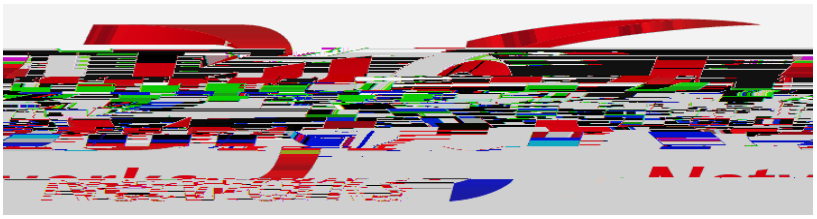

”Ą

# RG-NPE ⁄ ˜Ω ę

# RGOS 10.3(4b8)

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**3.**

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**4.**

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5˙ HTTP `

# 1 Ƃ ҳ

Ƃ ҳ ˘ ʌ Ɲ Ƃ ҳ Â

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CLI

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CLI

CLI

## 1.1 Ƃ ҳ

ǂ a˚ ˘ Ƃ ҳ ᾱ ʌ Ɲ Ƃ ҳ Â

Ƃ ҳ Ю ʌ ^ ?˜ ʌ Ɲ Ƃ ҳ Ƃ ҳ Â

˘ ˝I ^ User EXEC

˜ ˘ ʌ Ɲ Ƃ ҳ Â ЮЃ ʌ ʌ Ɲ Ƃ ҳ˘ з Ƃ ҳ ╖ ≠ ʎ

ˢ˘ show Ƃ ҳ Â Ƃ ҳ a Â

Ƃ ҳ˘ ˝I ^ Privileged EXEC ˜ Â ˘

ҳ Â ﻉ Ю ц ʌ Ɲ Ƃ ҳ˘ ρ

Â Ң ˜ ⊤ ҵ ὸ

User EXEC ˆ ˜ ”I Â Ruijie> exit Ъ ҳ Â ˘ enable Ъ ҳ Â

| | |
|---|---|
| abbreviated-command-entry? | Ъ ъ ъΩ Â<br>Ruijie# di?<br>dir disable |
| abbreviated-command-entry<Tab> | Ъ ъ ъΩ Â<br>Ruijie# show conf<Tab><br>Ruijie# show configuration |
| ? | Ъ ъ Ю ъΩ ъΩ Â<br>Ruijie# show ? |
| command keyword ? | ъΩ ъΩ Ю ∕ Â<br>Ruijie(config)# snmp-server community ?<br>WORD SNMP community string |

## 1.3 Ъ ъ

Ъ ъ ∕ Ъ ъΩ ∣ ∕ Ъ ъΩ ∕ Â

show configuration Ъ ъ ∕ Л

Ruijie# show conf

## 1.4 Ъ ъ no default

ύ ψ Ъ ъ no Â no ╖ б Ъ ъ ∕ Â ∕ Ъ ъ no shutdown ъΩ ∕ Ъ ъ shutdown ∕ ∕ Â ∕ Â a no ъΩ ъΩ ъΩ Â

Ъ ъ default Ъ ъ default Ъ ъ й Â Ъ ъ ╖ Ю default no Â ∣ Ъ ъ ╖ ЮЎ default no ∕ Â default Ъ ъ ╖ ∕ й Â

## 1.5 CLI

Ю CLI ∕ Â

CLI

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|---|---|---|
| | Ж | ∕ ╞ |

| ╖ | | |
|---|---|---|
| ╟ ″I Â | ẗ Ctrl-B | ″I Â |
| | ∧ ẗ Ctrl-F | ″I ∧ Â |
| | Ctrl-A | ″I Ъ ҳ Â |
| | Ctrl-E | ″I Ъ ҳ Â |
| Â | Backspace | ″I Â |
| | Delete | ″I Â |
| ╟ Â | Return | ẗ Э ╟ ˘ Ю ˘ Â |
| | Space | ẗ Э ╟ ˘ Ю ˘ Â |

## 1.7.2 Ъ ҳ ╟ ∧

Л Лъ ╖ ╟ ∧ ˘ Ъ ҳ˘ Ъ ҳ Лъ
Â ″I ∧ ˘ Ъ ҳ ẗ ╟ 20 ˘ Ÿ Л Лъ ″I
Ъ ҳ Â

Ъ ҳ ″I ╟ Ю ˙

| ╖ | |
|---|---|
| ″I ẗ | ẗ Ctrl-B |
| ″I | Ctrl-A |
| ″I ẗ ∧ | ∧ ẗ Ctrl-F |
| ″I ╟ | Ctrl-E |

Ъ ҳ mac-address-table static Л Â ″I
˘ Ъ ҳ ẗ ╟ 20 Â Ъ ҳ ǂ ∧ˆ $˜ ҳ
Â ∧ ẗ ╟ 20 Â

mac-address-table static 00d0.f800.0c0c vlan 1
interface
$tatic 00d0.f800.0c0c vlan 1 interface fastEthernet
$tatic 00d0.f800.0c0c vlan 1 interface fastEthernet 0/1

Л Лъ Ctrl-A Ъ ҳ Â Ъ ҳ ǂ ∧ˆ $˜ ҳ ˙

-address-table static 00d0.f800.0c0c vlan 1 interface $

## a _ Ё

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Ъ ҳ ╟ ⊀ ⊀ Ъ ҳ ╖ ˘ ⊀ Л Ъ Ъ ҳ Â é
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ˇ ¦ Â

## 1.9 Ъ ҳ ¨

Ъ ҳ ¨ ╖ ˘ Л Л Ъ ѝ Ъ ҳ ¨ ˘ ' "mygateway" Ћ ѝ
"ip route 0.0.0.0

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

Ruijie(config-if)# ip address

”ip address ”Ƀ ҳ ɬ ˘ ȝ ¨ Ƀ ҳ Â

Ƀ ҳ ¨ ˘ ŭ ‡ a Â

show aliases Ƀ ҳ ʌ ɅƄ ¨ Â

## 1.9.1 CLI

CLI ˘ PC Â ╟ ˘
˚ ˚ ◘ ɬ ʌ ɅƄ CLI Â ʌ ʌ^ Console˜
˘ ѝ ^ Outband˜ Â ˷Ω ɬ˘ ʌ ɅƄ Telnet
Â ч ʌ ɅƄ Ƀ ҳ Â

# 2

## 2.1

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | ˜Ω | CLI Ƒ ҳ | | ˘ | ê | Ƒ ҳ | Ì Â |

### 2.1.1 Ƒ ҳ 8

#### 2.1.1.1 VE$

Step 1

Ruijie(config)# enable password [level level] {password | encryption-type encrypted-password}

| | | |
|---|---|---|
| Step 2 | Ruijie(config)# privilege mode [all] {level level \| reset} command-string | Ъ ҳ ǂ Â<br>mode ʻ · Ъ ҳ CLI Ъ ҳ ˇ<br>ʻ config ʼ exec<br>Ъ ҳ ˇ interface ⅄<br>Â<br>allʻ Ъ ҳ Ъ ҳ ˇ ⅄ ѝ<br>ˇ Â<br>level levelʻ ˇ ÿ 0 15 Â<br>resetʻ Ъ ҳ ѝ Â<br>command-stringʻ Ъ ҳ Â |

lno-5(l p-5(lr2(li-7( )-93ile-7(e)g-5(l )]TJ /TT3 1 Tf 0.0120 Tc 0 Tw 06.11D0 Td ( od)eTj /TT2 1
Ъ ҳ ˇ ⅄ Ћ Ю

RADIUS

RADIUS

web ePortal

ePortal

2.1.2.2

AAA

AAA web

| | |
|---|---|
| | |

Step 1 Ruijie(config)# username

| | 0*ü |
|---|---|
| **Step 1** | flash ˚ ˘<br>˝I flash Ə<br>ˈɔ flash ˚<br>web à tftp |

˚ ˘ Э Э Л ˚

˘ ˘ Ю ł ˘ Â

| Step 1 | Ъ ҷ | |
|---|---|---|
| | Ruijie# clock set hh:mm:ss month day year | Â |

2003-6-20˝ 10:10:12

Ruijie# clock set 10:10:12 6 20 2003 //
Ruijie# show clock //
clock: 2003-6-20 10:10:54

### 2.1.3.3

Л Лъ Ю show clock Ъ ҷ ˘ Ю'

Ruijie# show clock //
clock: 2003-5-20 11:11:34

### 2.1.3.4 ˚

Л ˚ ^ calendar˜ 'I ˚ ˘ ˚ a ˘

## 2.1.4

### 2.1.4.1

reload [modifiers] Ъ ҳ ⁸ ^ scheme˜ ˘ Лъ
Â ╗ ˘ Ю( è ) Л Лъ ѝ
Э Â modifers reload Ъ ҳ ˘ Л Лъ Ъ ҳ ╗ Â
Л modifiers in ѣ at ѣ cancel Â é Ю˙

reload in mmm | hhh:mm [string]

ł Â mmm hhh:mm ā ˘ Лъ˛
ѝ æ˘ Л Лъ Â string ╠ ˘ Л Лъ ѝ
╠ ¨ ˘ Лъ Л ˘ ˘
10˛ ł ˘ Л Лъ reload in 10 test Â

reload at hh:mm month day year [string]

Â Â year
Л , ˘ ‡ ˘ ⁸
a 31 ˘ Лъ ˘ 1 1 11 30 ˘ ‡
Â ˘ ѝ 12 ˘
Л з 1 ˘ Ю˘
1 a ӟ 1 ˘ ˘ ‡ ѝ ӟ
1 ˘ ÿ Â string ˚ Э Â 2005-01-10
14:31˘ Э ˘ Л Лъ reload at 08:30 11 1
newday Â 2005-12-10 14:31˘ 2006-01-01
12:00 ˘ Л Лъ reload at 12:00 1 1 2006 newyear Â

reload cancel

Ъ ҳ Â 8 30 ˘
reload cancel ł˘ Â

at ˘ ‡ ╗ Â ˝I
˘ Лъ ˛ Â ˘
‡ ł Ѧ Â ˘
˘ ‡ Â
б a 31 з Â
˚ ł a Ѧ , ў ‡ Л
˘ ł Â

2.1.4.2

Ю˘ Ю Ъ ҳ˘ Л Ц ‘

| Ъ ҳ | |
|---|---|
| Step 1 Ruijie# reload at hh:mm month day [year] [reload-reason] | year month day hh mm ˚ reload Âreload ) Â reload-reason ( |

Ю 2005 1 11 ´ 12:00 ( 2005 1 11 8:30)˙

Ruijie# reload at 1 2:00 1 11 2005 midday //

Ruijie# show reload //

Reload scheduled in 16581 seconds.

At 2005-01-11 12:00

Reload reason: midday

2.1.4.3 ł

Ю˘ Ю Ъ ҳ ł ‘

| Ъ ҳ | |
|---|---|
| Step 1 Ruijie# reload in mmm [reload-reason] | mmm˚ ł reload˘ reload reload-reason( ) |
| Step 2 Ruijie# reload in hhh:mm [reload-reason] | hhh mm˚ ł reload˘ reload reload-reason( ) |

Ю 125˚ ł reload ( 2005-01-10 12:00)˙

Ruijie# reload in 125 test //

‘

Ruijie# reload in 2:5 test //

Ruijie# show reload //

System will reload in 7485 seconds.

2.1.4.4

a reload Ъ ҳ ¨ ˘ Л Ц Ю reload Ъ ҳ Â

2.1.4.5

Ю˘ Ю Ъ ҳ ‘

| Ъ ҳ | |
|---|---|
| Ruijie# reload cancel | |

Step 1

˘ ‡ ╟ Â

## 2.1.5 ¨ Ъ ҳ

2.1.5.1

ѝ ˘ Л Љ ѝ Л ¨ (System Name) Â˚
ѝ CLI Ъ ҳ ˘ ‡ ¨ ^ ¨ 32 ˘ ‡ Ч è
32 ~ ѝ Ъ ҳ ˘ ¨ Ч □ Ч □ Â
Ю˘ ¨ ѝ ľ Ruijie Ł Â

2.1.5.2 ¨

ң Ю Ъ ҳ ¨ ‘

| Ъ ҳ | |
|---|---|
| Ruijie(Config)# hostname name | ¨ ˘ ¨ Л ˘ a 32 Â |

Step 1

Л Љ Ю no hostname ¨ Æ Â Ю ¨ RGOS‘

Ruijie# configure terminal //
Ruijie(config)# hostname RGOS // ¨ ѝ RGOS
RGOS(config)# // ¨

2.1.5.3 Ъ ҳ

Ъ ҳ ˘ ‡ ¨ ^ ¨ 32 ˘ ‡ Ч è 32
~ ѝ ˘ ¨ Ч □ Ч □ Â Л Љ
Ю prompt Ъ ҳ Ъ ҳ ˘ Ъ ҳ Л EXEC Â

| Ƃ ҳ | |
|---|---|
| Step 1<br>Ruijie# prompt string | Ƃ ҳ ˘ ¨ /\<br>˘ 32 ˘ ‡ ∧ è 32<br>Â |

/\ Л Ю no prompt Ƃ ҳ ѝ Â

## 2.1.6

### 2.1.6.1

˘ /\ Â /\ Л
Â /\ Л… ч ^ banner˜ ‘ Â
˘ ˘ ˝I Э Â
˘ /\ Л ѝ ^ ¨ ˜Ω ~ Â
ł ˘ ў Â
Ю˘ Â

### 2.1.6.2

/\ Л…
Â /\ Л ЛЮ Ƃ ҳ ‘

| Ƃ ҳ | |
|---|---|
| Step 1<br>Ruijie(config)# banner motd c message c | (message of the day) Â c<br>ǂ ˘ ǂ /\ Л (<br>’&’ ) Â ǂ ł ˘ ł ˘<br>Â˘ /\ Л ł |

2.1.6.3

Л Љ ЉЮ Ђ ҳ

## 2.1.8 ⁸ ⁄

### 2.1.8.1

⁸ ⁄ ⁄ˆ Console˜ ˘ ⁸ ⁄ ⁄˘ ⁄ Л Ъ
Â ˘ ⁸ ⁄ ⁄ è Â ⁄ Л Ъ
⁄ ⁄ Â ˘
⁸ ⁄ Â

### 2.1.8.2 ⁸ ⁄

Ю˘ ⁄ Л Ъ Л Ъ Ю Ь ҳ ⁸ ⁄ ˙

| Ь ҳ | |
|---|---|
| Step 1<br>Ruijie(config-line)# speed speed | ⁸ ⁄ ˘ Æ bps Â<br>⁄˘ ⁄ ù 9600 à<br>19200 à 38400 à 57600 à 115200 ˘<br>9600 Â |

Ю ⁄ ù 57600 bps˙

```
Ruijie#  configure terminal                    //
Ruijie(config)#  line console  0  //                ⁸ ⁄
Ruijie(config-line)#  speed  57600  //             ⁸ ⁄  ù 57600
Ruijie(config-line)#  end                //
Ruijie# show line console  0  //                        ⁸ ⁄
CON  Type  speed  Overruns
* 0  CON  57600  0
Line 0, Location: "", Type: "vt100"
Length: 25 lines, Width: 80 columns
Special Chars: Escape  Disconnect  Activation
     ^^x  none  ^M
Timeouts:  Idle EXEC  Idle Session
     never  never
History is enabled, history size is 10.
Total input: 22 bytes
Total output: 115 bytes
Data overflow: 0 bytes
stop rx interrupt: 0 times
Modem: READY
```

## 2.1.9 Э telnet

### 2.1.9.1

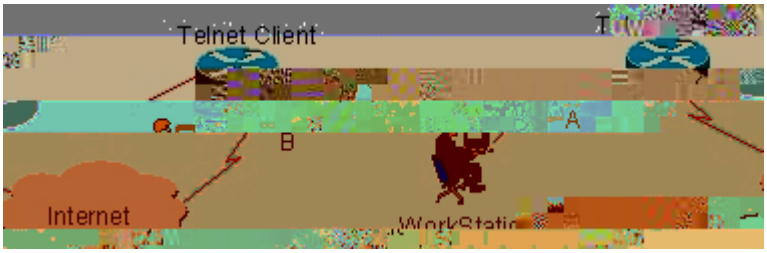
Telnet TCP/IP ˜ ˜ ˘

Ї Â Telnet Client Ь ѝ Э

Telnet Client Э ѐ Ь Â Ю

Э Telnet б A ѣ ˘ Л telnet

Ѣ ҂ Ѫ В ѐ Â




### 2.1.9.2 Telnet Client

Л Љ Э telnet Ѣ ҂ Э

| Ѣ ҂ | |
|---|---|

Step 1

| | |
|---|---|
| Ruijie(config-line)# session-timeout minutes [output ] | LINE<br>minutes<br>output |

no exec-timeout LINE

Ruijie# configure terminal //
Ruijie(config)# line vty 0 // LINE
Ruijie(config-line)# session-timeout 20 // 20min

## 2.1.11

CLI

Step 1

| | |
|---|---|
| Ruijie# execute {[flash:] filename } | |

line_rcms_script.text Telnet

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

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

| | |
|---|---|
| | PC Э<br>TFTP Flash Â<br>CLI Ƃ ҳ<br>Ƃ ҳ ‡ ”I Ƃ ҳ<br>Â |

## 2.1.12 Ł ƸΩ

SNMP Server/SSH Server/Telnet Server/Web Server Â

| | Ƃ ҳ | |
|---|---|---|
| Step 1 | Ruijie(Config)# enable service snmp-agent | SNMP Server |
| Step 2 | Ruijie(Config)# enable service ssh-sesrver | SSH Server |
| Step 3 | Ruijie(Config)# enable service telnet-server | Telnet Server |
| Step 4 | Ruijie(Config)# enable service web-server | Http Server https server |

no enable service Ƃ ҳ ƸΩ Ł Â

```
Ruijie# configure terminal                              //
Ruijie(config)#  enable service ssh-server             //  SSH Server
```

```
Ruijie(config)#  enable service web-server http
```

```
Ruijie(config)#  enable service web-server https
```

| | |
|---|---|
| | enable service web-server Ƃ ҳ ł 3 ƸΩ Ю<br>enable service web-server [http \| https \| all]<br>Ƃ ҳ ł a ƸΩ all ƸΩ ‡ http Ł https Ł’ http ƸΩ ‡ https ƸΩ ‡ https Ł Â |
| ~ | https Ł ł Ю Ł<br>,https Ł Â Ł Ƃ й httpd_cert.crt<br>Ƃ й httpd_key.pem tftp Э Ю Â<br>Â |

### 2.1.13 HTTP

| | |
|---|---|
| a "¼ ã | http ┣ https ┣ ˇ ﾉ Â http ┣<br>Ю˘ Ą https ┣, з a ﾉ http ┣ ﾉ ˘ ‡<br>ﾉ ﾉ https ┣˘ http ┣ ˘ https ┣ ﾉ ﾉ<br>┣ ˜Ω ˘ http ┣ Â |

# 3

## 3.1

Flash

## 3.2

## 3.2.1

4096

flash

128M

dir

˚

˚ Â

flash ^ a flash ~ ѝ 32M Э˘ æ
512K ˘ ѝ ł flash ˚ ˘ ╠
˚ Â
‘ USB ˘ flash ˚ Â USB ˚
a з flash æ 512K ˘ ╠ ˚ ł
Ѫ Â
flash ^ a flash ~ ѝ 512M Э˘ æ
4M ˘ ѝ ł flash ˚ ˘ ╠ ˚ Â
‘ USB ˘ flash ˚ Â USB ˚
a з flash æ 4M ˘ ╠ ˚ ł Ѫ
Â
flash æ ˚ 110% ˘ ѝ ╖ ˘
╠ ˚ Â
‘ 10MB ˚ ˘ ǂ flash ѝ
10MB ˘ flash æ 11MB ˘ ╠
˚ ł Ѫ Â

## 3.2.2 ǂ

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Ю Ю Ъ ҷ‘

| Ъ ҷ | |
|---|---|
| Ruijie# cd directroy | directory Â |
| Ruijie# cd ../ | Э |
| Ruijie# cd ./ | |

ЛЬЮ D ث ѧ ‘

| | |
|---|---|
| Ruijie# mkdir directoryname | … |

ЛЬЮ Ю … BAK

Ruijie# mkdir bak

### 3.2.7

Ю

| | |
|---|---|
| Ruijie# rename flash: old_filename flash: new_filename | й old_filename й new_filename Â |

