route-map  redrip  permit  10
```

```
Ruijie(config-route-map)# match length 1 3
Ruijie(config-route-map)# match route-type external
Ruijie(config-route-map)# set level backbone


Ruijie(config)# router ospf 1
Ruijie(config-router)# redistribute rip subnets route-map
redrip

% ospf redistribute rip not support match length
% ospf redistribute rip not support match route-type
% ospf redistribute rip not support set level backbone
```

38.4.2

-

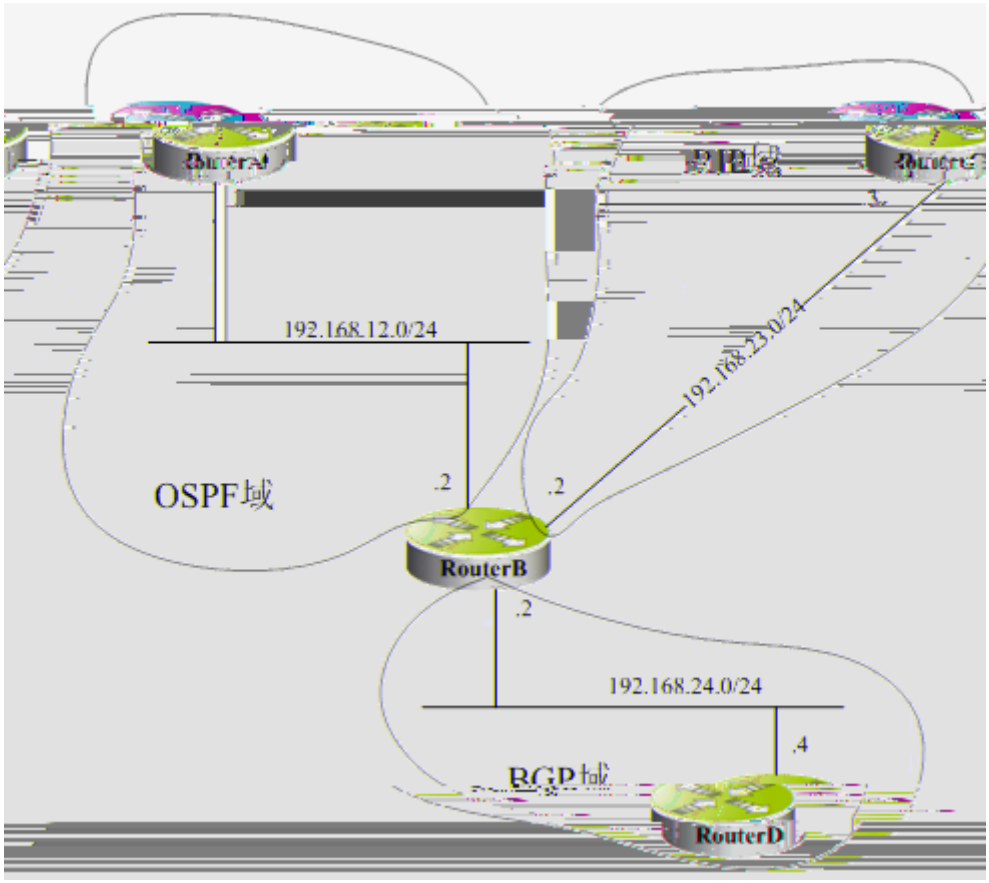
- **é**



```
Ruijie(config)# iproute 172.16.1.0255.255.255.0172.200.1.2
Ruijie(config)# iproute 192.168.1.0255.255.255.0172.200.1.2
Ruijie(config)# iproute 192.168.2.0255.255.255.0172.200.1.4


Ruijie(config)# router rip
Ruijie(config-router)# version 2
Ruijie(config-router)# redistribute static
Ruijie(config-router)# network 192.168.34.0
Ruijie(config-router)# distribute-list EXT_ACL out static
Ruijie(config-router)# no auto-summary


Ruijie(config)# ip access-list extended EXT_ACL
Ruijie(config-ext-nacl)#10 permit ip 192.168.1.0 0.0.0.255
any
Ruijie(config-ext-nacl)#10 permit ip 172.16.1.0 0.0.0.255 any
```

38.4.3

●



1

●

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

```
Ruijie(config-if)# ip address 192.168.10.1 255.255.255.0
Ruijie(config)# interface loopback 1
Ruijie(config-if)# ip address 192.168.100.1 255.255.255.0
Ruijie(config-if)# no ip directed-broadcast
Ruijie(config)# interface gigabitEthernet 0/1
Ruijie(config-if)# ip address 192.168.12.55 255.255.255.0

      OSPF
Ruijie(config)# router ospf 12
Ruijie(config-router)# network 192.168.10.0 0.0.0.255 area 0
Ruijie(config-router)# network 192.168.12.0 0.0.0.255 area 0
Ruijie(config-router)# network 192.168.100.0 0.0.0.255 area 0

Ruijie(config)# interface gigabitEthernet 0/0
Ruijie(config-if)# ip address 192.168.12.5 255.255.255.0
Ruijie(config)# interface Serial 1/0
Ruijie(config-if)# ip address 192.168.23.2 255.255.255.0

Ruijie(config)# router ospf 12
Ruijie(config-router)# redistributeripmetric 100 metric-type
1 subnets
Ruijie(config-router)# redistribute bgp route-map ospfrm
subnets
Ruijie(config-router)# network 192.168.12.0 0.0.0.255 area 0

Ruijie(config)# router rip
Ruijie(config-router)# redistribute ospf 12 metric 2
Ruijie(config-router)# network 192.168.23.0
Ruijie(config-router)# distribute-list 10 out ospf
Ruijie(config-router)# default-information originate always
Ruijie(config-router)# no auto-summary


Ruijie(config)# router bgp 2
Ruijie(config-router)# neighbor 192.168.24.4 remote-as 4
Ruijie(config-router)# address-family ipv4
Ruijie(config-router-af)# neighbor 192.168.24.4 activate
Ruijie(config-router-af)# neighbor 192.168.24.4
 send-community

Ruijie(config)# route-map ospfrm
Ruijie(config-route-map)# match community cl_110
```

```
Ruijie(config)# access-list       10  permit    192.168.10.0

    community
Ruijie(config)# ipcommunity-liststandard            cl_110    permit    11:11

           .

          /
Ruijie(config)#  interface gigabitEthernet              0/0
Ruijie(config-if)#  ip address       192.168.30.1 255.255.255.0
Ruijie(config)#  interface       gigabitEthernet         0/1
Ruijie(config-if)#  ip address       192.168.3.1 255.255.255.0
Ruijie(config)#  interface Serial          1/0
Ruijie(config-if)#  ip address       192.168.23.3 255.255.255.0

      RIP
Ruijie(config)#  router rip
Ruijie(config-router)#  network    192.168.23.0
Ruijie(config-router)#  network    192.168.3.0
Ruijie(config-router)#  network    192.168.30.0

           .

          /
Ruijie(config)#  interface gigabitEthernet              0/0
Ruijie(config-if)#  ip address       192.168.40.1 255.255.255.0
Ruijie(config)#  interface       gigabitEthernet         0/1
Ruijie(config-if)#  ip address       192.168.4.1 255.255.255.0
Ruijie(config)#  interface gigabitEthernet              1/0
Ruijie(config-if)#  ip address       192.168.24.4 255.255.255.0

      BGP
Ruijie(config)#  router bgp 4
Ruijie(config-router)#  neighbor    192.168.24.2      remote-as    2
Ruijie(config-router)# redistribute       connected route-map bgprm
Ruijie(config-router)#  address-family ipv4
Ruijie(config-router-af)#  neighbor    192.168.24.2     activate
Ruijie(config-router-af)# neighbor    192.168.24.2
 send-community

         
Ruijie(config)# route-map    bgprm
Ruijie(config-route-map)#  set  community    22:22


O E1 192.168.30.0/24 [110/101] via 192.168.12.5, 00:04:07,
GigabitEthernet0/1
O E1 192.168.3.0/24 [110/101] via 192.168.12.5, 00:04:07,
GigabitEthernet0/1
```

```
R    0.0.0.0/0 [120/1] via 200.168.23.2, 00:00:00, Serial1/0
R    192.168.10.0/24 [120/2] via 200.168.23.2, 00:00:00,
Serial1/0
```

39

39.1

й ѧ ą ā ˇ ˘ ˚ ˛
Â ѧ ą ЉЮ ˛

- ˚
- ˚
- ˚
- ˚
- ˚

Л Љ é a˘ ˚ ˚ Â

39.1.1

й ˚ ˘ ≠ й ^ ~ ˘
й ˘ й Â ЊЖ ‡ Л
Э ˚ ˛ Â è ˘ Л Љ ˇ й
Â

Л Љ ˚ ˘ ˚ Â
è ˇ ˘ ÿ Л
˘ Ƀ ˚ ā è Â

˘ ˚ ÿ ˘
. ˮI ˇ Â

˘ й ˚ ˛ Â
˚ Ƀ ˚ Л й Â

‡ Л Љ à à Э ˘ Ѵ Â

39.1.2

˘ ў ЉЮ ˛

- ˚ ˛ ˚ ж ˘ ˚ ж
  Â

● 8 ˋ ѝ ˘ ЊЖ ‡˘ Л Лʊ 8 Ь^

Л ˚ Ь˘ ѐ Ь ‡ ~ ˘

AC ‘ 2 يي

╕ ‡ ╕ ł˘ ⅄ … Лъ ł˘ ˘ ⅄

Â Лъ ⅄ Â ā ĺ

˘ ⅄… ĺ б ⅄ ˘ ē ⅄ ł˘ a Ậ è

‡ ⅄ Â

… ⅄˘ ˘ ‡ ł ⅄ a Â

Ю ‘

access list deny ip any any

access list permit tcp eq telnet any

‡ ⅄ ˘ Лъ ў

˘ ѝ ‡ ⅄ ē ˘ a Ậ ł ‡ ⅄ Â

39.2.2 IP

ЛъЮ ч ‘

ЬЖ

⅄

˘ ЛъЮ ч ‘

Ю ЛъЮ Ѣ ҳ‘

Ѣ ҳ	╖
access-list *id* **deny permit** *src-wildcard* **host** *src* **any time-range** *tm-rng-name*	ЬЖ
interface *interface*	⅄
ip access-group *id* **in out unreflect**	⅄

ү Ю ЛъЮ Ѣ ҳ‘

Ѣ ҳ	╖
ip access-list standard extended *id name*	

3

Э ˘ ЛЪЮ ╖ ‘

ў Л Э ў Ы

Ы Â

8 Л Э a ў Ы Â

🕮

ЛЪ Э ◘˘ ¨ Л ¦ Э ў ў ˘

a Э ў Â

●

‘

```
Ruijie(config)# interface GigabitEthernet 0/1
Ruijie(config-if)# ip address 192.168.12.1 255.255.255.0
Ruijie(config-if)# exit
Ruijie(config)# interface GigabitEthernet 0/2
Ruijie(config-if)# ip address 2.2.2.2 255.255.255.0
Ruijie(config-if)# ip access-group 101 in
Ruijie(config-if)# ip access-group 101 out
```

˘ Л й 101

```
Ruijie(config)# access-list 101 permittcp 192.168.12.00.0.0.255 any
eq telnet time-range check
```

```
Ruijie(config)# access-list      101  denyicmp   192.168.12.00.0.0.255          any
Ruijie(config)# access-list       101   deny ip     2.2.2.0 0.0.0.255          any
Ruijie(config)#  access-list       101   deny ip any any
```

```
Ruijie(config)#  time-range check
Ruijie(config-time-range)# periodic weekdays        8:30    to    17:30
```

ł ‡ ⅄ Л Ъ a ˘ ѝ

ł ‡ ⅄ Â

```
Ruijie(config)#  hostname Ruijie
Ruijie(config)#  interface GigabitEthernet            0/1
Ruijie(config-if)#  ip address      192.168.202.1 255.255.255.0
Ruijie(config)#  interface GigabitEthernet            0/2
Ruijie(config-if)#  ip address      2.2.2.1 255.255.255.0
```

39.3 Expert

Э ˘

⅄˘ Л Ъ Â Ю ⅄ Â

	⅄

a Â

39.3.1 Expert

…

-

ˆ ﾊ ~ ﾙ ˇ

ﾐ Â

ˇ ﾊ ﾉ ﾋ ‡ˇ è

ﾊ ˚ ﾊ ¨ ˇ ﾉ ﾊ ˚ Â

39.3.2 Expert

ﾉﾋﾘ ﾁ ˈ

ﾋﾏ

ﾊ

ˇ ﾉﾋﾘ ﾁ

ﾘ ﾉﾋﾘ ﾓ ﾔˈ

ﾓ ﾔ	ﾗ
access-list *id* **deny** **permit** *prot* *ethernet-type* **cos** *cos* **VID** *vid* *src-wildcard* **host** *src* **host** *src-mac-addr* **any** *dst-wildcard* **host** *dst* **any** **host** *dst-mac-addr* **any** **precedence** *precedence* **tos** *tos* **dscp** *dscp* **fragment** **time-range** *tm-rng-name*	ﾋﾏ ﾓ ﾔ é ﾓ ﾔ
interface *interface*	ﾊ
expert access-group *id* **in** **out** **unreflect**	ﾊ

ﾕˇ ﾘ ﾉﾋﾘ ﾓ ﾔˈ

ﾓ ﾔ	ﾗ
expert access-list **extended** *id name*	

sn **permit**
deny *prot* *ethernet-type* **cos** *cos*
VID
vid *src-wildcard* **host** *src* **host**
src-mac-addr **any**

```
Ruijie(config-exp-nacl)# exit
Ruijie(config)# interface gigabitEthernet 0/1
Ruijie(config-if)# expert access-group expert-list in
Ruijie(config-if)# end
Ruijie# show access-lists
expert access-list extended expert-list
petmit ip vid 20 any host 0013.2049.8272 any any
deny any any
Ruijie#
```

39.4 TCP Flag

8 8

permit tcp any any match-all rst

Â

Ѓ Ѓ Ѓ Ѓ È Aƒ,€RÖijw 0 e(.34cw 6.on.34fig)#

exit **interface** *interface*	8 ˘ Л
ip access-group *id name* **in out**	Л

Ю

```
Ruijie> enable
Ruijie#
```

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

```
Ruijie(config)# ip access- list extended test-tcp-flag
Ruijie(config-ext-nacl)#
```

╕

```
Ruijie(config-ext-nacl)# permit tcp any any match- all rst
```

╕

```
Ruijie(config-ext-nacl)# deny tcp any any match-all fin
```

╕ ˘

```
Ruijie(config-ext-nacl)# end
```

```
Ruijie# show access- list test-tcp-flag
ip access-lists extended test-tcp-flag
10 permit tcp any any match-all rst
20 deny tcp any any match-all fin
```

39.5 ACL

ѝ . ″I ˘ ˘ Лъ Ю

˘ Л ˘ έ Ю˙

- Лъ л ,
- Лъ л ˘ a л Лъ л й Лъ Â
- л Лъ ˘ ч
  Â
- л л Â

ip access-list resequence *acl-id| acl-name sn-start sn-inc* Ъ ъ˘ Ъ ъ Ъ ъ
Â

Лъ Э Ъ ъ˘ Ю ˘ ¨ й Ю л
й'

```
ace1: 10
ace2: 20
ace3: 30
```

ip access-list resequence *tst_acl 100 3* л Ю

```
Ruijie(config)# ip access-list resequence tst_acl 100 3
ace1: 100
ace2: 103
ace3: 106
```

a ╗ ˘ л Ю

```
Ruijie(config-std-nacl)# permit Â Â Â
ace1: 100
ace2: 103
ace3: 106
ace4: 109
```

╗ ˘ л Ю

```
Ruijie(config-std-nacl)# 105 permit Â Â Â
ace1: 100
ace2: 103
ace5: 105
ace3: 106
ace4: 109
```

л й . ″I ╗ Â

```
Ruijie(config-std-nacl)# no 106
ace1: 100
ace2: 103
ace5: 105
```

```
ace4: 109
```

Э ⁄ ≠ ⁄ Л Ъ Â

39.6 ACL

⁄ Л Ъ ˘ Â ѝ

˘ ″I Â

˘ ╖ ˘ ⁄

Â

ÿ ˘ ⁄ Л Ъ Л Ъ Ю ‘

Ѣ ҂	

Л Љ Â ѝ

Ќ ˘ ‡ Ќ

Ю Љ Ќ ѝ ˘ ‘

```
Ruijie(config)# time-range    no-http
Ruijie(config-time-range)# periodic weekdays      8:0039-/jie(con1 -195Con1 -195Con1 46 -
```

```
Ruijie# show access-lists     101

ip access-list extended 101
10 deny tcp any any match-all syn
20 permit ip any any
```

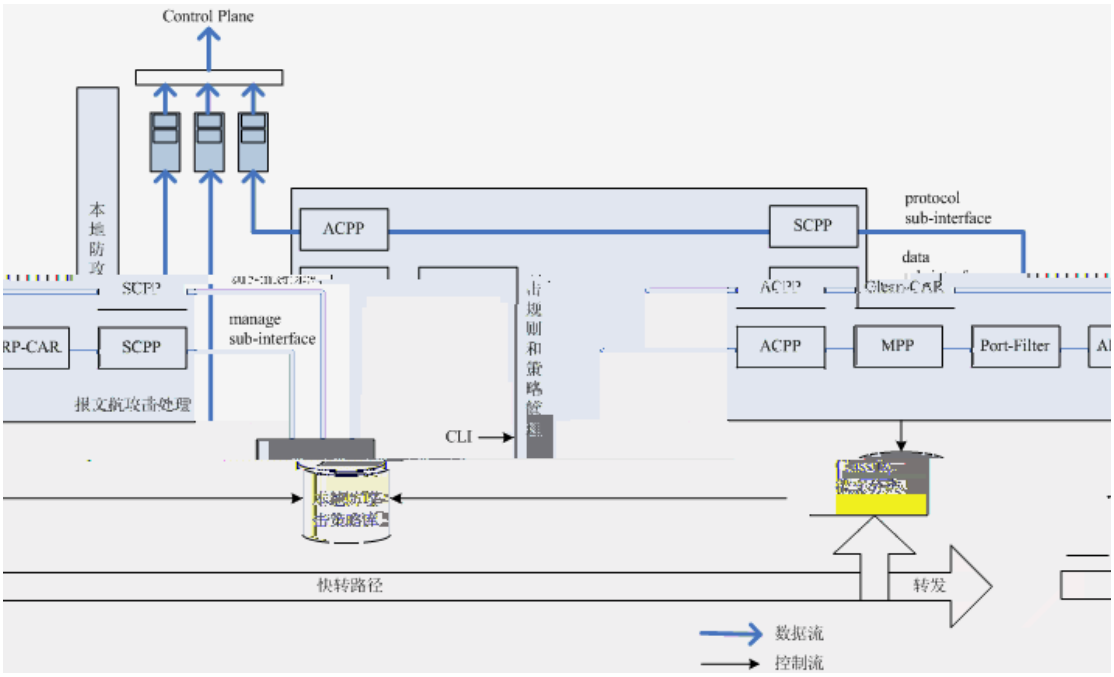
40 RPL

40.1 RPL

40.1.1 RPL

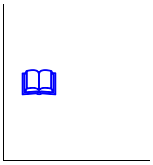
41

41.1



Classify

-
-
-
-
-
- ‡



˜ Ł ˘ Л Љ

Â ℸ Â

41.2.2 control-plane

Ю Â

Ю Ъ ҙ ՝

Ъ ҙ	
control-plane protocol manage data	˘ Л Љ Л

Ъ ҙ Ъ ҙ Â

41.2.3 SCPP

Л ^ ˀ ℸ ˜ ˘ Л Љ ℸ

ℸ ՝ Â Ю Ъ ҙ ՝

Ъ ҙ	
scpp list *acl_no* **bw-rate** *bw* **bw-burst-rate** *bw burst rate*	Л Э˘ ℸ^ Æ ˜ ˘ ℸ Â ՝ ‡˘ ՝ ℸ^ Æ й ˜ ՝ ℸ^ Æ й ˜
no scpp list	‡

Ь Л Э Л Љ è Э Â

˘ ˘ ‡ ł Â

41.2.4 Glean-CAR

ɨ ƃ ˘ Ю

Ƒ ɜ ˋ

41.2.6 Port-Filter

port-filter	
no port-filter	

41.2.7 MPP

management-interface *interface* **allow ftp http https ssh snmp telnet tftp**	
no management interface *interface*	

41.2.8 ACPP

acpp bw-rate *rate*

Ь ⅄ Э ⅄ Л̀ è Э Â

Ю̋ ˘ ‡ ł Â

41.2.9

‡ ˘ ‡ Ю Ю Ѣ ҳ ˙

Ѣ ҳ	
ef-rnfp enable	‡
ef-rnfp disable	

‡ а˚ ң ⅄ Â

41.3

41.3.1

˘ ⅄ Л̀ Ю Ѣ ҳ ˙

Ѣ ҳ	

show ef-rnfp acpp scpp

