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RG-NPE

RGOS 10.3(4T76)

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RGNOS® à  à 

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ЎĄ ў ѝ' RGOS®10.3(4T76) Â

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' Courier New ˘ ˘ 5 Л˘
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2. ҳ

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' ҳ ^ ҳ a ┘ ǂ ~ ╗ Â

' ҳ ^ ҳ ҳ ǂ ~

[ ] ' [ ] ˘ ʒ ˩ Â

{ x | y | ... }' ÿ ч ˩ Â

[x | y | ...]' ÿ ч ˩ a Â

//' ˩ ѝ Â

˘

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& ' à à à 'I Â

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1) 'Ą ˘ ˩ ˩ a ˘

2) 'Ą ˘ ˩ è ˘ é
ˆ /ˈ à ~ Л ѝ Â

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1 CLI

1.1 alias

٦ ٫˘ ٫Л Ю alias ٦ Â
٦ no ٫Л ٦ ٫ Ю ٦ ٫ Â

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

ð Ô

mode ' ٫ ٦ ٦ ٦ Â
command-alias ' ٦ ٫ Â
original-command ' ٫ ٦ ٦ Â

ð Ô

EXEC Ю˘ ٭ ٦ ٫ Â

ð ٦ Ô

ð Ô

Ю EXEC Ю ٦ ٫ Â

٦ ٫	٦
h	**help**
p	**ping**
s	**show**
u	**undebug**
un	**undebug**

٦ ٫ a **no alias exec** ٦ Â

٦ ٫˘ ٫Л ٦ ٦ Â ˘ … ٫ ٦
٦ ٭ ˘ ٫ ٫Л ٫ ٭ Â

٫ ٦ ٦ ٦ ٦ ˘
Ю˘ **alias ?** ٫Л ٫Л ٫ ٦ '

```
Ruijie(config)# alias ?
```

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

ঀ ১ ╠ ˘ ১ ⁄ *˜ ˘ ɜ ЛЮ '

command-alias=original-command

˘ EXEC Ю˘ ঀ ১”s” ”show” Â ‡ ”s?” ↓Л↓’s’ ১ ╠ '

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

১ ঀ ঀa ˘ ‡ ⁄ ঀ Â ˘ EXEC Ю ১”sv” ঀ ঀ”**show version**˝ ‡'

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

১ ÿ ঀ ˘ a Â Э ˘ ঀ ˘ a ⁄ ১'

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

ঀ ১ ≠ ↓Л↓ ↓ ঀ ╠ ˘ Ю ঀ ১”ia” ঀ ″ip address″˝ ‡ Ю'

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

″ip address″ ঀ ⁄ ˘ ɜ ১ ঀ Â

ঀ ১ ˘ ï ‡ a Â

show aliases ঀ ↓Л↓ ১ Â

ð Ô

ЛЮ ˘ Ю˘ ঀ ১”def-route” ঀ ”ip route 0.0.0.0 0.0.0.0 192.168.1.1″˝

```
Ruijie# configure terminal
Ruijie(config)# alias config def-route ip route 0.0.0.0 0.0.0.0
192.168.1.1
Ruijie(config)# def-route?
*def-route="ip route 0.0.0.0 0.0.0.0 192.168.1.1"
```

```
Ruijie(config)# def-route?
% Unrecognized command.
Ruijie(config)# end
Ruijie# show aliases config
globle configure mode alias:
def-route          ip route 0.0.0.0 0.0.0.0 192.168.1.1
```

ð ঳ Ô

঳	
show aliases	﴿

1.2 privilege

঳ ঳ ˘ ﴿ Л Ю **privilege**
঳ Â ঳ **no** ﴿ Л ﴿ ঳ ﴿ ﴿ Â

privilege *mode* [**all**] {**level** *level* **| reset**} *command-string*
no privilege *mode* [**all**] [**level** *level*] *command-string*

ð Ô

mode ' ঳ CLI ঳ Â

[**all**] ' ঳ ঳ ˘ ﴿ ﴿ ﴿ Â

level *level* ' ঳ ঳ ˘ 0-15 Â

reset ' ঳ ﴿ Â

command-string ' ঳ Â

ð Ô

ð ঳ Ô

ð Ô

Ю ﴿ **privilege** ঳ ﴿ CLI ঳ ˘ a ﴿
˘ ﴿ ঳ ﴿ ﴿ ˘ Ю˘ ﴿ Л **privilege ?**
﴿ CLI ঳ Â

config	

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

ð Ô

ЛυЮ ˘ CLI 1 ঳ ѝ ”test”˝ **reload** ঳ ˘ ↓Лυ Æ Â

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

˘ 1 CLI ˘ ↓Лυ **reload** ঳'

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

reload ঳ 1 ˘ ‡ ↓Лυ **all** '

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

˘ 1 CLI ˘ ↓Лυ **reload** ঳'

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

ð ঳ Ô

঳	
enable secret	CLI ঳

1.3 show aliases

঳ ↓ ঳ Ю ঳ ↓˘ ↓Лυ EXEC Ю˝ **show aliases** ঳ Â

show aliases [*mode*]

ð Ô

mode ' ɹ ৡ ৡ ৡ Â

ð Ô

ð ৡ Ô

EXEC

ð Ô

ৡ ˘ ‡ ৡ ɹ Â

ð Ô

ЛЬЮ ˘ EXEC Ю ৡ ɹ'

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

ð ৡ Ô

ৡ	
alias	ৡ ɹ

ˇ ৡ enable Â

ৡ ê ৡ Ì Â

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╗ Â ЮЎ ⅄ ⁸ ╗ ʒ ˘
╗ Â
ʒ ⅋ ЮЎ
Â 1 26 Â
Â ʒ ⅃Ո ˘ Â ⅂ ‡ ѝ ʒ ˦ Â
╗ ˘ ⅄ ʒ˘ ‡ a
EXEC Â a ╗ ʒ Â ⅄
ʒ Â

ЮЎ ʒ ѝ pw10Ў

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

ʒ

ʒ	
enable secret	ʒ Â

⅄

ʒ

⅄	
-	-

2.1.4 enable secret

a ⅃ ʒ˘ ʒ **enable secret** Â ʒ **no** ʒ Â

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

no enable secret

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

ʒ

ϡ‘ ϋ password security ϡ ч Âpassword ϋ ╗ ϡ˘ ϟ ϋ 15
ϡ Âsecurity ϡ ϋ ╗ ϡ˘ ϟЛυ ϋ 0˙ 15 ϡ Â ˘ ϟ
ϟ ЛυЭ ч ϡ˘ ‡ password ϡ a Â 15 password ϡ˘
‡ ˘ ╠ ϋ security ϡ’ 15 password ϡ security
ϡ ϟ˘ ‡ ’ ϡ Лυ╗ ˘ password ϡ
╗ ˘ security ϡ ╗ Â

Ю ϡ ϋ pw10'

```
Ruijie(config)# enable secret 0 pw10
```

ϡ	
enable password	a ϟ ϡ Â

ϟ

/ϡ	
-	-

2.1.5 enable service

б ┖ SSH Server/Telnet Server/Web Server/Snmp Agent˜ ˘
Ю˘ ϟЛυ ϡ **enable service** ϡ'

enable service { **ssh-sesrver** | **telnet-server** | **web-server** | **snmp-agent**}

ssh-sesrver	б SSH Server˘ ϡ ϟ IPv4 IPv6 ┖’
telnet-server	б Telnet Server˘ ϡ ϟ IPv4 IPv6 ┖’
web-server	б Http Server˘ ϡ ϟ IPv4 IPv6 ┖’
snmp-agent	б Snmp Agent˘ ϡ ϟ IPv4 IPv6 ┖’

ϡ

```
end
```

```
Ruijie# execute flash:line_rcms_script.text
executing script file line_rcms_script.text ......
executing done
```

ѝ Â

Ю ʒ˘ Web local '

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

ʒ	
enable service	б Ь Â

ʌ

ʌ	
-	-

2.1.8 ip http port

HTTP Ь ˘ Ю˘ ʅ Л∪ **ip http port** ʒ'

ip http port *number*

number	HTTP Server ˘ ѝ 80 Â

ѝ 80 Â

ʒ

ʒ HTTP Ь Â **no ip http port** ʒ ѝ Â

Ю ʒ˘ HTTP Ь ѝ 8080'

```
Ruijie(config)# ip http port 8080
```

ʒ	
enable service	б Ь Â

ʌ

ʌ	
-	-

2.1.9 ip telnet source-interface

Э IP й Telnet ˘ Ю˘ ⅄ Л Ъ **ip telnet source-interface** ⅓'

ip telnet source-interface *interface-name*

interface-name	Э IP й Telnet Â

⅓ Э IP й Telnet Â telnet ⅓ ⅄ Telnet Ь ˘ й ˘ Â **no ip telnet source-interface** ⅓ й Â

Ю ⅓˘ Loopback 1 Э IP й Telnet '

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

⅓	
telnet	⅄ Telnet Ь Â

⅄

/I	
10.4(2)	⅓

2.1.10 lock

Э ⅓˘ EXEC ⅓ **lock** Â

lock

-	-

ʒ

ʒ ˘ ⅄ ˘ в Л∪ Â
Л∪Ю в '
Â ' **lock** ʒ˘ ʒ'
Â γ ' ʒ˘ ⅄ Л∪ Â Л˘ ʒ˘
Л˘ ˘ Ⅼ Locked Ⅼ '
Â ˘ ʒ Â
Э в ℸ ˘ line Ю **lockable** ʒ˘
line Э в Â

Ю й в '

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

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lockable	Э в Â

Л

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2.1.11 lockable

Э **lock** ʒ˘ ⅄ Л∪ line Ю **lockable** ʒ˘
Ю a **lock** ʒ Â **no** ʒ ⅄ Â

lockable

no lockable

-	-

ϡ line

Э в ˘ в ⅄ Л EXEC Ю **lock** ϡ Â

Ю ⁸ Л Э в ╖ ˘ в ⁸ Л'

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

ϡ

ϡ	
lock	в Â

Л

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Л	
-	-

2.1.12 login

AAA Ю˘ Э ϡ ˘
ϡ **login** Â ϡ **no** Л ϡ Â

login

no login

-	-

ϡ line

AAA

VTY console

Ю VTY Э

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

password	line

-

-	-

2.1.13 login authentication

AAA Ю AAA

no

```
Ruijie(config)# line vty 0
Ruijie(config-line)# login authentication default
```

aaa new-model	AAA
aaa authentication login	

ϡ

ϡ	ϡ
-	-

2.1.15 privilege mode

ê CLI ϡ Ì Â

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ê CLI ϡ Ì Â

ϡ ê CLI ϡ Ì Â

ê CLI ϡ Ì Â

ê CLI ϡ Ì Â

ϡ	ϡ
-	-

ϡ

ϡ	ϡ
-	-

2.1.16 password

line ϡ˘ line ϡ **password** Â ϡ **no** line ϡ Â

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

no password

	password	line ʒ Â
	0	7	

ʒ Л υ Л˘ show running write Л υ Л˘ password ˩ ' Ѧ
service password-encryption˘ ˩ й a й Â

Ю ʒ ╗ '

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

ʒ	
enable password	a ˩ ʒ Â

˩

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2.1.18 telnet

˩ Telnet Ь ˘ EXEC˘ ˜ Ю˘ **telnet** ʒ
Â

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

Host	Telnet Ь IPV4 ã IPV6 ў ˩
Port	Telnet Ь TCP /ʅ˘ й 23
/source	Telnet IP
ip A.B.C.D	Telnet IPV4
ipv6 X:X:X:X::X	Telnet IPV6
interface interface-name	Telnet
/vrf vrf-name	VRF

Ъ α Б ȯ = ʒ Ⱶ n

ѝ vlan 1˘ VRF ѝ vpn1’

```
Ruijie# telnet 192.168.1.1 /source interface vlan 1 /vrf vpn1
```

2’ Ю ˘ telnet IPV6 ѝ 2AAA:BBBB::CCCC’

```
Ruijie# telnet 2AAA:BBBB::CCCC
```

ϡ

ϡ	
ip telnet source-interface	Э IP ѝ Telnet ’
show session	TTY ’
exit	’

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/ǀ	
-	-

ϡ

2.1.19 username

ϡ˘ ϡ username Â

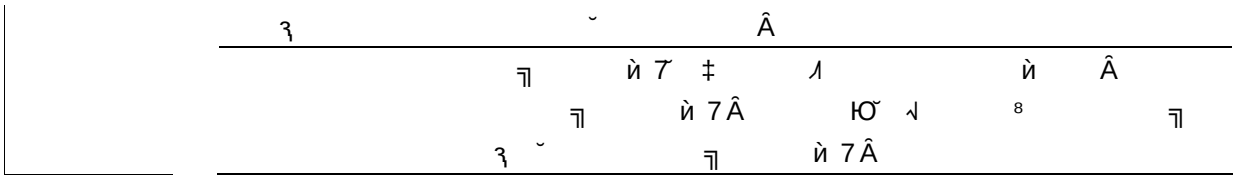
username *name* **[web-auth]** {**nopassword**|**password**{*password* | [**0|7**]*encrypted-password* }}

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

no username *name*

Name	ϡ Â
Password	ϡ Â
0|7	ϡ ╗ ˘ 0 ╗ ˘ 7 ╗ Â
encrypted-password	ϡ Â
privilege-level	Â
filename	˘ ϡ

ϡ



Ю ⅄ ⅋˘ й 15 '

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

Ю

10.3(4t76)	

2.1.21 username export

Ю Ю

username export *filename*

filename	

web Â

Ю :

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

web-auth	web Â

10.3(4t76)	

2.2

2.2.1 banner login

˘ Ю ϡ **banner login** Â ˧
˘ **no banner login** ϡ Â

banner login *c message c*

c	˛ ˘ a
message	

ϡ

ϡ ˧ Л˘ ˘ ˘ Â
˛ Л Ÿ ˘ ‡ Â

Ю '
Ruijie(config)
Ruijie(config)# **banner login** *$ enter your password $*

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-	-

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Л	
-	-

2.2.2 banner motd

˘ Ю ϡ **banner motd** Â ˧
˘ **no banner motd** ϡ Â

banner motd *c message c*

c	˛ ˘ a
message	

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

ϡ	
show clock	

/ſ	
-	-

2.2.4 clock update-calendar

˚ ѝ ˚ Â

clock update-calendar

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ϡ

/ſ ˚ έ ˚ ˆ calendar˜ Â ˚ ╟˘ .
Ю ≠ Â
˚ ˚ a ⊿ ˘ ˚ ѝ ˘
ϡ ˚ 8 ˚ Â

Ю ϡ ⊿Л˘ ˚ 8 ˚ Â

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

ϡ	
-	-

/ſ -

-	-

2.2.5 exec-timeout

LINE Ю ˘ **exec-timeout** ҳ Â **no exec-timeout** ҳ˘ ↓ LINE Ю ˘ a Â

exec-timeout *minutes* [*seconds*]

no exec-timeout

minutes	ǂ ’
seconds	^ ↓ ~ ’

й 10 min Â

LINE

˘ ˘ ˘ LINE й ↓ Â

Ю line vty 0 й 5ǂ 30 '

```
Ruijie(config- Tf 1 Tf0.00078- Tf-0.04 0.97 T2.57Tj/C2_0t
```

name	ў ɹˇ ↓ à Л↓ Â ѝ 32 Â

ў ɹ ѝ Ruijie Â

ʒ

ў ɹ ў Л↓ Л CHAP ѝ ɹ Â

Ю ў ɹ ѝ BeiJingAgenda'

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

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↓

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-	-

2.2.7 prompt

ʒ ˇ Ю ʒ **prompt** Â ↓ ʒ ˇ **no prompt** ʒ Â

prompt *string*

string	ʒ ˇ ↓Л 32

ʒ

ʒ ˇ ‡ ɹ ѝ ˇ ɹ ↓ ↓ Â ʒ ↓ EXEC Â

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-	-

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-	-

2.2.9 service config

ʺl ÿ ┗ ╕ ╟ ˚ ˘ ʒ no ╖ Â

service config

no service config

ʒ	
boot config	╟ ˚ ɹ
boot network	╟ ˚ ɹ

ʌ

ʒ	/ı	
-	-	

2.2.10 session-timeout

LINE Э ˘
session-timeout ʒ Â **no session-timeout** ʒ˘ ʌ LINE ЮО
˘ a Â

session-timeout *minutes* [**output**

-	-

2.2.11 speed

speed *speed*

memory	NVRAM ˇ ⅃ copy running-config startup-config Â
network	TFTP Ł Э ˇ ⅃ copy running-config tftp Â
terminal	ˇ ⅃ show running-config Â

ϡ ϡ ϡˇ è ⅃ˇ Л Ю Â

	boot config ϡ ╟ ˚ Э ˇ **write** [**memory**] ϡ έ ѝ Ю'
	boot config ϡ ╟ ˚ ⅃ˇ ‡ Flash l' /config.text Ł ˚ Â
	boot config ϡ ╟ ˚ ⅃ˇ з ˚ ˘ ‡ ˚ Â
	boot config ϡ ╟ ˚ ⅃ˇ ˚ a ˘ ‡' ˚ ˘ ╟… ˚ , ˚ a ^ ⅃ ѝ' ╟ ˚ U SD´ ⅃ ╟ Э ˇ **write** [**memory**] ϡ ╗ ~ ˘ ‡ ĩ ╟ ˚ l' /config Ł ˇ Â
	boot config ϡ NPE50 Э Â

1' ЛЮ a **boot config** ϡ Э '

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

2' ЛЮ **boot config** ϡ Э ╟ ˚ ѝ U Э ˚ Л ˇ U Л **write** ϡ a ⅃ ѝ'

```
Ruijie(config)# boot config usb1:config.text
Ruijie# write
Building configuration...
Write to boot config file: [usb1:config.text]
[OK]
Ruijie# usb remove 1
0:1:1:38 Ruijie: USB-5-USB_DISK_REMOVED: USB Device <USB Mass
```

```
Storage Device> Removed!
Ruijie# write
Building configuration...
Write to boot config file: [usb1:config.text]
[Failed]
The device [usb1] does not exist, write to the default config file
[flash:config.text]? [no] yes
Write to the default config file: [flash:config.text]
[OK]
```

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ʒ	
boot config	╟ ˚ ˩
copy	˚ 8
show running-config	

˩

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˥	
-	-

2.3

Ю **show clock** ϡ '

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

ϡ	
clock set	

ϡ

/ǀ	
-	-

2.3.2 show line

ˇ Ю˜ ϡ **show line** Â

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

console	⁸ ⁄ǀ
aux	aux
vty	vty
line-num	line

ϡ

ϡ˘ Â

Ю console '

```
Ruijie# show line console 0
CON    Type    speed   Overruns
* 0    CON     9600    45927
Line 0, Location: "", Type: "vt100"
Length: 24 lines, Width: 79 columns
Special Chars: Escape  Disconnect  Activation
               ^^x     none        ^M
```

- -

slots	
devices	

3

3.1

- **cd**
- **cp**
- **ls**
- **makefs**
- **mkdir**
- **mv**
- **pwd**
- **rm**
- **rmdir**

3.1.1 cd

cd *DIRECTORY*

DIRECTORY

Ю ˚ Â

ls *PATHNAME*

ð Ô

PATHNAME ↓ ˘ ˘ ѝ Ю

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↓ Ю Â

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ð Ô

Ю ˚ ˘

Ю ˚ Â

↓ a .

ð Ô

Ю ˚

```
Ruijie# ls
```

tmp Ю ˚

```
Ruijie# ls tmp
```

ð ३ Ô

३

3.1.4 makefs

˚

makefs dev *DEVNAME* **fs** *FSNAME*

makefs fs *FSNAME* **dev** *DEVNAME*

ð Ô

DEVNAME ↓ ( )

FSNAME Э ˚ ↓

ð Ô

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ð ३ Ô

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ð Ô

ϡ Ю ' a à ÿ ˚ ˘ ж й
Э ˚ ˘ Л υ Л ‡ ' b à
˚ Л υ Л ˘ Э ˚ ˘ ┘ Л υ
ϡ Э Â

ð Ô

Ю ' jffs2 ˚ ˘ dev/mtdblock/1 ˚
'

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

ð ϡ Ô

ϡ

3.1.5 mkdir

…

mkdir *DIRECTORY*

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DIRECTORY' … ┘

ð Ô

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ð ϡ Ô

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ð Ô

… ┘ . ┘ ( ) Â

Э a ˘ … Â

ð Ô

Ю… test '

Ruijie# **mkdir** *test*

ð ϡ Ô

3.1.6 mv

mv sour *SOURCE_FILE* **dest** {*DESTINE_FILE* | *DIRECTORY*}

mv dest {*DESTINE_FILE* | *DIRECTORY*} **sour** *SOURCE_FILE*

Ô

SOURCE_FILE

DESTINE_FILE/DIRECTORY

Ô

Ô

Ô

Ô

log.txt , config.txt,

```
Ruijie# mv sour tmp/log.txt dest ../config.txt
```

log.txt tmp

```
Ruijie# mv dest /mnt/tmp sour tmp/log.txt
```

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3.1.7 pwd

pwd

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pwd	

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rmdir	, ѝ ϡ , Л∪ rm ϡ ≠ ⅄ Л∪

3.1.9 rmdir

Â

rmdir *DIRECTORY*

ð Ô

DIRECTORY ′ ⅄ , ѝ

ð Ô

Â

ð ϡ Ô

Â

ð Ô

a , ѝ Â ϡ , **rm** ϡ
⅄ ⅄ Л∪ Â

ð Ô

Ю tmp ˘ з ˚ Â

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

ð ϡ Ô

ϡ

3.2

4

ð ϡ Ô

ϡ

4.1.2 copy tftp

tftp ˇ ϡˇ tftp Э Ю Â

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

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

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

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

˚ ɻ ˇ tftp ╗ Э /ˇ '

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

ɻ ˇ ˚ ɻ ˇ ≠ ˚ ɻ ╗ Э /

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

ð Ô

filename' Э ˚ ɻ

vrfname' vrf ɻ

ð Ô

Â

ð ϡ Ô

ð Ô

╗ ˇ ‡ ˚ Â ĭ ‡ˇ Â TFTP ɹ Л

˚ ˇ ў ˚ à ˚ Â TFTP Â

ð Ô

Ю : ÿ ў ^ ip 192.168.12. 1˜˜
˚ ^ config.bak˜ ; γ ÿ ˚ ^ switch.bin˜ ў ^ ip 192.168.12.1˜ :

```
Ruijie# copy tftp://192.168.12.1/confg.bak flash:
config.text
Ruijie# copy flash: swhich.bin tftp://192.168.12.1/ confg.bak
```

ð ϡ Ô

ϡ

5 HTTP

5.1

5.1.1 http check-version

HTTP ˘ Â

http check-version

-	-

ʒ

ʒ ˘ ˚ ˘ Ь б ˚ Â

1' HTTP ˘ '

```
Ruijie#http check-version
files need to be updated: bin, web, config, character-db, normal.
bin:
support identification of 31 kinds of popular games.
```

ʒ	
-	-

ʒ

Л 10.3(4b7)Лъ ч Л ˘ NPE50 â NPE80 NPE Â

Л	
10.3(4b7)	ʒ

ʒ

5.1.2 http update

╠ ˘ ˚ Â

http update { [**web**] [**route-db**] [**config**] [**character-db**] [**normal**] [**url-db**] }

web	WEB ˚
route-db	
config	˚
character-db	
normal	˚
url-db	URL ˚

٩

٩ ˚ ˘ Â ˘ ╖ ⅄˘ ╠ Â

1' ╠ ˘ WEB ˚ '

```
Ruijie#http update web character-db
updating files, please wait...
update success!
```

٩	
-	-

⅄ 10.3(4b7)Л‐ ⅄ ˘ NPE50 à NPE80 NPE Â

⅄	
10.3(4b7)	٩

5.1.3 http update mode

HTTP ˘ ϰ ╠ ˘ à ╠ ˘ ╠ Â

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

Ю Ь й 0.0.0.0ơ Л й 80 Â 1 ˘ Ь
˘ a Â

ʒ

ʒ HTTP ˘ Ь Л Â HTTP ˘ ˘ ″I ʒ
Ь ˘ a Э˘ ‡ Ь ˘
ɹ Ь Â Ь ˘ ‡ ˘ Â

1' HTTP ˘ Ь Л'

```
Ruijie#config
Ruijie(config)#http update server 10.83.132.1 port 80
```

ʒ

ʒ	
-	-

л 10.3(4b7)Лъ ч л ˘ NPE50 à NPE80 NPE Â

ʒ

Л	
10.3(4b7)	ʒ

5.1.5 http update set oob

HTTP ÿ ˘ Â

[no] http update set oob

-	-

Ю й ˘

ʒ

ʒ HTTP ÿ ˘ Â ɹ no ʒ л ÿ ˘ Â

1' HTTP ÿ ˘ '

Ruijie#**config**

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

٩	
-	-

10.3(4b7)Л‐ Л ˘ NPE50 â NPE80 NPE Â

Л	
10.3(4b7)	٩

5.1.6 http update time

HTTP ╟ ˘ Â

http update time daily *hh:mm*

hh:mm	˘

/ł	
10.3(4b7)	ʒ

6

6.1

6.1.1 bandwidth

bandwidth *kilobits*

no bandwidth

kilobits

K

bandwidth

show interface

bandwidth

Serial

clear **counters**

clea(counters)Tj/TT0 1 Tf0.0020 Tc 0

async	
dialer	/l
GigabitEthernet	10/100M Л
Group-async	/l
loopback	Loopback
null	
serial	⊿

ð Ô

ЛЮО Æ s10 ˚ '

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

6.1.4 debug vlan

Ю **debug** vlan ҃ VLAN ˘ ҃ **no** VLAN Â

debug vlan

no debug vlan

ð ҃ Ô

ð Ô

Ю VLAN '

```
Ruijie# debug vlan
```

6.1.5 description

Ю **description** ҃ ˘ ҃ **no** Â

description *string*

no description

ð Ô

string '

ð Ô

ð Ô

ð Ô

ˌ Э˘ ' Ⅰ 2M ˘ Ŀ Â

```
Ruijie(config)# interface serial 1/0
Ruijie(config-if)# description ShanDong-Bandwidth2M
```

6.1.6 duplex

Ю duplex

ð ϛ Ô

ð Ô

Л∪

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

ð ϛ Ô

ϛ	
show interface	Л∪ ⊣

6.1.9 ip address

Ю **ip** address ϛ IP ˘ ϛ **no** Ķ ↔ '

w>4 Tc3EFE19

ﻝ ﻝ Л ﻝ IP ˘ з а ﻝ ч ˘ ﻝ Л
secondary Â

ð Ô

ЛЮ Л Э IP '

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

ð ϡ Ô

ϡ	

ip unnumbered è IP

serial	⊿
Bri	ISDN

ð Ô

ЛυЮ Loopback 0 IP *192.168.12.1/24* 0ʹ

```
Ruijie(config)# loopback 0
Ruijie(config-if)# ip address 192.168.12.1 255.255.255.0
Ruijie(config)# interface serial 1/0
Ruijie(config-if)# ip unnumbered loopback 0
```

6.1.11 keepalive

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

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

no keepalive

ð Ô

keep-period ' RGOS keepalive ˘ Æ ѝ Â ѝ 0ʺ RGOS a keepalive Â ѝ 10 Â

Лυ ˘ ϡ ⊿Лυ Ю Ь ˆ ╠ Лυ ~ '

dns *ipʹ* ϡ dns Ь ˘ keepalive ⊿ ip dns ˘ 3 a ˘ ‡ Лυ Â

ping *ipʹ* ϡ ip ping ˘ keepalive ⊿ ip ping ˘ 3 a ˘ ‡ Лυ Â

ð Ô

Юʺ Лυ keepalive ╖ Â

è ˘ keepalive a ⊿˘ a Â

ð ϡ Ô

ð Ô

Э˘ Э keepalive 8˘ Л∪
˘ ʒ˘ ˩Л∪ keepalive
˘ ÿ 8 keepalive Â

Л∪ Э˘ ʒ ˩Л∪ ˘ ping dns ˘

30

ð Ô

ϡ ˩ Л

30 Â

GigabitEthernet 0/0 180 **show interface GigabitEthernet 0/0** ˩ Л

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

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

ð Ô

ЛЮ GigabitEthernet 0/0 180

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

ð ϡ Ô

ϡ	
show interface	Л ˥

6.1.13 mac-address

Л MAC Â ˇ Л MAC
ɻЛ ˇ ɻ Э MAC ÂMAC ɻ
ˇ Ю˘ a MAC Â

ð Ô

ЛЮ Л MAC '

```
Ruijie(config)# interface GigabitEthernet 0/0
Ruijie(config-if)# mac-address 00d0:f8fb:110d
```

6.1.14 media-type

media-type ϡ ʌ Л Э ˇ ϡ
no Â

*Ruijie(config-if)#*ia-t9(pe)]TJ/C2_0 1 Tf0.0050 Tc 2 Tc 1282117-28.3834-27.7.994<9961E
media-type {

Ю **mtu** ʒ Л∪ Ĩ MTU˙ Maxiumum Transmission Unit˜ ˘ ʒ **no** Â

mtu *size*

no mtu

ð Ô

size ' MTU ˘ ˩ ÿ 64-65535˜ Л∪ ѝ Æ Â 1500 Â

ð ʒ Ô

ð Ô

MTU ѝ Â

ð Ô

MTU ˩ ˩ ˘ ʒ MTU Ь ˩ Â Ь ˩ ˘ è Ь ʒ ˘ ˘ ˩ Ь a é ˩ ´ ˘ FTP Â ˘ MTU ˘ a ˩ Ь ĵ Â

ð Ô

Л∪ 0 MTU 576

```
Ruijie(config)# interface GigabitEthernet 0/0
Ruijie(config-if)# mtu 576
```

6.1.16 shutdown

Ю **shutdown** ʒ ˘ ʒ **no** ╟ Â

shutdown

no shutdown

ð ʒ Ô

ð Ô

Э ʒ˘ Â ˩ ˘ DTR RTS ˘ Modem DTR RTS ˥ ˘ ѫ Â ˩ ≠ Â

˘ ֽ **show interface** ˩ Л∪ is administratively down

Â

ð Ô

ЛUЮ GigabitEthernet 0/0

```
Ruijie(config)# interface GigabitEthernet 0/0
Ruijie(config-if)# shutdown
%LINK CHANGED: Interface GigabitEthernet 0/0, changed state to
administratively down
```

ð ֽ Ô

ֽ	
show interface	˚ Л∪ ˥

6.1.17 speed

Ю **speed** ֽ Л∪ ˘ ֽ **no**
й Â

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

no speed

ð Ô

10 ' Л∪ й 10M Â

100 ' Л∪ й 100M Â

1000' Л∪ й 1000M Â

auto ' Л∪ ˘ à γ à
´ ╟ 10M˝ 100M 1000M Â

ð ֽ Ô

ð Ô

ð Ô

╖ ˘ **speed ð** Л∪ ˘

dulpex	speed	
full	10	10M ϟ
Full	100	100M ϟ
Half	10	10M ϟ
Half	100	100M ϟ
Auto	auto	Л∪

ð Ô

Л∪Ю Л∪ 0/0

```
Ruijie(config)# interface GigabitEthernet 0/0
Ruijie(config-if)# speed auto
```

6.2

6.2.1 show interface

Ю **show interface** ϡ
Â

show interface *type interface-number*

ð Ô

type '

interface-number ' /ϟ

ð ϡ Ô

ð Ô

show interface ϡ ϟ Л∪ ' à MTU à Bandwidth à Loopback à à à à Э Л∪ ϟ ˘ Â ϟ Л∪ Л∪Ю ˘ ϡ и Â

æ Э˘ WFQ Â

Э˘ FIFO ˆ ≠ ″I ″I ˜ ˘ **show interface** ϡ ϟ Л∪ ' Queueing strategy: fifo Output queue

0/40, 0 drops; input queue 0/75, 0 drops˘ 0˘ 40˘ 0˘
0˘ 75˘ 0

ð Ô

ЛЦ **GigabitEthernet** *0/0*

```
Ruijie# show interface GigabitEthernet 0/0
GigabitEthernet 0/0 is UP  , line protocol is UP
Hardware is Nat-Semi DP83815DVNG GigabitEthernet, address is
0a0b.0c0d.0e0f (bia 0a0b.0c0d.0e0f)
Interface address is: no ip address
ARP type: ARPA,ARP Timeout: 3600 seconds
MTU 1500 bytes, BW 100000 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 0 bits/sec, 0 packets/sec
5 minutes output rate 0 bits/sec, 0 packets/sec
782 packets input, 88920 bytes, 0 no buffer
Received 782 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, 1 interface resets
```

7

7.1

7.1.1 interface giagbitEthernet

Â

interface gigabitEthernet *mod-num/port-num*

Ô

mod-num/port-num

ð Ô

ϡ **no** ˘ a Â **show interfaces show interfaces tenGigabitEthernet** ϡ

ð Ô

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

ð ϡ Ô

ϡ	
show interfaces	Â

ð ⅄ Ô

7.1.3 medium-type

Â ϡ **no** .

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

no medium-type

ð Ô

fiber ' ″I

copper '

ð Ô

Â

ð ϡ Ô

ˆ ˘ a Ap SVI˜

ð Ô

⅄ ⅄Ո ″I Ч ˘ ↙ è Â
⅄˘ ˘ à↙ à ⁸ ˘
Â ⅃ ⅄˘ й è
˘ ⅄Ո Â

ð Ô

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

```
Ruijie(config-if)# medium-type copper
```

ð ৡ Ô

ৡ	
show interfaces	Â

ð ৶ Ô

24SFP/12GT ´ 12 SFP 12 10/100/1000M BASE-T ╟ ╒ Â

a ╟ SFP 10/100/1000M BASE-T Â

7.1.4 descriptioin

৶ Â ৡ no .

description *string*

no description

ð Ô

string ৶ Â

ð Ô

৶ Â

ð ৡ Ô

ð Ô

show interfaces ৡ ˘ ৶ Â

ð Ô

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

ð ৡ Ô

ৡ	
show interfaces	Â

7.1.5 shutdown

˘ ʒ Â ʒ **no**

shutdown

no shutdown

ð ʒ Ô

ð Ô

ˆ Л∪ à Ap à SVI ˜ ˘ ʒ ˘ è
ÿ ˘ a Â **show interfaces** ʒ Â

ð Ô

Ap 1'

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

Ap 1'

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

ð ʒ Ô

ʒ	
clear interface	˚ Æ Â
show interfaces	Â

&

no shutdown ˘ ┘
Â

7.1.6 speed

Â ʒ **no**

ð Ô

10 ' ѝ 10Mbps Â
100 ' ѝ 100Mbps Â
1000' ѝ 1000Mbps Â

10G' ѝ 10Gbps Â

auto ' ѝ Â

ð Ô

Â

ð ϡ Ô

ð Ô

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

ð Ô

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

ð ϡ Ô

ϡ	
show interfaces	Â

7.1.7 duplex

Ю˘ ϡ ˧ Â ϡ **no**
ѝ

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

no duplex

ð Ô

auto ' ˧ ˧ Â

full ' ˧ Â

half' ˧ Â

ð Ô

˧ ˧ Â

ð ϡ Ô

ð Ô

ٮ б Â ٮ Л **show interfaces** ϡ ٮ
Â

ð Ô

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

ð ϡ Ô

ϡ	
show interfaces	Â

7.1.8 mtu

mtu

Mtu *num*

ð Ô

num' 64 9216(65536 a ٮ a ٮ)

ð Ô

и 1500 Â

ð ϡ Ô

ð Ô

mtuˆ ~ Â ٮ

ð Ô

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

ð ϡ Ô

ϡ	
show interfaces	Â

7.1.9 carrier-delay

ЮО ϡ **carrier-delay** ˘ ϡ **no**
Â

carrier-delay [*seconds*]

no carrier-delay

ð Ô

seconds ' ˩ ˘ Л ѝ Æ˘ 1˙ 60

ð Ô

2

ð ϡ Ô

ð Ô

/ DCD ÿ Down Up ˘
DCD ˩ ˘ ѫ ˩ a Э
Â

DCD ˘ ѫ ˘ ˩Л ╗

˘ Л ˩Л Â ˩˘ DCD
˘ ѫ ˘ Л Â

ð Ô

ЛЮ ѝ 5 '

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

7.1.10 clear counters

clear counters [*interface-id*]

ð Ô

interface-id ' /Â

ð ϡ Ô

ð Ô

ڧ ۅ ۄ Ӈ ، ן ա ϑ ˘

ˬ Л∪ ĭ LinkTrapˇ ╖ ˇ
Link ˬ ˇ SNMP LinkTrap, ˬ ‡ a Â ʒ **no** SNMP a LinkTrap Â

snmp trap link-status

no snmp trap link-status

ð Ô

Ю˘ ╖ ˇ Link ˬ ˇ SNMP LinkTrap Â

ð ʒ Ô

ð Ô

ˆ Л∪ à Ap à SVI ˜ ˇ ʒ ĭ
LinkTrapˇ ╖ ˇ Link ˬ ˇ SNMP LinkTrap,
ˬ ‡ a Â

ð Ô

Ю ѝ a Link trap:

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

Ю ѝ Link trap:

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

ð ʒ Ô

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

8

8.1

ЛЬЮ

- Â bridge-map
- Â link-mode
- Â native-vlan
- Â specify interface
- Â sys-mode
- Â vlan-enable
- Â xaui-mode slot

8.1.1 bridge-map

Â

bridge-map *bridge-num*

bridge-num	Â

Â

Â

1'

```
Ruijie#config
Ruijie(config)#bridge-map 1
Ruijie(config-bridge-map)#
```

-	-

10.3(4b7)

NPE50 NPE80 NPE

10.3(4b7)	

8.1.2 link-mode

no

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

interface-name1	a
interface-name2	a
forward	forward
sniffer	sniffer
bypass	bypass

forward

sniffer

bypass

a GigabitEthernet 0/0 GigabitEthernet 0/1 forward GigabitEthernet 0/2

GigabitEthernet 0/3 sniffer ЮÂ

1' GigabitEthernet 0/0 GigabitEthernet 0/1 forward Ю'

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

ϡ	
-	-

10.3(4b7)Лυ ⊣ Л ˘ NPE50 à NPE80 NPE Â

Л	
10.3(4b7)	ϡ

8.1.3 native-vlan

native-vlan id Â ┘Лυ ϡ no native-vlan id ѝ Â

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

vlan-id num	Vlan id ˘ ѝ 1~4094

Ю native-vlan id ѝ 1˘ no ┘Лυ native-vlan id ѝ Â

ϡ ϡ

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

1' 1 native-vlan id ѝ 100'

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

ϡ

ϡ	
-	-

ϻ 10.3(4b7)Лъ ч л ˘ NPE50 â NPE80 NPE Â

ϡ

ϻ	
10.3(4b7)	ϡ

8.1.5 sys-mode

ѝ Â ϟ Лъ ϡ no ѝ
˘ ѝ Â

[**no**] **sys-mode gateway**

-	-

Ю ѝ ˘ no ϟ Лъ ѝ

ϡ

ϡ Â
Ю ˘ ˘ ϟ NAT ˘
ѝ Ь ˘ ϟ Лъ IP Â
Ю ˘ ˘ a ± NAT ˘
ѝ γ ˘ a IP Â

1' ѝ '

```
Ruijie#config
Ruijie(config)#no sys-mode gateway
```

ϡ

ϡ	
-	-

ϻ 10.3(4b7)

8.1.7 xaui-mode

¨I Â

xaui-mode slot *slot-num*

¾ no ¼ ¨I ˘ ¦ 4 ¨I

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

xaui-mode	¨I Â
slot	slot
slot-num	slot /I

¾ Â

4 ¨I ¦ ¨I Â

1' XAUI ¨I '

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

¾	
-	-

ʒ no ˬ ˚ bypass

[**no**] **bypass couple** *couple-num*

bypass	˚ bypass Â
couple	
couple-num	*couple* ʌ

ʒ Â

˚ bypass Â

1' ˚ bypass '

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

ʒ	
-	-

ʌ 10.3(4b7)ЛЬ ч ʌ ˘ NPE40 Â

ʌ	
10.3(4b7)	ʒ

NPE50E à NPE60E'

bypass copper couple *couple-num*

bypass fiber couple *couple-num*

ʒ no ˬ ˚ bypass

[**no**] **bypass copper couple** *couple-num*

[**no**] **bypass fiber couple** *couple-num*

bypass	˚ bypass Â
copper	

fiber	
couple	
couple-num	*couple*

bypass

1'

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

-	-

10.3(4b7)

NPE50E à NPE60E

10.3(4b7)	

8.2

8.2.1 show bridge-map

show bridge-map [*bridge-num*]

bridge-num	Â Ь ‡ ѝ 0~2 Â

sys-mode	˘ Л ı wan lan Â ' ˘ LAN : GigabitEthernet 0/0 GigabitEthernet 0/3 WAN : GigabitEthernet 0/1 GigabitEthernet 0/2 GigabitEthernet 0/4 Â

```
Ruijie#show sys-mode
System is gateway mode.
copper couple 0 hardware bypass off
copper couple 1 hardware bypass off
fiber couple 0 hardware bypass off
fiber couple 1 hardware bypass off
LAN: GigabitEthernet 0/0 GigabitEthernet 0/3
WAN: GigabitEthernet 0/1 GigabitEthernet 0/2 GigabitEthernet 0/4
```

environment	ˇ ˇ ˇ NPE60 NPE50E NPE60E ˇ ˇ NPE60

NPE60:

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

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

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

9

9.1

Л ЛЮ ч'

- copy
- description
- duplex
- flowcontrol
- gateway
- ip address
- mtu
- ping oob

Л Ъ ҳ

Ruijie#**config**
Ruijie(config)#**interface mgmt 0**
Ruijie(config-if-Mgmt 0)#**gateway** *192.168.0.1*
Ruijie(config-if-Mgmt 0)#end
Ruijie#

ҳ	
show interface mgmt	MGMT

NPE40 à NPE60 Â

Л	
10.3(4b7)	ҳ

9.1.3 ip address

ҳ MGMT IP б Â

ip address *ip-address subnet-mask*

ip-address	IP
subnet-mask	

ҳ Â

MGMT MGMT Л ѝ 0Â

1' MGMT IP '

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

show interface mgmt	MGMT

NPE40 à NPE60 Â

10.3(4b7)

9.1.4 ping oob

ў Й ў Â

ping oob *host*

host	ў IP Й

б MGMT ў Â

1' ў *192.168.0.1* б MGMT '

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

-

NPE40 à NPE60 Â

ҳ	Л	
	10.3(4b7)	ҳ

9.1.5 sntp enable oob

б MGMT SNTP ╟ Â

sntp enable oob

	-	-

ҳ	
	б MGMT SNTP ╟ Â

1' SNTP ╖ '

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

ҳ	ҳ	
	-	-

Л	10.3(4b7)Л Ч Л ˘ NPE50 à NPE80 NPE Â

ҳ	Л	
	10.3(4b7)	ҳ

9.1.6 telnet oob

б MGMT ў Â

telnet oob *host*

MGMT ў Â

1' MGMT ў 192.168.200.1 '

```
Ruijie#traceroute oob 192.168.200.1
 < press Ctrl+C to break >
Tracing the route to 192.168.200.1

 1   192.168.196.1 10 msec 10 msec 0 msec
 2   192.168.187.1 10 msec 10 msec 10 msec
 3   192.168.198.43 0 msec 10 msec 0 msec
 4   192.168.200.1 10 msec 10 msec 10 msec
```

ҙ	
-	-

NPE40 à NPE60 Â

Л	
10.3(4b7)	ҙ

10 LINE

10.1 LINE

10.1.1 line

LINE ˘ ЛЬЮ ϡ'

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

ð Ô

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

ð Ô

ð ϡ Ô

ð Ô

LINE

ð Ô

LINE VTY 1 3 LINE '

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

ð ϡ Ô

10.1.2 line vty

٪ ٦ Л∪ ╗ ٦ Л∪ VTY Â ٪ **no** ٦ Л∪
٦ Л∪ VTY Â

line vty *line-number*

no line vty *line-number*

ð Ô

Ю˝ ٦ VTY й 5˝ Л й 0--4 Â

ð ٪ Ô

ð Ô

╗ ٦ VTY ˇ ٦ Л∪ Э ٪ Â

ð Ô

٦ VTY ╗

none	Line ЮЎ a Â

ð Ô

ˇ VTY Â è TTY й NONEЎ
a Â ٫Л٥ ٫ˇ ٫Л٥ **default**
transport input ٩ й Â

ð ٩ Ô

Line

ð Ô

٩ Line Ю Â VTY ЮЎ Â
٫ˇ ٫ ٫Л٥ VTY Э ╖ Â
show running ٩ Line Ю Â

default transport input ٩ Â **no transport input** ٩ˇ
LINE Ю Â б **transport input none** ٫ Â

ð Ô

line vty 0 4 ЮЎ ٫ telnet '

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

ð ٩ Ô

٩	

11 DLDP

11.1.1 DLDP

DLDP ЛЬЮ ٪'

- **dldp ip**
- **dldp passive**

11.1.2 dldp ip

٪ dldp ip ╗ ˘ 100 ˘ Ь Â
no ٪ è Â

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

no dldp ip [nexthopip]

ð Ô

ip' ip

***nexthopip*:** Ю ip

interval'

retry '

ð Ô

Ю interval й 100 ˘ Ь ' й ÿ Â

ð ٪ Ô

Interface

ð Ô

б MSTP ˆ ˜ ę ˘
Э ˘ a ٦ Y ˚ Â ╗ ˘ ٬ЛЬ٦
٬ Â

ð Ô

ЛЬЮ й ˘ й 10.83.132.1'

```
Ruijie(config)# interface GigabitEthernet 1/0
Ruijie(config-if)# dldp 10.83.132.1
```

```
Ruijie(config-if)#
    dldp      ў    '
Ruijie(config-if)# dldp passive
Ruijie(config-if)#
        ˘     ip ѝ 20.1.1.1˘ Ю    ip ѝ 10.1.1.1'
Ruijie(config)# dldp 20.1.1.1 10.1.1.1
```

ð ٶ Ô

ð ٨ Ô

ð Ô

ٶ RGNOS10.3 ٨ Э ˘ RGNOS10.3 Â

11.1.3 dldp passive

ٶ dldp passive dldp ╟ ˘ **no** ٶ è Â

dldp passive

ð Ô

३ RGNOS10.3 ﾉ Э ˘ RGNOS10.3 Â

12

12.1

12.1.1 clear counters

˘ ҙ **clear counters** Â

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

ð Ô

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

interface-number ' Л Â

ð ҙ Ô

ð Ô

show interface Â ҙ ˘ ў Â

ð Ô

Ю ҙ '

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

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

ð ¶Ô

¾	
show interface	

12.1.2 clear dialer

DDR Ñ ˘ **clear dialer** Â

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

ð Ô

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

interface-number ' Ñ

ð Ô

É ˘ DDR Ñ Â

ð ¾ Ô

ð Ô

ÞO DDR Ñ 1 '