### 3.2.8

Ю Ю Л Лъ

| | |
|---|---|
| Ruijie# pwd | |

### 3.2.9

Ю Ю

| | |
|---|---|
| Ruijie# rm [recursive ] filename | Â |
| Ruijie# delete [recursive] filename | Â |

Ю MNT Ю Л large.c

Ruijie# delete mnt/large.c

Ю aaa

Ruijie# delete recursive aaa

## 3.2.10

Ю Ю Л Љ

| Ѕ ҳ | |
|---|---|
| Red-Giant# rmdir directoryname | Â |

ЉЮ MNT

Ruijie# rmdir mnt

# 4 `

## 4.1

` Ъ ҳ Ю ў CTRL ` ˚ Э Ю ˘
ч ‘ TFTP ˜ Ѧ ` ˘ Ѩ Xmodem ˜
Ѧ ` Â

## 4.2 `

ÿ ЛЬЮ ύ ` ˚

TFTP ˜ ˚

XMODEM ˜ ˚

### 4.2.1 TFTP˜ ˚

ÿ ў Ю ˚ ˘ Ѩ ÿ Э ˚ ў Â

CLI Ъ ҳ Ю Ю ˚ Ю ‘

Ю ˘ ˝I ў TFTP Server ˚ ’ ł Ю ˚ ’ ł
J ˚ Ё

TFTP Server

`

˚ ˚ ¨ ˘ ‡ tftp ╗ Э ⁄˘ Ю˚

copy tftp: ”//localtion/filename” flash: filename [vrf vrfname]

˚ ˘ ˚ ¨ ˘ ≠ ˚ ¨ ╗ Э ⁄˘ Ю˚

copy tftp: //localtion/filename flash: ”filename” [vrf vrfname]

### 4.2.2 XMODEM˜ ˚

ÿ ў Ю ˚ ˘ ↓ ÿ Э ˚ ў Â

CLI Ъ ҂ Ю˜ Ю ˚ Ю ‘

Ю ˘ ”I Windows

`

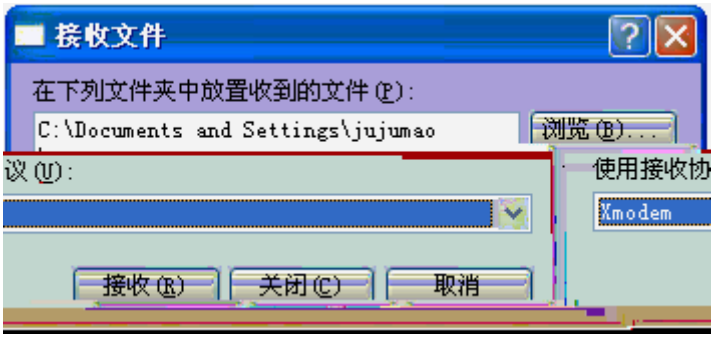
| Ƀ ҂ | |
|---|---|
| Ruijie# copy xmodem flash :filename | ÿ ў Ю ˚ Ƀ̈ ù filename Â |

CLI Ƀ ҂ ЮЎ Ю ˚ Э ‘

Э ˇ ”I Windows ’ ł Ю ЛЧЮ Ƀ ҂ Э ˚ ’ ł ў Windows ˇ “ ” “ ˚ ”Ⅱ Â يي 3 ‘

يي 3

Э ˚ Æ ˘ ~ “Xmodem” “ ” ˚ ¨ ˘ “ ” ł ˚ Â يي 4 ‘




يي 4

| Ƀ ҂ | |
|---|---|
| Ruijie# copy flash :filename xmodem | ÿ Э ˚ filename ў |

˚ ¨ ˘ ˚ ¨ ╗ Э ⁄˘ Ю˚
copy xmodem flash: ”filename” copy flash: ”filename” xmodem

## 4.2.3 `

a ˘ ⁄ Л Э tftp xmodem ` ˚
Э Â ╥ ł˘ ╟ ˘ ` ˚ ╟ ` ˘ a
ӯ Â

` ˚ Э ` ╟ a˚ ‘

1˜ ` ⁄ ` ˘ ` ˘ ╟ Æ˘ Ą ╟
Â

2˜ ˘ . Л Ь ╘ ˘ ` ˚ `
Â ”I ` ˘ Æ Â Ą ╟ ˘ ╟˚ ╥ ╟ ˘
. ╘ ` Â

╟` ╥ ‘ ў ╥ ˘ ў ˘ . Ь
˘ ў a ˘
. ` ˚ ˘ ` ˘ Л Ь Â

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. . ˚ ` Â ` a ⁄ ˘ ŭ ‡ ⁄
` Â

` ˘ ⁄ show version . ˚ ŭ б`
` ŭ ˘ a ў ⁋ ^ ‘ redundancy
force-switchover ˜ ˘ ŭ ‡ ` Â

` ˚ ` ‘

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# 5 HTTP`

## 5.1 HTTP`

### 5.1.1 HTTP`

HTTP` HTTP ` HTTP ` ч Â

HTTP ` ий HTTP Ь ъ л Ь Э ъ
ъ ` Â

HTTP ` ий HTTP Ь ъ WEB ъ Э ъ
ъ ` Â

### 5.1.2

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HTTP ` Ь Эъ ў Ь ЭЮ ` ъ Э Â

л ий ЛЬЮ ъ

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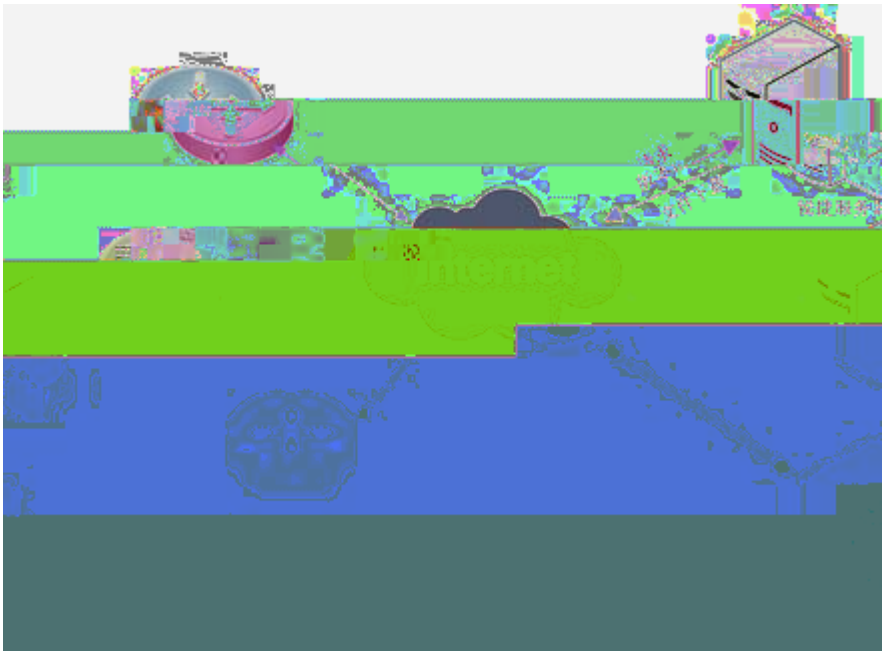

HTTP WEB Э Э Â

### 5.1.3 ˜

RFC1945 - Hypertext Transfer Protocol -- HTTP/1.0

RFC2616 - Hypertext Transfer Protocol -- HTTP/1.1

RFC1867 - Form-based File Upload in HTML

## 5.2 Л

### 5.2.1 Л

Л Ш ч ' à й ЎΩ Ш ˘ Ю
Ш à Ь Â γ à ˘
Л Лъ Â

`

Л ╥ ╠ Ь ˘ ˚
╠ ˚ Â

## 5.2.2

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и‘

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2 Ь˘ ˚ à ╗ ˘ ł ˚ HTTP Э Л Â

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и‘

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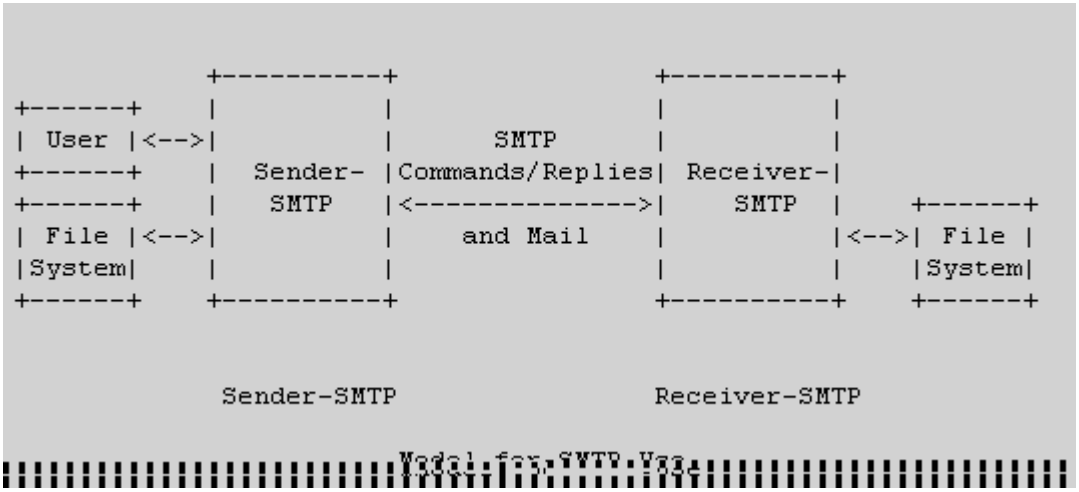
Л л˘ ˚ ˘ ˚ Â

˚ Ь

ў SMTP ~ ˚ ╥ Â

SMTP Юيي ‘

`




SMTP

˚ Ł Э يي Sender-SMTP Â Л ˚ ˜Ω ˘
˚ ˘ ˚ Ł ˆ ¯ Receiver-SMTP˜ Â

˚ Foxmail à Outlook

| | |
|---|---|
| ㄴ | 0.0.0.0ơ ` ˚ ㄴ ~ |
| ㅅ ㅅ | 80 |
| ╟` | |
| ` | ╟` |
| ` ㅅ | ㅅ |

support identification of 31 kinds of popular games.

Ruijie# http update web character-db //` WEB ˚

updating files, please wait...

update success!

## 5.4.2 Ł

ЮЎ HTTP ` Ł 0.0.0.0Ў ⁄ ⁄ 80Ў Ł

˘ ˘ ЛЬЮ ‘

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

| | |
|---|---|
| | Ł ⁄ a ˘ ` ˚ ⁄ ` 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

# 5.5 ╟`

ˆ ⁄` ~ ÿ ⁄ `

╟`

`

╟` ˚

## 5.5.1 ÿ ⁄ `

ЮЎ HTTP ` ÿ ⁄ ` Â ÿ ⁄ ` ˘

˘ ЛЬЮ ‘

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

### 5.5.3 ╟`

ЮЎ HTTP ╟` Â ╟` ˘ ˘
ЛЬЮ

`

‘

# ÿ ⅄ HTTP `

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

## 5.6 ⅂ ℸ

˜Ω ⅂ ℸ
ˆ ⅂ ˜ ╟ ⅂
ˆ ⅂ ˜ ˚
ˆ ⅂ ˜
ˆ ⅂ ˜
ˆ ⅂ ˜ ⅂

### 5.6.1 ˜Ω ⅂ ℸ

ЮЎ ⅂ ℸ ˜Ω ’ ⅂ ℸ ˘ ЛЬЮ ‘

| | Ѣ ҂ | |
|---|---|---|
| Step 1 | **configure terminal** | |
| Step 2 | **feedback enable** | ˜Ω ⅂ ℸ |
| Step 3 | **feedback user enable** | ˜Ω ⅂ ℸ |
| Step 4 | Ruijie(config)#end | OX3– SÀ |

## 5.6.2 ╟ Л

Ю Л ˚ , ˚ ˘ Л Л
˘ ЛЬЮ ‘

| Ф ₹ | |
|---|---|
| Step 1 **feedback update** | Л |

‘

# Л

Ruijie# feedback update

## 5.6.3 ˚

Ю ˚ ˘ ˚ ˘ ЛЬЮ ‘

| Ф ₹ | |
|---|---|
| Step 1 **configure terminal** | |
| Step 2 **feedback subscriber** mail-addr | |

## 5.6.4

| | Ѣ ҂ | |
|---|---|---|
| Step 1 | **configure terminal** | |
| Step 2 | Ruijie(config)# feedback user-info | |

`

no. name ignore

---

1, no memory, NO

2, no flash, NO

3, high cpu, NO

Ruijie# configure terminal
Ruijie(config)# feedback ignore-item 2
Ruijie(config)# end

Ruijie# show feedback items

no. name ignore

---

1, no memory, NO

2, no flash, YES

3, high cpu, NO

## 5.6.6 Л

Л Â ˘ Л Ц ˘ ˚
Â æ ˘ ł ˘ a ‘

| Ъ ҷ | |
|---|---|

Step 1

## 5.7

SMTP

### 5.7.1

| | | |
|---|---|---|
| Step 1 | **configure terminal** | |
| Step 2 | **no mail-service enable** | |
| Step 3 | Ruijie(config)# end | |
| Step 4 | **show running** | |

mail-service enable

#

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

### 5.7.2 SMTP

SMTP

| | | |
|---|---|---|
| Step 1 | **configure terminal** | |
| Step 2 | **mail-client smtp-server** host **port** value | |
| Step 3 | **mail-client username** username **password 0 7** password | |

`

| | | |
|---|---|---|
| Step 4 | Ruijie(config)# end | |
| Step 5 | **show running** | |
| Step 6 | **mail-client check** | ŭ |

| | |
|---|---|
| | SMTP ┗ ∕ ɨ˘ ╟ ˅ Â |

‘

# SMTP ┗

Ruijie# configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Ruijie(config)# mail-client smtp-server smtp.qq.com
Ruijie(config)# mail-client username test@qq.com password test
Ruijie(config)# end
Ruijie#show run
...
!
mail-client smtp-server smtp.qq.com
mail-client username test@qq.com password 093b10013
...
Ruijie#mail-client check
Connect to SMTP server. OK!
Login to SMTP server. OK!
Send a test mail. OK!
Check SMTP OK!

Л

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Ї ЎД Ў Л ЎД ЎЏ ў ЛЬЮ ‘

1. Л

2. Л

3. Л

4.

5. Лъ Л

6. LINE

7.

8. л

9. Aggregate Port

# 1

## 1.1

Ruijie ч Â Э
à Â

Â Dial à NULL à Loopback à

Э Â

uijie Ю

| | | |
|---|---|---|
| Лъ | GigabitEthe | IE 3 à RFC894 |
| Dialer | dialer | — |
| Loopback | Loopbac | — |
| NULL | NULL | — |
| | Gigabi rnet 0/0.10 | — |

## 1.2

## 1.2.2 IP

NULL ﻝˇ ﻝ Лъ ѝ ﻝ IP ˇ Ѣ ҂ Ю̛

| Ѣ ҂ | |
|---|---|
| Ruijie(config-if)# ip address ip-address ip-mask | ﻝ |
| Ruijie(config-if)# no ip address | ﻝ |

˜Ω IP ê ﻩ ﻣ ќ ┗..

## 1.3 ﻝ

ﻝ ﻠ ЮO '

ﻝ 8

Æ ﻝ

˜Ω ﻝ

### 1.3.1 ﻝ 8

| Ƃ ҂ | |
|---|---|
| Ruijie# show interface [interface-type interface-number] | ﻝ ã ˜ |

### 1.3.2 Æ ﻝ

ﻝ Э ( ﻟ ﻥ ◘ ◘ ժ ċ ,

0 output errors, 0 collisions, 2 interface resets

clear counter Ъ ҷ ғ show interface gigabitEthernet 0/0 Ъ ҷ ﾉ ‘
Ruijie# show interface gigabitEthernet 0/0
GigabitEthernet 0/0 is DOWN , line protocol is DOWN
Interface address is: 192.168.10.10/24
MTU 1500 bytes, BW 2000 Kbit
Keepalive interval is 10 sec , set
Carrier delay is 2 sec
RXload is 1 ,Txload is 1
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, 2 interface resets

### 1.3.3 ӯ ﾉ

ﾉ a Ю ﾉ Лъӯ Â shutdown Ъ ҷ ӯ ﾉˇ no shutdown Ъ ҷ
╟ ﾉ Â

| Ъ ҷ | |
|---|---|
| Ruijie(config-if)# shutdown | ӯ ﾉ |
| Ruijie(config-if)# no shutdown | ﾉ |

## 1.4 ﾉ

### 1.4.1 ﾉ

Ю Лъ ﾉ ╖ ‘

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

### 1.4.2 ﾉ ӯ

ﾉ a ˘ ﾉ Лъ ﾉ ӯ Â Ю ‘

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

# 2

VLAN

## 2.1

### 2.1.1

IP

#### 2.1.1.1

| | |
|---|---|
| Ruijie(config)#interface interface-type interface-number | interface range interface range macro |

Gigabitethernet 0/1

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

## 2.1.1.2 interface range

### 2.1.1.2.1

interface range interface range

| | |
|---|---|
| Ruijie(config)# interface range {port-range \| macro macro_name} | interface range macro |

interface range range

GigabitEthernet slot/{ port} - { port}

TenGigabitethernet slot/{ port} - { port}

TenGigabitethernet

interface range

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

range

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

### 2.1.1.2.2

| | |
|---|---|
| Ruijie(config)# define interface-range macro_name interface-range | macro_name 32 |

Ruijie(config)# interface range macro macro_name

interface range

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 ﻝ ﻝ Â ﻝ Лъ ﻝ ẑΩ
ﻝ Â ẑΩ ﻝ ‡ ﻝ Э a ﻝ ﻝ
Ѫ Â ≠ ﻝ Лъ ẑΩ ﻝ Â ﻝ
ч Up Down ﻝ ẑΩ ﻝ ѝ down ŭ ‡ ѝ up Â

| Ѣ ҳ | |
|---|---|
| Ruijie(config-if)# shutdown | ẑΩ ﻝ |
| Ruijie(config-if)# no shutdown | ﻝ |

Ю ẑΩ ﻝ Gigabitethernet 0/2

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

## 2.1.3 ﻝ Ӯ

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è Ӯ Â Ӯ ﻝ à à ﻝ à
Ӯ ﻝ Ӯ Ӯ ﻝ
Лъ Â

Ѣ ҳ ﻝ ǂ Лъ ﻝ è a Ӯ ǂ ﻝ a Ѣ ҳ Â

| Ѣ ҳ | |
|---|---|
| Ruijie(config-if)# media-type { | |

Ruijie(config-if)# end

## 2.1.4 ⅄ à ⅃

⅄ à ⅃ Â

| Ъ ҳ | |
|---|---|
| Ruijie(config-if)# speed {10 \| 100 \| 1000 \| auto } | ⅄ ˘ ѝ auto Â ‘ 1000 /ℸ ”I ⅄ ’ |
| Ruijie(config-if)# duplex { auto \| full \| half } | ⅄ ⅃ Â ‘ speed,duplex, ѝ auto ˘ ⅄ ℥Ω ~ |

⅄ Ю no speed˘ no duplex Ъ ҳ˘ ⅄ à ⅃ ѝ ˆ ~ ~ ÂЮ Gigabitethernet 0/1 ѝ 100M˘ ⅃ ѝ ⅃ ‘

```
Ruijie# configure terminal
Ruijie(config)# interface gigabitethernet 0/1
Ruijie(config-if)# speed 100
Ruijie(config-if)# duplex full
Ruijie(config-if)# end
```

---

**a_É**

IEEE ℥Ω ˘ ”I ⅄ ~ ⅄ Master Slave ..