```
          ˇ      Э          й       ˇ                 й
Ruijie(config-cp)# acpp  bw-rate 500   bw-burst-rate     600
              ˇ                      Ƃ
Ruijie(config-cp)# glean-car   10
                        ˇ                   ⅄
Ruijie(config)# control-plane manage
          ˇ        Э          й       ˇ                 й
Ruijie(config-cp)# acpp  bw-rate 500   bw-burst-rate     600
             ˇ
Ruijie(config-cp)# arp-car   10
               ℸ
Ruijie(config-cp)# port-filter
           ‡ˇ          ⅄ й          ⅄ˇ    ⅄             ˇ
Ruijie(config-cp)# management-interface gi0/0 allow telnet snmp
```

42

42.1 ip-mac

42.1.1 ip-mac

Ƀ ҳ **no** ˘ Â
˘ Л Љ **clear ipmacbind** ╟ ˘ ‘

```
Ruijie# clear ipmacbind dynamic
```

Э Ƀ ҳ **ipmacbind auto** ÿ ╟ ’

```
Ruijie# clear ipmacbind all
```

Э Ƀ ҳ ’

Ю ƀ Э ‡ ˘ Л Љ
ѝ ƀ Э ‡ Â ‘

```
Ruijie(config)#
```

˘ **show ipmacbind** Ƀ ҳ Â

```
Ruijie# show ipmacbind table
Totol number of IPMAC-Bind: 5
No       Type         IP Address       MAC Address        Log
1      <static>     192.168.52.69    032a.33ac.3f11     on
2      <auto>       192.168.52.1      00d0.f8b8.c898     on
3      <auto>       138.138.138.138    00d0.f822.33aa     on
```

Л Љ ’

```
Ruijie# show ipmacbind stati39.5A0 Td [fD p6( )T41Tf 0 TE5 nu9.66(-Ba)6(0 Td [(r6(c.ppMA)6ow i)3
```

˘ è Â ﾉ Э ⁸˘ a ‡
Â a ˘ Â

42.2.2

Ю ﾉ ╖ ˘ ﾉ ╖ ˘ ﾉ Ю
ip ingress-filter Ƀ ȝ˘ ˙

```
Ruijie(config-if)# ip ingress-filter log
```

Э Ƀ ȝ ﾉ Э ﾉ ╖ ˘ ˚ ﾉ ╖ ’

Ƀ ȝ ﾉ Л Ъ ﾉ Э ﾉ ╖ ˘ ‘

```
Ruijie(config-if)# no ip ingressB00739>-cng
```

Э Ƀ ȝ ﾉ Э ﾉ ╖ Â

42.3.2 TCP SYN

Ю ʒ ╖ ˘ ʒ ╖ ˘ ″I
‡˘ ʒ ˘ ‘

```
Ruijie(config)# access-list 100 permitip 192.168.52.00.0.0.255 any
```

ł ⅄ Ю **ip tcp-intercept list in|out** Ƌ ʒ˘ ⅄ ă Э
‡ ʒ ˘ ‘

```
Ruijie(config)# interface gigabitEthernet 0/0
Ruijie(config-if)# ip tcp-intercept list 100 in log
```

Э Ƌ ʒ ⅄ ă ʒ ˘
ʒ ╖ Â

╖ **ip tcp-intercept list in out** Ƌ ʒ ˘

```
Ruijie(config)# interface gigabitEthernet 0/0
Ruijie(config-if)# no ip tcp-intercept list 100 in log
```

ʒ ˘ Ƌ ʒ˘
‘

```
Ruijie(config-if)# show ip tcp-intercept
Intercepting new connections using access-list 100 at gigabitEthernet
0/0 in
20 incomplete, 1320 established connections (total 1340)
```

Э Ƌ ʒ ⅄ Л Ъ ⅄ Э ʒ ˘ з
˘ ⅃ Â

42.4

42.4.1

˘ ˘ ˘ Ƌ ʒ ⁸ б ˚ ˘ з
⅃ ⁸ ⅄ ⅄ Â Э
‡ Л ⁸ ⅄ ˘ ж ˘

Â Љ й

ª Â

42.4.2

˝I Ю ‡˘ ‡ й

Л Љ ╗ й ‡ Л Љ ╗ з ч

а ă Â

Л Љ Ж й ‡ Â

```
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

Ruijie(config)# show ip inspect all
Inspection Rule Configuration
Inspection name abc
ftp
mms
Inspection name 123
mms
h323
```

ł Л Ю˘ ╗ ‡ Â

```
Ruijie(config)# interface gigabitEthernet 0/0
Ruijie(config-if)# ip inspect abc in
Ruijie(config)# show ip inspect all
Inspection Rule Configuration
Inspection name abc
ftp
mms
Inspection name 123
mms
h323

Interface Configurationn
Interface gigabitEthernet 0/0
Inbound inspection rule is abc
ftp
```

42.5.2 TCP

Ю **ip inspect**

```
Ruijie(config)# ip inspect name abc tcp
```

```
Ruijie(config)# interface gigabitEthernet 0/0
Ruijie(config-if)# ip inspect abc in
```

42.6

42.6.1

42.6.2

```
access-list 1 permit any
```

˘ ⊀ Ю ‡˘ ‡ ⊀ ă Э˘ ⁸
ѝ ˘ ѝ ѝ ˘ з˘ Э
˚ ˘ è ˘ Â

```
Ruijie(config)# in gi     0/0
Ruijie(config-if)# session-limit access-group          1 rate   100 concurrent
100000   in log
```

Л Ъ Ђ ҳ

42.6.3

```
Ruijie(config-if)# show session-limit config

             Show gigabitEthernet 0/0's config
Input
session-limit access-group 1 rate 12 concurrent 123 in log
session-limit access-group 12 rate 20 concurrent 100 in log
session-limit access-group 13 rate 20 concurrent 100 in log
session-limit access-group 14 rate 20 concurrent 100 in log

 Output
session-limit access-group 1 rate 12 concurrent 123 out log
            Show gigabitEthernet 0/0's config end]
```

╖ ˘ ⊀ Л Ъ ˘ Ђ ҳ

```
Ruijie(config-if)# show session-limit del-rule

       Show Cmd to del the rule on the gigabitEthernet 0/0
Input
no session-limit access-group 1 rate 12 concurrent 123
in log
no session-limit access-group 12 rate 20 concurrent 100
in log
no session-limit access-group 13 rate 20 concurrent 100
in log
no session-limit access-group 14 rate 20 concurrent 100
in log
```

```
Output
no session-limit access-group 1 rate 12 concurrent 123
out log
   Show Cmd to del the rule on the gigabitEthernet 0/0's end



Ruijie(config-if)# show session-limit statistics

         Show gigabitEthernet 0/0's Statistics
Input
matches access-group  : 1
[Configure]:  new_session_rate : 12 , concurren : 123
[Statistics]:  conformed 2247 sessions, blr  blr  blr  blr  blr  blr  blr  b

[S20tistics]:  coormed 2247 sessions, blr  blr  blr  blr0t: 123 colr  d4 0 T

[S20tistics]:  coormed 2247 sessions, blr  blr  blr  blr0t: 123 colr  d4 0 T

[S20tistics]:  coormed 2247 sessions, blr  blr  blr  blr0t: 123 colr  d4 0 T
Output
no session-limit accessoup  : 1
[Configure]:  new_sessio Tw 0 -1.617 Trate : 12 , concurren : 123
```

ш à

43 VPDN

43.1 VPDN

ʌ ң ѝ ʻ Â

- ,
- Â

ч ʌ ˘ б ł Â

ң ˘ Э Â ѝ

˘ Â

˘ ЊЖ Э Â

44 PPTP

44.1 PPTP

˘ ╖ ж Љ ↓ ˘
а Ѧ … Â

↓ ң Ю Ф ҳ ╖ Â
ћ ˘ б Â

Ф ҳ	
vpdn source-ip *ip-address*	
no vpdn source-ip *ip-address*	↓

Ю а ў й Â

↓ ң Ю Ф ҳ Ь Â
ћ ˘ Â

Ф ҳ	
vpdn session-limit sessions	
no vpdn session-limit	

Ю ¯ й Ф ҳ Л Â

44.2.5 virtual-template

Ь ˘ Â й
Л Â .

- Л ’
- ’
- Л ’
- Л ’

è ˘ ˘ б Л Љ Л
Â

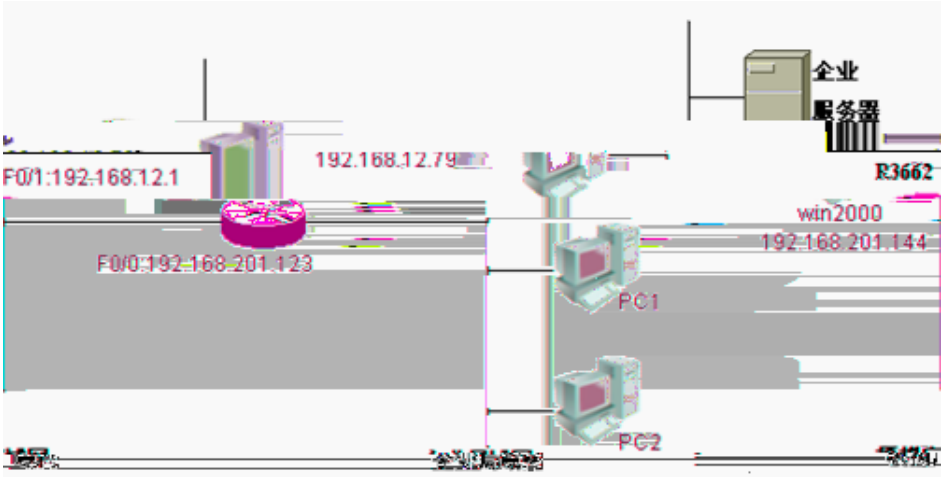
ﻍ ﻩ Ю Ъ ﻉ ﻍ Ъ ﻍ Â

è *name* ¨ Â… ĩ

ﻍ ң Ю Ѣ ҳ Л Љ ¨ Â ¨ ˘ ӂ
Л ѣ ў ¨ Â ¨ ˘ ӂ
ѝ ˘

ﾍ ﾈ Ю Ъ ﾇ ﾉ Л Â ˘ ﾉ Л а
Â

Ъ ﾇ	
pptp flow-control receive-window winsize	ﾉ ˘ ﾍ
no pptp flow-control receive-window	ﾍ ﾉ I ˘ ă ă



1

PPTP

```
R3660# show running-config
Building configuration...
Current configuration : 1053 bytes
!
hostname R3660
enable password  1
!
vpdn enable
!
vpdn-group pptp
! Default PPTP VPDN group
accept-dialin
protocol pptp
virtual-template 1
!
username pc password 0 1111
!
ip local pool pptp 1.1.1.2 1.1.1.254
interface GigabitEthernet 0/0
ip address 192.168.201.123 255.255.255.0
duplex auto
speed auto
!
interface GigabitEthernet 0/1
```

```
ip address 192.168.12.1 255.255.255.0
duplex auto
speed auto
!
interface Virtual-Template 1
ppp authentication pap
ip unnumbered GigabitEthernet 0/1
peer default ip address pool pptp
!
ip route 0.0.0.0 0.0.0.0 GigabitEthernet0/0
!
line con 0
session-timeout 0
escape-character 29
line aux 0
session-timeout 0
escape-character 29
password 1
line vty 0
login
terminal-type ANSI
escape-character 29
line vty 1 4
login
escape-character 29
!
!
end
R3660#
```

‘

```
F:\>ver
Microsoft Windows 2000 [Version 5.00.2195]
F:\>ipconfig /all
Windows 2000 IP Configuration
Host Name . . . . . . . . . . . . : topding
Primary DNS Suffix  . . . . . . . :
Node Type . . . . . . . . . . . . : Hybrid
IP Routing Enabled. . . . . . . . : Yes
WINS Proxy Enabled. . . . . . . . : No
Ethernet adapter        :
Connection-specific DNS Suffix  . :
```

```
Description . . . . . : STAR 901 Family Fast Ethernet
r (ACPI)
Physical Address. . . . . : 00-D0-F8-00-68-E5
DHCP Enabled. . . . . : No
IP Address. . . . . : 192.168.201.144
Subnet Mask . . . . . : 255.255.255.0
Default Gateway . . . . . : 192.168.201.123
DNS Servers . . . . . : 202.101.143.141
Primary WINS Server . . . . . : 192.168.9.7
F:\>route print
===========================================================
Interface List
0x1 ........................... MS TCP Loopback interface
0x2 ...00 d0 f8 00 68 e5 ...... PCI Bus Master Adapter
===========================================================Active
Routes:
Network Destination  Netmask   Gateway      Interface  Metric
0.0.0.0    0.0.0.0  192.168.201.123  192.168.201.144     1
127.0.0.0  255.0.0.0       127.0.0.1      127.0.0.1      1
192.168.201.0  255.255.255.0  192.168.201.144 192.168.201.144
1
192.168.201.144  255.255.255.255 127.0.0.1   127.0.0.1    1
192.168.201.255  255.255.255.255  192.168.201.144  192.168.201.144
1
224.0.0.0  224.0.0.0  192.168.201.144  192.168.201.144  1
255.255.255.255  255.255.255.255  192.168.201.144  192.168.201.144
1
Default Gateway:   192.168.201.123
===========================================================
Persistent Routes:
None
```

```
                    ﾉ                ˘                                  ж
     ˘ ‘Ω            a          ˘          ù          ˘ Ъ¨
¨    ù          Â                ˘          Ь          ù       ˘
          ЬЖ          ↓ ﾉ  ╗  Â      O ﾉ  ˘                        ¨
          Â
     ˘                    ь˘ ¨  ﾉ    ‘Ω ﾉ          Ь  ˘       Ь
          ˘   Ю‘
```

```
F:\>ipconfig /all
Windows 2000 IP Configuration
Host Name . . . . . : testpc
```

```
Primary DNS Suffix  . . . . . :
Node Type . . . . . : Hybrid
IP Routing Enabled. . . . . : Yes
WINS Proxy Enabled. . . . . : No
Ethernet adapter        :
Connection-specific DNS Suffix  . :
Description . . . . . : STAR 901 Family Fast Ethernet Adapte
r (ACPI)
Physical Address. . . . . : 00-D0-F8-00-68-E5
DHCP Enabled. . . . . : No
IP Address. . . . . : 192.168.201.144
Subnet Mask . . . . . : 255.255.255.0
Default Gateway . . . . . :
DNS Servers . . . . . : 202.101.143.141
Primary WINS Server . . . . . : 192.168.9.7
PPP adapter vpn_rgnos:
Connection-specific DNS Suffix  . :
Description . . . . . : WAN (PPP/SLIP) Interface
Physical Address. . . . . : 00-53-45-00-00-00
DHCP Enabled. . . . . : No
IP Address. . . . . : 1.1.1.4
Subnet Mask . . . . . : 255.255.255.255
Default Gateway . . . . . : 192.168.12.1
DNS Servers . . . . . :
F:\>
F:\>route print
===========================================================
==
Interface List
0x1 ........................... MS TCP Loopback interface
0x2 ...00 d0 f8 00 68 e5 ...... PCI Bus Master Adapter
0x30000004 ...00 53 45 00 00 00 ...... WAN (PPP/SLIP) Interface
===========================================================
Active Routes:
Network Destination       Netmask         Gateway      Interface
Metric
0.0.0.0       0.0.0.0      192.168.12.1     1.1.1.4    1
1.1.1.4  255.255.255.255    127.0.0.1     127.0.0.1    1
1.255.255.255  255.255.255.255    1.1.1.4    1.1.1.4    1
127.0.0.0     255.0.0.0     127.0.0.1    127.0.0.1    1
192.168.201.0   255.255.255.0  192.168.201.144  192.168.201.144
1
```

```
192.168.201.123  255.255.255.255  192.168.201.144  192.168.201.144
1
192.168.201.144  255.255.255.255       127.0.0.1      127.0.0.1
1
192.168.201.200  255.255.255.255  192.168.201.100  192.168.201.144
1
192.168.201.255  255.255.255.255  192.168.201.144  192.168.201.144
1
224.0.0.0     224.0.0.0       1.1.1.4        1.1.1.4    1
224.0.0.0  224.0.0.0  192.168.201.144  192.168.201.144  1
255.255.255.255  255.255.255.255  192.168.201.144  192.168.201.144
1
Default Gateway:          192.168.12.1
===========================================================
Persistent Routes:
None
F:\>
F:\>ping 192.168.12.1
Pinging 192.168.12.1 with 32 bytes of data:
Reply from 192.168.12.1: bytes=32 time<10ms TTL=255
Reply from 192.168.12.1: bytes=32 time<10ms TTL=255
Reply from 192.168.12.1: bytes=32 time<10ms TTL=255
Reply from 192.168.12.1: bytes=32 time<10ms TTL=255
Ping statistics for 192.168.12.1:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Minimum = 0ms, Maximum =  0ms, Average =  0ms
F:\>ping 192.168.12.79
Pinging 192.168.12.79 with 32 bytes of data:
Reply from 192.168.12.79: bytes=32 time=10ms TTL=127
Reply from 192.168.12.79: bytes=32 time<10ms TTL=127
Reply from 192.168.12.79: bytes=32 time<10ms TTL=127
Reply from 192.168.12.79: bytes=32 time<10ms TTL=127
Ping statistics for 192.168.12.79:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Minimum = 0ms, Maximum =  10ms, Average =  2ms
```

Э Ю