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

12.1.3 clear interface

˚ ˘ **clear interface** Â

clear interface *interface-type interface-number*

ð Ô

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

interface-number ' Ñ

ð ¾ Ô

ð Ô

ÞO 0 ˚ '

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

12.1.4 clear line

˘ ȷ ȻȖ ȝ **clear line** Â

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

ð Ô

line-type ' Line ˘ **aux** à **console** à **vty** Â ‡ ὶ **tty** Â

line-number ' /ı Â

ð ȝ Ô

ð Ô

ȝ ȷ ȻȖ /ı ^ **tty** à **aux˜** à ^ **vty** à **console˜** Â
ȝ˘ line Â

ð Ô

GM[illegible]mÁÜ”kn=4“CÑ4”2Á4F[illegible]Ê4[illegible]6QF]ëÚ_U4Ü“CÃ> (M#fhíT ¥[illegible]M@UÛXÐ€2Ñ

-type Line

Ï S*ü Û + Ð

ȝ ȷ ȻȖ /ı ^ 3 φ

PPP ˘ ⅄ Л∪ ¾ **debug ppp** Â

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

ð Ô

authentication ' PPP

error ' PPP

event ' PPP Y˚

negotiation ' PPP

packet ' PPP

ð Ô

˘ ‡ PPP Â

ð ¾ Ô

ð Ô

¾ ў PPP ˘ έ ˘ ⅄ Л∪ ˘
a ⅄ Â

ð Ô

Ю PPP Y˚ '

```
Ruijie# debug ppp event
```

12.1.7 dialer enable-timeout

˘ ¾ **dialer enable-timeout** Â ¾ no Â

dialer enable-timeout *seconds*

no dialer enable-timeout

ð Ô

senconds ' ^ ~ Â

ð Ô

15

ð ¾ Ô

ð Ô

Ґ Л Л Л Л Л ˇ . Ä
Л Â

ð Ô

Ю й 10 '

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

12.1.8 dialer-group

₁ Л ‡ˇ ђ **dialer-group** Â ђ no
Л ‡ Â

dialer-group *group-number*

no dialer-group

ð Ô

group-number ' ₁ Л ‡ Л

ð Ô

Л ‡ Â

ð ђ Ô

ð Ô

Лˇ ¨I ж Л ₁ Лˇ ₁ Л ‡
ђ **dialer-list** ˇ Лˇ Э è Л ‡ Â

ð Ô

Ю ₁ Л ‡ 1ˆ Л IP ₁ Л˜ '

```
Ruijie(config)# dialer-list 1 protocol ip permit
Ruijie(config)# interface async 1
Ruijie(config-if)# dialer-group 1
```

ð ђ Ô

ђ	
dialer-list	Нж Л ‡

12.1.9 dialer hold-queue

˘ ч **dialer hold-queue** Â ч **no**
Â

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

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

ð Ô

packet ' ¦ ˘ ы 0 100 Â

timeout *seconds* ' ¦ ˆ ~ ˘ 45s Â

ð Ô

ð ч Ô

ð Ô

MODEM Л ˘ Â
˘ ‡ Л Л∪ 1 Л ‡ Э˘ Л∪ Л˘
. Â

ð Ô

Ю й 50

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

12.1.10 dialer idle-timeout

˘ ч **dialer idle-timeout** Â ч no
Â

dialer idle-timeout *seconds*

no dialer idle-timeout

ð Ô

seconds ' ˆ ~ Â

ð Ô

120

ð ҳ Ô

ð Ô

Л ˙ ˘
˘ Æ Â

ð Ô

Ю 1 и 60 '

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

ð ҳ Ô

ҳ	
dialer-group	Л ‡
dialer fast-idle	

12.1.11 dialer-list

Ю₁ Л ‡˘ ҳ **dialer-list** Â ҳ **no** ₁ Л ‡ Â

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

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

ð Ô

dialer-group ' ₁ Л ‡ Л Â

permit '

deny Ò t Ô

ð Ô

ђ Ю Њ 1 Л ‡˘ **dialer-group** Л ‡
é Л Â ђ Â

ð Ô

Ю Њ ч 1 Л ‡˘ IP 1 Л˘ ы
Л 120 1 Л'

```
Ruijie(config)# access-list 120 permit tcp
192.168.11.0 0.0.0.255 192.168.12.0 0.0.0.255
Ruijie(config)# dialer-list 1 protocol ip permit
Ruijie(config)# dialer-list 2 protocol ip list 120
```

ð ђ Ô

ђ	
dialer-group	Э 1 Л ‡
access-list	Њ

12.1.12 dialer pool

DDR Л ˘ é Л
Л˘ Л ˘ ђ **dialer pool** Â ђ **no** ы Â

dialer pool *number*

no dialer pool *number*

ð Ô

number ' Л Л˘ и 1~255 Â

ð Ô

a Л

ð ђ Ô

ð Ô

DDR ˘ é Л Â и
˘ Л Â ″I˘ é ╕

Л ˘ Л˘ Э è Л ˘ ÿ
Â

ы Л Л Л ˘ ы Л ˘
é Л ˘ Л Л Â

ð Ô

Ю 0 Э Л 1'

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

ð ч Ô

ч	
dialer pool-member	╕ Л
dialer remote-name	ў Л Â

12.1.13 dialer pool-member

╕ Л ˘ ч **dialer pool-member** Â
ч **no** ы Л Â

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

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

ð Ô

number ' Л Л

priority *priority* ' Л ″I ^ 0 255˜ ˘ 0 и æ ″I
˘ 255 и ″I Â ″I Л ″I
Л Â

ð Ô

a ╕ Л Â ″I и 0Â

ð ч Ô

ð Ô

ч ╕ Л ˘ Л Â

ы Л ╕ Л ˘ ы Л ″I Â
Л Л ˘ ″I з ″I Â

ð Ô

Ю 1 ╕ Л 1 2˜ ″I ¦ и 50 100˙

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

ð ч Ô

ч	
dialer pool	Э Л Â
dialer remote-name	ў ⅄ Â

12.1.14 dialer priority

Л ^ DDR˜ ″I ˇ ч **dialer priority** Â ч **no** Â

dialer priority *number*ê ÐÞ1Hm-bÎpбąKÐÝýÆ

PPP ˘ ¶ **ip address negotiated** Â

¶ **no** ╖ ↓ ╖ Â

ip address negotiated

no ip address negotiated

ð Ô

ð ¶ Ô

ð Ô

¶ ў / ˘ IP ┺ ╟ ↑ ˘
Â

ð Ô

Ю 1 IP '

```
Ruijie(config)# interface async 1
Ruijie(config-if)# ip address  negotiate
```

ð ¶ Ô

¶	
encapsulation ppp	PPP
ip address	IP
ip unnumbered	è IP

12.1.16 ip address-pool

Ж IP ↑ ˘ ¶ **ip address-pool** Â ¶ **no**
Â

ip address-pool [**local**]

no ip address-pool

ð Ô

local ' ↑ ˘ IP й ↑ IP Â

ð Ô

a ↑

ð ҳ Ô

ð Ô

ҳ й ǂ ˘ ЛЪЮ Ю˘ ǂ
'

peer default ip address ҳ Э й ˘

ð Ô

Ю ǂ й '

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

ð ҳ Ô

ҳ	
ip local pool	Њ
peer default ip address	IP

12.1.17 ip route

ҳ IP ҳ Â

12.1.18 line

⁸ Line ˘ ҳ **line** Â

line [**aux** | **console** | **vty**] *line-number* [*ending-line-number*]

ð Ô

aux ' Line

console ' ⁸ Л Line

vty ' й

line-number ' Line Л˘ Line Л Â

end-line-number ' Line Л line Л Â

ð Ô

Line

ð ҳ Ô

ð Ô

ҳ Line Line Â Line Л **aux** \ **console** \ **vty** ˘ ‡ Л ѝ Л˘ Л ⅃Л **show line** ҳ Â

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

Tty Ю Л ѝ Л Â ⁸ Л Л 0 Â è Л ´ ⅃ ⅃ ˘ Л **show line** ѝ Â

aux \ **console** \ **vty** Line Л˘ Ю Л ˘ . 1 Line Л ѝ 1˘ a ⅃ Ш ˘ **show line** ҳ Â

ð Ô

Ю 0 4 Line ˘ 0 4'

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

ð ҳ Ô

ҳ	
show line	line

й IP ˘ ҳ **peer default ip address** Â ҳ **no** ↓ IP Â

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

no peer default ip address

ð Ô

ip-address ' й IP ˘ й IP ˘ a DDR Л й IP Â

pool ' Л *pool-name-list* ˘ ‡ ↑ Â

pool-name-list ' Л

ð Ô

↑ й ↑ IP Â

ð ҳ Ô

ð Ô

ҳ PPP й IP ˘ ˘ ‡ IP Â

ЛЪЮ Ю˘ ҳ ↑ '

¸ **peer default ip address** *ip-address* й IP

¸ **peer default ip address pool-name-list** й ↑ IP

ð Ô

Ю й 1 IP '

```
Ruijie(config)# interface async 1
Ruijie(config-if)# peer default  ip address 1.1.1.2
```

ð ҳ Ô

ҳ	
ip address-pool	
ip dhcp-server	DHCP ┗
ip local pool	

12.1.20 ppp max-bad-auth

PPP ˘ ҷ **ppp max-bad-auth** Â ҷ **no** Â

ppp max-bad-auth *number*

no ppp max-bad-auth

ð Ô

number ' PPP ˘ ѝ 0 Â

ð Ô

a

ð ҷ Ô

ð Ô

˘ . ѝ З˝ Љ Л˘ 2 Â Л Љ Л˘ ˆ Æ˜ Â

ð Ô

Ю 1 ѝ 4:

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

ð ҷ Ô

ҷ	

ð ч Ô

ð Ô

ч Л PPPoE Л ч ˘ PPPoE
Т Â

ч RGNOS PPPoE Â

ð Ô

Ю RGNOS Л Э PPPoE

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

ð ч Ô

ч	
pppoe-client	PPPoE DDR Т

12.1.22 pppoe-client

Л PPPOE Л^ DDR˜ Т ˘ ч
pppoe-client Â ч **no** ч PPPoE Л Т Â

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

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

ð Ô

number ' Л Л

dial-on-demand' PPPoE Client Â

no-ddr' PPPoE Client Â

ð Ô

ð ч Ô

ð Ô

ч Л Л ˘ Л ˘ ÿ и
Л ˘ DDR Л Â

↓Л∪ ч Л '

1˜ ' ѝ **dial-on-demand** ˘ Л ₁ Л ‡ ˘
˘ ‡ ₁ Л∪ PPPoE Л Â
˘ ‡ Â

2˜ ' ѝ no-ddr ˘ ‡ a Л ‡ ˘ ≠ a ↓ ⁸
˘ ╟ ₁ Л∪ PPPoE Л Â

ð Ô

Ю Л∪ 1 Л 1˜ PPPOE Л ╖ '

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

ð ⅋ Ô

⅋	
pppoe enable	PPPoE ╖

12.2

12.2.1 show dialer

DDR Л ˘ ⅋ **show dialer** Â

show dialer [**interface** *type number*] [**maps**] [**pools**]

ð Ô

interface *type number* ' Л Â

maps ' Л Â

pools ' Л Â

ð ⅋ Ô

ð Ô

Ю 1 Л '

```
Ruijie# show dialer interface async 1
Interface Async 1 , Dial-type = IN-BAND ASYNC
Async dialer
```

```
Idle-timer value(120 secs), Fast-Idle-timer value(20 secs)
Enable-timer value(15 secs), Carrier-timer value(30 secs)
DialStr  SuccCalls          FailCalls          LastCall-time
LastStat
```

default **dialer string** ч Нж Л ˇ ‡ default Â

è ˇ a Ą Â

12.2.2 show ip local pool

ˇ ч **show ip local pool** Â

show ip local pool

ð ч Ô

ð Ô

Ю ч

```
Ruijie# show ip local pool
Pool    Begin          End            Free InUse
star    1.1.1.3        1.1.1.10        8    0
```

Лъэ ˇ a Ą Â

ð ч Ô

ч	
ip address-pool	Нж ¦
ip local pool	Нж

12.2.3 show pppoe

PPPoE ˇ ч **show pppoe** Â

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

ð ч Ô

ð Ô

३ **session tunnel** Â

ð Ô

ЮO ३ '

```
Ruijie# show pppoe tunnel
pppoe0000D01C8t890AA206
```

IP

13 IP

13.1

ЛЪЮ ҳ'

- **ip address**
- **ip unnumbered**

13.1.1 ip address

ҳ IP ˇ ↓Л Ъ no IP Â ҳ
Ю'

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

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

ð Ô

Ī ⁎ Ł П ő e Ĺ ȯ ȯ ҳ

Ľ 255.0.0.0 Ŀ Â ⅃ Л ŧ ˘ ŧ
ў ŧ æ ≠ й ŧ ˘ ў ˘ ╗ ˘
й Â

RGOS ˚ ⅃ Л IP ˘ è й ў IP ˘ è
й IP Â IP Э ⁸˘ ⅃ Л ˘ ⅄ ⅄
ў IP ⅄ IP Â IP ⅃ Л б ў IP ⅄
a ⅄ Â ˘ IP ˘ ЛЮ Ю
IP '

ˌ ў Â C ˘ ⅃ŧ
254 ⅄ ў Â ў 254 ⅄ ˘ C a ŧ ˘
ŧ ⅄ C Â ч ˘ Л IP
Â

ˌ ү ˘ ŧ Â IP
⅃ Л ˘ IP Â ˘
IP Â

ˌ ч ⅄ ˘ ⅃ Л…
˘ IP ˘ Â a
ч ч ЛЭ Â

ð Ô

IP 3

Â

ʌ ˘ ARP VRRP ARP˝ AnyIP ╟ ARP ╕
˘ AnyIP ╖ a Â

1' ЛЬЮ ˘ ARP AnyIP ╖ Â

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

2' ЛЬЮ ˘ ARP AnyIP ╖

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

ȝ

ȝ	
-	-

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10.3(4t76)	10.3(4t76)

13.2.3 arp retry interval

ȝ˘ ɻЛЬ arp ˘ . ɻ IP ˘
2 ARP Â ȝ no ɻЛЬ 1
ARP Â

arp retry interval *seconds*

no arp retry interval

ð Ô

seconds	<1-3600>,ARP ɻЛЬ ѝ 1 ——3600 ˘ ѝ 1

ð Ô

ARP ѝ 1 Â

ð ȝ Ô

ð Ô

ȷ ARP ˘ è ˘ ȷ Л
ARP ˘ a ╟ ARP Â

ð Ô

ЛЬЮ ˘ ARP й 30s

```
arp retry interval 30
```

ð ȝ Ô

ȝ	
Arp retry times *number*	ARP

13.2.4 arp retry times

ȝ˘ ȷ Л arp ˘ . ȷ IP ˘
ARP Â ȝ no ȷ Л 5 ARP Â

arp retry times *number*

no arp retry times

ð Ô

number	ȷ ARP ˘ <1-100> Â й 1 ˘ a ARP ˘ ȷ 1 ARP

ð Ô

ARP ˘ ARP 5 ˘ ȷ Â

ð ȝ Ô

ð Ô

ȷ ARP ˘ è ˘ ȷ Л
ARP ˘ a Â

ð Ô

ЛЬЮ ˘ ARP a Â

```
arp retry times 1
```

ЛЬЮ ˘ ARP 1 Â

```
arp retry times 2
```

ð ३ Ô

३	
arp retry interval *seconds*	arp

13.2.5 arp trusted NUM

३˘ ↓Л ↓ ARP Â ३ no Â

arp trusted *number*

no arp trusted

ð Ô

number	↓Л ↓ ARP , ↓ <10-4096> Â

ð Ô

a ↓ a ↓ Â

ð ३ Ô

ð Ô

३ ˘ ˝I ↓ ARP ╖ Â ↓ ARP è ˘ ↓ ´ ˘ ↓ ╟ ARP a Â ˘ a Â

ð Ô

ЛЬЮ ˘ ↓Л 1000 ↓ ARP Â

```
arp trusted 1000
```

ð ३ Ô

३	
service trustedarp	↓ ARP ╖

13.2.6 arp trusted aging

३˘ ⅃Ⅱ ⅃ ARP Â ३ no Â

arp trusted aging

no arp trusted aging

ð Ô

ð Ô

GSN ⅃ ARP a Â

ð ३ Ô

ð Ô

३ ⅄ ⅃ ARP ˘ ╟ ARP ⅄ Â
⅃Ⅱ Ю **arp timeout** ३ Â

ð Ô

Â

ð ३ Ô

३	
service trustedarp	⅃ ARP ╖

13.2.7 arp unresolve

३˘ ⅃Ⅱ ARP Â ३ no ⅃Ⅱ
8192 Â

arp unresolve *number*

no arp unresolve

ð Ô

ð Ô

ARP ă ⅃Л 8192 Â

ð ʒ Ô

ð Ô

ARP ˘ з ⅄ ˘ ⅃Л
ʒ 8 Â

ð Ô

ЛЬЮ ˘ й 500 Â

```
arp unresolved 500
```

ð ʒ Ô

13.2.8 arp gratuitous-send interval

ʒ˘ ⅃Л arp Â ʒ no
Э ℸ

arp gratuitous-send interval *seconds*

no arp gratuitous-send

ð Ô

seconds	ARP ˘ Æ ˘ ⅄ <1-3600> Â

ð Ô

ARP ℸ Â

ð ʒ Ô

ð Ô

й Ю ˘ Ю ˈI й˘ ‡
⅃Л ARP ˘ Ὼ Â

ð Ô

ЛυЮ ˘ ⅃ SVI 1 ARP Â

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

ЛυЮ ˘ ⅃ SVI 1 ARP

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

ð ٶ Ô

13.2.9 arp timeout

ARP ă ш ARP ˘ ⅂Л ٶ Â ٶ no ⅂Л Â

arp timeout *seconds*

no arp timeout

ð Ô

seconds	˘ Л й Æ˘ 0-2147483

ð Ô

й 3600 Â

ð ٶ Ô

ð Ô

ARP ⅂ ╠ ˜ IP MAC Â ˘ ARP ă ˘ ARP ≠ ˘ Л Â ˘ ĭ ‡ a ARP Â

ꝛ	
clear arp-cache	ARP ă
show interface	

13.2.10 ip proxy-arp

Э ꝛ ARP ╖ ˘ ┘Л **ip proxy-arp** ꝛ Â ꝛ no ┘ Л ꝛ ARP ╖ Â

ip proxy-arp

no ip proxy-arp

ð Ô

10.2(3) ⁄ ˘ ꝛ ARP Â

ð ꝛ Ô

ð Ô

ꝛ ARP ╖ ┘Л ╠ ў ˘ è IP MAC Â ARP ˘ ARP IP б IP a ┘ ˘ ┐ IP ˘ ARP ˘ MAC и Л MAC Â Л Э ꝛ ARP ╖ Â

ð Ô

ЛЮ ˘ Л GigabitEthernet 0 ꝛ ARP ╖ Â

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

ð ⁄ Ô

ꝛ γ Э a Â

13.2.11 service trustedarp

┘ ARP ╖ ˘ ┘Л **service trustedarp** ꝛ Â ꝛ no ┘ ARP ╖ Â

service trustedarp

no service trustedarp

ð Ô

ل ARP Â

ð ֽ Ô

ð Ô

ل ARP ╖ ARP ╖ ˘ ѝ GSN ˘
GSN Â

ЛЬЮ Ь ˘ STP ╟ MAC ˘ ≠ ل Э
ل ˘ ل MAC ل ARP Â

1) STP

2) ل root port ≠ design , ل ل updown ˘
˝I

3) tc ˘

ð Ô

ЛЬЮ ˘ Ю˘ service trustedarp ╖ Â

```
config
service trustedarp
```

ð ل Ô

ֽ γ Лυ ل s32 Э a Â

13.3

б ֽ '

¸ **ip broadcast-addresss**

¸ **ip directed-broadcast**

13.3.1 ip broadcast-addresss

Ћ˘ ֽ **ip broadcast-addresss** Â ֽ
no ل Лυ ل Â

ip broadcast-addresss *ip-address*

no ip broadcast-addresss *ip-address*

ð Ô

ip-address	IP

ð Ô

IP ы 255.255.255.255 Â

ð ৡ Ô

ð Ô

IP ы ľ 1 Ľ˘ ы 255.255.255.255 Â RGOS ˚ ⅃ Л∪ Ⱨ Ѫ è IP ˘ з ⅃ Л∪ ⅃ ľ 1 Ľ Л∪ ⅂ Ⱨ Ѫ Â

ð Ô

ЛЬЮ ˘ IP ы 0.0.0.0 Â

```
ip broadcast-address 0.0.0.0
```

ð ⅄ Ô

ৡ γ Э a Â

13.3.2 ip directed-broadcast

IP ⅃ ˘ ৡ **ip directed-broadcast** Â ৡ no ⅄ ⅃ Â

ip directed-broadcast [*access-list-number*]

no ip directed-broadcast

ð Ô

access-list-number	ˆ ⅃ ˜ /⁄˘ ÿ 1-199˝ 1300 - 2699 Â Ⱨ /⁄˘ ⅄ ⅂ IP ⅃ Â

ð Ô

Â

ð ৡ Ô

ð Ô

IP ɹ й IP IP ˘ й
172.16.16.255 й ɹ Â ٧ a
Â

б IP ɹ ˘ ɹ
Â ɹ ɻ˘ ɹ
й ˆ IP й Ґ 1 Ŀ ˜ ˘ ɻƱ
Э ў Â

٧Ʊ Э˘ ╟ ɹ ╖ ˘ ٧Ʊ
ɹ Â ʒ ٧ ɹ
ɻ ˘ a è ɹ Â

Э˘ ٧Ʊ ⱻ ⁸ ɹ Â ⱻ
˘ ٧ ɻ ⱻ ɹ Â

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

ð Ô

ЛЬЮ ˘ GigabitEthernet 0/1 ɹ Â

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

ð ɻ Ô

ʒ γ Э a Â

13.4 IP

б IP ʒ '

- **clear arp-cache**
- **show arp**
- **show arp counter**
- **show arp timeout**
- **clear ip route**
- **show ip arp**
- **show ip interface**

13.4.1 clear arp-cache

ÿ ARP ă ╟ ARP ˘ Л υ ˥ IP ă ˘
ϛ clear arp-cache Â

clear arp-cache [*A.B.C.D*] | **interface** *interface-name*]

ð ϛ Ô

ð Ô

˩ Л υ ϛ [9] ARP Â

RNFP(Ruijie Network Foundation Protection,) Э˘
mac (IP) ˋ ARP ˘ ARP ⌊n#Ù)B!ßÓ ɮ ȯ Ь ARP

Age (min)	“-”

Interface	б IP Â

ЛЫЮ show arp 192.168.195.68

```
Ruijie# show arp 192.168.195.68
Protocol  Address    Age(min)  Hardware       Type   Interface
Internet  192.168.195.68   1   0013.20a5.7a5f  arpa   VLAN 1
```

ЛЫЮ **show arp** *192.168.195.0 255.255.255.0*

```
Ruijie# show arp 192.168.195.0 255.255.255.0
Protocol  Address    Age(min)  Hardware   Type   Interface
Internet  192.168.195.64   0   0018.8b7b.9106  arpa   VLAN 1
Internet  192.168.195.2    1   00d0.f8ff.f00e  arpa   VLAN 1
Internet  192.168.195.5    --   00d0.f822.33b1  arpa   VLAN 1
Internet  192.168.195.1    0   00d0.f8a6.5af7  arpa   VLAN 1
Internet  192.168.195.51   1   0018.8b82.8691  arpa   VLAN 1
```

ЛЫЮ **show arp** *001a.a0b5.378d*

```
Ruijie# show arp 001a.a0b5.378d
Protocol  Address  Age(min)  Hardware  Type   Interface
Internet  192.168.195.67   4   001a.a0b5.378d  arpa   VLAN 1
```

ð Л Ô

showъar4 γ Э a Â 80CFC0460121641920EDB0380CFC04<41B8>.255.0 T0 9B03DE

ð ✓ Ô

३ γ Э a Â

13.4.4 show arp timeout

╟ ARP

show arp timeout

ð Ô

३ γ Э a Â

ð Ô

˘ ⅃Л . ⁹ Â

˘ Â

ð Ô

ЛЬЮ ˘ ⅄ 192.168.12.0 Â

```
clear ip route 192.168.12.0
```

ð ꝛ Ô

ꝛ	
show ip route	IP

ð ⅄ Ô

ꝛ γ Э a Â

13.4.6 show ip arp

ˆ ARP˜ ă ˘ ꝛ Â

show ip arp

ð Ô

ð ꝛ Ô

ð Ô

ЛЬЮ й **show ip arp** '

```
Ruijie# show ip arp
Protocol Address      Age(min)Hardware       Type
Interface
Internet  192.168.7.233    23          0007.e9d9.0488    ARPA
GigabitEthernet 0/0
Internet  192.168.7.112    10          0050.eb08.6617    ARPA
GigabitEthernet 0/0
Internet  192.168.7.79      12          00d0.f808.3d5c    ARPA
GigabitEthernet 0/0
```

```
Internet  192.168.7.1       50         00d0.f84e.1c7f    ARPA
GigabitEthernet 0/0
Internet  192.168.7.215     36         00d0.f80d.1090    ARPA
GigabitEthernet 0/0
Internet  192.168.7.127     0          0060.97bd.ebee    ARPA
GigabitEthernet 0/0
Internet  192.168.7.195     57         0060.97bd.ef2d    ARPA
GigabitEthernet 0/0
Internet  192.168.7.183     --         00d0.f8fb.108b    ARPA
GigabitEthernet 0/0
```

ARP ă Ћ Ю'

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

ð ⁄ Ô

ʒ γ Э a Â

13.4.7 show ip interface

ʒ ⌟ Лu IP Â ʒ Ю'

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

ð Ô

Interface-type	
Interface-number	/ǀ

ð ʒ Ô

ð Ô

˩ ˘ RGOS … Â ˩
RGOS ˚ ˩Л Â ÿ ˩ ˩ ѝ a ˩
˘ RGOS ˚ ÿ Â

˩ ˘ ˩ ˩ ˘ Ľ UP Ł’
˩ ˘ Ľ UP Ł Â

a ˩ ˘ ˩ a ˘ ѝ Â

ð Ô

ЛЬЮ ѝ **show ip interface** Â

```
Ruijie# show ip interface GigabitEthernet 0/1
IP interface state is: UP
IP interface type is: BROADCAST
IP interface metric is: 0
IP interface MTU is: 1500
IP address is:
192.168.5.133/24 (primary)
IP address negotiate is: OFF
Forward direct-boardcast is: ON
ICMP mask reply is: ON
Send ICMP redirect is: ON
Send ICMP unreachabled is: ON
DHCP relay is: OFF
Fast switch is: ON
Route horizontal-split is: ON
Help address is: 0.0.0.0
Proxy ARP is: ON
Outgoing access list is not set.
Inbound access list is not set.
```

ЮЎ

IP interface state is:	˩ ˘ è ˚ ѝ “UP”
IP interface type is:	˘ ˘
IP interface MTU is:	MTU
IP address is:	IP
IP address negotiate is:	IP ĭ
Forward direct-boardcast is:	ĭ ˩
ICMP mask reply is:	ĭ ICMP

Send ICMP redirect is:	ĭ ICMP ˩
Send ICMP unreachabled is:	ĭ ICMP a ˩
DHCP relay is:	ĭ DHCP
Fast switch is:	ĭ IP ╖
Route horizontal-split is:	ĭ † ˘ ˩ ѝ
Help address is:	helper IP
Proxy ARP is:	ĭ ʒ ARP
Outgoing access list is	ĭ
Inbound access list is	ĭ

13.4.8 show ip redirects

ʒ Â ʒ Ю'

show ip redirects

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ʒ γ Э Â

ð Ô

Ю ѝ **show ip redirects** Â

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

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ʒ	
ip default-gateway	˘ γ Â

14 IP

14.1 IP

IP Ł ʒ ЛЬЮ ʒ'

- **ip default-gateway**
- **ip mask-reply**
- **ip mtu**
- **ip redirects**
- **ip source-route**
- **ip unreachables**

14.1.1 ip default-gateway

γ Э ˘ ʒ **ip default-gateway** Â ʒ no Â

ip default-gateway

no ip default-gateway

ð Ô

ð ʒ Ô

ð Ô

a ˘
Â ˩ **show ip redirects** ʒ Â

ð Ô

ЛЬЮ ˘ й 192.168.1.1 Â

```
ip default-gateway 192.168.1.1
```

ð ʒ Ô

ʒ	

show ip redirects	

ð Ô

ð Ô

14.1.2 ip mask-reply

RGOS ICMP ICMP ICMP **ip mask-reply** no ICMP

ip mask-reply

no ip mask-reply

ð Ô

ICMP

ð Ô

ð Ô

ICMP ICMP

ð Ô

GigabitEthernet 0/1 ICMP

```
interface GigabitEthernet 0/1
ip mask-reply
```

ð Ô

14.1.3 ip mtu

IP MTU **ip mtu** no

ip mtu *bytes*

no ip mtu

ð Ô

bytes	IP ĩ ˘ Л∪ ѝ Æ˘ 68~1500 Â

ð Ô

б ⅋ mtu ⅄ Â

ð ⅋ Ô

ð Ô

IP IP MTU ˘ RGOS ˚ ⍞ Â ⅄ Э ˘ è IP MTU Â

⅋ mtu ĩ ˘ IP MTU ╟ б MTU Â ⅄ ˘ IP MTU ˘ MTU a ⅄ Â

ð Ô

ЛЮ ˘ GigabitEthernet 0/1 IP MTU ѝ 512 Â

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

ð ⅋ Ô

⅋	
mtu	ĩ Â

ð ⅄ Ô

⅋ γ Э a Â

14.1.4 ip redirects

RGOS ˚ ⅄ Л∪ ICMP ⅄ ˘ ⅋ **ip redirects** Â ⅋ no ⅄ Л∪ ICMP ⅄ ╖ Â

ip redirects

no ip redirects

ð Ô

Â

ð ⅋ Ô

ð Ô

a ˘ ⅃ ÿ ˘ ÿ
Â ÿ ˘
ICMP ⅃ ˘ ѝ ⅃ Э ⅄ ⅄ Â
⅄ Â

RGOS ˚ ICMP ⅃ Â

ð Ô

ЛЬЮ ˘ GigabitEthernet 0/1 ICMP ⅃ Â

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

ð ⅄ Ô

⅋ γ Э a Â

14.1.5 ip source-route

RGOS ˚ IP ˘ ⅋ **ip source-route** Â ⅋ no ╗ Â

ip source-route

no ip source-route

ð Ô

Â

ð ⅋ Ô

ð Ô

RGOS IP Â IP ˘ IP ш ầ
ầ ˘ RFC 791 Â
ὲ ˘ ╟ ’
˘ ICMP ˘ ⅄ Â

RGOS ˚ Ю IP Â

ð Ô

ЛЬЮ ˘ IP Â

```
no ip source-route
```

ð ⅄ Ô

⅋ γ Э a Â

14.1.6 ip unreachables

RGOS ˚ ICMP a ⅃ ˘ ⅋ **ip unreachables** Â ⅋ no ⅃Ո

15.2.1 show ip ref packet-statistic

३ REF Â è ३ Ю'

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

३

```
3     unresolve   glean   0.0.0.0          1     0    0    0      0
0000.0000.0000  FastEthernet 0/0
                '
```

id	
state	unresolve' resolved'
type	local' forward' drop' glean' ∧
rfct	
chg	ĩ ˩
l2addr	ϒ
interface	

३	३	
	show ip ref route	REF

∧	NPE

३	∧	
	-	-

15.2.3 show ip ref exact-route

३ ˩ ∫∪ IP ∫' Â è ३ Ю'

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

vrf	
source-ipaddress	IP
dest_ipaddress	IP

Â

ȝ Â

ȝˇ IP IP б IP ˇ ⊣ Л∪ REF
ˇ Â

1'

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

ȝ

ȝ	
show ip ref route	REF

⊣ NPE

ȝ

/I	
-	-

15.2.4 show ip ref route

ȝ ⊣ Л∪ REF ˇ è ȝ Ю'

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

vrf	
default	
ip	IP
mask	
statistic	

Â

ȝ Â

16

16.1

Â [ip session timeout](#)

16.1.1 ip session timeout

ip session timeout **no**

Â

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

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

icmp-closed	ICMP 10s

tcp-close-wait	ŭ TCP ŭ close-wait ˘ 60s
tcp-closed	ŭ TCP ŭ closed ˘ 10s
tcp-established	ŭ TCP ŭ established ˘ 1800s
tcp-fin-wait	ŭ TCP ŭ fin-wait ˘ 60s
tcp-last-ack	ŭ TCP ŭ last-ack ˘ 30s
tcp-syn-receive	ŭ TCP ŭ syn-receive ˘ 10s
tcp-syn-sent	ŭ TCP ŭ syn-send ˘ 10s
tcp-time-wait	ŭ TCP ŭ time-wait ˘ 10s
udp-closed	ŭ UDP ŭ ˘ 10s
udp-connected	ŭ UDP ŭ ˘ 30s
udp-established	ŭ UDP ŭ ˘ 600s
udp-started	ŭ UDP ŭ ˘ 60s
num	

Â

1' ЛьЮ ˘ tcp established ŭ 600s Â

```
ip session timeout tcp-established 600
```

-	-

Â

10.3(4t90)	

16.2

- show ip fpm flows
- show ip fpm counters
- show ip fpm statistics
- show ip fpm users

16.2.1 show ip fpm counters

show ip fpm counters

-	-

```
Ru Ruijie#show ip fpm counters
Droped packet counters:
Count     Reason
0         Non-IPv4 packet
0         Bad IPv4 header length
0         Bad IPv4 total length
0         IPv4 fragment with DF bit set
0         Too small IPv4 fragment
0         Bad IPv4 fragment offset
0         IPv4 fragment timeout
0         Bad IPv4 checksum
0         Invalid IPv4 address
```

```
0         Invalid TCP flags
0         Invalid TCP initial flags
0         Invalid TCP initial ACK number
0         Invalid TCP initial window
0         Invalid TCP sequence
0         Invalid ICMP message type
0         Invalid ICMP initial message type
0         Exceptional connection state
0         Droped by policy
0         Out of capability
<end>
Rejected or terminated connection counters:
Count     Reason
0         Out of life time
0         Exceptional TCP connection
0         Exceptional UDP connection
0         Exceptional ICMP connection
0         Exceptional RawIP connection
0         Rejected by policy
```

Count	
Reason	

-	-

-	-

16.2.2 show ip fpm flows

Â

show ip fpm flows [**filter** ip_protocol_number source_ip source_ip_mask_len dest_ip dest_ip_mask_len]

filter	
ip_protocol_number	
source_ip	IP
source_ip_mask_len	IP
dest_ip	IP
dest_ip_mask_len	IP

show ip fpm flow

```
Ruijie#show ip fpm flows
Pr  SrcAddr          DstAddr          SrcPort     DstPort     Vrf
SendBytes  RecvBytes  St
1   192.168.52.68    192.168.52.67      5           2048        0
100       100       2
Ruijie#show ip fpm flows filter 1 192.168.52.0 24 192.168.52.67 24
Pr  SrcAddr          DstAddr          SrcPort     DstPort     Vrf
SendBytes  RecvBytes  St
1   192.168.52.68    192.168.52.67      5           2048        0
100       100       2
```

Pr	
SrcAddr	IP
DstAddr	IP
SrcPort	
DstPort	
Vrf	Vrf
SendBytes	
RecvBytes	
St	

-	-

-	-

16.2.3 show ip fpm statistics

show ip fpm statistics

-	-

Ю **show ip fpm statistic**

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

The capacity of the flow table	
Number of active flows	
Number of the defragment contexts	IP
Number of the buffers hold by FPM	buffer

	Event count	Y

	-	-

	-	-

16.2.4 show ip fpm users

show ip fpm users

	-	-

	-	-

17 IP NAT

17.1

IP NAT ЛЬЮ ʒ'

- address
- clear ip nat translation
- ip nat
- ip nat application
- ip nat inside destination
- ip nat inside source
- ip nat outside source
- ip nat p2p-rate-limit
- ip nat pool
- ip nat translation

17.1.1 address

NAT ˇ NAT ʒ address ʒ
no ˩ Л Ь

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

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

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

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

start-ip	IP
end-ip	IP
interface *interface*	NAT outside Pool ˇ • match interface interface ˇ з ч interface ї ‡ ˩ NAT a

match interface *interface*	NAT outside Â ā ЛЎ NAT ЎĄ ч pool б ך Â

ЊЖ Â

ҳ NAT

ЊЖ ˇ ”I NAT ˇ Л
NAT ЊЖ Â

	NPE80 **match** a ч ˇ . ҳ Ю' **address** *start-ip end-ip* **match interface** *interface* **no address** *start-ip end-ip* **match interface** *interface* **address interface** *interface* **match interface** *interface* no address interface *interface* match interface *interface*

1' ЛЬЮ ˇ … mulnets ˇ ЊЖ ч Â

```
ip nat pool mulnets netmask 255.255.255.0
address 172.16.10.1 172.16.10.254
address 192.168.100.1 192.168.100.50
```

ҳ

ҳ	
ip nat pool	ЊЖ IP NAT

Л Â

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-	-

17.1.2 clear ip nat translation

ÿ NAT ˇ ҳ Â

clear ip nat translation { * }

*	╟ NAT Â

ֽ

ֽ˘ ˩Л NAT Â NAT
˘ и ˘ ˩ ftp ˘
ǂ Â

Â

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ֽ	
ip nat	Ⱶ NAT Â
ip nat inside destination	NAT Â
ip nat inside source	NAT Â
ip nat outside source	NAT Â
ip nat pool	Ⱶ IP NAT
show ip nat statistics	IP NAT Â
show ip nat translations	IP NAT Â

˩

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-	-

17.1.3 ip nat

NAT ˘ ˩Л **ip nat** ֽ Â
ֽ **no** ˘ ˩Л a ¨Ą NAT Â

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

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

inside	Â
outside	Â

˘ NAT Â

३

ৰ outside inside ˘ ३ ﾉ ‡ ˘
NAT Â inside outside Â

1' ЛЬЮ ˘ ৰ Лъ 192.168.12.0/24 ў ˘ ╠
200.168.12.0/28 Â è ў a NAT Â

```
!
interface GigabitEthernet0
ip address 192.168.12.6 255.255.255.0
ip nat inside
!
interface GigabitEthernet1
ip address 200.168.12.17 255.255.255.240
ip nat outside
!
ip nat pool net200 200.168.12.1 200.168.12.15 prefix-length 28
ip nat inside source list 1 pool net200
!
access-list 1 permit 192.168.12.0 0.0.0.255
```

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३	
clear ip nat translation	NAT Â
ip nat inside destination	NAT Â
ip nat inside source	NAT Â
ip nat outside source	NAT Â
ip nat pool	⊮ IP NAT ip na 394.987 30

NAT ˘ ⅃ Л∪ ʒ **ip nat application** Â ʒ **no** ⅃ Л∪ ⅄ Â

ip nat application source list *list-num* **destination** *dest-ip*

{ **dest-change** | **src-change** } *ip-addr* [**vrf** vrf*_name*]

ip nat application source list *list-num* **destination** { **tcp** | **udp**

dest-ip port-num} { **dest-change** *ip-addr port-num* | **src-change**

ip-addr } [**vrf** vrf*_name*]

no ip nat application source list *list-num* **destination** *dest-ip*

{ **dest-change** | **src-change** } *ip-addr* [**vrf** vrf*_name*]

no ip nat application source list *list-num* **destination** { **tcp** | **udp**

dest-ip port-num} { **dest-change** *ip-addr port-num* | **src-change**

ip-addr } [**vrf** vrf*_name*]

list-num	˚ ʔ ,
dest-ip	ʔ ˘ . ʔ ˚ ˘ ⅄ ʔ 3 ʔ Ⱨ … NAT ˘ Â
tcp *dest-ip port-num*	ʔ Л∪ ⅂ ˘ ⅄ tcp ʔ Ⱨ ˚ 3 ʔ Ⱨ … NAT ˘ Â
udp *dest-ip port-num*	ʔ Л∪ ⅂ ˘ ⅄ udp ʔ Ⱨ ˚ 3 ʔ Ⱨ … NAT ˘ Â
dest-change *ip-addr port-num*	˚ Л∪ ⅂
src-change *ip-addr*	˚
vrf vrf*_name*	vrf ⅃˘ vrf

Ⱨ ‡ Â

ʒ ˘ NPE80 Э a ʒ Â

NAT ⅄˘ IP Â ⅃ Л∪ ʒ ÂЮ ʒ ⅃ ⊾(DNS relay) Â ʒ Э Â

1' ЛЮ 192.168.1.0 ў DNS ⊾ ⅃ NAT inside

IP" 192.168.1.1˘ NAT ╖ ў DNS
DNS ╘ 202.101.98.55˘ DNS ў Â ip nat
application ३ ╖ ˘ Hא '
92.10

17.1.5 ip nat inside destination

NAT ˘ ʒ **ip nat inside destination** Â
ʒ **no** NAT Â

ip nat inside destination list *access-list-number* **pool** *pool-name* [**vrf** vrf_*name*]

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

list access-list-number	lʭ ˘ ˘ pool lʭ Â ˥ IP ŷ IP 100-199 ACL Â
pool pool-name	lʭ ˘ ˘ ÿ ˦ Â
vrf vrf_name	vrf ɻ˘ vrf

Â

ʒ ˘ NPE80 a ʒ Â

˘ ɻ Ɲ TCP Â ɻ ў TCP ˘ ɻ ɻ ў TCP Ŀ Â ˘ ɻ Ɲ NAT TCP ˘ NAT … ɻ ў TCP Ŀ˘ ў ɻ ў ˘ ɻ ˘ ˦ Â è IP ˘ a ɻ˘ NAT è Â NAT TCP ˘ ɻ Ɲ ɻ ˘ ≠ ɻ Ɲ Â ў ŷ ɻ Â

1' ƝЮ ˘ ў 10.10.10.100 WWW Ŀ˘ Ŀ Э ч ɻ ŷ 10.10.10.1 à 10.10.10.2 ў ÂNAT ˘ Â

```
!
interface GigabitEthernet0
ip address 10.10.10.254 255.255.255.0
ip nat inside
!
interface GigabitEthernet1
ip address 200.168.12.17 255.255.255.240
ip nat outside
!
```

```
ip nat pool net10 10.10.10.1 10.10.10.2 prefix-length 24 type rotary
ip nat inside destination list 100 pool net10
!
access-list 100 permit ip any host 10.10.10.100
```

¾

¾	
clear ip nat translation	NAT Â
ip nat	Ħ NAT Â
ip nat inside source	NAT Â
ip nat outside source	NAT Â
ip nat pool	Ħ IP NAT
show ip nat statistics	IP NAT Â
show ip nat translations	IP NAT Â

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17.1.6 ip nat inside source

NAT ¼ Ո ¾ **ip nat inside source** Â ¾ **no** ¼ Ո ¼ ╟ NAT Â

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

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

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

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

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

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

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

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

list access-list-number	Â ɻ ˥ ˘ … NAT Â
interface interface-type interface-number	outside ˆ ˜ ˘ ≠ ɻ Â
pool pool-name	Â
Overload	ˆ ɻ ˜ pool ɻ Л ˘ Â ˘ ≠ Â Л ╗ ѝ cisco ʒ Â
static local-ip global-ip	Ѭ Â local-ip ѝ ˘ global-ip ѝ Â
static protocol	Ѭ Â protocol ɻ Л ѝ TCP UDP Â
local-port	Ь /ɬ Â TCP UDP /ɬ˘ Ь Ь Â
global-port	Ь /ɬ Â ў Ь Â /ɬ ɻ Л б a ɻ Â
permit-inside	ɻ ip nat inside source static ʒ ˘ Л global-ip local-ip ў Â Э Â
vrf vrf_name	vrf ɻ˘ vrf
match	
netmask *mask*	

NAT Â

ʒ Â

IP ѝ ˘ ɻ б ˘ NAT˘ IP IP Â

ĭ Æ˘ ѝ Э ˘ à ˘ àЮ ˘ ˘ a Ь˘ ɻ Л outside IP ˘ Л NAPT Â a NAT˘ ĭ . Э б ˘ . a ˘ ѝ Â

Ь ў ˘ NAT NAPT Â Ь ɻ ˘ a outside NAPT˘ ѝ ѝ б ISP ˘ ɻ ɻ Â Ю˘ ў Ь˘ ɻ IP ɻ Л Â Ь˘ Л IP Ь Â

NAT NAPT ˘ ╗ permit-inside Â ≠
inside Э Э no ip redirects˘ inside ⅃ Â

1' ЛЬЮ ˘ ⅃Л 192.168.12.0/24 ў ˘ ╠
200.168.12.0/28 Â è ў a NAT Â

```
!
interface GigabitEthernet0
ip address 192.168.12.6 255.255.255.0
ip nat inside
!
interface GigabitEthernet1
ip address 200.168.12.17 255.255.255.240
ip nat outside
!
ip nat pool net200 200.168.12.1 200.168.12.15 prefix-length 28
ip nat inside source list 1 pool net200
!
access-list 1 permit 192.168.12.0 0.0.0.255
```

⅋

⅋	
clear ip nat translation	NAT Â
ip nat	⊮ NAT Â
ip nat inside destination	NAT Â
ip nat outside source	NAT Â
ip nat pool	⊮ IP NAT Â
show ip nat statistics	IP NAT Â
show ip nat translations	IP NAT Â

⅄

⅋

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-	-

17.1.7 ip nat outside source

NAT˘ ⅃Л ⅋ **ip nat outside source** Â ⅋
no ⅃Л⅄ NAT Â

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

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

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

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

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

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

list access-list-number	Â ˩ ˥ ˘ … NAT Â
pool pool-name	NAT Â
static global-ip local-ip	Ьж NAT Â local-ip ˭ ˘ global-ip ˭ Â
static protocol	Ьж NAT˘ protocol ˩ Л˽ ˭ TCP UDP Â
local-port	Ь ˥ Â TCP UDP ˥˘ Ь Ь Â ˥ ˩ Л˽ б global-port a Â
global-port	Ь ˥ Â
vrf vrf_name	vrf ˫˘ vrf

NAT Â

ʒ ˘ NPE80 a ʒ Â

NAT ў Â ч ˀ ˩ IP ˘ Ѽ ˀ ˩ IP ˘ ˭ Â ч ў a ˩ ˘ ˭ ˭ ў Â NAT ж ˘ NAT˘ ў ˭ ˫ ў ˘ ˫ Â NAT ˘ ѐ ˀ ˭ ч ˀ ' 1˜ NAT ' 2˜ NAT ˘ ˫ б ˘ ˩ Л˽ NAT ╟ NAT Â

ˀ ЇА IP ˘ б ˘ Â ˫ ў ˘ DNS NAT Â

1' ЛьЮ ˘ 92.168.12.0/24 б Â ˫˘

ў ㄴ Л∪ 192.168.12.0/24 92.168.12.0/24 ў Â

```
interface GigabitEthernet0/0
ip address 92.168.12.55 255.255.255.0
```