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## 2.1.5 ⅄ MTU

⅄ ă˘ ⁄ℸ Лъ ˘ ѝ jumbo Â ⁄ℸ Лъ ⅄ MTU ⁸ ⅄ Â

MTU ˘ a Лъ Â

⅄ MTU ⁄ℸ Â a MTUÂ ⅄ ˘ MTU˘ Â

Лъ ⅄ MTU ѝ 64~1500 ˘ ѝ 4 ˘ ѝ 1500 Â

Ъ ҳ ⁄ℸ ⅄ ÂSVI ⅄ a MTU Â

| Ъ ҳ | |
|---|---|

| | |
|---|---|
| Ruijie(config-if)# Mtu num | ㅅ MTU<br>Num' <64-1500> |

ЮО ㅅ Gigabitethernet 0/1 MTU'

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

## 2.1.6 Лъ ㅅ

Лъ ㅅ Ъ ъ ў '

Лъ ㅅ

Лъ ㅅ

### 2.1.6.1 Лъ ㅅ

ㅅ ˘ Â ∧ ЮО show Ъ ъ ∧ ㅅ Â
ЮО ∧ ЛъЮЪ ъ ㅅ '

| Ъ ъ | |
|---|---|
| Ruijie# show interfaces [interface-id] | ㅅ Â |
| Ruijie# show interfaces [interface-id] description | ㅅ ㅅ Â |

ЛъЮО ”I Лъ ㅅ '

Ruijie# show interface GigabitEthernet 0/0
GigabitEthernet0/0 is up, line protocol is up
HardwareisPQ3TSECGIGABITETHERNETCONTROLLERGigabitEthernet,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
5 minutes output rate 0 bits/sec, 0 packets/sec

82 packets input, 7947 bytes, 0 no buffer
Received 76 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, 3 interface resets
Link Mode: 1000M/Full-Duplex, media-type is twisted-pair.
Output flowcontrol is off;Input flowcontrol is off.

### 2.1.6.2 Лъ Л

Лъ Л Ъ ч Ю

| Ъ ч | |
|---|---|
| Ruijie# clear counters<br>GigabitEthernet interface-number | "I Лъ Л |

## 2.1.7 LinkTrap

Л Лъ Л ў Л LinkTrap ў ╖ ˘ Л Link
Л ◘ˇ SNMP LinkTrap, Л ‡ a Â Ю ў ╖ Â

### 2.1.7.1 Ъ ч

| Ъ ч | |
|---|---|
| Ruijie(config-if)# [no] snmp trap link-status | ˜Ω Л link<br>trap ╖ . |

### 2.1.7.2

Ю Л и a Link trap:

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

## 2.1.8 Лъ Л

Лъ Л ˘ Л IP ˘ è
Л Лъ Â Ю

Ruijie# config terminal

```
Ruijie(config)#          interface gigabitEthernet          0/0
Ruijie(config-if)#           ip address       192.168.12.1 255.255.255.0
Ruijie(config-if)#           no shutdown
```

## 2.2 VLAN

VLANˇ Virtual Local Area Network˜ ¯ ˘ Э ˛
˘ ISO ɣ Â IEEE 1999 Лъ ◘ VLAN
802.1Q ˜ Â

VLAN LAN ˛ a ˚ ˆ LANˇ ¯
VLAN˜ ˘ VLAN ˚ ˘ б Э LAN
˚ Â ˛ a ˛ ˘ Лъ˚ VLAN
˚ ˘ ¯ a ˚ LAN Â VLAN
a è VLAN ˘ ÿ ╠ ⁸ à à ◘ à
Â

VLAN ѝ ᾱ Лъ ˜ ˘ Лъ Э ╕
VLAN ˘ VLAN ID ˛ ѝ ˘ ⁸ a˚ ɣ ˘
Â Л Лъ ⁸ ˘ ˘
╠ Â

### 2.2.1 802.1Q Ӯ

ˇΩ 802.1Q Л Лъ ˜ ˘ Ӯ Ю 802.1Q ˘
802.1Q ˘ Лъ Â

ي 1 ˘ 802.1Q ˜ ў ˘ ˘ Лъ
ł ╕ 4 802.1Q ˘ ł Лъ Â

ي 1 802.1Q Лъ

4 802.1Q 2 ˜ ˆ TPIDˇ Tag Protocol Identifierˇ
ѝ 0x8100˜ ˘ ч ⁸ ˆ TCIˇ Tag Control Information˜ ˘ TPID IEEE
Ђ ˘ ╕ 802.1Q ˘ ي 2 802.1Q
Â

| TPID (Tag Protocol Identifier) | | TCI | | |
|---|---|---|---|---|
| 0x81 | 0x00 | P | C | VLAN ID |

31 23 15 12 0

يﻲ 2 802.1Q

ЮЎ

VLAN Identifiedˆ VLAN IDˆ ‘ 12 Æ ˘ VLAN IDˆ 4096 ˘
802.1Q ˜ ў ˘ Лъ VLANÂ

Canonical Format Indicatorˆ Cˆ ‘ Æ T-R ˘ ҳ Â ҳ
a ˘ ﻝ Лъ Â

Priorityˆ Pˆ ‘ 12 Æ ˘ . ”I Â 8 . ”I ˘ ў
˘ . ”I Â

ǂ VLAN ˘ aˇ VLAN ȁ ⁸ ȁ Â

## 2.2.2 VLAN Ь

VLAN Ь ЛъЮ ǂ ‘

VLAN

ﻝ IP

### 2.2.2.1 VLAN

VLAN ˘ Ю ЛъЮ Ф ҳ‘

| Ф ҳ | |
|---|---|
| Ruijie(config)# interface GigabitEthernet Sub_interface_number | … 802.1Q ﻝ |
| Ruijie((config-subif))# encapsulation dot1Q VlanID | 802.1Q VLAN ID ﻝˇ VLANID б Э è VLANID |

VLANID ﻧ и 1 4085Â

ضﺫ ∩ ş

ˇ è ˘ з VLAN native ╖ ˘ ў ﻝ è Â

### 2.2.2.2 Л IP

VLAN Ъ Лъ ы˘ ий VLAN Лъ Л IP Â
Л IP ˘ Л Ю ЛъЮ Ъ ч˙

| Ъ ч | |
|---|---|
| Ruijie((config-subif))# ip address ip-address mask | Л IP |

802.1Q Лъ Л Л IP VLAN ў è VLAN ў ˜Ω Â

## 2.2.3 VLAN

VLAN ˘ Ю˝ Ю show Ъ ч Â

| Ъ ч | |
|---|---|
| Ruijie# show vlans [VlanID] | VLAN |
| Ruijie# clear vlan [VlanID ] | VLAN |

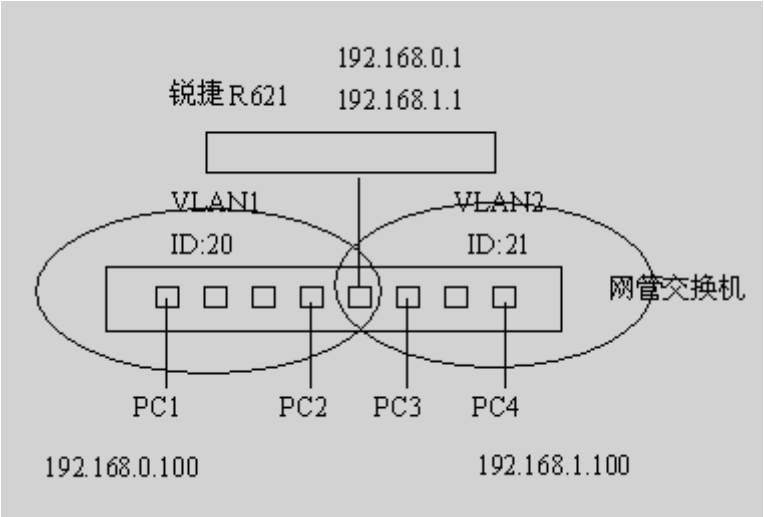
## 2.2.4 VLAN

Л VLAN Э ∫ ч VLAN˝

1. VLAN 192.168.0.0/24 ў ˘ VLAN 192.168.1.0/24 ў Â

Лъ Л 802.1Q ий ч VLAN ў ˜Ω Â

ﻲﻳ Ю˝




ыь 3

é ‘

```
hostname "Ruijie"
!
interface gigabitEthernet 0/0
no ip address
!
interface gigabitEthernet 0/0.20
encapsulation dot1Q 20 // 802.1Q ˇ VlANID й 20
ip addr 192.168.0.1 255.255.255.0 // Л IP
!
interface GigabitEthernet0/0.21
encapsulation dot1Q 21 // 802.1Q ˇ VlANID й 21
ip addr 192.168.1.1 255.255.255.0 // Л IP
!
interface GigabitEthernet0/1
no ip address
shutdown
!
end
```

# 3

Э a à Loopback( ) NULL( ) Dialer( ) Â

## 3.1 Loopback

Loopback( ) UP Â Loopback Â Loopback IP OSPF Telnet Telnet Loopback Â

| | |
|---|---|
| Ruijie(config)# interface loopback loopback-interface-number | loopback |
| Ruijie(config)# no interface loopback loopback-interface-number | loopback |

interface loopback loopback-interface-number… Loopback ( IP ) Â

Loopback no interface loopback loopback-interface-number Loopback Â show interfaces loopback loopback-interface-number б Loopback Â

| | |
|---|---|
| Ruijie# show interfaces loopback loopback-interface-number | loopback |

Ю show interfaces loopback Â

Ruijie# show interfaces loopback 0
Loopback 0 is UP , line protocol is UP
Hardware is Loopback
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 Л Лъ Loopback

1)

## 3.3.2

### 3.3.2.1

### 3.3.2.2

interface gigabitEthernet

# 4

## 4.1

### 4.1.1

ў ң ˘ ˜Ω Ю ˘ Лъ Л
ſ Â

### 4.1.2

NPE ң й ˜Ω ң ˘ й ң Â
˘ ˚ ˜Ω ң ң Â

#### 4.1.2.1

a

ÿ ˜Ω ˛ ˜Ω ˘ ÿ ˜Ω ˛ ˜Ω ˘

ł Â

## 4.2

Ю Â

| ╖ | |
|---|---|
| | ˇΩ |
| | |
| ⅄ | a˚ ң a˚ ˘ ⅄Л Ъ Ъ ҳ ˛ Â |

## 4.3

### 4.3.1 ˇΩ ˇΩ

Ю˝ ˇΩ ˘ ˇΩ Ю˝ ⅄ ⅄Л Ъ IP ˘ ⅄Л Ъ NAT ˇΩ ˙

| | Ъ ҳ | |
|---|---|---|
| Step 1 | **configure terminal** | |
| Step 2 | **sys-mode gateway** | ѝ ˇΩ |
| Step 3 | Ruijie(config)# end | |
| Step 4 | **show running** | |

### 4.3.2 ˇΩ ˇΩ

⅄Л Ъ ЛЪЮ ˇΩ ˇΩ ˙

| | Ъ ҳ | |
|---|---|---|
| Step 1 | **configure terminal** | |
| Step 2 | **sys-mode gateway** | ˇΩ |
| Step 3 | Ruijie(config)# bridge-map bridge-num | |

| | | |
|---|---|---|
| Step 4 | Ruijie(config-bridge-map)# link-mode interface-name1 interface-name2 { forward \| sniffer \| bypass \| receive-only} | Â<br>è interface-name1 :<br>interface-name2 :<br>Ю<br>forward<br>sniffer<br>bypass bypass<br>receive-only a |
| Step 5 | Ruijie(config-bridge-map)# native-vlan vlan-id num | native vlan-id Â<br>vlan-id й native vlan-id<br>vlan Â |
| Step 6 | Ruijie(config-bridge-map)# end | |
| Step 7 | **show running** | |

Ю

no link-mode Ф Â

#  0  Ω GigabitEthernet 0/0

# GigabitEthernet 0/1  native vlan-id й 100 Â

```
Ruijie#  configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Ruijie(config)#  bridge-map  0
Ruijie(config-bridge-map)#  link-mode  GigabitEthernet0/0GigabitEthernet0/1
sniffer
Ruijie(config-bridge-map)#  native-vlan  100
Ruijie(config-bridge-map))#  end
```

ЮЮ Ω receive-only Ю

| | Ф | |
|---|---|---|
| Step 1 | **configure terminal** | |
| Step 2 | **no sys-mode gateway** | Ω |
| Step 3 | Ruijie(config)# bridge-map bridge-num | |
| Step 4 | Ruijie(config-bridge-map)# link-mode interface-name1 interface-name2 receive-only | receive-only Â |
| Step 5 | Ruijie(config-bridge-map)# [no] lan-ip ip_address subnet_mask | receive-only Ю б |
| Step 6 | Ruijie(config-bridge-map)# end | |
| Step 7 | **show running** | |

receive-only ˘ Л Љ Ю no lan-ip

Ђ ҳ Â

‘

# 0 receive-only Â

# 192.168.0.0/255.255.255.0 10.10.10.0/255.255.255.0 ѝ

Ruijie# configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Ruijie(config)# bridge-map 0
Ruijie(config-bridge-map)# link-mode GigabitEthernet0/0GigabitEthernet0/1
receive-only
Ruijie(config-bridge-map)# lan-ip 192.168.0.0 255.255.255.0
Ruijie(config-bridge-map)# lan-ip 10.10.10.0 255.255.255.0
Ruijie(config-bridge-map))# end

### 4.3.3 Л Ґ

ЉЮ ˘ Л Љ Л ‘

1. GigabitEthernet 0/0 и л.

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

2. GigabitEthernet 0/0

## 4.3.5 bypass

NPE40

NPE40 bypass GigabitEthernet 0/0 GigabitEthernet 0/1 GigabitEthernet 0/3 GigabitEthernet 0/4 couple 0 couple 1

| | | |
|---|---|---|
| Step 1 | **configure terminal** | |
| Step 2 | **bypass couple** couple-num | couple-num |
| Step 3 | Ruijie(config)# end | |
| Step 4 | **show running** | |

1 bypass

```
Ruijie(config)#bypass couple 0
Couple 0 bypass started.
```

2 bypass

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

NPE50E NPE60E

NPE50E NPE60E bypass GigabitEthernet 0/0 GigabitEthernet 0/1 GigabitEthernet 0/2 GigabitEthernet 0/3 couple 0 couple 1

NPE50E NPE60E bypass

| | | |
|---|---|---|
| Step 1 | **configure terminal** | |
| Step 2 | **bypass copper couple** couple-num | couple-num |
| Step 3 | Ruijie(config)# end | |
| Step 4 | **show running** | |

NPE50E NPE60E bypass

| | | |
|---|---|---|
| Step 1 | **configure terminal** | |
| Step 2 | **bypass fiber couple** couple-num | couple-num |
| Step 3 | Ruijie(config)# end | |
| Step 4 | **show running** | |

1

Ruijie(config)#bypass copper couple 0

Copper Couple 0 bypass started.

2

Ruijie(config)#no bypass copper couple 0

Copper Couple 0 bypass stoped.

3

Ruijie(config)#bypass fiber couple 0

Fiber Couple 0 bypass started.

4

Ruijie(config)#no bypass fiber couple 0

Fiber Couple 0 bypass stoped.

| | |
|---|---|
| | bypass DOWN a CPU |

| | |
|---|---|
| | NPE NPE40 NPE50E NPE60E |

## 4.4

| | |
|---|---|
| **show bridge-map** bridge-num | |
| **show bridge-map** bridge-num**lan-ip** | |
| **show sys-mode** | |
| **show environment** | a |

1˙ ﾉ ﾙ 0 ﾞ ˙

Ruijie#show bridge-map 0

BR]8GE MAP 0,STATE is DOWN

Inside interface is GigabitEthernet 0/0,Outside interface is GigabitEthernet 0/1

Working mode is forward

Native vlan is 1

2˙ ﾉ ﾙ 1 ˆ receive-only ˘ 100.100.100.0/24 IP ˜ ˙ Ruijie#show bridge-map 1 lan-ip

IP add mask add

100.100.100.0 255.255.255.0

# 5 Лъ л

## 5.1 Лъ л

### 5.1.1 Лъ л

NPE40 ä NPE60 ң Э Лъ л˘ ⁸˘ л Э
б ˚ ˆ ˘ а б ⁸ ℸ ˘ л Э
б Э Ь ˆ ˘ ѝ ľ Ь Â л л Лъ
˘ б ÿ Console л Э Â Лъ л л ˘
а ℸ ˘ ˉ Э ѝ MGMT˜ Management˜ л Â

˚ ˘ MGMT л л ”I Лъ л ”I Лъ л Â

### 5.1.2

MGMT л˘ л Лъ б Ь ˆ ˘ а ∧ Ь
˘ ÿ л ˘ Ь ˘ Ў л Лъ
˘ Ь Â

л ˘ б Console л ˘ MGMT л ^ 100M vs 115200bps˜ ˘ з ѓ
Ь ˘ MGMT л л Лъ Ь ˘ б ≠
а ∧ Ь Â

MGMT л ѓ ЛъЮ ⁸‘

1¨ MGMT л л Telnet WEB ’

2· MGMT л л TCP/IPv4 ˘ Ethernet II ’

3· б Ь ˘ Ў MGMT л б
а ă ˘ IP ˜Ω Â

## 5.2

Ю MGMT л Â

| ℸ | |
|---|---|

| | |
|---|---|
| ip ref | enable |
| duplex | auto |
| speed | auto |
| flowcontrol | enable |

## 5.3 MGMT Л

^

| | |
|---|---|
| Ң | NPE40 ä NPE60 Â |

## 5.3.2 MGMT л è ˝Ω

л è ˝Ω ˘ ˘ ЛЪЮ ˙

| | Ъ ҳ | |
|---|---|---|
| Step 1 | **configure terminal** | |
| Step 2 | **interface mgmt 0** | л |
| Step 3 | **gateway** A.B.C.D | ˝Ω |
| Step 4 | **mtu** mtu-value | л ĭ^ ~ |
| 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** | ˝Ω л |

| | |
|---|---|
| | è Ъ ҳ mtu ä speed ä duplex ä flowcontrol ä description shutdown<br>б Ж б è л ˘ ˘ ˝Ω л Лъ ľ л Ъ ҳ Ł˘<br>а Ą Â |

˙

# ˝Ω

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

| | |
|---|---|
| Ң | NPE40 ä NPE60 Â |

## 5.3.3 ѐ

ѝ б ˘ ж Ъ ҳ ѐ˘ ‘

ping oob

| Ъ ҳ | |
|---|---|
| Ruijie#ping oob host | ICMP echo request э ў л |

‘

# MGMT л ў 192.168.1.2 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

traceroute oob

| Ъ ҳ | |
|---|---|
| Ruijie#traceroute oob host | ў |

‘

# 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

telnet oob

| Ъ ч | |
|---|---|
| Ruijie#telnet oob host | ў |

‘

# ў 192.168.9.1

Ruijie# telnet oob 192.168.9.1
User Access Verification

Password:

sntp enable oob

| | Ъ ч | |
|---|---|---|
| Step 1 | **configure terminal** | |
| Step 2 | **sntp enable oob** | ╖ |

‘

# SNTP ╖

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

| н | NPE40 ä NPE60 Â |
|---|---|

## 5.3.4 ▾

| Ѣ ҳ | |
|---|---|
| **copy** source-url destination-url | source-url Æ 8 destination-rul Æ |

#  8

Ruijie#  copy oob_tftp  ://192.168.1.2/ngsa-compress.bin  flash:file.bin
Accessing tftp://192.168.1.2/ngsa-compress.bin...
!!!