```
R3660#sh ip route
Codes: C - connected, S - static,  R - RIP
O - OSPF, IA - OSPF inter area
```

```
E1 - OSPF external type 1, E2 - OSPF external type 2
Gateway of last resort is 0.0.0.0 to network 0.0.0.0
1.0.0.0/8 is variably subnetted, 2 subnets, 2 masks
C       1.1.1.0/24 is directly connected, Virtual-Access1
C       1.1.1.4/32 is directly connected, Virtual-Access1
C    192.168.12.0/24 is directly connected, GigabitEthernet0/1
C    192.168.201.0/24 is directly connected, GigabitEthernet0/0
S*   0.0.0.0/0 is directly connected, GigabitEthernet0/0
R3660#
```

˘ ѝ Ь ˘ Ь Л Љ

Â Ю˝ Л Ь ѝ

Л Љ ˘ ¨ ѝ

ˆ ˜ à ⁄¨ ˆ ˜ à ¨
ˆ ˜ à Л ⁄ ◘ ˆ ˜ Â

⁄ ң **clear vpdn** Ƀ ҳ ⁄ Л ⁄ è Â

Ƀ ҳ	
clear vpdn tunnel **l2tp** **pptp** *remote name*	à ў ¨ ⁄ è

remote name ѝ ў ¨ Â ˘ … ł
clear vpdn tunnel pptp **clear vpdn tunnel** ‡ ˘ Ƀ ҳ ł ‘

```
R3660#
```

```
VPDN: Pptp tunnel id 0 recv outgoing-call-request!
Pptp: Tunnel to 192.168.200.114 get config para. from vpdn-group pptp!
```

```
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
```

Лъ ˜ ѝ ˇ **debug vpdn error** Ю

```
VPDN: PPTP session Virtual-Access1 wait pak ack timeout(wait seq=37,
ack=36), de
crease 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), de
crease send window to half of current = 16!
VPDN: PPTP session Virtual-Access1 adjust ATO to 280 ms!
```

˘ Л ˘ Л Љ

8 Â

- ĩ
- 8
- 8
- 8

Л ң Ю Ђ ҳ Л Љ Љ 8
ĩ Â

Ђ ҳ	
l2tp-class *l2tp-class-name*	… ¨ Л
no l2tp-class *l2tp-class-name*	¨ Л

è … ĩ ¨ ˘ …
Л Љ è¨ Â

Л ң Ю Ђ ҳ 8 Â

Ђ ҳ	
receive-window *size*	8 Н Л
no receive-window	8 Н Л
retransmit initial retries *initial-retries* **timeout max min** *initial-timeout* **retries** *retries* **timeout max min** *timeout*	8
no retransmit initial retries timeout max min retries timeout max min	8

timeout setup *seconds*	8 Л
no timeout setup	8 Э ѝ

ѐ ˘ *size* ѝ Л Л ˘ ѝ ’ *initial-retries* ѝ ˘
ѝ ’ *initial-timeout* ˘ ѝ ˘
ѝ ’ *retries* 8 ˘ ’ *timeou*
8 ˘ ѝ ˘
ѝ ’ *seconds* 8 Э ˘ ѝ Â

Л ң Ю Ъ ҳ 8 Â

Ъ ҳ	

45.2.3 pseudowire-class

˘ Л ˘ Л Љ

Â ‘

- ĩ
-
-
- 8

л ң Ю Ѣ ҳ Л Љ Љ

Pseudowire-class ĩ Â

Ѣ ҳ	
pseudowire-class *pseudowire- class-name*	… ¨ Л
no pseudowire-class *pseudowire- class-name*	¨ Л

è *pseudowire-class-name* … **Pseudowire-class** ĩ ¨ ˘ …

Pseudowire-class Л Љ **Interface Vrtual-ppp** Л ‡ è¨ Â

è ˘ Ɱ ɻ ʌ Ɱ ɻ ę ˆ

no pseudowire	‡

ﾉ Э ‡˘ ﾉ ╟ б

˘ ˘ ɬ Ậ

Â ˘ ﾊ

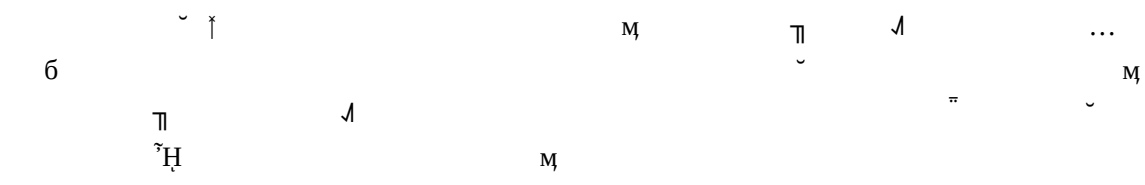
ὺ έ ˆ ㄴ Э Ậ ˘

```
l2tp-class l2x
hostname branch
!
pseudowire-class pw
encapsulation l2tpv2
protocol l2tpv2 l2x
ip local interface GigabitEthernet 0/1
!
!
!
!
!
!
interface GigabitEthernet 0/0
ip address 192.168.201.1 255.255.255.0
ip nat inside
duplex auto
speed auto
!
interface GigabitEthernet 0/1
ip address 192.168.12.217 255.255.255.0
ip nat outside
duplex auto
speed auto
!
interface Null 0
!
interface Virtual-ppp 1
pseudowire 192.168.12.213 12 pw-class pw
ppp pap sent-username rgnos password 7 072C04211A01
ip mtu 1460
ip address negotiate
ip nat outside
!
ip nat inside source list 102 interface GigabitEthernet0/1 overload
ip nat inside source list 101 interface Virtual-PPP1 overload
ip route 0.0.0.0 0.0.0.0 GigabitEthernet 0/1 192.168.12.1
ip route 192.168.207.0 255.255.255.0 Virtual-ppp 1
!
line con 0
line aux 0
line vty 0 4
```

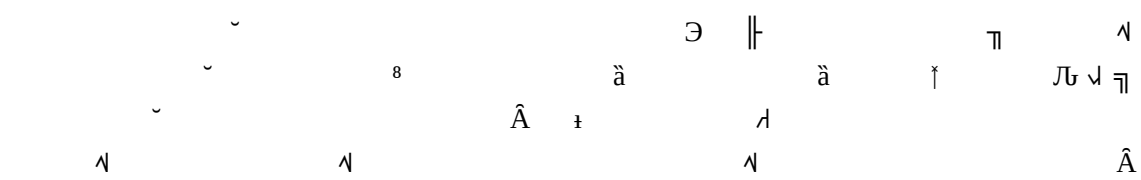
!

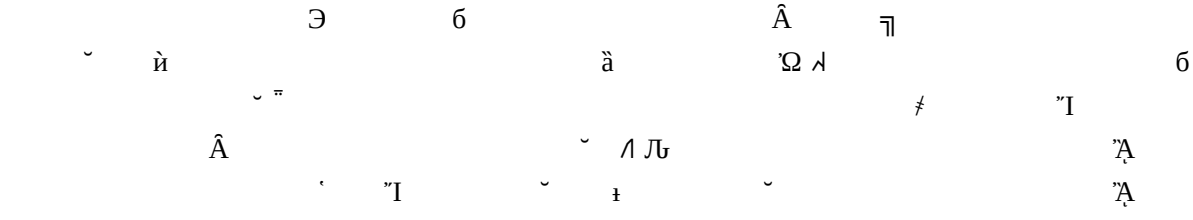
!

end



```
0x1000002 ...00 53 45 00 00 00 ...... WAN (PPP/SLIP) Interface
0x1000003 ...00 10 88 01 a5 c3 ...... Novell 2000 Adapter.
===========================================================
Active Routes:
Network Destination       Netmask         Gateway      Interface
Metric
0.0.0.0    0.0.0.0    192.168.12.1  192.168.12.213    1
127.0.0.0    255.0.0.0     127.0.0.1    127.0.0.1    1
192.168.12.0    255.255.255.0   192.168.12.213  192.168.12.213
1
192.168.12.213  255.255.255.255       127.0.0.1      127.0.0.1
1
192.168.12.217  255.255.255.255   192.168.12.213  192.168.12.213
1
192.168.12.255  255.255.255.255   192.168.12.213  192.168.12.213
1
192.168.103.2  255.255.255.255       127.0.0.1      127.0.0.1
1
192.168.103.6  255.255.255.255    192.168.103.2   192.168.103.2
1
224.0.0.0  224.0.0.0  192.168.12.213  192.168.12.213  1
255.255.255.255  255.255.255.255   192.168.12.213  192.168.12.213
1
Default Gateway:     192.168.12.1
===========================================================
Persistent Routes:
None
C:\>
```





ˇ ł Ю… ¨ ѝ ↓ є ѝ
ˇ ⁹ Ѧ ˇ ł Â ÿ a
Ѧ Â
ˇ ṗ ↓ ˇ ˇ ŭ ‡
Â

Ю ǀ ў Љ ↓
˛

```
icrosoft Windows 2000 [Version 5.00.2195]
(C)        1985-2000 Microsoft Corp.
C:\WINNT\system32>ipconfig /all
Windows 2000 IP Configuration
Host Name . . . . . . . . . . . . : DENGL-NECBOOK
Primary DNS Suffix  . . . . . . . :
Node Type . . . . . . . . . . . . : Hybrid
IP Routing Enabled. . . . . . . . : No
WINS Proxy Enabled. . . . . . . . : No

Ethernet adapter        :
Connection-specific DNS Suffix  . :
Description . . . . . .: Realtek RTL8139(A)-based PCI Fast Ethernet
Adapter
Physical Address. . . . . . . . . : 00-10-60-75-BD-7A
DHCP Enabled. . . . . . . . . . . : No
IP Address. . . . . . . . . . . . : 192.168.201.78
Subnet Mask . . . . . . . . . . . : 255.255.255.0
Default Gateway . . . . . . . . . : 192.168.201.1
DNS Servers . . . . . . . . . . . : 202.101.143.141
                                    202.101.98.55

C:\WINNT\system32>route print
===========================================================Interf
ace List
0x1 ........................... MS TCP Loopback interface
0x1000003 ...00 10 60 75 bd 7a ...... NDIS 5.0 driver
===========================================================Active
Routes:
Network Destination       Netmask         Gateway      Interface
Metric
0.0.0.0    0.0.0.0    192.168.201.1  192.168.201.78    1
127.0.0.0    255.0.0.0    127.0.0.1    127.0.0.1    1
```

```
192.168.201.64  255.255.255.192   192.168.201.78  192.168.201.78
1
192.168.201.78  255.255.255.255       127.0.0.1      127.0.0.1
1
192.168.201.255  255.255.255.255   192.168.201.78  192.168.201.78
1
224.0.0.0   224.0.0.0   192.168.201.78  192.168.201.78   1
  255.255.255.255  255.255.255.255   192.168.201.78
192.168.201.78      1
Default Gateway:    192.168.201.1
===========================================================
Persistent Routes:
Network Address         Netmask  Gateway Address  Metric
192.168.2.0    255.255.255.0     192.168.1.1      1
192.168.9.0    255.255.255.0    192.168.12.1      1
61.154.22.0    255.255.255.0    192.168.12.1      1
C:\WINNT\system32>ping 192.168.12.1
Pinging 192.168.12.1 with 32 bytes of data:
Reply from 192.168.12.1: bytes=32 time=50ms TTL=254
Reply from 192.168.12.1: bytes=32 time=20ms TTL=254
Reply from 192.168.12.1: bytes=32 time<10ms TTL=254
Reply from 192.168.12.1: bytes=32 time=60ms TTL=254
Ping statistics for 192.168.12.1:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Minimum = 0ms, Maximum =  60ms, Average =  32ms
C:\WINNT\system32>ping 192.168.103.2
Pinging 192.168.103.2 with 32 bytes of data:
Reply from 192.168.103.2: bytes=32 time<10ms TTL=128
Reply from 192.168.103.2: bytes=32 time<10ms TTL=128
Reply from 192.168.103.2: bytes=32 time<10ms TTL=128
Reply from 192.168.103.2: bytes=32 time<10ms TTL=128
Ping statistics for 192.168.103.2:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Minimum = 0ms, Maximum =  0ms, Average =  0ms
C:\WINNT\system32>
```

Л ĭ ў Л Ћ Ћ Ч

˘ ў ˘ Л ĭ

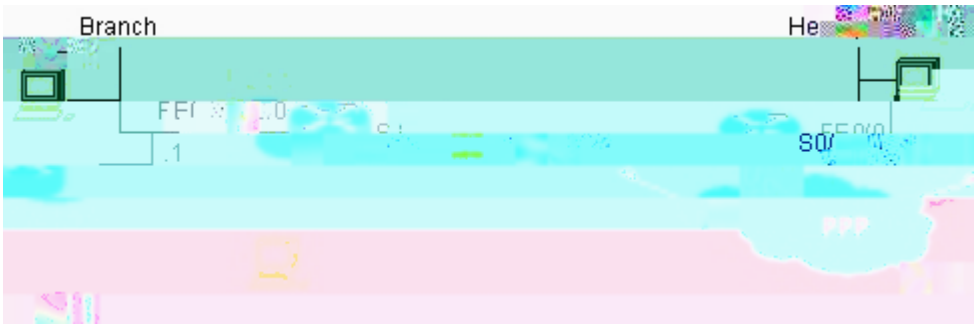
è и ¯ Л Â ≠ Л Ћ

ÿ Э Л Ћ ‘

```
R3660#  show ip nat translations
Pro Inside global     Inside local      Outside local     Outside
global
icmp 192.168.103.6:512 192.168.201.78:512 192.168.207.2:512
192.168.207.2:512
icmp 192.168.12.217:512 192.168.201.78:512 192.168.12.1:512
192.168.12.1:512
R3660#  show ip route
Codes: C - connected, S - static,  R - RIP
O - OSPF, IA - OSPF inter area
E1 - OSPF external type 1, E2 - OSPF external type 2
Gateway of last resort is 192.168.12.1 to network 0.0.0.0
192.168.103.0/32 is subnetted, 2 subnets
C       192.168.103.6 is directly connected, Virtual-PPP1
C       192.168.103.2 is directly connected, Virtual-PPP1
C    192.168.12.0/24 is directly connected, GigabitEthernet0/1
C    192.168.201.0/24 is directly connected, GigabitEthernet0/0
S*   0.0.0.0/0 [1/0] via 192.168.12.1, GigabitEthernet0/1
R3660#
```

Ю б ˇйи

й ˇ йи ˙

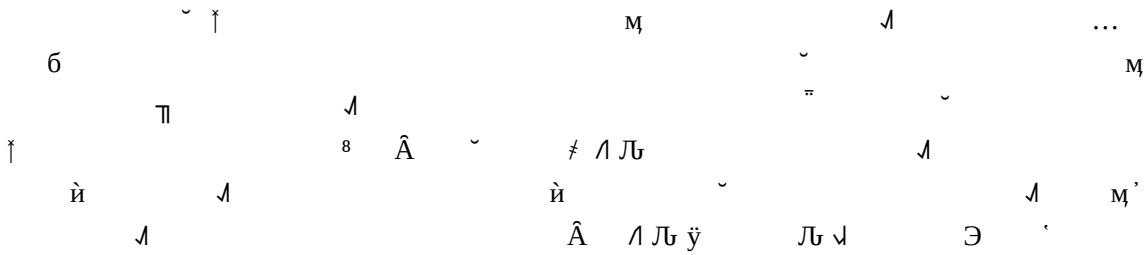


йи 3 б Cisco 2620(LNS) L2TP Ìòã8 йиÔ Cisco

is

```
hostname R3660
access-list 1 permit any
!
l2tp-class l2x
authentication
hostname branch
password share
!
pseudowire-class pw
encapsulation l2tpv2
protocol l2tpv2 l2x
ip local interface serial1/0
!
!
!
!
!
!
interface serial 1/0
encapsulation PPP
ip address 202.101.93.21 255.255.255.192
ip nat outside
!
interface serial 1/1
clock rate 64000
!
interface serial 1/2
clock rate 64000
!
interface serial 1/3
clock rate 64000
!
interface GigabitEthernet 0/0
ip address 192.168.201.1 255.255.255.0
ip nat inside
duplex auto
speed auto
!
interface GigabitEthernet 0/1
duplex auto
speed auto
!
```

```
interface Null 0
!
interface Virtual-ppp 1
pseudowire 202.101.93.23 7 pw-class pw
ppp pap sent-username rgnos password 7 072C04211A01
ip mtu 1460
ip address 192.168.103.3 255.255.255.0
!
router ospf
network 192.168.103.0 0.0.0.255 area 0.0.0.1
network 192.168.201.0 0.0.0.255 area 0.0.0.1
!
ip nat inside source list 1 interface Serial1/0 overload
ip route 0.0.0.0 0.0.0.0 serial 1/0
ip route 192.168.19.0 255.255.255.0 Virtual-ppp 1
!
line con 0
line aux 0
line vty 0 4
!
!
end
R3660#
```



```
R3660# show ip route
Codes: C - connected, S - static,  R – RIP
       O - OSPF, IA - OSPF inter area
       E1 - OSPF external type 1, E2 - OSPF external type 2
Gateway of last resort is 0.0.0.0 to network 0.0.0.0
     192.168.103.0/32 is subnetted, 2 subnets
C       192.168.103.3 is directly connected, Virtual-PPP1
C       192.168.103.2 is directly connected, Virtual-PPP1
S    192.168.19.0/24 is directly connected, Virtual-PPP1
C    192.168.201.0/24 is directly connected, GigabitEthernet0/0
     202.101.93.0/24 is variably subnetted, 2 subnets, 2 masks
C       202.101.93.23/32 is directly connected, Serial1/0
```

```
C      202.101.93.0/26 is directly connected, Serial1/0
S*   0.0.0.0/0 is directly connected, Serial1/0
R3660#show arp
Protocol  Address         Age (min)  Hardware Addr   Type
Interface
Internet  192.168.201.213        3   0010.8801.a5c3  ARPA
GigabitEthernet0/0
Internet  192.168.201.1          -   00d0.f8fb.126e  ARPA
GigabitEthernet0/0
R3660#
```