BT ˘ ⅃ Л∪ **ip nat p2p-rate-limit**

঳ Â ঳ **no** ˘ ⅃ Л∪ a ̈Ą BT Â

ip nat p2p-rate-limit { **in** | **out** } *NUM*

no ip nat p2p-rate-limit { **in** | **out** }

```
interface GigabitEthernet 0/4
ip nat p2p-rate-limit out 192000
ip nat outside
 ip address 220.181.28.52 255.255.255.0
 duplex auto
 speed auto
!
```

३	३	
	Ip nat { inside | outside }	NAT ↵

Prefix-length *prefix-length*	NAT Â
Type	NAT Ârotary ѝ ˘ ˆ Â rotary Â Л∪ rotary б cisco ३ Â
Hardware	NPE80 ˘ ˚ ˘ NAT ‡ ˚ ˘ ⅃ Л∪ Â

Ѭ Â

३ Â

Ѭ ˘ ‡ ″I … ˘ ⅄ Ѭ Â

1' ЛUЮ ˘ … ⅄ ѝ net192 ˘ ѝ 192.168.12.1˘ ѝ 192.168.12.254˝ ѝ 24 æ Â

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

३	
address	Ѭ
clear ip nat translation	NAT Â
ip nat	Ѭ NAT Â
ip nat inside destination	NAT Â
ip nat inside source	NAT Â
ip nat outside source	NAT Â
show ip nat statistics	IP NAT Â
show ip nat translations	IP NAT Â

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⅄	
-	-

17.1.10 ip nat translation

NAT ALG ╖ ˘ ৡ **ip nat translation** Â ৡ **no** ⅃ Л∪ Â ALG Â

ip nat translation { **dns | ftp | h323 | mms | pptp | rtsp | sip | tftp** }

no ip nat translation { **dns | ftp | h323 | mms | pptp | rtsp | sip | tftp** }

dns	DNS ALG
ftp	ftp ALG
h323	h323 ALG
mms	mms ALG
pptp	pptp ALG
rtsp	rtsp ALG
sip	sip ALG
tftp	tftp ALG

ЮЎ ALG Â

ৡ

⁸ NAT ALG Â ˘ ⅄ a DNS ALG ˘ ⅃ Л∪ ৡ ὲ ˘ Â

1' ЛЮ ˘ DNS ALG

```
no ip nat translation dns
```

ৡ 6Xy0ᵀᴹ4P€MXẽ₩ÒNNNErc@H#e#”€QB29ᵀgpt‰CzXgêTẽ

17.2

ЛυЮ ৡ'

Â [show ip nat statistics](#)

Â [show ip nat translations](#)

17.2.1 show ip nat statistics

IP NAT ˘ **show ip nat statistics** ৡ Â

show ip nat statistics [*suspicious-pc* | *per-user* [*NUM*]]

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ৡ Â

show ip nat statistics *per-user* [*NUM*] PC

ㄱ Ⴑ ˘ IP à à

Â ὲ ৡ NUM NUM ˘

NUM Â

```
translate ip packet's source-ip use pool abc
```

ЮЖ ЮЎ

Total active translations	╟ Â
max entries permitted	╟ Â
Outside interfaces	Â
Inside interfaces	Â
Rule statistics	NAT ‡
NAT ‡	à à à ╟ Â
hit	‡ Â
match	ˇ ˥ Ж NAT Â
action	NAT ˇ Ж Â

ৡ	
clear ip nat translation	NAT Â
ip nat	ЮЖ NAT Â
ip nat inside destination	NAT Â
ip nat inside source	NAT Â
ip nat outside source	NAT Â
ip nat pool	ЮЖ IP NAT
show ip nat translations	IP NAT Â

ˇ

ˇ	
-	-

17.2.2 show ip nat translations

NAT ˇ show ip nat translations ৡ Â

show ip nat translations [*acl_num*] [**icmp** | **tcp** | **udp**] [**vrf** *vrf_name*] [**verbose**]

icmp	↙ icmp nat Â
tcp	↙ tcp nat Â
udp	↙ udp nat Â
acl_num	acl /↑ , ↙ acl˘
vrf_name	vrf ↓˘ vrf ↓
verbose	NAT Â

ʒ Â

ʒ ↙ Л∪ IP NAT ˘ ˘ ↑ /↑ à ↑ /↑ à ↑ /↑ à ↑ /↑ Â **verbose** ↙ Л∪ ˘ timeout ˘ à Â

1' ЛЬЮ ѝ show ip nat translations verbose ʒ Â

```
Ruijie# show ip nat translations verbose
timeout for NAT TCP flows: 86400
timeout for NAT TCP flows after a FIN or RST: 60
timeout for NAT TCP flows after a SYN : 60
timeout for NAT UDP flows: 300
timeout for NAT DNS flows: 60
timeout for NAT ICMP flows: 60
Pro Inside global     Inside local      Outside local     Outside
global timeout vrf
tcp   192.168.5.103:1987   192.168.211.21:1987   211.67.71.7:80
211.67.71.7:80 timeout=85139 1
udp  192.168.5.103:1041  192.168.211.183:1041  202.101.98.55:53
202.101.98.55:53 timeout=38 1
```

ЬЖ ЮЎ

Pro	Â “udp” ѝ UDP ’ “tcp” ѝ TCP Â“icmp” ѝ ICMP Â
Inside global	↑ /↑ Â
Inside local	↑ /↑ Â
Outside local	↑ /↑ Â
Outside global	↑ /↑ Â

timeout	NAT ˘ Æ Â
vrf	vrf

३

३	
clear ip nat translation	NAT Â
ip nat	HX NAT Â
ip nat inside destination	NAT Â
ip nat inside source	NAT Â
ip nat outside source	NAT Â
ip nat pool	HX IP NAT
show ip nat translations	IP NAT Â

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✓	
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18

18.1

18.1.1 mllb enable

mllb enable

no mllb enable

no	

1

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

-	-

NPE

10.3(4b7)	

18.1.2 mllb policy

mllb policy { **bandwidth** | **latency** | **load** | **intelligent**}

no mllb policy

bandwidth	
latency	
load	
intelligent	
no	

bandwidth â latency â load â intelligent

mllb policy

no mllb policy

bandwidth Â

1'

load

```
Ruijie(config)# mllb policy load
```

2'

```
Ruijie(config)# no mllb policy load
```

mllb enble	
bandwidth	

NPE

10.3(4b7)	

18.1.3 mllb policy intelligent

mllb policy intelligent [**bandwidth** *base1*] [**latency** *base2*] [**load** *base3*]

no mllb policy intelligent

bandwidth *base1*	1-100
latency *base2*	1-100
load *base3*	1-100
no	

1.

percent	ϯ
no	й

й 100

ϡ

й ϯ ˘ ϻ 1-100 Â

1' 95

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

ϡ	ϡ	
	mllb enable	ℸ

ϻ NPE

ϡ	ϻ	
	10.3(4b7)	ϡ

18.1.5 mllb load-sharing original

Ю ϫ IP ϻ ÿ ϫ

mllb load-sharing original

no mllb load-sharing original

	ϫ IP ϻ ϫ
no	

ϫ IP ÿ a ϫ

ϡ

ϻ˘ a ϫ IP ÿ a ϫ ˘ ‡ ϡ Â ϫ

ʎ ϡ mllb policy bandwidth Â

1' ɹ IP ɻ ɹ

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

ϡ	ϡ	
	mllb enable	ℸ

ʎ NPE

ϡ	ʎ	
	10.3(4b7)	ϡ

18.2

18.2.1 show mllb config

show mllb config ϡ Â

Ю ˘ ˘ '

show mllb config

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ϡ

1' '

20

```
----------   -----------     ---------    ------  ----------
any           9               0            0
vlan1          0               0            0        1
vlan2          0               0            0        3-5
vlan3          0               0            0        7,9
```

2' Ï' vlan1 Ł '

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

show vlan-group ȝ '

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

ȝ

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

ȷ

10.3(4b7)ЛЬ ч ȷ ˘ NPE50 â NPE80 NPE Â

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10.3(4b7)	ȝ

21

21.1

21.1.1 subscriber export

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

filename	

Â

Â

Â

1' userfile

Ruijie#subscriber export txt userfile

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10.3(4b7) NPE50 NPE80 NPE

10.3(4b7)	

21.1.2 subscriber import

Â

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

name	

Ю a Â

Â

avoid-monitor deny

1 1 1

Ruijie#**config**

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

2 1

Ruijie#**config**

Ruijie(config)#**no subscriber set** *1* **attribute avoid-monitor**

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

10.3(4b7) NPE50 NPE80 NPE

10.3(4b7)	

21.1.4 subscriber static

Â no Â

subscriber static name *name* **parent** *parent* [[**ip-host** *ip-addr*] [**mac** *mac-addr*] **\| ip-subnet** *subnet mask* **\| ip-range** *start end*]

no subscriber static name *name*

name	
parent	

ip-addr	ip ip
mac-addr	mac
subnet	Ip
mask	
start	Ip ip
end	Ip ip

ip a ă ˇ mac ‡ a è
ă Â ЛЬ ip ǂ ip ầip ip
Ь ˇ ЛЬ mac ǂ mac a mac
ч ˇ è ip ⅃ЛЬ⅃ mac ˇ ip ip
a ⅃ЛЬ⅃ mac Â mac ip ⅃ ך ˇ ЛЬ mac
ך й Â
ľ / Ł, γ Ь ǂ ╗ ˇ ip ך a
è ‡ ך Â

a ⅃ ⅃ a ⅃

1' ľ 1 Ł˘ ip ľ 192.168.196.156 Ł˘ è ľ 1 Ł˘ ľ
1 Ł ľ Ł'

Ruijie#**config**

Ruijie(config)# **subscriber static name** *1* **parent** / / *1* **ip-host** *192.168.196.156*

// ⅃ ľ /

ʌ 10.3(4b7)ЛЬ ⊣ ʌ ˘ NPE50 à NPE80 NPE Â

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ʌ	
10.3(4b7)	ʒ

21.2

21.2.1 show subscriber

Â

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

Avoid	
Deny	
Ip	ip

subscriber static name *name* **parent** *parent* [[**ip-host** *ip-addr*] [**mac** *mac-addr*] **| ip-subnet** *subnet mask* **| ip-range**

22

22.1

22.1.1 network-group

Â ⅃Л Ъ ҳ no Â

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

no network-group *name*

name	⅄ Â
ip-addr	ip ip
subnet	Ip
mask	
start	Ip ip
end	Ip ip

Â

ҳ Â

⅂ ip ˘ ⍑ ѝ ip ằip ⅁ ip
Ь Â ľ / Ŀ˘ γ Ь ⍑ ˘ ip
ך a è ‡ ך ľ / Ŀ Â

a ⅄ ⅄ a ⅄ Â

1' ip ľ network1 Ŀ 192.168.196.0 '

```
Ruijie#config
Ruijie(config)#network-group name network1 ip-subnet 192.168.196.0 255.255.255.0
```

2' ľ network1 Ŀ'

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


show network-group [name]

```
network2        0          0          0        192.168.197.1
network3        0          0          0        192.168.197.2
```

2' network1 '

```
Ruijie#show network-group network1
network-group police_flow police_url flow     ip
------------  -------     --------   ------   ----------
/              0          0          0
network1        0          0          0        192.168.197.3
```

show network-group ȝ '

Network-group	ȷ
Police_flow	‡
Police_url	url ‡
Flow	
Ip	ip

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

ȷ 10.3(4b7)ЛЧ ȷ ˘ NPE50 à NPE80 NPE Â

ȝ

ȷ	
10.3(4b7)	ȝ

23

23.1

23.1.1 identify-application custom

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

im˘ ὴ 111˘ ὴ 2020˘ ὴ udp˙

Ruijie#**config**

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

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

10.3(4b7)Л Ч Л ˘ NPE50 à NPE80 NPE Â

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10.3(4b7)	

23.1.3 identify-application inhibitive

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identify-application inhibitive *app-name*

app-name	┘

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1' MSN ╕ '

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

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

10.3(4b7)Л Ч Л ˘ NPE50 à NPE80 NPE Â

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10.3(4b7)	

23.1.4 identify-application key

identify-application key *app-name*

app-name	

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

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identify-application signature update

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

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

⊿ 10.3(4b7)Л ⊣ ⊿ ˇ NPE50 à NPE80 NPE Â

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10.3(4b7)	ϡ

23.2

23.2.1 show identify-application

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show identity-application

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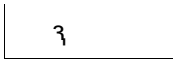

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10.3(4b7)

10.3(4b7)	

23.2.2 show identify-application class

show identity-application class

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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             5-0-0-0
                6-0-0-0
HTTP            7-0-0-0
                8-0-0-0
                9-0-0-0
               10-0-0-0
                   11-0-0-0
                12-0-0-0
                13-0-0-0
```

14-0-0-0

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10.3(4b7)	ʒ

23.2.4 show identify-application inhibitive

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show identity-application inhibitive

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show identity-application key

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

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10.3(4b7)

10.3(4b7)	

23.2.6 show identify-application userdef-rule

show identity-application userdef-rule

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```
Ruijie#show identity-application userdef-rule
TYPE  NAME              CLASS             SPL    SPH    DPL    DPH
TCP                       ⅏               1      10     1      100
TCP   myqq                .               any    any    200    888
UDP   myxunlei          myp2p             18     18     any    any
```

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10.3(4b7)	ϡ

23.2.7 show identity-application version

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show identify-application version

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```
Ruijie#show identity-application version
Version' 1.0
Date' 2010-1-8
```

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10.3(4b7)

10.3(4b7)	

23.3

23.3.1 identify-application clear key-inhibitive group

identify-application clear key-inhibitive group

-	-

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

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

ʌ 10.3(4b7)ЛЬ ⊣ ʌ ˘ NPE50 à NPE80 NPE Â

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10.3(4b7)	ʒ

24

24.1

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- Â change-priority
- Â channel-default
- Â channel-group
- Â channel-tree
- Â flow-control
- Â flow-policy
- Â flow-rule

24.1.1 change-priority

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change-priority rule1 *rule1-pri-num* **rule2** *rule2-pri-num*

rule1-pri-num	‡ ˮI Л
rule2-pri-num	ү ‡ ˮI Л

Â

ҳ ⁸ Â

‡ ˮI Л ﻝ ЛЬ **show flow-control-policy rule** [**group** *name*]
Pri_num Â

⁸ group1 Ю ˮI Л 1 2 ч ‡ ˮI '

```
Ruijie#config
Ruijie(config)#flow-control group1
Ruijie(config-flow-control)#change-priority rule1 1 rule2 2
```

show flow-control-policy rule [group *name*]	‡ ¸ Ю ‡ Â

NPE40 NPE60

10.3(4b7)	

24.1.2 channel-default

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channel-default *channel-name*

no channel-default

channel-name	

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channel-tree Â

```
ľ test Ł Ю Э ľ depart5 Ł и '
Ruijie(config)#flow-control test
Ruijie(config-flow-control)#channel-tree inbound
Ruijie(config-channel-tree)#channel-default depart5
```

channel-group	…
channel-tree	…

NPE40 NPE60

session-limit session_limit_num	**per-mask** ѝ 32˝ . ѝ IP Per-net ˩ Л˅ ˘ 8 IP ˘ 1˙ 65535˝ a 8 IP

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… ˘ **pri** ˘ ˝І ѝ 4˝ **schedule-type**

˘ ѝ **fifo**

channel-tree Â

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cir ˘ **cir** б ѐ ’І **cir** **cir**ˈ

pir ˘ **pir** **pir**ˈ

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‡ Â

1' group1'
Ruijie#**config**
Ruijie(config)#**flow-control** *group1*
Ruijie(config-flow-control)#
2' group2'
Ruijie#**config**
Ruijie(config)# **flow-control** *group2*
Ruijie(config-flow-control)#
3' group1'
Ruijie#config
Ruijie(config)#**no flow-control** *group1*

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flow-policy	wan ⁸

NPE40˘ NPE60

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10.3(4b7)	ϡ

24.1.6 flow-policy

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Э Â

flow-policy *name*

no flow-policy

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

flow-rule *num* **session-limit** *session-num* **action** {**drop** | **log-drop** | **pass** [**in-channel** *in-channel-name*] [**out-channel** *out-channel-name*]} [**commet** *string*]

no flow-rule *num*

num	‡ /ˇ 1˙ 8192
vlan-group-name	‡ vlan-group ˇ any ˥ Â
subscriber-name	‡ subscriber ˇ any ˥ Â
network-group-name	‡ network-group ˇ any ˥ Â
app-group-name	‡ app-group ˇ any ˥ Â
time-rang-name	‡ time-rang
session-num	‡ ˇ ˥ ˇ 0˙ 4000000˝ 0 a ⁸
in-channel-name	‡ in-channel
out-channel-name	‡ out-channel
string	‡

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a num /ˡ a ˇ ‡ Â ‡ ˥ ‡ /
ˮl ˇ ‡ ˚ ‡ ч ˦ à Л ˥
à ‡ ⁸ WAN Э Â

pass out-channel *3M*

2' 8 group2 Ю˘ 8 Ώ Λ Ь Э a sina˘ a 8'

```
Ruijie#config
Ruijie(config)#flow-control group1
Ruijie(config-flow-control)#flow-rule 1 vlan-group any subscriber
       Ь network-group sina app-group any time-rang work
Ruijie(config-flow-control)#flow-rule 1 session-limit 0 action
drop
```

3' 8 group1 Ю ‡ 1'

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

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

NPE40˘ NPE60

10.3(4b7)	

4.2

flow-control *Name*	
inbound	
outbound	
channel-group *channel-nam*	

channel-group *channel-name*

```
Ruijie#show flow-control test inbound channel-group root
group-name  cir  pir  pri  schedule CIDR/cir/pir/limit/sess-limit
----------  --   --   --   -------- ------------------------
root        100  100  4    per-net  32/10/10/10/100
```

```
Ruijie#show flow-control test inbound
group-name  cir  pir  pri  schedule CIDR/cir/pir/limit/sess-limit
----------  --   --   --   -------- ------------------------
root        100  100  4    per-net  32/10/10/10/100
part1       100  100  4    fifo
```

group-name	
Cir	
Pir	
Pri	
Schedule	
CIDR/cir/pir/limit/sess-limit	Per-net

-	

NPE40 NPE60

10.3(4b7)	

24.2.3 show flow-control-policy rule

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

name	

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```
Ruijie#show flow-control-policy rule
Pri_num grp_id rule_num ifx   vlan_id    subs_id    net_wk_id  app_id
ichl_id ochl_id ses_num ses_lim effec
1       0       1        0     0         814695740  0          0
NA      2       0       2000   0
2       0       2        0     18661884   18577704  18577496   0
1       NA      0       2000   0
3     1    3        6     18661884    18577704   18577496   4294967290
1       1       0       2000   1
Ruijie#show flow-control-policy rule group group1
Pri_num grp_id rule_num ifx   vlan_id    subs_id    net_wk_id  app_id
ichl_id ochl_id ses_num ses_lim effec
1       0       1        0     0         814695740  0          0
NA      2       0       2000   0
2       0       2        0     18661884   18577704  18577496   0
```

25

25.1

25.1.1 flow-audit enable

Â no Â

flow-audit enable

no flow-audit enable

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```
Ruijie#config
Ruijie(config)#flow-audit enable
```

2'

'

```
Ruijie#config
Ruijie(config)#no flow-audit enable
```

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NPE

10.3(4b7)-	

25.2

25.2.1 show flowrate application

show flowrate application {**interface** *interface-name* **| bridge** *bridge-name*}
s | bridg]49f 0.0002 Tc 0.3 0.00 Td0 1 Tf -36.891 ([460.00 Td[1 Tf -0.0002 Tc 0.35 91 0 3 0.00 Tc

day-interval by-group by-type

1 gigabitEthernet 0/1

```
Ruijie#show flowrate application interface gigabitEthernet 0/1
path:GigabitEthernet 0/1
Application                Subscriber-num
PASS:          Upload(bps)          Download(bps)        Upload(pps)
Download(pps)
DROP:          Upload(bps)          Download(bps)        Upload(pps)
Download(pps)
App1           46
  62597              65955              15                 17
  0                  0                  0                  0
```

2 bridge 0

```
Ruijie# show flowrate application bridge 0 by-group
path:bridge-map 0
Application_group
PASS:          Upload(bps)          Download(bps)        Upload(pps)
Download(pps)
DROP:          Upload(bps)          Download(bps)        Upload(pps)
Download(pps)
App_group1
  211              249                0                  0
  0                0                  0                  0
```

3 bridge 0 2010 1 9 2010 1 9

```
Ruijie# show flowrate application bridge 0 by-group day-interval
2010 1 9 to 2010 1 9
path:bridge-map 0
day-interval: 2010-1-9 ~ 2010-1-9
Application_group
PASS:  Upload(KB)          Download(KB)           Upload(packets)
Download(packets)
DROP:  Upload(KB)          Download(KB)           Upload(packets)
Download(packets)
P2P
  0                6                24                 24
  0                0                0                  0
```

/HTTP

5229 116742 59983 89151

0 0 0 0

/ QQ

220 135 1349 1290

0 0 0 0

27684236 159994 363431164 226927

0 0 0 0

/Lotus-Notes

793 772 5327 4766

0 0 0 0

32 252 567 635

0 0 0 0

/NETBIOS

2 98 24 1187

0 0 0 0

0 2 0 4

0 0 0 0

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NPE a day-interval

channel_groupC/ channel_nameC

down 39632 , 61

0 , 0

2' Й NBR

10.3(4b7)	

25.2.4 show flowrate ip

show flowrate ip {**interface** *interface-name* **| bridge** *bridge-name*} [**subscriber-group** *subscriber-group*] {[**by-group**] |[**subscriber** *subscriber-name*] [**ip** *ip-address*] [**application** *application-name*] [**application-group** *application-group*] [**application-type** *application-type*] }[**day-interval** *begin-year begin-month begin-day* **to** *end-year end-month end-day* [**hour-interval** *begin-hour1* **to** *end-hour1 begin-hour2* **to** *end-hour2*] [**order-by** {{**pass** | **drop**} {**upload** | **download**} | **ip** | **subscriber**} {**desc** | **asc**}[**top** *n* [**detail**]]]

interface-name	
hour	
subscriber-name	
subscriber-group	
Ip-address	IP
application-name	
application-group	
application-type	
begin-hour	
begin-day	
begin-month	
begin-year	
end-day	
end-month	
end-year	
begin-hour	
end-hour	
begin-hour2	2
end-hour2	2
n	n

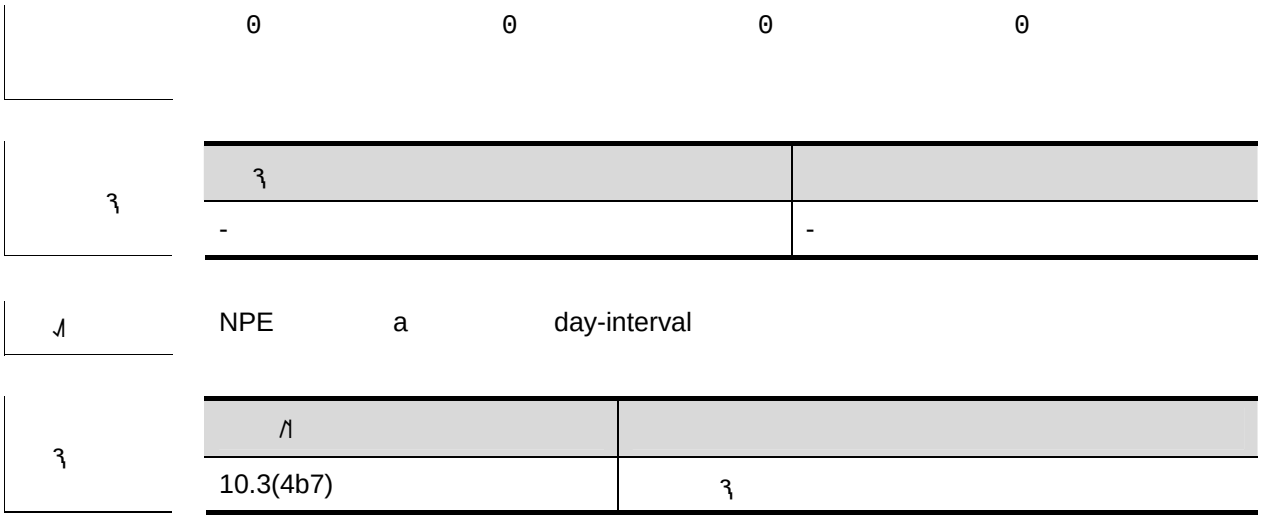
IP a

day-interval,hour-interval

begin-year begin-month begin-day end-year end-month end-day begin-hour end-hour begin-hour2 end-hour2 ˘ 2 ' order-by ‡˘ top n n '

1' HO˘ gigabitEthernet 0/1 '

```
Ruijie#show flowrate ip interface gigabitEthernet 0/1
Subscriber                Application-num
PASS: Upload(bps)    Download(bps)   Upload(pps)    Download(pps)
DROP: Upload(bps)    Download(bps)   Upload(pps)    Download(pps)
/User_groupA/User_nameA 1
  230              134              0               0
 Applic3 Tc -29.647 -10(/UsSS: )-rpA/User_namEA 1
```



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10.3(4b7)	

25.2.5 show flowrate ip-application

IP IP

show flowrate ip-application {**interface** *interface-name* **| bridge** *bridge-name*} [**subscriber-group** *subscriber-group*] [**subscriber** *subscriber-name*] [**ip** *ip-address*] [**application-group** *application-group*] [**application-type** *application-type*] [**application** *application-name*] [**day-interval** *begin-year te i76 0.24 0.4*

begin-hour2	2
end-hour2	2
n	n

IO IP IP '

day-interval '

1' IO gigabitEthernet 0/1 IP '

```
Ruijie#show flowrate ip-application interface gigabitEthernet 0/1
path:GigabitEthernet 0/1
Subscriber          Application
PASS: Upload(bps)    Download(bps)   Upload(pps)    Download(pps)
DROP: Upload(bps)    Download(bps)   Upload(pps)    Download(pps)
/user_groupA/user_nameA       applicationA
  46003            2093107          93              173
  0                0               0               0
/user_groupB/user_nameB       applicationB
  46001            2093102          193              173
  0                0               0               0
/user_groupC/user_nameC       applicationC
  4003            1093107          63               73
  0                0               0               0
```

2' IO bridge 0 2010 1 9 /

```
Ruijie# show flowrate ip-application bridge 0 day-interval 2010 1
9 to 2010 1 9
 path:bridge-map 0
day-interval: 2010-1-9 ~ 2010-1-9
time-interval(min): 60
count:5
Subscriber          Application
PASS:  Upload(KB)          Download(KB)           Upload(packets)
Download(packets)51  TD(time-ici(c18iFF5>6<14E300(wnload(KB)        )-6(
```

```
0               0               0               0
/User_groupB/User_nameB          NETBIOS-DGM
0               56              0               346
0               0               0               0
/User_groupC/User_nameC          NETBIOS-NS
0               31              0               699
0               0               0               0
/User_groupD/User_nameD               TCP
0               6               0               29
0               0               0               0
/User_groupE/User_nameE               UDP
0               82              0               156
0               0               0               0
```

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NPE a day-interval

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10.3(4b7)	ϡ

25.2.6 show online ip

Ю IP Э à ˥ IP Э Â

show online ip {**interface** *interface-name* **| bridge** *bridge-name*} [**subscriber** *subscriber-name*] [**subscriber-group** *subscriber-group*] [**ip** *ip-address*] [{**day-interval** *begin-year begin-month begin-day* **to** *end-year end-month end-day* [**hour-interval** *begin-hour* **to** *end-hour begin-hour2* **to** *end-hour2*]}] **[]]**

[{

IP AuthType LoginTime OnlineTime(min)
PASS-Upload(KB) PASS-Download(KB) DROP-Upload(KB)
DROP-Download(KB)
/User_groupA/User_nameA
192.168.196.37 2010-1-7 20:43 1255
485103 7718860 0 0
/User_groupB/User_nameB
192.168.203.27 2010-1-8 9:5 514
65293 2320266 0 0
/User_groupC/User_nameC
192.168.196.63 2010-1-7 13:47 1671
79176 1410420 0 0
/User_groupD/User_nameD
192.168.196.74 2010-1-7 9:37 1922
5830311 1275917 0 0
/User_groupE/User_nameE
192.168.203.39 2010-1-8 8:48 530
42329 515173 0 0
/User_groupF/User_nameF
192.168.196.72 2010-1-7 9:37 1922
274249 396572 0 0
/User_groupG/User_nameG
192.168.203.48 2010-1-7 9:37 1922
55562 380214 0 0
/User_groupH/User_nameH
192.168.196.70 2010-1-7 9:37 1922
105615 285195 0 0
/User_groupI/User_nameI
192.168.196.55 2010-1-7 9:37 1922
33071 205676 0 0
/User_groupJ/User_nameJ
192.168.203.40 2010-1-7 9:37 1922
15904 160891 0 0

3' Ю˜ gigabitEthernet 0/1 2010 1 8 /\ 1 3 ip Э ˘ Ю ⁄'

Ruijie# **show online ip interface** *gigabitEthernet 0/1* **day-interval 2010 1 8 to 2010 1 8 hour 1 to 3 order-by pass download desc**
path:GigabitEthernet 0/1

```
Subscriber
IP              OnlineTime(min)
PASS-Upload(KB)         PASS-Download(KB)         DROP-Upload(KB)
DROP-Download(KB)
/User_groupC/User_nameC
192.168.196.37     180
  75381            1193654          0               0
/User_groupD/User_nameD
192.168.203.36     180
  381              3120             0               0
/User_groupE/User_nameE
192.168.196.53     180
  206              1457             0               0
/User_groupF/User_nameF
192.168.196.63     135
  142              1437             0               0
```

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ʃ NPE a day-interval

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10.3(4b7)	ʒ

25.2.7 show online ip-application

Ю IP à Э à Â

show online ip-application {**interface** *interface-name* **| bridge** *bridge-name*} [**subscriber** *subscriber-name*] [**subscriber group** *subscriber-group*] [**ip** *ip-address*] [**application** *application-name*] [**application-group** *application-group*] [**application-type** *application-type*] [**order-by** {{**pass** | **drop**} {**upload** | **download**} | **ip** | **subscriber** | **application**} {**desc** | **asc**}[**top** *n*]]

interface-name	Ь ɻ ˘ Ю
bridge-name	ɻ˘ Ю

subscriber-name	
subscriber-group	
Ip-address	IP
application-name	
application-group	
application-type	
n	n

Ю IP à Э à Â
ip,subscriber,subscriber-group,application,application-group
order-by ' top n n

1' Ю bridge-map0 IP Э '

```
Ruijie#show online ip-application bridge 0
path:bridge-map 0
Subscriber
IP              Application
LoginTime       OnlineTime(min)
PASS-Upload(KB)           PASS-Download(KB)           DROP-Upload(KB)
DROP-Download(KB)
/User_groupA/user_nameA
 192.168.196.14          UDP
  2010-1-8 19:7         0
   24             0             0             0
/user_groupB/user_groupB
 192.168.196.15          UDP
  2010-1-8 19:7         0
   24             0             0             0
/User_groupC/User_nameC
 192.168.196.16          UDP
  2010-1-8 19:7         0
   24             0             0             0
```

2' Ю gigabitEthernet 0/1 IP й 192.168.196.70
IP

```
Ruijie#show online ip-application  interface gigabitEthernet 0/1 ip
192.168.196.70
```

```
path:GigabitEthernet 0/1
Subscriber
IP                Application
LoginTime         OnlineTime(min)
PASS-Upload(KB)         PASS-Download(KB)         DROP-Upload(KB)
DROP-Download(KB)
/user_groupA/user_nameA
 192.168.196.70       by_pass
  2010-1-7 9:37         2032
   107182            327352           0                0
```

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10.3(4b7)	ϡ

25.2.8 show online statistic

Ю ˘ hour IP Л Ч ’

show online statistics{**interface** *interface-name* **| bridge** *bridge-name*} [{**detail|recent** *hour* **| time-interval** *begin-year begin-month begin-day begin-hour* **to** *end-year end-month end-day end-hour*}]

interface-name	Ь Ј ˘ Ю
bridge-name	Ј˘ Ю
hour	
begin-year	
begin-month	
begin-day	
begin-hour	
end-year	
end-month	
end-day	
end-hour	

ʒ

a ЮЎ ЮО IP '
detail ε IP ˘ ' recent
hour IP ⊣ ˘ time-interval
begin-hour begin-day begin-month begin-year to end-hour end-day end-month
end-year IP ⊣ '

1' ЮЎ bridge-map0 IP ˘

```
Ruijie#show
```

8	99	666
9	97	542
10	96	885
11	97	986
12	95	820

-	-

NPE a recent à time-interval

10.3(4b7)	

26

26.1

26.1.1 ping

ϡ ˘ ˩ ʃʊ ╟ à Æ
Â ϡ ЮՎ

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

ð Ô

vrf-name	VRF ˩
ip-address	IPv4 Â
length	

ˇ ˇ ping ╖ ˇ ﾉ ≠ Â
ﾉ ╖ ˇ ‡ ˝I ﾉ ┺ ˇ é DNS ¦ Â

ð Ô

ping '

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

ping '

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

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

ð ﾉ Ô

¾ Э Â

26.1.2 Traceroute

traceroute ¾ˇ ┘Ո ÿ
.

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

ð Ô

vrf-name	VRF ﾉ
Ip-address	IPv4 Â

number	
source-address	IPV4
seconds	
minimum maximum	TTL

ð ʒ Ô

ð Ô

traceroute ʒ ў ˘ ˘ Æ
Æ Â ɻ ╖ ˘ ‡ ″I ɻ Ł ˘ é DNS
ɬ Â

ð Ô

ЛЬЮ й traceroute ч ˘ й ˘ й
a Â

1 à traceroute '

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

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

ÿ Э ˘ ɻЛ ˘ ÿ IP й 61.154.22.36 ў ˘
ˆ 1˙ 6˜ ˘ ɻ ˘
ɬ ˘ Â

2 à a traceroute '

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

1     192.168.12.1    0 msec  0 msec  0 msec
2     192.168.9.2       0 msec  4 msec 4 msec
```

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

ÿ Э ˘ ٦Л ˘ ÿ IP ѝ 202.108.37.42 ў ˘
ˆ 1˙ 17˜ ˘ з 4 Â

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

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

1     192.168.217.1   0 msec  0 msec  0 msec
2     10.10.25.1        0 msec  0 msec  0 msec
3     10.10.24.1        0 msec  0 msec  0 msec
4     10.10.30.1        10 msec 0 msec  0 msec
5     218.5.3.254       0 msec  0 msec  0 msec
6     61.154.8.49       10 msec 0 msec  0 msec
7     202.109.204.210    0 msec  0 msec  0 msec
8     202.97.41.69      20 msec 10 msec 20 msec
9     202.97.34.65      40 msec 40 msec 50 msec
10    202.97.57.222     50 msec 40 msec 40 msec
11    219.141.130.122    40 msec 50 msec 40 msec
12    219.142.11.10     40 msec 50 msec 30 msec
13    211.157.37.14     50 msec 40 msec 50 msec
14    222.35.65.1       40 msec 50 msec 40 msec
15    222.35.65.18      40 msec 40 msec 40 msec
16    222.35.15.109     50 msec 50 msec 50 msec
17    *      *      *
18   64.170.98.32     40 msec 40 msec 40 msec
```

ð ٨ Ô

ϡ Э Â

26.1.3 Line-detect

line-detect ϡ˘ ϟЛυ Â

line-detect

ð Ô

ð ϡ Ô

ð Ô

line-detect ϡ ў ˘ ˆ ~ ˘
Æ Æ Â

ð Ô

```
Ruijie(config)#int gigabitEthernet 3/1
Ruijie(config-if)#line-detect
start cable-diagnoses,please wait...
cable-daignoses end!this is result:
4 pairs
pair state     length(meters)
---- ---------- --------------
A      Ok          2
B      Ok          1
C      Short       1
D      Short       1
```

ϡ '
pairs' ˘ ϟ ϗ Â
State' ˘ Ь ' OK˝ ~ ˘ Short˝ ~ ˘ Open˝ ~ Â
Ю˝ ¨І ϟ A à B ч й OK˝ C à D ч й Short Â ¨І ϟ
A à B à C à D й OK Â
Length: ˘ Æ й Â ϟ state й OK Â ϗ ˘
/Ѓ ˘ Лυ ϟ Â
й Short Open length Â

ð ϗ Ô

DHCP ३

27.1.2 client-identifier

ᵻ DHCP ˆ Ո Ὼ ⁸ ~ ˇ DHCP
ৡ **client-identifier** Â ৡ **no** ˩ Ո Â

client-identifier *unique-identifier*

no client-identifier

ð Ô

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

ð Ô

Â

ð ৡ Ô

DHCP

ð Ô

DHCP DHCP ᴸ ᛏ IP

३

host	¯ IP Â DHCP Â
ip dhcp pool	¯ DHCP ¸ ˇ DHCP Â

27.1.4 default-router

¯ DHCP ˇ DHCP ¯ **default-router** Â
¯ **no** ¸ Ո ¯ Â

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

no default-router

ð Ô

	DHCP DHCP
ip-address	¯ IP Â Â
ip-address2…ip-address8	ˆ ¸ ˜ ¸ Ո 8 Â

ð Ô

¯ Â ð ¯ ¸ DHCP

27.1.5 dns-server

Ю DHCP DNS ˇ DHCP ¾ **dns-server** Â
¾ **no** Л П DNS Ю Â

dns-server { *ip-address* [*ip-address2…ip-address8*] |
use-dhcp-client *interface-type interface-number* }

no dns-server

ð Ô

ip-address	Ю DNS Ю IP Â Â
ip-address2…ip-address8	^ Л ~ Л П 8 DNS Ю Â
use-dhcp-client *interface-type interface-number*	RGOS ° DHCP DNS Ю ˇ й DHCP DNS Ю Â

ð Ô

Ю DNS Ю Â

ð ¾ Ô

DHCP

ð Ô

Ю DNS Ю ˇ ″I ˇ DHCP Л б DNS Ю

ip dhcp pool	¤ DHCP ¦ ¨ DHCP Â

27.1.6 domain-name

¤ DHCP ¦ ¦¨ DHCP ¢ **domain-name** Â ¢ **no** ¬ Ð ¦ ¦ Â

domain-name *domain-name*

no domain-name

ð Ô

domain-name	¤ DHCP ¦ ¦ Â

ð Ô

¦ ¦ Â

ð ¢ Ô

DHCP

ð Ô

DHCP ¦ ¦ ¦¨ ¢ ¬ ¦ ¦ ÿ ¨ ÿ ¦ ¬ Ð Â

ð Ô

ÐÞÖ ¨ DHCP ¤ ¦ ¦ i-net.com.cn Â

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

ð ¢ Ô

¢	
dns-server	¤ DHCP DNS ¦
ip dhcp pool	¤ DHCP ¦ ¨ DHCP Â

27.1.7 hardware-address

Ì¾ DHCP ˚ ˘ DHCP ¾ **hardware-address** Â
¾ **no** ˩ Ո ˚ Ì¾ Â

hardware-address *hardware-address type*

no hardware-address

ð Ô

hardware-address	Ì¾ DHCP MAC Â DHCP

type

27.1.8 host

lѫ DHCP ў IP ˇ DHCP ʒ **host** Â
ʒ **no** ˩ Ո DHCP IP lѫ Â

host *ip-address* [*netmask*]

no host

ð Ô

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

ų Ô IP Â

ê DHCP ѫ

â

27.1.9 ip address dhcp

Л∪ PPP à HDLC à FR DHCP IP ˘
ৡ **ip address dhcp** Â ৡ **no** ⅄ Л∪ ⅄ Â

ip address dhcp

no ip address dhcp

ð Ô

a DHCP IP Â

ð ৡ Ô

ð Ô

RGOS ˚ DHCP ˘ IP ˘ DHCP Ł
' 1˜ DHCP 1˜ ' 2˜ DHCP 3˜ ⅄ Э
' 3˜ DHCP 6˜ DNS Ł ' 4˜ DHCP 15˜ ў ⅄
⅄' DHCP 44˜ WINS Ł Â

RGOS ˚ PPP à FR à HDLC Э dhcp ˘
Ł ˘ Ł
╖

ð Ô

ЛυЮ ˘ GigabitEthernet 0 ╟ IP Â

```
interface GigabitEthernet 0
ip address dhcp
```

ð ৡ Ô

ৡ	
dns-server	Ⱨ DHCP DNS Ł
ip dhcp pool	Ⱨ DHCP ⅄ ˘ DHCP Â

27.1.10 ip dhcp excluded-address

Ⱨ IP ˘ DHCP Ł a è† DHCP ˘
ৡ **ip dhcp excluded-address** Â ৡ **no** ⅄ Л∪ ⅄ Ⱨ Â

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

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

ð Ô

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

ð Ô

DHCP Ł ¦ IP Â

ð ʒ Ô

ð Ô

IP ˘ DHCP Ł ¦ DHCP IP Â ʒ ˩ Л ט ŷ IP ˘ ¦ DHCP Â ₩ IP ˘ ≠ ˩ Л DHCP Ł ¦ ă Â

ð Ô

ЛЬЮ ˘ DHCP Ł a ¦ 192.168.12.100~150 IP Â

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

ð ʒ Ô

ʒ	

number	ˆ ˩ ˜ ÿ 0 10̋ 0 ping Â ping ч Â

ð Ô

ping ѝ 2 Â

ð ʒ Ô

ð Ô

DHCP Ļ ÿ DHCP ĭ IP ˇ ping
Ї Ѐ ў ´ ˇ ´ Ю ˇ ´ ĭ DHCP Â
Ping ѝ ч ˇ ˩Л 10 Â

ð Ô

ЛЮ ˇ ping ѝ 3 Â

```
ip dhcp ping packets 3
```

ð ʒ Ô

ʒ	

milli-seconds	DHCP ᒷ ping ˆ Л ˜ Â ᔦ ᕀ 100 10000 Â

ð Ô

ᕀ 500 Â

ð ৡ Ô

ð Ô

ᖻ ping Â

ð Ô

ЛЮ ˇ ping ᕀ 600ms Â

```
ip dhcp ping timeout 600
```

ð ৡ Ô

ৡ	
clear ip dhcp conflict	DHCP ă Â
ip dhcp ping packets	ᖻ DHCP ᒷ ↑ ˇ ă ping Â
show ip dhcp conflict	DHCP ᒷ ↑ ˇ ă Â

27.1.13 ip dhcp pool

ᖻ DHCP ᔭ DHCP ˇ ৡ **ip dhcp pool** Â ৡ **no** ᔦ Л DHCP Â

ip dhcp pool *pool-name*

no ip dhcp pool *pool-name*

ð Ô

ᕼ DHCP Â

ð ৡ Ô

ð Ô

ৡ˘ DHCP ˘ ӥ'

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

˘ ᒧ Ո IP à DNS ᒪ à Â

ð Ô

ՈЮ ˘ ᕼ ᒧ ӥ mypool0 DHCP Â

```
ip dhcp pool mypool0
```

ð ৡ Ô

ৡ	
host	ᕼ IP Â DHCP Â
ip dhcp excluded-address	ᕼ DHCP ᒪ a ᛏ IP Â
networkˆ DHCP˜	ᕼ DHCP ᐣ Â

27.1.14 lease

ᕼ DHCP ᒪ ᛏ ˘ DHCP ৡ **lease** Â ৡ **no** Â

lease { *days* [*hours*] [*minutes*] | **infinite** }

no lease

ð Ô

days	ᕼ ˘ Ո ӥ Æ Â
hours	ˆ ᒧ ˜ ᕼ ˘ Ո ӥ Æ Â ᕼ ᕼ Â

minutes

ip-address2…ip-address8	ˆ ¸ ˜ ¸Л∪ 8 WINS Ь Â

ð Ô

Ьѫ WINS Ь Â

ð ¾ Ô

DHCP

ð Ô

Ьѫ WINS Ь ˘ ″I ˘ DHCP ¸ б WINS Ь ˘ Ю WINS Ь Â

ð Ô

ЛUЮ ˘ й DHCP WINS Ь 192.168.12.3 Â

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

ð ¾ Ô

¾	
ip address dhcp	DHCP ¸ IP Â
ip dhcp pool	Ьѫ DHCP ˛ ˘ DHCP Â

27.1.16 netbios-node-type

Ьѫ DHCP ў NetBIOS ˘ DHCP

type	ЊЖ NetBIOS ˘ ч Â ЊЖ˝ ÿ 0~FF˝ Ѝ ⁸ ˘ ↙ ↙ ЛЬЮ ' Õ 1˝ ҃ b-node' Õ 2˝ ҃ p-node' Õ 4˝ ҃ m-node' Õ 8˝ ҃ h-node Â ЊЖ' Õ b-node˘ ' Õ p-node˘ ' Õ m-node˘ ⁄ ' Õ h-node˘ ⁄ Â

ð Ô

ЊЖ NetBIOS Â

ð ҃ Ô

DHCP

ð Ô

DHCP NetBIOS ' 1˝ Broadcast˝ ˘
NetBIOS ⁄ ' 2˝ Peer-to-peer˝ ˘
WINS Ь NetBIOS ⁄ ' 3˝ Mixed˝ ⁄ ˘ ″I
⁄ ˘ ⁄ б WINS Ь ⁄ ' 4˝ Hybrid˝ ⁄
˘ ″I WINS Ь NetBIOS ⁄ ˘ ˘
NetBIOS ⁄ Â

Ю˝ й ⁄ Â WINS
Ь ˘ й ' WINS Ь ˘ й ⁄ Â
NetBIOS й Hybrid Â

ð Ô

ЛЬЮ ˘ DHCP NetBIOS й ⁄ Â

```
netbios-node-type h-node
```

ð ҃ Ô

27.1.17 network ō DHCP Ǒ

Ⱶ DHCP /ʅ ˇ DHCP ϟ **network** Â
ϟ **no** ˩ Ʌ Ⱶ Â

network *net-number net-mask*

no network

ð Ô

net-number	DHCP IP /ʅ Â
net-mask	DHCP IP Â Ⱶ ˇ ỳ Â

ð Ô

Ⱶ /ʅ Â

ð ϟ Ô

DHCP

ð Ô

Ⱶ ˧ ὲ ˇ ỳ DHCP Ꝉ ˩ʈ
Â ˇ ĭ ‡ ˩ ʈ Â
DHCP ʈ ˇ ˇ DHCP
ˇ Ю ˇ ʈ
Â

ʈ ˩ **show ip dhcp binding** ϟ ˇ ă ˩
show ip dhcp conflict ϟ Â

ð Ô

Ʌ Ю ˇ Ⱶ DHCP /ʅ ỳ 192.168.12.0ˇ ỳ
255.255.255.240 Â