# 6 LINE

## 6.1

LINE

LINE

╗/ LINE VTY

LINE Ю Л Лъ ~

## 6.2 LINE

### 6.2.1 LINE

LINE ˘ Л Лъ LINE Ю́ é LINE Â
LINE ˘ ЛъЮ Ѣ ҳ'

| Ѣ ҳ | |
|---|---|
| Ruijie(config)# line [aux \| console \| tty \| vty] first-line [last-line] | LINE |

### 6.2.2 ╗/ LINE VTY

Ю́ LINE VTY ѝ 5 Â Л Лъ Ѣ ҳ ╗ LINE VTY Â VTY
Л Лъ ╗ 36 Â

Л LINE VTY ˘ VTY Э ˘ ѝ ӳ
˘ a Â show users a Â ў Лъ
Ю '

Л VTY ѝ 7˝ telnet ˘ ѝ ĭ VTY 7 ’

CLI ѣ˘ Ľ no line vty 6 Ł Ѣ ҳ˘ VTY Л Â VTY 7
Э ˘ ˘ Ѧ Â

| Ѣ ҳ | |
|---|---|
| Ruijie(config)# line vty line-number | LINE VTY ╗ |

| | |
|---|---|
| Ruijie(config)# no line vty line-number | LINE VTY |

## 6.2.3 Line Ю Л ~

8 LINE Ю Л Л ~ ˇ Л Л Ъ Ѣ ҂ Â Ю˝ VTY Л Л Ъ ~ ’ è TTY˝ a ~ Â

| Ѣ ҂ | |
|---|---|
| configure terminal | |

Line vty line number Line

# 7

## 7.1 ӯ

DLDP Лъ Ь à ˘ Ь Â й Лъ Ѳ
~ ˘ Лъ DLDP Э ˘ ~
˘ ˘ з ╕ Æ Â

ў Л Лъ╡ Ю ű ˙

◘ ˙

Л Э ╠ ╖ ˘ ~ й ◘˘ arp ˘ Л
mac Â Л a mac ◘ ˘ ╖
˘ й Â Л mac ь˘ й ╖ Â

╖ ˙

Ю˘ Л Лъ ICMP echo Â ‡ Л
й UP Â ˘ ‡ echo ˘ Л ˘ ˘ й
◘ Â ˘ ╖ ˘ й Â

˙

Ю˘ Л a Ӓ ╖ ╡ ˘ ѐ Â

DLDP Л╡ ў ╠/ ╠ ˘ ╠ a ў ╠ arp icmp echo ˘ Л
icmp echo Â ˘ dldp ˘ ╠ Л
Â

╠ й ў ╠ Â

## 7.2

### 7.2.1 Ь

Лъ ˘ Л Ю Ь Â

Лъ ╖

Ю ip

interval

retry

7.2.2 Л Ш

# 8

## 8.1 PPPOE

### 8.1.1 PPPOE

PPP(PPPOE PPP over Ethernet) DDR DDR

PPPOE DDR( DDR Profiles)

### 8.1.2 PPPOE

PPPOE PPPOE

#### 8.1.2.1

PPPOE

PPPOE

PPPOE

no shutdown

PPPOE

| | |
|---|---|
| Ruijie(config-if)# pppoe enable | PPPOE |

PPPOE DDR Profiles DDR Profiles

| | |
|---|---|
| | |

| | |
|---|---|
| Ruijie(config-if)# pppoe-client dial-pool-number pool-number dial-on-demand | Лъ ﻝ ﻝ ( ﻝ ╖ , ﻝ pppoe ╘ ) |

| Ъ ҳ | |
|---|---|
| Ruijie(config-if)# pppoe-client dial-pool-number pool-number no-ddr | Ъ ҳ Э Ъ ҳ ╖ ˇ , ≠ Лъ ﻝ ﻝ ( ╟ ﻝ ╖ , ╟ ﻝ pppoe ╘ ) |

dail-on-demand no-ddr ˇ dail-on-demand PPPOE DDR ╖ ˇ ў , DDR ╖ Â
no-ddr pppoe ╟ ﻝ ╖ , ╟ ﻝ pppoe ╘ .

8.1.2.2 ﻝ

PPPOE ﻝ PPP˜ ﻝ Э ˇ ﻝ Э PPPOE ﻝ ˝Ω Â

ﻝˇ Ю ЛЬЮЪ ҳ˙

| Ъ ҳ | |
|---|---|
| Ruijie(config)# interface dialer dialer-number | ﻝ |
| Ruijie(config-if)# ip address negotiate | ˜ |
| Ruijie(config-if)# dialer pool pool-number | ˝Ω ﻝ ˇ б Лъ ﻝ ﻝ Â |
| Ruijie(config-if)# dialer idle-timeout seconds | ˆ ﻝ ˜ ˇ ѣˇ ╟ Â |
| Ruijie(config-if)# encapsulation ppp | PPP˝ PPPOE PPP Э Â |
| Ruijie(config-if)# mtu 1488 | ĩ ѝ 1488 Â |
| Ruijie(config-if)# dialer-group dialer-group-number | б dialer-list ˇ ˝Ω ﻝ ‡ Â |
| Ruijie(config-if)# ppp pap sent-username username password password | ¨ Â |

ضد ∩ ş

ЛЬЭ ⅋ ҳ ⅋ ҳ ӣ ﻫ ⅋ ҳ ЛЬ ˘ è ⅋ ҳ Â Ώ MTU
ӣ 1488˝ ŭ ‡ Â

PPPoE Ю ﻯ IP ˘ ‡ Ю
clear pppoe tunnel ⅋ ҳ PPPoE ˜ ˘ Лъ Â

8.1.2.3

PPPOE ˘ ў Ю

ЊЖ ﻫ ‡

ﻫ

PPPOE è ╖ NAT˘ ‡ è Â é
˘ Â

ЊЖ ﻫ ‡˘ Ю ЛЬЮ⅋ ҳ'

| ⅋ ҳ | |
|---|---|
| Ruijie(config)# dialer-list number dialer-group protocol protocol-name {permit \| deny \| list access-list-number \| access-group} | ЊЖ<br>ﻫ ‡ |

ﻯ IP Ю ˜ ˘ ﻯ ˘ Лъ ӣ
PPPOE ﻯ ˘ ﻯ ӣ PPPOE ﻫ ﻯ ﻫ Â

ﻫ ˘ Ю ЛЬЮ⅋ ҳ'

| ⅋ ҳ | |
|---|---|
| Ruijie(config)# ip route 0.0.0.0 0.0.0.0 dialer dialer-number [permanent ] | Â permanent<br>˘ ¨ ﻯ<br>^ enable-timeout˜ ˘<br>ﻯ down Â |

ضﻍ ∩ ş

ﻫ ﻯ Лъ a ˘ ﻯ Лъ Â ж ˘
ﻫ ˘ ŭ ‡ ﻫ Â

## 8.1.3 PPPOE

PPPOE,˘ EXEC Ю ЛЬЮ⅋ ҳ'

| Ƒ ϗ | |
|---|---|
| Ruijie# show pppoe {tunnel \| session} | Ƒ ϗ ˘ tunnel session Â |
| Ruijie# show interfaces dialer dialer-number | ﻍ ˘ ŭ ˜ IP Â |
| Ruijie# debug pppoe {datas \|errors \|events \|packets } | PPPOE ˇΩ |

## 8.1.4 PPOE

ﻍ PPPOE ﻍ Â

1. ѝ 5† ˘ 5† ˘ ╠ Â
2. ¨ ѝ pppoe ѣ pppoe Â
3. NAT ╗ ˘ ѝ 192.168.0.0/24 Â

ЛЬЮ
!
hostname "Ruijie"
!
ip subnet-zero

# PPPOE, Лъ ﻍ ﻍ 10 Â
interface GigabitEthernet0/0
no ip address
duplex auto
pppoe enable
pppoe-client dial-pool-number 10 dial-on-demand

# Лъ ﻍ
interface GigabitEthernet0/1
ip address 192.168.0.1 255.255.255.0
ip nat inside
ip mtu 1488
duplex auto
speed auto

# ﻍ
interface Dialer1
ip address negotiate
mtu 1488
encapsulation ppp

```
ip nat outside
dialer pool 10                                  //˜Ω      ㅓ    10
dialer-group 1
dialer idle-timeout 300                                  //5ˆ
ppp pap sent-username pppoe password 0 pppoe
!
ip nat inside source list 1 interface Dialer1
access-list 1 permit any
ip route 0.0.0.0 0.0.0.0 Dialer1
!
dialer-list 1 protocol ip permit
!
line con 0
line aux 0
line vty 0 4
login
!
```

# 9 Aggregate Port

## 9.1

### 9.1.1 Aggregate Port

Лъ ˘ ѝ Aggregate Porť AP˘ Â
AP ╖ IEEE802.3ad ˘ Л Лъ ˘ Л Â

AP ╖ ˘ Л Лъ ! ǂ ÂAP ╖ ˘ AP ˘
╠ ǂ AP è Э Â AP ˘
a è Э Â

ŗ NPE40/NPE50E/NPE60E !6[]

IP + IP IP IP ↑ Â Ь ˘
Ю ɣ ˘ ‡ ╟ Â é a˚ IP+ IP IP+
IP ↑ ˘ é ˚ IP+ IP ‡ ↑ ˚ Â

L4 ⅄ L4 ⅄ L4 ⅄ ⅄ L4 ⅄ ⅄ ↑ Â
Ь ˘ Ю ɣ ˘ ‡ ╟ Â é a˚ L4
⅄ ⅄ ⅄ ⅄ ↑ ˘ é ˚ L4 ⅄ ⅄ ⅄ ⅄ ‡ ↑ ˚
Â

L4 ⅄+L4 ⅄ L4 ⅄ ⅄ L4 ⅄ ⅄ ↑ Â
Ь ˘ Ю ɣ ˘ ‡ ╟ Â é a˚ L4 ⅄
⅄+L4 ⅄ ⅄ ↑ ˘ é ˚ L4 ⅄ ⅄+L4 ⅄ ⅄ ‡ ↑
˚ Â

IP+L4 ⅄ IP L4 ⅄ ⅄ ↑ Â Ь ˘
Ю ɣ ˘ ‡ ╟ Â é a˚ IP+L4 ⅄ ⅄
↑ ˘ é ˚ IP+L4 ⅄ ⅄ ‡ ↑ ˚ Â

IP+L4 ⅄ IP L4 ⅄ ⅄ ↑ Â Ь ˘
Ю ɣ ˘ ‡ ╟ Â é a˚ IP+L4 ⅄ ⅄
↑ ˘ é ˚ IP+L4 ⅄ ⅄ ‡ ↑ ˚ Â

IP+L4 ⅄ IP L4 ⅄ ⅄ ↑ Â Ь ˘
Ю ɣ ˘ ‡ ╟ Â é a˚ IP+L4 ⅄ ⅄
↑ ˘ é ˚ IP+L4 ⅄ ⅄ ‡ ↑ ˚ Â

IP+L4 ⅄ IP L4 ⅄ ⅄ ↑ Â Ь ˘
Ю ɣ ˘ ‡ ╟ Â é a˚
L4

IP+$µ4ÔÂ ðÁ6 ´Zóâ 1Tz0}¤r @A¹# G£ G>5 • ã*ü b ½ y [ È
V p ü!8# G£ G>5 ò Ôã ß o ,X ⅄ ⅄

`

IP+L4IP+L4 IP+L4

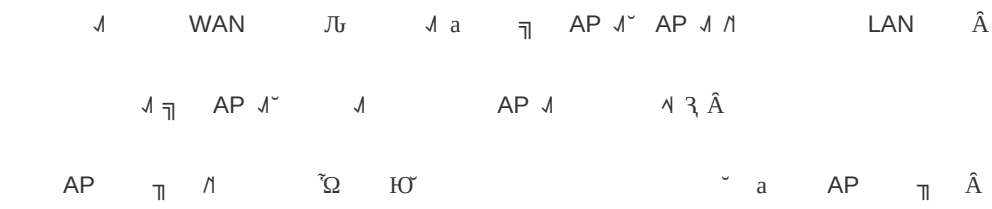
Ł4Á6 #p E¯> # G£ ÚG
V p ü!8# G£ G>5 ò7 ½N0=ñ° €@F ðÁ6 ÑÔq'Â ñ ,] Î hy [ í Î n ÚG!4-,Ì | `1àE

IP+ IP+L4 IP IP L4 Â Ь Ю ‡ Â IP+ IP+L4 IP+ IP+L4 ‡ Â

IP+ IP+L4 +L4 IP IP L4 L4 Â Ь Ю ‡ Â IP+ IP+L4 +L4 +L4 ‡ Â

Э AP a Â

R5h<[ MAC c, MAC W MAC + , MAC cW IP c, IP cW IP + , IP cL4 L4 L4 W IP+L4 IP+L4 IP+L4 W IP+L4 IP+L4 IP+, IP+L4 IP+, IP+L4 IP+c, IP+ TJ 54095D0T.2 5.2 TfDB947<6F2A1094058<6FA9>47<0654>-4FEf



a

| | |
|---|---|
| ÜJ‰vQ | AP Ç jØ‡ AP ÜÇP•"¥KĪ'" |
| ‰Ÿ | AP NTÇP"Ø‰NÀÀÀÇ AP Ø‡Çd |

## 9.2.4 Aggregate Port

Ю Л Љ aggregateport load-balance Ъ ҙ AP Â

| Ъ ҙ | |
|---|---|
| Ruijie(config)# aggregateport load-balance { dst-mac \| src-mac \| src-dst-mac \| dst-ip \| src-ip \| src-dst-ip \| src-l4port \| dst-l4port \| src-dst-l4port \| src-ip-src-l4port \| src-ip-dst-l4port \| dst-ip-src-l4port \| dst-ip-dst-l4port \| src-ip-src-dst-l4port \| dst-ip-src-dst-l4port \| src-dst-ip-src-l4port \| src-dst-ip-dst-l4port \| src-dst-ip-src-dst-l4port } | AP ˘ й src-dst-mac Â<br>dst-mac˙ MAC ĺ Â<br>src-mac˙ MAC ĺ Â<br>src-dst-mac ˙ MAC б MAC ĺ Â<br>dst-ip ˙ IP ĺ Â<br>src-ip ˙ IP ĺ Â<br>src-dst-ip ˙ IP б IP ĺ Â<br>src- l4port ˙ L4 Л Л ĺ Â<br>dst- l4port ˙ L4 Л Л ĺ Â<br>src-dst-l4port ˙ L4 Л Л б L4 Л Л ĺ Â<br>src-ip -src-l4port ˙ IP б L4 Л Л ĺ Â<br>src-ip-dst-l4port ˙ IP б L4 Л Л ĺ Â<br>dst-ip-src-l4port ˙ IP б L4 Л Л ĺ Â<br>dst-ip-dst-l4port ˙ IP б L4 Л Л ĺ Â<br>src-ip-src-dst-l4port: IP à L4 Л Л б L4 Л Л ĺ Â<br>dst-ip-src-dst-l4port ˙ IP à L4 Л Л б L4 Л Л ĺ Â<br>src-dst-ip-src-l4port ˙ IPIP б L4 Л Л ĺ Â IP б L4 Л Л ĺ Â à Л Л б L4pm 0 1 Tf S0 |

## 9.2.5 Aggregate Port LinkTrap

1) AP LinkTrap

LinkTrap

| | |
|---|---|
| Ruijie(config-if-AggregatePort ap_number)# snmp trap link-status | AP LinkTrap |

no snmp trap link-status AP LinkTrap

AP 5 LinkTrap

```
Ruijie(config)# interface aggregateport 5
Ruijie(config-if-AggregatePort 5)# no snmp trap link-status
```

AP LinkTrap

2) AP LinkTrap

aggregateport member linktrap AP LinkTrap

| | |
|---|---|
| Ruijie(config)# aggregateport member linktrap | AP LinkTrap |

no aggregateport member linktrap AP LinkTrap

AP LinkTrap

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

# 9.3

# IP Ь

---


ї ЎĄ Ў IP Ь ЎĄ ЎΩ ˘ ЛЬЮ ·

1˙ IP Ь

2˙ IPv4

3˙ Л

4˙ NAT

5˙ Л

# 1 IP б Ь

## 1.1 IP

### 1.1.1 IP ӯ

IP 32 æ ɣ ⁸ ˘ ѝ ˘ ⁸ Â ⁸ ˘ ˦ ѝ
˘ 8 æ˘ ÿ 0~255˜ ľ . Ł ѧ ˘ ľ 192.168.1.1 Ł ⁸
IP Â

IP ¨ Ћ˜ IP ˜ Â 32 æ IP ч ˦ ‘ 1˜ ˦ ’
2˜ ˦ Â ˦ ű æ ˘ IP ѧ Ѣ ˦
Â

A ˘ æ ѝ ľ 0 Ł˘ 7 æ ѧ˘ 24 æ Â
128 A Â

B ˘ ч æ ѝ ľ 10 Ł˘ 14 æ ѧ˘ 16 æ
Â 16,348 B Â

˘ Ь æ ѝ ľ Ł˘ æ ѧ˘ æ
Â Â

˘ æ ѝ ľ Ł˘ ѐ æ ѝ Â

## ضU ş

æ ỳ ľ 1111 Ł a ǂ ˘ ỳ E ˘
Â

˘ IP ˘ IP ǂ Â
б ˘ ‡ ǂ IP Â ىي ٧ ﾉ Ћ ъ ä̈ α ىي
ˆ CNNIC˜ ˘ IP ǂ ỳ ىي ˙ б ﾉǂ Ώ ﾉ
ˆ ICANN,Internet Corporation for Assigned Names and Numbers˜ Â ỳ
˘ a IP ˘ ≠ a ǂ ˘ ǂ ж Â

Ю ỳ б ﾉ ˙

| | | |
|---|---|---|
| A | 0.0.0.0 | |
| | 1.0.0.0~126.0.0.0 | ﾉ |
| | 127.0.0.0 | |
| B | 128.0.0.0~191.254.0.0 | ﾉ |
| | 191.255.0.0 | |
| C | 192.0.0.0 | |
| | 192.0.1.0~223.255.254.0 | ﾉ |
| | 223.255.255.0 | |
| D | 224.0.0.0~239.255.255.255 | |
| E | 240.0.0.0~255.255.255.254 | |
| | 255.255.255.255 | |

ˆΩ IP à TCP/UDP ˄ è ˚ ˘ RFC 1166

1.1.2.1.1 ⩘ IP

⩘ ң ⩘ Л Ъ ⩘ IP ˘ è ѝ ў IP ˘ è ѝ IP Â
IP Э ʁ˘ IP б ў IP Л Ъ IP а˘
Â ˘ IP ˘ Л Ъ Ю Ю IP ‘

ў Â ˘ C ˘ ⩘ ǂ 254
⩘ ў Â ў 254 ⩘ ˘ C a ǂ ˘ ǂ ⩗ C
Â ч ˘ Л Ъ IP Â

I P IP Ö

б ㄴ

| | |
|---|---|
| Ruijie(config-if)# arp timeout seconds | ARP ˘ 0-2147483˝ è 0 a ◘ |
| Ruijie(config-if)# no arp timeout | |

Ю˝ ѝ 3600 ˘ ¨ 1 Â

1.1.2.2.4 ⁄ ˇΩ⁄ ARP

⁄ ˇΩ⁄ ш ˉ Â ⁄ ˇΩ⁄ ╗ ѣ˘ ˉ

ЮЎ Л ╟ arp ¯ ╖ Â

### 1.1.2.2.6 ARP

ARP ╖ ł ˘ ˘ ¯ ARP Â Л Л Ъ

˘ Л Ю ў 5B 5B,XLbCp%a,H0h0,t@ð

| | |
|---|---|
| Ruijie(config)# ip routing | ╠ IP ╗ |

ضذ ∩ ş

ip checksum ˘ ip ˘ a Ą ˘
˘ Л Ү Â

1.1.2.4

й Э ў Â л ң ч ‘ 1˜ ă
˘ й ў ˘ ў ǂ й ľ 1 Ł’ 2˜
˘ й ў ˘ 32 æ й ľ 1 Ł Â
IP ˜ ˘ è ǂ IP ˜ Â Љ ⁸
Â

IP ˘ Л ˘ ш ˘
й Â ╕ ⁸ ˘ è Â
Ү ˘ Â

ā ╕ ˘ ă ˘
IP ˜ Л ă a Â

ˇΩ ˘ RFC 919 RFC 922 Â

˘ ЉЮ Ь Ь ˘ Â

ă

… IP

1.1.2.4.1 ă

IP ă й IP IP ˘ й 172.16.16.255
й ă Â ң a Â

б IP ă ˘ ă Â
ă ћ˘ ă й ^
IP й ľ 1

л Э˘ л Лъ Ж 8 8 ă Â Ж ˘ л
Ж ă Â

ă ˘ л ЛъЮ Ъ ҳ'

| Ъ ҳ | |
|---|---|
| Ruijie(config-if)# ip directed-broadcast [access-list-number] | л Э˘ ╟ ă |
| Ruijie(config-if)# no ip directed-broadcast | л |

1.1.2.4.2 … IP

˘ è ѝ Ґ 1 Ь˘ ѝ 255.255.255.255 Â л ң л Лъ
˚ Ж ң è ˘ з л Лъ Â

255.255.255.255 ˘ л ЛъЮ Ъ ҳ'

| Ъ ҳ | |
|---|---|
| Ruijie(config-if)# ip broadcast-address ip-address | … |
| Ruijie(config-if)# no ip broadcast-address | л |

## 1.1.3 IP

˘ ЛъЮ Ь ˘ Â

ă

### 1.1.3.1 ă

л Лъ ă à à ˘ ў Ь '

1) ARP ă'
2) ў IP '
3) Â

| Ъ ҳ | |
|---|---|
| Ruijie# clear arp-cache | ARP ă |

| | |
|---|---|
| Ruijie# clear ip route {network [mask] \| *} | IP |

1.1.3.2

Л Лъ IP à ă à ˘ ĭ
╠ Â Л ˘ Л Лъ ł
Â

˘ ЛЊЮ Ђ ђ‘

| Ђ ђ | |
|---|---|
| Ruijie# show arp | ARP ă |
| Ruijie# show ip arp | IP ARP ă |
| Ruijie# show ip interface [interface-type interface-number] | Л IP |
| Ruijie# show ip route [network [mask] ] | |
| Ruijie#show ip route | |
| Ruijie# ping ip-address [length bytes] [ntimes times] [timeout seconds] | Л |