```
Cisco2620# show running-config
Building configuration...
Current configuration : 1212 bytes
!
version 12.2
service timestamps debug uptime
service timestamps log uptime
no service password-encryption
!
hostname Cisco2620
!
!
username 163 password 0 163
username rgnos password 0 rgnos
username 263 password 0 263
ip subnet-zero
!
!
no ip domain-lookup
!
vpdn enable
!
vpdn-group 1
! Default L2TP VPDN group
accept-dialin
protocol l2tp
virtual-template 1
l2tp tunnel password 7 0832444F1B1C
!
call rsvp-sync
```

```
!
interface GigabitEthernet0/0
ip address 192.168.19.1 255.255.255.0
duplex auto
speed 10
!
interface Serial0/0
ip address 202.101.93.23 255.255.255.192
encapsulation ppp
fair-queue
clockrate 2000000
!
interface Serial0/1
no ip address
shutdown
!
interface Virtual-Template1
ip address 192.168.103.2 255.255.255.0
ppp authentication pap
!
router ospf 100
log-adjacency-changes
network 192.168.103.0 0.0.0.255 area 1
!
ip classless
ip http server
!
!
voice-port 1/0/0
!
voice-port 1/0/1
!
dial-peer cor custom
!
!
gatekeeper
shutdown
!
!
line con 0
exec-timeout 0 0
line aux 0
```

```
Primary DNS Suffix  . . . . . :
Node Type . . . . . : Broadcast
IP Routing Enabled. . . . . : No
WINS Proxy Enabled. . . . . : No

Ethernet adapter         2:
Connection-specific DNS Suffix  . :
Description . . . . . : NE2000 Compatible
Physical Address. . . . . : 00-10-88-01-A5-C3
DHCP Enabled. . . . . : No
IP Address. . . . . : 192.168.201.213
Subnet Mask . . . . . : 255.255.255.0
Default Gateway . . . . . : 192.168.201.1
DNS Servers . . . . . : 202.101.143.141

C:\>route print
===========================================================
Interface List
0x1 ........................... MS TCP Loopback interface
0x3000003 ...00 10 88 01 a5 c3 ...... Novell 2000 Adapter.
===========================================================
===========================================================Active
Routes:
Network Destination       Netmask         Gateway      Interface
Metric
0.0.0.0    0.0.0.0    192.168.201.1  192.168.201.213    1
127.0.0.0    255.0.0.0     127.0.0.1    127.0.0.1      1
192.168.201.0    255.255.255.0  192.168.201.213  192.168.201.213
1
192.168.201.213  255.255.255.255       127.0.0.1      127.0.0.1
1
192.168.201.255  255.255.255.255  192.168.201.213  192.168.201.213
1
224.0.0.0   224.0.0.0  192.168.201.213  192.168.201.213   1
255.255.255.255  255.255.255.255  192.168.201.213  192.168.201.213
1
Default Gateway:    192.168.201.1
===========================================================
Persistent Routes:
None
C:\>ping 192.168.103.2
Pinging 192.168.103.2 with 32 bytes of data:
Reply from 192.168.103.2: bytes=32 time=10ms TTL=0
```

```
Reply from 192.168.103.2: bytes=32 time<10ms TTL=0
Reply from 192.168.103.2: bytes=32 time<10ms TTL=0
Reply from 192.168.103.2: bytes=32 time<10ms TTL=0
Ping statistics for 192.168.103.2:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Minimum = 0ms, Maximum =  10ms, Average =  2ms
C:\>ping 192.168.19.1
Pinging 192.168.19.1 with 32 bytes of data:
Reply from 192.168.19.1: bytes=32 time<10ms TTL=254
Reply from 192.168.19.1: bytes=32 time<10ms TTL=254
Reply from 192.168.19.1: bytes=32 time<10ms TTL=254
Reply from 192.168.19.1: bytes=32 time<10ms TTL=254
Ping statistics for 192.168.19.1:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Minimum = 0ms, Maximum =  0ms, Average =  0ms
C:\>ping 202.101.93.23
Pinging 202.101.93.23 with 32 bytes of data:
Reply from 202.101.93.23: bytes=32 time<10ms TTL=254
Reply from 202.101.93.23: bytes=32 time<10ms TTL=254
Reply from 202.101.93.23: bytes=32 time<10ms TTL=254
Reply from 202.101.93.23: bytes=32 time<10ms TTL=254
Ping statistics for 202.101.93.23:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Minimum = 0ms, Maximum =  0ms, Average =  0ms
C:\>
```

Л ŧ ў Л Ћ Ћ ↓

˘ ˆ б

˜

Ł Э ̈Ą˘ ̈I ╖ Â

з ˘ Л Љ Ł

‘

45.3

45.3.1

- Л
- Л
-
- Л
-

45.3.2

˘ Л Â й ˘ й Н

˘ й è†

Â Ю˘ ÿ † ˘ Л

ң Ю Ъ ҳ Â

Ъ ҳ	
ip local pool *poolname first-ip last-ip*	…
no ip local pool *poolname*	¨

è *poolname* …

ﾍ ﾈ Ю Ъ ﾇ ﾃ Â
ﾉ ˘ б Â

Ъ ﾇ	
vpdn source-ip *ip-address*	
no vpdn source-ip *ip-address*	ﾍ

Ю˝ a ﾍ ў й Â

45.3.5 virtual-template

˘ Â й

Ѣ ҳ	
protocol any l2tp pptp	
no protocol	ʌ

˘ ”I Â

ʌ ң Ю Ѣ ҳ Л Љ Â

Ѣ ҳ	
virtual-template *number*	
no virtual-template *number*	ʌ

local name *name*	¨
no local name	¬ ¨

è *name* ù ¨ Â Ю˘ ¬ ę ¨ ù ¨
ў Â

¬ ę Ю Ф ę Л Љ Â
б ō ˘ Â

Ф ę	
source-ip *src-ip*	
no source-ip	¬

è *src-ip* ù Â

¬ ę Ю Ф ę Л Љ [8] Â

Ф ę	
l2tp tunnel authentication	
no l2tp tunnel authentication	
l2tp tunnel hello *interval*	
no l2tp tunnel hello	¬
l2tp tunnel password *pass-word*	Л ę

l2tp tunnel **retransmit retries** *number* **timeout** **min max** *seconds*	8
no l2tp tunnel **retransmit retries timeout min max**	8
l2tp tunnel timeout **no-session setup** *seconds*	8
no l2tp tunnel **timeout no-session setup**	8

Ю а Ю Â

8 й ˘ 8 л л й ˘

8 й ˘ 8 й ˘ 8

й ˘ й ˘

8 й Â ˘ ч

˘ л з˘ Ю˘ й

45.3.7

Ю Ь Â й

ˇ 8 ˇ a ,

й ˇ , ˩

й ˇ Â

Ю б

ˇ يي يي Â

يي 4 б Windows 2000(LAC) L2TP

Ю ˚ б

```
R3660# show running-config
Building configuration...
Current configuration : 708 bytes
!
hostname R3660
!
vpdn enable
!
vpdn-group 1
! Default L2TP VPDN group
accept-dialin
protocol l2tp
virtual-template 1
!
!
!
username rgnos password 7 04251F083110
```

```
!
ip local pool vpdnusers 192.168.101.3 192.168.101.253
!
interface GigabitEthernet 0/0
ip address 192.168.201.1 255.255.255.0
duplex auto
speed auto
!
interface GigabitEthernet 0/1
ip address 192.168.12.217 255.255.255.0
duplex auto
speed auto
!
interface Loopback 1
ip address 192.168.101.2 255.255.255.0
!
interface Null 0
!
interface Virtual-Template 1
ppp authentication pap
ip unnumbered Loopback 1
peer default ip address pool vpdnusers
!
!
line con 0
line aux 0
line vty 0 4
!
!
end
R3660#
```

```
Microsoft Windows 2000 [Version 5.00.2195]
(C)
```

```
Ethernet adapter         2:
Connection-specific DNS Suffix  . :
Description . . . . . . . . . . . : NE2000 Compatible
Physical Address. . . . . . . . . : 00-10-88-01-A5-C3
DHCP Enabled. . . . . . . . . . . : No
IP Address. . . . . . . . . . . . : 192.168.12.213
Subnet Mask . . . . . . . . . . . : 255.255.255.0
Default Gateway . . . . . . . . . : 192.168.12.1
DNS Servers . . . . . . . . . . . : 202.101.143.141

C:\>route print
===========================================================
Interface List
0x1 ........................... MS TCP Loopback interface
0x2000003 ...00 10 88 01 a5 c3 ...... Novell 2000 Adapter.
===========================================================
===========================================================
Active Routes:
Network Destination       Netmask         Gateway
Interface  Metric
0.0.0.0     0.0.0.0    192.168.12.1  192.168.12.213      1
127.0.0.0    255.0.0.0       127.0.0.1      127.0.0.1     1
192.168.12.0   255.255.255.0   192.168.12.213
192.168.12.213      1
192.168.12.213  255.255.255.255       127.0.0.1
127.0.0.1      1
192.168.12.255  255.255.255.255   192.168.12.213
192.168.12.213      1
224.0.0.0   224.0.0.0   192.168.12.213  192.168.12.213    1
255.255.255.255  255.255.255.255   192.168.12.213
192.168.12.213      1
Default Gateway:     192.168.12.1
===========================================================
Persistent Routes:
None
C:\>
```

л ж

ж ˘ й ˘

й Ьж ˘ ╕ й л ╕ ╕ ≠ л Лъ

з ╕ а ╕ й ˘ ы

Â л Лъ л è л ъ Â

Ю ╖ ɨ Лъ ↓

R3660# show ip route
Codes: C - connected, S - static, R - RIP
O - OSPF, IA - OSPF inter area

```
Node Type . . . . . . . . . . . . : Broadcast
IP Routing Enabled. . . . . . . . : No
WINS Proxy Enabled. . . . . . . . : No

Ethernet adapter         2:
Connection-specific DNS Suffix  . :
Description . . . . . . . . . . . : NE2000 Compatible
Physical Address. . . . . . . . . : 00-10-88-01-A5-C3
DHCP Enabled. . . . . . . . . . . : No
IP Address. . . . . . . . . . . . : 192.168.12.213
Subnet Mask . . . . . . . . . . . : 255.255.255.0
Default Gateway . . . . . . . . . : 192.168.12.1
DNS Servers . . . . . . . . . . . : 202.101.143.141
PPP adapter L2TP:
Connection-specific DNS Suffix  . :
Description . . . . . . . . . . . : WAN (PPP/SLIP) Interface
Physical Address. . . . . . . . . : 00-53-45-00-00-00
DHCP Enabled. . . . . . . . . . . : No
IP Address. . . . . . . . . . . . : 192.168.101.8
Subnet Mask . . . . . . . . . . . : 255.255.255.255
Default Gateway . . . . . . . . . : 192.168.101.8
DNS Servers . . . . . . . . . . . :
C:\>route print
===========================================================
Interface List
0x1 ........................... MS TCP Loopback interface
0x2000003 ...00 10 88 01 a5 c3 ...... Novell 2000 Adapter.
0xd000004 ...00 53 45 00 00 00 ...... WAN (PPP/SLIP) Interface
===========================================================
===========================================================
Active Routes:
Network Destination       Netmask         Gateway      Interface
Metric
0.0.0.0    0.0.0.0     192.168.12.1  192.168.12.213    2
0.0.0.0    0.0.0.0    192.168.101.8   192.168.101.8     1
127.0.0.0    255.0.0.0      127.0.0.1    127.0.0.1    1
192.168.12.0    255.255.255.0   192.168.12.213  192.168.12.213
1
192.168.12.213  255.255.255.255       127.0.0.1      127.0.0.1
1
192.168.12.217  255.255.255.255   192.168.12.213  192.168.12.213
1
```

```
192.168.12.255  255.255.255.255   192.168.12.213  192.168.12.213
1
192.168.101.2  255.255.255.255    192.168.101.8   192.168.101.8
1
192.168.101.8  255.255.255.255       127.0.0.1       127.0.0.1
1
192.168.101.255  255.255.255.255    192.168.101.8   192.168.101.8
1
224.0.0.0    224.0.0.0   192.168.12.213  192.168.12.213   1
224.0.0.0   224.0.0.0    192.168.101.8   192.168.101.8    1
255.255.255.255  255.255.255.255   192.168.12.213  192.168.12.213
1
Default Gateway:    192.168.101.8
===========================================================
Persistent Routes:
None
C:\>ping 192.168.101.2
Pinging 192.168.101.2 with 32 bytes of data:
Reply from 192.168.101.2: bytes=32 time<10ms TTL=255
Reply from 192.168.101.2: bytes=32 time<10ms TTL=255
Reply from 192.168.101.2: bytes=32 time<10ms TTL=255
Reply from 192.168.101.2: bytes=32 time<10ms TTL=255
Ping statistics for 192.168.101.2:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Minimum = 0ms, Maximum =  0ms, Average =  0ms
C:\>ping 192.168.201.1
Pinging 192.168.201.1 with 32 bytes of data:
Reply from 192.168.201.1: bytes=32 time<10ms TTL=255
Reply from 192.168.201.1: bytes=32 time<10ms TTL=255
Reply from 192.168.201.1: bytes=32 time<10ms TTL=255
Reply from 192.168.201.1: bytes=32 time<10ms TTL=255
Ping statistics for 192.168.201.1:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Minimum = 0ms, Maximum =  0ms, Average =  0ms
C:\>ping 192.168.201.3
Pinging 192.168.201.3 with 32 bytes of data:
Reply from 192.168.201.3: bytes=32 time<10ms TTL=254
Reply from 192.168.201.3: bytes=32 time<10ms TTL=254
Reply from 192.168.201.3: bytes=32 time<10ms TTL=254
Reply from 192.168.201.3: bytes=32 time<10ms TTL=254
```

```
Ping statistics for 192.168.201.3:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Minimum = 0ms, Maximum =  0ms, Average =  0ms
C:\>ping 192.168.12.1
Pinging 192.168.12.1 with 32 bytes of data:
Reply from 192.168.12.1: bytes=32 time=10ms TTL=255
Reply from 192.168.12.1: bytes=32 time<10ms TTL=255
Reply from 192.168.12.1: bytes=32 time<10ms TTL=255
Reply from 192.168.12.1: bytes=32 time<10ms TTL=255
Ping statistics for 192.168.12.1:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Minimum = 0ms, Maximum =  10ms, Average =  2ms
C:\>
```

```
! Default L2TP VPDN group
accept-dialin
protocol l2tp
virtual-template 1
l2tp tunnel authentication
l2tp tunnel password share
!
!
!
username rgnos password 7 025144391715
!
ip local pool vpdnusers 192.168.101.3 192.168.101.253
!
interface GigabitEthernet 0/0
ip address 192.168.201.1 255.255.255.0
duplex auto
speed auto
!
interface GigabitEthernet 0/1
ip address 192.168.12.217 255.255.255.0
duplex auto
speed auto
!
interface Loopback 1
ip address 192.168.101.2 255.255.255.0
!
interface Null 0
!
interface Virtual-Template 1
ppp authentication pap
ip unnumbered Loopback 1
peer default ip address pool vpdnusers
!
!
line con 0
line aux 0
line vty 0 4
!
!
end
R3660#
```

```
C3640# show running-config
Building configuration...
Current configuration : 2096 bytes
!
version 12.3
service timestamps debug uptime
service timestamps log uptime
no service password-encryption
no service dhcp
!
hostname C3640
!
!
ip subnet-zero
!
l2tp-class l2x
authentication
password 0 share
!
pseudowire-class pw
encapsulation l2tpv2
protocol l2tpv2 l2x
ip local interface GigabitEthernet2/0
!
no mpls ldp logging neighbor-changes
no scripting tcl init
no scripting tcl encdir
!
no voice hpi capture buffer
no voice hpi capture destination
!
controller E1 3/0
channel-group 1 timeslots 1-2
!
!
!
interface Loopback0
ip address 132.11.10.2 255.255.255.0
!
interface GigabitEthernet2/0
ip address 192.168.12.242 255.255.255.0
```

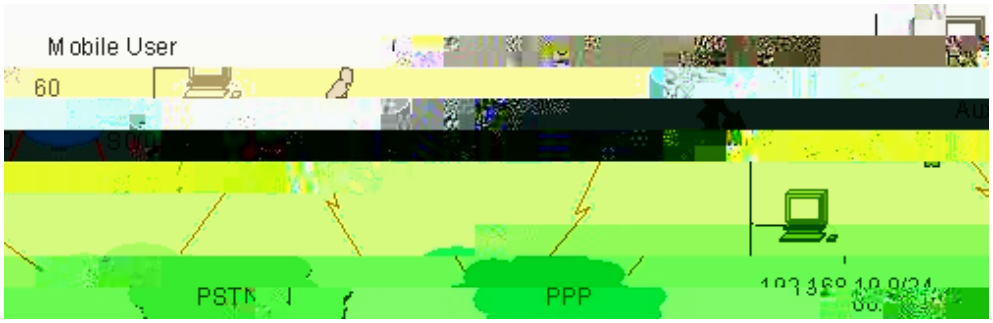
R3660# show ip route

R3660#

```
C       132.11.10.0 is directly connected, Loopback0
C    192.168.1.0/24 is directly connected, Serial3/0:1
192.168.101.0/32 is subnetted, 2 subnets
C       192.168.101.9 is directly connected, Virtual-PPP1
C       192.168.101.2 is directly connected, Virtual-PPP1
S*   0.0.0.0/0 [1/0] via 192.168.12.1, GigabitEthernet2/0
C3640# show vpdn
%No active L2F tunnels
L2TP Tunnel and Session Information Total tunnels 1 sessions 1
LocID RemID Remote Name   State  Remote Address  Port  Sessions L2TP
Class/
                                                        VPDN Group
21511 9     R3660       est    192.168.12.217  1701  1     l2x
LocID      RemID      TunID      Username, Intf/      State  Last Chg
Uniq ID
                              Vcid, Circuit
14      1       21511      11, Vp1       est    00:23:58   2
%No active PPTP tunnels
C3640# ping  192.168.101.2
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.101.2, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/2/4 ms
C3640#
```

Л Э ╖

Ю б ييˇ ي
Â Э˚ Ɪ Ь ˘ ¨ б ˇ
╖ з ╖
˚ Â Л
‘ б ˇ ˊ ╟ Л
б Â Л ˇ ł
ǂ ¨ б Л ҳ Л Ь Э˘ б a ˇ ≠
Â й ˇ Лъ a
б ˇ è Л ˇ Â



ي 6 б Cisco 2620(LAC) L2TP

Ю ↑ б

```
R3660# show running-config
Building configuration...
Current configuration : 989 bytes
!
hostname R3660
!
vpdn enable
!
vpdn-group 1
! Default L2TP VPDN group
accept-dialin
protocol l2tp
virtual-template 1
l2tp tunnel authentication
l2tp tunnel password share
!
!
!
username rgnos password 7 025144391715
username pc@i-net.com.cn password 7 127654431B
!
ip local pool vpdnusers 192.168.101.3 192.168.101.253
!
interface serial 1/0
encapsulation PPP
ip address 202.101.93.21 255.255.255.0
!
interface serial 1/1
clock rate 64000
```