```
network 192.168.12.0 255.255.255.240
```

ð ϟ Ô

ϟ	
ip dhcp excluded-address	Ⱶ DHCP Ꝉ a ʈ IP Â

ip dhcp pool	¤ DHCP ¬ ˘ DHCP Â

27.1.18 next-server

¤ DHCP ╟ ╟ Ł ˘ DHCP
¶ **next-server** Â ¶ **no** ¬ Л ╟ Ł ¤ Â

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

no next-server

ð Ô

ip-address	¤ ╟ Ł IP ˘ и TFTP Ł Â Â
ip-address2…ip-address8	^ ¬ ~ ¬ Л 8 ╟ Ł Â

ð Ô

Â

ð ¶ Ô

DHCP

ð Ô

¤ ╟ Ł ˘ ″I ˘ DHCP ¬ б
╟ Ł ˘ Ю ╟ Ł Â

ð Ô

ЛЮ ˘ и DHCP ╟ Ł 192.168.12.4 Â

```
next-server 192.168.12.4
```

ð ¶ Ô

¶	
bootfile	¤ DHCP ╟ ˚ ¬
ip dhcp pool	¤ DHCP ¬ ˘ DHCP Â
ip help-address	¤ Helper
option	RGOS ˚ DHCP Ł Â

27.1.19 option

DHCP Ь ˘ DHCP ҄ **option** Â ҄ **no** ˩ Л∪ option Ѭ Â

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

no option

ð Ô

code	Ѭ DHCP ҄ Â
ascii *string*	Ѭ ASCII Â
hex *string*	Ѭ Ὼ ˢ Â
ip *ip-address*	Ѭ IP Â

ð Ô

Â

ð ҄ Ô

ð Ô

DHCP ˢ˘ TCP/IP ў Â DHCP ж option ˘ ϯ ѝ ˩ ˩ ˘ ˩ Л∪ Ѭ˝ DHCP 312 option DHCP Â ˀ DHCP ≠ ѝ Â DHCP option Ѭ˝ RFC 2131 Â

ð Ô

ЛЬЮ ˘ ҄ 19 Ѭ˝ ᾱ DHCP ї IP Â 0 IP ’ 1 IP Â ЛЬЮ ˘ DHCP IP Â

```
option 19 hex 1
```

ЛЬЮ ˘ ҄ 33 Ѭ˝ DHCP ˘ DHCP ч ' 1˜ 172.16.12.0˝ 192.168.12.12’ 2˜ 172.16.16.0˝ 192.168.12.16 Â

```
option 33 ip 172.16.12.0 192.168.12.12 172.16.16.0
192.168.12.16
```

ð ৡ Ô

ৡ	
ip dhcp pool	⊮ DHCP ⅃ ˘ DHCP Â

27.1.20 service dhcp

Э DHCP ⊾ ৡ ˘ ৡ **service dhcp** Â ৡ **no** ⅃ Л∪ DHCP ⊾ ৡ Â

service dhcp

no service dhcp

ð Ô

ð Ô

DHCP ⊾ ৡ Â

ð ৡ Ô

ð Ô

DHCP ⊾ ⅃ Л∪ ╟ ↑ IP ˘ DNS ⊾ à Â DHCP ⅃ Л∪ DHCP è ⊾ ˘ DHCP DHCP ˘ DHCP Â

Э ⅃ DHCP ╖ è ╖ ă ˘ é ˘ Л∪ ⅂ Â

ð Ô

ЛЬЮ ˘ DHCP ⊾ Â

```
service dhcp
```

ð ৡ Ô

ৡ	
show ip dhcp server statistics	DHCP ⊾ Â

27.2

27.2.1 clear ip dhcp binding

DHCP

ð Ô

*	DCHP ă Â
ip-address	IP ă Â

ð Ô

ѝ Â

ð ৡ Ô

ð Ô

DHCP Ŀ ă ping ˘ DHCP ă
ˆ ARP˜ Â **clear ip dhcp conflict** ˩ Л ă Â

ð Ô

ЛЮ ˘ ă Â

```
clear ip dhcp conflict *
```

ð ৡ Ô

ৡ	
ip dhcp ping packets	ĦR DHCP Ŀ ˚ ˘ ă ping Â
show ip dhcp conflict	DHCP Ŀ ˚ ˘ ă Â

27.2.3 clear ip dhcp server statistics

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

clear ip dhcp server statistics

ð Ô

ѝ Â

ð ৡ Ô

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

debug ip dhcp server

no debug ip dhcp server

ð Ô

ð Ô

ð ৡ Ô

ð Ô

ৡ dhcp server ў ˘ Лυ ч Â

ð Ô

ЛυЮ ˘ Э dhcp Ь Â

```
debug ip dhcp server
```

ð ৡ Ô

27.2.6 show dhcp lease

DHCP ˘ EXEC ৡ **show dhcp lease** Â

show dhcp lease

ð Ô

ð Ô

й Â

ð ৡ Ô

ð Ô

Њ IP ˘ Â Њ IP ˘ ы IP Â

ð Ô

ЛьЮй **show dhcp lease** Â

```
Ruijie# show dhcp lease
Temp IP addr: 192.168.5.71 for peer on Interface:
GigabitEthernet0/0
Temp sub net mask: 255.255.255.0
DHCP Lease server: 192.168.5.70, state: 3 Bound
DHCP transaction id: 168F
Lease: 600 secs, Renewal: 300 secs, Rebind: 525 secs
Temp default-gateway addr: 192.168.5.1
Next timer fires after: 00:04:29
Retry count: 0 Client-ID: redgaint-00d0.f8fb.5740-Fa0/0
```

27.2.7 show ip dhcp binding

DHCP ˇ EXEC ¾ **show ip dhcp binding** Â

show ip dhcp binding [*ip-address*]

ð Ô

ip-address	ˆ ˩ ˜ ˫ IP Â

ð Ô

й Â

ð ¾ Ô

ð Ô

Ю IP ˇ Â Ю IP ˇ ˫ IP Â

ð Ô

ЛьЮй **show ip dhcp binding** Â

```
Ruijie# show ip dhcp binding
IP address Client-Id/ Lease expiration Type
           Hardware address
192.168.1.2 00d0.f866.4777 IDLE Manual
```

Ю ЮÂ

IP address	ᛏ DHCP IP Â
Client-Id/ Hardware address	DHCP client identifier ˚
Lease expiration	Â Infinite 8’ IDLE ˘ ᒐ DHCP ў ╟ Â
Type	Â Automatic ╟ᛏ ’ Manual ᛏ Â

ð ৡ Ô

ৡ	
clear ip dhcp binding	DHCP

27.2.8 show ip dhcp conflict

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

show ip dhcp conflict

ð Ô

ð Ô

и Â

ð ৡ Ô

ð Ô

ৡ ᒐ Л DHCP ᒪ ă Â

ð Ô

ЛЬЮ и **show ip dhcp conflict** ৡ Â

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

dhcpd excluded ipaddress
192.168.12.100
```

```
Message                 Received
BOOTREQUEST              216
DHCPDISCOVER             33
DHCPREQUEST              25
DHCPDECLINE              0
DHCPRELEASE              1
DHCPINFORM               150

Message                 Sent
BOOTREPLY                16
DHCPOFFER                9
DHCPACK                  7
DHCPNAK                  0
```

ЊЖ ЊО Â

Address pools	
Automatic bindings	╟ Â
Manual bindings	Â
Expired bindings	Â

28 DHCP Relay

28.1 DHCP Relay

28.1.1 service dhcp

Э DHCP ٪ ˘ ٪ **service dhcp** Â ٪
no ٨ Л∪ DHCP ٪ Â

service dhcp

no service dhcp

ð Ô

DHCP ٪ Â

ð ٪ Ô

ð Ô

DHCP ٨ Л∪ DHCP è ٤ ˘ DHCP
DHCP ˘ DHCP Â

ð Ô

ЛЮ ˘ DHCP ٤ Â

service dhcp

ð ٪ Ô

٪	
ip helper-address [**vrf**] *A.B.C.D*	╗ DHCP server

28.1.2 ip helper-address

٪ ٨ Л∪ ╗ DHCP ٤ Â ٪ no ˘ ٤
Â

٤ ٨ Л∪ ˘ ≠ ٨ Л∪ Â ٪ ٨ Л∪
Ю˘ ≠ ٨ Л∪ Ю ˘ ╗ Ю DHCP ٤ Â

ð Ô

Ł Â

ð ˀ Ô

/

ð Ô

˩ Л dhcp Ł ˘ DHCP
Ł Â ˩ Л ÿ Â

vrf ˘ a ˩’
a vrf ˘ Ł a vrf Ł ’
a vrf ˘ Ł ˩ vrf

ð Ô

ЛЮ ˘ ч Ł ˘ ˀ ˩ vrf Ł ù 61.154.26.49˝
Л ˧ vrf ˩ ù local Ł ù 192.168.197.1 Â

```
ip helper-address 61.154.26.49
ip helper-address vrf local 192.168.197.1
```

ð ˀ Ô

ˀ	
service dhcp	DHCP ˀ

28.1.3 ip dhcp relay information option dot1x

ˀ **dhcp option dot1x** ╖ ˘ ˀ no **dhcp option dot1x** ╖ Â

ð Ô

ð ˀ Ô

ð Ô

ˀ ¨I DHCP relay˘ ˧ ˧ 802.1x Â

ð Ô

```
Ip dhcp relay information option dot1x
```

ð ৡ Ô

ৡ	
service dhcp	DHCP ৡ
ip dhcp relay information option dot1x access-group	option dot1x acl

28.1.4 ip dhcp relay information option dot1x access-group

ৡ **dhcp option dot1x acl** ৡ no **dhcp option dot1x acl** Â

ð Ô

a ACL

ð ৡ Ô

ð Ô

ৡ а б Э ACL ACE ă Â

ð Ô

```
Ip dhcp relay information option dot1x access-group acl-name
```

ð ৡ Ô

ৡ	
service dhcp	DHCP ৡ
ip dhcp relay information option dot1x	DHCP option dot1x ╖

28.1.5 ip dhcp relay information option82

ৡ **ip dhcp relay information option82** ╖ ˘ ৡ no **ip dhcp relay information option82** ╖ Â

ð Ô

ð ৡ Ô

ð Ô

¾ б option dot1x ¾ Â

ð Ô

```
Ip dhcp relay information option82
```

ð ¾ Ô

¾	
Service dhcp	DHCP ¾
ip dhcp relay information option dot1x	DHCP option dot1x ¶

28.1.6 ip dhcp relay check server-id

¾ **ip dhcp relay check** *server-id* ¶ ˘ ¾ no **ip dhcp relay information check** *server-id* ¶ Â

ð Ô

ð ¾ Ô

ð Ô

¾˘ DHCP REQUEST server-id option server Â

ð Ô

```
Ip dhcp relay check server-id
```

ð ¾ Ô

¾	
Service dhcp	DHCP ¾

28.1.7 ip dhcp relay suppression

ৡ DHCP ╖ ˘ ৡ no DHCP
╖ DHCP relay ⁸ ╖ Â

ð Ô

ð ৡ Ô

ð Ô

˧ ৡ ˅ DHCP request a relay Â

ð Ô

ЛЬЮ ˘ 1 relay ⁸ ╖ Â

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

ð ৡ Ô

ৡ	
service dhcp	DHCP ৡ

ð Ô

ip-address	٫ ٹ IP

ð Ô

٫ ٹ

ð ٩ Ô

ð Ô

╗ DNS Server IP Â ٩˘ ╗ DNS Server Â
ÿ Server ٬ ٫ ˘ ٫ ٫ Server DNS
˘ ٕ Â

6 ٹ Â DNS Server ˘ ip-address ˘
‡ ٬ ٹ ˘ ĭ ‡ DNS ٹ Â

ð Ô

```
Ruijie(config)# ip name-server 192.168.5.134
```

ð ٩ Ô

٩	
show hosts	DNS Â

ð Ô

٩ RGNOS10.1 Э Â

29.1.3 ip host

٩ ў ٫ IP Â ٩ no ў Â

ip host *host-name ip-address*

no ip host *host-name ip-address*

ð Ô

host-name	ў ٫
ip-address	IP

ð ৡ Ô

ð Ô

ў ˘ ⌟Л **no ip host host-name ip-address** ৡ

ð Ô

```
Ruijie(config)#
```

ঽ	
show hosts	ў ɹ ă

ð Ô

ঽ RGNOS10.1 Э Â

29.1.5 show hosts

DNS Â

show hosts

ð ঽ Ô

ð Ô

DNS Â

ð Ô

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

ð ঽ Ô

ঽ	
ip host	ў ɹ IP
ip name-server	DNS Ŀ

ð Ô

ঽ RGNOS10.1 Э Â

30 NTP

30.1 NTP

30.1.1 no ntp

ntp ¬ ¦˘ б ¦ ¬ ˘ ntp Â

no ntp

ð Ô

Â

ð Ô

Ю NTP ¦ Â

ð ¦ Ô

Â

ð Ô

Ю˘ NTP ╖ ˘ ¬ NTP ¦ NTP
⁸˘ NTP ╖ Â

ð Ô

ЛЪЮ ˘ NTP ¦ Â

no ntp

ð ¦ Ô

¦	
ntp server	NTP ¦

30.1.2 ntp access-group

NTP ¦ ⁸ ˘ ¦ no ¬ ⁸ Â

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

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

access-list-number| *access-list-name*

ð Ô

peer	NTP Ł ⁸ ˘ ≠ б ⊿ ˆ ~ Â
serve	NTP Ł ⁸ ˘ a б ⊿ Â
serve-only	NTP Ł Â
query-only	NTP Ł ⁸ Â
access-list-number	IP ⁸ Л’ и 1˙ 99 1300˙ 1999
access-list-name	IP ⁸ ⊿ Â

ð Ô

Ю NTP ⁸ ‡ Â

ð ϡ Ô

Â

ð Ô

NTP Ł ⁸ Â ˘
NTP ⁸ Â

˘ NTP Ł ÿ ⁸ ⁸
ϟ ‡˘ Л∪ ϟ ‡ и Â ϟ и peer à serve à serve-only à query-only Â

---

⁸ ℸ Â Э ‡ ϟ ˘ ϟ б
⁸ Â

---

⁸ ‡˘ ‡ Â ⁸
‡˘ ‡ ‡ Â

ð Ô

ЛЬЮ 1 Л à
⁸ ⊿ ’ ⁸ 2 Л Â

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

ð ৡ Ô

ৡ

30.1.4 ntp authentication-key

ѝ NTP Ŀ NTP Â

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

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

ð Ô

key-id	ID'
key-string	'
enc-type	ˆ ˩ ˜ ĭ ╕ ˇ 0 ╕ ˇ 7 ╕ '

ð Ô

NTP ╖ Â

ntp disable

ð Ô

Â

ð Ô

Ю ⅃Л ⅃ NTP Â

ð ɂ Ô

Â

ð Ô

Ю˘ Э ⅃ NTP ⅃Л ˘
╖ ˘ ⅃Л Э NTP Â

⅃ IP ˘ è Э
ɂ Â

ð Ô

ЛЮ ˘ NTP Â

`no ntp`

ð ɂ Ô

Â

30.1.6 ntp master

й NTP ў ˆ ⅃ ˜˘ й è ⅃ Â
ɂ no й ⅃ NTP ў Â

ntp master *[stratum]*
no ntp master

ð Ô

stratum	˘ й 1· 15' a ‡ й 8 Â

ð Ô

a NTP ў ╖ Â

version	ˆ ˩ ˜ NTP ˆ 1-3˜˘ NTPv3 ,
if-name	ˆ ˩ ˜ NTP ˆ Ь ˜'
keyid	ˆ ˩ ˜ б Ł ╗
prefer	ˆ ˩ ˜ Ł й Prefer Ł

ð Ô

NTP Ł Â

ð ʒ Ô

Â

ð Ô

Ł ˘ ˩ Ł Э й 20 Â

б Ł ╗ ˘ ˝I ╗ Л Л ˘ Л
й Ł ˘ ˩ Л Ł ╗ ˘ б Ł
╗ Ł ˩ ╗ б

˩ ˆ ˜ Ю˘ ˝I prefer ˩

NTP Ю˘ й IP
˩ Л NTP Ł Â

ð Ô

ЛЮ ˘ Э й NTP server Â

IPv4 ' `Ruijie(config)# ntp server 192.168.210.222`

IPv6 ' `Ruijie(config)# ntp server 10::2`

ð ʒ Ô

ð Ô

Â

ð Ô

Â

ð ʒ Ô

Â

ð Ô

NTP б Ł ⅄ ŭ 8 ˘ ⅄ ŭ ⍞ ⅄
˘ ╟ ⅄ ˘ . ⅄ ˘ ‡ ⅄Ⴎ ʒ

ð Ô

ⅅЮ ˘ NTP ⅄ Â

```
Ntp synchronize
```

ð ʒ Ô

ʒ	
ntp server	NTP Ł ⅄

30.1.9 ntp trusted-key

ID ŭ

ntp trusted-key *key-id*

no ntp trusted-key *key-id*

ð Ô

key-id	ID Â

ð Ô

Ю Â

ð ʒ Ô

Â

ð Ô

ЛЬЮ NTP

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

30.2

30.2.1 debug ntp

NTP

debug ntp

no debug ntp

Â

Â

ð Ô

ѝ Â

ð ʒ Ô

ð Ô

NTP Ь ˘ NTP ˘ ╗ ⌟ Ь

ʒ a Â

ð Ô

ЛЪЮ ˘ NTP Â

```
show ntp status
```

ð ʒ Ô

31 SNTP

31.1

31.1.1 sntp enable

ৡ SNTP ╖ ˘ ৡ **no** ѝ
Disable Â

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

ð Ô

ð Ô

SNTP Disable

ð ৡ Ô

ð Ô

show sntp ৡ SNTP

ð Ô

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

ð ৡ Ô

ৡ	
show sntp	SNTP
clock update-calendar	˚ ⊿ ˚
clock set	˚

ð ⊿ Ô

˚ RGOS10.0 Л Э

31.1.2 sntp server

¯ SNTP Server˘ SNTP NTP ˇ Л Server
˩ Л internet Э Ѽ NTP Server Â

sntp server ip-addr

no sntp server

ð Ô

ip-addr ' NTP/SNTP Ь IP

ð Ô

NTP/SNTP Ь

ð ¯ Ô

ð Ô

show sntp ¯ SNTP

ð Ô

```
RedGiant(config)# sntp server 192.168.4.12
```

ð ¯ Ô

¯	
show sntp	SNTP
sntp enable	SNTP

ð ˩ Ô

˘ RGOS10.0 Л Э

31.1.3 sntp interval

¯ SNTP Client NTP/SNTP Server ˩ Â

sntp interval *seconds*

no sntp interval

ð Ô

seconds ' ˩ ˇ Æ й Ґ Ь й 60 --65535 Â

ð Ô

й 1800s

ð ¾ Ô

ð Ô

show sntp ¾ SNTP Â

ð Ô

```
RedGiant(config)# sntp interval 3600
```

ð ¾Ô

¾	
sntp enable	SNTP
show sntp	SNTP
clock update-calendar	˚ ˚

ð Ô

˚ RGOS10.0 Л Э

ð Ô

show sntp ¾ SNTP

ð Ô

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

ð ¾Ô

¾	
sntp enable	SNTP
show sntp	SNTP

ð Ô

RGOS10.0 Л Э

32 SSH

32.1 SSH

32.1.1 crypto key generate

Ł Ὼ ˘ ЮЎ ȝ'

crypto key generate {**rsa | dsa**}

ð Ô

rsa	RSA
dsa	DSA

ð Ô

Ю SSH Server Ὼ Â

ð ȝ Ô

ð Ô

SSH Server Ł ˘ ȝ SSH Ł Ὼ Â ⅄
enable service ssh-server ȝ˘ SSH Server ╖ Â SSH 1 RSA
’ SSH 2 RSA DSA Â ˘ RSA ˘ ‡ SSH1
б SSH2 ⅄ Л ’ DSA ˘ ‡ SSH2 ⅄ Л Â

˘ a ȝ **no crypto key generate**˘ ȝ **crypto key zeroize** ȝ Â

ð Ô

Ruijie# **configure terminal**
Ruijie(config)# **crypto key generate rsa**

ð ȝ Ô

¶	
show ip ssh	SSH Server Â
crypto key zeroize {**rsa	dsa**}	DSA б RSA ˘ SSH Server ╖ Â

ð Ô

˚ RGOS10.1 Л Э

32.1.2 crypto key zeroize

SSH Ь Ώ ˘ Ю˘ ¶'

crypto key zeroize {**rsa** | **dsa**}

ð Ô

rsa	RSA
dsa	DSA

ð Ô

ð ¶ Ô

ð Ô

¶ Ь Ώ Â Л˘ SSH Server й й DISABLE Â SSH Server˘ **no enable service ssh-server** ¶ Â

ð Ô

Ruijie# **configure terminal**
Ruijie(config)# **crypto key zeroize rsa**

ð ¶ Ô

¶	
show ip ssh	SSH Server Â
crypto key generate {rsa|dsa}	DSA б RSA Â

SSH Server Â ৡ no
ѝ Â

ip ssh authentication-retries *retry times*

no ip ssh authentication-retries

ð Ô

retry times	Â

ð Ô

Ю ѝ 3 Â Л˘ **no ip ssh authentication-retries** ৡ ≠ ┘ Л∪ ѝ Â

ð ৡ Ô

ð Ô

ৡ SSH Server Â SSH Server
˘ Ÿ ╖˘ ‡ ѝ Â **show ip ssh** ৡ SSH Server Â

ð Ô

ѝ 2'

Ruijie# **configure terminal**
Ruijie(config)# **ip ssh ssh authentication-retries** *2*

ð ৡ Ô

show ip ssh

ð Ô

ð Ô

ð ֽ Ô

ð Ô

SSH Server Â ' à ï SSH Server à
à Â

' . SSH ˘ Ł ˘ ÿ
SSH й a ˩ Â

ð Ô

Ruijie# **show ip ssh**

ð ֽ Ô

ֽ	
Ip ssh version {**1**	**2**}	SSH Server Â
ip ssh time-out time	SSH Server Â
Ip ssh authentication-retries retry times	SSH Server Â

ð Ô

˚ RGOS10.1 Лъ Э

32.2.2 show ssh

SSH Â

show ssh

ð Ô

ð Ô

ð ٪ Ô

ð Ô

SSH Â ' ´ VTY ٨ à SSH à
╗ à à à ٫ Â

ð Ô

Ruijie# **show ssh**

ð ٪ Ô

ð Ô

˙ RGOS10.1 Л Э

32.2.3 show crypto key mypubkey

SSH Server Ω Ω ٭ Â

show crypto key mypubkey {***rsa****|****dsa***}

ð Ô

rsa	RSA Ω ٭
dsa	DSA Ω ٭

ð Ô

ð ٪ Ô

ð Ô

SSH Server Ω Ω ٭ Â '
à ٫ à Ω ٭ Â

ð Ô

Ruijie# **show crypto key mypubkey rsa**

ð ¾ Ô

¾	
crypto key generate {**rsa	dsa**}	DSA б RSA Â

ð Ô

˚ RGOS10.1 Л Э

32.2.4 disconnect ssh

SSH Â

disconnect ssh [**vty**] *session-id*

ð Ô

session-id	SSH Л Â

ð Ô

ð ¾ Ô

ð Ô

SSH Л˘ SSH Â
VTY Л˘ SSH Â Л SSH Â

ð Ô

Ruijie# **disconnect ssh** *1*
Ruijie# **disconnect ssh vty** *1*

ð ¾ Ô

¾	
show ssh	SSH Â
Clear line vty *line_number*	VTY Â

ð Ô

˚ RGOS10.1 Л Ъ Э

33 UDP-Helper ३

UDP ┗ Â no UDP
┗ Â

ip helper-address *address*

no ip helper-address *address*

ð Ô

address	UDP ┗ ˘ ѝ ↑ ⁸ ˘ 20 ┗ Â

ð Ô

UDP ┗

ð ֽ Ô

ð Ô

ˬ Л∪ ѝ 20 ┗ Â ┗
Э , ‡ ╟ UDP-Helper ╖ ˬ˘ ÿ UDP
˘ Л∪ Э ┗ Э Â

no ip helper-address ˬ ┗ Â

ð Ô

Ю UDP ┗ :

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

ð ֽ Ô

ֽ	
ip forward-protocol	UDP

ð Ô

ֽ RGNOS10.1 Э Â

33.1.3 ip forward-protocol UDP 0Ã · 0Ã ·

ip forward-protocol udp [*port* | **tftp | domain | time | netbios-ns | netbios-dgm | tacacs**]

no ip forward-protocol udp [*port* | **tftp | domain | time | netbios-ns | netbios-dgm | tacacs**]

ð Ô

		˘ a
port	‡	69,53,37,137,138,49

34

34.1

34.1.1 ip policy route-map

ˇ ¦ **ip policy route-map** Â

¦ **no** Â

ip policy route-map *route-map*

no ip policy route-map

ð Ô

route-map	˛ Â

ð Ô

Â

ð ¦ Ô

Â

ð Ô

Э ˇ ˇ

ð Ô

ЛЬЮ ˘ Ль FE0 ˘
ѝ 10.0.0.1˘ ‡ Ю ѝ 196.168.4.6˘ ѝ 20.0.0.1
‡ Ю ѝ 196.168.5.6˘ Ї ‡ Â

```
access-list 1 permit 10.0.0.1
access-list 2 permit 20.0.0.1
route-map lab1 permit 10
match ip address 1
set ip next-hop 196.168.4.6
exit
route-map lab1 permit 20
match ip address 2
set ip next-hop 196.168.5.6
exit
interface GigabitEthernet 0/0
ip policy route-map lab1
exit
```

ð ϟ Ô

ϟ	
access-list	Ѭ ‡ Â
route-map	Ѭ Â
set ip next-hop	Ѭ Ю
set ip default next-hop	Ѭ Ю
set interface	Ѭ
set default interface	Ѭ
set ip tos	IP TOS
set ip dscp	IP DSCP
set ip precedence	IP ″I
match ip address	‡
match length	ϗ

' route-map ϟ ê ϟ Ì

ip local policy route-map

˘ ϟ **ip local policy route-map** Â ϟ **no** Â

ip local policy route-map *route-map*

no ip local policy route-map

set interface	⊮
set default interface	⊮
set ip tos	IP TOS
set ip dscp	IP DSCP
set ip precedence	IP ″I
match ip address	‡
match length	ϗ

' route-map ϗ ê ϗ Ì

34.1.2 ip policy

set ip nexthop ˘
Ю **ip policy** Â ϗ **no**
Â

ip policy {**load-balance|redundance**}

no ip policy

NPE80 a ϗ Â

ð Ô

load-balance|redundance	

ð Ô

Â

ð ϗ Ô

Â

ð Ô

set ip next-hop ˘ ⅃ Л Ю ˘
˘ ⅄ ⅃ Л Ю '
˘ Ю ˘ WCMP ⅃ Л

4 Ю ˘ ECMP ⌟Л 32 Ю Â Ю
˗ ARP Ю Â

ð Ô

ЛЬЮ ˘ nexthop, Ю
⌠˘ ‡ EF0 Э ⌟
nexthop ˘ Â

```
access-list 1 permit 10.0.0.1
access-list 2 permit 20.0.0.1
route-map lab1 permit 10
match ip address 1
set ip next-hop 196.168.4.6
set ip next-hop 196.168.4.7
set ip next-hop 196.168.4.8
exit
route-map lab1 permit 20
match ip address 2
set ip next-hop 196.168.5.6
set ip next-hop 196.168.5.7
set ip next-hop 196.168.5.8
exit
interface GigabitEthernet 0/0
ip policy route-map lab1
exit
ip policy redundance
```

35

35.1

35.1.1 route-auto-choose

ঽ Â ┘Ո ঽ no ঽ Â

[**no**] **route-auto-choose** {**cnc** | **cnii | cernet**} *interface next-hop* [**tag** *num*] [*distance*]

35.1.2 route-auto-choose update

route-auto-choose update

-	-

36 RIP

36.1

36.1.1 address-family ō RIP ǒ

RIP ˘ ৡ

address-familyˇ ˘ ৡ

no Â

address-family ipv4 vrf *vrf-name*

no address-family ipv4 vrf *vrf-name*

ð Ô

```
255.255.255.0
Ruijie(config)# router rip
Ruijie(config-router)# address-family ipv4 vrf vpn1
Ruijie(config-router-af)# network 192.168.1.0
Ruijie(config-router-af)# exit-address-family
```

ð ȝ Ô

ȝ	
exit-address-family	Â
ip vrf	… VRF Â

ð ȷ Ô

ð Ô

36.1.2 auto-summary (RIP)

RIP ╠ ╥ ˘ ȝ **auto-summary** Â
ȝ **no** ╠ ╥ Â

auto-summary

no auto-summary

ð Ô

Â

ð Ô

╠ ╥ Â

ð ȝ Ô

Â

ð Ô

RIP ╠ ˘ ˘ ╠
Â RIPv1 RIPv2 Ю ╠ Â

RIP ╠ ╥ ˘ Â
˘ a ˘ ȷ Л
Â

˘ ў ЛЮ '

¸ RIP ˘ ˝I '

¸ RIP ˘ ˘ Â

¸ ȷ ɛ ˘ a ȷ ȷ

RIP

Ы˜ default-metric Ы Â a
¾ ‡ default-metric ѝ 1 Â

ð Ô

ЛЬЮ ˜ RIP OSPF
† ˜ † RIP ѝ 3 Â

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

ð ¾ Ô

¾	
redistribute	ÿ † ˥ Â

ð ˩ Ô

ð Ô

36.1.4 default-information originate(RIP)

RIP ˜ ˩ Л¦ ¾
default-information originate ¾˜ ¾ **no** ˩
Â

default-information originate [**always**] [**metric** *metric-value*] [**route-map** *map-name*]

no default-information originate [**always**] [**metric**] [**route-map** *map-name*]

ð Ô

always	^ ˩ ~ RIP ˚ ˜ a ĭ Â
metric *metric-value*	^ ˩ ~ ˜ *metric-value* ˩ ' 1-15 Â
route-map *map-name*	^ ˩ ~ route-map ˧ , route-map

ð Ô

, metric ѝ 1 Â

ð ¾ Ô

Â

ð Ô

˘ RIP a ⅃

˘ **default-information originate** ¾

˘ ⅃ Â

always ˘ RIP

distance *distance* [*ip-address wildcard*]

no distance [*distance ip-address wildcard*]

ð Ô

no distribute-list {[*access-list-number* | *name*] | **prefix** *prefix-list-name* [**gateway** *prefix-list-name*]} **in** [*interface-type interface-number*]

ð Ô

access-list-number	Â ¬ ˘ ¬ Л∪ Â
prefix *prefix-list-name*	Â
gateway *prefix-list-name*	Â
interface-type interface-number	(¬) ¦ ˘ ¬ Â

ð Ô

Ня¶ Â

ð ¾ Ô

Â

ð Ô

ѝ ˘ ¬ Л∪ ¦ ⁸ ˘ Â

˘ Â

ð Ô

ЛυЮ ˘ RIP ÿ GigabitEthernet 0/0 ˘ ⁸ ˘ ¬ 172.16 Â

```
Ruijie(config)# router rip
Ruijie(config-router)# network 200.168.23.0
Ruijie(config-router)# distribute-list 10 in
GigabitEthernet 0/0
Ruijie(config-router)# no auto-summary
Ruijie(config)#access-list 10 permit 172.16.0.0
0.0.255.255
```

ð ¾ Ô

¾	
access-list	Ня ‡ Â
prefix-list	Ня Â

ð ¬ Ô

ð Ô

36.1.7 distribute-list out ō RIP Ǒ

⁸ ˘ Л∪ ˘ ʒ
distribute-list out Â ʒ **no** Ⱨ Â

distribute-list {[*access-list-number* | *name*] | **prefix** *prefix-list-name*} **out** [*interface* | *protocol* [*process-id* | *process-name*]]

no distribute-list {[*access-list-number* | *name*] | **prefix** *prefix-list-name*} **out** [*interface* | *protocol* [*process-id*| *process-name*]]

ð Ô

access-list-number	Â ↓ ˘ ↓ Л∪ Â
prefix *prefix-list-name*	Â
interface	(↓) ↑ ˘ ⁸ ↓ Â
protocol	(↓) ↑ ˘ ↑ Â
process-id	(↓) *protocol* и OSPF ˘ OSPF id Â
process-name	(↓) *protocol* и ISIS ˘ ISIS ↓ Â

ð Ô

⁸ Â

ð ʒ Ô

Â

ð Ô

ʒ a ↓ ˘ ⁸ ’
˘ ⁸ ↓ ’ è
˘ ‡ ⁸ ↓ Â

ð Ô

ЛЬЮ ˘ RIP ↓ 192.168.12.0/24 Â

```
Ruijie(config)# router rip
Ruijie(config-router)# network 200.4.4.0
Ruijie(config-router)# network 192.168.12.0
```

address-family	Â

ð ¼ Ô

ð Ô

36.1.9 ip rip authentication key-chain

RIP ˘ RIP ˘ ¾ **ip rip authentication key-chain** Â ¾ **no** Â

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

no ip rip authentication key-chain

ð Ô

name-of-keychain	¼ ˘ RIP Â

ð Ô

Â

ð ¾ Ô

Â

ð Ô

˘ **key chain** ¾ Ìõ a RIP Â

RIPv1 a RIP ˘ ¼ RIPv2 Â

ð Ô

ЛЬЮ ˘ Serial 0 RIP ˘ й ripchain Â

```
Ruijie(config)# interface serial 0/0
Ruijie(config-if)# ip rip authentication key-chain
ripchain
```

ð ¾ Ô

¾	
ip rip authentication mode	Ìõ RIP Â
ip rip authentication text-password	RIP Â
key chain	… ˘ Â

authentication mode

lĦ RIP ˘ ʒ **ip rip authentication**
ode Â ʒ **no** RIP Â

rip authentication mode {**text** | **md5**}

ip rip authentication mode

ext	RIP ѝ Â
nd5	RIP ѝ MD5 Â

36.1.11 ip rip authentication text-password

RIP ˘ ¾ **ip rip authentication text-password** Â ¾ **no** Â

ip rip authentication text-password *password-string*

no ip rip authentication text-password

ð Ô

password-string	˘ 1˙ 16 Â

ð Ô

Â

ð ¾ Ô

Â

ð Ô

RIP ╖ ˘ ≠ ⅄ Л∪ ⅄ ˘ Л ″I Â

RIPv1 a RIP ˘ ⅄ RIPv2 Â

ð Ô

ЛЬЮ ˘ Serial 0 RIP ˘ ѝ ruijie Â

```
Ruijie(config)# interface serial 0/0
Ruijie(config-if)# ip rip authentication text-password ruijie
```

ð ¾ Ô

¾	
ip rip authentication mode	Ьѫ RIP

36.1.12 ip rip default-information

ÿ RIP ˘ ч **ip rip default-information** Â ч **no** ˩ Â

ip rip default-information¸ **only**¸ **originate**ˀ [**metric** *metric-value*]

no ip rip default-information

ð Ô

only	˘ a è Â
originate	˘ ≠ è Â
metric *metric-value*	˘ ˩ ' 1-15 Â

ð Ô

Â

╟ ˥˘ *metric* ѝ 1 Â

ð ч Ô

Â

ð Ô

ч ˥˘ ÿ Â

˩ Ю **ip rip default-information** RIP **default-information originate**˘ ‡ ˩ Â

---

1 à ˩ **ip rip default-information**˘ RIP a Ą ˉ Â ˉ ˘ Â

2 à Э **ip rip default-information**˘ a . ˘ Ю Â

ð Ô

ЛЪЮ ˘ ethernet0/0 Э… ˘ ˩ Â

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

ð ч Ô

ч	

default-information originate	RIP

ð ✓ Ô

ð Ô

ð Ô

36.1.14 ip rip receive version

ꟻ RIP Э RIP ˘
ꝛ **ip rip receive version** Â ꝛ **no** Â

ip rip receive version [**1**] [**2**]

no ip rip receive version

ð Ô

1	ˆ ˩ ˜ ˩ RIPv1 Â
2	ˆ ˩ ˜ ˩ RIPv2 Â

ð Ô

ὶ ˩ ᾱ **version** ꝛ Â

ð ꝛ Ô

Â

ð Ô

ꝛ ˘ ˩Л **vesion** ꝛ Â ꝛ ˩
RIP ὶ˘ ˩Л ˩ RIPv1 RIPv2
Â ꝛ a ‡ ὶ ˩ ᾱ version Â

ð Ô

ЛЬЮ ˘ GigabitEthernet 0/0 ˩Л RIPv1 RIPv2
Â

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

ð ꝛ Ô

ꝛ	
version	ꟻ RIP Â

ð ˩ Ô

ð Ô

36.1.15 ip rip send enable

RIP Э RIP ˘ ¢ **ip rip send enable** Â ¢ **no** RIP Э RIP Â

ip rip send enable

no ip rip send enable

ð Ô

Â

ð Ô

RIP

ð ¢ Ô

ð Ô

RIP ˘ Ю ¢ **no** Â ¢ ¢ Â ┘ ¢ **default** RIP Â

ò Ô

ЛЪЮ ˘ GigabitEthernet 0/0 RIP Â

```
Ruijie(config)# interface GigabitEthernet 0/0
Ruijie(config-if)# no ip rip send enable
```

ð ¢ Ô

¢	
ip rip receive enable	RIP
passive-interface	RIP ╟

ð ┘ Ô

ð Ô

36.1.16 ip rip send version

№ RIP Э RIP ˘ ¢ **ip rip receive version** Â ¢ **no** Â

ip rip send version [**1**] [**2**]

no ip rip send version

ð Ô

1	ˆ ˩ ˜ ˩ RIPv1 Â
2	ˆ ˩ ˜ ˩ RIPv2 Â

ð Ô

ϋ ˩ ¤ **version** ֽ Â

ð ֽ Ô

Â

ð Ô

ֽ ˘ ˩Л **vesion** ֽ Â ֽ ˩
RIP ϋ˘ ˩Л ˩ RIPv1 RIPv2
Â ֽ a ‡ ϋ ˩ ¤ version Â

ð Ô

ЛЮ ˘ GigabitEthernet 0/0 ˩Л RIPv1 RIPv2
Â

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

ð ֽ Ô

ֽ Ⱶ

Â

ð Ô

ѝ ↓ ¤ **version** ֽ Â

ð ֽ Ô

Â

ð Ô

ֽ ˘ ↓ Л **vesion** ֽ Â ֽ ↓
RIP ѝ˘ ↓ Л ↓ RIPv1 RIPv2
Â ֽ a ‡ ѝ ↓ ¤ version Â

ð Ô

ЛЮ ˘ GigabitEthernet 0/0 Л RIPv2 Â

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

ð ֽ Ô

ֽ	
version	Ѭ RIP Â

ð ↓ Ô

ð Ô

36.1.18 ip split-horizon (RIP)

RIP ֿ ╗ ˘ ֽ **ip split-horizon** Â
ֽ no RIP ֿ ╗ Â

ip split-horizon

no ip split-horizon

ð Ô

Â

ð Ô

Ю ֿ Э Â

ð ֽ Ô

Â

ð Ô

ɻ IP Э˘ ɳ ɻ ˘
ɬ ⁸ Л Â ɬ ɻ Л
ÿ ˉ ˘ ѝ
Â

ˆ à X.25 ˜ ˘ ɬ ɻ
ɬ ˉ a Â Ю˘ ɻ
ɬ Â IP ˘ ≠ ɬ Â

RIP ɻ ˘ ɬ
Â a ї ɬ ˘ ɻ Л **show ip rip**
ʒ Â ɻ **neighbor** ʒ Ѭ ˘ a ɻ RIP
ɬ Â

ð Ô

ЛЮ ˘ GigabitEthernet 0/0 RIP ɬ ╖ Â

```
Ruijie(config)# interface GigabitEthernet 0/0
Ruijie(config-if)# no ip split-horizon
```

ð ʒ Ô

ʒ	
neighbor˄ RIP˜	Ѭ RIP IP Â
validate update source	RIP Â

ð ɻ Ô

ð Ô

36.1.19 ip summary-address rip

Ю RIP ˘ Ю ʒ **ip summary-address rip** Â ʒ no Â

ip summary-address rip *ip-address ip-network-mask*

no ip summary-address rip *ip-address ip-network-mask*

ð Ô

ip-address	IP
ip-network-mask	ѝ IP

ð Ô

RIP ╟ Â

ð ৡ Ô

Â

ð Ô

ৡ **ip summary-address rip** Ю
Â RIP ╟ Â ৲ Â

ð Ô

ЛЪЮ ˘ RIPv2 ╟ Â ˘
GigabitEthernet 1/0 ৶ 172.16.0.0/16 Â

```
Ruijie(config)# interface GigabitEthernet 1/0
Ruijie(config-if)# ip summary-address rip 172.16.0.0
255.255.0.0
Ruijie(config-if)# ip address 172.16.1.1 255.255.255.0
Ruijie(config)# router rip
Ruijie(config-router)# network 172.16.0.0
Ruijie(config-router)# version 2
Ruijie(config-router)# no auto-summary
```

ð ৡ Ô

wildcard	ЊЖ IP Æˇ 0 ¬ ˇ 1 a Â

ð Ô

ð ¾ Ô

Â

ð Ô

ɻ ɅU ɻ *network-number* *wildcard* ˇ
б RIP Â

wildcard ˇ RGOS ˇ
б RIP Â

ɻ RIP ЊЖ ˇ ɻ ɅU RIP
ˇ RIP Â

ð Ô

ɅU ЮО ˇ ЊЖ б RIP ч /ˇ
192.168.12.0/24 172.16.0.0/24 б RIP '

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

ð ¾ Ô

ð ɻ Ô

ð Ô

36.1.21 neighbor (RIP)

ЊЖ RIP IP ˇ ɻ ɅU ¾ **neighbor** Â
¾ **no** ЊЖ Â

neighbor *ip-address*

no neighbor

ð Ô

ip-address	IP Â Â

ð Ô

ЊЖ Â

ð ¢ Ô

Â

ð Ô

RIPv1 IP ^ 255.255.255.255˜ ˘ RIPv2
^ 224.0.0.9˜ Â a
Э ˘ ┘ ˘ ┘Л
¢ **passive-interface** и ╟ ˘ Л ┘ Н
┘Л Â ¢ a RIP Â
passive ˘ Л ≠ a Â

ð Ô

ð ¢ Ô

ð Л Ô

ð Ô

36.1.22 offset-list(RIP)

╕ RIP metric ˘ ┘Л ¢
offset-list ¢ **no** offset

offset-list access-list-number {**in** | **out**} *offset* [*interface-type interface-number]*

no offset-list access-list-number {**in** | **out**} *offset* [*interface-type interface-number*]

ð Ô

access-list-number	acl Л
in	acl metric
out	acl metric
offset	metric ┘ ╟
interface-type	acl
interface-number	Л

ð Ô

offset Â

ð ¢ Ô

Â

ð Ô

RIP ل offset-list Л ٦
offset-list ‡ RIP ╗ offset-list metric

ð Ô

ЛЮ ˘ acl 7 RIP metric ╗ 7 Â

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

ЛЮ ˘ GigabitEthernet1/0 ˉ acl 8
RIP metric ╗ 7 Â

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

ð ֽ Ô

ð ل Ô

ð Ô

36.1.23 output-delay

ل RIP ˘ ֽ
output-delay ֽ **no** ل Â

output-delay *delay*

no output-delay

ð Ô

delay	˘ Æ ѝ ˘ <8-50>

ð Ô

ѝ Â

ð ֽ Ô

Â

ð Ô

Ю RIP ѝ 512 ˘ ل Л 25 ˘
25 ˘ Ю

ˇ ɹ æ ˇ æ ɻ a
ˇ Â ˇ **output-delay**
ʒ ╗ ˇ æ
Â

ð Ô

ЛЬЮ ˇ RIP ѝ 30

```
Ruijie(config)# router rip
Ruijie(config-router)# output-delay 30
```

ð ʒ Ô

ð ɻ Ô

ð Ô

36.1.24 passive-interface

ɻ Э ╖ ˇ ʒ
passive-interface ʒ Â ʒ **no** ╖
Â

passive-interface {**default** | *interface-type interface-num*}

no passive-interface {**default** | *interface-type interface-num*}

ð Ô

ΐ ˘ **ip rip send enable** ϡ **ip rip receive enable** ϡ ⁸ Â

ð Ô

ЛЬЮ й passive ˘ л ethernet0/0 й passive

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

ð ϡ Ô

ϡ	
ip rip receive enable	RIP
ip rip send enable	RIP

ð л Ô

ð Ô

36.1.25 redistribute ō RIP Ǒ

† ˘ Ю **redistribute** ϡ Â л † ˘ ϡ **no** Â

redistribute {**bgp** | **isis** [*process-name*] |**ospf** *<1-65535>* | **connected** | **static**}[**metric** *value*] [**route-map** *route-map-name*][**match internal** | **external** *type* | **nssa-external** *type*]

no redistribute {**bgp** | **isis** [*process-name*] |**ospf** *<1-65535>* | **connected** | **static**}[**metric** *value*] [**route-map** *route-map-name*] [**match internal** | **external** *type* | **nssa-external** *type*]

ð Ô

bgp	**isis**	**ospf**	**connected**	**static**	†
metric	† metric
route-map	† ‡
match	† ospf
process-name	ISIS л

<1-65535>	OSPF ٨

ð Ô

Ю

† OSPF ‡ † ’

† ISIS ‡ † level-2 ’

è Ю † ’

† ٨ metric й 1’

a route-map Â

ð ٣ Ô

Â

ð Ô

٣ † RIP Â

† ˘ ٨

˘ й a ٫ a ٫ ÂRIP

˘ OSPF ˘

٫ Â † ˘ ٧ ˘ ї ‡

† Â

† **isis** ˘ a level ˘ ٧ † level-2

˘ † ˘ level ˘ ‡ † level

Â ˘ й ˘ ٫ level 1, level 2 ˘ ٨

й level-1-2 Â

† **ospf** ˘ a match ˘ †

ospf ’ ٨ match й match

˘ † ٧ ٦ † ’ no ٣

match й Â

ð Ô

ЛЪЮ ٣ † RIP

```
Ruijie(config-router)# redistribute static
```

ð ٣ Ô

٣	
default-metric *metric*	†

ð ٨ Ô

ð Ô

36.1.26 router rip

… RIP ˘ ֽ
router rip Â ֽ **no** RIP Â

router rip

no router rip

ð Ô

Â

ð Ô

RIP Â

ð ֽ Ô

Â

ð Ô

RIP ˘ ⅋ /ı Â Э ╟
˘ **async default routing** Â

ð Ô

ЛЬЮ ˘ … RIP ˘
Â

```
Ruijie(config)# router rip
```

ð ֽ Ô

36.1.29 version (RIP)

ÞÆ RIP Ñ¯ ¾ **version** Â ¾ **no** Â

version {**1** | **2**}

no version

ð Ô

1	ÞÆ RIP Ñ ù 1 Â
2	ÞÆ RIP Ñ ù 2 Â

ð Ô

Ù Ú RIPv1 RIPv2 ¯ Ù RIPv1 Â

ð ¾ Ô

Â

ð Ô

ÞÆ RIP Ñ Â Ù Ú **ip rip receive version** à **ip rip send version** ¾¯ RIP ÞÆ Â

ð Ô

ÚÛÞ ¯ RIP Ñ ù 2 Â

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

ð ¾ Ô

¾	
ip rip receive version	ÞÆ RIP Э RIP Â
ip rip send version	ÞÆ RIP Э RIP Â
show ip rip	**rip** Â