## 1.1.4 IP

ЛЊЮ IP ‘

IP

### 1.1.4.1 IP

IP ĭ يي يي 1 Â

1 IP

RIP ~ ˘ Л ù RIPv1˘ C Э Л Љ 172.16.2.0/24
˘ D Э Л Љ 172.16.1.0/24 Â

é

RIPv1 ~ a ˘ ¨ a ˘ 172.16.1.0/24 c/24ÈÃ< C

network 192.168.12.0

## 1.2 IP Ь

### 1.2.1 IP Ь Ь

IP Ь ˘ ЛЬЮ Ь˘ ЛЬЮ Ь Л Ь˘ Л Лъ ˙

IP MTU

IP

### 1.2.3.1 ICMP а л

й ˘ а IP ˜ ˘ ˝
ICMP ˜ а л Â л ˘ а а ˘ ≠
ICMP ў а л Â Â

ICMP ˜ а л ˘ л ЛЬЮЅ ҳ'

| Ѕ ҳ | |
|---|---|
| Ruijie(config-if)# ip unreachables | ICMP ˜ а л ў а л |
| Ruijie(config-if)# no ip unreachables | ˇΩ ICMP ˜ а л ў а л |

### 1.2.3.2 ICMP ˝

а . ◘˘ ÿ л ˘ ÿ л Â
ÿ л ˘ ICMP ˝ ˘
ˇΩ й˚ Э л л Â ł
Â Â

ICMP ˝ ˘ л ЛЬЮЅ ҳ'

| Ѕ ҳ | |
|---|---|
| Ruijie(config-if)# ip redirects | ICMP ˝ ˘ |
| Ruijie(config-if)# no ip redirects | ˇΩ ICMP ˝ |

### 1.2.3.3 ICMP

Э ˘ й н ˘ л Љ
ICMP ˘ ICMP Â н ң
л Љ ICMP ˘ Ю Â

ICMP ˘ л ЛЬЮЅ ҳ'

| Ѣ ҳ | |
|---|---|
| Ruijie(config-if)# ip mask-reply | |
| Ruijie(config-if)# no ip mask-reply | ӟΩ |

### 1.2.3.4 IP MTU

л MTUƱ ĩ ~ ˘ MTU ÿ л
ĭ ˘ ŭ ‡ Â

л ң л MTU ˘ з MTU л ◘ IP MTU л ◘˘ IP MTU
╠ б л MTU Â л a ˘ IP MTU ˘ л MTU a л Â

Э л˘ ˚ ~ MTU Â

IP MTU ˘ л ЛЬЮѢ ҳ'

| Ѣ ҳ | |
|---|---|
| Ruijie(config-if)# ip mtu bytes | MTU ˘ 68~1500 |

# 2 IPv4

## 2.1 IPv4

### 2.1.1 IPv4

й ˘ (Prefix Tree+Adjacency) Ruijie Express Forwarding REF˜ Â REF ˘ a /ı ˘ a Ą Cache ˘ CPU Ą ╗ Cache ˘ CPU ă ˘ ≠ Â

REF Ю ч ˚ ‘

Â Ƀ ‡ IP ˘ Â ˘ Prefix Tree б Radix Tree a˚ ˘ ѝ M-Tries Tree Â M-Tries Tree Prefix Tree Radix Tree ˘ Prefix ≠ ˘ ‘ Â

Â ı ˘ Ю ˘ Ю ˚ ˘

## 2.3

˘ Ь IP Â REF ˘
IP/MASK ˇΩ Ю ˘ ¨ ˘ ˇΩ ˘
Â IP Ƀ ˘ IP
˘ è Â é Ь Ю˙
Â ˘
ΰ Â Â
˘ ˘
Â
˘ ˘ ˘
˚ ÿ˚ Â
˘ ЛЬЮЅ ϟ˙

| Ѕ ϟ | |
|---|---|
| **ip ref load-sharing**<br>**Original** | ѝ IP + IP |
| **no ip ref load-sharing original** | ∧ IP + IP ˘ ¨ |

## 2.4.1

¨ REF ˘ ˘ Л

Â

| Ъ ҳ | |
|---|---|
| **show ip ref packet-statistic clear** | / REF |

## 2.4.2

˘ Â Л Л ЛЊОЪ ҳ ‘

| Ъ ҳ | |
|---|---|
| Ruijie# show ip ref adjacency [glean \| local l◊cal] | |

# 3 /I

## 3.1 /I

### 3.1.1 /I

### 3.1.2

˘ show ip fpm flows Ф ҂ Â

| Ф ҂ | |
|---|---|

Ruijie# show ip fpm flows [filter

| Ð ¾ | |
|---|---|
| Ruijie# show ip fpm users | /I |

## 3.5 /I

ˇ ip session timeout Ð ¾ Â3"bVQ W&Q'E4Hw 2¼GF64!f k 66a ¥ß(Aà)uf ßß$2E7d R2

| | |
|---|---|
| tcp-time-wait | 10s |
| udp-closed | 10s |
| udp-connected | 30s |
| udp-established | 600s |
| udp-started | 60s |

ЛЬЮ

## 3.6.1

˘ Â ˘ Л a
˘ Л Лъ tcp-established udp-established ¯ Л Â
ЮЎ

ip session timeout tcp-established 600

ip session timeout udp-established 300

## 3.6.2

˘ ˘ ѝ ˘ ѣ
ѣ ѣ ѣ ˘ ѷ Â
ЮЎ

ip session timeout tcp-closed 5

ip session timeout tcp-close-wait 10

ip session timeout tcp-fin-wait 10

ip session timeout tcp-syn-sent 5

ip session timeout tcp-time-wait 5

## 3.6.3

˘ ˘ ѝ ˘
ѣ ѣ ѣ ѣ ˘ ѷ

Â Ю

ip session timeout tcp-closed 5

ip session timeout tcp-close-wait 10

ip session timeout tcp-fin-wait 10

ip session timeout tcp-syn-sent 5

ip session timeout tcp-time-wait 5

UDP ˘ и ˘ udp-connected ã udp-closed
udp-connected Â Ю

ip session timeout udp-closed 5

ip session timeout udp-connected 600

# 4 NAT

## 4.1 NAT

NAT( )

╟ NAT˘ ˇΩ ˘

ˇΩ Â ╟ NAT˘ ЛЬЮ Ъ ҂ˈ

| | Ъ ҂ | |
|---|---|---|
| Step 1 | Ruijie(config)# ip nat pool address-pool start-address end-address {netmask mask \| prefix-length prefix-length} | |

| | | |
|---|---|---|
| Step 4 | Ruijie(config)# interface interface-type interface-number | |
| Step 5 | Ruijie(config-if)# ip nat outside | |

NAPT

| | | |
|---|---|---|
| | | |
| Step 1 | Ruijie(config)# ip nat pool address-pool start-address end-address {netmask mask \| prefix-length prefix-length} | IP NAPT IP |
| Step 2 | Ruijie(config)# access-list ccess-list-number permit ip-address wildcard | |
| Step 3 | Ruijie(config)# ip nat inside source list access-list-number {[ pool address-pool] \| [interface interface-type interface-number]} overload [vrf vrf_name] | overload |
| Step 4 | Ruijie(config)# interface interface-type interface-number | |
| Step 5 | Ruijie(config-if)# ip nat inside | |
| Step 6 | Ruijie(config)# interface interface-type interface-number | |
| Step 7 | Ruijie(config-if)# ip nat outside | |

NAPT IP 64512 NAT a

## 4.1.3 NAT

IP Z

IP NAPT

| | | |
|---|---|---|
| Step 2 | Ruijie(config)# interface interface-type interface-number | ⁄ |
| Step 3 | Ruijie(config-if)# ip nat inside | ⁄ |
| Step 4 | Ruijie(config)# interface interface-type interface-number | ⁄ |
| Step 5 | Ruijie(config-if)# ip nat outside | ⁄ |

### 4.1.4 TCP

⁄ ў TCP ˘ ⁄ ⁄ ў TCP Â ˘ ⁄ NAT TCP Â NAT … ⁄ ў TCP ў ⁄ ў ˘ ł ˘ ĺ Â ˘

| | |
|---|---|
| Ruijie(config)# ip nat pool address-pool start-address end-address {netmask mask \| prefix-length prefix-length} | IP ˘ ў |
| Ruijie(config)# access-list access-list-number permit ip-address wildcard | ˘ ⁄ ē ў Â ē IP ACL Â |
| Ruijie(config)# ip nat inside destination list access-list-number pool address-pool [vrf vrf_name] | ╟ ˜Ω |
| Ruijie(config)# interface interface-type interface-number | |

| | |
|---|---|
| Ruijie(config)#no ip nat translation tftp | ˜Ω TFTP ALG˜ |

## 4.1.6 NAT

ЛЪЮ ˙

╟

TCP

### 4.1.6.1 ╟

ЛЪЮ ˘ ÿ NAT Net200 ↑ ˘ ЊЖ ѝ 200.168.12.2~200.168.12.100 Â Л ѣ 1 NAT Â

```
!
interface GigabitEthernet 0/0
ip address 192.168.12.1 255.255.255.0
ip nat inside
!
interface GigabitEthernet 0/1
ip address 200.168.12.1 255.255.255.0
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
```

### 4.1.6.2

˘ è NAPT Â л ң 8.1 ЛЪ Э ˇ ╟ NAT ╟ NAPT Â ЛЪЮ ˘ ÿ NAT Net200 ↑ ˘ Л ЊЖ 200.168.12.200 IP ˘ Â Л ѣ 1 NAT 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
```

NAT

```
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
```

### 4.1.6.3 NAPT

NAPT

### 4.1.6.4 TCP

TCP

Realhosts

1

TCP

NAT ACL

IP ACL

```
!
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
!
ipnatpoolrealhosts10.10.10.210.10.10.3netmask255.255.255.0typerotary
ip nat inside destination list 100 pool realhosts
!
access-list 100 permit ip any host 10.10.10.100
!

NAT

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

### 4.1.6.5

WEB E-MAIL Internet NAT

ù ╖ ˘ NAT ╖ Â ‘

#

Ruijie> enable

#

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

# WAN0 ⅄

Ruijie(config)#interface GigabitEthernet 0/1

# WAN ⅄

Ruijie(config-if)# ip address 218.5.19.2 255.255.255.0

# WAN ⅄ ù м Internet ⅄

Ruijie(config-if)# ip nat outside

# WAN ⅄

Ruijie(config-if)# no shut

#

Ruijie(config-if)# end
Ruijie#

# ˘ WAN ⅄ UP ( ⅄ ).

%LINK CHANGED: Interface GigabitEthernet 0/1, changed state to up
%LINEPROTOCOLCHANGE:InterfaceGigabitEthernet0/1,changedstatetoUPRuijie#
config terminal
Enter configuration commands, one per line. End with CNTL/Z.

# LAN ⅄

Ruijie(config)# interface GigabitEthernet 0/0

# LAN ⅄

Ruijie(config-if)# ip address 192.168.0.1 255.255.255.0

# LAN ⅄ ù м Intranet ⅄

Ruijie(config-if)# ip nat inside

# LAN ⅄

Ruijie(config-if)# no shut
Ruijie(config-if)# end
Ruijie#
%LINK CHANGED: Interface GigabitEthernet 0/0, changed state to up
%LINE PROTOCOL CHANGE: Interface GigabitEthernet 0/0, changed state to UP
Ruijie# config terminal

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

# Internet

Ruijie(config)# ip route 0.0.0.0 0.0.0.0 GigabitEthernet 0/1 218.5.19.1

# NAT

Ruijie(config)# access-list 1 permit any

#

Ruijie(config)#ip nat inside source list 1 interface GigabitEthernet 0/1

# FTP

Ruijie(config)# ip nat inside source static tcp 192.168.0.220 218.5.19.220
Ruijie(config)# ip nat inside source static tcp 192.168.0.221 218.5.19.221

# WEB

Ruijie(config)# ip nat inside source static tcp 192.168.0.380 218.5.19.280

# EMAIL

Ruijie(config)# ip nat inside source static tcp 192.168.0.425 218.5.19.225
Ruijie(config)# ip nat inside source static tcp 192.168.0.4 110 218.5.19.2
110
Ruijie(config)# end
Ruijie#
Ruijie# config terminal
Enter configuration commands, one per line. End with CNTL/Z.

# Telnet

Ruijie(config)# line vty 0 4
Ruijie(config-line)# password remoteuser
Ruijie(config-line)# end
Ruijie#
Ruijie# config terminal
Enter configuration commands, one per line. End with CNTL/Z.
Ruijie(config)# enable secret private

#

Ruijie(config)# host EG
RUIJIE(config)# end
RUIJIE#

#

RUIJIE# write
Building configuration...
[OK]
RUIJIE#

#

```
RUIJIE# show running-config
Building configuration...
Current configuration:
!
!
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#
```

### 4.1.6.6 NAT

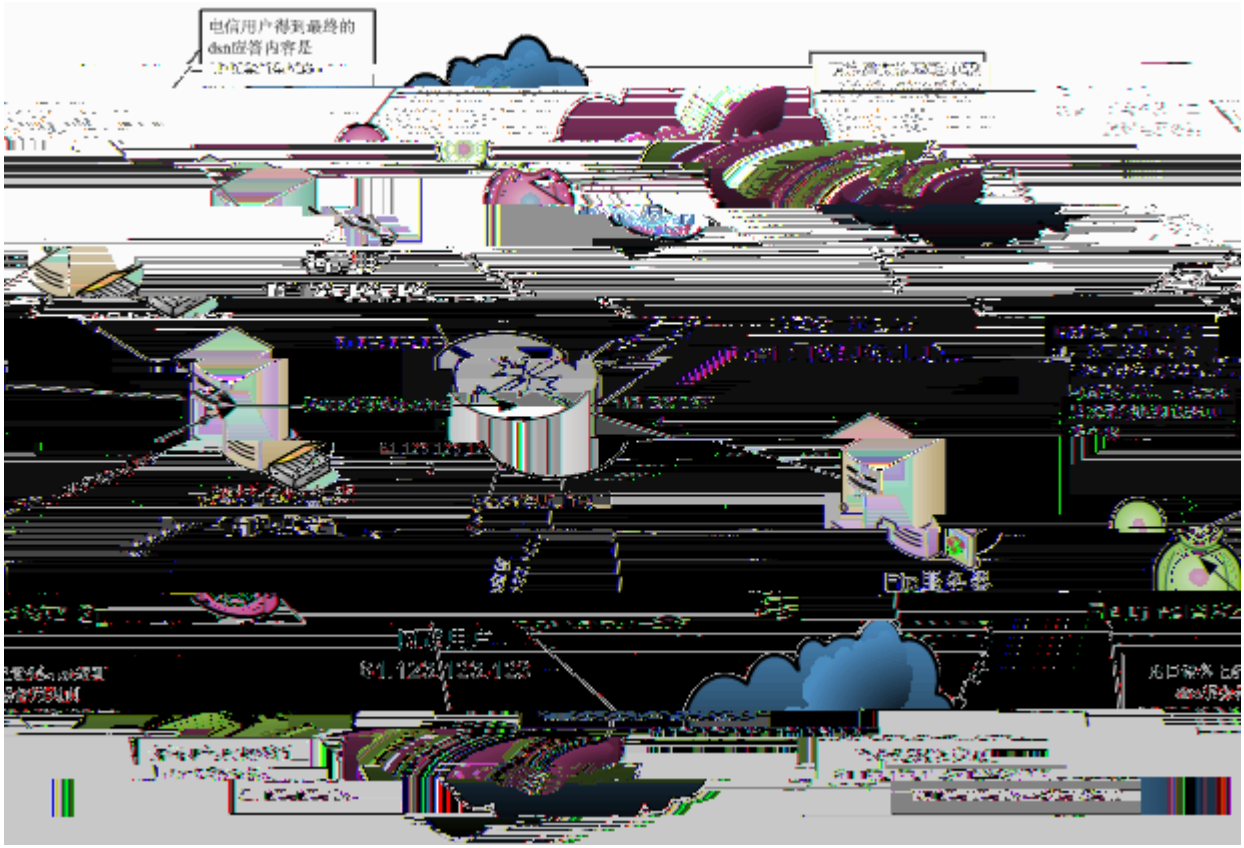
ˇ Л б ˚ Ю Â
Ю a ў ╟ ˇ Â

ЮЎ 192.168.12.0 200.198.12.0 Â

```
!
interface GigabitEthernet 0/0
ip address 192.168.12.1 255.255.255.0
ip nat inside
!
interface GigabitEthernet 0/1
ip address 200.198.12.1 255.255.255.0
ip nat outside
!
ipnatinsidesourcestatic192.168.12.0200.198.12.0netmask255.255.255.0
```

### 4.1.6.7 NAT DNS

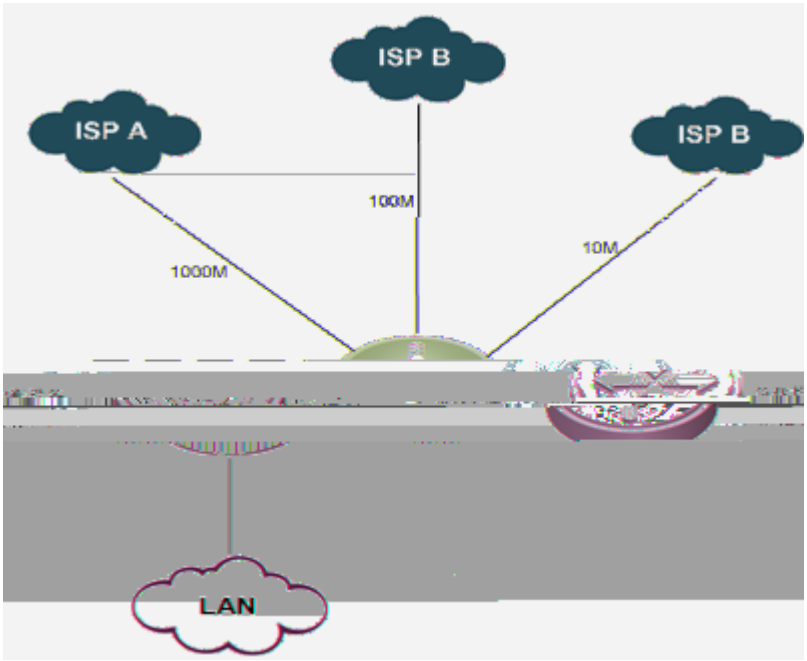
˘ ˘ ˘ 




Ю

# 5 ⅄

## 5.1 ⅄

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### 5.1.1 ⅄

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˘ ECMP Э ĭ ˘
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| ÿ 10.3(4b8) | ╗ ╖ Â |

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## 5.1.2 ⅄

### 5.1.2.1 ECMP

| ECMP | ѝ ˑ ˘ ˘ ЛЪ Э ⅄ Ю Â |
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| | 10.3(4b8) ˘ ECMP˝ ÿ 10.3(4b8)<br>ѐ ł ECMP˝ ≠ ECMP Â |

### 5.1.2.2

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### 5.1.2.3

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a˚ ⅄ ˘ ˚ a˚ ⅄
˘ ў ˝Ω Â

### 5.1.2.4

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### 5.1.2.5

IP˝ ł ⅄ Э ў ╟ ping udp
IP ˘ Ю Â ‘ IP ⅄ ⅄˘ ⅄
IP

5.1.2.6

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˘ ‡ ˘ ≠ Л Лъ ł . Л Â

5.1.3.4

˘ ECMP Л ˛ ˘
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5.1.3.5

IP ˘ ECMP Л ˘ Л Â
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5.1.3.6

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IP Л ў è Л з a Л ˘ ˘
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## 5.1.4

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## 5.2 ⅄

### 5.2.1 /ʷΩ

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| | Ƀ ҂ | |
|---|---|---|
| Step 1 | Ruijie# configure terminal | Â |
| Step 2 | Ruijie(config)# mllb enable | ╖ |
| | Ruijie(config)# no mllb enable | ʷΩ ╖ |

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

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

### 5.2.2

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| | Ƀ ҂ | |
|---|---|---|
| Step 1 | Ruijie# configure terminal | Â |
| Step 2 | **interface** interface-name | ⅄ Â |
| Step 3 | Ruijie(config-if)# bandwidth kilobits | |
| | Ruijie(config-if)# no bandwidth | ѝ |

‘

# ѝ 1M‘
Ruijie# configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Ruijie(config)# interface fastEthernet 0/1

Ruijie(config-if)# bandwidth 1000

# ʌ ʻ

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

## 5.2.3

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ỳ ʌ ’ æ Ю ˘ ỳ ʌ
Â ʌ Â Лъ ˚ ˘ ʌ 1˙ 100.