```
!
interface serial 1/2
clock rate 64000
!
interface serial 1/3
clock rate 64000
!
interface GigabitEthernet 0/0
duplex auto
speed auto
!
interface GigabitEthernet 0/1
ip address 192.168.19.1 255.255.255.0
duplex auto
speed auto
!
interface Loopback 1
ip address 192.168.101.2 255.255.255.0
!
interface Null 0
!
interface Virtual-Template 1
ppp authentication pap
ip unnumbered Loopback 1
peer default ip address pool vpdnusers
!
!
line con 0
line aux 0
line vty 0 4
!
!
end
R3660#


Cisco2620# show running-config
Building configuration...
Current configuration : 1677 bytes
!
version 12.3
service timestamps debug uptime
```

```
service timestamps log uptime
no service password-encryption
no service dhcp
!
hostname Cisco2620
!
!
username pc password 0 1111
username 163 password 0 163
no aaa new-model
ip subnet-zero
!
!
!
vpdn enable
!
vpdn-group 1
request-dialin
protocol l2tp
domain i-net.com.cn
initiate-to ip 202.101.93.21
l2tp tunnel password 7 0832444F1B1C
!
interface GigabitEthernet0/0
ip address 192.168.7.1 255.255.255.0
duplex auto
speed 10
!
interface Serial0/0
ip address 202.101.93.23 255.255.255.0
encapsulation ppp
fair-queue
clockrate 2000000
!
interface Serial0/1
no ip address
shutdown
!
interface Async65
ip address 5.5.5.5 255.255.255.0
encapsulation ppp
dialer in-band
```

```
dialer idle-timeout 30000
dialer string 8435
dialer-group 1
async mode dedicated
peer default ip address 5.5.5.6
ppp authentication pap
!
no ip http server
ip classless
!
dialer-list 1 protocol ip permit
!
!
line con 0
exec-timeout 0 0
line aux 0
login local
modem InOut
transport input all
autoselect during-login
autoselect ppp
line vty 0 4
privilege level 15
no login
line vty 5 15
login
!
no scheduler allocate
end
Cisco2620#
```

Л ¬ ˘ Л ҳ Л Љ

Â

45.4 L2TP

л ң б ╖ Â

45.4.1 L2TP

л ң ЉЮЅ ҳ

Ƀ ϛ	
show vpdn tunne session **show vpdn tunnel session**	Л ч
debug vpdn error	
no debug vpdn error	
debug vpdn event	
no debug vpdn event	
debug vpdn packet	
no debug vpdn packet	
debug vpdn l2x-data	
no debug vpdn l2x-data	
debug vpdn l2x-errors	
no debug vpdn l2x-errors	
debug vpdn l2x-events	
no debug vpdn l2x-events	
debug vpdn l2x-packets	
no debug vpdn l2x-packets	

Л Л Ƀ ϛ **show vpdn** б

Â

```
Ruijie# show vpdn tunnel
L2TP Tunnel Information Total tunnels 1
LocID RemID Remote Name   State  Remote Address  Port  Sessions L2TP
Class/
                                                        VPDN Group
1     35390 C3640        est    192.168.12.242  1701  1        1
%No active PPTP tunnels
Ruijie# show vpdn session
L2TP Session Information Total sessions 1
LocID     RemID     TunID     Username, Intf/     State
Last Chg
                            Vcid, Circuit
1         1261      1          rgnos,Vi1              est
01:04:42
```

```
%No active PPTP tunnels
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    35390 C3640        est    192.168.12.242  1701  1       1
LocID     RemID     TunID     Username, Intf/     State  Last Chg
                            Vcid, Circuit
1        1261      1         rgnos,Vi1              est
01:04:45
%No active PPTP tunnels
Ruijie#
```

ﾍ ң ˘ a ˘ ˚ ≠ ÂЮ

ﾍ б ‘

```
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: ReceibugVPDN:
```

```
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
L2X: UDP socket write 54 bytes, 255.255.255.255(1701) to
4.83.68.68(1701)
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, 255.255.255.255(1701) to
4.83.68.68(1701)
Vi1 VPDN PROCESS Into tunnel: Sending 54 byte pak
L2X: UDP socket write 54 bytes, 255.255.255.255(1701) to
4.83.68.68(1701)
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, 255.255.255.255(1701) to
4.83.68.68(1701)
Vi1 VPDN PROCESS Into tunnel: Sending 54 byte pak
L2X: UDP socket write 54 bytes, 255.255.255.255(1701) to
4.83.68.68(1701)
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)
Vi1 VPDN PROCESS Into tunnel: Sending 54 byte pak
L2X: UDP socket write 54 bytes, 192.168.12.217(1701) to
192.168.12.242(1701)
VPDN PROCESS From tunnel: Received 54 byte pak
Vi1 VPDN PROCESS From tunnel: Queue 18 byte pak to ppp parse and iqueue
Vi1 VPDN PROCESS From tunnel: Pak send successful
VPDN PROCESS From tunnel: Received 56 byte pak
Vi1 VPDN PROCESS From tunnel: Queue 20 byte pak to ppp parse and iqueue
Vi1 VPDN PROCESS From tunnel: Pak send successful
Vi1 VPDN PROCESS Into tunnel: Sending 45 byte pak
L2X: UDP socket write 45 bytes, 192.168.12.217(1701) to
192.168.12.242(1701)
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)
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)
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
Ruijie# show ip route
Codes: C - connected, S - static,  R - RIP
O - OSPF, IA - OSPF inter area
E1 - OSPF external type 1, E2 - OSPF external type 2
Gateway of last resort is not set
192.168.101.0/24 is variably subnetted, 2 subnets, 2 masks
C      192.168.101.5/32 is directly connected, Virtual-Access1
```

```
C      192.168.101.0/24 is directly connected, Virtual-Access1
C    192.168.12.0/24 is directly connected, GigabitEthernet0
C    192.168.201.0/24 is directly connected, Ethernet0
Ruijie#
```

ў ╖ ⁸ ˘ Л Љ Â Ю

l2x-data Ю˘ Ч

б ·

```
Ruijie# no debug all
All possible debugging has been turned off
Ruijie# debug vpdn l2x-data
L2X data packets debugging is on
Ruijie#
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
Ruijie#
```

Л Љ **l2x-erorrs** ў ч a

a Â Ю ·

```
Ruijie# no debug all
All possible debugging has been turned off
Ruijie# debug vpdn l2x-errors
L2X protocol errors debugging is on
Ruijie# config terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Ruijie(config)# interface virtual-ppp        1
Ruijie(config-if)# no shutdown
Ruijie(config-if)# end
Ruijie#
```

```
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
Ruijie# no debug all
All possible debugging has been turned off
Ruijie#
```

Л Лъ **l2x-events** ÂЊО

l2x-evetns Ю˝ Ч

б ˘ ╖ Â

```
Ruijie# show vpdn tunnel
%No active L2TP tunnels
%No active PPTP tunnels
Ruijie# no debug all
All possible debugging has been turned off
Ruijie# debug vpdn l2x-events
L2X protocol events debugging is on
Ruijie#
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
Ruijie# show ip route
Codes: C - connected, S - static,  R - RIP
O - OSPF, IA - OSPF inter area
```

```
Tnl 21 L2TP: Control channel retransmit delay set to 1 seconds
Tnl 21 L2TP: Tunnel state change from idle to wait-ctl-reply
Tnl 21 L2TP: SM State wait-ctl-reply
Tnl 21 L2TP: O Resend SCCRQ, flg TLS, ver 2, len 96, tnl 0, ns 0, nr
0
Tnl 21 L2TP: Control channel retransmit delay set to 1 seconds
Tnl 21 L2TP: I SCCRP from
Tnl 21 L2TP: O SCCCN  to BLIZZARD tnlid 40
Tnl 21 L2TP: Control channel retransmit delay set to 1 seconds
Tnl 21 L2TP: Tunnel state change from wait-ctl-reply to established
Tnl 21 L2TP: SM State established
Vi1 Tnl/Sn 21/1 L2TP: O ICRQ to BLIZZARD 40/0
Vi1 Tnl/Sn 21/1 L2TP: Control channel retransmit delay set to 1 seconds
Vi1 Tnl/Sn 21/1 L2TP: Session state change from wait-for-tunnel to
wait-reply
Vi1 Tnl/Sn 21/1 L2TP: I ICRP from BLIZZARD
Vi1 Tnl/Sn 21/1 L2TP: O ICCN to BLIZZARD 40/1
Vi1 Tnl/Sn 21/1 L2TP: Control channel retransmit delay set to 1 seconds
Vi1 Tnl/Sn 21/1 L2TP: Session state change from wait-reply to
established
%UPDOWN: Interface Virtual-PPP1, changed state to up
%UPDOWN: Line protocol on Interface Virtual-PPP1, changed state to
up
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
21    40    BLIZZARD     est    192.168.12.213  1701  1
LocID    RemID   TunID    Username, Intf/    State  Last Chg
                             Vcid, Circuit
1      1         21        13,Vi1          est    00:00:27
%No active PPTP tunnels
Ruijie#
```

ж **l2x-packets** ł 8

ÂЮ **l2x-packets** Ю˝ ٨

б ˘ ٦ Â

```
Ruijie# no debug all
```

```
All possible debugging has been turned off
Ruijie# debug vpdn l2x-packets
L2X control packets debugging is on
Ruijie# show vpdn
%No active L2TP tunnels
%No active PPTP tunnels
Ruijie#
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)
```

```
Ruijie#
```

Ю **l2x-packets** Ю˘

б ˘ ╖ Â

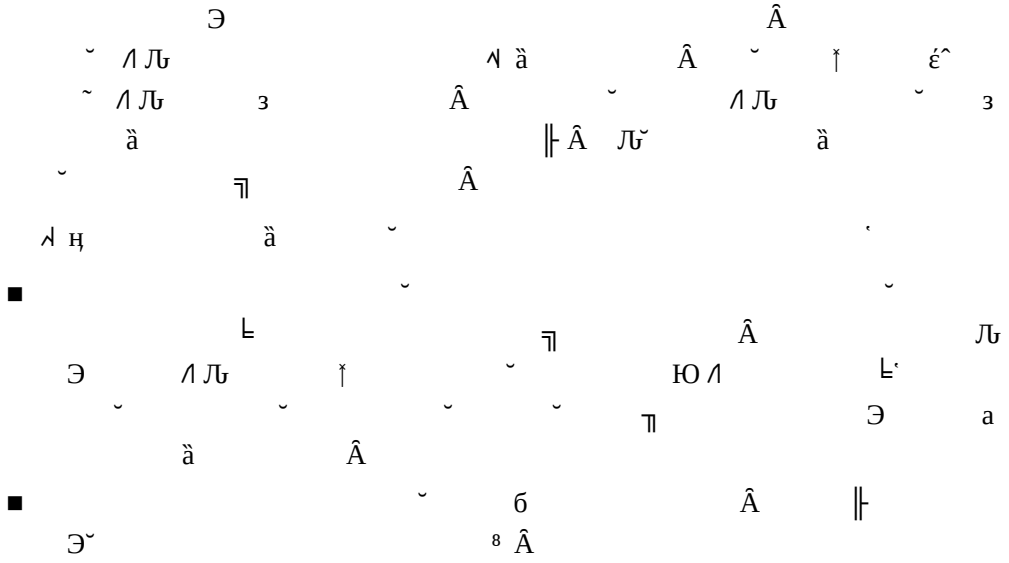
```
Ruijie# no debug all
All possible debugging has been turned off
Ruijie# debug vpdn l2x-packets
L2X control packets debugging is on
Ruijie# config terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Ruijie(config)# interface virtual-ppp        1
Ruijie(config-if)# no shutdown
Ruijie(config-if)# end
Ruijie#
Tnl 21 L2TP: O SCCRQ
Tnl 21 L2TP: O SCCRQ, flg TLS, ver 2, len 96, tnl 0, ns 0, nr 0
C8 02 00 60 00 00 00 00 00 00 00 80 08 00 00
00 00 00 01 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 21 L2TP: Parse  AVP 0, len 8, flag 0x8000 (M)
Tnl 21 L2TP: Parse SCCRP
Tnl 21 L2TP: Parse  AVP 2, len 8, flag 0x8000 (M)
Tnl 21 L2TP: Protocol Ver 1
Tnl 21 L2TP: Parse  AVP 3, len 10, flag 0x8000 (M)
Tnl 21 L2TP: Framing Cap 0x1
Tnl 21 L2TP: Parse  AVP 4, len 10, flag 0x8000 (M)
Tnl 21 L2TP: Bearer Cap 0x0
Tnl 21 L2TP: Parse  AVP 6, len 8, flag 0x0
Tnl 21 L2TP: Firmware Ver 0x500
Tnl 21 L2TP: Parse  AVP 7, len 14, flag 0x8000 (M)
Tnl 21 L2TP: Hostname BLIZZARD
Tnl 21 L2TP: Parse  AVP 8, len 15, flag 0x0
Tnl 21 L2TP: Vendor Name Microsoft
Tnl 21 L2TP: Parse  AVP 9, len 8, flag 0x8000 (M)
Tnl 21 L2TP: Assigned Tunnel ID 41
Tnl 21 L2TP: Parse  AVP 10, len 8, flag 0x8000 (M)
Tnl 21 L2TP: Rx Window Size 8
Tnl 21 L2TP: No missing AVPs in SCCRP
Tnl 21 L2TP: I SCCRP, flg TLS, ver 2, len 101, tnl 21, ns 0, nr 1
contiguous pak, size 101
```

```
C8 02 00 65 00 15 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 05 00 80 0E 00 00 00 07 42 4C
49 5A 5A 41 52 44 00 0F ...
Tnl 21 L2TP: O SCCCN  to BLIZZARD tnlid 41
Tnl 21 L2TP: O SCCCN, flg TLS, ver 2, len 20, tnl 41, ns 1, nr 1
C8 02 00 14 00 29 00 00 00 01 00 01 80 08 00 00
00 00 00 03
Vi1 Tnl/Sn 21/1 L2TP: O ICRQ to BLIZZARD 41/1
Vi1 Tnl/Sn 21/1 L2TP: O ICRQ, flg TLS, ver 2, len 48, tnl 41, lsid
1, rsid 1, ns 2, nr 1
C8 02 00 30 00 29 00 00 00 02 00 01 80 08 00 00
00 00 00 0A 80 08 00 00 00 0E 00 01 80 0A 00 00
00 0F 00 00 00 00 80 0A 00 00 00 12 00 00 00 02
Tnl 21 L2TP: O ZLB ctrl ack, flg TLS, ver 2, len 12, tnl 41, ns 3,
nr 1
C8 02 00 0C 00 29 00 00 00 03 00 01
Tnl 21 L2TP: I ZLB ctrl ack, flg TLS, ver 2, len 12, tnl 21, ns 1,
nr 2
Tnl 21 L2TP: I ZLB ctrl ack, flg TLS, ver 2, len 12, tnl 21, ns 1,
nr 3
Vi1 Tnl/Sn 21/1 L2TP: Parse  AVP 0, len 8, flag 0x8000 (M)
Vi1 Tnl/Sn 21/1 L2TP: Parse ICRP
Vi1 Tnl/Sn 21/1 L2TP: Parse  AVP 14, len 8, flag 0x8000 (M)
Vi1 Tnl/Sn 21/1 L2TP: Assigned Call ID 1
Vi1 Tnl 21/1 L2TP: No missing AVPs in ICRP
Vi1 Tnl/Sn 21/1 L2TP: I ICRP, flg TLS, ver 2, len 28, tnl 21, lsid
1, rsid 1, ns 1, nr 3 contiguous pak, size 28
C8 02 00 1C 00 15 00 01 00 01 00 03 80 08 00 00
00 00 00 0B 80 08 00 00 00 0E 00 01
Vi1 Tnl/Sn 21/1 L2TP: O ICCN to BLIZZARD 41/1
Vi1 Tnl/Sn 21/1 L2TP: O ICCN, flg TLS, ver 2, len 40, tnl 41, lsid
1, rsid 1, ns 3, nr 2
C8 02 00 28 00 29 00 01 00 03 00 02 80 08 00 00
00 00 00 0C 80 0A 00 00 00 18 00 98 96 80 80 0A
00 00 00 13 00 00 00 01
Tnl 21 L2TP: O ZLB ctrl ack, flg TLS, ver 2, len 12, tnl 41, ns 4,
nr 2
C8 02 00 0C 00 29 00 00 00 04 00 02
Tnl 21 L2TP: I ZLB ctrl ack, flg TLS, ver 2, len 12, tnl 21, ns 2,
nr 4
```

46 ō IPSec Ŏ

46.1

46.1.1



-
-

- ‘ ˆ
  ˘ ↓ ˜
  ˘ ˘ Лъ ↓ Â
- ‘ Нж à Â
- ‘ Ѽ ╗ ˘ б ↓ а Э
  м Â

46.1.3

‘ Ь˘ Л Лъ ↓ ˘ Лъ
а Â Ь Â

… а ╖ ˘ Л
Â

‘ ЛъЮ ч ‘

- ‘ ў Â
- ‘ ў

╗ ‘ ╗ ∤ ˘ Љ
↓ ˘ б Â
╗ ˘ Â
˘ ∧ Â й ÿ Y
˘ a Â
˘ ж Â
˘ ¨ Ὼ Â

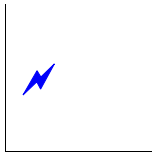
46.2 IPSec

46.2.1 IPSec

й ч ˘и ц ∧ жќ ˝ l ˝↓ ˝ ˘ ˝

46.2.2 IPSec

- **P2 0 Td[<1B8D1E1C19A3>6<4r 0.9272 Td[<45AD1C0303FE09C38571CF311DA**



crypto dynamic-map *dynamic-map-name dynamic-seq-num*	…
set transform-set *transform-set-name1* *transform-set-name2...transform-set-name6*	
match address *access-list-id*	Â
set peer *hostname* *ip-address*	Â
set security-association lifetime seconds *seconds*	Â

clear crypto sa spi *destionation-address* **ah** **esp** *spi*	Â

HX

46.3.2 IKE

- **IKE**
- **б IKE**
- **ø kG¡..kQÑ cC0@**

Э ˘ è й ˘ л й Â
Э ˆ ~ ˘ ˘ Â
Лъ Â

б л ˘ ╗
˚ Â л Э… é . ″I ˘ Лъ
ѳ Â

ЊЖЛЪЮ ˙

	л л	
╗		
	ˆ л ~	ˆ л ~
	л	
	м	¨
	¨	
Ѣ	ǐ	ˆ ~

˘ ي ч Э Â
˘ л . ″I
б ѳ Â
л ˚ ╗ à à л ˘
з Ѣ Ѣ
ѳ ˆ Ѣ ˘ ‡ Ѣ
~ Â л л ѳ ˘ ˘ ÿ а Â
ѳ ˘ ˘ з … Â

■ мҷ Â мҷ
ɻ мҷ ˘ ɻ
ˆ ~ Â

■ ч ‘ Â
˘ Â

■ Ƀ а˚ б Ƀ ˘
˘ ʌЛъ ѝ Â ѝ ‡˘ Ƀ ˆ
~˘ Â ˘ Ƀ ˘
Â

ʌЛъ… ˘ а˚ Â …
˘ ǂ . ″I ˆ ˘ . ″I ~ Â

ʌЛъ ʌ Э ˘ б
Э ╗ ѐ ѐ ɻ ˆ
Ƀ ʌЛъ а ~ Â а ˘ ‡ ˘
ѝ æ. ″I ˘ Â

˘ Ю ЛъЮ Ƀ ҳ‘

Ƀ ҳ	
crypto isakmp policy *Priority*	… ˘ . ″I Â
encryption des | 3des | aes-128 | aes-192 | aes-256	╗
hash sha md5	
authentication pre-share | rsa-sig	
group 1 2	
lifetime *seconds*	Ƀ Â
exit	Ю Â

а ˘ ‡ǂ Â

˘ Ю ЛъЮ Ƀ ҳ‘

Ƀ ҳ	
show crypto isakmp policy	

🕮	˘ а Â ˘ **show crypto isakmp policy** Ƀ ҳ Â

ˆ ~

ч ‘ ў ˆ Ю ў ~

ѝ ˘ ╗

ЉЮЂ ҄‘

Ђ ҄	
crypto map *map-name seq-num* **ipsec-isakmp**	… ╗ ˘ Ђ ҄ ╗ Â
set exchange-mode main aggressive	Â Ю ў Â

ѝ ˘ Ю ў ˘ ˘

Э ЉЮЂ ҄‘

Ђ ҄	
crypto ipsec-isakmp mode-detect	˘ Â

˘ Ю ЉЮЂ ҄‘

Ђ ҄	
show crypto isakmp sa	Â

ў ˆ ў ~

˘ ў ˘ a Â ˘

˘ ˘ ⁄

Љ ⁸ Ь ‘ ѣ Â ү ѣ ¨ Â Ь ѣ ¨ ¨ Â Â

Ђ ҄	
self-identity address fqdn user-fqdn *identity*	Â ‘ ⁄ ў ‘ ѝ ¨ ‘ ѝ ¨ Â

ѝ ˘ ⁄ ˆ ў ˘ ~ ˘

ѝ ч a ˚ ˘ Љ Ђ ҄ ў

Ю Ђ ҄ Â

Ѣ ҳ	
crypto isakmp mode-detect	╟ Â

Â ˘
˘ ê Ѽ Ì ╎ Â

ӌ б ч ˚ ˘ ӌ
Â Э б ӌ
˚ ˌ ѝ ˘ а˚ а˚ Â
ӌ ˘ Ю ЉЮѢ ҳ˙

Ѣ ҳ	
ip host *hostname address*	˘ Â
crypto isakmp key 0|7 *keystring* **hostname** *peer-hostname* **address** *peer-address*	б ӌ Â ѝ ѝ ѝ ѝ
crypto isakmp key 0|7 *keystring* **address** *peer-address mask*	ӌ Â ӌ Â

Л Э ˚ ӌ Â

ł ˘ ‥ Â
ӌ ˘ ╕ Â Ю ˙

🕮
Л ӌ
Э ‘Ą˘ Э Ү
Л Љ Â
Э ӌ ‡
Â

Э ч ȣ ȁ ȣ ȣ

˘ ˘ Â ɣ ȁ

ȣ ȣ ł ў ╟ Â

Âˆ ˜

Ѣ ҳ Ю

Ѣ ҳ	

ˆ ˜

ʌ ╠˘ Ю ЛЬЮ Ъ ҳ˙

Ъ ҳ	
show crypto isakmp policy	Â
show crypto isakmp sa	Â
debug crypto isakmp	Y˚ Â

46.3.3 IKE

Ю ˙