ð Ù Ô

ð Ô

36.2

36.2.1 show ip rip

RIP ˘ **show ip rip** Â

show ip rip [**vrf** *vrf-name*]

ð Ô

vrf *vrf-name*	ˆ ˩ ˜ VRF RIP

ð Ô

Â

ð ʒ Ô

à à Â

ð Ô

˩ RIP Ь à ǂ à ǂ
à rip à rip б à metric б distance Â
VRF

```
192.168.26.0 255.255.255.0
192.168.64.0 255.255.255.0
Distance: (default is 50)
```

ЛЬЮ ˘ vrf˝ RIP '

```
Ruijie(config-router)# sh ip rip vrf 1
VRF 1  VRF-id:1
Routing Protocol is "rip"
Sending updates every 30 seconds
Invalid after 180 seconds, flushed after 120 seconds
Outgoing update filter list for all interface is: not
set
Incoming update filter list for all interface is: not
set
Default redistribution metric is 1
Redistributing:
Default version control: send version 1, receive any
version
Routing for Networks:
Distance: (default is 120)
```

ð ३Ô

ð ⁄ Ô

ð Ô

36.2.2 show ip rip database

RIP ˘ **show ip rip database** Â

show ip rip database [**vrf** *vrf-name*] [*network-number* {*network-mask*}]

ð Ô

vrf *vrf-name*	ˆ ˩ ˜ VRF RIP
network-number	ˆ ˩ ˜ ⁄ Â
network-mask	Â ⁄ ˘

ð Ô

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ð ३ Ô

à à Â

ð Ô

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ð ʒ Ô

à à Â

ð Ô

ð Ô

ЛЬЮ ˘ RIP Â

```
Ruijie# show ip rip interface
GigabitEthernet 1/1 is down, line protocol is down
  RIP is not enabled on this interface
GigabitEthernet 1/0 is up, line protocol is up
  Routing Protocol: RIP
  Receive RIPv2 packets only
  Send RIPv2 packets only
  Passive interface: Disabled
  Split horizon: Enabled
  V2 Broadcast: Disabled
  Multicast register: Registed
  Interface Summary Rip:
    Not Configured
  Authentication mode: Text
  Authentication key-chain: ripk1
  Authentication text-password: ruijie
  Default-information: only, metric 5
  IP interface address:
    192.168.64.100/24, next update due in 14 seconds
    2.2.1.1/24, next update due in 24 seconds
      neighbor 2.2.1.6, next update due in 3 seconds
      neighbor 2.2.1.77, next update due in 13 seconds
    2.2.2.57/24, next update due in 16 seconds
```

RIP б BFD ╠, ж ʒ Ю :

```
Ruijie#show ip rip interface
VLAN 1 is up, line protocol is up
  Routing Protocol: RIP
    Receive RIPv1 and RIPv2 packets
    Send RIPv1 packets only
    Receive RIP packet: Enabled
    Send RIP packet: Enabled
    Send RIP supernet routes: Enabled
    Passive interface: Disabled
    Split horizon: Enabled
```

```
  BFD: Enabled
  V2 Broadcast: Disabled
  Multicast registe: Registed
  Interface Summary Rip:
    Not Configured
  IP interface address:
    2.2.2.111/24, next update due in 24 seconds
```

ð ৡ Ô

ৡ	
show ip rip	Â

ð ✓ Ô

ð Ô

37 OSPF2

37.1

37.1.1 area

no OSPF ʊ Â

area area-id

no area area-id

ð Ô

¸	¸
¸ area-id	¸ OSPF ʊ /ʃ Â ʊ /ʃ ɻ Ɲ ⁸ ˘ ≠ ɻ Ɲ IP Â

ð Ô

³ OSPF ʊ Â

ð ȝ Ô

³

ð Ô

ɻ Ɲ ȝ **no** ˘ OSPF ʊ ³ ˘ **area authentication** à**area default-cost** à**area filter-list** à **area nssa** ʊ ³

ЮЮ˘ OSPF ʊ ³

1. ў ʊ ³ ³
³
2. ʊ ˘ **network area** ȝ Â ╕ ʊ ȝ˘

ð Ô

ЛЮ ³ OSPF ʊ 2

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

ð ȝ Ô

ЛЬЮ ˘ OSPF ѡ 0́ ѡ ˜ MD5 ˘
ʒ ѝ backbone Â

```
Ruijie(config)# interface GigabitEthernet 0/0
Ruijie(config-if)# ip address 192.168.12.1
255.255.255.0
Ruijie(config-if)# ip ospf message-digest-key 1 md5
backbone
```

OSPF

```
Ruijie(config)# router ospf 1
Ruijie(config-router)# network 192.168.12.0
0.0.0.255 area 0
Ruijie(config-router)# area 0 authentication
message-digest
```

ð ʒ Ô

ʒ	
ip ospf authentication-key	Ⱨ OSPF ʒ Â
ip ospf message-digest-key	Ⱨ OSPF MD5 ʒ Â
area virtual-link	Ⱨ Â

ѝ˝ Â

ð ʒ Ô

Â

ð Ô

ʒ ˬ ABR˜ ш ˜ Э ˘ з ABR
STUB ш ˆ ѝ ˜ NSSA Â ABR
˘ ш ˘ ˥ ш Â

OSPF ш ѝ STUB NSSA ч Ь ʒ **area stub**˘ **area nssa** **area default-cost** Â STUB Э˘ **area stub** ʒ˘ NSSA ш **area nssa** ʒ˘ **area default-cost** ʒ ˬ ABR Э Â

ð Ô

ЛЬЮ ʒ˘ ѝ 50 Â

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

ð ʒ Ô

ʒ	
area stub	OSPF ш ѝ Â
area nssa	OSPF ш ѝ NSSA ш

ð ˥ Ô

ð Ô

37.1.4 area fil005Anist

ABR Э ˘ a ˫ ш intra-area ˝ Â

area *area-id* **fil005Anist** [**access** *acl-name*| **prefix** *prefix-name*] [**in** | **out**]

no area *area-id* **fil005Anist** [**access** *acl-name* | **prefix** *prefix-name*] [**in** | **out**]

ð Ô

area-id	NSSA ʁ ʁ ʌ Â
no-redistribution	ˆ ɻ ˜ nssa ABR ˘ ɤ ɪ ʒ ʁ a nssa ʁ ˘ ɻ Ɲ Э Â
default-information-originate	ˆ ɻ ˜ 7 LSA nssa ʁ ˘ ɤ NSSA ABR ASBR Э Â
no-summary	ˆ ɻ ˜ nssa (ABR) Ь LSA nssa ʁ Â

ð Ô

Ⱶ NSSA ʁ Â

ð ʒ Ô

Â

ð Ô

default-information-originate Type-7 LSA˘ nssa ABR ASBR Э ˘ ABR Э ĭ ˘ Type-7 LSA ˘ ASBR Э(ɻ ≠ a ABR) ˘ Type-7 LSA Â

no-redistribution ASBR Э OSPF redistribute ʒ è a NSSA ʁ Â NSSA ASBR ɤ ABR ˘ ɻ Ɲ nssa Â

ѝ NSSA ʁ ˆ LSA˜ ˘ ɻ Ɲ ABR Э no-sµmmary ˘ ABR ɻ NSSA ʁ summary LSAs˜ Type-3 LSA˜ Â

ʌ **area default-cost** NSSA ʁ ABR Э Â ʒ ʁ NSSA ʁ Â ЮЎ NSSA ѝ 1 Â

ð Ô

ЛЮ ˘ ʁ 1 ѝ ˘ ʁ Â

```
Ruijie(config)# router ospf 1
Ruijie(config-router)# network 172.16.0.0 0.0.255.255
area 0
```

```
Ruijie(config-router)# network 192.168.12.0 0.0.0.255
area 1
Ruijie(config-router)# area 1 nssa
```

ð ˧ Ô

˧	
area default-cost	˫ NSSA ˆ OSPF ˜ Â

ð ˩ Ô

ð Ô

37.1.6 area range

OSPF ʊ ˇ ˧ **area range** Â ˧ **no** ˇ **no** б **cost** ˩ ˩ Ո ˇ a Â

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

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

ð Ô

area-id	OSPF ʊ ˥ Â ʊ ˥ ˩ Ո ⁸ ˇ ≠ ˩ Ո IP Â
ip-address	˫ Â
advertise | **not-advertise**	˫ ĭ Ὼ ˇ Ὼ
cost *cost*	Â

ð Ô

ʊ Â

б ĭ RFC1583 ˇ
RFC1583 ˇ cost ˇ ĭ ‡
cost Â

ð ˧ Ô

Â

ð Ô

ʒ ˧ ABR Э ˘ ш ˥
˘ ˥ è ш Â ˥ ˧ ˧ ш
˘ ш Э é ˘ ш ˧
Â з ˧ Л advertise not-advertise

ā Ї Ω ˘ ˘ ˩ Ω Â

˧ Л ⊮ ш ʒ˘ OSPF
˘ ˘ Â

ð Ô

ЛЬЮ ˘ ш ˝ 172.16.16.0/20 Â

```
Ruijie(config)# router ospf 1
Ruijie(config-router)# network 172.16.0.0 0.0.15.255
area 0
Ruijie(config-router)# network 172.16.17.0 0.0.15.255
area 1
Ruijie(config-router)# area 1 range 172.16.16.0 255.2
55.240.0
```

ð ˥ Ô

ð Ô

37.1.7 area stub

OSPF ш й ˘ ʒ
area stub Â ʒ **no** Â

area *area-id* **stub** [**no-summary**]

no area *area-id* **stub** [**no-summary**]

ð Ô

area-id	STUB ш ш ˥ Â
no-summary	ˆ ˩ ˜ ABR ˘ ˩ й Â˧ ABR Â

ð Ô

⊮ Â

ð ʒ Ô

Â

ð Ô

OSPF **area stub** ֽ Â ABR ٴ ٸ
Ь (LSA)' 1˜ 1˝ LSA' 2˜ 2˝
LSA' 3˜ 3˝ LSA Â ÿ ˘
ٴ ˝ OSPF ˘ ABR
Â a ˝ OSPF Â

˘ ٴ ABR Э **area stub** ֽ ˘
no-summary Â ٴ ш ˘ Л٦ ٴ
ABR Â

OSPF ш й ч ֽ **area stub** **area default-cost** Â Э˘ **area stub**
ֽ˘ **area default-cost** ֽ ٴ ABR Э Â **area default-cost**
ֽ Ыҗ ˆ ˜ Â

ð Ô

ЛЮ ˘ ш 1 й ˘ ш
Â

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

ð ֽ Ô

ֽ	
area default-cost	Ыҗ STUB ш ˆ OSPF ˜ Â

37.1.8 area virtual-link

no area *area-id* **virtual-link** *router-id*

ô

area-id	OSPF ʁ ʌ Â ʁ ʌ ⅃ Ɲ ˢ ˇ ≠ ⅃ Ɲ IP Â
router-id	Â ⅃ Ɲ show ip ospf ʒ Â

ˆ ⅃ ˜ ⅈ ˇ Ɲ

dead-interval *seconds* ᵡ Æˇ ᵡ 40 T

a ;

è Â

ð ʒ Ô

Â

ð Ô

OSPF ˘ ш б ˘ ˘
˘ ĭ ‡ Â
ч ш ˆ ABR˜ … ˘ ч ABR ⅄
ш ѝ ш Â ˆ Stub Area˜ NSSA a ѝ ш
Â ≠ ⅄ Л è ш Â

router-id ѝ OSPF ˘ a router-id ˘
show ip ospf neighbor ʒ Â⅄ Л Loopback
Â

area virtual-link ʒ ⅄ Ⱨ ˘
ш OSPF ˘ ʒ **area authentication** Â

ð Ô

ЛЮ ˘ Л ш 1 ѝ ш ˘ б 2.2.2.2 Â

```
Ruijie(config)# router ospf 1
Ruijie(config-router)# network 172.16.0.0 0.0.15.255 area
0
Ruijie(config-router)# network 172.16.17.0
0.0.15.255area 1
Ruijie(config-router)# area 1 virtual-link 2.2.2.2
```

ЛЮ ˘ Л ш 1 ѝ ш ˘ б 1.1.1.1
Â ш 10 ш ˘ OSPF
˘ ѝ MD5 Â

```
Ruijie(config)# router ospf 1
Ruijie(config-router)# network 172.16.17.0
0.0.15.255area 1
Ruijie(config-router)# network 172.16.252.0
0.0.0.255area 10
Ruijie(config-router)# area 0 authentication
message-digest
Ruijie(config-router)# area 1 virtual-link 1.1.1.1
message-digest-key 1 md5 hello
```

ð ʒ Ô

ʒ	
area authentication	OSPF ʊ ˥ Â
show ip ospf	OSPF ˘ Â

ð ˎ Ô

ð Ô

37.1.9 auto-cost

ʒ ╟ ʒ˙ ╥ ˎ ˘ ╟ ʒ˙ ˘ ʒ **no** ˩ Л∪ ╟ ʒ˙ ╥ ˘ ˩ Л∪ Â

auto-cost [**reference-bandwidth** *ref-bw*]

no auto-cost [**reference-bandwidth**]

ð Ô

ref-bw	Â Л∪ Mbps ѝ Æ˘ : 1-4294967

ð Ô

ѝ 100Mbps Â

ð ʒ Ô

Â

ð Ô

ʒ ╟ ʒ˙ , a ˩ ╟ ʒ ˙ ╥ , . Э ˩ ‡ ╟ ʒ˙ ( ) ˩ . **default auto-cost** **no auto-cost** a ˩˘ . ╟ ʒ˙ ╥ ˘ ˎ ╟ ʒ˙ ╥ Â

ʒ **ip ospf cost** cost˘ ‡ ╟ ʒ˙ cost Â

ð Ô

ЛЮ ˘ ѝ 10M Â

```
Ruijie(config)# router ospf 1
```

OSPF2 ३

¿ AS ˘ ˘
¾ RFC1583 ″I ‡ RFC2328
″I ‡ Â

commpatible rfc1583

no commpatible rfc1583

ð Ô

¾	

ð Ô

RFC1583 ‡ Â

ð ¾ Ô

Â

ð Ô

ЛъЮ ˘ rfc 2328 ‡ Â

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

ð ¾ Ô

¾	
show ip ospf	ospf

ð ¿ Ô

ð Ô

37.1.12 default-information originate õ OSPF ð

OSPF ˘ ¾
default-information originate Â ¾ **no** Â

default-information originate [**always**] [**metric** *metric*] [**metric-type** *type*] [**route-map** *map-name*]

no default-information originate [**always**] [**metric** *metric*]

always	^ ˩ ~ OSPF ˚ ˘ a ĭ Â
metric *metric*	^ ˩ ~ ˘ ѝ 1 Â
metric-type *type*	^ ˩ ~ Â OSPF ч ' 1˘ a ˩ Э a ' 2˘ Â 1 2 ˩ Â ѝ 2 Â
route-map *map-name*	route-map ˩ , route-map

ð Ô

a Â

ð ʒ Ô

Â

ð Ô

redistribute default-information ʒ ˘ OSPF ╟ ˩ ѝ ASBR˘ ~ Â ASBR a ╟ ˘ OSPF Â ASBR ˘ **default-information originate** ʒ Â

always ˘ OSPF a ĭ ˘ ˩ Â a ˘ ĭ ˘ ˩ Л **show ip ospf database** OSPF ˘ ѝ 0.0.0.0 Â OSPF **show ip route** ʒ˘ ˩ Л Â

˘ ˅ **default-information originate** ʒ Ѭ a ʒ **default-metric** Â

OSPF ч ˘ 1 ˩˘ 2 a ˩ Â ч ˘ ˩ ˘ 1 2 ˝I ˘ Л **show ip route** ˅ 1 Â

STUB ѡ a ˩ Л Â

ð Ô

ЛЮ ˘ OSPF ˘ OSPF ˘ ѝ 1˘ ѝ 50 Â

```
Ruijie(config)# router ospf 1
```

```
Ruijie(config-router)# network 172.16.24.0 0.0.0.255
area 0
Ruijie(config-router)# default-information originate
always metric 50 metric-type 1
```

ð ¾ Ô

¾	
show ip ospf database	OSPF Â
show ip route	IP Â

ð Ô

ð Ô

37.1.13 default-metric

OSPF ¯ ¾
default-metric Â ¾ **no** Â

default-metric *metric*

no default-metric

ð Ô

	¾ ÕÕ PHÄÄ n¸XÂ f'3 ÍyH',3

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

ð ¢ Ô

¢	
redistribute	¦ è Â
show ip ospf	ospf

ð ¬ Ô

ð Ô

37.1.14 distance ospf

a ¬ OSPF

distance ospf {**intra-area** <*1-255*> | **inter-area** <*1-255*> | **external** <*1-255*>}

no distance ospf

ð Ô

intra-area <*1-255*>	¥ ˘ ¼ 110
inter-area <*1-255*>	¥ ˘ ¼ 110
external <*1-255*>	˘ ¼ 110

ð Ô

¼ 110 Â

ð ¢ Ô

OSPF Â

ð Ô

OSPF a ¬ a ¬ ˘ ¢ Â

ð Ô

ЛЬЮ ˘ OSPF й 160

```
Ruijie(config)# router ospf 1
Ruijie(config-router)# distance ospf external 160
```

ð ३Ô

ð ⁄ Ô

ð Ô

37.1.15 distribute-list in

LSA

distribute-list {*listname* | **gateway** *plist-name* | **prefix** *plist-name* } **in** [**in726list-name**

```
Ruijie(config-router)# distribute-list 3 in ethernet
1/0
Ruijie(config-router)# distribute-list 3 in ethernet
1/1
```

ð ¾Ô

ð Ô

ð Ô

37.1.16 distribute-list out

† ˘ redistribute ¾

distribute-list {l*istname* | **gateway** *plist-name* | **prefix** *plist-name*} **out** [**bgp** | **connected** | **isis** *area-tag* | **ospf** *process-id* | **rip** | **static**]

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

ð Ô

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

ð Ô

ù ˘ Â

ð ¾ Ô

Â

ð Ô

distribute-list out б **redistribute route-map** ¾ ˘ ÿ è † OSPF ˘ a † ˘ б **redistribute** ¾ Л ÂACL ‡ prefix-list ‡ a , ACL ‡ , ‡ a Ä prefix-list Â

ð Ô

Ю †

३	
show ip ospf	OSPF
enable traps	OSPF TRAP ╗

ð ✓ Ô

lsa	б lsa traps ˘ ˩ Л Ю lsa traps ' **lsdbapproachoverflow** LSA Э ǂ **lsdboverflow** LSA Э **maxagelsa** LSA **originatelsa** LSA
retransmit	б retransmit traps ˘ ˩ Л Ю retransmit traps ' **iftxretransmit** Э **virtiftxretransmit** Э
state-change	б state-change traps ˘ ˩ Л Ю state-change traps ' **ifstatechange** ˩ **nbrstatechange** ˩ **virtifstatechange** ˩ **virtnbrstatechange** ˩

ð Ô

Ю˘ TRAP Â

ð ʒ Ô

Â

ð Ô

ʒ ˩ **snmp-server** ʒ 8˘ ˝I **snmp-server enable traps ospf** Л ˥˘ ʒ ˩ Л Â

ʒ a ˩ MIB 8˘ a ˩ ˩ TRAP Â

ð Ô

ЛЮ ˘ OSPFv2 100 TRAP

ð Ô

37.1.19 ip ospf authentication

ֽ ˘ **no** ⅃Ո ѝ Â

ip ospf authentication [**message-digest** | **null**]

no ip ospf authentication

ð Ô

message-digest	Э MD5 ╗ Â
null	a Â

ð Ô

Э , Э ѡ
Â

ð ֽ Ô

Â

ð Ô

ֽ ⅄ a .
no ˘ ĭ ѡ
Э ᾱ ˘ ѝ **null**ʹ ‡ ⁸ ѝ
a , Э ѡ ,
ʺI Э Â

ð Ô

ЛЬЮ ˘ GigabitEthernet 0/0 OSPF ѝ MD5
Â

```
Ruijie(config)# interface GigabitEthernet 0/0
Ruijie(config-if)# ip address 172.16.10.0
255.255.255.0
Ruijie(config-if)# ip ospf authentication
message-digest
```

ð ֽ Ô

ֽ	
area authentication	OSPF ѡ Ⱨ Â
ip ospf authentication-key	OSPF Â

ip ospf message-digest-key	OSPF MD5 Â

ð ⊀ Ô

ð Ô

37.1.20 ip ospf authentication-key

OSPF ˘ ʒ **ip ospf authentication-key** Â ʒ **no** Â

ip ospf authentication-key *key*

no ip ospf authentication-key

ð Ô

Key	˘ ⊣ Л∪ 8 Â

ð Ô

Â

ð ʒ Ô

Â

ð Ô

ip ospf authentication-key ʒ ˘ OSPF Â a ˘ ч ⊀ a OSPF ˘ ≠ a Â

a ⊣ ⊣ Л∪ a ˘ ⊣ Э ˘ Â

OSPF ш ї̈ ˘ ʒ **area authentication** Â

Э ≠ ⊣ Л∪ , Ю ʒ **ip ospf authentication** , ш ″І ⊀ .

ð Ô

ЛЬЮ ˘ GigabitEthernet 0/0 OSPF й ospfauth Â

```
Ruijie(config)# interface GigabitEthernet 0/0
Ruijie(config-if)# ip address 172.16.10.0
255.255.255.0
```

```
Ruijie(config-if)# ip ospf authentication-key ospfauth
```

ð ٪ Ô

٪	
area authentication	OSPF ש Ⱨ Â
Ip ospf authentication	Э Ⱨ

ð ⁄ Ô

ð Ô

37.1.21 ip ospf cost

OSPF ˆ OSPF ˜ ˘
٪ **ip ospf cost** Â ٪ **no** Â

ip ospf cost *cost*

no ip ospf cost

ð Ô

cost	OSPF Â

ð Ô

ѝ /Bandwidthˆ ѝ 100Mbps˜ Â

ð ٪ Ô

Â

ð Ô

Ю˘ OSPF ѝ 100Mbps/Bandwidth˘ ѐ Bandwidth
ѝ ˘ ٪ bandwidth Â

ђ OSPF ѝ'

¸ 64K ˘ cost ѝ 1562'

¸ E1 ˘ cost ѝ 48'

¸ 10M Л ˘ cost ѝ 10'

¸ 100M Л ˘ cost ѝ˝ Â

ip ospf cost ٪ OSPF ˘ Â

ð Ô

ЛъЮ ˘ serial 1/0 OSPF й 100 Â

```
Ruijie(config)# interface serial 1/0
Ruijie(config-if)# ip ospf cost 100
```

ð ¾ Ô

¾	
bandwidth	Â a Â
show ip ospf	Ospf

ð ⅄ Ô

ð Ô

37.1.22 ip ospf database-filter all out

¾ a ⅄ LSA ˘ a Э LSA , ¾ **no** ⅄Л

ip ospf database-filter all out

no ip ospf database-filter

ð Ô

¾	

ð Ô

╖ , ⅄Л Э LSA Â

ð ¾ Ô

Â

ð Ô

Э LSA ,⅄Л Э ╖ .

ð Ô

ЛъЮ ˘ LSA serial 1/0 Э Â

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

```
Ruijie(config-if)# ip ospf database-filter all out
```

ð ⅄ Ô

ð Ô

37.1.23 ip ospf dead-interval

OSPF ˘ ʒ **ip ospf dead-interval** Â ʒ **no** Â

ip ospf dead-interval *seconds*

no ip ospf dead-interval

ð Ô

seconds	ⱻ ˘ Л∪ ѝ Æ Â

ð Ô

ѝ **ip ospf hello-interval** " Â

ð ʒ Ô

Â

ð Ô

OSPF Hello Â OSPF ˘
Hello ˘ ÿ
Â ѝ hello 4 ˘ hello
˘ ╟ Â

ʒ ⅃ Л∪ OSPF ˘ ↾ Â
ч '

¸ ˘ a hello '

¸ ⅃ Э Â

ð Ô

ЛЬЮ ˘ serial 1/0 OSPF ѝ
30 Â

```
Ruijie(config)# interface serial 1/0
Ruijie(config-if)# ip address 172.16.10.1
255.255.255.0
Ruijie(config-if)# encapsulation ppp
Ruijie(config-if)# ip ospf dead-interval 30
```

ð ʒ Ô

¾	
ip ospf hello-interval	OSPF Hello Â

ð ¼ Ô

ð Ô

37.1.24 ip ospf disable all

a Ą ospf Â

ip ospf disable all

no ip ospf disable all

ð Ô

¾

ð Ô

ð ¾ Ô

Â

ð Ô

¾ **network area** ĭ ¬ ˘ ¾ ¼˘
. network˘ ≠ a Ą ospf Â a
OSPF ˘ ≠ a б OSPF Â

ð Ô

```
Ruijie(config)# interface serial 1/0
Ruijie(config-if)# ip address 172.16.10.1
255.255.255.0
Ruijie(config-if)# ip ospf disable all
```

ð ¾Ô

ð ¼ Ô

ð Ô

37.1.25 ip ospf hello-interval

OSPF Hello ˘ ¾ **ip ospf hello-interval** Â ¾ **no** Â

ip ospf hello-interval *seconds*

no ip ospf hello-interval

ð Ô

seconds	OSPF hello ˘ Л∪ ѝ Æ Â

ð Ô

¸ Л∪ 10 ’
¸ PPP à HDLC 10 ’
¸ 10 ’
¸ à .25 30 Â

ð ¾ Ô

Â

ð Ô

hello hello Â ˘ OSPF
↓ ≠ ˘ ╕ Â↓ Э
hello Â ˘
hello a Â

ð Ô

ЛυЮ ˘ serial 1/0 OSPF Hello
ѝ 15 Â

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

ð ¾Ô

¾	
ip ospf dead-interval	OSPF Â

ð ↓ Ô

ð Ô

37.1.26 ip ospf message-digest-key

OSPF MD5 ˘ ¾ **ip ospf message-digest-key** Â ¾ no OSPF MD5 Â

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

no ip ospf message-digest-key

ð Ô

Key	˘ ⅃Л 16 Â
Key-id	˘ ÿ˝ 255 Â

ð Ô

MD5 Â

ð ʒ Ô

Â

ð Ô

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

a ⅃ ⅃Л a ˘ ⅃ Э
˘ Â ⅃
Â

OSPF ʊ ї Б

```
Ruijie(config-if)# ip ospf message-digest-key 5 md5
hello5
                ¶          ¦˜                              Â
Ruijie(config)# interface Serial1/0
Ruijie(config-if)# no ip ospf message-digest-key 10 md5
hello10
```

ð ¢ Ô

¢	
area authentication	OSPF ш Ю Â
ip ospf authentication	Э Ю

ð ¦ Ô

ð Ô

37.1.27 ip ospf mtu-ignore

¦ **mtu** ¦Ո ¢ Â

¢ **no** Â

ip ospf mtu-ignore

no ip ospf mtu-ignore

ð Ô

¢	

ð Ô

mtu Â

ð ¢ Ô

Â

ð Ô

OSPF MTU

MTU U,1 Tf 0 Tc 0 Tw 10.5 02, Tf 0.0057 Tc 2 T2 Td (Md 4E38550602AFC41B45EE

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

ð ¼ Ô

ð Ô

37.1.28 ip ospf network

OSPF ˘ ¾ **ip ospf network** Â ¾ **no** Â

ip ospf networkı broadcast ¸ non-broadcast ¸ point-to-multipoint [non-broadcast]¸ point-to-pointº

no ip ospf networkı broadcast ¸ non-broadcast ¸ point-to-multipoint [non-broadcast]¸ point-to-pointº

ð Ô

broadcast	OSPF ù Â
non-broadcast	OSPF ù ˘ NBMA Â
point-to-multipoint [non-broadcast]	OSPF ù Â , non-broadcast ù Â
point-to-point	OSPF ù Â

ð Ô

¸ ' PPP à SLIP à à X.25 ' ò ù Ò

¸ ˆ HDLC˜ PPP˜ SLIP˜

è ˘ OSPF a ⅃ ↰ ́ ч '

¸ (NBMA) ÂNBMA

˘ ↰ ˘ SVC

ˆ X.25˜ ˘ PVC˜ ˜

ÂOSPF NBMA Э б Э ˘

ˆ Designated Router˜ ˘ NBMA

Â

¸ Â a ˘

OSPF Â

˘ OSPF ˘ Л

Â ↰ ́ ,

.

a ж˘ ⅃Л ́ Â ⅃Л

ˆ ˘ X.25˜ ˘ OSPF

˘ Â **X.25 map**

frame-relay map ʒ˘ ⅃Л X.25 é ˘

OSPF ⅃Л X.25 Â

⅃Л ˘ OSPF

˘ ў Â б

ЛЮ '

¸ ˘ a ˘ ≠ ,

¸ ʒ' ˘ a Â

/ı à Л ⅂ X.25 ˘ IP ˘

broadcast .

ð Ô

ЛЮ ˘ ́ ˘ /

Â

```
Ruijie(config)# interface Serial1/0
Ruijie(config-if)# ip address 172.16.24.4
255.255.255.0
Ruijie(config-if)# encapsulation frame-relay
Ruijie(config-if)# ip ospf network broadcast
```

ЛЮ ˘ ́ ˘ /

Â

```
Ruijie(config)# interface Serial1/0
Ruijie(config-if)# ip address 172.16.24.4
255.255.255.0
Ruijie(config-if)# encapsulation frame-relay
```

OSPF ″I hello Â OSPF
DR/BDR ˜ ˘ ″I
˘ ѝ DR BDR Â ″I ˘
ѝ DR BDR Â ″I ѝ˚ ˘ a ˩ ѝ DR
BDR Â ֳ ˩ OSPF **broadcast** **non-broadcast**
Â

:

DR BDR ѫ ″I a . ˘
˩ Ю DR BDR ″I .

ð ʒ Ô

Â

ð Ô

LSU ˘ LSU ă ˘
ip ospf retransmit-interval ʒ Ѭ ˘
˘ LSA Â

˘ Л∪ a ˘ Э˘
ɻ Л∪ Â LSU area
virtual-link ʒ retransmit-interval Ѭ Â

ð Ô

ЛЬЮ ˘ serial 1/0 LSU и 10 Â

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

ð ʒ Ô

ʒ	
area virtual-link	Ѭ OSPF Â

ð ɻ Ô

ð Ô

37.1.31 ip ospf transmit delay

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

ip ospf transmit delay *seconds*

no ip ospf transmit delay

ð Ô

Seconds	Ѭ OSPF LSU ˘ Л∪ и æ Â и 1 Â

ð Ô

и 1 Â

ð ʒ Ô

Â

ð Ô

LSU ˘ LSAs ˜ Age
╗˘ ╗ ¾ **ip ospf transmit delay** ⌧Â
˘ æ ˘
Â LSU ˘ **area**
virtual-link ¾ **retransmit-interval** ⌧Â LSU
Œ ¾

ЛЬЮ ˘ ↓ Â

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

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ʒ	
show ip ospf	ospf Â

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37.1.33 max-concurrent-dd

↓ DD Â

max-concurrent-dd <*1-65535*>

ð Ô

<*1-65535*>	DD

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б ↓ ˘ è ↓ ˘ ʒ˘
↓ ⁸ OSPF ↓ DD Â

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ЛЬЮ ˘ DD й 4Â

```
Ruijie(config)# router ospf 10
Ruijie(config-router)# max-concurrent-dd 4
```

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37.1.34 neighbor

Ⱨ OSPF ˘ ʒ **neighbor** Â ʒ **no** Â

neighbor *ip-address* [**poll-interval** *seconds*] [**priority** *priority*] [**cost** *cost*]

no neighbor *ip-address*

ð Ô

ip-address	IP Â
poll-interval *seconds*	ˆ ˩ ˜ ˘ Л υ й Æ˘ 120 ÂNon-broadcast(NBMA) Â
priority *priority*	ˆ ˩ ˜ ˝I ˘ й˚ Â Non-broadcast(NBMA)
Cost *cost*	ˆ ˩ ˜ ˘ Ⱨ, Э cost Âpoint-to-multipoi nt [non-broadcast] Â

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RGOS ˚ й ˘ Â
IP ˘ й ў IP Â

NBMA Э ˩ й a ˘
Hello ˘ OSPF Hello ˘ Hello
й Â OSPF ˘ ˧ ˩ ˝I
a й 0 Hello ˘ ˝I й 0 a
б DR/BDR Â DR/BDR Л ˘ DR/BDR ˩
Hello Â

Э, й a ɛ Л ╟
, ∃ ص Л ص ï

ЛЬЮ ˘ OSPF ˘ è IP ѝ
172.16.24.2ˇ ˝I ѝ 1˘ ѝ 150 Â

```
Ruijie(config)# router ospf 20
Ruijie(config-router)# network
```

OSPF2 ३

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OSPF ˘ **hard** ˘ a OSPF˝
˙ ˘ **soft**

ð Ô

ЛЬЮ ¾ LSA 10 ˘ OSPF 10 Â

```
Ruijie# config terminal
Ruijie(config)# router ospf 10
Ruijie(config-router)# overflow database 10 hard
```

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37.1.37 overflow database external

¾ external LSA б ÿ
Â

overflow database external *max-dbsize wait-time*

no overflow database external

ð Ô

max-dbsize	external lsa ˆ ˙ AS ˙˜ ˘ ˙ ' 0-2147483647 Â
wait-time	ÿ ˘ ˙ ' 0-65535 Â

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a ⁸ external-LSA Â

⁸ external-LSA ˘ external-LSA
˙˘ a Ą Â

ð ¾ Ô

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1' OSPF a Ю a OVERFLOW '

```
Ruijie(config)# router ospf 1
Ruijie(config-router)# no overflow memory-lack
```

OSPF2 ३

route-map	ʃ ‡ Â
tag	ʃ OSPF tag Â
subnets	ɹ ʃ Â

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ð ʒ Ô

ð Ô

ʒ ʌˇ ɹ ŭ ASBRˇ OSPF ˇ Лυ type-5 LSA è OSPF Â

ʃ ˇ BGP metric ŭ 1ˇ è LSA metric ŭ 20ʹ

ʃ **isis** ˇ a level ˇ ɻ ʃ level-2 ˇ ʃ ˇ level ˇ ‡ ʃ level Â ˇ ŭ ˇ ɹ level 1, level 2 ˇ ʌ ŭ level-1-2 Â Â

ʃ **ospf** ˇ a match ˇ ʃ ospf ' ʌ match ŭ match ˇ ʃ ɻ ɳ ʃ ' no ʒ match ŭ Â Â

ʃ ˇ route-map ˇ route-map match ‡ ʃ ɳ ' ʃ OSPF ISIS ˇ ɻ ʃ match level ‡ˇ Ạ route-map Â

ð Ô

ЛυЮ ʒ ʃ OSPF

```
Ruijie(config-router)# redistribute static subnets
Ruijie(config)# router ospf 1
Ruijie(config-router)# redistribute ospf 2 subnets
Ruijie(config-router)# redistribute ospf 2 match
external 1 internal
Ruijie(config-router)# redistribute isis isis-001
Ruijie(config-router)#  redistribute  isis  isis-001
level-1
```

Show run Ю'

```
router ospf 1
redistribute ospf 2 match external 1 internal subnets
```

```
redistribute isis isis-001 level-1-2
```

ð ३Ô

ð ⁄ Ô

ð Ô

37.1.41 router ospf

… OSPF ˘ ३ **router ospf** Â ३ **no** ЊЖ OSPF Â

router ospf *process-id* [**vrf** *vrf-name*]

no router ospf *process-id*

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process-id	ospf ⁄
vrf-name	VRF ˘ OSPF VRF

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a OSPF Â

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RGOS10.1 Э ╗ ' ⁄˘ и ospf Â a ⅄ ospf ˘ ⅄Ц и ч a Â

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ЛЦЮ ˘ **vrf** *vpn_1* … OSPF 10 Â

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

ð ३Ô

३	
show ip protocols	Â
show ip ospf	ospf Â

ð ⁄ Ô

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37.1.42 router-id

ID, ३ **no** ⊣ Л∪ Router ID˘ Router ID Â

router-id *router-id*

no router-id

ð Ô

OSPF ˘ ३

37.1.45 timers spf

OSPF ˘ SPF ˘ Л
ч SPF ˘ ֳ **timers spf** Â
ֳ no Â

timers spf *spf-delay spf-holdtime*

no timers spf

ð Ô

spf-delay	ЬЖ SPF ˘ Л и Æ Â OSPF ˘ SPF Â
spf-holdtime	ЬЖ ч SPF ˘ Л и Æ Â ˘ ч ˘ a SPF Â

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spf-delay 5 ' *spf-holdtime* 10 Â

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spf-delay *spf-holdtime* ˘ OSPF ˘ ≠ ˘ ≠ ˘ ´ CPU Â

ð Ô

ЛЮ ˘ OSPF ¦ и 3 9 Â

```
Ruijie(config)# router ospf 20
Ruijie(config-router)# timers spf 3 9
```

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ֳ	
show ip ospf	ospf

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37.2

37.2.1 show ip ospf

OSPF ˘ ʒ **show ip ospf** Â

show ip ospf [*process-id*]

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process-id	ospf /ı

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ʒ ˩ Л∪ OSPF Â

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Л∪Ю ѝ **show ip ospf** ʒ '

```
Ruijie#
```

```
Number of LSA originated 6
Number of LSA received 2
Log Neighbor Adjency Changes : Enabled
Number of areas attached to this router: 1
Area 0 (BACKBONE)
Number of interfaces in this area is 1(1)
Number of fully adjacent neighbors in this area is 1
Area has no authentication
SPF algorithm last executed 00:01:26.640 ago
SPF algorithm executed 4 times
Number of LSA 3. Checksum 0x0204bf
Area 1 (NSSA)
Number of interfaces in this area is 1(1)
Number of fully adjacent neighbors in this area is 0
Number of fully adjacent virtual neighbors through this
area is 0
Area has no authentication
SPF algorithm last executed 02:09:23.040 ago
SPF algorithm executed 4 times
Number of LSA 6. Checksum 0x028638
NSSA Translator State iselected
```

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LsaGroupPacing	LSA ˘ ˘
Incomming current DD exchange neighbors	˘ incomming exstart
Outgoing current DD exchange neighbors	˘ outgoing ÿ exstart
Number of external LSA	LSA
External LSA Checksum Sum	LSA
Number of opaque LSA	opaque-LSA
Opaque LSA Checksum Sum	opaque-LSA
Number of non-default external LSA	external-LSA
External LSA database limit	external-LSA 8
Exit database overflow state interval	overflow
Database overflow state	OSPF ĭ overflow
Number of LSA originated	LSA
Number of LSA received	LSA
Log Neighbor Adjency Changes	ȷ ĭ
Number of areas attached to this router	Ɔ ʁ
Area type	ʁ , Default, Stub,NSSA
Number of interfaces in this area	ʁ
Number of fully adjacent neighbors in this area	ʁ Full
Number of fully adjacent virtual neighbors through this area	ʁ Full ’ ȷ ʁ ’
Area authentication	ʁ
SPF algorithm last executed	Ɔ SPF
SPF algorithm executed times	SPF

Number of LSA	ʍ LSA
Checksum Sum	ʍ LSA
NSSA Translator State	ĭ NSSA LSA ѝ External LSA' NSSA ʍ˘ ɜ ABR OSPF '

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37.2.2 show ip ospf border-routers

ABR/ASBR OSPF ˘ ʒ

show ip ospf border-routers Â

show ip ospf [*process-id*] **border-routers**

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I	ѝ ѡ Â
1.1.1.1	OSPF Â
[2]	ˆ cost˜ Â
via 10.0.0.1	Ю Â
GigabitEthernet 0/1	Â
ABR, ASBR	ˇ ABR ASBR ч ˇ ㄴ ㄩ ㄴ ABR ASBR Â
Area 0.0.0.1	˜ ѡ Â
select	ASBR ˇ select Â

show ip ospf [*process-id area-id*] **database** [**summary**] [*link-state-id*] [**self-originate**]

show ip ospf [*process-id area-id*] **database** [**asbr-summary**] [*link-state-id*]

show ip ospf [*process-id area-id*] **database** [**asbr-summary**] [*link-state-id*] [**adv-router** *ip-address*]

show ip ospf [*process-id area-id*] **database** [**asbr-summary**] [*link-state-id*] [**self-originate**]

show ip ospf [*process-id area-id*] **database** [**external**] [*link-state-id*]

show ip ospf [*process-id area-id*] **database** [**external**] [*link-state-id*] [**adv-router** *ip-address*]

show ip ospf [*process-id area-id*] **database** [**external**] [*link-state-id*] [**self-originate**]

show ip ospf [*process-id area-id*] **database** [**nssa-external**] [*link-state-id*]

show ip ospf [*process-id area-id*] **database** [**nssa-external**] [*link-state-id*] [**adv-router** *ip-address*]

show ip ospf [*process-id area-id*]**database** [**nssa-external**] [*link-state-id*] [**self-originate** | **maxage**]

show ip ospf [*process-id area-id*]**database** [**database-summary**]

external	ˆ ˩ ˜ OSPF Â
nssa-external	ˆ ˩ ˜ OSPF Â
opaque-area	ˆ ˩ ˜ LSA
opaque-as	ˆ ˩ ˜ LSA
opaque-link	ˆ ˩ ˜ LSA
database-summary	ˆ ˩ ˜ OSPF LSA

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OSPF ˘ ˦ ˦ Â
ʒ˘ ╠ OSPF Â

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ЛЬЮ ѝ **show ip ospf database** ʒ '

```
Ruijie# show ip ospf database
    OSPF Router with ID (1.1.1.1) (Process ID 1)

        Router Link States (Area 0.0.0.0)
         Link IDDDDDDDDDADVk(Routeru)-6DDDDDAge  Seq#DDDDDDDCkSum

        Area 0.0.0.0)

         Link(Routerru)-6D(Route8 )]43035075Vk 0.0.0.0-6D10.90.01
```

```
Link ID         ADV Router      Age  Seq#       CkSum
Link count
1.1.1.1       1.1.1.1       2    0x80000001 0x91a2 1

      Summary Link States (Area 0.0.0.1 [NSSA])

Link ID         ADV Router      Age  Seq#       CkSum
Route
100.0.0.0      1.1.1.1        2    0x80000001 0x52a4
100.0.0.0/16
192.88.88.0    1.1.1.1        2    0x80000001 0xbb2d
192.88.88.0/24

   NSSA-external Link States (Area 0.0.0.1 [NSSA])

Link ID         ADV Router      Age  Seq#       CkSum
Route            Tag
20.0.0.0       1.1.1.1       1    0x80000001 0x033c E2
20.0.0.0/24    0
100.0.0.0      1.1.1.1       1    0x80000001 0x9469 E2
100.0.0.0/28   0

              AS External Link States

Link ID         ADV Router      Age  Seq#       CkSum
Route            Tag
20.0.0.0       1.1.1.1        380  0x8000000a 0x7627
E2 20.0.0.0/24    0
100.0.0.0      1.1.1.1        620  0x8000000a 0x0854
E2 100.0.0.0/28   0
```

show ip ospf database ҃ ЮÂ

OSPF Router with ID	OSPF б OSPF Л
Router Link States	ЛЬЮ ѝ Â
Net Link States	ЛЬЮ ѝ Â
Summary Net Link States	ЛЬЮ ѝ Â
NSSA-external Link States	ЛЬЮ ѝ
AS External Link States	ЛЬЮ ѝ Â
Link ID	Â
ADV Router	Â

Age	Â
Seq#	Л˘ LSA Â
Cksum	Â
Link-Count	
Route	LSA
Tag	Â

ЛЬЮ ѝ **show ip ospf database asbr-summary** ʒ '

```
Ruijie# show ip ospf database asbr-summary
OSPF Router with ID (1.1.1.35) (Process ID 1)
ASBR-Summary Link States (Area 0.0.0.1)
LS age: 47
Options: 0x2 (*|-|-|-|-|-|E|-)
LS Type: ASBR-summary-LSA
Link State ID: 3.3.3.3 (AS Boundary Router address)
Advertising Router: 1.1.1.1
LS Seq Number: 80000001
Checksum: 0xbe8c
Length: 28
Network Mask: /0
TOS: 0  Metric: 1
```

show ip ospf database asbr-summary ʒ
ЮÂ

OSPF Router with ID	ЛЬЮ б

Length	˘ Л∪ ѝ Æ Â
Network Mask	Â
Metric Type	Â
TOS	TOS ˘ ѵ ѝ 0 Â
Metric	Â
Forward Address	˘ IP Â ѝ 0.0.0.0ˇ ‡ Â
External Route Tag	˘ 32 Â OSPF a ˘ è ƚ OSPF Â

ЛЬЮ ѝ **show ip ospf database network** ֳ '

```
Ruijie# show ip ospf database network
OSPF Router with ID (1.1.1.1) (Process ID 1)
Network Link States (Area 0.0.0.0)

LS age: 572
Options: 0x2 (*|-|-|-|-|-|E|-)
LS Type: network-LSA
Link State ID: 192.88.88.27 (address of Designated
Router)
Advertising Router: 1.1.1.1
LS Seq Number: 80000001
Checksum: 0x5366
Length: 32
Network Mask: /24
Attached Router: 1.1.1.1
Attached Router: 3.3.3.3
```

show ip ospf database network ֳ Ю Â

Link State ID	Â
Advertising Router	Â
LS Seq Number	Л Â
Checksum	Â
Length	˘ Лu ù Æ Â
Network Mask	Â
Attached Router	Э Â

ЛuЮ ù **show ip ospf database router** ҳ '

```
Ruijie# show ip ospf database router
OSPF Router with ID (1.1.1.1) (Process ID 1)
Router Link States (Area 0.0.0.0)
LS age: 322
Options: 0x2 (*|-|-|-|-|-|E|-)
Flags: 0x3 : ABR ASBR
LS Type: router-LSA
Link State ID: 1.1.1.1
Advertising Router: 1.1.1.1
LS Seq Number: 80000012
Checksum: 0x6d3a
Length: 48
Number of Links: 2

Link connected to: Stub Network
(Link ID) Network/subnet number: 100.0.1.1
(Link Data) Network Mask: 255.255.255.255
Number of TOS metrics: 0
TOS 0 Metric: 0
```

show ip ospf database router ҳ ЮÂ

OSPF Router with ID	ЛuЮ б OSPF Л Â
Router Link States	ЛuЮ ù Â
LS age	Â
Options	
Flag	router
LS Type	Â

Link State ID	Â
Advertising Router	Â
LS Seq Number	Л Â
Checksum	Â
Length	˘ Лυ ѝ Æ Â
Number of Links	Â
Link connected to	˘ Лυ Ч Â
(Link ID)	Â
(Link Data)	Â
Number of TOS metrics	TOS ˘ ч TOS0 Â
TOS 0 Metrics	TOS˚ Â

ЛЬЮ ѝ **show ip ospf database summary** ʒ '

```
Ruijie# : 0x330e0 08trics2 j-ength: 280 08trics metrics
```