˘ Ю ʻ

| | Ѣ ҂ | |
|---|---|---|
| Step 1 | Ruijie# configure terminal | Â |
| Step 2 | **mllb threshold** percent-upper \| percent-lower | ỳ percenť ʌ Â ỳ Э ˘ ỳ Ю Â |
| | Ruijie(config)# no mllb threshold | ỳ 90 Â |

ʻ

# Э ỳ 95˜ Ю ỳ 80˜

Ruijie# configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Ruijie(config)# mllb threshold 95 lower 80

# ỳ ʻ

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

| | |
|---|---|
| | 10.3(4b8) Лъ ʌ Ю ˘ ỳ 100 Â ÿ 10.3(4b8) ѐ ł Э ˘ ˚ 90 Â Ю 90 ¯ ʌ Â |

5.2.4

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Ruijie(config)# mllb load-sharing original

## 5.2.6 . ”I Л Ю

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˘ ∫ IP MLLB Â Л Лъ . ”I Л йЮ Â

Ю . ”I Л

| | Ѣ ҁ | |
|---|---|---|
| Step 1 | Ruijie# configure terminal | Â |
| Step 2 | **mllb first-choice** interface-type interface-number | Ь Л й. Л |
| Step 3 | **no mllb first-choice** | Л . Л |

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# . Л й gi0/1

Ruijie# configure terminal

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

Ruijie(config)# mllb first-choice gi0/1

**a**

Mllb ÿ 10.3(4b8) ˚ ECMP˝ Mllb first-choice
Ÿ Л ˘ ¨ Ѣ ҁ Л Л Â

## 5.2.7 ӑ

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| | Ѣ ҁ | |
|---|---|---|
| Step 1 | Ruijie# configure terminal | Â |
| Step 2 | **load-monitor uplink mixed-link** | ӑ˘ Ю<br>**uplink˘** Э<br>**mixed-link˘** Э ╗ Ю |
| Step3 | **end** | |

‘

# ∫ й Э

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

5.2.10

ﻠ Э ˘ ˛ ˘ ù 90 Â

| | Ƃ ϟ | |
|---|---|---|
| Step 1 | Ruijie# configure terminal | Â |
| Step 2 | **over-load-protect threshold** percent | percent˝t ˘ ù |
| Step3 | | |

5.3.2

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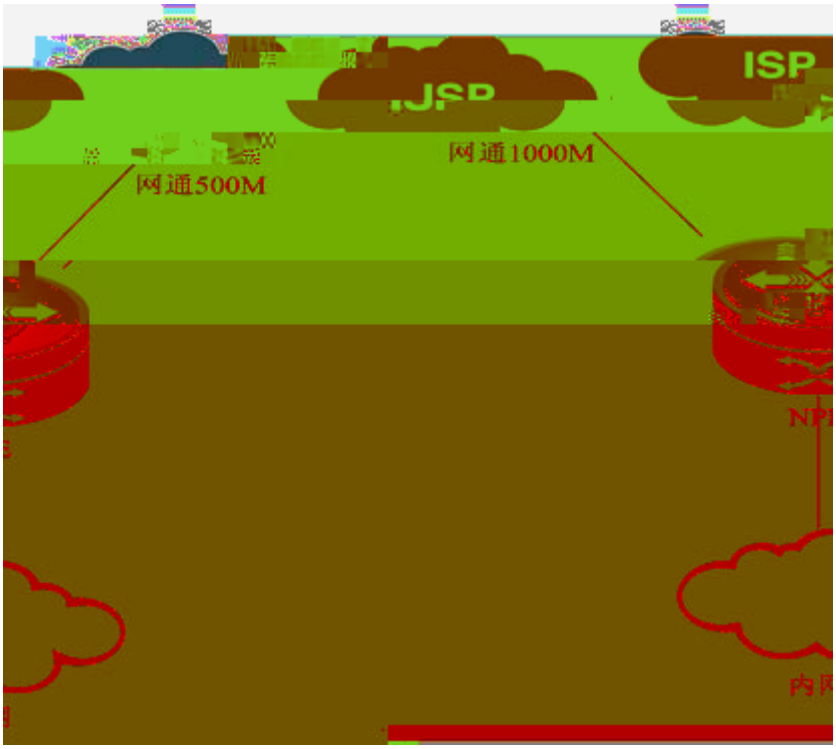
5.4.1.2



# 5.5 ή 2

## 5.5.1.1

ˇ è ˇ ή ΰ a ˇ ISPˇ
1 ﾊ ﾙ 1000Mˇ 1 ﾊ ﾙ 500M Â ﾚ
ˇ ﾞ ˇ Â
ﾗ ﾗ first-choice Â

## 5.5.1.2

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## 5.5.1.3

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# ﾗ Â

Ruijie# configure terminal

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

2˜

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

Ruijie(config)# ip route 0.0.0.0 0.0.0.0 Gi0/4 58.63.60.33

Ruijie(config)# ip route 0.0.0.0 0.0.0.0 Gi0/5 192.168.14.2

3˜ ù

# ù lately

Ruijie(config)# mllb policy latelty

4˜

# gi0/4 ˆ

Ruijie(config)# route-auto-choose cnii Gi0/4 58.63.60.33

# gi0/5 ˆ

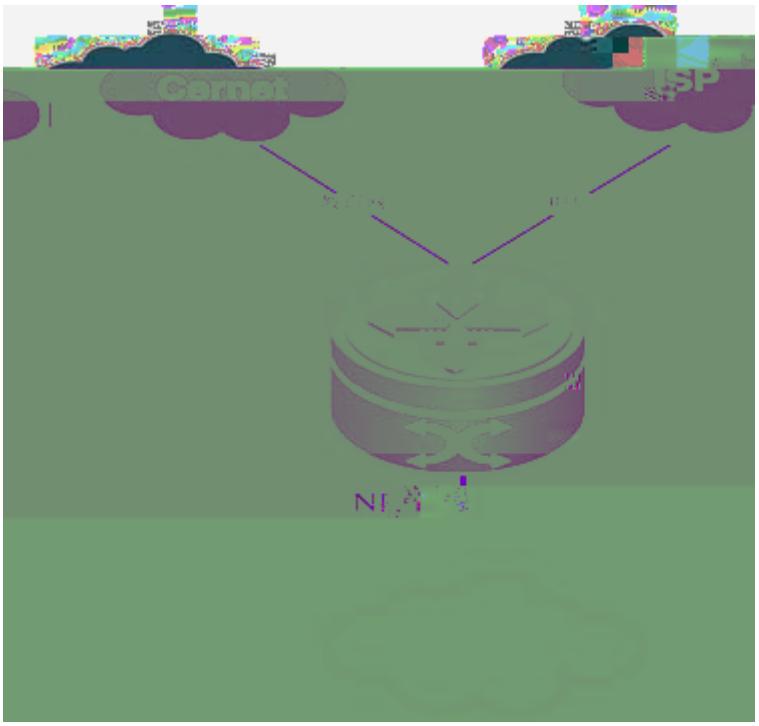
Ruijie(config)# route-auto-choose cernet Gi0/5 192.168.14.2

## 5.6 ù

### 5.6.1.1

ˆ ˆ˜ 1000M˜ gigabitEthernet 0/1 ˆ˜ ˆ˜ gigabitEthernet 0/2 ˆ Â

5.6.1.2

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5.6.1.3

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# ﻯ Â

Router(config)# interface-group 1

Router(config-intf-group)# interface gi 0/1

Router(config-intf-group)# interface gi 0/2

Router(config-intf-group)# exit

2˜ ╗

Ruijie(config)# over-load-protect enable

3˜ 1

Ruijie(config)# over-load-protect interface-group 1

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# 1 ɣ Ь ǀ Ф ҳ

## 1.1 ɣ Ь ǀ

### 1.1.1 ɣ Ь ǀ

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vlan ѣ IP IP ǀ ˘ ѕ
Л Ю Â

### 1.1.2 ɣ Ь ǀ

ɣ Ь ǀ Л ˘ vlan tag ѣ IP IP
vlan ѣ ˘ a˚
ǀ ˘ Лъ ˘ ѝ ⁸ Â

#### 1.1.2.1 vlan

ɣ Ь ǀ Л Лъ vlan ˘ vlan id Л vlan Â
vlan tag ǀ Â ˇѿ Ю˘ ѳ
ľ any Ŀ˘ Ю ѳ native vlan vlan ˘
native vlan vlan ˘ ‡ ѳ ľ any Ŀ Â

#### 1.1.2.2

˘ ip mac ѝ ⁸ Â
ip mac ˘ ip mac
ǀ ˘ ћ Â mac
ip ǀ ѳ a˚ Лъ mac ѳ ѝ ѳ Â

1.1.2.3

Ю ⁸ Â ү Ь ǂ Л Љ
ip ѓ ˘ Л Љ ˘
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1.1.2.4

web ˘ ip mac ѓ ˘ IP Л
Љ̌ Л ip mac Â

# 1.2

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# 1.3 ү Ь ǂ

ˆ ˜ ү Ь ǂ ₸

## 1.3.1 ү Ь ǂ ₸

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# ү Ь ǂ ╖

Ruijie# configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Ruijie(config)# layer23 classify enable
Ruijie(config)# end

## 1.4

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### 1.4.1 ╖

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| Ф ҳ | |
|---|---|
| **configure terminal** | |
| Ruijie(config)# layer23 deny-mode enable | |
| Ruijie(config)#end | |
| Ruijie# show running | |

Ѽ ˘ Л Лъ Ю no layer23 deny-mode enable Ф ҳ Â

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# ╖

Ruijie# configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Ruijie(config)# layer23 deny-mode enable
Ruijie(config)# end

## 1.5

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## 1.5.1 Ⅱ

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˘ ˘ ЛЬЮ Ⅱ ˈ

| Ф ҳ | |
|---|---|
| **configure terminal** | |

## 1.6.1 vlan

vlan ˘ ˘ ЛЬЮ vlan ‘

| | Ф ҳ | |
|---|---|---|
| Step 1 | Ruijie#configure terminal | |
| Step 2 | Ruijie(config)#vlan-group name vlan vid-list | vlan |
| Step 3 | Ruijie(config)#end | |
| Step 4 | Ruijie#show vlan-group | |

ˇΩ ˘ Л Лъ Ю no vlan-group name Ф ҳ Â

л vlan-enable Ф ҳ л vlan tag ˘ vlan Â

vlan vlan id a ă ˘ vlan id л ˘ vlan id ˇ vlan ˘ Л ľ - Ł vlan id vlan id vlan id Â

vlan ľ any Ł˘ γ Ь ǂ ╗ ˘ vlan id ѣ a è vlan ˘ ‡ ѣ vlan ľ any Ł Â

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# vlan ľ vlan-group1 Ł vlan 1 ầ vlan 3 ầ vlan7 ầ vlan8 ầ vlan9

Ruijie# configure terminal

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

Ruijie(config)# end

# 1.7 vlan

| Ф ҳ | |
|---|---|
| **show vlan-group** group name | ’ ╗ Э έ ‟ Л Â |

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Ruijie#show vlan-group

vlan-group police_flow police_url flow vlan id

any 9 0 0

| | | | | |
|---|---|---|---|---|
| vlan1 | 0 | 0 | 0 | 1 |
| vlan2 | 0 | 0 | 0 | 3-5 |
| vlan3 | 0 | 0 | 0 | 7,9 |

# 1.8

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## 1.8.1

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| Ф ҳ | |
|---|---|
| **configure terminal** | |
| Ruijie(config)# subscriber static name name parent parent [ [ip-host ip-addr] [mac mac-addr] \| ip-subnet subnet mask \| ip-range start end] | |
| Ruijie(config)#end | |
| **show subscriber all static dynamic parent** name \|**root** | |

ˇΩ ˇ Л Ль Ю no subscriber static name name Ф ҳ Â

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¨ ╗ ľ / Ł ҳ ˇ Â

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ă Â Ль ip ǀ ip à ip ip
Ь ˇ Ль mac ǀ mac a mac ч ˇ è
ip Л Ль˚ mac ˇ ip ip a Л Ль˚
mac Â

ˌ

# ľ 1 Ł˘ ip ľ 192.168.196.156 Ł˘ è ľ 1 Ł˘ ľ 1 Ł ľ Ł Â

Ruijie# configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Ruijie(config)#subscriber static name 1 parent / / 1 ip-host 192.168.196.156
Ruijie(config)# end

## 1.8.2

˘ ˘ ЛЬЮ ‘

| Ф ҳ | |
|---|---|
| **configure terminal** | |
| Ruijie(config)# [no] subscriber set name attribute {avoid-monitor [flow-monitor] \| deny \| release \| vip} | ˆ Л Лъ Л ~ ˘ ˘ vip |
| Ruijie(config)#end | |
| **show subscriber all static dynamic parent** name \|**root** | |

˜Ω ˘ Л Лъ Ю [no] subscriber set name attribute {avoid-monitor [flow-monitor] | deny | release | vip}Ф ҳ Â

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Э˘ Л Лъ ˆ flow-monitor˜ Ą 8 ’ Л
Ю ˘ Ю˘ ˘ ‡ Лъ . ”I ’ ¨
Л Ю ˘ ł a Э ˘ Л ¨
ˆ white-list˜ ;Vip vip Â

## 1.8.3

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|---|---|
| Ruijie# show subscriber [all \| static \| dynamic \| parent [name \| root ] ] | |

# 1.9

| Ф ҳ | |
|---|---|
| **show subscriber all static dynamic parent** name **\| root** | ╗ Э έ ¨ Л Â |

Ruijie#show subscriber all

| name | mac | flow | fc | url | dir | dym | av-fc | av-con | vip | rel | deny | ip |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| / | 0000.0000.0000 | 2 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | 0000.0000.0000 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | 0000.0000.0000 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | |

# 1.10

## 1.10.1

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⅄ ip˘ Ђ a è ‡ Ђ Â

5 ˘ ¨ ѝ 4 ˘ ЛЬЮ
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ľ / Ł˘ ¨ ╗ ľ / Ł ϛ ˘ Â

ip a ă Â Лъ ip ǀ ip
à ip ip Ь Â

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# ľ baidu Ł˘ ip ľ 192.168.196.156 Ł˘ è ľ 1 Ł˘ ľ 1 Ł
ľ Ł Â

```
Ruijie# configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Ruijie(config)#network-group name baidu parent / / 1 ip-host
192.168.196.156
Ruijie(config)# end
```

## 1.10.2

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˚ ˙

| Ф ϛ | |
|---|---|
| network-group import txt csv filename | ˚ |
| **show network-group [ all \| brief \| parent [ root ] ]** | |

ľ .txt Ł ˚ ЮЃ ˚ ϛ ˘
ĩ ˙ à ¨ à ip Â ĩ ľ˘ Ł ˘
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Ю ľ .txt Ł ˚ ˙

/ / 1, 1,192.168.197.1

ľ .csv Ł ˚ Microsoft Excel ł ⅃ ѝ ľ .csv Ł ¯ ⅄ ˚ Â
˚ ѝ˙ ǀ ѝ 3 ˘ ǀ ѝ˙ à ¨ à ip Â

Ю ľ .csv Ł ˚ ˙

```
/group1    xinlang          192.168.196.11-192.168.196.25

/group1    baidu            192.168.197.0/24
/group1    user1            192.168.198.1
/group1    user2
```

‘

# ˚ l’ userfile Ł

Ruijie# network-group import txt userfile

## 1.10.3

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|---|---|
| Ruijie# network-group export [txt \| csv] filename | ˚ |

‘

# ˚ l’ userfile Ł

Ruijie# network-group export txt userfile

## 1.11

| Ƒ Ɂ | |
|---|---|
| **Show network-group [ all \| brief \| parent [ root ] ]** | ’ ╗ Э é ¨ Л Â |

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Ruijie#show network-group all

network-group police_flow police_url flow ip

/ 9 0 351

| | | | | |
|---|---|---|---|---|
| network1 | 0 | 2 | 0 | 192.168.197.3 |
| network2 | 0 | 0 | 0 | 192.168.197.1 |
| network3 | 0 | 0 | 0 | 192.168.197.2 |

## 1.12

| Ѣ ҳ | |
|---|---|
| **show auth-subs [ all \| brief \| parent [ root ] ]** | , ₹ Э έ ¨ Л Â |

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Ruijie#show auth-subs all

name mac
flow fc url dir dym ip

/ 0000.0000.0000 16
0 1 1 0

smp_root 0000.0000.0000 0
0 0 1 0

webauth_root 0000.0000.0000 0
0 0 1 0

# 2

## 2.1

### 2.1.1

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### 2.1.2

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#### 2.1.2.1

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Ł à ў ╠ Ł à ў ╠ ў Ł à ў ╠ ¯
Ł à ў ╠ Ł à ў ╠ ў Ł à ў ╠ WEB , Ł à
ў ╠ Ł à ў RFC Ł à ў HTTP Ł à ў è Ł ~ ’

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### 2.1.2.2 DPI

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### 2.1.2.3 ~

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˘ ł ˘ ˅ Љ Â ł ◘˘
˅ Љ ◘ Â

### 2.1.2.4 ~

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8˘ ╕ Â

### 2.1.2.5 DFI

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a˚ ˘ P2P Ю Â DFI ˆ
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## 2.2

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## 2.3.1 ╖

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| | Ъ ъ | |
|---|---|---|
| Step 1 | **configure terminal** | |
| Step 2 | Ruijie(config)# identifyplication enable | ╖ |
| Step 3 | Ruijie(config)#end | |
| Step 4 | **show running** | |

˜Ω ╖ Л Лъ Ю no identityn.pplication enable Â

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#

Ruijie# configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Ruijie(config)# identifyn.pplication en.ble
Ruijie(config)#

## 2.3.2 ╖

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ˈ Â ╖ Л ˇ ˇ ЛъЮ ╖ ‘

| | Ъ ъ | |
|---|---|---|
| Step 1 | **configure terminal** | |
| Step 2 | Ruijie(config)# identify-application app-db en.ble | ╖ ˇ ˇ ˇ ‡ a Â |
| Step 3 | Ruijie(config)#end | |
| Step 4 | **show running** | |

ˇΩ ╖ ˘ Л Лъ Ю no identify-application app-db enable

NPE н ˘ ˘ ╖ ˇΩ ,

## 2.3.3 ~ ╖

˘ ЛъЮ ~ ╖ ‘

| | Ѣ ҂ | |
|---|---|---|
| Step 1 | **configure terminal** | |
| Step 2 | Ruijie(config)# identify-application proto-expect enable | ~ ╖ ˘ ˘ ˘ ‡ a Â |
| Step3 | Ruijie(config)#identify-application proto-expect timeout seconds | ~ |

Step

| | | |
|---|---|---|
| Step 1 | **configure terminal** | |
| Step 2 | Ruijie(config)# identify-application proto-detect enable | ~ ╖ ˘ ˘ ˘ ‡ a Â |
| Step 3 | Ruijie(config)#end | |
| Step 4 | **show running** | |

˜Ω ˘ Л Лъ Ю no identify-application proto-detect enable

## 2.3.5 DFI P2PЮ ╖

˘ ЛъЮ DFI P2P Ю ╖ ‘

| | Ѣ ҂ | |
|---|---|---|
| Step 1 | **configure terminal** | |

Step 2 Ruijie(config)#

P2P Ю DPI ł ˘ ў ╗
P2P Ю Â
DPI P2P ˚ ˘ a ѝ P2P Ю
Â
P2P Ю ~ ¨ ѝ ľ P2P Ю ѝ Ł
~ ¨ ѝ ľ ѝ Ł

## 2.3.6 DFI ╗

˘ ЛЬЮ DFI Л ╗ ‘

| | Ф ҂ | |
|---|---|---|
| Step 1 | **configure terminal** | |
| Step 2 | Ruijie(config)# identify-application dfi gather | DFI ╗ |
| Step 3 | Ruijie(config)#end | |
| Step 4 | **show running** | |

ˇΩ DFI ╗ Л Лъ Ю no identify-application dfi gather Â

‘

# DFI ╗

Ruijie# configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Ruijie(config)# identify-application dfi gather
Ruijie(config)#