```
crypto isakmp enable
crypto isakmp policy 4
group 1
encryption 3des
crypto isakmp policy 5
authen pre-share
group 2
lifetime 1000
crypto isakmp policy 6
authen rsa-sig
group 1
lifetime 1000
```

˘ Ю ЛЬЮЪ ҳ˙

```
Ruijie# show crypto isakmp policy
Protection suite of priority 4
encryption algorithm:   3DES - Data Encryption Standard (56 bit
keys).
hash algorithm:         Secure Hash Standard
authentication method:  Rsa-Sig
Diffie-Hellman group:   #1 (1024 bit)
lifetime:               1000 seconds
Protection suite of priority 5
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:               1000 seconds
Protection suite of priority 6
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:             1000 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:               86400 seconds
```

46.3.4

- ƚ

  ч ˘ ѝ ˘
  ˘ ⅄ ѝ ˘ Â ЛЬЮ ‘

- ╗
-
- ѝ ˆ ╗ Ⅎ˜ Â

  Ю ˘ ˘ ƚ Â يي

ѝ

-

  ˘ ¨

  ˘ ˚ ˘ ѝ Э ˘ ≠ Â

‘

```
!
hostname "RouterA"


crypto isakmp enable
crypto isakmp policy 1
authentication pre-share
encrytiong 3des
!
crypto isakmp key preword address 2.2.2.1
crypto ipsec transform-set myset  esp-des esp-md5-hmac
crypto map mymap 5 ipsec-isakmp
set peer 2.2.2.1
set transform-set myset
match address 101
!
interface FastEthernet0
ip address 192.168.202.1 255.255.255.0
interface Serial0
ip address 2.2.2.2 255.255.255.0
encapsulation ppp
crypto map mymap
!
ipeo1ppCrrrCrrrC Serial0
```

```
crypto isakmp key preword address 2.2.2.2
    Ы Ѓ
crypto ipsec transform-set myset esp-des esp-md5-hmac
    Ы ╗
crypto map mymap 5 ipsec-isakmp
set peer 2.2.2.2
set transform-set myset
match address 101
!
interface FastEthernet0/0
ip address 192.168.12.1 255.255.255.0
    ╗              Ѓ Э
interface Serial0
ip address 2.2.2.1 255.255.255.0
encapsulation ppp
crypto map mymap
!
ip route 192.168.202.0 255.255.255.0 Serial0
#   Ы ╗          ˇ    192.168.12.0/24   192.168.202.0/24
IP
access-list 101 permit ip 192.168.12.0 0.0.0.255 192.168.202.0
0.0.0.255
!
end
             ‘
!
hostname "RouterA"
    Ы Ѓ
crypto ipsec transform-set myset  esp-des esp-md5-hmac
    Ы     ╗
crypto map mymap 5 ipsec-manual
set peer 2.2.2.1
set session-key inbound esp 300 cipher abcdef1234567890
authenticator abcdef1234567890abcdef1234567890  // б Э     ˚
      Ѓ
set session-key outbound esp 301 cipher abcdef1234567890
authenticator abcdef1234567890abcdef1234567890  // б Э     ˚
      Ѓ
set transform-set myset
match address 101
```

```
!
interface FastEthernet0
ip address 192.168.202.1 255.255.255.0
    ╗             ⅄
interface Serial0
ip address 2.2.2.2 255.255.255.0
encapsulation ppp
crypto map mymap
!
ip route 0.0.0.0 0.0.0.0 Serial0
    ⊬╗          ˘

access-list 101 permit ip 192.168.202.0 0.0.0.255 192.168.12.0
0.0.0.255
!
end
          ˛

!
hostname Cisco
    ⊬⅄
crypto ipsec transform-set myset esp-des esp-md5-hmac
    ⊬╗
crypto map mymap 5 ipsec-manual
set peer 2.2.2.2
set session-key inbound esp 301 cipher abcdef1234567890
authenticator abcdef1234567890abcdef1234567890  // б Э    ˚
     ⅄
set session-key outbound esp 300 cipher abcdef1234567890
authenticator abcdef1234567890abcdef1234567890  // б Э    ˚
     ⅄
set transform-set myset
match address 101
!
interface FastEthernet0/0
ip address 192.168.12.1 255.255.255.0
    ╗             ⅄ Э
interface Serial0
ip address 2.2.2.1 255.255.255.0
encapsulation ppp
crypto map mymap
!
```

```
ip route 192.168.202.0 255.255.255.0 Serial0
```

```
access-list 101 permit ip 192.168.12.0 0.0.0.255 192.168.202.0
0.0.0.255
!
end
```

```
RouterA# debug crypto ipsec
IPSEC debugging is on
RouterA# debug crypto isakmp
ISAKMP debugging is on
```

```
Get acquire: 192.168.202.0/0.0.0.255 -> 192.168.12.0/0.0.0.255 ,
prot 0, port 0/0
Acqurire negociate with 2.2.2.1
(36) Beginning Quick Mode exchange, M-ID of 4445127
(36) sending packet to 2.2.2.1 (I) QM_SI1_WR1
ipsec_output:423, get item acclist 101
ipsec_output:429, match  3
(36) received packet from 2.2.2.1 (I) QM_SI1_WR1
payload format: <Hdr>,<hash> <sa> <nonce> <id>
(36) processing SA payload. message ID = 4445127
(36) Creating IPSec SAs.
inbound SA has spi 4445127
protocol esp, DES_CBC
auth MD5
outbound SA has spi 275385850
protocol esp, DES_CBC
auth MD5
lifetime of 3600 seconds, soft 3570 seconds
lifetime of 4608000 kilobytes, soft 256 kilobytes
ipsec_output:423, get item acclist 101
ipsec_output:429, match  3
(36) sending packet to 2.2.2.1 (I) QM_IDLE
(36) Phase_2 negotiate complete!
```

RouterA# show crypto isakmp sa
destination source state conn-id
lifetime(second)
2.2.2.1 2.2.2.2 QM_IDLE 36
5013

RouterA# show crypto ipsec sa
Interface: Serial0
Crypto map tag:mymap, local addr 2.2.2.2 //
mymap 2.2.2.2
media mtu 1500
local ident (addr/mask/prot/port):
(192.168.202.0/0.0.0.255/0/0))
remote ident (addr/mask/prot/port):
(192.168.12.0/0.0.0.255/0/0))
PERMIT // 192.168.202.0/24 192.168.12.0/24

current_peer: 2.2.2.1 // 2.2.2.1
#pkts encaps: 3, #pkts encrypt: 3, #pkts digest 3
#pkts decaps: 3, #pkts decrypt: 3, #pkts verify 3
#send errors 0, #recv errors 0
//

inbound esp sas: //
spi:0x43D3C7 (4445127) //spi 4445127
transform: esp-des esp-md5-hmac // esp-des-md5
in use settings={Tunnel,} //
sa timing: remaining key lifetime (k/sec): (4607999/3578)
// 4607999 /3578
IV size: 8 bytes //IV 8
Replay detection support:Y //
outbound esp sas: // ESP
spi:0x106A0DFA (275385850) //spi 275385850
transform: esp-des esp-md5-hmac // esp-des-md5
in use settings={Tunnel,} //
sa timing: remaining key lifetime (k/sec): (4607999/3577)
// 4607999 /3577
IV size: 8 bytes //IV 8
Replay detection support:Y //

^ ~

```
RouterA# show crypto ipsec sa
Interface: Serial0
Crypto map tagf10.5 0 0 10.5 a40 10.5 a40 10. local addr  2.2.2.2  //
```

- ˘ ╠
  ┼
-
- м

ή

-

˘ ¨ Â

‘

```
!
hostname "RouterB"


crypto isakmp enable
```

м ⁄

```
crypto isakmp policy 1
authentication pre-share
crypto isakmp key preword address 202.1.1.2
crypto ipsec transform-set myset  esp-des esp-md5-hmac
```

ĦX ╕

```
crypto map mymap 5 ipsec-isakmp
set peer 202.1.1.2
set transform-set myset
match address 101
!
```

```
interface FastEthernet0
ip address 192.168.12.1 255.255.255.0
interface FastEthernet1
no ip addrsss
pppoe enable
pppoe-client 1 dial-pool-number 1 dial-on-demand
interface Dialer0
mtu 1488
ip address negotiate
encapsulation ppp
ppp pap sent-username xxx password xxx
crypto map mymap
dialer idle-timeout 2400
dialer pool 1
dialer-group 1
!
dialer-list protocol ip permit
ip route 0.0.0.0 0.0.0.0 Dialer0 permanent
access-list 101 permit ip 192.168.12.0 0.0.0.255 192.168.1.0
0.0.0.255
!
end
!
hostname “RouterA”
crypto isakmp policy 1
authentication pre-share
crypto isakmp key preword address 0.0.0.0 0.0.0.0
crypto ipsec transform-set myset esp-des esp-md5-hmac
crypto dynamic-map dymymap 5
set transform-set myset
match address 101
```

```
!
    ╗     ╠    ╗                ╗
crypto map mymap 10 ipsec-isakmp dynamic  dymymap
!
interface FastEthernet0/0
ip address 192.168.1.1 255.255.255.0
    ╗              Л Э
interface Serial0
ip address 202.1.1.2 255.255.255.0
encapsulation ppp
crypto map mymap
!
ip route 0.0.0.0 0.0.0.0  Serial0
    ЬЖ╗           ˘

access-list 101 permit ip 192.168.1.0 0.0.0.255 192.168.12.0
0.0.0.255
!
end
```

- ў
  ч ˘ й ˘
  ˘ Л й¦ ˘ Â ЛЬЮ ‘
-
- й ^ ╗ Ь˜ Â
- Л ˘ ж
- ˘ ╠
  ¦
- м ˘ з ў ¨ м
-

■

```
!
hostname "RouterB"


crypto isakmp enable


self-identity fqdn www.google.com

crypto isakmp key preword address 202.1.1.2
crypto ipsec transform-set myset  esp-des esp-md5-hmac

crypto map mymap 5 ipsec-isakmp
set peer 202.1.1.2
set exchange-mode aggressive
set transform-set myset
match address 101
!
interface FastEthernet0
ip address 192.168.12.1 255.255.255.0
interface FastEthernet1
no ip addrsss
pppoe enable
pppoe-client 1 dial-pool-number 1 dial-on-demand
```

```
interface Dialer0
mtu 1488
ip address negotiate
encapsulation ppp
ppp pap sent-username xxx password xxx
crypto map mymap
dialer idle-timeout 2400
dialer pool 1
dialer-group 1
!
dialer-list protocol ip permit
ip route 0.0.0.0 0.0.0.0 Dialer0 permanent

access-list 101 permit ip 192.168.12.0 0.0.0.255 192.168.1.0
0.0.0.255
!
end

!
hostname “RouterA”

crypto isakmp policy 1
authentication pre-share

crypto isakmp key preword hostname www.google.com

crypto isakmp mode-detect

crypto ipsec transform-set myset esp-des esp-md5-hmac

crypto dynamic-map dymymap 5
set transform-set myset
match address 101
!

crypto map mymap 10 ipsec-isakmp dynamic  dymymap
```

```
!
interface FastEthernet0/0
ip address 192.168.1.1 255.255.255.0
```

```
interface Serial0
ip address 202.1.1.2 255.255.255.0
encapsulation ppp
crypto map mymap
!
ip route 0.0.0.0 0.0.0.0  Serial0
```

```
access-list 101 permit ip 192.168.1.0 0.0.0.255 192.168.12.0
0.0.0.255
!
End
```

-
-
-
-
-

```
hostname center
!
!
route-map static-ospf permit 10
 match ip address 1
!
access-list 1 permit 0.0.0.0 255.255.255.0
!
vpdn enable
!
vpdn-group 1
! Default L2TP VPDN group
accept-dialin
protocol l2tp
virtual-template 1
l2tp tunnel force_ipsec
source-ip 63.23.12.212
!
username RGOS password 0 RGOS
!
crypto pki certificate chain
certificate ca 56AE073C10A17E8C45AE8D3F15523357
3082032E 308202D8 A0030201 02021056 AE073C10 A17E8C45 AE8D3F15
52335730
0D06092A 864886F7 0D010105 05003081 AC312130 1F06092A 864886F7
0D010901
16126469 6E676A73 40737461 722D6E65 742E636E 310B3009 06035504
06130243
4E310F30 0D060355 04081306 46754A69 616E310F 300D0603 55040713
0646755A
686F7531 20301E06 0355040A 13175265 6769616E 74204E65 74776F72
6B20436F
2E204C74 64311D30 1B060355 040B1314 52657365 61726368 20417061
72746D65
6E742035 31173015 06035504 03130E43 41207465 73742073 65727665
72301E17
0D303530 32323530 38343630 325A170D 30373033 30313032 33363233
5A3081AC
3121301F 06092A86 4886F70D 01090116 1264696E 676A7340 73746172
2D6E6574
```