Link State ID	Â
Advertising Router	Â
LS Seq Number	ʌ Â
Checksum	Â
Length	˘ ЛU ѝ Æ Â
Network Mask	Â
TOS	TOS ˘ ˩ ѝ 0 Â
Metric	Â

ЛЬЮ ѝ **show ip ospf database nssa-external** ʒ '

```
Ruijie# show ip ospf database nssa-external
o ref5019
```

Options	Â
LS Type	Â
Link State ID	Â
Advertising Router	Â
LS Seq Number	Л Â
Checksum	Â
Length	˘ Л∪ ѝ Æ Â
Network Mask	Â
Metric Type	Â
TOS	TOS ˘ ѵ ѝ 0 Â
Metric	Â
NSSA:Forward Address	˘ IP Â ѝ 0.0.0.0ˇ ‡ Â
External Route Tag	˘ 32 Â OSPF a ˘ ѐ ʈ OSPF Â

ЛЬЮ ѝ **show ip ospf database external** ʒ '

```
Ruijie# show ip ospf database external
OSPF Router with ID (1.1.1.1) (Process ID 1)
AS External Link States
LS age: 1290
Options: 0x2 (*|-|-|-|-|-|E|-)
LS Type: AS-external-LSA
Link State ID: 20.0.0.0 (External Network Number)
Advertising Router: 1.1.1.1
LS Seq Number: 8000000a
Checksum: 0x7627
Length: 36
Network Mask: /24
Metric Type: 2 (Larger than any link state path)
TOS: 0
Metric: 20
Forward Address: 0.0.0.0
External Route Tag: 0
```

show ip ospf database external ʒ Ю Â

OSPF Router with ID	ЛЬЮ б OSPF Л Â
Type-7 AS External Link States	ЛЬЮ ѝ Â
LS age	Â

Options hecksum2_0 1 TTf 0 Tc 0 Tw 100 Td <1C122F0E41B94

OSPF2 ३

```
Internet Address 192.88.88.27/24, Ifindex 4, Area
0.0.0.0, MTU 1500
Matching network config: 192.88.88.0/24
Process ID 1, Router ID 1.1.1.1, Network Type BROADCAST,
Cost: 1
Transmit Delay is 1 sec, State DR, Priority 1
Designated Router (ID) 1.1.1.1, Interface Address
192.88.88.27
Backup Designated Router (ID) 3.3.3.3, Interface Address
192.88.88.72
Timer intervals configured, Hello 10, Dead 40, Wait 40,
Retransmit 5
Hello due in 00:00:03
Neighbor Count is 1, Adjacent neighbor count is 1
Crypt Sequence Number is 70784
Hello received 1786 sent 1787, DD received 13 sent 8
LS-Req received 2 sent 2, LS-Upd received 29 sent 53
LS-Ack received 46 sent 23, Discarded 1
```

show ip ospf interface serial *1/0* ৡ ÞO Â

GigabitEthernet 0/0 State	˘ UP ˘ Down LÒ/ ðm $ Hï ROµVFI A!Q*ƒ*–4 !$ï¿µVFI „ 9e FI # ûU

BDR's Interface address	BDR
Time intervals configured	Hello˘ Dead˘ Wait˘ Retransmit
Hello due in	Э HELLO
Neighbor count	
Adjacent neighbor count	Full
Crypt Sequence Number	md5 /ł
Hello received send	б HELLO Â
DD received send	б DD Â
LS-Req received send	б LS Â
LS-Upd received send	б LS Â
LS-Ack received send	б LS Â
Discard	OSPF Â

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37.2.5 show ip ospf neighbor

OSPF ˘ ȝ **show ip ospf neighbor** Â

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

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detail	ˆ ˩ ~ Â
interface-type interface-number	ˆ ˩ ~ Â
neighbor-id	ˆ ˩ ~ Â

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ЛЪЮ ѝ **show ip ospf neighbor** ֳ '

```
Ruijie# show ip ospf neighbor
OSPF process 1, 1 Neighbors, 1 is Full:
Neighbor ID     Pri   State                Dead Time
Address         Interface
3.3.3.3           1   Full/BDR             00:00:32
192.88.88.72    GigabitEthernet 1/0

Ruijie# show ip ospf neighbor detail
Neighbor 3.3.3.3, interface address 192.88.88.72
In the area 0.0.0.0 via interface GigabitEthernet 1/0
Neighbor priority is 1, State is Full, 11 state changes
DR is 192.88.88.27, BDR is 192.88.88.72
Options is 0x52 (*|O|-|EA|-|-|E|-)
Dead timer due in 00:00:32
Neighbor is up for 05:11:27
Database Summary List 0
Link State Request List 0
Link State Retransmission List 0
Crypt Sequence Number is 0
Thread Inactivity Timer on
Thread Database Description Retransmission off
Thread Link State Request Retransmission off
Thread Link State Update Retransmission off
Thread Poll Timer on
```

show ip ospf neighbor ֳ Ю'

Interface	
interface address	
In the area	ѕ
via interface	Â
Neighbor priority	OSPF ″I Â
State	OSPF ÂFULL ’ DR ѝ ’ BDR ѝ ’ DROTHER a DR/BDR Â DR BDR Â
State changes times	↓
Dead Time	'
DR	DR (Hello DR)
BDR	BDR (Hello BDR)
Options	Hello E ˘ 0 ѕ ѝ STUB’ ˘ ѕ a STUB ѕ Â
Dead timer due in	Â
Neighbor up time	
Database Summary List	DD
Link State Request List	LS
Link State Retransmission List	
Crypt Sequence Number	ѕ MD5
Thread Inactivity Timer	
Thread Database Description Retransmission	DD
Thread Link State Request Retransmission	LS
Thread Link State Update Retransmission	LS
Thread Poll Timer	˘ Poll Timer ╠

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37.2.6 show ip ospf route

ospf Â

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

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process-id	ospf ¼˘ ospf Â
count	ospf Â

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```
Ruijie# show ip ospf route
OSPF process 1:
Codes: C - connected, D - Discard, O - OSPF,
IA - OSPF inter area  N1 - OSPF NSSA external type 1,
N2 - OSPF NSSA external type 2
E1 - OSPF external type 1, E2 - OSPF external type 2
E2    100.0.0.0/24    [1/20]    via    192.88.88.126,
GigabitEthernet 1/0
C     192.88.88.0/24   [1]   is   directly   connected,
GigabitEthernet 1/0, Area 0.0.0.1
```

show ip ospf route ¢ Ю'

codes	Лъ ¬
100.0.0.0/24	Â
[1]	cost
via	Ю б

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37.2.7 show ip ospf summary-address

OSPF ĭ ˘ ʒ

show ip ospf summary-address Â

show ip ospf summary-address

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ʒ ⊀ NSSA ABR Э ˘ з ⊀

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ЛЬЮ ѝ **show ip ospf summary-address** ʒ '

```
Ruijie# show ip ospf summary-address
Summary Address Summary Mask    Advertise     Status
Aggregated subnets
--------------- --------------- ------------ --------
202.101.0.0           255.255.0.0           advertise
Inactive 0
Ruijie#
```

Summary Address	
Summary Mask	Â
Advertise	ĭ Ώ
Status	ĭ
Aggregated subnets	

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37.2.8 show ip ospf virtual-link

OSPF ˘ ꝛ **show ip ospf virtual-link** Â

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

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˘ ѵ ꝛ ˘ Л ч è Â **show ip ospf neighbor** ꝛ a Â

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ЛЮ ѝ **show ip ospf virtual-links** ꝛ '

```
Ruijie# show ip ospf virtual-links
Virtual Link VLINK0 to router 1.1.1.1 is up
Transit area 0.0.0.1 via interface GigabitEthernet 0/1
Local address 10.0.0.37/32
Remote address 10.0.0.27/32
Transmit Delay is 1 sec, State Point-To-Point,
Timer intervals configured, Hello 10, Dead 40, Wait 40,
Retransmit 5
Hello due in 00:00:05
Adjacency state Full
```

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Virtual Link VLINK0 to router	Л ч
Virtual Link state	.
Transit area	ѡ Â

via interface	Â
Local address	
Remote Address	
Transmit Delay	Â
State	
Time intervals configured	Hello˘ Dead˘ Wait˘ Retransmit
Adjacency State	Â FULL ѝ Â

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38

38.1

38.1.1 distribute-list in

distribute-list in **no**

distribute-list {{*access-list-number* | *access-list-name*] | **prefix** *prefix-list-name* [**gateway** *prefix-list-name*]} **in** [*interface-type interface-number*]

no distribute-list {{*access-list-number* | *access-list-name*] | **prefix** *prefix-list-name* [**gateway** *prefix-list-name*]} **in** [*interface-type interface-number*]

access-list-number	1-99 1300-1999 100-199 2000-2699
access-list-name	
prefix *prefix-list-name*	
gateway *prefix-list-name*	
i*nterface-type interface-number*	

ѝ ˘ ⅃Ⅱ ˆ ⁸ ˘
Â ʒ OSPF ˘ ѝ
OSPF a ɛ ˘ Â
˘ Â

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ЛЬЮ ˘ RIP ÿ GigabitEthernet 0/0 ˘
⁸ ˘ ⅃ 172.16 Â

```
Ruijie(config)# router rip
Ruijie(config-router)# network 200.168.23.0
Ruijie(config-router)# distribute-list 10 in
GigabitEthernet 0/0
Ruijie(config-router)# no auto-summary
Ruijie(config-router)# exit
Ruijie(config)# access-list 10 permit 172.16.0.0
0.0.255.255
```

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ʒ	
access-list	Ⱶ ‡
prefix-list	Ⱶ

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38.1.2 distribute-list out

⁸ ˘ Ⅱ ˘ ʒ
distribute-list out Â ʒ **no** Ⱶ Â

distribute-list {[*access-list-number* | *access-list-name*] | **prefix** *prefix-list-name*} **out** [*interface* | *protocol* | *process-id*]

no distribute-list {[*access-list-number* | *name*] | **prefix** *prefix-list-name*} **out** [*interface* | *protocol* | *process-id*]

ð Ô

access-list-number	1-99 1300-1999 100-199 2000-2699
access-list-name	
prefix *prefix-list-name*	
Interface	
protocol	

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ð Ô

ৡ ꟾ BGP Â

ð Ô

```
Ruijie(config)# ip community-list standard test deny
100:20 200:20
Ruijie(config)# ip community-list standard test2 permit
internet
```

ð ৡ Ô

ৡ	
match community	ৗ
set comm-list delete	BGP
show ip community-list	
show ip bgp community-list	ৗ BGP

ð ৶ Ô

Ô 38.1.4 ip default-network

ৡ **ip default-network** Â ৡ no ৶ Ո Â

ip default-network *network*

no ip default-network *network*

seq-number	Л∪ л Â è 1 2147483647 Â ϡ л˘ ‡ и ϯ л Â л 5˝ л л л 5
deny	ϩ
permit	ϩ
ip-prefix	Л∪ ч Â ы Л∪ IP Â ÿ 0 32
minimum-prefix-length	ˆ ы ~ ( ) ' **ge** ϡ
maximum-prefix-length	ˆ ы ~ ( ) ' **le** ϡ

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… Â

ð ϡ Ô

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ip prefix-list ϡ IP Â permit deny ᾱ ϩ Ю ы ╟ Â

Ⱶ ϩ ϩ Âge le Ⱶ ϩ ˘ ip-prefix ╕ ϩ Â ϡ ge le ˘ ‡ ip-prefix ϩ Â ge˘ ‡ ϩ minimum-prefix-length 32 Â le˘ ‡ ϩ ip-prefix maximum-prefix- length Â γ ˘ ‡ ϩ ÿ minimum-prefix-length maximum-prefix- length Ậ ˘ ip-prefix à minimum-prefix-length maximum-prefix-length ' ip-prefix < minimum-prefix-length < maximum-prefix-length <= 32 Â

ð Ô

ЛЮ и ϯ ˘ OSPF ϯ RIP ϯ IP ˘ ‡ IP Ⱶ(ы IP 201.1.1.0/24 ϯ) ˘ ‡ Ю '

```
Ruijie# configure terminal
Ruijie(config)# ip prefix-list pre1 permit 201.1.1.0/24
Ruijie(config)# router ospf
Ruijie(config-router)# distribute-list prefix pre1 out
rip
Ruijie(config-router)# end
```

38.1.6 ip prefix-list description

ν ╗ ˘ **ip prefix-list description** ϡ Â
ϡ **no** Â

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

ð Ô

prefix-lis-name	ɻ
descripton-text	

ð Ô

╗

on0 1 Tf0 Tc 12.371 0 00 0 11.537escript<FF5>6<141B84<114>TjB9 1 Tf-27[(de150 g/TT<FF

╗

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ð Ô

ð Ô

ЛЬЮ ѝ ╗ '

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

38.1.8 ip route

˘ ϡ ip route Â ϡ no Â

ip route [**vrf** *vrf_name*] *network net-mask* {*ip-address* | *interface* [*ip-address*]} [*distance*] [**tag** *tag*] [*permanent*] [**weight** *number*] [*disable* | *enable*]

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ù 1˘ ˘ ⅃ Л ╟
˘ ⅂ ╟ a ˘ Â
⅃ Л ˘ ˘
⅂ ù ╟ Â OSPF ù 110˘ ⅃ Л
ù 125˘ OSPF ˘
⅃ Л⁋ Э Â

⅃ Л vrf˘ ‡ ╗ vrf Â

ù 1˘ ⅃ Л **show ip route weight** ȝ
Â weight WCMP ╗ Â
WCMP ⁸ ù 32 Â

⁸ ĭ ˘ ‡ a Â
˘ ˘ ĭ ‡ Â

Л ˘ Ю ù ^ ip route 0.0.0.0 0.0.0.0 GigabitEthernet 0/0˘ Â
˘ GigabitEthernet 0/0 ˘ ў
ARP ˘ ´ CPU Â Л a
⅄ Л Â

ð Ô

ЛЮ ˘ ╗ 172.16.100.0/24 ˘
Ю ù 192.168.12.1˘ ù 115 Â

```
ip route 172.16.100.0 255.255.255.0 192.168.12.1 115
```

˘ ˘

Э ѝ ⁸ ˘ **ip static route-limit** Э л Ю ˘ а Э Â **show running-config** ˩Л∪ Э Â

ð Ô

Л∪Ю ˘ Э ѝ 900 ˘ л Â

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

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ʒ γ Э а Â

38.1.11 ipv6 prefix-list

… IPv6 ╗ ˘ **ipv6 prefix-list** ʒ Â ʒ **no** Â

Ipv6 prefix-list *prefix-lis-name* [**seq** *seq-number*] { **deny** | **permit** } *ipv6-prefix* [**ge** *minimum-prefix-length*][**le** *maximum-prefix- length*]

no ipv6 prefix-list *prefix-lis-name*[**seq** *seq-number*] { **deny** | **permit**} *ipv6-prefix* [**ge** *minimum-prefix- length*][**le** *maximum-prefix- length*]

ð Ô

prefix-lis-name	˩ Â

Л∪ л Âε

1 2147483647 Â

seq-number

maximum-prefix- length	ˆ ˩ ˜ ( ) ' **le** ϡ

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… Â

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ipv6 prefix-list ϡ IPv6 Â permit deny ᾱ ϩ Ю ˩ ╟ Â

Ⱨ ϩ ϩ Âge le Ⱨ ϩ ˘ ipv6-prefix ╗ ϩ Â ϡ ge le ˘ ‡ ipv6-prefix ϩ Â ge˘ ‡ ϩ minimum-prefix-length 32 Â le˘ ‡ ϩ ipv6-prefix maximum-prefix- length Â γ ˘ ‡ ϩ ÿ minimum-prefix-length maximum-prefix- length Â . ˘ ipv6-prefix à minimum-prefix-length maximum-prefix-length ' ipv6-prefix < minimum-prefix-length < maximum-prefix-length <= 128 Â

ð Ô

ЛЪЮ ѝ ↑ ˘ RIP ↑ OSPF 1 ↑ IP ˘ ‡ IPv6 Ⱨ(˩ IP 2222::/64 !ÞÏ wVJQ A¹Q Â òÂ ÐÏ w }2

prefix-lis-name	IPv6 ɻ
descripton-text	IPv6

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ЛЪЮ й IPv6 pre ╗ **Deny routes from Net-A'**

```
Ruijie# configure terminal
Ruijie(config)# ipv6 prefix-list pre description Deny routes from Net-A
```

38.1.13 ipv6 prefix-list sequence-number

й IPv6 ╗ ˘ **ipv6 prefix-list description** ϡ Â ϡ **no** ч ╗ Â

ipv6 prefix-list sequence-number

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ЛЪЮ й IPv6 ╗ '

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

38.1.14 match as-path

match community { *community-list-number* | *community-list-name*} [**exact-match**] [{ *community-list-number* | *community-list-name*} [**exact-match**] …]

no match community { *community-list-number* | *community-list-name*} [**exact-match**] [{ *community-list-number* | *community-list-name*} [**exact-match**] …]

ip community-list	
match as-path	ϗ AS_PATH
match metric	ϗ
match origin	ϗ
set as-path prepend	ϯ AS_PATH Â
set comm-list delete	ϗ
set community	
set metric	ϯ

38.1.16 match interface

ϗ Ю ϧ ˘ ϗ **match interface** Â ϗ **no** Â

match interface *interface-type interface-number* [*…interface-type interface-number*]

no match interface *interface-type interface-number* [*…interface-type interface-number*]

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interface-type	
interface-number	Ⴏ

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match interface ϗ Ⴏ ϟ Ո Â

ϟ Ո ÿ ϯ Ⴑ ╗ Â ϟ Ո OSPF ϯ Ⴏ RIP ˘ ≠ ϟ Ո RIP ϯ Ⴏ OSPF Â

ϯ ˘ ^ route maps˜ ˘ Ч ϯ ˘ ⁸ Â

‡ ˘ ⅄Л 1 **match** ʒ 1
set ʒ Â **match** ʒ˘ ‡ ¬ ’ **set** ʒ˘
‡ a Â

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ǂ ˘ ⅄Л ǂ Э Âa
˘ è ˘ ⅄ ʒ a ⅄ Â
. ⅄ ǂ Э˘ a ⅄ ˘ è
ʒ ≠ a ⅄ Â

ЛЬЮ ˘ OSPF ǂ RIP ˘ ⅄ ǂ Ю
ѝ GigabitEthernet 0/0 RIP Â

```
Ruijie(config)# router ospf
Ruijie(config-router)#  redistribute  rip  subnets
route-map redrip
Ruijie(config-router)# network 192.168.12.0 0.0.0.255
area 0
Ruijie(config-router)# exit
Ruijie(config)# route-map redrip permit 10
Ruijie(config-route-map)#      match      interface
GigabitEthernet 0/0
```

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ʒ	
match ip address	¬
match ip next-hop	¬ 6 ¬ ¬

† ˘

ϡ **match ip address** Â ϡ **no** Â

match ip address {*access-list-number* [*access-list-number...* | *access-list-name...*] |*access-list-name* [*access-list-number...*| *access-list-name*] | **prefix-list** *prefix-list-name* [*prefix-list-name...*]}

no match ip address {*access-list-number* [*access-list-number...* | *access-list-name...*] | *access-list-name* [*access-list-number...*| *access-list-name*] | **prefix-list** *prefix-list-name* [*prefix-list-name...*]}

ð Ô

access-list-number	Ⴏ Ⴏ ' 1-99˘ 1300-1999 Ⴏ ' 100-199˘ 2000-2699
access-list-name	⅄
prefix-list *prefix-list-name*	ϗ ⅄

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match ip address ϡ ⅄ ⅃Ω Ⴏ ⅄ Â

⅃Ω ÿ † ⅄ ╖ Â ⅃ Ω OSPF † ⅄ RIP ˘ ≠ ⅃Ω RIP † ⅄ OSPF Â † ⅃ Ω IP Â

† ˘ ^ route maps˜ ˘ ч † ˚ ⁸ Â

‡ ˘ ⅃Ω 1 **match** ϡ 1 **set** ϡ Â **match** ϡ˘ ‡ ϗ ' **set** ϡ˘ ‡ a Â

ð Ô

† ˘ ⅃Ω † Э Â a ˘ è ˘ ⅃ ϡ a ⅄ Â

† Ю IP ⊀ ‡ ˘
ϡ **match ip next-hop** Â ϡ **no** Â

match ip next-hop {*access-list-number* [*access-list-number...* | *access-list-name...*] |*access-list-name* [*access-list-number...*| *access-list-name*] | **prefix-list** *prefix-list-name* [*prefix-list-name...*]}

no match ip next-hop {*access-list-number* [*access-list-number...* | *access-list-name...*] | *access-list-name* [*access-list-number...*| *access-list-name*] | **prefix-list** *prefix-list-name* [*prefix-list-name...*]}

ð Ô

access-list-number	⁄ı ⁄ı ' 1-99˘ 1300-1999 ⁄ı ' 100-199˘ 2000-2699
access-list-name	⊀
prefix-list *prefix-list-name*	ϧ ⊀

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match ip next-hop ϡ ⊀ ⊣ Л ⁄ı ⊀ Â

⊣ Л ÿ † ⊀ ₸ Â
⊣ Л OSPF † ⊀ ₸ Â ⊣ Л
OSPF † ⊀ RIP ˘ ≠ ⊣ Л RIP
† ⊀ OSPF Â † ⊣
Л IP Â

† ˘ ^ route maps˜ ˘ ч
† ˚ ⁸ Â

‡ ˘ ⊣ Л 1 **match** ϡ 1
set ϡ Â **match** ϡ˘ ‡ ϧ ' **set** ϡ˘
‡ a Â

ð Ô

ЛЬЮ ˘ OSPF ↑ RIP Â ↓ RIP Ю
ʌ 10 20˝ OSPF è ↑ Â

```
Ruijie(config)# router ospf
Ruijie(config-router)#  redistribute  rip  subnets
route-map redrip
Ruijie(config-router)# network 192.168.12.0 0.0.0.255
area 0
Ruijie(config-router)# exit
Ruijie(config)# access-list 10 permit host 192.168.10.1
Ruijie(config)# access-list 20 permit host 172.16.20.1
Ruijie(config)# route-map redrip permit 10
Ruijie(config-route-map)# match ip next-hop 10 20
```

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ʒ 7 6

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

ɻ Ɲ ÿ ɬ ɻ ╗ Â ɻ
Ɲ OSPF ɬ ɻ RIP ˘ ≠ ɻ Ɲ RIP
ɬ ɻ OSPF Â ɬ ɻ
Ɲ IP Â

ɬ ˘ ˆ route maps˜ ˘ ч
ɬ ˚ ⁸ Â

‡ ˘ ɻ Ɲ 1 **match** ʒ 1
set

set metric-type	ɬ
set tag	ɬ

ð ⊿ Ô

ð Ô

38.1.21 match ipv6 next-hop

ɬ Ю IPv6 ⊿ ‡
˘ ʒ **match ipv6 address** Â ʒ **no**
Â

match ipv6 next-hop { *access-list-name* | **prefix-list** *prefix-list-name* }

no match ipv6 next-hop

ð Ô

access-list-name	⊿
prefix-list *prefix-list-name*	¬ IPv6 ⊿

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⊣ Л υ ÿ ɬ ⊿ ℸ Â ⊣
Л υ OSPF ɬ ⊿ RIP ˘ ≠ ⊣ Л υ RIP
ɬ ⊿ OSPF Â ɬ ⊣
Л υ IP Â

ɬ ˘ ˆ route maps˜ ˘ ч
ɬ ˘ ⁸ Â

‡ ˘ ⊣ Л υ 1 **match** ʒ 1
set ʒ Â **match** ʒ˘ ‡ ¬ ’ **set** ʒ˘
‡ a Â

ð Ô

ɬ ˘ ⊣ Л υ ɬ Э Â a
˘ è ˘ ⊣ ʒ a ⊿ Â

. ⊿ ⍞ Э˘ a ⊿ ˘ è
ꝛ ≠ a ⊿ Â

ЛЬЮ ˘ OSPF ⍞ RIP ˘ ↙ ⍞
⊿ 10 RIP ˘ OSPF ˘ ѝ
type-1˘ ѝ 40 Â

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

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ꝛ	
ipv6 access-list	Ѭ IPv6 ‡
match interface	ꝛ Ю
match ipv6 address	ꝛ IPv6 Ю
match ipv6 route-source	ꝛ IPv6
match metric	ꝛ
match route-type	ꝛ
match tag	ꝛ
set metric	⍞
set metric-type	⍞
set tag	⍞

ð ↙ Ô

ð Ô

38.1.22 match ipv6 route-source

⍞ Ю IPv6 ↙ ‡
˘ ꝛ **match ipv6 address** Â ꝛ **no**
Â

match ipv6 route-source { *access-list-name* | **prefix-list** *prefix-list-name* }

no match ipv6 route-source

```
Ruijie(config)# route-map redrip permit 10
Ruijie(config-route-map)#  match  ipv6  route-source
v6acl
Ruijie(config-route-map)# set metric 50
```

ð ʒ Ô

ʒ	
ipv6 access-list	⅋ IPv6 ‡
match interface	┑ Ю
match ipv6 address	┑ IPv6 Ю
match ipv6 route-source	┑ IPv6
match metric	┑
match route-type	┑
match tag	┑
set metric	↑
set metric-type	↑
set tag	↑

ð ⅄ Ô

ð Ô

38.1.23 match length

IP ˘ ʒ **match length** Â ʒ **no** ⅄ Ո ⅋ Â

match length *min-length max-length*

no match length *min-length max-length*

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ϗ ˘ ϡ **match metric** Â ϡ **no** Â

match metric *metric*

no match metric

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metric	ϟ ' 0-4294967295

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ϟ Л υ ÿ ϯ ϰ ℸ Â ϟ Л υ OSPF ϯ ϰ RIP ˘ ≠ ϟ Л υ RIP ϯ ϰ OSPF Â ϯ ϟ Л υ IP Â

ϯ ˘ ^ route maps˜ ˘ ч ϯ ˚ ⁸ Â

‡ ˘ ϟ Л υ 1 **match** ϡ 1 **set** ϡ Â **match** ϡ˘ ‡ ϗ ' **set** ϡ˘ ‡ a Â

ð Ô

ЛυЮ ˘ OSPF ϯ RIP Â ϟ й 10 RIP ˘ OSPF ϯ Â

```
Ruijie(config)# router ospf
Ruijie(config-router)# redistribute rip subnets
route-map redist-rip
Ruijie(config-router)# network 192.168.12.0 0.0.0.255
area 0
Ruijie(config-router)# exit
Ruijie(config)# route-map redist-rip permit 10
Ruijie(config-route-map)# match metric 10
```

ð ϡ Ô

ϡ	

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

38.1.25 match origin

match origin **no**

match origin {**egp** | **igp** | **incomplete**}

no match origin {**egp** | **igp** | **incomplete**|}

egp	EGP
igp	IGP
Incomplete	a

ৡ ৲ Â

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```
Ruijie(config)# route-map MY_MAP 10 permit
Ruijie(config-route-map)# match origin egp
Ruijie(config-route-map)# set community 109
Ruijie(config-route-map)# exit
Ruijie(config)# route-map MAP20 20 permit
Ruijie(config-route-map)# match origin incomplete
Ruijie(config-route-map)# set community no-export
```

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ل Л υ ÿ ǂ ʌ ╖ Â ل
Л υ OSPF ǂ ʌ RIP ˘ ≠ ل Л υ RIP
ǂ ʌ OSPF Â ǂ ل
Л υ IP Â

ǂ ˘ ^ route maps˜ ˘ ч
ǂ ˘ ⁸ Â

‡ ˘ ل Л υ 1 **match** ϡ 1
set ϡ Â **match** ϡ˘ ‡ ר ’ **set** ϡ˘
‡ a Â

ð Ô

Л υ Ю ˘ RIP ǂ OSPF ÂRIP ل ǂ OSPF
Â

```
Ruijie(config)# router rip
Ruijie(config-router)# redistribute ospf route-map
redrip
Ruijie(config-router)# network 192.168.12.0
Ruijie(config-router)# exit
Ruijie(config)# route-map redrip permit 10
Ruijie(config-route-map)# match route-type internal
```

ð ϡ Ô

ϡ	
access-list	Ю ‡
match ip address	ר
match interface	ר Ю
match ip next-hop	ר Ю
match ip route-source	ר
match metric	ר
match tag	ר
set metric	ǂ

set metric-type	ʈ
set tag	ʈ

ð ⊀ Ô

ð Ô

38.1.27 match tag

ʔ ˘ ʒ **match tag** Â ʒ **no** Â

match tag *tag* [*…tag*]

no match tag *tag* [*…tag*]

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tag	

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match tag ʒ ⊀ ⊣ Л tag Â

⊣ Л ÿ ʈ ⊀ Â ⊣ Л OSPF ʈ ⊀ RIP ˘ ≠ ⊣ Л RIP ʈ ⊀ OSPF Â ʈ ⊣ Л IP Â

ʈ ˘ ˆ route maps˜ ˘ ч ʈ ˚ ⁸ Â

‡ ˘ ⊣ Л 1 **match** ʒ 1 **set** ʒ Â **match** ʒ˘ ‡ ʔ ’ **set** ʒ˘ ‡ a Â

ð Ô

ЛЬЮ ˘ RIP ʈ OSPF ÂRIP ⊣ ʈ OSPF й 50 80 Â

```
Ruijie(config)# router rip
```

```
Ruijie(config-router)# redistribute ospf 100 route-map
redrip
Ruijie(config-router)# network 192.168.12.0
Ruijie(config-router)# exit
Ruijie(config)# route-map redrip permit 10
Ruijie(config-route-map)# match tag 50 80
```

ð ʒÔ

ʒ	
access-list	Ⱶ ‡
match ip address	˥
match interface	˥ Ⱶ
match ip route-source	˥
match metric	˥
match ip next-hop	˥ Ⱶ
match route-type	˥
set metric	˫

permit	ˆ ˩ ˜ ⱵⱾ permit ˇ ˪ ˥ match ⱵⱾ ˧ ‡ Â ‡ set ʒ ˦ ⁸’ ˇ set ʒ ⁸ Â Â ⱵⱾ permit ˇ a ˥ match ⱵⱾ ˧ ‡ Â ‡ ɣ Â set ʒ
deny	ˆ ˩ ˜ ⱵⱾ deny ˇ ˪ ˥ match ⱵⱾ ˧ ‡ Â ‡ a ˇ a ˦ ˇ ɜ Â ⱵⱾ deny ˇ a ˥ match ⱵⱾ ˧ ‡ Â ‡ ⱷO Â set ʒ Â
sequence-number	˥ Â æ ˥ ˝l ˇ ˥ Â

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RGIOS ˚ ў ч ˈ ˝ ˜ ˦ ⁸’ ˇ ˜
Â

˝ ˜ ˦ ⁸

˩ Ɽ ÿ ˦ ˥ ˩ Â ˩
Ɽ OSPF ˦ ˥ RIP ˇ ≠ ˩ Ɽ RIP
˦ ˥ OSPF Â ˦ ˩
Ɽ
match **!¨ V Ã** **!¦ V Ã**

˘ ,

˘ ʌ˘ ĭ ‡ Â

ð Ô

ЛЬЮ ˘ OSPF ʈ RIP ˘ ɻ ʈ
ѝ 4 RIP ˘ OSPF ˘ ѝ type-1˘
ѝ 40˘ ѝ 40 Â

```
Ruijie(config)# router ospf
Ruijie(config-router)#  redistribute  rip  subnets
route-map redrip
Ruijie(config-router)# network 192.168.12.0 0.0.0.255
area 0
Ruijie(config-router)# exit
Ruijie(config)# route-map redrip permit 10
Ruijie(config-route-map)# match metric 4
Ruijie(config-route-map)# set metric 40
Ruijie(config-route-map)# set metric-type type-1
Ruijie(config-route-map)# set tag 40
```

ð ʒ Ô

ʒ	
Redistribute	ʈ

ð ɻ Ô

ð Ô

38.1.30 set aggregator as

ʅ match ‡ ʌ AS ˘
ʒ **set aggregator as** Â ʒ **no** Â
ʒ Â

set aggregator as *as-num ip_addr*

no set aggregator as [*as-num ip_addr*]

ð Ô

as-number	ʌ AS ʌ
ip_addr	ʌ

ð Ô

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ৡ BGP ˘ ﾉ Â

ৡ ﾍ ^ as,ip-addr˜ ˘ a ﾍ

ð Ô

```
Ruijie(config)# route-map set-as-path
Ruijie(config-route-map)# match as-path 1
Ruijie(config-route-map)# set aggregator as 3 2.2.2.2
```

ð ৡ Ô

ৡ	
match as-path	ﾇ AS_PATH
match community	ﾇ
match metric	ﾇ
match origin	ﾇ
set community	ﾅ COMMUNITY
set metric	ﾅ
set metric-type	ﾅ

38.1.31 set as-path prepend

ﾇ match ‡ ╗ AS_PATH ˘
ৡ **set as-path prepend** Â ৡ **no** Â
ৡ Â

set as-path prepend *as-number*

no set as-path prepend [*as-number*]

ð Ô

as-number	╗ AS_PATH AS ﾊ

ð Ô

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ð ৡ Ô

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ð Ô

ৡ ৲ AS_PATH

↲Л↻ as-path ╗ 15 as Â

ð Ô

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

ð ৡ Ô

ৡ	
match as-path	৲ AS_PATH
match community	৲
match metric	৲
match origin	৲
set community	⁑ COMMUNITY
set metric	⁑
set metric-type	⁑

38.1.32 set comm-list delete

৲ match ‡ COMMUNITY_LIST community ˘ ৡ **set comm-list delete** Â ৡ **no** Â ৡ Â

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

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

ð Ô

community-list-number	ʃ ' ʃ ѝ 1-99 ' ʃ ѝ 100-199
community-list-name	ɻ ɻ a 80

ð Ô

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```
Ruijie(config)# router bgp 100
Ruijie(config-router)#     neighbor     172.16.233.33
remote-as 120
Ruijie(config-router)#     neighbor     172.16.233.33
route-map ROUTEMAPIN in
Ruijie(config-router)#     neighbor     172.16.233.33
route-map ROUTEMAPOUT out
Ruijie(config-router)# exit
Ruijie(config)# ip community-list 500 permit 100:10
Ruijie(config)# ip community-list 500 permit 100:20
Ruijie(config)# ip community-list 120 deny 100:50
Ruijie(config)# ip community-list 120 permit 100:.*
Ruijie(config)# route-map ROUTEMAPIN permit 10
Ruijie(config-route-map)# set comm-list 500 delete
Ruijie(config-route-map)# exit
Ruijie(config)# route-map ROUTEMAPOUT permit 10
Ruijie(config-route-map)# set comm-list 120 delete
```

ð ꝛ Ô

ꝛ	
ip community-list	
match as-path	ꞁ AS_PATH
match community	ꞁ
match metric	ꞁ

match origin	ϩ
set as-path prepend	ϯ AS_PATH
set comm-list delete	ϩ
set local-preference	ϯ ΅I

38.1.33 set community

ϩ match ‡ COMMUNITY ˘
ϡ **set community** Â ϡ **no**

set community {*community-number*[*community-number …*] **additive** | **none**}

no set community { *community-number*[*community-number …*] **additive** | **none**}

ð Ô

Â

community-number

ð Ô

ৗ Â

ð Ô

```
Ruijie(config)# route-map SET_COMMUNITY 10 permit
Ruijie(config-route-map)# match as-path 1
Ruijie(config-route-map)# set community 109:10
Ruijie(config-route-map)# exit
Ruijie(config)# route-map SET_COMMUNITY 20 permit
Ruijie(config-route-map)# match as-path 2
Ruijie(config-route-map)# set community no-export
```

ð ৡ Ô

ৡ	
match as-path	ৗ AS_PATH

match community

suppress	˘ ⁸ Â 1..20000˝ 2000 Â
max-suppress-time	⁸ Â 1..255(ʃ ʖ ѝ 4* half-life

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```
Ruijie(config)# route-map tag
Ruijie(config-route-map)# match as path 10
Ruijie(config-route-map)# set dampening 30 1500 10000
120
Ruijie(config-route-map)# exit
Ruijie(config)# router bgp 100
Ruijie(config-router)#     neighbor     172.16.233.52
route-map tag in
```

ð ϡ Ô

ϡ	
match as-path	ϩ AS_PATH
match community	ϩ
match metric	ϩ
match origin	ϩ
set as-path prepend	ʃ AS_PATH
set metric	ʃ
set local-preference	ʃ ˝I

38.1.35 set default interface

ʔ match ‡ ɜ ˘
ʒ **set default interface** Â ʒ **no**
Â

set default interface *interface-type interface-number* [*…interface-type interface-number*]

no set default interface *interface-type interface-number* [*…interface-type interface-number*]

ð Ô

interface-type	
interface-number	

ð Ô

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set default interface ʒ ʌ ˩ Л∪ Â

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ª Â ˘ ᾱ
˘ ᾱ Ю Â
˘ ˘ ɜ … Â
˘ Ⱨ 1 ʔ
‡ Â ʌˇ
˘ a ʌ
˘ ʌ Ⱨ
Â

Ⱨ ˩ и downˇ γ set ʒ
Â ˩ Л∪ set Â

ð Ô

Л∪Ю ˘ serial 1/0 ˘
500 ˘ ɜ ˘ ÿ GigabitEthernet 1/0 Â

```
Ruijie(config)# interface serial 1/0
Ruijie(config-if)# ip policy route-map smallpak
Ruijie(config-if)# exit
Ruijie(config)# route-map smallpak permit 10
```

```
Ruijie(config-route-map)# match length 0 500
Ruijie(config-route-map)#  set  default  interface
GigabitEthernet 1/0
```

ð ϡ Ô

ϡ	
route-map	Hπ
match ip address	ϩ
match length	ϩ
set interface	
set ip default next-hop	HO IP ˘
set ip next-hop	HO IP
set ip precedence	IP ˝I

ð ⁄ Ô

38.1.36 set extcommunity

ϩ match ‡ ˘
ϡ **set extcommunity** Â ϡ **no** Â ϡ
Â

set extcommunity {**rt** *extend-community-value* | **soo** *extend-community-value*}

no set extcommunity {**rt** | **soo**}

ð Ô

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ˆ Â

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```
Ruijie(config)# access-list 2 permit 192.168.78.0
255.255.255.0
Ruijie(config)# route-map MAP_NAME permit 10
Ruijie(config-route-map)# match ip-address 2
Ruijie(config-route-map)# set extcommunity rt 100:2
```

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set interface ʒ ʌ ˩ Л Ъ Â

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⁸ Â ˘ ᾱ

˘ ᾱ Ю Â

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˘ Ѭ 1 ʔ

‡ Â ʌ˘

˘ a ʌ

˘ ʌ Ѭ

Â

Ѭ ˩ ѝ down˘ γ set ʒ

Â ˩ Л Ъ set Â

ѝ null 0˝ Â

ð Ô

ЛЪЮ ˘ serial 1/0 ˘

500 ˘ ÿ GigabitEthernet 0/0 Â

```
Ruijie(config)#interface serial 1/0
Ruijie(config-if)#ip policy route-map smallpak

Ruijie(config)#route-map smallpak permit 10
Ruijie(config-route-map)#match length 0 500
Ruijie(config-route-map)#set                interface
GigabitEthernet 0/0
```

set ip precedence	IP ″I

ð ⊿ Ô

38.1.38 set ip default next-hop

ϩ match ‡ Ю IP ˘
ϧ **set ip next-hop** Â ϧ **no** Â

set ip default next-hop *ip-address* [*weight*] [*…ip-address* [*weight*]]

no set ip default next-hop *ip-address* [*weight*] [*…ip-address* [*weight*]]

ð Ô

ip-address	Ю IP
weight	Ю

ð Ô

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ð ϧ Ô

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ð Ô

set ϧ ч ' WCMP ˘ WCMP
Â Ю˘ weight
WCMP Â

set ip default next-hop ϧ ⊿ ⊿Ц IP ˘ a 32
Â

ip address ⊿ ╗ weight ˘ ‡ ⊿Ц a 4
nexthop Â

˘ next-hop ⊿ weight ˘ set ϧ
╟ и WCMP Â WCMP
Ю˘ weight nexthop ˘ ε weight
и 1 Â

set ip next-hop **set ip default next-hop** ϧ ш ' **N[illegible]**

set interface	

set ip default next-hop	Ю IP ˇ
set ip precedence	IP ˝I

ð ⊀ Ô

ð Ô

38.1.40 set ip next-hop

عي ר″ match ‡ Ю YIP ˛ˇא ⊥ ב ˛ ג

╗

set default interface	
set interface	
set ip default next-hop	Ю IP
set ip precedence	IP

38.1.41 set ip next-hop verify-availability

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

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

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

ip-address	Ю IP
track-obj-num	

ЛЪЮ serial 1/0 Э

10.0.0.0/8 192.168.100.1

```
Ruijie(config)#interface serial 1/0
Ruijie(config-if)#ip policy route-map load-balance

Ruijie(config)#access-list 10 permit 10.0.0.0
0.255.255.255
Ruijie(config)#access-list 20 permit 172.16.0.0
0.0.255.255

Ruijie(config)#route-map load-balance permit 10
Ruijie(config-route-map)#match ip address 10
Ruijie(config-route-map)#set ip next-hop
192.168.100.1

Ruijie(config)#route-map load-balance permit 20
Ruijie(config--route-map)#match ip address 20
Ruijie(config-route-map)#set ip next-hop 172.16.100.1
```

rmit *30*
ull *0*

[(s.5).72 4 .7003)Tute-a

set ip precedence {*<0-7>* | *critical* | *flash* | *flash-override* | *immediate* | *internet* | *network* | *priority* | *routine* }

no set ip precedence {*<0-7>* | *critical* | *flash* | *flash-override* | *immediate* | *internet* | *network* | *priority* | *routine* }

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IP ″I IP a ˩ ″I Â

‡ ˘ ˩Л **set ip precedence** ϡ˘ ˬ ˩ ˘ з ˬ ר IP ″I Â

ð Ô

ЛЮ ˘ ÿ GigabitEthernet 0/0 ѝ 192.168.217.68 precedence ѝ 4 Â

```
Ruijie(config)#access-list 1 permit 192.168.217.68 0.0.0.0
Ruijie(config)#route-map name
Ruijie(config-route-map)#match ip address 1
Ruijie(config-route-map)#set ip precedence 4
Ruijie(config)#interface GigabitEthernet 0/0
Ruijie(config-if)#ip policy route-map name
```

ð ϡ Ô

ϡ	
match interface	ר Ю
match ip address	ר
match ip next-hop	ר Ю
match ip route-source	ר
match metric	ר
match route-type	ר
match tag	ר
set metric-type	ϯ

set tag	ϯ
set ip tos	IP tos

38.1.43 set ip tos

ϩ match ‡ IP TOS,
ϡ **set ip tos** Â ϡ **no** ˘ tos Â

set ip tos {*<0-15>* | *max-reliability* | *max-throughput* | *min-delay* | *min-monetary-cost* | *normal* }

no set ip tos {*<0-15>* | *max-reliability* | *max-throughput* | *min-delay* | *min-monetary-cost* | *normal* }

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IP TOS IP
a ϳ Ł Â

ϳ ϩ IP Э TOS Â

ð Ô

ЛЮ ˘ ÿ GigabitEthernet 0/0 ѝ
192.168.217.68 tos ѝ 4 Â

```
Ruijie(config)#access-list 1 permit 192.168.217.68 0.0.0.0
Ruijie(config)#route-map name
Ruijie(config-route-map)#match ip address 1
Ruijie(config-route-map)#set ip tos 4
Ruijie(config)#interface GigabitEthernet 0/0
Ruijie(config-if)#ip policy route-map name
```

ð ϡ Ô

ϡ	
match interface	ϩ Ю
match ip address	ϩ
match ip next-hop	ϩ Ю

match ip route-source	ֿ
match metric	ֿ
match route-type	ֿ
match tag	ֿ
set metric-type	ֹ
set tag	ֹ
set ip precedence	IP ״I

38.1.44 set level

ֿ match ‡ ש ˘
ֽ **set level** Â ֽ **no** Â

set level {**level 1**| **level 2** | **level 1-2** | **stub-area** | **backbone**}

no set level

match ip next-hop	ꝛ HO
match ip route-source	ꝛ
match metric	ꝛ
match route-type	ꝛ
match tag	ꝛ
set metric-type	ꝉ
set tag	ꝉ

38.1.45 set local-preference

ꝛ match ‡ LOCAL_PREFERENCE ˘
ꝛ **set local-preference** Â ꝛ **no** Â

set local-preference *number*

no set local-preference

ð Ô

number	˝I Â ' 0-4294967295

ð Ô

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ð Ô

ﻯ local-preference ˘ a local-preference Â

ꝛ ꝛ ˝I Â

ð Ô

```
Ruijie(config)# route-map SET_PREF permit 10
Ruijie(config-route-map)# match as-path 1
Ruijie(config-route-map)# set local-preference 6800
Ruijie(config-route-map)# exit
Ruijie(config)# route-map SET_PREF permit 20
Ruijie(config-route-map)# match as-path 2
Ruijie(config-route-map)# set local-preference 50
```

ð ϧ Ô

ϧ	
match as-path	ϩ AS_PATH
match metric	ϩ
match origin	ϩ
set as-path prepend	ϯ AS_PATH
set metric	ϯ
set metric-type	ϯ

38.1.46 set metric

ϩ match ‡ ˘ ϧ **set metric** Â ϧ **no** Â

set metric [+ *metric-value* | **-** *metric-value* | *metric-value*]

no set metric

ð Ô

+	╗ˆ metric Э ╗˜
-	ˆ metric Э ˜
metric-value	ϯ

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a ⅄ ϯ a Â

ð ϧ Ô

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˘ ˘

Â ὲ set metric ἇ Ѧ ϟ ļ + Ľ ļ - Ľ metric
ЭЮ Â RIP ϯ ὲ ˘ metric
⅄ ὶ 1-16 Â

⅄ Ѧ ÿ ϯ ϟ ╗ Â ⅄
Ѧ OSPF ϯ ⅄ RIP ˘ ≠ ⅄ Ѧ RIP

ſ ʎ OSPF Â ſ ɻ
ɅȣIP Â

ſ ˘ ˆ route maps˜ ˘ ч
ſ ˚ ʁ Â

‡ ˘ ɻɅȣ 1 **match** ʒ 1
set ʒ Â **match (G[illegible]**

match

set metric-type **no**

set metric-type *type*

no set metric-type

type

match ip address	ϩ
match ip next-hop	ϩ Ю
match ip route-source	ϩ
match metric	ϩ
match route-type	ϩ
match tag	ϩ
set metric	ϯ
set tag	ϯ

ð ⊿ Ô

ð Ô

38.1.48 set next-hop

ϩ match ‡ Ю IP ˘
ϡ **set next-hop** Â ϡ **no** Â ϡ
Â

set next-hop *ip-address*

no set next-hop *ip-address*

ð Ô

i*p-address*	Ю IP

ð Ô

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ð ϡ Ô

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ð Ô

ϟ Л υ ÿ ϯ ⊿ ℸ Â ϟ
Л OSPF ϯ ⊿ RIP ˘ ≠ ϟ Л RIP
ϯ ⊿ OSPF

ώ ⊣Л 1 **match** ʒ 1
set ʒ Â **match** ʒ˘ **set** ʒ˘

ð Ô

ЛЮ ˘ Ɔ ⁸ ˝ Ю ѝ
192.168.1.2 Â