DFI ╗ P2P ╗ ˘ з
Л Â

1 à DFI ╗ ˇΩ ’

## 2.3.7

˘ ЛЬЮ ‘

| | Ъ ҂ | |
|---|---|---|
| Step 1 | **configure terminal** | |
| Step 2 | Ruijie(config)# identify-application signature update | ` |
| Step 3 | Ruijie(config)#end | |
| Step 4 | **show identity-application version** | |

‘

#

Ruijie# configure terminal

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

Ruijie(config)# identify-application signature update

Ruijie(config)#

| |
|---|
| ` signature.upd ˚ ÿ web ` Â<br>‘ ` a ` db ˚ ^ signature.db˜ ˘ ` ˚<br>ł ˘ ¨ ѝ signature.upd Â |

## 2.3.8 ЊЖ ‡

TYPE NAME CLASS SPL SPH DPL DPH SIPL
SIPH DIPL DIPH

TCP HX any any any any 192.168.1.2
192.168.1.2 100.1.1.1 10.1.1.10

# ╕ ᛁ HX ‡

Ruijie# configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Ruijie(config)# identify-application custom name myqq class ᵐ ᵛ
udp dip 66.12.11.34 66.12.11.36 dport 1 10
Ruijie#end
Ruijie#*Jan 1.01 Tf -0.006 Tw 9. 0.0467on coed(.36f2( )TT2( )con Tf ol )10 b Tc -[(R)6(uij)6(ie#*)6(# )]TJ T

# FTP ╗ ˜Ω

Ruijie# configure terminal

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

Ruijie(config)# identify-application key FTP

Ruijie(config)#

## 2.3.10 8

˘ ЛЬЮ 8 ‘

| | Ъ ҳ | |
|---|---|---|
| Step 1 | **configure terminal** | |
| Step 2 | Ruijie(config)# identify-application inhibitive app-name | app-name ╗ 8 |
| Step 3 | Ruijie(config)#end | |
| Step 4 | **show identity-application inhibitive** | |

˜Ω ˘ Л Лъ Ю no identity-application inhibitive app-name

‘

# QQ ╗ 8

Ruijie# configure terminal

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

Ruijie(config)# identify-application inhibitive QQ

Ruijie(config)#

## 2.3.11

˘ ЛЬЮ ‘

| Ъ ҳ | |
|---|---|

Ruijie(config)#

## 2.3.13

˘ ЛЬЮ ЬЖ ˙

| | Ъ ҂ | |
|---|---|---|
| Step 1 | **configure terminal** | |
| Step 2 | Ruijie(config)# identify-application custom-group group-name | … ЬЖ group-name |
| Step3 | Ruijie(config-app-group)#app-add app-name | app-name ╗ ЬЖ group-name |
| Step 4 | Ruijie(config-app-group)#end | |
| Step 5 | **show identify-application custom-group** group-name | |

˜Ω ˘ Л Лъ Ю no identify-applicat ion custom-group group-name˘ Л Лъ ЬЖ Â

app-group Ъ ҂ Ю app-del app-name˘ Л Лъ ЬЖ Â

˙

# … ЬЖ MYQQ˘ QQ ╗ MYQQ

Ruijie# configure terminal

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

Ruijie(config)# identify-application custom-group MYQQ

Ruijie(config-custom-group)# app-add QQ

## 2.3.14

| | |
|---|---|
| show identity-application userdef-rule | |
| show identity-application | |
| show identity-application routable | |
| show identity-application key | |
| show identity-application inhibitive | |
| show identity-application block | |
| show identity-application other | |
| show identity-application class | |
| show identity-application group-state | |
| show identify-application user-group group-name | |
| show identify-application expect | |

#

Ruijie(config)#show identify-application ver
Version:2012.02.11.01.01.11

#

Ruijie(config)#show identify-application custom-rule
TYPE NAME CLASS SPL SPH
DPL DPH SIPL SIPH DIPL
DIPH
---
----- ----- ----- ---------- ---------- ----------
- ----------
UDP mymsn myim any any
any any any any 220.22.12.3
220.22.12.10
TCP myqq myim any any
8000 8000 any any any
Any

#

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

MSN 1-6-0-0

MSN-CHAT 1-6-1-0

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 identity-application routable

3-0-0-0

3-3-0-0

3-8-0-0

3-9-0-0

3-10-0-0

3-12-0-0

3-14-0-0

3-16-0-0

3-18-0-0

3-20-0-0

3-23-0-0

6-0-0-0

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#

Ruijie#show identity-application class

1-0-0-0

IP 2-0-0-0

3-0-0-0

4-0-0-0

P2P

## 2.4 Ω ˘ 8

| | Ъ ₹ | |
|---|---|---|
| Step 1 | **configure terminal** | |
| Step 2 | Ruijie(config)# identify-application clear key-inhibitive-block group | Ω ˘ 8 |
| Step 3 | Ruijie(config)#end | |
| Step 4 | **show running** | |

‘

# Ω ˘ 8

Ruijie# configure terminal

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

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

Ruijie(config)#

# 3

## 3.1

### 3.1.1

˘ Ю ˘ ↖ IP IP ˘
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є ў б Ю ˙

ǐ ˝I ж ADSL ˚ ˘ ↖ M ˚ 7-8 ˘ й ˚
˘ ⁄ ˝I +ADSL Â ǐ ⁄ Э ⁄ Л ъ Ь ˘ ˇ Ω
ˆ à à ¯ ~ ⁸ ˆ à P2P Ю ~ ↖ǂ Â ˇ Ω Ь
ǐ Ţ ˘ ⁸ ‡ æ Â

Ю ˝ ⁸ ǂ ADSL ˘ ˇ Ω ˝I Â ⁄ Л ъ ˇ Ω
˘ ÿ ` ˘ ⁄
˚ Â

| | |
|---|---|
| | NPE40˝ NPE50E˝ NPE60E<br>ˇ Ω ˘ a |

### 3.1.2

#### 3.1.2.1

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3.1.2.2

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ľ ǀ Ł Â

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. ˝I ˇΩ б ˇΩ˝ ł . ˝I ˝I Â

### 3.1.2.4

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˘ Л ŷ DOWN˝ ‡ ≠ ŷ DOWN Â б IP Â

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### 3.1.2.5 Ъ

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### 3.1.2.6 Л б Л

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## 3.1.3

### 3.1.3.1

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˘ ‡ IP Â

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### 3.1.3.2 NAT

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˘ ‡ ˚ ł И a˚ Â

Ω Э NAT ˘ И a˚ ˘ IP a˚ ˘
Â ˘ ł ˘ a И Â И ˘
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Ω ң ў 8 Â ˘
И Л 80% Â

### 3.1.3.3 DNS

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Â

ى ў ч DNS Â DNS ˩ ˘ ā
˙ IP Â ˘ ˘ Н Н ˘ ˚

é ч IP Â PC Э DNS Ь ˘ ā è
Ь Â

DNS HTTP ˘ DNS ѝ Ь ˘ ѝ HTTP
Л Л˘ б DNS a ˘ Â

ѝ ā ˘ ℨΩ ң ā̈ DNS ҂ ╖ Â ћ˘
DNS DNS ҂ ˘ DNS ҂ ˘ DNS
Ь IP˘ DNS б Â

| a | Ь ˘ ж ÿ DNS Ь<br>˘ ˚ ˘ ˘ Л б<br>Ь a˚ ˘ ‡ Ÿ Â |
|---|---|

### 3.1.4 ~

## 3.2

Ю Â

| ╖ | |
|---|---|
| | ℨΩ |
| | ˘ ╟ |
| Л | Л ˘ ╟ |
| Л ℨΩ | ℨΩ |

## 3.3

ЛЬЮ

- ^ ~
- ^ ~
- ^ Л ~ Л
- ^ Л ~ Л ℨΩ

### 3.3.1

| | | |
|---|---|---|
| | **Ъ ҳ** | |
| Step 1 | **enable** | |
| Step 2 | **configure terminal** | |
| Step 3 | **app route enable** | |
| Step 4 | **end** | |

no app route enable Ъ ҳ Â

### 3.3.2

| | | |
|---|---|---|
| | **Ъ ҳ** | |
| Step 1 | **enable** | |
| Step 2 | **configure terminal** | |
| Step 3 | **app route enable** | |
| Step 4 | **app route** app-name **interface** interface-name **interface-group** group-name **time-range** time-rang-name | **interface** interface-name **interface-group** group-name **time-range** time-rang-name |
| Step 5 | **end** | |

no app route app-name Ъ ҳ Â

# HTTP inhibitive_intf_group no_midnight

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

## 3.3.3 ⅄

⅄ ˘ ˘ Ю

| | Ѣ ҳ | |
|---|---|---|
| Step 1 | **enable** | |
| Step 2 | **configure terminal** | |
| Step 3 | **interface-group** interface-group-name | … ⅄ ˘ ⅄ |
| Step 4 | **interface** interface-name | ╗ ⅄ ⅄ |
| Step 5 | **load-balance policy bandwidth load** | ⅄ |
| Step 6 | **end** | ⅄ ˘ |

⅄ ˘ Ю no interface-group interface-group-name Ѣ ҳ Â

⅄ ⅄ ˘ ⅄ Ю no interface interface-name Ѣ ҳ Â

⅄ ˘ ⅄ Ю no load-balance ˘ ˘ IP hash Â

‘

# ⅄ ľ inhibitive_intf_group Ł˘ ⅄ ľ dialer 1 Ł˘ ľ dialer 2 Ł ľ dialer 3 Ł ⅄ Â ⅄ ѝ ľ Ł Â

Router(config)#interface-group inhibitive_intf_group

Router(config-intf-group)#interface-member dialer 1

Router(config-intf-group)#interface-member dialer 2

Router(config-intf-group)#interface-member dialer 3;

Router(config-intf-group)#load-balance policy load

Router(config-intf-group)#exit

**a** ⅄ ⅄ WAN ⅄˘ dialer ⅄ WAN ⅄˘ ⅃ Ъ ╗ ⅄ Â ⅄ ⅄ ÿ WAN ⅃ ѝ LAN ˘ ⅄ ╟ ⅄ Â

## 3.3.4 ⅄ ℨΩ

⅄ a ⅄ ℨΩ ὲ WAN ⅄ ⅄ ℨΩ ˘
˘ Ю

| | Ƀ ϟ | |
|---|---|---|
| Step 1 | **enable** | |
| Step 2 | **configure terminal** | |
| Step 3 | **interface** type number | ⅄ |
| Step 4 | **nexthop** ip-address | ⅄ ℨΩ |
| Step 5 | **end** | ⅄ ˘ |

⅄ ℨΩ ˘ ⅄ Ю no nexthop Ƀ ϟ Â

‘

# GigabitEthernet 0/1 ⅄ ℨΩ ὶ 100.0.0.1

Router(config)#interface gi 0/1

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

| | |
|---|---|
| **a** | /\| ὶ WAN ⅄ ⅄ ℨΩ Â ⅄ ÿ WAN ⅄ ὶ LAN ˘ ℨΩ ╟ Â |

## 3.3.5

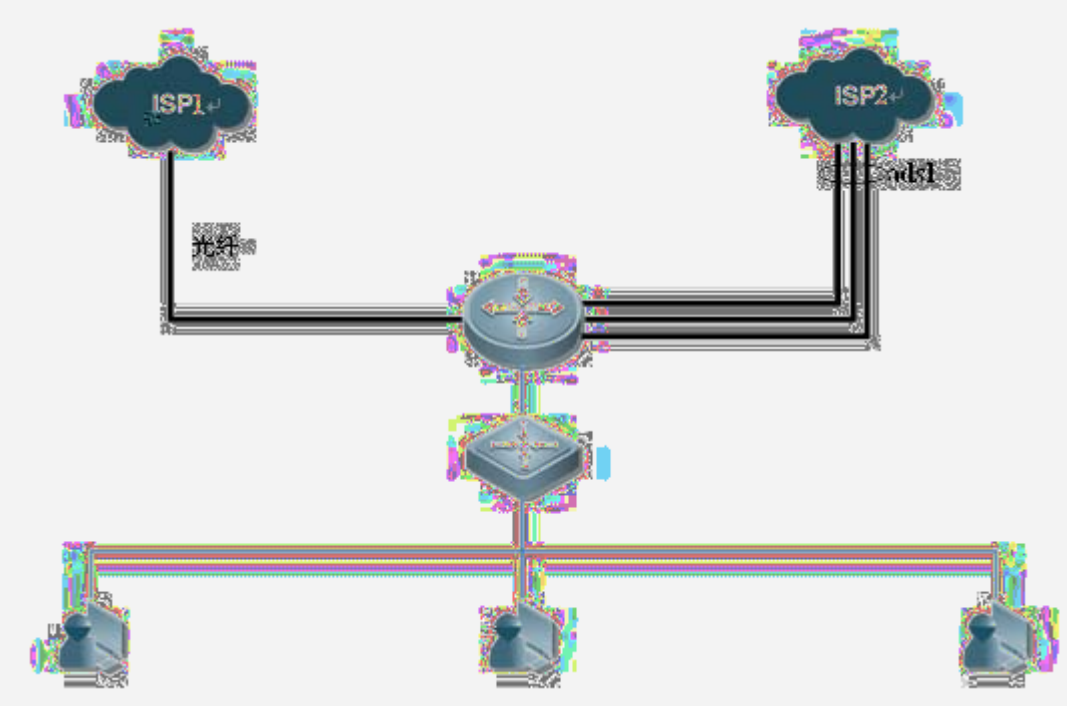
## 3.4 ή

### 3.4.1 ″I + ADSL

#### 3.4.1.1

ΐ̃ ⁄ 1 ″I ˘ ADSL Â ⁸ ADSL ˛ ˘ Ł
″I Â ˚ HTTP ´ a ⁸˘ ⁄ Л Ъ ″I
Â

#### 3.4.1.2




يي 2 ″I + ADSL

#### 3.4.1.3

1˜

# ˝I

Router(config)#ip route 0.0.0.0 0.0.0.0 202.100.12.5

2˜ ⅄

# dialer 1,2,3 ⅄

Router(config)#interface-group inhibitive_intf_group
Router(config-intf-group)# interface-member dialer 1
Router(config-intf-group)# interface-member dialer 2
Router(config-intf-group)# interface-member dialer 3

#

Router(config-intf-group)# load-balance policy load
Router(config-intf-group)#exit

3˜

Router(config)#time-range no_midnight
Router (config-time-range)#periodic daily 9:00 to 23:00
Router (config-time-range)#exit

4˜

# ⊾

Router(config)#app route enable

# ⁸ ⁸ ⅄ ˘ ˘ http ˘ ´ a ⁸

Router(config)#app route P2P Ю ˝ interface-group inhibitive_intf_group
Router(config)#app route ˝ interface-group inhibitive_intf_group
time-range no_midnight
Router(config)#approuteHTTP interface-groupinhibitive_intf_group
time-range no_midnight
Router(config)#app route interface-group inhibitive_intf_group
Router(config)#app route interface-group inhibitive_intf_group
Router(config)#app route ˝ interface-group inhibitive_intf_group

3.4.1.4

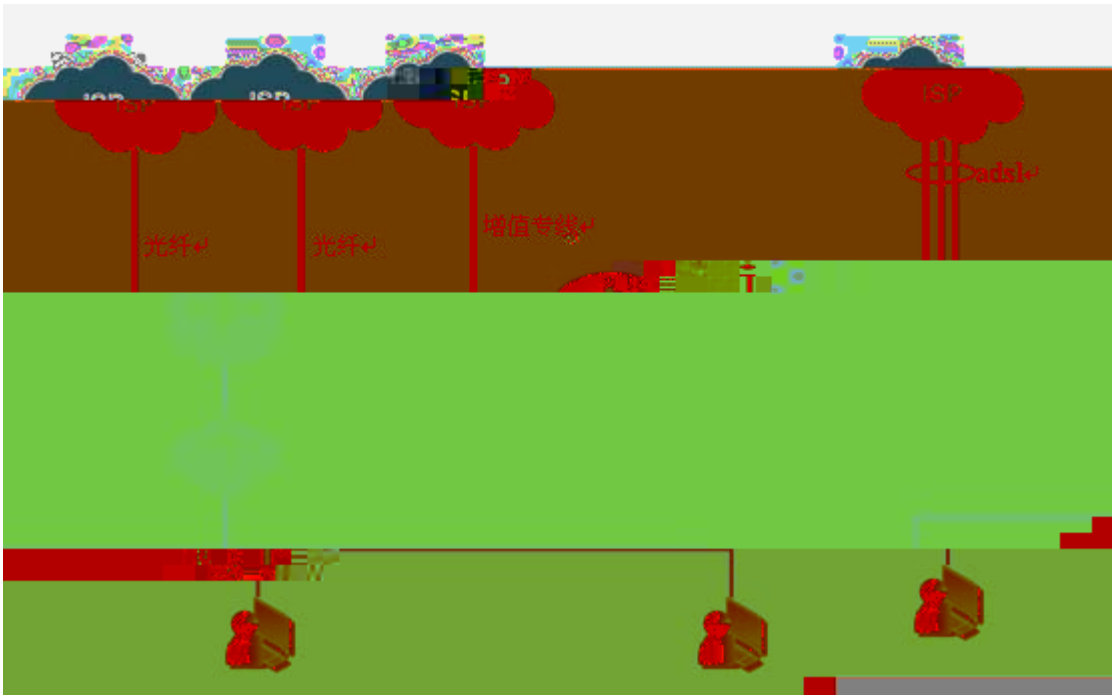
1˜

Router#show app route

| CLASS | INTERFACE(GRPUP) | time-range | state |
| --- | --- | --- | --- |
| P2P IO | inhibitive_intf_group(group) | NA | UP |
| | inhibitive_intf_group(group) | no_midnight | UP |
| HTTP | inhibitive_intf_group(group) | no_midnight | UP |
| | inhibitive_intf_group(group) | NA | UP |
| | inhibitive_intf_group(group) | NA | UP |
| | inhibitive_intf_group(group) | NA | UP |

?šERy'F9b7–€Hª0cH 'ñ , &(p

3.4.2.2




يي 3 ″I + ADSL

3.4.2.3

1˜

# ч ″I ecmp

Router(config)#ip route 0.0.0.0 0.0.0.0 gi0/1 202.100.12.51

Router(config)#ip route 0.0.0.0 0.0.0.0 gi0/2 202.96.128.86

2˜ ⅄

# ˘ gi0/1 ѝ ″I ˘ gi0/2 ѝ ″I

Router(config)#route-auto-choose cnii gi0/1 202.100.12.51

Router(config)#route-auto-choose cnc gi0/2 202.96.128.86

3˜ ж PBR

# ّيي ّ 88.0.0.0/8 www ˘ ж Ю 88.0.0.1

Router(config)# access-list 100 permit ip any 88.0.0.0 0.255.255.255

Router(config)# access-list 101 permit tcp any any eq www

Router(config)# route-map RM_FOR_PBR 10

Ruijie(config-route-map)#match ip address 100

Ruijie(config-route-map)#match ip address 101

Ruijie(config-route-map)#set ip nexthop 88.0.0.1

# ججِ ! شج m

# ⊾

Router(config)#app route enable

# 8 8 ⩘ ˘ ˘ ´ a 8

Router(config)#app route P2P Ю ˚ interface-group inhibitive_intf_group
Router(config)#app route ˚ interface-group inhibitive_intf_group
time-range no_midnight
Router(config)#app route interface-group inhibitive_intf_group
Router(config)#app route

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

P2P Ю ˚ inhibitive_intf_group(group)

92333/297997 0.6/3.75

202918/342496 0.7/4.68

˚ inhibitive_intf_group(group)

31030/101901 0.2/1.75

401189/212002 0.3/2.61

inhibitive_intf_group(group)

10120/201331 0.1/2.57

100121/204691 0.2/2.98

inhibitive_intf_group(group)

41035/97997 0.3/1.01

60168/91067 0.1/1.41

˚ inhibitive_intf_group(group)