```
2E636E31 0B300906 03550406 1302434E 310F300D 06035504 08130646
754A6961
6E310F30 0D060355 04071306 46755A68 6F753120 301E0603 55040A13
17526567
69616E74 204E6574 776F726B 20436F2E 204C7464 311D301B 06035504
0B131452
65736561 72636820 41706172 746D656E 74203531 17301506 03550403
130E4341
20746573 74207365 72766572 305C300D 06092A86 4886F70D 01010105
00034B00
30480241 00D91F1A C60EF951 924CDC96 4D4443FA DABE53F2 DDF513B6
34B5A6A1
9FFD57A1 6C6F7AF4 A113C159 3D0C4C3E 8E62DE76 D8A24CF2 2CF8DA82
AA17D3E8
CC80C295 8F020301 0001A381 D33081D0 300B0603 551D0F04 04030201
C6300F06
03551D13 0101FF04 05300301 01FF301D 0603551D 0E041604 14724384
1C2B0345
2D8258F5 844377F5 21AA4B2C 21307F06 03551D1F 04783076 3038A036
A0348632
68747470 3A2F2F7A 6A2D726F 75746572 2F436572 74456E72 6F6C6C2F
43412532
30746573 74253230 73657276 65722E63 726C303A A038A036 86346669
6C653A2F
2F5C5C7A 6A2D726F 75746572 5C436572 74456E72 6F6C6C5C 43412532
30746573
74253230 73657276 65722E63 726C3010 06092B06 01040182 37150104
03020101
300D0609 2A864886 F70D0101 05050003 41007F2E 7D1676B5 560EDD1E
D80B4205
3B39A742 B8E06813 786E9992 2E4C5860 AB4AF193 63A34170 50BD756A
AEA7086A
7A9FC2AC D1D8A3A0 CC6779D0 76CE7D1A 7F4C
quit
!
certificate 1FFC97F0000100000029
308204B3 3082045D A0030201 02020A1F FC97F000 01000000 29300D06
092A8648
86F70D01 01050500 3081AC31 21301F06 092A8648 86F70D01 09011612
64696E67
6A734073 7461722D 6E65742E 636E310B 30090603 55040613 02434E31
0F300D06
03550408 13064675 4A69616E 310F300D 06035504 07130646 755A686F
75312030
1E060355 040A1317 52656769 616E7420 4E657477 6F726B20 436F2E20
4C746431
```

1D301B06 0355040B 13145265 73656172 63682041 70617274 6D656E74
20353117
30150603 55040313 0E434120 74657374 20736572 76657230 1E170D30
35303332
31303632 3335395A 170D3036 30333231 30363333 35395A30 81A63122
30200609
2A864886 F70D0109 0116137A 68616F6A 756E4073 7461722D 6E65742E
636E310B
30090603 55040613 02434E31 0F300D06 03550408 13064675 4A69616E
310F300D
06035504 07130646 755A686F 75312030 1E060355 040A1317 52656769
616E7420
4E657477 6F726B20 436F2E20 4C746431 1D301B06 0355040B 13145265
73656172
63682041 70617274 6D656E74 20353110 300E0603 55040313 077A6861
6F6A756E
305C300D 06092A86 4886F70D 01010105 00034B00 30480241 00BB70FF
351D18F5
7735FE4F C890AF42 8E8744BA D946C4B8 61F046DF 614E4A37 D8A3BA80
7003D7E1
BC5394F3 58DDE033 4ABA82D1 AEAD4C10 3135C2AE BB58FA2F 75020301
0001A382
02633082 025F300E 0603551D 0F0101FF 04040302 06C03013 0603551D
25040C30
0A06082B 06010505 08020230 1D060355 1D0E0416 0414420E 87E0F7C1
B744AFE3
2C1EFD64 E03E2144 844C3081 E8060355 1D230481 E03081DD 80147243
841C2B03
452D8258 F5844377 F521AA4B 2C21A181 B2A481AF 3081AC31 21301F06
092A8648
86F70D01 09011612 64696E67 6A734073 7461722D 6E65742E 636E310B
30090603
55040613 02434E31 0F300D06 03550408 13064675 4A69616E 310F300D
06035504
07130646 755A686F 75312030 1E060355 040A1317 52656769 616E7420
4E657477
6F726B20 436F2E20 4C746431 1D301B06 0355040B 13145265 73656172
63682041
70617274 6D656E74 20353117 30150603 55040313 0E434120 74657374
20736572
76657282 1056AE07 3C10A17E 8C45AE8D 3F155233 57307F06 03551D1F
04783076
3038A036 A0348632 68747470 3A2F2F7A 6A2D726F 75746572 2F436572
74456E72
6F6C6C2F 43412532 30746573 74253230 73657276 65722E63 726C303A
A038A036

86346669 6C653A2F 2F5C5C7A 6A2D726F 75746572 5C436572 74456E72
6F6C6C5C
43412532 30746573 74253230 73657276 65722E63 726C3081 AC06082B
06010505
07010104 819F3081 9C304B06 082B0601 05050730 02863F68 7474703A
2F2F7A6A
2D726F75 7465722F 43657274 456E726F 6C6C2F7A 6A2D726F 75746572
5F434125
32307465 73742532 30736572 76657228 31292E63 7274304D 06082B06
01050507
30028641 66696C65 3A2F2F5C 5C7A6A2D 726F7574 65725C43 65727445
6E726F6C
6C5C7A6A 2D726F75 7465725F 43412532 30746573 74253230 73657276
65722831
292E6372 74300D06 092A8648 86F70D01 01050500 034100AF 173B4A23
E95C8042
ED4F2F97 0D869C1E 715800E6 F64F505F 1A6F291C 4B8C95C8 2FE04F9C
CA81778F
07A2DE20 C9640A8B DD36BCC0 359C26BB D5A5E434 B5F46B
quit
!
!

!

crypto ipsec transform-set myset esp-des

crypto dynamic-map dy 1
set transform-set myset
!
!
crypto map mymap 1 ipsec-isakmp dynamic dy
!
interface FastEthernet 0/0
ip address 63.23.12.212 255.255.255.248
crypto map mymap
duplex auto
speed auto
!
interface FastEthernet 0/1
ip address 192.168.216.1 255.255.255.0
ip address 192.168.217.1 255.255.255.0 secondary
ip address 192.168.218.1 255.255.255.0 secondary

```
ip address 192.168.219.1 255.255.255.0 secondary
duplex auto
speed auto
!
interface Null 0
!
interface Virtual-Template 1
mtu 1400
ip ospf mtu-ignore
ip unnumbered FastEthernet 0/1
ip mtu 1360
!
!
router ospf
redistribute static subnets route-map static-ospf
network 192.168.216.0 0.0.0.255 area 0.0.0.0
network 192.168.217.0 0.0.0.255 area 0.0.0.0
network 192.168.218.0 0.0.0.255 area 0.0.0.0
network 192.168.219.0 0.0.0.255 area 0.0.0.0
!
line con 0
exec-timeout 0 0
line aux 0
disconnect-character 240
line vty 0 4
exec-timeout 0 0
privilege level 15
no login
!
!
end
```

```
hostname routerA
!


access-list 101 permit ip interface dialer 0 host 63.23.12.212
access-list 177 deny icmp any any unreachable
access-list 177 permit ip any any
dialer-list 1 protocol ip permit
!
l2tp-class l2x
hostname rg36_1
!
pseudowire-class pw
```

```
encapsulation l2tpv2
protocol l2tpv2 l2x
ip local interface dialer 0
!
!
                  à
crypto pki certificate chain
certificate ca 56AE073C10A17E8C45AE8D3F15523357
3082032E 308202D8 A0030201 02021056 AE073C10 A17E8C45 AE8D3F15
52335730
0D06092A 864886F7 0D010105 05003081 AC312130 1F06092A 864886F7
0D010901
16126469 6E676A73 40737461 722D6E65 742E636E 310B3009 06035504
06130243
4E310F30 0D060355 04081306 46754A69 616E310F 300D0603 55040713
0646755A
686F7531 20301E06 0355040A 13175265 6769616E 74204E65 74776F72
6B20436F
2E204C74 64311D30 1B060355 040B1314 52657365 61726368 20417061
72746D65
6E742035 31173015 06035504 03130E43 41207465 73742073 65727665
72301E17
0D303530 32323530 38343630 325A170D 30373033 30313032 33363233
5A3081AC
3121301F 06092A86 4886F70D 01090116 1264696E 676A7340 73746172
2D6E6574
2E636E31 0B300906 03550406 1302434E 310F300D 06035504 08130646
754A6961
6E310F30 0D060355 04071306 46755A68 6F753120 301E0603 55040A13
17526567
69616E74 204E6574 776F726B 20436F2E 204C7464 311D301B 06035504
0B131452
65736561 72636820 41706172 746D656E 74203531 17301506 03550403
130E4341
20746573 74207365 72766572 305C300D 06092A86 4886F70D 01010105
00034B00
30480241 00D91F1A C60EF951 924CDC96 4D4443FA DABE53F2 DDF513B6
34B5A6A1
9FFD57A1 6C6F7AF4 A113C159 3D0C4C3E 8E62DE76 D8A24CF2 2CF8DA82
AA17D3E8
CC80C295 8F020301 0001A381 D33081D0 300B0603 551D0F04 04030201
C6300F06
03551D13 0101FF04 05300301 01FF301D 0603551D 0E041604 14724384
1C2B0345
```

```
2D8258F5 844377F5 21AA4B2C 21307F06 03551D1F 04783076 3038A036
A0348632
68747470 3A2F2F7A 6A2D726F 75746572 2F436572 74456E72 6F6C6C2F
43412532
30746573 74253230 73657276 65722E63 726C303A A038A036 86346669
6C653A2F
2F5C5C7A 6A2D726F 75746572 5C436572 74456E72 6F6C6C5C 43412532
30746573
74253230 73657276 65722E63 726C3010 06092B06 01040182 37150104
03020101
300D0609 2A864886 F70D0101 05050003 41007F2E 7D1676B5 560EDD1E
D80B4205
3B39A742 B8E06813 786E9992 2E4C5860 AB4AF193 63A34170 50BD756A
AEA7086A
7A9FC2AC D1D8A3A0 CC6779D0 76CE7D1A 7F4C
quit
!
certificate 11F7C51700010000003E
308204B1 3082045B A0030201 02020A11 F7C51700 01000000 3E300D06
092A8648
86F70D01 01050500 3081AC31 21301F06 092A8648 86F70D01 09011612
64696E67
6A734073 7461722D 6E65742E 636E310B 30090603 55040613 02434E31
0F300D06
03550408 13064675 4A69616E 310F300D 06035504 07130646 755A686F
75312030
1E060355 040A1317 52656769 616E7420 4E657477 6F726B20 436F2E20
4C746431
1D301B06 0355040B 13145265 73656172 63682041 70617274 6D656E74
20353117
30150603 55040313 0E434120 74657374 20736572 76657230 1E170D30
35303431
32303932 3935335A 170D3036 30343132 30393339 35335A30 81A43121
301F0609
2A864886 F70D0109 01161264 696E676A 73407374 61722D6E 65742E63
6E310B30
09060355 04061302 434E310F 300D0603 55040813 0646754A 69616E31
0F300D06
03550407 13064675 5A686F75 3120301E 06035504 0A131752 65676961
6E74204E
6574776F 726B2043 6F2E204C 7464311D 301B0603 55040B13 14526573
65617263
68204170 6172746D 656E7420 35310F30 0D060355 04031306 64696E67
6A73305C
300D0609 2A864886 F70D0101 01050003 4B003048 024100CD 2C3B2981
FF9BF7E6
```

F9DFFCF9 495FE6AA 6691FD76 BB5EBEC3 5A1E48F8 8B75DD68 9E79AC5A
36C0B4F4
AA959323 49EEEB7F 24B546B8 74421F17 401033AE EC3F4102 03010001
A3820263
3082025F 300E0603 551D0F01 01FF0404 030204F0 30130603 551D2504
0C300A06
082B0601 05050802 02301D06 03551D0E 04160414 216567F3 E72263B2
4990E14D
ECC22471 1596A71F 3081E806 03551D23 0481E030 81DD8014 7243841C
2B03452D
8258F584 4377F521 AA4B2C21 A181B2A4 81AF3081 AC312130 1F06092A
864886F7
0D010901 16126469 6E676A73 40737461 722D6E65 742E636E 310B3009
06035504
06130243 4E310F30 0D060355 04081306 46754A69 616E310F 300D0603
55040713
0646755A 686F7531 20301E06 0355040A 13175265 6769616E 74204E65
74776F72
6B20436F 2E204C74 64311D30 1B060355 040B1314 52657365 61726368
20417061
72746D65 6E742035 31173015 06035504 03130E43 41207465 73742073
65727665
72821056 AE073C10 A17E8C45 AE8D3F15 52335730 7F060355 1D1F0478
30763038
A036A034 86326874 74703A2F 2F7A6A2D 726F7574 65722F43 65727445
6E726F6C
6C2F4341 25323074 65737425 32307365 72766572 2E63726C 303AA038
A0368634
66696C65 3A2F2F5C 5C7A6A2D 726F7574 65725C43 65727445 6E726F6C
6C5C4341
25323074 65737425 32307365 72766572 2E63726C 3081AC06 082B0601
05050701
0104819F 30819C30 4B06082B 06010505 07300286 3F687474 703A2F2F
7A6A2D72
6F757465 722F4365 7274456E 726F6C6C 2F7A6A2D 726F7574 65725F43
41253230
74657374 25323073 65727665 72283129 2E637274 304D0608 2B060105
05073002
86416669 6C653A2F 2F5C5C7A 6A2D726F 75746572 5C436572 74456E72
6F6C6C5C
7A6A2D72 6F757465 725F4341 25323074 65737425 32307365 72766572
2831292E
63727430 0D06092A 864886F7 0D010105 05000341 00148479 89448BB7
E6D3A7A7
34376464 C8D857C2 D9075263 9E278FC3 2D6C5041 036B66C7 F59ADCA5
39C9F824

```
A40A4C57 0537396916i671538 921FF39C B95C90F4 3F
quit
!
crypto pki revocation-check none
!
          и
crypto isakmp keepalive 20 periodic
      ⁄
crypto ipsec transform-set myset  esp-des
      ╗
crypto map mymap 1 ipsec-isakmp
set peer 63.23.12.212
set transform-set myset
match address 101
!
!
!
interface FastEthernet 0/0
pppoe enable
pppoe-client dial-pool-number 1 no-ddr
duplex auto
speed auto
!
interface FastEthernet 0/1
ip address 192.168.161.1 255.255.255.0
duplex auto
speed auto
!
interface dialer 0
mtu 1488
encapsulation PPP
ppp chap hostname abcd@163.com
ppp chap password 0 123456
ppp pap sent-username abcd@163.com password 0 123456
ip access-group 177 in
ip address negotiate
crypto map mymap
dialer pool 1
dialer idle-timeout 1200
dialer-group 1
bandwidth 2048
!
interface Null 0
```

```
!
interface Virtual-ppp 1
pseudowire 63.23.12.212 20 encapsulation l2tpv2 pw-class pw
mtu 1400
ppp pap sent-username RGOS password 0 RGOS
ip ospf mtu-ignore
no ip route-cache policy
ip unnumbered FastEthernet 0/1
ip mtu 1360
!
!
router ospf
network 192.168.161.0 0.0.0.255 area 0.0.0.0
!
ip route 0.0.0.0 0.0.0.0 dialer 0
!
!
line con 0
line aux 0
line vty 0 4ine aux 0
privilege level Tj
no login
!
!
end
```

Â

copy tft flash **crypto pki import pem terminal**

47 Tunnel

47.1 Tunnel

47.1.1 Tunnel

ﻝ ң ﻝ ℸ ˘
Ã̃ è ﻝ ˘ ﻝ ≠ ﻝ Â
ﻝ a ˘
Â ˘ Лъ
ﻝ Â
ℸ Ю Ь ў ˈ
˘ Â ﻝ ң
˚ ﻝ Э ﻝ ѝ ’
˘ Ү ﻝ ң ⋆
ﻝ Ѝ h

ЛЬЮ ‘

˘ ѝ

а˚ ’ 8 л Лъ

˘ ѝ ’

’

Э ╖ Â

ł ˘ Э ˘ Ю

л □ Â

˘ л ^ ~ ˘ л

Э л è а Â

б а Â

˘ 8

˘ , ˚

≠ Â

Ю л Ў л ˘ è Лъ л è

à Â

47.1.2 Tunnel

… л л ˘ ЛЬЮ Ъ ‚‘

Ъ ‚	
interface tunnel *tunnel-number*	л
no interface tunnel *tunnel-number*	… л

˚ è л ˘ л …

л Â

л ˘ ѝ л

˘ ѝ Â л

˘ Â

л ˘ л ЛЬЮ Ъ ‚‘

tunnel source *ip-address* **interface-name** *interface-number*	
no tunnel source	

tunnel source

Ю Â

Ъ ъ	
tunnel checksum	
no tunnel checksum	ʌ

Ю ʌ a Â

ʌ Э Л Љ ч ˘
˚ ≠ Л Љ б Â

Ъ ъ	
tunnel key *key-value*	ʌ
no tunnel key	ʌ ʌ

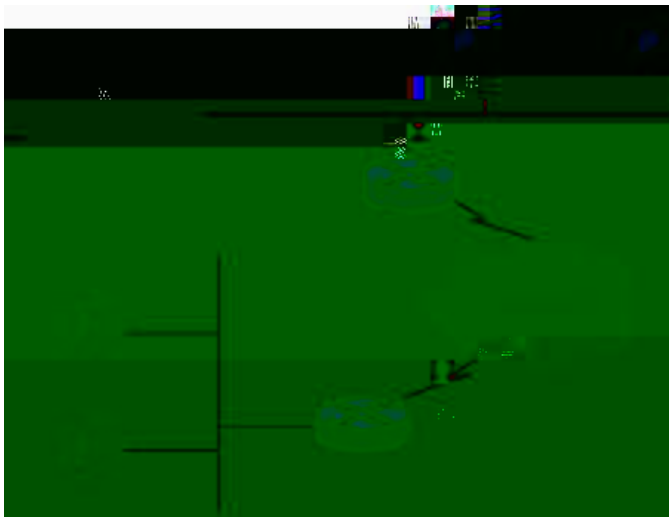
ˇ Лъ ˇ ﻝ
^ ~ ˇ Э ﻝ a Â ﻝ ң
ˇ ≠¯ Â
ﻝ ˇ ѝ Â

Ѣ ҁ	
tunnel ttl *hop-count*	
no tunnel ttl	ﻝ ˇ ѝ

Ю ѝ Â

47.1.3 Tunnel

يي يي Â



يي 9. يي 2 Tunnel ﻝ يي

ˇ ﻝ б ˇ ﻝ ł
б ﻝ ł б
Â ˇ б
a ﻝ ˇ ¯ ж Â Ю ﻝ
б Â

ﻝ

```
interface Tunnel0
ip address 21.21.21.3 255.255.255.0
tunnel source 179.208.12.221
tunnel destination 179.208.12.55
```

```
!
interface gigabitEthernet 0/0
ip address 179.208.12.221 255.255.255.0
!
interface gigabitEthernet 0/1
ip address 202.106.101.2 255.255.255.0
!
```

л ‘

```
interface Tunnel0
ip address 21.21.21.5 255.255.255.0
tunnel source 179.208.12.55
tunnel destination 179.208.12.221
!
interface gigabitEthernet 0/0
ip address 179.208.12.55 255.255.255.0
!
interface gigabitEthernet 0/1
ip address 67.151.69.202 255.255.255.0
!
```

ÿ Э л Лъ ˘ л б ”I Лъ л

˘ ”I Лъ л б ѝ

Â

47.1.4 Tunnel

л ң Ѣ ҁ **show interfaces tunnel** Лъ ѵ Ѣ ҁ **debug [gre/ip | ipip]**

б л Â

Ѣ ҁ	
show interfaces tunnel *tunnel-number*	л
show tunnel gre	Â
debug [gre/ip | ipip]	
no debug [gre/ip | ipip]	

Ю ĵ Ѣ ҁ **show interfaces tunnel** Лъ ѵ Ѣ ҁ **debug Ѣ ҁ** Â

show interfaces tunnel Ѣ ҁ

```
Ruijie# show interfaces tunnel 1
Tunnel 1 is UP , line protocol is UP
Hardware is Tunnel
Interface address is: 1.1.1.1/24
MTU 1500 bytes, BW 9 Kbit
Encapsulation protocol is Tunnel, loopback not set
```

```
Keepalive interval is 0 sec , no set
Carrier delay is 0 sec
RXload is 1 ,Txload is 1
Tunnel source 192.168.200.200 (FastEthernet 0/0), destination
192.168.200.100
Tunnel protocol/transport GRE/IP, key 0xea
Order sequence numbers 0/0 (tx/rx)
Checksumming of packets enabled  Queueing strategy: WFQ
5 minutes input rate 0 bits/sec, 0 packets/sec
5 minutes 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 abort
0 packets output, 0 bytes, 0 underruns
0 output errors, 0 collisions, 0 interface resets
```

ÿ Э Л Љ Л Љ Ы ˘ Л б ˘
˘ ˘ Â

debug Ф ђ