```
Ruijie(config)# route-map redrip permit 10
Ruijie(config-route-map)# match ip address 1
Ruijie(config-route-map)# set next-hop 192.168.1.2
```

ð ʒ Ô

ʒ	
match interface	Ɔ
match ip address	Ɔ
match ip next-hop	Ɔ
match ip route-source	Ɔ
match metric	Ɔ
match route-type	Ɔ
match tag	Ɔ
set metric-type	↑
set tag	↑

38.1.49 set origin

Ɔ uP[Qd1Ъ9Ⅱ#!_¦US*ũPÍT

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```
Ruijie(config)# route-map SET_ORIGIN 10 permit
Ruijie(config-route-map)# match as-path 1
Ruijie(config-route-map)# set origin igp
Ruijie(config-route-map)# exit
Ruijie(config)# route-map SET_ORIGIN 20 permit
Ruijie(config-route-map)# match as-path 2
Ruijie(config-route-map)# set origin egp
```

ð ৡ Ô

ৡ	
match as-path	৲ AS_PATH
match metric	৲
match origin	৲
set as-path prepend	৻ AS_PATH
set metric	৻
set local-preference	৻ ৷

38.1.50 set originator-id

৲ match ‡ ˘ ৡ

set originator-id Â ৡ **no** Â

set originator-id *ip-addr*

no originator-id [*ip-addr*]

ð Ô

ip-addr	

ð Ô

Â

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ϡ ┐ Â

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```
Ruijie(config)# route-map SET_ORIGIN 10 permit
Ruijie(config-route-map)# match as-path 1
Ruijie(config-route-map)# set originator-id 5.5.5.5
Ruijie(config-route-map)# exit
Ruijie(config)# route-map SET_ORIGIN 20 permit
Ruijie(config-route-map)# match as-path 2
Ruijie(config-route-map)# set originator-id 5.5.5.6
```

ð ϡ Ô

ϡ	
match as-path	┐ AS_PATH
match metric	┐
match origin	┐
set as-path prepend	┤ AS_PATH
set metric	┤
set local-preference	┤ ″I

38.1.51 set tag

┐ match ‡ ˘ ϡ **set tag** Â
ϡ **no** Â

set tag *tag*

no set tag

ð Ô

tag	┤

ð Ô

a ⅃ Â

ð ϡ Ô

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ϡ ⅄ ǂ Â ϡ˘

Â

" ɟ N Â

ֽ

ֿ match ‡ BGP ˘ ֽ

set weight Â ֽ **no** Â

set weight *number*

no set weight

ð Ô

number	Â ' 0-65535

ð Ô

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ð ֽ Ô

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ð Ô

ֽ ֿ BGP Â

ЮЎ ÿ ˘ neighbor weight
, 32768 Â

ֿ Л Ъ ֽ BGP ֿ Â

ð Ô

ЛЪЮ ˘ BGP in Ј Э ˘ ÿ
1.1.1.1 й 100 Â

```
Ruijie(config)# router bgp 1
Ruijie(config-router)# neighbor 1.1.1.1 route-map
nei-rmap-in in
Ruijie(config-router)# exit
Ruijie(config)# route-map nei-rmap-in permit 10
Ruijie(config-route-map)# set weight 100
```

ð ֽ Ô

ֽ	
match as-path	ֿ AS_PATH
match community	ֿ
match metric	ֿ
match origin	ֿ
set community	ֿ COMMUNITY

set metric	ᛏ
set metric-type	ᛏ

ð ⁄ Ô

ð Ô

38.2

38.2.1 show ip community-list

ʒ Â

show ip community-list [*community-list-number*|*community-list-name*]

ð Ô

community-list-number	⁄ı ' ⁄ı ѝ 1-99 ' ⁄ı ѝ 100-199
community-list-name	⁄ ⁄ a 80

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ð ʒ Ô

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ð Ô

```
Ruijie# show ip community-list
Community-list standard local
permit local-AS
Community-list standard Red-Giant
permit 0:10
deny 0:20
```

ð ʒ Ô

ʒ	

match community	ৗ
set comm-list delete	BGP

ð ৶ Ô

38.2.2 show ip prefix-list

˘ **show ip prefix-list**

ৡ Â

show ip prefix-list [*prefix-name*]

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prefix-name	৶

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ð Ô

```
Ruijie# show ip prefix-list
ip prefix-list pre: 2 entries
seq 5 permit 192.168.64.0/24
seq 10 permit 192.2.2.0/24
```

38.2.3 show ip route

IP ˘ **show ip route** ৡ Â

show ip route [[**vrf** *vrf_name*] [*network* [*mask*] | **count** | **protocol** [*process-id*] | **weight**]]

ð Ô

vrf *vrf_name*	ˆ ˩ ˜ ˥ VRF
network	ˆ ˩ ˜ ˥
mask	ˆ ˩ ˜ ˥
count	ˆ ˩ ˜
protocol	ˆ ˩ ˜ ' **connected**, **static**' ˘ Ю ' **bgp**, **isis**, **ospf**, **rip**
process-id	ˆ ˩ ˜ /ˀ
weight	ˆ ˩ ˜ ˥

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˩ ˥ Л˘ ˘ Â

ð Ô

Л˘Ю ѝ **show ip route** '

```
Ruijie# show ip route
Codes:  C - connected, S - static, R - RIP, B - BGP
o.434 Td 7.994 0 Td( )Tj/TT3  exp45D-30 Tw 6.71,N0 -12434 Td45D-8(p
```

C 192.1.1.254/32 is local host.

show ip route Ю'

O	Â ┘ ┘ ий' C' ' S' ' R' RIP ' B' BGP ' O' OSPF ' i' IS-IS Â
E2	Â ┘ ┘ ий' E1' OSPF ˝ ' E2' OSPF ˇ ' N1' OSPF NSSA 1' N2' OSPF NSSA 2' IA' OSPF ' su' IS-IS ' L1' IS-IS 1 ' L2' IS-IS 2 ' ia' IS-IS Â
20.0.0.0/8	
[1/0]	¸
Via 20.0.0.1	Ю IP
00:00:06	
VLAN 1	Ю

ЛЬЮ ий **show ip route** *network* '

```
Ruijie# show ip route 30.0.0.0
Routing entry for 30.0.0.0/8
Distance 110, metric 20
Routing Descriptor Blocks:
*192.1.1.1, 00:01:11 ago, via VLAN 1, generated by OSPF,
extern 2
```

show ip route *network* Ю'

Routing Descriptor Blocks	Ю IP à à à à à à BGP

ЛЬЮй **show ip route count** ʒ '

```
Ruijie# show ip route count
--------- route info ----------
the num of active route: 5
```

ЛЬЮй **show ip route weight** ʒ '

```
Ruijie# show ip route weight
------------[distance/metric/weight]-----------
S   23.0.0.0/8 [1/0/2] via 192.1.1.20
S   172.0.0.0/16 [1/0/4] via 192.0.0.1
```

38.2.4 show ipv6 prefix-list

IPv6 ˘ **show ipv6 prefix-list** ʒ Â

show ipv6 prefix-list [*prefix-name*]

ð Ô

prefix-name	IPv6 ɻ

ð Ô

IPv6 Â

ð ʒ Ô

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Â

ð Ô

```
Ruijie# show ipv6 prefix-list
ipv6 prefix-list p6: 2 entries
permit 13::/20
permit 14::/20
```

38.2.5 show route-map

ˇ ʒ **show route-map** Â

show route-map *route-map-name*

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route-map-name	ˆ ˩ ˜ ˩

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Â

ð Ô

```
Ruijie# show route-map
route-map AAA, permit, sequence 10
Match clauses:
ip address 2
Set clauses:
metric 10
```

route-map	˩
Permit	permit
sequence 10	˥
Match clauses	⊮ ˥ ‡ Â permit deny ᾱ ĭ set
Set clauses	⊮ ˩ match ˥ ‡ ˩

39 ACL

ЛЬЮ ʒ ˩ ЛЬЮ ʒ

id	/ˡ Â ˩ IP ACL: 1-99,1300-1999 IP ACL: 100-199,2000-2699 MAC ACL: 700–799 ж ACL: 2700–2899

	⊮			⊮	
A	MAC	0	O	TTL	34
B	MAC	6	P	/ा	35
C		12	Q	IP	36
D	VLAN tag	14	R	ip	38
E	DSAP(⊾)	18	S	ip	42
F	SSAP(⊾)	19	T	TCP	46
G	Ctrl	20	U	TCP	48
H	Org Code				

- **permit**
- **list-remark text**
- **no sn**

¾

- **ip access-group**
- **mac access-group**
- **expert access-group**
- **ipv6 traffic-filter**

39.1.1 access-list

¾ … ‡˘ Â ¾ **no** Â

1) IP ˆ 1 - 99˝ 1300 - 1999˜

access-list *id* {**deny** | **permit**} {*source source-wildcard* | **host** *source* | **any**}

2) IP ˆ 100 - 199˝ 2000 - 2699˜

access-list *id* {**deny** | **permit**} **protocol** {*source source-wildcard* | **host** *source* | **any**} {*destination destination-wildcard* | **host** *destination* | **any**} [**precedence** *precedence*] [**tos** *tos*] [**fragments**] [**time-range** *time-range-name*]

3) MAC ˆ 700 - 799˜

access-list *id* {**deny** | **permit**} {**any** | **host** *source-mac-address*} {**any** | **host** *destination-mac-address*} [*ethernet-type*][**cos** [*out*][**inner** *in*]]

4) Expert ˆ 2700 - 2899˜

access-list *id* {**deny** | **permit**} [**protocol** | [*ethernet-type*][**cos** [*out*][**inner** *in*]]] [**VID** [*out*][**inner** *in*]] {*source source-wildcard* | **host** *source* | **any**} {**host** *source-mac-address* | **any**} {*destination destination-wildcard* | **host** *destination* | **any**} {**host** *destination-mac-address* | **any**}][**precedence** *precedence*] [**tos** *tos*] [**fragments**] [**time-range** *time-range-name*]

Л∪ Ethernet-type cos '

access-list *id* {**deny** | **permit**} {*ethernet-type*| **cos** [*out*][**inner** *in*]} [**VID** [*out*][**inner** *in*]] {**s***ource source-wildcard* | **host** *source* | **any**} {**host** *source-mac-address* | **any** } {*destination destination-wildcard* | **host** *destination* | **any**} {**host** *destination-mac-address* | **any**} [**time-range** *time-range-name*]

Protocol '

access-list *id* {**deny** | **permit**} **protocol** [**VID** [*out*][**inner** *in*]] {*source source-wildcard* | **host** *source* | **any**} {**host** *source-mac-address* | **any** } {*destination destination-wildcard* | **host** *destination* | **any**} {**host** *destination-mac-address* | **any**} [**precedence** *precedence*] [**tos** *tos*] [**fragments**] [**time-range** *time-range-name*]

Expert '

Internet Control Message Protocol (ICMP)

access-list *id* {**deny** | **permit**} **icmp** [**VID** [*out*][**inner** *in*]] {*source source-wildcard* | **host** *source* | **any**} {**host** *source-mac-address* | **any** } {*destination destination-wildcard* | **host** *destination* | **any**} {**host** *destination-mac-address* | **any**} [*icmp-type*] [[*icmp-type* [*icmp-code*]] | [*icmp-message*]] [**precedence** *precedence*] [**tos** *tos*] [**fragments**] [**time-range** *time-range-name*]

Transmission Control Protocol (TCP)

access-list *id* {**deny** | **permit**} **tcp** [**VID** [*out*][**inner** *in*]]{*source source-wildcard* | **host** *Source* | **any**} {**host** *source-mac-address* | **any** } [**operator** port [*port*]] {*destination destination-wildcard* | **host** *destination* | **any**} {**host** *destination-mac-address* | **any**} [**operator port** [*port*]] [**precedence** *precedence*] [**tos** *tos*] [**fragments**] [**time-range** *time-range-name*] [**match-all** *tcp-flag*]

User Datagram Protocol (UDP)

access-list *id* {**deny** | **permit**} **udp**[**VID** [*out*][**inner** *in*]] {*source source –wildcard* | **host** *source* | **any**} {**host** *source-mac-address* | **any** } [**operator port** [*port*]] {*destination destination-wildcard* | **host** *destination* | **any**}{**host** *destination-mac-address* | **any**} [**operator port** [*port*]] [**precedence** *precedence*] [**tos** *tos*] [**fragments**] [**time-range** *time-range-name*]

5)

access-list *list-remark text*

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ЛЬЮ Лb л й ˘ ˘ л
л a Ą Â

id ' л Â ⅃ ˆ 1-99ˇ 100-199ˇ 1300-1999ˇ 2000-2699ˇ 2700 – 289ˇ 700 - 799˜ Â

Deny ' ٦ ˘ ‡ Â

Permit ' ٦ ˘ ‡ Â

Source ' ˆ ў ˜

source-wildcard ' Â ⅃ Ո a ˘ 0.255.0.32

protocol ' IP /ı˘ ⅃ Ո EIGRP

ᄀ Â

TCP Flag ЛЪЮ ᚋ

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

″I ⅄ Ю'

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

Ⱡ ⅄ Ю'

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

ICMP ⅄ Ю'

- **administratively-prohibited**
- **dod-host-prohibited**
- **dod-net-prohibited**
- **echo**
- **echo-reply**
- **fragment-time-exceeded**
- **general-parameter-problem**
- **host-isolated**
- **host-precedence-unreachable**
- **host-redirect**
- **host-tos-redirect**

- **host-tos-unreachable**
- **host-unknown**
- **host-unreachable**
- **information-reply**
- **information-request**
- **mask-reply**
- **mask-request**
- **mobile-redirect**
- **net-redirect**
- **net-tos-redirect**
- **net-tos-unreachable**
- **net-unreachable**
- **network-unknown**
- **no-room-for-option**
- **option-missing**
- **packet-too-big**
- **parameter-problem**
- **port-unreachable**
- **precedence-unreachable**
- **protocol-unreachable**
- **redirect**
- **router-advertisement**
- **router-solicitation**
- **source-quench**
- **source-route-failed**
- **time-exceeded**
- **timestamp-reply**
- **timestamp-request**
- **ttl-exceeded**
- **unreachable**

Ю TCP ɹ ˘ TCP ɻ ɲ ɹ ʎ é '

- **bgp**
- **chargen**
- **cmd**
- **daytime**
- **discard**

- **domain**
- **echo**
- **exec**
- **finger**
- **ftp**
- **ftp-data**
- **gopher**
- **hostname**
- **ident**
- **irc**
- **klogin**
- **kshell**
- **ldp**
- **login**
- **nntp**
- **pim-auto-rp**
- **pop2**
- **pop3**
- **smtp**
- **sunrpc**
- **syslog**
- **tacacs**
- **talk**
- **telnet**
- **time**
- **uucp**
- **whois**
- **www**

Ю w w w

Ю www

ftp Н

- **tacacs**

- **isakmp**
- **mobile-ip**
- **nameserver**
- **netbios-dgm**
- **netbios-ns**
- **netbios-ss**
- **ntp**
- **pim-auto-rp**
- **rip**
- **snmp**
- **snmptrap**
- **sunrpc**
- **syslog**
- **tacacs**
- **talk**
- **tftp**
- **time**
- **who**
- **xdmcp**

Л Ethernet-type Ю

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

ð Ô

1) IP

Ю IP й 192.168.1.64 - 192.168.1.127 ˘
è '

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

2) IP

Ю IP DNS ICMP '

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

3) MAC

Ю ˘ MAC й 00d0f8000c0c ў й 100
Лυ ˘ 1Â '

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

4) Expert

Ю … ч Expert Extended ACLˇ ж ACL IP
й 192.168.12.3 з MAC й 00d0.f800.0044 TCP Â

```
Ruijie(config)# access-list 2702 deny tcp host
192.168.12.3 mac 00d0.f800.0044 any any
Ruijie(config)# access-list 2702 permit any any any any
Ruijie(config)# show access-lists
expert access-list extended 2702
10 deny tcp  host  192.168.12.3 mac 00d0.f800.0044 any any
10 permit any any any any
```

ð ʒ Ô

ʒ	
show access-lists	
mac access-group	Э MAC

¢… IP ACL IP ACL˘ Â ¢ **no** ACL

ip access-list {**extended** | **standard**} {*id* | *name*}

no ip access-list {**extended** | **standard**} {*id* | *name*}

ð Ô

id IP /!˘ ^ 1-99˝ 1300-1999˜ ˘ ^ 100-199˝ 2000-2699˜

name ' IP ♩

ð Ô

ACL

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ACL a ♩˘ ACL ╗ Â **deny** **permit** ¢ Â **show access-lists** ¢ ACL Â

ð Ô

… ACL'

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

… ACL'

```
Ruijie(config)# ip access-list standard std-acl
Ruijie(config-std-nacl)# show access-lists
ip access-list standard std-acl
Ruijie(config-std-nacl)#
```

ð ¢ Ô

¢	
show access-lists	IP

ð ♩ Ô

˚ RGOS10.0 Л Э

39.1.3 expert access-list

¾… ж ACL˘ Â ¾ **no** ACL

expert access-list extended {

¾ ip ACL ˘ … IPV6 ACL˘ Â
¾ **no**

ip access-list resequence {*id* | *name*} **start-sn inc-sn**

no ip access-list resequence {*id* | *name*}

ð Ô

Id' ACL /ł

Name' ACL ł

start-sn'

˚ RGOS10.0 Л Э

39.1.5 deny

(deny) ˚ Л ¤ Â ACL
Ю˘ ACL Â

1) IP

[*sn*] **deny** {*source source-wildcard* | **host** *source* | **any**}

2) IP

[*sn*] **deny protocol** *source source-wildcard destination destination-wildcard* [**precedence** *precedence*] [**tos** *tos*] [**fragments**] [**time-range** *time-range-name*]

IP 8 '

Internet Control Message Protocol (ICMP)

[*sn*] **deny icmp** {*source source-wildcard* | **host** *source* | **any**} {*destination destination-wildcard* | **host** *destination* | **any**} [*icmp-type*] [[*icmp-type* [*icmp-code*]] | [*icmp-message*]] [**precedence** *precedence*] [**tos** *tos*] [**fragments**] [**time-range** *time-range-name*]

Transmission Control Protocol (TCP)

[*sn*] **deny tcp** {*source source-wildcard* | **host** *Source* | **any**} [*operator* **port** [*port*]] {*destination destination-wildcard* | **host** *destination* | **any**} [*operator* **port** [*port*]] [**precedence** *precedence*] [**tos** *tos*] [**fragments**] [**time-range** *time-range-name*] [**match-all** *tcp-flag*]

User Datagram Protocol (UDP)

[*sn*] deny udp {*source source –wildcard* | **host** *source* | **any**} [*operator* **port** [*port*]] {*destination destination-wildcard* | **host** *destination* | **any**} [*operator* **port** [*port*]] [**precedence** *precedence*] [**tos** *tos*] [**fragments**] [**time-range** *time-range-name*]

3) MAC

[*sn*] **deny** {**any** | **host** *source-mac-address*}{**any** | **host** *destination-mac-address*} [*ethernet-type*][**cos** [*out*] [**inner** *in*]]

4) Expert

[*sn*] **deny**[**protocol** | [*ethernet-type*][**cos** [*out*] [**inner** *in*]]] [[**VID** [*out*][**inner** *in*]]] {*source source-wildcard* | **host** *source* | **any**}{**host** *source-mac-address* | **any** } {*destination destination-wildcard* | **host** *destination* | **any**} {**host**

ACL ३

source-ipv6-address} {*destination-ipv6-prefix / prefix-length* | **any** | *hostdestination-ipv6-address*} [**dscp** *dscp*] [**flow-label** *flow-label*] [**fragments**] [**time-range** *time-range-name*]

IPV6 ⁸ '

Internet Control Message Protocol (ICMP)

[*sn*]**deny icmp** {*source-ipv6-prefix / prefix-length* | *any source-ipv6-address* | **host**} {*destination-ipv6-prefix / prefix-length* | **host** *destination-ipv6-address* | **any**} [*icmp-type*] [[*icmp-type* [*icmp-code*]] | [*icmp-message*]] [**dscp** *dscp*] [**flow-label** *flow-label*] [**fragments**] [**time-range** *time-range-name*]

Transmission Control Protocol (TCP)

[*sn*] **deny tcp** {*source-ipv6-prefix / prefix-length* | **host** *source-ipv6-address* | **any**}[*operator* **port**[*port*]] {*destination-ipv6-prefix /prefix-length* | **host** *destination-ipv6-address* | **any**} [*operator* **port** [*port*]] [**dscp** *dscp*] [**flow-label** *flow-label*] [**fragments**] [**time-range** *time-range-name*] [**match-all** *tcp-flag*]

User Datagram Protocol (UDP)

[sn] **deny udp** {*source-ipv6-prefix/prefix-length* | **host** *source-ipv6-address* | **any**} [*operator* **port** [*port*]] {*destination-ipv6-prefix /prefix-length* | **host** *destination-ipv6-address* | **any**}[*operator* **port** [*port*]] [**dscp** *dscp*] [**flow-label** *flow-label*] [**fragments**] [**time-range** *time-range-name*]

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ЛЪЮ **access-list**

Sn ′ ACL /!

source-ipv6-prefix ' IPv6 .

destination-ipv6-prefix ′ IPv6

prefix-length ′ Æ Æ

source-ipv6-address ′ IPv6

destination-ipv6-address ′ IPv6

dscp ' Ł

dscp ' ˘ 0-63.

flow-label '

flow-label ' ˘ 0-1048575.

protocol ' IPV6 Ɉ ѝ IPV6 | icmp | tcp | udp ⊣<0-255>

ð Ô

ð ʒ Ô

ACL Ю

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ACL Ю ACL ˚

ð Ô

Ю … ˧ Expert Extended ACLˇ ж ACL IP
й 192.168.4.12 з MAC й 001300498272 TCP Â

```
Ruijie(config)# expert access-list extended 2702
Ruijie(config-exp-nacl)# deny tcp  host
192.168.4.12 host 0013.0049.8272 any any
Ruijie(config-exp-nacl)# permit any any any any
Ruijie(config-exp-nacl)# show access-lists
expert access-list extended 2702
10 deny tcp  host  192.168.4.12 host 0013.0049.8272 any any
20 permit any any any any
Ruijie(config-exp-nacl)#
```

Ю IP ACL ˇ IP й 192.168.4.12 ў TCP
й 100 Ĺˇ 1 Â

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

Ю MAC ACL ˇ MAC й 0013.0049.8272 ў
й 100 Лυ ˇ 1 Â

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

Ю IP ACL ˘ IP й 192.168.4.12 ў ˘
1 Â '

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

Ю IPV6 ACL ˘ IP й 192.168.4.12 ў ˘
1 Â '

```
Ruijie(config)# ipv6 access-list extended v6-acl
Ruijie(config-ipv6-nacl)# 11 deny ipv6 host 192.168.4.12 any
Ruijie(config-ipv6-nacl)# show access-lists
ipv6 access-list extended v6-acl
11 deny ipv6 host 192.168.4.12 any
Ruijie(config-ipv6-nacl)# exit
Ruijie(config)# interface gigabitethernet 1/1
Ruijie(config-if)# ipv6 traffic-filter v6-acl in
```

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ҳ	
show access-lists	
ipv6 traffic-filter	Э IPV6
ip access-group	IP ACL
mac access-group	MAC ACL
ip access-list	IP ACL Ӈ
mac access-list	MAC ACL Ӈ
expert access-list	ж ACL Ӈ
ipv6 access-list	IPV6 ACL Ӈ
permit	Ӈ ҳ

ð ӌ Ô

˙ RGOS10.0 Л Э

39.1.6 permit

(**permit**) ˚ Л ū Â ACL
Ю˘ ACL Â

1) IP

[*sn*] **permit** {*source source-wildcard* | **host** *source* | **any**}

2) IP

[*sn*] **permit protocol** *source source-wildcard destination*

destination-wildcard [**precedence** *precedence*] [**tos** *tos*] [**fragments**]

[**time-range** *time-range-name*]

IP 8 '

Internet Control Message Protocol (ICMP)

[*sn*] **permit icmp** {*source source-wildcard* | **host** *source* | **any**}
{*destination destination-wildcard* | **host** *destination* | **any**}
[*icmp-type*] [[*icmp-type* [*icmp-code*]] | [*icmp-message*]] [**precedence** *precedence*] [**tos** *tos*] [**fragments**] [**time-range** *time-range-name*]

Transmission Control Protocol (TCP)

[*sn*] **permit tcp** {*source source-wildcard* | **host** *Source* | **any**} [*operator* **port** [*port*]] {*destination destination-wildcard* | **host** *destination* | **any**}
[*operator* **port** [*port*]] [**precedence** *precedence*] [**tos** *tos*] [**fragments**]
[**time-range** *time-range-name*] [**match-all** *tcp-flag*]

User Datagram Protocol (UDP)

[*sn*] **permit udp** {*source source -wildcard*|**host** *source* |**any**} [*operator* **port** [*port*]] {*destination destination-wildcard*p o r t

[*sn*port

destination-mac-address | **any**} [**precedence** *precedence*] [**tos** *tos*][**fragments**] [**time-range** *time-range-name*]

Ethernet-type cos

[*sn*] **permit** {*ethernet-type*| **cos** [*out*] [**inner** *in*]} [**VID** [*out*][**inner** *in*]] {*source source-wildcard* | **host** *source* | **any**} {**host** *source-mac-address* | **any** } {*destination destination-wildcard* | **host** *destination* | **any**} {**host** *destination-mac-address* | **any**} [**time-range** *time-range-name*]

Protocol

[*sn*] **permit protocol** [**VID** [*out][***inner** *in*]] {*source source-wildcard* | **host** *Source* | **any**} {**host** *source-mac-address* | **any** } {*destination destination-wildcard* | **host** *destination* | **any**} {**host** *destination-mac-address* | **any**} [**precedence** *precedence*] [**tos** *tos*] [**fragments**] [**time-range** *time-range-name*]

Expert

Internet Control Message Protocol (ICMP)

[*sn*] **permit icmp** [**VID** [*out*][**inner** *in*]] {*source source-wildcard* | **host** *source* | **any**} {**host** *source-mac-address* | **any** } {*destination destination-wildcard*

| *hostdestination-ipv6-address*} [**dscp** *dscp*] [**flow-label** *flow-label*] [**fragments**] [**time-range** *time-range-name*]

IPV6 ⁸ '

Internet Control Message Protocol (ICMP)

[*sn*] **permit icmp** {*source-ipv6-prefix* / *prefix-length* | **any** *source-ipv6-address* | **host**} {*destination-ipv6-prefix* / *prefix-length* | **host** *destination-ipv6-address* | **any**} [*icmp-type*] [[*icmp-type* [*icmp-code*]] | [*icmp-message*]] [**dscp** *dscp*] [**flow-label** *flow-label*] [**fragments**] [**time-range** *time-range-name*]

Transmission Control Protocol (TCP)

[*sn*] **permit tcp** {*source-ipv6-prefix* / *prefix-length* | **host** *source-ipv6-address* | **any**} [*operator* **port** [*port*]] {*destination-ipv6-prefix* / *prefix-length* | **host** *destination-ipv6-address* | **any**} [*operator* **port** [*port*]] [**dscp** *dscp*] [**flow-label** *flow-label*] [**fragments**] [**time-range** *time-range-name*] [**match-all** *tcp-flag*]

User Datagram Protocol (UDP)

[*sn*] **permit udp** {*source-ipv6-prefix* / *prefix-length* | **host** *source-ipv6-address* | **any**} [*operator* **port** [*port*]] {*destination-ipv6-prefix* / *prefix-length* | **host** *destination-ipv6-address* | **any**} [*operator* **port** [**port**]] [**dscp** *dscp*] [**flow-label** *flow-label*] [**fragments**] [**time-range** *time-range-name*]

ð Ô

ЛЬЮ deny

ð Ô

ð ৡ Ô

ACL Ю

ð Ô

ACL Ю ACL ˚

ð Ô

Ю … Ч Expert Extended ACL˘ ж ACL IP й 192.168.4.12 з MAC й 001300498272 TCP Â

```
Ruijie(config)# expert access-list extended exp-acl
```

```
Ruijie(config-exp-nacl)# permit tcp  host  192.168.4.12 host
0013.0049.8272 any any
Ruijie(config-exp-nacl)# deny any any any any
Ruijie(config-exp-nacl)# show access-lists
expert access-list extended exp-acl
10 permit tcp  host  192.168.4.12 host 0013.0049.8272 any any
20 deny any any any any
Ruijie(config-exp-nacl)#
```

Ю IP ACL ˘ IP й 192.168.4.12 ў TCP й 100 Ь˘ 1Â

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

Ю MAC ACL ˘ MAC й 0013.0049.8272 ў й 100 Л˘ ˘ 1Â

```
Ruijie(config)# mac access-list extended 702
Ruijie(config-mac-nacl)# permit host 0013.0049.8272 any aarp
Ruijie(config-mac-nacl)# show access-lists
mac access-list extended
10 permit host 0013.0049.8272 any aarp702
Ruijie(config-mac-nacl)# exit
Ruijie(config)# interface gigabitethernet 1/1
Ruijie(config-if)# mac access-group 702 in
```

Ю ip ACL ˘ IP й 192.168.4.12 ў ˘ 1Â '

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

Ю IPV6 ACL ˘ IP й 192.168.4.12 ў ˘
1 Â '

```
Ruijie(config)# ipv6 access-list extended v6-acl
Ruijie(config-ipv6-nacl)# 11 permit ipv6
host ::192.168.4.12 any
Ruijie(config-ipv6-nacl)# show access-lists
ipv6 access-list extended v6-acl
11 permit ipv6 host ::192.168.4.12 any
Ruijie(config-ipv6-nacl)# exit
Ruijie(config)# interface gigabitethernet 1/1
Ruijie(config-if)# ipv6 traffic-filter v6-acl in
```

ð ˀ Ô

ˀ	
show access-lists	
ipv6 traffic-filter	Э IPV6
ip access-group	IP ACL
mac access-group	MAC ACL
ip access-list	IP ACL Ьѫ
mac access-list	MAC ACL Ьѫ
expert access-list	ж ACL Ьѫ
ipv6 access-list	IPV6 ACL Ьѫ
deny	Ьѫ ACL

ð ˩ Ô

˚ RGOS10.0 Л Э

39.1.7 list-remark text

й ACL ╕ ˘ **no**

list-remark *text*

ð Ô

Text '

ð ˀ Ô

ACL

ð Ô

ӥ ACL ╗

ð Ô

```
Ruijie# ip access-list extended 102
Ruijie(config-ext-nacl)# list-remark this acl is to filter the
host 192.168.4.12
Ruijie(config-ext-nacl)# show access-lists
ip access-list extended 102
deny ip host 192.168.4.12 any
1000 hits
this acl is to filter the host 192.168.4.12
Ruijie(config-ext-nacl)#
```

ð ৡ Ô

	ৡ			

show access-lists

```
Ruijie(config-ipv6-nacl)# 12 deny ipv6 host any any
Ruijie(config-ipv6-nacl)# show access-lists
ipv6 access-list extended v6-acl
10 permit ipv6 host ::192.168.4.12 any
12 deny ipv6 any any
Ruijie(config-ipv6-nacl)# no 12
Ruijie(config-ipv6-nacl)# show access-lists
ipv6 access-list extended v6-acl
10 permit ipv6 host ::192.168.4.12 any
Ruijie(config-ipv6-nacl)#
```

ð ¾ Ô

¾	
show access-lists	
ip access-list	ip ACL Ⅱ
ipv6 access-list	IPV6 ACL Ⅱ
deny	Ⅱ Ⅱ ACL
permit	Ⅱ Ⅱ ACL

ð Ù Ô

˚ RGOS10.0 Л Э

39.1.9 ip access-group

é ˘ ¾ **ip access-group** Â ¾ no Ù Â

ip access-group {*id* | *name*} {**in** | **out**} [**reflect | unreflect**]

no ip access-group { *id* | *name*} {**in** | **out**} [**reflect | unreflect**]

ð Ô

id ' IP Л^ 1-199˜ 1300-2699˜

name ' IP ı

in '

out ' ÿ

unreflect ' Ù ACL

reflect' Ù ACL

ð Ô

ACL

ð ¾ Ô

ð Ô

ip access-group ¾ ˘ . Â

ð Ô

Ю GigabitEthernet0/0 Э 120 '

```
Ruijie(config)# interface GigabitEthernet 0/0
Ruijie(config-if)#ip access-group 120 in
```

ð ¾ Ô

¾	
access-list	Нѫ Â
show access-lists	

ð ⊿ Ô

˚ RGOS10.0 Л Э

39.1.10 expert access-group

EXPERT ACL Â ¾ **no** ⊿ Â

expert access-group {*id* | *name*} {**in** | **out**} [**unreflect**]
no expert access-group {*id* | *name*} {**in** | **out**} [**unreflect**]

ð Ô

id ' Expert Л^ 2700-2899˜

name ' Expert ⊿

in '

out ' ÿ

unreflect ' ⊿ ACL

ð Ô

Expert ACL

ð ¾ Ô

Ю access-list v6-acl Gigabit 1 Э'

```
Ruijie(config)# interface GigaEthernet 0/1
Ruijie(config-if)# ipv6 traffic-filter v6-acl in
```

ð ⅓ Ô

⅓	
show access-group	Э ACL Â

ð ⅄ Ô

˚ RGOS10.0 Л Э

39.2

б ЛЮ ⅓:

- **show access-lists**
- **show ip access-group**
- **show mac access-group**
- **show ipv6 traffic-filter**
- **show expert access-group**
- **show access-group**

39.2.1 show access-lists

ACL ⅄ ACL

show access-lists [*id* | *name*]

ð Ô

id ' ⅄

name ' ⅄

ð ⅓ Ô

ð Ô

acl˘ *id* *name˘* ‡ ACL

ð Ô

```
Ruijie# show access-lists n_acl
```

```
ip access-list standard n_acl
Ruijie# show access-lists 102
ip access-list extended 102
Ruijie# show access-lists
ip access-list standard n_acl
ip access-list extended 101
mac access-list extended mac-acl
expert access-list extended exp-acl
ipv6 access-list extended v6-acl
```

ð ৡ Ô

ৡ	
ip access-list	IP ACL ᏂՋ Â
mac access-list	MAC ACL ᏂՋ
expert access-list	Expert ACL ᏂՋ
ipv6 access-list	IPv6 ACL ᏂՋ

ð ৶ Ô

˚ RGOS10.0 Л৬ Э

39.2.2 show ip access-group

IP ACL

show ip access-group[**interface** <*interface*>]

ð Ô

<*interface*> '

ð ৡ Ô

ð Ô

IP ACL˘ ˘ ‡ IP ACL

ð Ô

```
Ruijie# show ip access-group interface gigabitethernet 0/1
ip access-group aaa in
Applied On interface GigabitEthernet 0/1.
```

ð ৡ Ô

¾	
ip access-list	IP ACL ЬЖ Â

ð ¼ Ô

˚ RGOS10.0 Л Э

39.2.3 show expert access-group

Expert Â

show expert access-group [**interface** <*interface*>]

ð Ô

<*interface*> '

ð ¾ Ô

ð Ô

Expert ACL˘ ˘ ‡ Expert ACL

ð Ô

```
Ruijie# show expert access-group interface gigabitethernet 0/2
expert access-group ee in
Applied On interface GigabitEthernet 0/2.
```

ð ¾ Ô

¾	
expert access-list	Expert ACL ЬЖ

ð ¼ Ô

˚ RGOS10.0 Л Э

39.2.4 show ipv6 traffic-filter

IPV6

show ipv6 traffic-filter [**interface** <*interface*>]

ð Ô

<*interface*> '

ð ৡ Ô

ð Ô

IPv6 ACL˘ ˘ ‡ IPv6 ACL

ð Ô

```
Ruijie# show ipv6 traffic-filter interface gigabitethernet 0/4
ipv6 traffic-filter v6 in
Applied On interface GigabitEthernet 0/4.
```

ð ৡ Ô

ৡ	

```
Applied On interface GigabitEthernet 0/8.
```

ð ৡ Ô

ৡ	
ip access-group	ip ᵻ
mac access-group	MAC ᵻ
expert access-group	Expert ᵻ
ipv6 traffic-filter	IPV6 ᵻ

ð ✓ Ô

˚ RGOS10.0 ᒧ Э

40 RPL

40.1

40.1.1 reverse-path

Ю **reverse-path** ϡ ˘ è ˧ ˩
˘ ϡ no ˧ Â

reverse-path

no reverse-path

-	-

a ˧ ˩ ⁸ ╖

ϡ Â

ϡ ˧ Л∪ ˘ ˧

1' Э RPL ϡ.

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

ϡ

ϡ	
-	-

˩

ϡ

/ˡ	
10.3(3b7)	10.3(4)

41

41.1

41.1.1 acpp

Э PPP ˇ ч **ppp authentication** ˇ

41.1.2 arp-car

ARP ˇ Glean-CAR ˇ control-plane
Ю arp-car

no arp-car ‡

arp-car *packet_rate_per_group* [**log**]

no arp-car

protocol	8
manage	
data	Ł

Â

1' ЛuЮ ˘ control-plane ˘ 8 '

```
Ruijie(config)# control-plane protocol
Ruijie(config-cp)#
```

-	-

Â

-	-

41.1.4 debug ef-rnfp

Tl ˘ debug ef-rnfp

no

debug ef-rnfp [**acpp** | **scpp** | **glean-car** | **arp-car** | **port-filter** | **mpp | all**]

no debug ef-rnfp [**acpp** | **scpp** | **glean-car** | **arp-car** | **port-filter** | **mpp | all**]

-	-

Ю˝

Â

1' ЛЬЮ ˘ arp-car ℸ '

```
Ruijie# debug ef-rnfp arp-car
```

ϡ	
Ruijie# show ef-rnfp debug-buf [clear | echo]	ˆ REF˜ a ˘ Л show ef-rnfp debug-buf [clear | echo] Â

ℳ

ℳ	
-	-

41.1.5 ef-rnfp

‡ ˘ ℳ Л ϡ ef-rnfp enable

‡˘ ℳ Л ϡ ef-rnfp disable

ef-rnfp enable

ef-rnfp disable

-	-

Ю˘ ˘ ‡

ϡ control-plane

1' ЛЬЮ ˘ ‡'

```
Ruijie(config)# control-plane
Ruijie(config-cp)# ef-rnfp disable
```

ϡ	

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

˩

ϡ	
-	-

41.1.6 glean-car

˩ ˥ IP ˘ Glean-CAR ˘ control-plane Ю ϡ glean-car

ϡ no glean-car ‡

glean-car *packet_rate_per_group* [**log**]

no glean-car

packet_rate_per_group	ˆ Æ ѝ pps˜

Ю˝ Glean-CAR ˘ ˩ ˆ ˜ ˥ Glean ѝ 5pps Â

ϡ control-plane ˘ ˩ Ь

Â

1' ЛЮ ˘ ˩ ˆ ˜ ˥ Glean ѝ 10pps'

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

ϡ

ϡ	
Ruijie(config)# control-plane {protocol | manage | data}	control-plane ˘ ˩ Л

˩ Â

ϡ

ϡ	

-	-

41.1.7 management-interface

ˆ MPP˜ ╖ ѝ ˆ
ˇ ∢ Ь ˜ Â MPP ╖ Л∪ Л ˇ ∢
Â MPP˘ control-plane
Ю ҙ management-interface

ҙ no

management-interface *interface* **allow** {**ftp** | **http** | **https** | **ssh** | **snmp** | **telnet** | **tftp**} [**log**]

no management-interface *interface*

Interface	

Port-Filter ╖ ┘Л∪ ˘

Â Port-Filter ╖ control-plane Ю

ϟ port-filter

ϟ no Port-Filter ╖

port-filter [**log**]

no port-filter

-	-

Ю˝ Port-Filter

ϟ control-plane ˘ ┘

1' ЛЬЮ ˘ Э˘ Port-Filter ╖ '

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

ϟ

ϟ	
Ruijie(config)# control-plane {protocol | manage | data}	control-plane ˘ ┘Л∪

┘

/ǀ	
-	-

41.1.9 scpp

ǂ ⁸ ^ SCPP˜ ˘ ш

ǂ ' ⁸˘ ⁸˘ ⁸’ control-plane Ю

ϟ scpp

ϟ no scpp ‡

scpp list *acl_no* {**bw-rate** *bw-rate* **bw-burst-rate** *bw-burst-rate* | **conn-total** *conn-num* | **conn-create-rate** *conn-create-rate* **conn-create-burst-rate** *conn-create-burst-rate*} [**log**]

no scpp list acl_no


```
FUNC: ef_rnfp_pkt_classify              LINE: 318   INFO: detail
recognise ok: ARP
FUNC: ef_rnfp_pkt_classify              LINE: 348   INFO: detail
classify ok EXT: 0x1
FUNC: ef_rnfp_pkt_acpp             LINE: 383  INFO: token_num EXT:
0xf4240
FUNC: ef_rnfp_pkt_acpp             LINE: 393  INFO: acpp permit
FUNC: ef_rnfp_pkt_arp_car          LINE: 500  INFO: arp-car permit
FUNC: ef_rnfp_pkt_main_process      LINE: 1460 INFO: ef rnfp pkt
proc ok, permit EXT: 0x1
FUNC: ef_rnfp_pkt_classify         LINE: 164  INFO: origin reserve
reason EXT: 0xc
FUNC: ef_rnfp_pkt_classify              LINE: 348   INFO: detail
classify ok EXT: 0x1
-----------------------------------------------------
```

Ruijie# debug ef-rnfp [acpp | scpp | glean-car | arp-car | port-filter | mpp | all]	

-	-

42

42.1

42.1.1 ip inspect name

‡ Â ⍝ no ‡ Â

ip inspect name *inspection_name protocol*

no ip inspect name *inspection_name protocol*

ð Ô

inspection_name: ‡ ⅄

protocol: ⅄ ˘ ⅃Ո Ю ' **ftp˘ mms˘ rtsp˘ sip˘ h323, tcp**

ð Ô

ð ⍝ Ô

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ð Ô

⍝ ‡

‡ ⅃Ո ^ ~

ð Ô

Ю ч ‡˘ abc ftp mms ˘ 123 mms h.323

```
Ruijie(config)# ip inspect name abc ftp
Ruijie(config)# ip inspect name abc mms
Ruijie(config)# ip inspect name 123 mms
Ruijie(config)# ip inspect name 123 h323
```

ð Ô

42.1.2 show ip inspect

‡ Â

show ip inspect *parameter*

ð Ô

parameter: ˩ **name** *inspection_name*' ⁸ ˩ ‡

interface ' Э ‡

all '

ð Ô

ð ϡ Ô

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ð Ô

ϡ ^ ~ ‡

ð Ô

Ю ‡ abc '

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

ð Ô

42.1.3 ip inspect

Э ‡˘ ϡ no Э ‡ Â

ip inspect *inspection_name* {**in** | **out**}

no ip inspect *inspection_name* {**in** | **out**}

ð Ô

inspection_name: ‡ ˩

in | **out:** Э ˩

ð Ô

ð ϡ Ô

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ð Ô

ϡ Э ‡

ɻ ɻ Э ‡˘ Л ɻ ‡ и ˆ
ɻ Э˘ ɻ ‡˘ ‡ ɻ Л
˜

‡ ˆ ɻ˜ Э˘
’ ˆ ɻ˜ Э ‡˘
╖ ╟ Â

ð Ô

Ю Л 1/0 ɻ Э abc ‡'

```
Ruijie(conf)# interface ethernet 1/0
Ruijie(conf-if)# ip inspect abc in
```

ð Ô

42.2 IP MAC

42.2.1 ipmacbind

IP MAC ‡ Â ϡ **no** ‡ Â

ipmacbind *A.B.C.D H.H.H* **log**

no ipmacbind *A.B.C.D H.H.H* **log**

ð Ô

A.B.C.D: IP

H.H.H: MAC

log: ĭ

ð Ô

IP MAC ╖

ð ϡ Ô

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ð Ô

ϡ ‡

‡ ɻ˘ IP MAC ╖ ╟

ð Ô

permit: ┐ Э IP MAC ‡

deny: ┐ Э IP MAC ‡

ð Ô

┐ Э IP MAC ‡

ð ϡ Ô

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ð Ô

ð Ô

Ю ┐ Э IP MAC ‡ '

Ruijie(config)# **ipmacbind** default action permit

ð Ô

42.2.4 clear ipmacbind

```
Ruijie# clear ipmacbind dynamic
```

ð Ô

42.2.5 show ipmacbind

IP MAC ‡ Â

show ipmacbind table | hash | statistic

ð Ô

table: IP MAC ‡

hash: IP MAC ‡

statistic: IP MAC ˆ ˜

ð Ô

ð ϡ Ô

Â

ð Ô

ϡ IP MAC ‡ Â

ð Ô

ÞO IP MAC ‡ '

```
Ruijie# show ipmacbind table
No.    Type   IP address    MAC address         Log
1      static 192.168.52.66    52e1.5d33.aa21   on
2      auto   192.168.52.50    112e.3ca4.3381   off
<-- output omitted -- >
```

ð Ô

42.3

42.3.1 ip ingress-filter

╖ Â ϡ no ╖ Â

ip ingress-filter log

no ip ingress-filter

ð Ô

log: ĭ

ð Ô

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ЮЎ ℸ ˘ ℸ ˘ ″l
ϡ Â a ℸ ˘ ⅄ Л∪ ϡ no Â

ð Ô

Ю ℸ '

Ruijie(config)# **interface ethernet** 1/0

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

ð Ô

42.3.2 show ip ingress-filter

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show ip ingress-filter

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ð Ô

ð Ô

Ю show ℸ '

Ruijie# **show**

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

ð Ô

42.4 TCP SYN

42.4.1 ip tcp-intercept list

Ɉ Ɔ TCP SYN ϡ ╖ Â ϡ no ╖ Â

ip tcp-intercept list *extended_ACL_#* {**in** | **out**} <**log**>

no ip tcp-intercept list *extended_ACL_#* {**in** | **out**} <**log**>

ð Ô

extended_ACL_#:

in | **out:** Ɔ Ɉ

log: ĭ

ð Ô

TCP SYN ϡ ╖

ð ϡ Ô

Â

ð Ô

Ɉ Ɔ TCP SYN ϡ ╖ Â

Ю Â

ð Ô

Ю eth 1/0 Ɉ Ɔ TCP TCP SYN ϡ '