20136/40359 0.1/0.98

21031/60594 0.2/2.01

3˜ Ї HTTP Ł Ѣ

Router#show app route HTTP session

## 3.4.3 ٧ ˝I

### 3.4.3.1

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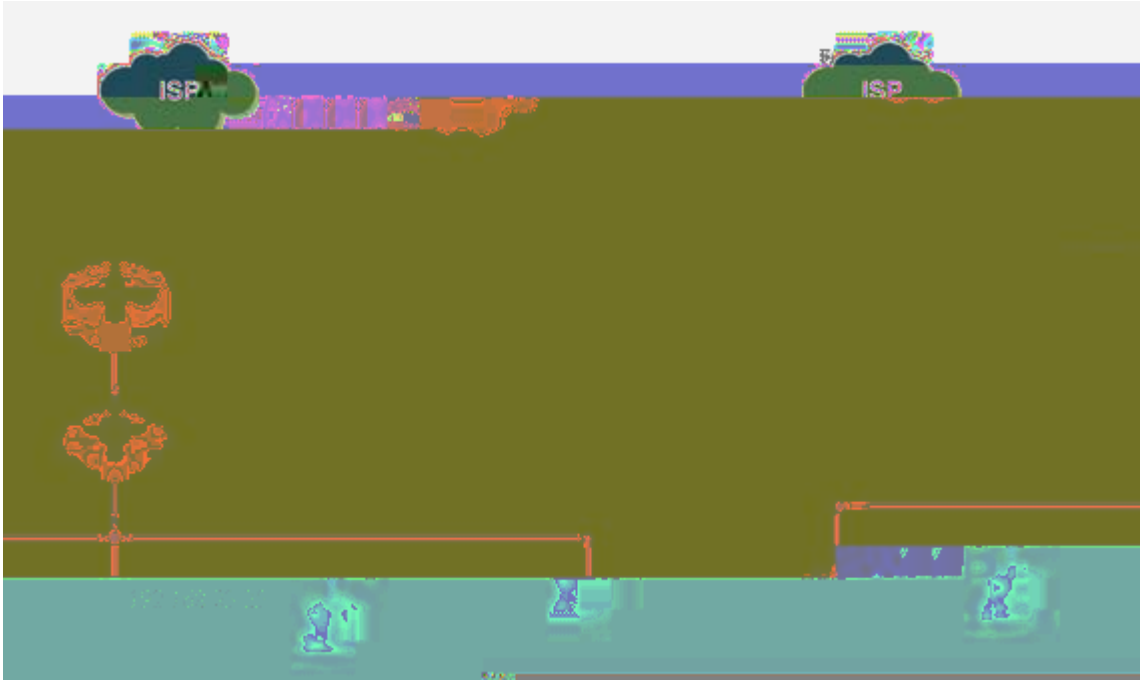
˘ è Ꞗ ˝I ˘ ˅ HTTP ´ a
⁸˘ ٨ Ꭻ ˝I Â

### 3.4.3.2




ي 4 ٧ ˝I

### 3.4.3.3

1˜

# ˝I

Router(config)#ip route 0.0.0.0 0.0.0.0 202.100.12.51

2˜

Router(config)#time-range no_midnight
Router (config-time-range)#periodic daily 9:00 to 23:00
Router (config-time-range)#exit

3˜ DNS ʖ

# ˘ ˀ DNS

Router(config)#interface gi 0/1
Router(config-if-GigabitEthernet 0/1)#dns 202.96.199.133
Router(config-if-GigabitEthernet 0/1)#exit
Router(config)#interface gi 0/2
Router(config-if-GigabitEthernet 0/2)#dns 58.240.57.33
Router(config-if-GigabitEthernet 0/2)#exit
# DNSʖ
Router(config)#dns-proxy enable

4˜ ˀ ˜Ω

Router(config)#interface gi 0/2
Router(config-if-GigabitEthernet 0/1)#nexthop 61.61.61.1

5˜

# ʟ

Router(config)#app route enable

# ⁸ ⁸ ˀ ˘ ˘ http ˘ ´ a ⁸

Router(config)#app route P2P IO ˚ GigabitEthernet 0/2
Router(config)#app route ˚ GigabitEthernet 0/2 time-range
no_midnight
Router(config)#app route HTTP GigabitEthernet 0/2 time-range
no_midnight
Router(config)#app route GigabitEthernet 0/2
Router(config)#app route GigabitEthernet 0/2
Router(config)#app route ˚ GigabitEthernet 0/2

3.4.3.4

1˜

Router#show app route

CLASS INTERFACE(GRPUP) time-range state

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

P2P IO ˚ GigabitEthernet 0/2(interface) NA UP

˚ GigabitEthernet 0/2(inte

401189/212002 0.3/2.61

inhibitive_intf_group(group)

10120/201331 0.1/2.57

100121/204691 0.2/2.98

inhibitive_intf_group(group)

41035/97997 0.3/1.01

60168/91067 0.1/1.41

inhibitive_intf_group(group)

20136/40359 0.1/0.98

21031/60594 0.2/2.01

3˜ Ï’ HTTP Ł Ƒƀ

Router#show app route HTTP session

## 3.4.4 ADSL

### 3.4.4.1

ISP ADSL ˘ Ł Â è ˘

30 ADSL˘ 20 ADSL Â ⁸ ¦ Ɔ˘ ˜Ω

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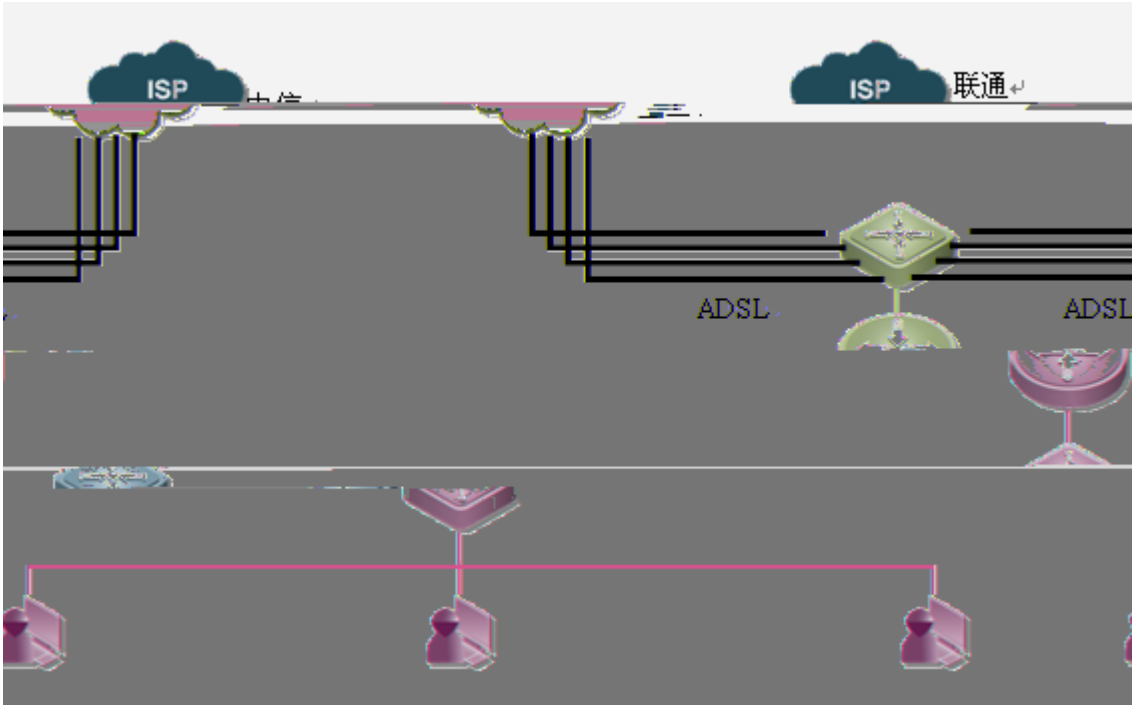
3.4.4.2




ي 5 ADSL

3.4.4.3

1˜

# 20 ADSL

Router(config)#ip route 0.0.0.0 0.0.0.0 dialer 30

Router(config)#ip route 0.0.0.0 0.0.0.0 dialer 31

Router(config)#ip route 0.0.0.0 0.0.0.0 dialer 32

Router(config)#ip route 0.0.0.0 0.0.0.0 dialer 33

Router(config)#ip route 0.0.0.0 0.0.0.0 dialer 34

Router(config)#ip route 0.0.0.0 0.0.0.0 dialer 35

Router(config)#ip route 0.0.0.0 0.0.0.0 dialer 36

Router(config)#ip route 0.0.0.0 0.0.0.0 dialer 37

Router(config)#ip route 0.0.0.0 0.0.0.0 dialer 38

Router(config)#ip route 0.0.0.0 0.0.0.0 dialer 39

Router(config)#ip route 0.0.0.0 0.0.0.0 dialer 40

Router(config)#ip route 0.0.0.0 0.0.0.0 dialer 41

Router(config)#ip route 0.0.0.0 0.0.0.0 dialer 42

Router(config)#ip route 0.0.0.0 0.0.0.0 dialer 43

Router(config)#ip route 0.0.0.0 0.0.0.0 dialer 44

Router(config)#ip route 0.0.0.0 0.0.0.0 dialer 45

Router(config)#ip route 0.0.0.0 0.0.0.0 dialer 46

Router(config)#ip route 0.0.0.0 0.0.0.0 dialer 47

Router(config)#ip route 0.0.0.0 0.0.0.0 dialer 48

Router(config)#ip route 0.0.0.0 0.0.0.0 dialer 49

2˜ ⁄

# ADSL dialer 1-30 ⁄

Router(config)#interface-group inhibitive_intf_group
Router(config-intf-group)# interface-member dialer 1
Router(config-intf-group)# interface-member dialer 2
Router(config-intf-group)# interface-member dialer 3
Router(config-intf-group)# interface-member dialer 4
Router(config-intf-group)# interface-member dialer 5
Router(config-intf-group)# interface-member dialer 6
Router(config-intf-group)# interface-member dialer 7
Router(config-intf-group)# interface-member dialer 8
Router(config-intf-group)# interface-member dialer 9
Router(config-intf-group)# interface-member dialer 10
Router(config-intf-group)# interface-member dialer 11
Router(config-intf-group)# interface-member dialer 12
Router(config-intf-group)# interface-member dialer 13
Router(config-intf-group)# interface-member dialer 14
Router(config-intf-group)# interface-member dialer 15
Router(config-intf-group)# interface-member dialer 16
Router(config-intf-group)# interface-member dialer 17

Router(config-intf-group)# interface-member dialer 18
Router(config-intf-group)# interface-member dialer 19
Router(config-intf-group)# interface-member dialer 20
Router(config-intf-group)# interface-member dialer 21
Router(config-intf-group)# interface-member dialer 22
Router(config-intf-group)# interface-member dialer 23
Router(config-intf-group)# interface-member dialer 24
Router(config-intf-group)# interface-member dialer 25
Router(config-intf-group)# interface-member dialer 26
Router(config-intf-group)# interface-member dialer 27
Router(config-intf-group)# interface-member dialer 28
Router(config-intf-group)# interface-member dialer 29
Router(config-intf-group)# interface-member dialer 30

#

Router(config-intf-group)# load-balance policy load
Router(config-intf-group)#exit

3˜

Router(config)#time-range no_midnight
Router (config-time-range)#periodic daily 9:00 to 23:00
Router (config-time-range)#exit

4˜

#

Router(config)#app route enable

# http a

Router(config)#app route P2P IO interface-group inhibitive_intf_group
Router(config)#app route interface-group inhibitive_intf_group
time-range no_midnight
Router(config)#approuteHTTP interface-groupinhibitive_intf_group
time-range no_midnight
Router(config)#app route interface-group inhibitive_intf_group
Router(config)#app route interface-group inhibitive_intf_group
Router(config)#app route interface-group inhibitive_intf_group

3.4.4.4

1˜

Router#show app route

CLASS INTERFACE(GRPUP) time-range state

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

P2P IO ˚ inhibitive_intf_group(group) NA UP

˚ inhibitive_intf_group(group) no_midnight UP

HTTP inhibitive_intf_group(group) no_midnight UP

inhibitive_intf_group(group) NA UP

inhibitive_intf_group(group) NA UP

˚ inhibitive_intf_group(group) NA UP

2˜

Router#show app route statistics

CLASS INTERFACE(GROUP)

HIT DATA(byte) HIT RATE(Mb/s)

SUM DATA(byte) SUM RATE(Mb/s)

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

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

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

P2P IO ˚ inhibitive_intf_group(group)

92333/297997 0.6/3.75

202918/342496 0.7/4.68

˚ inhibitive_intf_group(group)

31030/101901 0.2/1.75

401189/212002 0.3/2.61

inhibitive_intf_group(group)

10120/201331 0.1/2.57

100121/204691 0.2/2.98

inhibitive_intf_group(group)

41035/97997 0.3/1.01

60168/91067 0.1/1.41

inhibitive_intf_group(group)

20136/40359 0.1/0.98

21031/60594 0.2/2.01

3˜ Ĭ HTTP Ł Ƨ

Router#show app route HTTP session

# 4 … ⁸ б

## 4.1 … ⁸ б

### 4.1.1 … ⁸ б

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## 4.2

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## 4.3 ... ⁸ б

ˆ Л ˜ ╖ ˇΩ
ˆ Л ˜ ⁸
ˆ Л ˜ / ⁸
ˆ Л ˜ ACL ⁸
ˆ Л ˜ ˛ ч ‡ . ˝I

### 4.3.1 ╖ ˇΩ

Ю Ъ ҳ ˇΩ ╖ Â

| Ъ ҳ | |
|---|---|
| Step 1 Ruijie(config)#flow-pre-mgr enable | ╖ Â |

ˇΩ ╖ ˆ ‡ ˜ ˘ Ю no flow-pre-mgr enable¯ Л Â

| |
|---|
| ˇΩ ѝ ˘ ⁸ ‡ Â ˇΩ ˇΩ ˘ ‡ a Ą Â |

# ˇΩ ... ⁸ б ╖ Â

Ruijie# configure terminal

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

Ruijie(config)# no flow-pre-mgr enable

## 4.3.2 ⁸

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Â ˘ ∧Љ Ю … Â

| Ѣ ҷ | |
|---|---|
| Step 1 Ruijie(config)#flow-pre-mgr total-limit limit-number | ⁸ Â<br>limit-numberґ ⁸ ˘ ∧<br>ЎЎ ˘ è 0 a ⁸ Â |

ЎΩ ˘ Ю no flow-pre-mgr total-limit¨ ∧ Â

**a**

1 à б ЎЎ Ѣ ҷ ˘
¨ ѝ Â
2 à ЎΩ ЮЎ Э ˘ a
⁸ Â

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# ⁸ ѝ 20 ˘ 20 ˘ a Ѧ … ˘ Â

Ruijie# configure terminal

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

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

## 4.3.3 / ⁸

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Â ˘ ∧Љ Ю ѝ / …
Â

| Ѣ ҷ | |
|---|---|

| | | |
|---|---|---|
| Step 1 | Ruijie(config)# flow-pre-mgr rule-id subscriber subs_name action {block \| by-pass \| {trust total-limit total-limit-number per-ip-limit per-limit-number }} | / ⁸ ‘ block ä by-pass trust Â<br>rule-id‘ ‡ ˅ ˄ ù 1~50˝ ˅ ‡ ă ˇ<br>subs_name‘ ‡ ˇΩ<br>total-limit-number‘ / ⁸ ˇ ˄ ˇΩ˝ è 0 a ⁸ Â<br>per-limit-number‘ / Ю IP ⁸ ˇ ˄ б ˇΩ˝ a total-limit-number˘ è 0 a ⁸ Â |

ˇΩ ˇ Ю no flow-pre-mgr id¯ ˄ Â

| | |
|---|---|
| | 1 ä ‡ é . ˝I ˇ . ˝I ł ‡. ˝I ‡ ЂЖ Â<br>2 ä action ˇ block a ’ by-pass a … ˇ ˇΩ ^ Ф ҳ ˇΩ ˄ ä Ю ˇ ˇΩ Ю a Ф ҳ ˇΩ ~ ’ trust / ⁸ Лъ IP ⁸ˇ ⁸ ł a ˝Ą Â |

| | |
|---|---|
| **a** | 1 ä б ˇΩ˝ Ф ҳ ˇ ¯ ù Â<br>2 ä ˇΩ Ю˝ Э ˇ a ⁸ Â |

‘

# ľ UserGroupA Ł … 5000 ˇ з ľ UserGroupA Ł Ю IP … ù 300˝ ⁸ ł Â

Ruijie# configure terminal

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

Ruijie(config)# subscriber static name UserGroupA parent /

Ruijie(config)# subscriber static name UserA parent /UserGroupA ip-host 192.168.5.10

Ruijie(config)# subscriber static name UserB parent /UserGroupA ip-host 192.168.5.11

Ruijie(config)# flow-pre-mgr 1 subscriber UserGroupA action trust total-limit 5000 per-ip-limit 300

## 4.3.4 ACL ⁸

Л Лъ Ю ѝ ACL є … ‡ Â

| Ъ ҳ | |
|---|---|
| Step 1 Ruijie(config)# flow-pre-mgr rule-id access-list acl-number action {block \| by-pass \| {trust total-limit total-limit-number}} | ACL ⁸ ' block ѣ by-pass trust Â<br>rule-id ‡ л˘ Н ѝ 1~50<br>л ˘ ‡ ă ˘<br>Ⅱ ,<br>acl-number ‡ ˇΩ ACL л˘ Н ѝ 1~199<br>action ˘ л block ѣ by-pass trust action ѝ trust ˘<br>ACL ⁸˘ Ж˚<br>/ ⁸ Â<br>total-limit-number ACL ⁸ ˘<br>Н б ˇΩ є 0 a ⁸ Â |

ˇΩ ˘ Ю no flow-pre-mgr id¯ л Â

1 ѣ ‡ é . ″I ˘ . ″I ł ‡. ″I ‡ Ж Â

2 ѣ ACL ⁸ a IP ⁸ Â

3 ѣ action ˘ block a ' by-pass a … ˘
ˇΩ ^ Ъ ҳ ˇΩ л ѣ Ю
˘ ˇΩ Ю a Ъ ҳ ˇΩ ~ ' trust ACL
⁸˘ ⁸ ł a Ą Â

4 ѣ ACL IP IP˘ л л˘ IP IP˘
л л Â

**a**

1 ѣ б ˇΩ˘ Ъ ҳ ˘
¯ ѝ Â

2 ѣ ACL ⁸ ‡ ˘ a Â ‡
… Ж ˘ Â

3 ѣ ‡ ˇΩ ACL˘ є ACL IP ѣ л ѣ IP ѣ
л ѣ ~ л˘ ŭ ‡ ACL Â

4 ѣ ˇΩ Ю˘ Э ˘ a
⁸ Â

1˙

# ACL Ъ б IP˙ 220.200.20.20 ˘ ¸ є ѝ 30 Â

Ruijie# configure terminal

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

Ruijie(config)#ip access-list extended 120

Ruijie(config-ext-nacl)#permit ip any host 220.220.20.20

Ruijie(config-ext-nacl)#deny ip any any

Ruijie(config-ext-nacl)#exit

Ruijie(config)#flow-pre-mgr 2 access-list 120 action trust total-limit 30

2˙

# IP ѝ 192.168.1.0/24˙ IP … ˘ є by-pass Â

Ruijie# configure terminal

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

Ruijie(config)#ip access-list standard 2

Ruijie(config-std-nacl)#deny 192.168.1.0 0.0.0.255

Ruijie(config-std-nacl)#permit any

Ruijie(config-ext-nacl)#exit

Ruijie(config)# flow-pre-mgr 1 access-list 1 action by-pass # ‡ . ″I ¯ Л Â

## 4.3.5 ⎡ ч ‡ . ″I

‡ . ″I ˘ ł ‡˘ . ″I Â Л Љ Ю ѝ⎡ ч ‡ . ″I Â

| Ƃ ҁ | |
|---|---|
| Step 1 Ruijie(config)# flow-pre-mgr priority-swap rule-id1 rule-id2 | ⁋ ‡ rule-id1 rule-id2 . ″I Â |

**a**

1 à rule-id1 rule-id2 ˘ ŭ ‡ Ƃ ҁ a Â

2 à rule-id1 rule-id2 ˘ ‡ a Â

## 4.3.6

| Ƃ ҁ | |
|---|---|
| Ruijie# show flow-pre-mgr rule-info | ⁸ ‡ Ɉʊ ‡ ˘ ŭ ˘ Ƃ Â |

Ruijie# show flow-pre-mgr ip-info [

IP-ADDRESS flow-cnt flow-limit

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203 500

103 500

20 0

15 0

Ruijie#

## 4.4 … ⁸ б ѝ

### 4.4.1

… ⁸ 20 Љ ’

IP … ⁸ 500 Љ ’

Ѽ ѧ IP … ⁸ 1000 Љ Â