```
Ruijie# debug gre/ip
Ruijie#
GRE: to decaps 192.168.200.100->192.168.200.200(len=132
ttl=255) 112
```

Э ÿ ˘
ћ Â

47.1.5 Tunnel

ч а ˘ Л Љ ÿ ЉЮ ŭ ‘

”I ч Л ˘ ¯ а
ч ≠ έ ˘ ≠ б
,

è ч б έ ˘ ≠
б Ы ,

ћ ˘ ˘ з
ч ˘ ,

Ы ˘ й ћ˘ ч ầ

48 Web

48.1 Web

48.1.1 Web

48.1.2 Web

˘ Ю
ł˘ ˘ ‡ Л ˘ a ˘ ‡ Л Л
Â ˘ ˘ ł˘ Л Л
ă Â

ă ˘ ł ˘
Â ˘ ł
ˆ è ~ ˘ ł˘ Л
˘ з ╗ ă ˘ ă
˘ ㄴ ă Â

48.1.3

ή Юي ˘ Ь ‘ à
à Ĺ Â

ePortal

Radius

PC

➢ ‘

‘ Э ˘ ѝ
˘ Э ’
‘ ╟ ╥ ˘ ‘ ѣ
’
Ь ‘ Ь Ь ˘ Л Ъ ⋎
╥ Ь Â ⋎ Ь ˘
Ь ˘ б ’
Э ˘ ⋎ Л Л Ъ Ь б Ь ˘ ч
Э Â

➢ ў ‘

˘ Ю ˘
ӑ̈ Ь ˘ Э ’

˘ Э ^ ¨ ѣ ⋎ ҳ ѣ ~ б
Ь ˘ ╥ ’
ѣ ˘ Ь ˘
’

48.1.4

б ӑ̈ ╥ ^ ~ Â

48.2

Ю Â

╥	
╥	
ӑ̈	ӑ̈ Â
ӑ̈ ў	ӑ̈ ў Â
б Ь	Â
ӑ̈ ⋎	⋎ ѝ ӑ̈ Â
	ѝ Â
ӑ̈	ѝ Â
	Â
	ѝ Â
Ю	ў̆ Ю Â

48.3 Web

48.3.1 HTTP

Step 1	**configure terminal**	
Step 2	**http redirect** *ip-address*	
Step 3	**show http redirect**	

no http redirect

```
Ruijie# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Ruijie(config)# http redirect       176.10.0.1
Ruijie(config)# show http redirect
```

48.3.2 HTTP

	Ƒ ϟ	
Step 1	**configure terminal**	Â

б Ь ˘ Ю˘ **no web-auth key** Â

б Ь ѝй Â

```
Ruijie# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Ruijie(config)# web-auth portal key        web-auth
Ruijie(config)# show web-auth local-portal
```

48.3.4 SNMP

Ь Ю˘ Ь
˘ Э˘ ˘ Ь
˘ Л Љ Н ˘ Љ Й ⁸ Э àЮ
Â Ю ˘ Ь Â
Ц Ь Ц ˘ б Ь
Â Ю

	Ѣ ҳ	
Step 1	**configure terminal**	Â
Step 2	**snmp-server community** *community-string* **rw**	˘ Ь Л Љ Э Â *community-string* **rw** ˘ ˘
Step 3	**snmp-server enable traps web-auth**	ӑ ˘ Â **web-auth**

Step 4	**snmp-server host** *ip-address* **inform version 2c** *community-string* **web-auth**	ў ˘ à̀ à Â *ip-address*: ў ˘ ≠ Ŀ , **inform**: Â Ю ă̈ Ŀ ˘ ѝ ˘ Лъ a Â **version 2c**: Лъ ł ˘ a ѝ Â *community-string*: Â **web-auth**: Э ,

Ѣ ҳ є́ ĺ Ŀ Â

‘

б Ŀ ˆ ѝ ˜ ˘

ѝ ˘ Лъ ⅄ Â

```
Ruijie# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Ruijie(config)# snmp-server community       web-auth    rw
Ruijie(config)# snmp-server enable traps web-auth
Ruijie(config)# snmp-server host        176.10.0.1      inform version 2c
web-auth    web-auth
```

🕮	Лъ ѝ ˘ Ŀ ˘ ⅄ Лъ Â ˘ ѝ ˘ з ≠ ѝ ˘ ⅄ ˘ є́ ĺ Ŀ ˘ a Ạ Ў Â

48.3.5 Web

˘ Ю a ˘ ⅄

Ю ⅄ Э ╖ Â

Э ╟ ╖ ˘ Ю ‘

Step 2	**web-auth enable**	Â

Ruijie# configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Ruijie(config)# web-auth enable

48.3.6 portal

Step 1	**configure terminal**	Â
Step 2	**web-auth webauth-type {internal | external}**	Â

Ruijie# configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Ruijie(config)# web-auth webauth-type external

48.4 Web

Â ЛЬЮ

48.4.1 HTTP

	Ƃ ҁ	
Step 1	**configure terminal**	Â
Step 2	**http redirect port** *port-num*	⺁ ⺁ ä Â a˚ ⺁ ⺁˘ ⺁ ⺁ ≠ Â
Step 3	**show http redirect**	ä Â

⺁ ⺁ ä˘

Ю **no http redirect port** *port-num* Â

⺁ ⺁ ѝ ä Â

```
Ruijie# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Ruijie(config)# http redirect port 8080
Ruijie(config)# show http redirect
```

a ⺁ ⺁ ѝ ä Â

```
Ruijie# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Ruijie(config)# no  http redirect port 80
Ruijie(config)# show http redirect
```

Э ⺁^ à à ˜ Лъ ⺁ ⺁˘ a ѝ ä ⺁ Â Э˘ ⺁ ˘ ⺁ ⺁ Â ѝ б ⺁ ă ˘ ˘ a ⺁ ⺁ ⺁ ѝ ä ⺁ Â

48.4.2 HTTP

˘ ˘

Step 2	**http redirect session-limit** *session-num* **port** *port-session num*	*session-num* Â *port-session num*
Step 3	**show http redirect**	Â

no http redirect session-limit Â

Â

Ruijie# configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Ruijie(config)# http redirect session-limit 4
Ruijie(config)# show http redirect

Â

48.4.3

Â Â


```
Ruijie(config)# http redirect timeout              4
Ruijie(config)#  show http redirect
```

48.4.4

╟ ɬ˘ ″I ˘ Â

ù ˘ Ю **no**

web-auth update-interval Â

ù Â

```
Ruijie# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Ruijie(config)# web-auth update-interval 30
```

48.4.6 IP

˘ ж a ˘ ≠

/ Â ˘ ˘ ”I

˘ Â

˘ Ю

Ъ ҄	

Step 1

Step 1	**configure terminal**	Â
Step 2	**web-auth offline-detect flow**	Ю

Step 2	**web-auth redirect** *url-string*	ѝ *url-string*˘ ЛЫ Ь Ґ Ь ˘ a ↖† ˘ ѝ Â

ў ˘ Ю **no web-auth redirect** Â

‘

```
Ruijie# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Ruijie(config)# no web-auth redirect
```

48.5

a Ь Ь ˘ Л Лъ
Ь Â Ю
╗ a ˘ ЛъЮ Â
ѓ Â

48.5.1

Ь ˘ ˘ Л Лъ
ÿ Ь Э Л Â Ь
Â
Л ˘ Ю ‘

Ѣ ҂	

	Ƒ	
Step 1	**configure terminal**	Â
Step 2	**web-auth local-portal port** *port*	Ł ˬ ˘
Step 3	**show web-auth**	Â

```
Direct hosts:
  Address          Mask
  ---------------- ----------------
  192.168.1.1      255.255.255.255
```

48.6.2

Ю Ю Ѣ ҳ ‘

	Ѣ ҳ	
Step 1	**show web-auth local-portal**	Ь Â

ЛЬЮ Ь ‘

```
Ruijie# show web-auth local-portal
Local web-auth info:
  Server-port:    8080
  AAA method-list: portal
  Public account : disable
```

48.6.3 web

Ю Ю Ѣ ҳ ‘

	Ѣ ҳ	
Step 1	**show web-auth direct-host**	Â

ЛЬЮ ‘

```
Ruijie# show web-auth direct-host
direct-host
  Address          Mask
  ---------------- ----------------
  192.168.0.1      255.255.255.255
  192.168.4.11     255.255.255.255
  192.168.5.0      255.255.255.0
```

48.6.4 Web

Ю Ю Ѣ ҳ ‘

Step 1

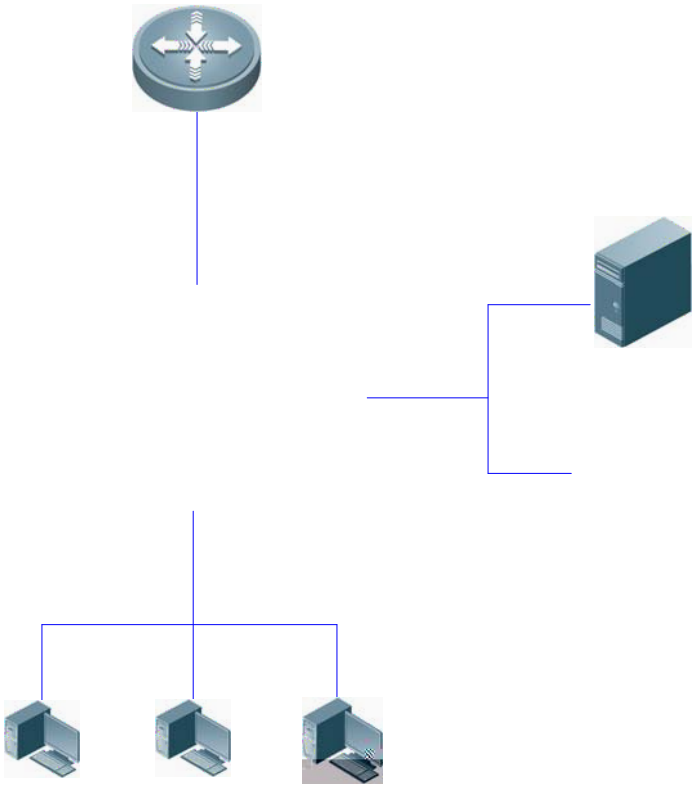
show web-auth user *ip-address*|**{online|all}***[pos count]*	Â ‘ ÿ Æ ł ˘ ў ѝ

ЛЬЮ ‘

```
Ruijie# show web-auth user
  Current user num  :  4

  User            Address        Online   Time Limit    Time Used        Status
  ---------------  -------------     -------   -------------     --------------
--------
  aaa             192.168.0.11    On      0d 01:00:00    0d 00:15:10     Active
  bbb             192.168.0.13    On      0              0d 00:00:59     Active
  ccc             192.168.0.25    Off     0              0               Create
  ddd             192.168.0.46    Off     0d 01:00:00    0d 01:00:00     Destroy

#                 ˘ ÿ  1  Æ        2
Ruijie# show  Tw w
                --------
```

Лъ ѝ ѧ˘ Ь б Ь Â

48.7.2



网关

يي

Ь ˘ Â

Э

˘ ^ ~ ˘ ,

˘ è ä̈

Ь ,

Э ¨ ł ,

Ь ˚ ,

ł˘ ,

˘ a Ą ,

˘ ЭЮ , Ь

˘ Л Лъ ,

,

内部局域网

ў ╟Ю ‘

Ь Ю Ю ’

ł˘ Ю ’ Ь

Ю ’

Ю ╖ ł˘ Ю ˘ ’

’

Portal Ю ‘

Ь ˘ α̈ ⁸ Ю ’

Ь ˚ Ь Ю ’

Ю ╖ ł˘ ’

Ю ‘

Ю ^ ˘ ~ ˘ Ь

⁸ Ю ’

Ь ˚ Ь Ю ’

Ю ╖ ł˘ ’

48.7.3

Y ‘

➢ ⅄ Э ł˘ ⅄ Ю¯ ˘ Л Љ Â

a ¨ ’

➢ ѝ ˘ ⁸ Љ ˘ Â

Л ˘ a ˘ Л è ˚ ˘

à Ю ˚ ˘ Л Â Ю Л è ˚ .

˘ ˘ Â ⁸ ᾱ˘

˘ ˘ Э ╟ ˚ ˘ ”I ’

➢ ˘ ˘

⅄ Â

48.7.4

Э Ь ⅃ б Ь

```
Ruijie# config
Enter configuration commands, one per line.  End with CNTL/Z.
Ruijie(config)# http redirect          192.168.3.1
Ruijie(config)# web-auth portal key          web_auth
```

Э ў

```
Ruijie(config)# http redirect homepage
http://www.web_auth.com/webportal/index.jsp
```

б Ь

```
Ruijie(config)# snmp-server community web_auth_key
Ruijie(config)# snmp-server enable traps web-auth
Ruijie(config)# snmp-server host 192.168.3.1 inform version 2c
web_auth_key web-auth
Ruijie(config)# exit
```

Ђ

```
Ruijie(config)# webauth enable
```

Э ˘ ˙Ω Ь й

```
Ruijie(config)# http redirect direct-site 192.168.5.1
```

Э ˘

```
Ruijie(config)# web-auth direct-host 192.168.4.12
```

″I α̈ Ь ˘ ђ˘

,

48.7.5

α̈ ‘

```
Ruijie# show http redirect
http redirect settings
 server        : 192.168.3.1
 port          : 80
 homepage      : http://www.web_auth.com/webportal/index.jsp
 session-limit : 3
 timeout       : 3
user-mode      ‘ ip

direct-site
  Address          Mask
  ---------------- ----------------
  192.168.4.1      255.255.255.255
  192.168.5.1      255.255.255.255

direct-host
  Address          Mask
  ---------------- ----------------
  192.168.4.12     255.255.255.255
```

```
Ruijie# show  web-auth direct-host
direct-host
  Address          Mask
  ---------------- ----------------
  192.168.4.12     255.255.255.255
```

49 VRRP

49.1

ˇ ǔ

يي 1 VRRP يي

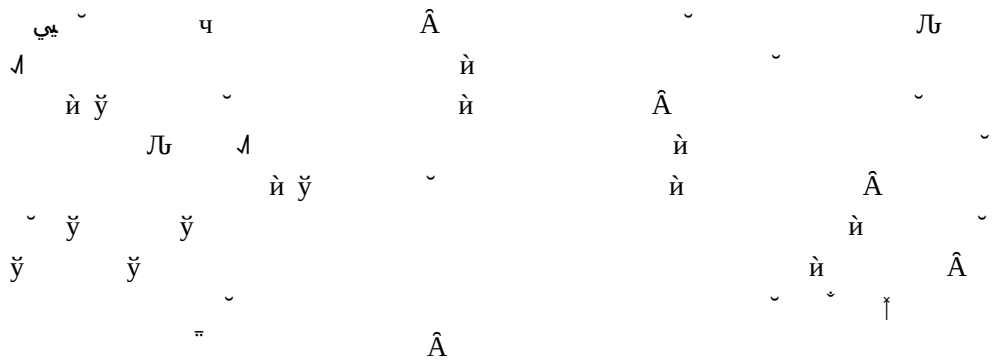
ў ˘ ў ў

б ў ˘
Â

49.2.2

Л Љ Â

3 VRRP



49.3 VRRP

49.3.1 VRRP

Љ Â

Љ Л Э Â è

- ’
- Л ’
- Л ’
- ’
- ’

- ◅ ◅ ’
- ◅ ’
- ˗ ╖ ◅ ’
- ◅ ’
- ╟ ◅ Â

˘ a Â ◥ ᾱ
Â

49.3.2 VRRP

◅ ◅ Л Ъ Э ╕ ÿ
╟ Ъ ◅ ╖ Â

Ѣ ҂	
vrrp *group* **ip** *ipaddress* **secondary**	
no vrrp *group* **ip** *ipaddress* **secondary**	

◅ ◥ й Â a ˘ a
б Â a ˘ ж й
ў Â

🕮

б Ъ ◅ Э
˘ ж й . Ъ
◅ ˘ . ”I й ˘ Ъ ◅ ◅ ˘
ж ╟ Â

. Э˘ ◅ Â
˘ ‡ Â

49.3.3 VRRP

Ъ ◟ Â
˚ ≠ Â
˚ Ю ◅ Â Ю ˚
˚ ◅ ҂ Â ◅ ҂ a ˘ ◅
Â

Ƀ ३	
vrrp *group* **authentication** *string*	
no vrrp *group* **authentication**	

ЮЎ Â ЮЎ a Â

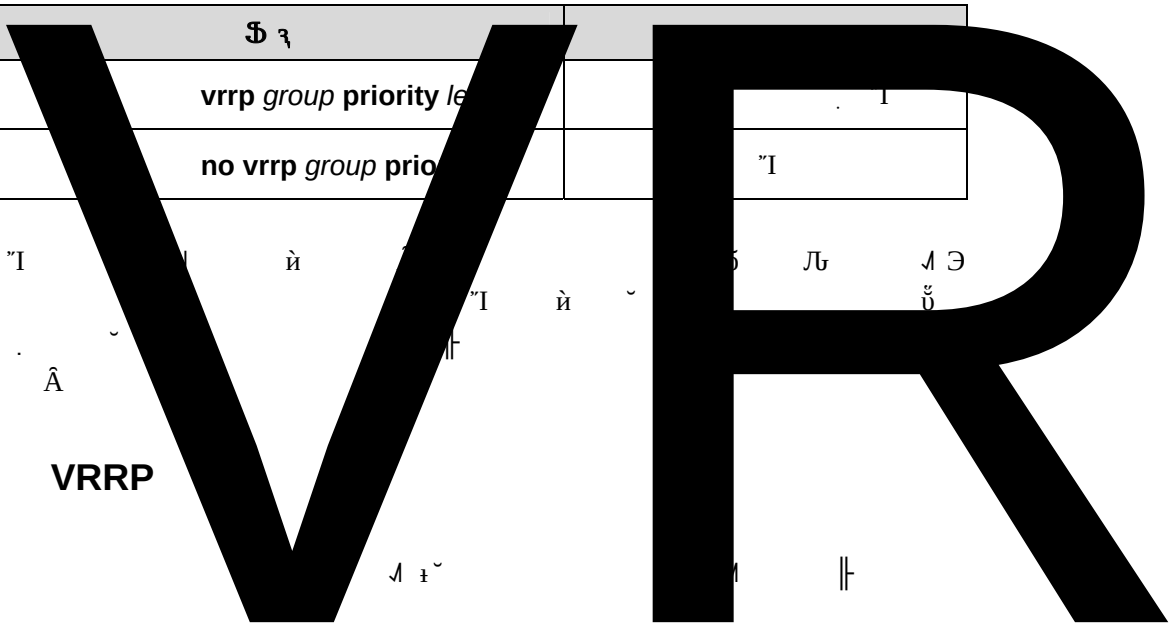
49.3.4 VRRP

Ƀ ३	
vrrp *group* **timers advertise** *interval*	ў

no vrrp *group* **timers**

no vrrp preempt delay	.

49.3.6 VRRP



vrrp *group* **priority** *le*	. I
no vrrp *group* **prio**	″I

49.3.7 VRRP