```
Ruijie(config)# access-list 100 tcp permit any any
Ruijie(config)# interface ethernet 1/0
Ruijie(config-if)# ip tcp-intercept list 100 in log
```

TCP SYN ϡ Â

show ip tcp-intercept

ð Ô

ð Ô

ð ϡ Ô

Â

ð Ô

ϡ TCP SYN ϡ

ў ' ϡ ˘ ϡ ˘

ð Ô

ƗO TCP SYN ϡ '

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

ð Ô

42.5 TCP

42.5.1 ip inspect name tcp

tcp ‡ˆ TCP Ѝ ˜ Â ϡ no ‡ Â

ip inspect name *inspection_name* **tcp**

no ip inspect name *inspection_name* **tcp**

ð Ô

inspection_name: ‡ ɹ ˇ ACL ɹ

ð Ô

ð ϡ Ô

Â

ð Ô

ֽ tcp ‡

tcp ‡ Э˘ **ip inspect** ֽ Â

tcp ‡ ˘ **show ip inspec**t ֽ Â

ð Ô

Ю tcp ‡ tcp_inspec'

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

ð Ô

ip inspect name ֽ ʌ Â ≠ **ip inspect** ֽ
Э˘ **show ip inspect** ˩ Л Â

42.6

42.6.1 session-limit

[8] ℸ

session-limit access-group *acl_no* **rate** *rate* **concurrent** *session_no* {**in|out**} <**log**>

no session-limit access-group *acl_no* **rate** *rate* **concurrent** *session_no* {**in|out**} <**log**>

ð Ô

acl_no ‡ ʌ

rate

session_no

in|out ˩

ð Ô

a [8]

ð ֽ Ô

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ð Ô

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ð Ô

1000˝ ˘ 100

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

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ℸ a Â

42.7

42.7.1 ip rate-control

⁸ ℸ

ip rate-control *acl_no* **bandwidth** {**both|up|down**} *rate* **<session total** *session_no***>** <**rate** *rate_no***>**

no ip rate-control *acl_no* **bandwidth** {**both|up|down**} *rate* **<session total** *session_no***>** <**rate** *rate_no***>**

ð Ô

acl_no' ‡ ʌ

rate' ˘ Æ kBps

session_no'

rate_no'

ð Ô

a ⁸

ð ʒ Ô

Â

ð Ô

⁸ ЭЮ й both

ʒ

ð Ô

200kBps˜ 500 ˘ 100

```
ip rate-control 1 bandwidth both 200 session total 500 rate 100
```

ð Ô

ϟ ʌ ˘ ǐ ‡ a Â

ℸ a Â

42.8

42.8.1 ip session log-on

˘ ϟ no Â

ip session log-on

no ip session log-on

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```
Ruijie(config)#ip session log-on
```

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42.8.2 ip session timeout

˘ ϟ no Â

ϟ й ϟ˘ ϟ Â

ip session timeout icmp-closed *timeout_value*

ip session timeout icmp-started *timeout_value*

ip session timeout icmp-connected *timeout_value*

ip session timeout tcp-established *timeout_value*

ip session timeout tcp-syn-sent *timeout_value*

ip session timeout tcp-syn-receive *timeout_value*

ip session timeout tcp-fin-wait *timeout_value*

ip session timeout tcp-time-wait *timeout_value*

ip session timeout tcp-closed *timeout_value*

ip session timeout tcp-close-wait *timeout_value*

ip session timeout tcp-last-ack *timeout_value*

ip session timeout udp-closed *timeout_value*

ip session timeout udp-started *timeout_value*

ip session timeout udp-connected *timeout_value*

ip session timeout udp-established *timeout_value*

ip session timeout rawip-closed *timeout_value*

ip session timeout rawip-started *timeout_value*

ip session timeout rawip-connected *timeout_value*

ip session timeout rawip-established *timeout_value*

no ip session timeout icmp-closed

no ip session timeout icmp-started

no ip session timeout icmp-connected

no ip session timeout tcp-established

no ip session timeout tcp-syn-sent

no ip session timeout tcp-syn-receive

no ip session timeout tcp-fin-wait

no ip session timeout tcp-time-wait

no ip session timeout tcp-closed

no ip session timeout tcp-close-wait

no ip session timeout tcp-last-ack

no ip session timeout udp-closed

no ip session timeout udp-started

no ip session timeout udp-connected

no ip session timeout udp-established

no ip session timeout rawip-closed

no ip session timeout rawip-started

no ip session timeout rawip-connected

no ip session timeout rawip-established

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timeout_value ˘ Æ ѝ

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icmp-closed 10

icmp-started 10

icmp-connected 10

tcp-established 1800

tcp-syn-sent 10

tcp-syn-receive 10

tcp-fin-wait 60

tcp-time-wait 10

tcp-closed 10

tcp-close-wait 60

tcp-last-ack 30

udp-closed 10

udp-started 60

udp-connected 30

udp-established 600

rawip-closed 10

rawip-started 300

rawip-connected 300

rawip-established 300

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Ю ʒ icmp-connected ѝ 10 '

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

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42.8.3 ip session threshold

ˇ ˩^ ~ ˇ ʒ no

rawip-closed 10

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ð Ô

Ю ʒ icmp-started ˩ й 10 '

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

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42.8.4 ip session track-state-strictly

ш TCP àICMP ˘
TCP ˆ SYN ˜ à ICMP a ˩ Ю Â
ʒ ш ╖ ˘ ʒ no ╖ Â

ip session track-state-strictly

no ip session track-state-strictly

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й ш ╖ Â

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Ю ʒ ш ╖ '

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

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ш Ю ˩ ˘ ¤ ǐ ╖
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43 VPDN

43.1 VPDN

43.1.1 vpdn enable

ৡ VPDN ╖ ˘ è **no** VPDN ╖ Â

vpdn enable

no vpdn enable

ð Ô

ЮЎ VPDN ╖ Â

ð ৡ Ô

ð Ô

(Client-Initiated Tunnel) L2TP a VPDN ╖
˘ RGNOS LAC LNS ╖ ˘ PPTP L2TP
VPDN ╖ Â ৡ ⅄ .
ў ╟ ⁸ Â

ð Ô

VPDN ╖

```
Ruijie(config)# vpdn enable
Ruijie(config)#
```

43.1.2 vpdn source-ip

ৡ VPDN ╖ ( ) ˘ è **no**
Â

vpdn source-ip *A.B.C.D*

no vpdn source-ip

ð Ô

A.B.C.D ' VPDN ╖

ð Ô

Ю˘ ѝ VPDN ╖ ( ) Â

ð ٪ Ô

ð Ô

LNS(L2TP) HGW(PPTP)╖ ˘ ┘Л┐ ٪
┘ ѝ Â ٪ ┘
. ў ╟ ⁸ Â

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┘ ѝ 192.168.12.223

```
Ruijie(config)# vpdn source-ip 192.168.12.223
Ruijie(config)#
```

43.1.3 vpdn session-limit

٪ VPDN ╖ ˘ è **no**
Â

vpdn session-limit *sessions*

no vpdn session-limit

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sessions ' VPDN ╖

ð Ô

Ю˘ ѝ ˘ è 36 ѝ 300 Â

ð ٪ Ô

ð Ô

┘ VPDN ˘ ┘ ٪
⁸ Â

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┘ ѝ 100

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

43.2 VPDN

43.2.1 clear vpdn tunnel

¯ ⁸ Â

clear vpdn tunnel [{**l2tp** | **pptp** }[*remote-host-name*]]

ð Ô

l2tp ' L2TP

pptp ' PPTP

remote-host-*name* ' ÿ ¸

ð ¯ Ô

ð Ô

¯ ⁸ Â a ˘ ¤ ⁸
(PPTP б L2TP)' ˘ ¤ ⁸
' ÿ ¸ ˘ ¤ ⁸
ÿ ¸ ¬ ¸ Â

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L2TP

```
Ruijie# show vpdn
L2TP Tunnel and Session Information Total tunnels 1 sessions
1
LocID RemID Remote Name  State  Remote Address  Port  Sessions
L2TP Class/
VPDN Group
1    1    BLIZZARD  est   192.168.12.213  1701  1  1
LocID     RemID     TunID     Username, Intf/
State  Last Chg                    Vcid, Circuit
1        1        1        ms,Vi1            est
00:46:30
%No active PPTP tunnels

Ruijie# clear vpdn tunnel l2tp
Ruijie#
%UPDOWN: Line protocol on Interface Virtual-Access1, changed
state to down
```

```
%CHANGED: Interface Virtual-Access1, changed state to
administratively down

Ruijie# show vpdn
%No active L2TP tunnels
%No active PPTP tunnels
Ruijie#
```

43.2.2 show vpdn

ৡ Э VPDN Â

show vpdn [**session | tunnel**]

ð Ô

session '

tunnel '

ð ৡ Ô

à

ð Ô

↲Л৬ ৡ Э VPDN Â a
Э VPDN б Â

ð Ô

Э VPDN

```
Ruijie# show vpdn
L2TP Tunnel and Session Information Total tunnels 1 sessions
1
LocID RemID Remote Name  State  Remote Address  Port  Sessions
L2TP Class/
VPDN Group
4    77   BLIZZARD     est   192.168.12.213  1701  1       1
LocID      RemID      TunID      Username, Intf/      State
Last Chg
                           Vcid, Circuit
1          1          4          ms,Vi1               est
00:33:58
%No active PPTP tunnels
Ruijie#
```

Э VPDN

```
Ruijie# show vpdn tunnel
L2TP Tunnel Information Total tunnels 1
LocID RemID Remote Name   State  Remote Address  Port  Sessions
L2TP Class/
VPDN Group
4     77    BLIZZARD     est    192.168r4Tj-0.102t1-5s41tate  Remo0 1 12.1
```

ð Ô

à ˘ ˩Л ꢀ VPDN ˥
… ˥ Y˚ à ⁸ Â error à event à packet
VPDN ˆ L2TP PPTP˜ Ω ˘ è ˩ L2TP Â

ð Ô

… pptp **debug vpdn event** Ю '

```
VPDN: Pptp recv start-control-connection-request from host
192.168.200.114
PPTP: New tunnel socket id =9
VPDN: Pptp get tunnel info for 192.168.200.114 ok!
VPDN: Pptp send start-control-connection-reply, ok
VPDN: Pptp tunnel id 0 state change: idle --> estbed
PPTP: Add send-echo-request timer, interval = 60
VPDN: Pptp tunnel id 0 recv outgoing-call-request!
Pptp: Tunnel to 192.168.200.114 get config para. from vpdn-group
pptp!
VPDN: Must process using ACCEPT_DIALIN parameters
Pptp: Session va0 get config para. from vpdn-group pptp!
VPDN: Pptp session va0 state change: idle --> connected
PPTP: Receive outcall request,process ok!assign local call id
= 1
VPDN: Pptp tunnel id 0 send out-call reply
%LINK CHANGED: Interface virtual-access 0, changed state to up
VPDN: Pptp tunnel to 192.168.200.114 peer callid 1 recv
set-linkinfo
VPDN: Pptp tunnel to 192.168.200.114 peer callid 1 recv
set-linkinfo
%LINE PROTOCOL CHANGE: Interface virtual-access 0, changed state
to UP
```

… pptp **debug vpdn packet** Ю '

```
PPTP: I Start-Control-Connection-Request len 156 Magic Cookie
0x1A2B3C4D
Protocol Version 0x100
Framing Type 0x1
Bearer Type 0x1
Maximum Channels 0x0
Firmware Revision 0x893
Host Name:
endor String: Microsoft Windows NT
PPTP: O Start-Control-Connection-Reply len 156 Magic Cookie
0x1A2B3C4D
```

```
Protocol Version 0x100
Framing Type 0x2
Bearer Type 0x3
Maximum Channels 0x0
Firmware Revision 0x100
Host Name: Dingjs
Vendor String: Ret-Giant Network Operating System
PPTP: I Outgoing-Call-Request len 168 Magic Cookie 0x1A2B3C4D
Call Id 0x4000
Call Serial Number 0x96A5
Min BPS 0x12C
Max BPS 0x5F5E100
Bearer Type 0x3
Framing Type 0x3
Rec Window Size 0x40
Proc Delay 0x0
Phone Number Length 0x0
Phone Number:
Subaddress:
PPTP: O Outgoing-Call-Reply len 32 Magic Cookie 0x1A2B3C4D
Call Id 0x1
Peer Call Id 0x4000
Result Code 0x1
Error Code 0x0
Cause Code 0x0
Connect Speed 0xFA00
Rec Window Size 0x10
Physical Channel Id 0x0
PPTP: I Set-Link-Info len 24 Magic Cookie 0x1A2B3C4D
Peer Call Id 0x1
Send ACCM 0xFFFFFFFF
Recv ACCM 0xFFFFFFFF
%UPDOWN: Interface Virtual-Access1, changed state to up
Vi1 VPDN PROCESS Into tunnel: Sending 54 byte pak
Vi1 VPDN PROCESS Into tunnel: Sending 64 byte pak
Vi1 VPDN PROCESS Into tunnel: Sending 50 byte pak
PPTP: I Set-Link-Info len 24 Magic Cookie 0x1A2B3C4D
Peer Call Id 0x1
Send ACCM 0xFFFFFFFF
Recv ACCM 0xFFFFFFFF
Vi1 VPDN PROCESS Into tunnel: Sending 45 byte pak
Vi1 VPDN PROCESS Into tunnel: Sending 46 byte pak
Vi1 VPDN PROCESS Into tunnel: Sending 187 byte pak
Vi1 VPDN PROCESS Into tunnel: Sending 56 byte pak
```

```
Vi1 VPDN PROCESS Into tunnel: Sending 64 byte pak
Vi1 VPDN PROCESS Into tunnel: Sending 50 byte pak
Vi1 VPDN PROCESS Into tunnel: Sending 50 byte pak
Vi1 VPDN PROCESS Into tunnel: Sending 52 byte pak
```

Л pptp й ˇ **debug vpdn error** Ю

```
VPDN: PPTP session Virtual-Access1 wait pak ack timeout(wait
seq=37, ack=36), decrease send window to half of current = 33!
VPDN: PPTP session Virtual-Access1 adjust ATO to 220 ms!
VPDN: PPTP session Virtual-Access1 wait pak ack timeout(wait
seq=38, ack=36), decrease send window to half of current = 16!
VPDN: PPTP session Virtual-Access1 adjust ATO to 280 ms!
VPDN: PPTP session Virtual-Access1 wait pak ack timeout(wait
seq=39, ack=36), decrease send window to half of current = 8!
VPDN: PPTP session Virtual-Access1 adjust ATO to 400 ms!
VPDN: Pptp EGRE encap fail, err=-4!
VPDN: PPTP session Virtual-Access1 wait pak ack timeout(wait
seq=40, ack=36), decrease send window to half of current = 4!
VPDN: PPTP session Virtual-Access1 adjust ATO to 640 ms!
```

LNS ↓ (б) VPDN
Â

```
Ruijie# debug vpdn error
vpdn protocol errors debugging is on
Ruijie# debug vpdn event
vpdn events debugging is on
Ruijie# debug vpdn packet
vpdn packet debugging is on
Ruijie# show debug
VPDN:
vpdn events debugging is on
vpdn protocol errors debugging is on
vpdn packet debugging is on
Ruijie#
VPDN PROCESS From tunnel: Received 158 byte pak
L2X: UDP socket write 168 bytes, 192.168.12.217(1701) to
192.168.12.242(1701)
L2X: UDP socket write 40 bytes, 192.168.12.217(1701) to
192.168.12.242(1701)
VPDN PROCESS From tunnel: Pak consumed
VPDN PROCESS From tunnel: Received 70 byte pak
L2X: UDP socket write 40 bytes, 192.168.12.217(1701) to
192.168.12.242(1701)
VPDN PROCESS From tunnel: Pak consumed
```

```
VPDN PROCESS From tunnel: Received 76 byte pak
Get virtual-access from free queue: Virtual-Access1
Clone virtual-access from interface Virtual-Template1
L2X: UDP socket write 56 bytes, 192.168.12.217(1701) to
192.168.12.242(1701)
L2X: UDP socket write 40 bytes, 192.168.12.217(1701) to
192.168.12.242(1701)
VPDN PROCESS From tunnel: Pak consumed
VPDN PROCESS From tunnel: Received 76 byte pak
L2X: UDP socket write 40 bytes, 192.168.12.217(1701) to
192.168.12.242(1701)
Vi1 Tnl/Sn 3/1 L2TP: Virtual interface created for unknown,
bandwidth 1024 Kbps
Vi1 Tnl/Sn 3/1 L2TP: VPDN session up
VPDN PROCESS From tunnel: Pak consumed
VPDN PROCESS From tunnel: Received 50 byte pak
Vi1 VPDN PROCESS From tunnel: Queue 14 byte pak to ppp parse
and iqueue
Vi1 VPDN PROCESS From tunnel: Pak send successful
%UPDOWN: Interface Virtual-Access1, changed state to up
Vi1 VPDN PROCESS Into tunnel: Sending 54 byte pak
L2X: UDP socket write 54 bytes, 255.255.255.255(1701) to
4.83.68.68(1701)
VPDN PROCESS From tunnel: Received 50 byte pak
Vi1 VPDN PROCESS From tunnel: Queue 14 byte pak to ppp parse
and iqueue
Vi1 VPDN PROCESS From tunnel: Pak send successful
Vi1 VPDN PROCESS Into tunnel: Sending 50 byte pak
L2X: UDP socket write 50 bytes, 255.255.255.255(1701) to
4.83.68.68(1701)
Vi1 VPDN PROCESS Into tunnel: Sending 54 byte pak
L2X: UDP socket write 54 bytes, 255.255.255.255(1701) to
4.83.68.68(1701)
VPDN PROCESS From tunnel: Received 50 byte pak
Vi1 VPDN PROCESS From tunnel: Queue 14 byte pak to ppp parse
and iqueue
Vi1 VPDN PROCESS From tunnel: Pak send successful
Vi1 VPDN PROCESS Into tunnel: Sending 50 byte pak
L2X: UDP socket write 50 bytes, 255.255.255.255(1701) to
4.83.68.68(1701)
Vi1 VPDN PROCESS Into tunnel: Sending 54 byte pak
L2X: UDP socket write 54 bytes, 255.255.255.255(1701) to
4.83.68.68(1701)
VPDN PROCESS From tunnel: Received 50 byte pak
```

```
Vi1 VPDN PROCESS From tunnel: Queue 14 byte pak to ppp parse
and iqueue
Vi1 VPDN PROCESS From tunnel: Pak send successful
Vi1 VPDN PROCESS Into tunnel: Sending 50 byte pak
L2X: UDP socket write 50 bytes, 192.168.12.217(1701) to
192.168.12.242(1701)
Vi1 VPDN PROCESS Into tunnel: Sending 54 byte pak
L2X: UDP socket write 54 bytes, 192.168.12.217(1701) to
192.168.12.242(1701)
VPDN PROCESS From tunnel: Received 54 byte pak
Vi1 VPDN PROCESS From tunnel: Queue 18 byte pak to ppp parse
and iqueue
Vi1 VPDN PROCESS From tunnel: Pak send successful
VPDN PROCESS From tunnel: Received 56 byte pak
Vi1 VPDN PROCESS From tunnel: Queue 20 byte pak to ppp parse
and iqueue
Vi1 VPDN PROCESS From tunnel: Pak send successful
Vi1 VPDN PROCESS Into tunnel: Sending 45 byte pak
L2X: UDP socket write 45 bytes, 192.168.12.217(1701) to
192.168.12.242(1701)
Vi1 VPDN PROCESS Into tunnel: Sending 50 byte pak
L2X: UDP socket write 50 bytes, 192.168.12.217(1701) to
192.168.12.242(1701)
VPDN PROCESS From tunnel: Received 50 byte pak
Vi1 VPDN PROCESS From tunnel: Queue 14 byte pak to ppp parse
and iqueue
Vi1 VPDN PROCESS From tunnel: Pak send successful
Vi1 VPDN PROCESS Into tunnel: Sending 50 byte pak
L2X: UDP socket write 50 bytes, 192.168.12.217(1701) to
192.168.12.242(1701)
VPDN PROCESS From tunnel: Received 50 byte pak
Vi1 VPDN PROCESS From tunnel: Queue 14 byte pak to ppp parse
and iqueue
Vi1 VPDN PROCESS From tunnel: Pak send successful
VPDN PROCESS From tunnel: Received 50 byte pak
Vi1 VPDN PROCESS From tunnel: Queue 14 byte pak to ppp parse
and iqueue
Vi1 VPDN PROCESS From tunnel: Pak send successful
Vi1 VPDN PROCESS Into tunnel: Sending 50 byte pak
L2X: UDP socket write 50 bytes, 192.168.12.217(1701) to
192.168.12.242(1701)
%UPDOWN: Line protocol on Interface Virtual-Access1, changed
state to up
```

LNS ↵ (б) **debug vpdn l2x-data** '

```
L2X: Punting to L2TP control message queue
L2X: Punting to L2TP control message queue
L2X: Punting to L2TP control message queue
L2X: Punting to L2TP control message queue
L2X: Punting to L2TP control message queue
L2X: Punting to L2TP control message queue
%UPDOWN: Interface Virtual-Access1, changed state to up
%UPDOWN: Line protocol on Interface Virtual-Access1, changed
state to up
```

L2TP **debug vpdn l2x-error** '

```
Tnl 14 L2TP: Tunnel auth failed for BLIZZARD
Tnl 14 L2TP: Expected
9E 8D 7A 8E 78 EA 41 9F A1 74 01 21 DE 4F F3 F0
Tnl 14 L2TP: Got
84 E5 62 69 AE 46 A5 98 4E FE E2 38 EE F2 B7 E2
```

LNS ↵ (б) **debug vpdn l2x-events** '

```
L2TP: I SCCRQ from C3640 tnl 26656
New tunnel created for remote C3640, address 192.168.12.242
Tnl 0 L2TP: Got a challenge in SCCRQ, C3640
Tnl 20 L2TP: O SCCRP  to C3640 tnlid 26656
Tnl 20 L2TP: Control channel retransmit delay set to 1 seconds
Tnl 20 L2TP: Tunnel state change from idle to wait-ctl-conn
Tnl 20 L2TP: I SCCCN from C3640 tnl 26656
Tnl 20 L2TP: Got a Challenge Response in SCCCN, C3640
Tnl 20 L2TP: Tunnel Authentication success
Tnl 20 L2TP: Tunnel state change from wait-ctl-conn to
established
Tnl 20 L2TP: SM State established
Tnl 20 L2TP: I ICRQ from C3640 tnl 26656
Tnl/Sn 20/1 L2TP: Accepted ICRQ, new session created
Tnl/Sn 20/1 L2TP: O ICRP to C3640 26656/1279
Tnl/Sn 20/1 L2TP: Session state change from idle to wait-connect
Tnl 20 L2TP: Control channel retransmit delay set to 1 seconds
Tnl/Sn 20/1 L2TP: I ICCN from C3640 tnl 26656, cl 1279
Tnl/Sn 20/1 L2TP: Session state change from wait-connect to
wait-for-service-sel
ection-iccn
```

```
00 08 00 00 00 06 11 30 80 0A 00 00 00 07 52 36
32 31 00 0E 00 00 00 08 ...
Tnl 22 L2TP: O ZLB ctrl ack, flg TLS, ver 2, len 12, tnl 18889,
ns 1, nr 1
C8 02 00 0C 49 C9 00 00 00 01 00 01
Tnl 22 L2TP: Parse  AVP 0, len 8, flag 0x8000 (M)
Tnl 22 L2TP: Parse SCCCN
Tnl 22 L2TP: I SCCCN from C3640 tnl 18889
Tnl 22 L2TP: Parse  AVP 13, len 22, flag 0x8000 (M)
Tnl 22 L2TP: Chlng Resp
5C D5 A4 37 36 A6 7D 0F FE EF 22 48 B8 DF F5 12
Tnl 22 L2TP: No missing AVPs in SCCCN
Tnl 22 L2TP: I SCCCN, flg TLS, ver 2, len 42, tnl 22, ns 1, nr
1 contiguous pak, size 42
C8 02 00 2A 00 16 00 00 00 01 00 01 80 08 00 00
00 00 00 03 80 16 00 00 00 0D 5C D5 A4 37 36 A6
7D 0F FE EF 22 48 B8 DF F5 12
Tnl 22 L2TP: O ZLB ctrl ack, flg TLS, ver 2, len 12, tnl 18889,
ns 1, nr 2
C8 02 00 0C 49 C9 00 00 00 01 00 02
Tnl 22 L2TP: Parse  AVP 0, len 8, flag 0x8000 (M)
Tnl 22 L2TP: Parse ICRQ
Tnl 22 L2TP: I ICRQ from C3640 tnl 18889
Tnl 22 L2TP: Parse  AVP 15, len 10, flag 0x8000 (M)
Tnl 22 L2TP: Serial Number -1714567290
Tnl 22 L2TP: Parse  AVP 14, len 8, flag 0x8000 (M)
Tnl 22 L2TP: Assigned Call ID 1280
Tnl 22 L2TP: Parse  AVP 18, len 10, flag 0x8000 (M)
Tnl 22 L2TP: Bearer Type 0
Tnl 22 L2TP: No missing AVPs in ICRQ
Tnl 22 L2TP: I ICRQ, flg TLS, ver 2, len 48, tnl 22, ns 2, nr
1 contiguous pak,size 48
C8 02 00 30 00 16 00 00 00 02 00 01 80 08 00 00
00 00 00 0A 80 0A 00 00 00 0F 99 CD C7 86 80 08
00 00 00 0E 05 00 80 0A 00 00 00 12 00 00 00 00
Tnl/Sn 22/1 L2TP: O ICRP to C3640 18889/1280
Tnl/Sn 22/1 L2TP: O ICRP, flg TLS, ver 2, len 28, tnl 18889,
lsid 1, rsid 1280,ns 1, nr 3
C8 02 00 1C 49 C9 05 00 00 01 00 03 80 08 00 00
00 00 00 0B 80 08 00 00 00 0E 00 01
Tnl 22 L2TP: O ZLB ctrl ack, flg TLS, ver 2, len 12, tnl 18889,
ns 2, nr 3
C8 02 00 0C 49 C9 00 00 00 02 00 03
Tnl/Sn 22/1 L2TP: I ICCN from C3640 tnl 18889, cl 1280
```

```
Tnl/Sn 22/1 L2TP: Parse  AVP 0, len 8, flag 0x8000 (M)
Tnl/Sn 22/1 L2TP: Parse ICCN
Vi1 Tnl/Sn 22/1 L2TP: Parse  AVP 24, len 10, flag 0x8000 (M)
Vi1 Tnl/Sn 22/1 L2TP: Connect Speed 0
Vi1 Tnl/Sn 22/1 L2TP: Parse  AVP 19, len 10, flag 0x8000 (M)
Vi1 Tnl/Sn 22/1 L2TP: Framing Type 1
Tnl/Sn 22/1 L2TP: No missing AVPs in ICCN
Tnl/Sn 22/1 L2TP: I ICCN, flg TLS, ver 2, len 48, tnl 22, lsid
1, rsid 1280, ns 3, nr 2 contiguous pak, size 48
C8 02 00 30 00 16 00 01 00 03 00 02 80 08 00 00
00 00 00 0C 80 0A 00 00 00 18 00 00 00 00 80 0A
00 00 00 13 00 00 00 01 00 08 00 00 00 1D 00 04
Tnl 22 L2TP: O ZLB ctrl ack, flg TLS, ver 2, len 12, tnl 18889,
ns 2, nr 4
C8 02 00 0C 49 C9 00 00 00 02 00 04
%UPDOWN: Interface Virtual-Access1, changed state to up
%UPDOWN: Line protocol on Interface Virtual-Access1, changed
state to up
```

44 VPDN-Group

44.1 VPDN-Group

44.1.1 accept dialin

ϡ ϶ ˇ è **no** Â

accept-dialin

no accept-dialin

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Ю Â

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VPDN-Group

flash' ″I й 3

flash-override' ″I й 4

immediate ' ″I й 2

internet ' ″I й 6

network ' ″I й 7

priority ' ″I й 1

routine ' ″I й 0

ð Ô

ЮЎ IP ″I й . **routine** Â

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VPDN-Group

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˘ a ў ╟ ⁸ Â
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″I й 7 Â

```
Ruijie(config-vpdn)# ip precedence 7
Ruijie(config-vpdn)#
```

44.1.3 ip tos

ֽ IP TOS(Type of Service) ˘ ὲ **no**
Â

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

no ip tos

ð Ô

tos-value ' TOS ˘ ↓ й 0~15

max-reliability ' TOS й 2

max-throughput ' TOS й 4

min-delay ' TOS й 8

min-monetary-cost ' TOS й 1

normal ' TOS й 0

reflect ' IP TOS й IP TOS

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Ю˜ IP TOS й Â

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VPDN-Group

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TOS ˩Л ʒ Â ʒ
˘ a ў ╟ ⁸ Â
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TOS й **min-delay** Â

```
Ruijie(config-vpdn)# ip tos min-delay
Ruijie(config-vpdn)#
```

44.1.4 local name

ʒ ў ɻ ˘ è **no** Â

local name *local-hostname-string*

no local name

ð Ô

local-hostname-*string* ' ў ɻ

ð Ô

Ю˜ ɻ й ў ɻ Â

ð ʒ Ô

VPDN-Group

ð Ô

˩Л Э ў ɻ Л Â ʒ
˩ . ў ╟ ⁸ Â

ð Ô

ў ɻ й”LNS”

```
Ruijie(config-vpdn)# local name LNS
Ruijie(config-vpdn)#
```

44.1.5 protocol

٪ Â ٪ **no** Â

protocol {**any** | **l2tp** | **pptp**}

no protocol

ð Ô

any ' ٦ ٬

l2tp ' ٦ L2TP

pptp ' ٦ PPTP

ð Ô

Ю˝ й Â

ð ٪ Ô

VPDN-Group

ð Ô

˘

ў ╟ Â

ð Ô

й L2TP Â

ð ֽ Ô

VPDN-Group

ð Ô

VPDN ╗ ( ) ˘ Ѫ
VPDN-Group ( ) б Â ֽ
↓ . ў ╠ ⁸ Â

ð Ô

VPDN-Group й 202.101.92.73

```
Ruijie(config-vpdn)# source-ip 202.101.92.73
Ruijie(config-vpdn)#
```

44.1.7 terminate-from

ֽ ў ɻ ˘ è **no** Â

terminate-from hostname *remote-hostname-string*

no terminate-from

ð Ô

remote-hostname-string ' ў ɻ

ð Ô

Ю˘ ў ɻ Â

ð ֽ Ô

VPDN-Group

ð Ô

↓Л ֽ ⁸ ў ɻ ˘
ў ɻ ˘ Ѫ VPDN-Group a ⁸ ў ɻ Â
ў ɻ VPDN-Group
⁸ ў ╠ Â

ð Ô

ў ɻ й"LAC"

```
Ruijie(config-vpdn)# terminate-from hostname LAC
Ruijie(config-vpdn)#
```

44.1.8 virtual-template

ʒ VPDN-Group ˘ è **no**
Â

virtual-template *number*

no virtual-template

ð Ô

number ' Л

ð Ô

Ю˝ VPDN-Group Э Â

ð ʒ Ô

VPDN-Group

ð Ô

Л Ъ ʒ VPDN-Group ÿ ā
Â VPDN-Group
Â VPDN- Group
VPDN-Group ⁸ Â

ð Ô

1 VPDN-Group Э

```
Ruijie(config-vpdn-acc-in)# virtual-template 1
Ruijie(config-vpdn-acc-in)#
```

44.1.9 vpdn-group

ʒ Ј VPDN-Group ˘ a
VPDN-Group … Ъ Ј й Ј VPDN-Group ˘
è **no** Ј VPDN-Group Â

vpdn-group *vpdn-group-name*

no vpdn-group *vpdn-group-name*

ð Ô

vpdn-group-name ' *vpdn-group* Ј

ð Ô

Ю˝ *vpdn-group* Â

ð ʒ Ô

ð Ô

ˈI LNS HGWˇ … VPDN-Group
Â ˩ Л℧ ʒ VPDN-Group Â VPDN-Group
ў ╟ ⁸ Â

ð Ô

… ɻ ѝ ”1” vpdn-group

```
Ruijie(config)# vpdn-group 1
Ruijie(config-vpdn)#
```

45 PPTP

45.1 PPTP

45.1.1 Pptp flow-control receive-window

ֳ ִ pptp ack
˘ ѝ ˘ è **no** Â

Pptp flow-control receive-window *packets*

No pptp flow-control receive-window

ð Ô

packets ' pptp ack
Â ѵ 1---64 Â

ð Ô

PNS ѝ 64 PAC ѝ 16 Â

ð ֳ Ô

vpdn-group

ð Ô

PPTP ж ֳ˘ Л ″l **protocol pptp**
protocol any ֳ Л˘ ֳ Â

PPTP RFC2637 ˘ ѵ ق ل no

echo-packet-interval ' pptp echo request ˘ Л∪
ѝ Æ Â ↓ 0---1000 Â

ð Ô

ѝ 60 Â

ð ʒ Ô

vpdn-group

ð Ô

PPTP ж ʒ˘ Л∪ ″I **protocol pptp**
protocol any ʒ л˘ ʒ Â
echo-packet-interval ѝ 0 ˘ a ў ╟ echo Â

echo-packet-interval a ѝ 0 ˘ PPTP *echo-packet-interval*
л ˘ ‡ ў ╟
echo request Л∪ ˘ **echo reply**
Â ѝ 1 ˘ ˘ ‡ . γ
echo request˝ Э ˘
Â 5 a **echo reply** ‡ ѝ ˘
↑ ѐ Â

ð Ô

pptp echo request ѝ 30 '

```
Ruijie(config-vpdn)# accept-dialin
Ruijie(config-vpdn-acc-in)# protocol pptp
Ruijie(config-vpdn-acc-in)# exit
Ruijie(config-vpdn)# pptp tunnel echo 30
Ruijie(config-vpdn)#
```

46 L2TP

46.1 L2TP

46.1.1 authentication (L2TP)

ৡ ╖ ˘ è **no** Â

authentication

no authentication

ð Ô

ƗØ˘ ╖ Â

ð ৡ Ô

L2TP-Class

ð Ô

┘ Ո ╖ Â ╖ ┘
L2TP-Class ў ╟ ⁸ Â

ð Ô

╖

```
Ruijie(config-l2tp-class)# authentication
Ruijie(config-l2tp-class)#
```

ð ৡ Ô

ৡ	
Ruijie(config-l2tp-class)# **password** *password-string*	ৡ

46.1.2 encapsulation (L2TP)

ৡ Â

encapsulation l2tpv2

ð Ô

l2tpv2 RFC 2661 L2TP Â

ð Ô

ЮЎ Â

ð ৡ Ô

Pseudowire-Class

ð Ô

pseudowire-class Э˘ ˝I
Â

ð Ô

ы l2tpv2

```
Ruijie(config-pw-class)# encapsulation l2tpv2
Ruijie(config-pw-class)#
```

46.1.3 hello

ৡ ы L2TP Keepalive Hello Â ৡ
no Â

hello *interval*

no hello

ð Ô

interval ' Hello

ð Ô

ЮЎ Hello ы 60 Â

ð ৡ Ô

L2TP-Class

ð Ô

ы Л Hello Л L2TP ĭ ы Â
ы ˘ ы Л Hello ы Â Hello
ы L2TP ў ╠ ⁸ Â

ð Ô

Hello ы 120

```
Ruijie(config-l2tp-class)# hello 120
```

```
Ruijie(config-l2tp-class)#
```

46.1.4 hostname (L2TP)

؃ L2TP ₈ ₩ ﷺ Å ὸ Ά 5 ,Õ ™ ‰ ß È2Ï4³ S*üCÃ+ <,X á/Ä 0

ɹ Л∪ ĭ ĭ Â ĭ ╗
╟ . ɹ Э˘ a L2TP
8 Â

ð Ô

ĭ

```
Ruijie(config-pw-class)# ip dfbit set
Ruijie(config-pw-class)#
```

46.1.6 ip local interface

ʒ ( ) ˘ è **no** Â

ip local interface *interface-name*

no ip local interface *interface-name*

ð Ô

interface-name ' ɻ

ð Ô

Ю˘ ( ) Â

ð ʒ Ô

Pseudowire-Class

ð Ô

ɹ Л∪ Э й ( ) Â ( )
ɹ L2TP ў ╟ 8 Â

ð Ô

( ) й Serial 0

```
Ruijie(config-pw-class)# ip local interface serial 0
Ruijie(config-pw-class)#
```

46.1.7 ip ttl

ʒ IP TTL ˘ è **no** Â

ip ttl *ttl-value*

no ip ttl

ð Ô

ttl-value ' TTL ˘ ↓ й 1~255

ð Ô

Ю˘ IP TTL й 255 Â

ð ֽ Ô

Pseudowire-Class

ð Ô

↓ Л∪ IP TTL Â IP
TTL ╟ . ↓ Э˘ a
L2TP ⁸ Â

ð Ô

IP TTL й 253

```
Ruijie(config-pw-class)# ip ttl 253
Ruijie(config-pw-class)#
```

46.1.8 l2tp ip udp checksum

ֽ UDP ΄I Checksum ˘ è **no**
Â

l2tp ip udp checksum

no l2tp ip udp checksum

ð Ô

Ю˘ UDP Checksum й (й) Â

ð ֽ Ô

VPDN-Group

ð Ô

↓ Л∪ ΐ UDP ΄I Checksum
Â UDP Checksum ╟ .
↓ Э˘ a L2TP ⁸ Â

ð Ô

UDP Checksum

```
Ruijie(config-vpdn)# l2tp ip udp checksum
Ruijie(config-vpdn)#
```

46.1.9 l2tp tunnel authentication

٣ ٦ ˘ è **no** Â

l2tp tunnel authentication

no l2tp tunnel authentication

ð Ô

ЮЎ ٦ Â

ð ٣ Ô

VPDN-Group

ð Ô

٫ Л∪ ٦ Â ٦
╟ L2TP ⁸ ў ╟ Â

ð Ô

٦

```
Ruijie(config-vpdn)# l2tp tunnel authentication
Ruijie(config-vpdn)#
```

46.1.10 l2tp tunnel hello

٣ Keepalive Hello ˘ è **no** Â

l2tp tunnel hello *interval*

no l2tp tunnel hello

ð Ô

interval ' Hello ˘ Л∪ и Æ

ð Ô

ЮЎ Hello и 60 Â

ð ٣ Ô

VPDN-Group

ð Ô

٫ Л∪ Л∪ ٩ Hello Â Hello
٫ L2TP ⁸ ў ╟ Â

ð Ô

Hello ù 30

```
Ruijie(config-vpdn)# l2tp tunnel hello 30
Ruijie(config-vpdn)#
```

46.1.11 l2tp tunnel password

¾ ¾˘ è **no** ¾ Â

l2tp tunnel password *password-string*

no l2tp tunnel password

ð Ô

password-string ' ¾

ð Ô

ЮЎ ¾ Â

ð ¾ Ô

VPDN-Group

ð Ô

Ю˜ ⁸ ↓ й 4 Â

ð ֽ Ô

VPDN-Group

ð Ô

⁸ ↓ ↓ L2TP
⁸ Â

ð Ô

⁸ ↓ й 12

```
Ruijie(config-vpdn)# l2tp tunnel receive-window 12
Ruijie(config-vpdn)#
```

46.1.13 l2tp tunnel retransmit

ֽ L2TP ⁸ ˘ è **no** Â

l2tp tunnel retransmit {**retries** *number* | **timeout** {**min** | **max**} *seconds*}

no l2tp tunnel retransmit {**retries** | **timeout** {**min** | **max**}}

ð Ô

number ' ⁸

seconds ' ⁸

ð Ô

Ю˜ ⁸ й 5˜ ⁸ й 1 ˘
й 8 Â

ð ֽ Ô

VPDN-Group

ð Ô

⁸ L2TP ⁸ ў
╟ Â

ð Ô

⁸ й 10

```
Ruijie(config-vpdn)# l2tp tunnel retransmit retries 10
Ruijie(config-vpdn)#
```

46.1.14 l2tp tunnel timeout

ৡ L2TP / ⁸ ˘ è **no**
Â

l2tp tunnel timeout {**no-session | setup**} *seconds*

no l2tp tunnel timeout {**no-session** | **setup**}

ð Ô

no-session '

setup ' ⁸ ( )

seconds ' ˘ Æ ѝ

ð Ô

Ю˘ ѝ 600 ˘ ⁸
( ) ѝ 300 Â

ð ৡ Ô

VPDN-Group

ð Ô

/ ®

Ю˜ L2TP-Class Â

ð ч Ô

ð Ô

ы Л∪ L2TP-Class L2TP ⁸ Â

ð Ô

… ы й ”l2x” L2TP-Class

```
Ruijie(config)# l2tp-class l2x
Ruijie(config-l2tp-class)#
```

46.1.16 password (L2TP)

ч ч˘ è **no** Â

password *password-string*

no password

ð Ô

password-string ' ч

ð Ô

Ю˜ ╖ ≠ ч Â

ð ч Ô

L2TP-Class

ð Ô

˘ ж ч ╖ ы

ч Â ч л L2TP ⁸

ў ╟ Â

ð Ô

ч й ”share”

```
Ruijie(config-l2tp-class)# password share
Ruijie(config-l2tp-class)#
```

46.1.17 protocol (L2TP)

ч L2TP ⁸ ˘ è **no** Â

protocol l2tpv2 [*l2tp-class-name*]

no protocol

ð Ô

l2tpv2 ' L2TP й

l2tp-class-name ' L2TP-Class ɻ

ð Ô

ЮЎ L2TPv2 й L2TP Â

ð ʒ Ô

Pseudowire-Class

ð Ô

⁸ ɭ L2TP ⁸ ў ╟ Â

ð Ô

й l2tpv2 L2TP-Class l2x ⁸

```
Ruijie(config-pw-class)# protocol l2tpv2 l2x
Ruijie(config-pw-class)#
```

46.1.18 pseudowire

ʒ pseudowire ‡˘ è **no** Â

pseudowire *peer-ip-address vcid* {**encapsulation l2tpv2** [**pw-class** *pw-class-name*] | **pw-class** *pw-class-name* }

no pseudowire

hostname pseudowire

pseudowire hostname *peer-hostname vcid* {**encapsulation l2tpv2** [**pw-class** *pw-class-name*] | **pw-class** *pw-class-name* }

no pseudowire

ð Ô

peer-ip-address ' L2TP Server(LNS)

peer-hostname' L2TP Serverˆ LNS˜ DNS Э Ѧ è hostname

vcid ' **pseudowire**

l2tpv2 ' l2tpv2(RFC 2661) й

pw-class-name ' Ĩ ɻ

ð Ô

ЮЎ ‡ Â

‡ ↙ virtual-ppp Э Â virtual-ppp Э
‡ ↓⁸ ў ╟ Â L2TP

ð Ô

Э ‡˘ è LиNS

”pw”

```
Ruijie(config)# interface virtual-ppp 1
Ruijie(config-if)# .6lcdowire 192.168.12.213 33 pw-class pw
Ruijie(config-if)#
```


hostname '

DNS˘ ⊨ DNS˘ ⊨

ip address negotiate

ip route 0.0.0.0 0.0.0.0 192.168.52.1

46.1.19 pseudowire-class

३ ɹ pseudowire-class ˘ a ɹ pseudowire- class … Л ɹ ѝ ɹ pseudowire-class ˘ è **no** ɹ pseudowire-class Â

pseudowire-class *pseudowire-class-name*

no pseudowire-class *pseudowire-class-name*

ð Ô

pseudowire-class-name ' pseudowire-class ɹ

ð Ô

ð ৡ Ô

L2TP-Class

ð Ô

⁸ ↓ ↓ L2TP ⁸ ў
╟ Â

ð Ô

⁸ ↓ й 12

```
Ruijie(config-l2tp-class)# receive-window 12
Ruijie(config-l2tp-class)#
```

46.1.21 retransmit

ৡ ⁸ ˘ è **no** Â

retransmit {**initial** {**retries** *initial-retries* | **timeout** {**max** | **min**} *initial-timeout*} | **retries** *retries* | **timeout** {**max** | **min**} *timeout*}

no retransmit { **initial** {**retries** | timeout {**max** | **min**} }| **retries** | **timeout** {**max** | **min**} }

ð Ô

initial-retries ' SCCRQ

initial-timeout ' SCCRQ

retries ' è ⁸

timeout ' è ⁸

ð Ô

Ю˝ SCCRQ й 2˝ è ⁸ й 5˝ ⁸
й 1 ˘ ⁸ й 8 Â

ð ৡ Ô

L2TP-Class

ð Ô

⁸ ↓ L2TP ⁸ ў ╟
Â

ð Ô

SCCRQ й 3

```
Ruijie(config-l2tp-class)# retransmit initial retries 3
Ruijie(config-l2tp-class)#
```

46.1.22 timeout setup

ৡ 8 ˘ è **no**
Â

timeout setup *seconds*

no timeout setup

ð Ô

seconds ' 8 ˘ Æ ѝ

ð Ô

Ю˘ 8 ѝ 120 Â

ð ৡ Ô

L2TP-Class

ð Ô

8
L2TP 8 ў ╟ Â

ð Ô

8 ѝ 240

```
Ruijie(config-l2tp-class)# timeout setup 240
Ruijie(config-l2tp-class)#
```

AAA

ৡ

ৡ	
aaa new-model	AAA ᒪ
dot1x authentication	802.1X Э
username	ᏂӾ

ᑲ

ৡ

ᑲ	
-	-

47.1.2 aaa authentication enable

AAA Enable ˘ ৡ **aaa authentication enable** Enable Â ৡ no Â

aaa authentication enable default *method1* [*method2*...]

no aaa authentication enable default

default	˘ ‡ ᑲ ᏂӾ ѝ Enable ÂEnable ˘ ᔰ Â
method	Ӏ' local à none à group ᒪ ˘ 4
local	ᒡ
none	a
group	ᒪ ˘ RADIUS TACACS+ ᒪ

ৡ Â

AAA Enable ᒪ˘ AAA Enable Â **aaa authentication enable** ৡ Enable

ᒪ ˘ RADIUS ᒪ ˘ ‡

Â

Ruijie(config)# **aaa authentication enable default group radius local**

঳	
aaa new-model	AAA ᒪ
enable	ᒥ
username	ᑦᑐ

ᐣ

ᐣ	
-	-

47.1.3 aaa authentication login

AAA Logiñ ~ ˘ ঳ **aaa authentication login** Login Â ঳ no Â

aaa authentication login {**default** | *list-name*} *method1* [*method2*...]

no aaa authentication login {**default** | *list-name*}

default	˘ ‡ ᐣ ᑦᑐ ᕀ Login Â
list-name	ᑦᑐ Login ˘ ᒧ ᑎᑌ Â
method	ᒥ local à none à group ᒪ ˘ 4
local	ᒣ
none	a

˄ ˇ ˅ Â
Login ˅ˇ è Login Э ˇ ï ‡ a
Â

Ю Ня ˃ й list-1 AAA Login Â ˝I
RADIUS Ь ˇ RADIUS Ь ˇ
‡ Â

```
Ruijie(config)# aaa authentication login list-1 group radius local
```

ˀ

ˀ	
aaa new-model	AAA Ь
username	Ня
login authentication	Э Login

˅

ˀ

˅	
-	-

47.1.4 aaa authentication ppp

AAA PPP ˇ ˀ **aaa authentication ppp**
PPP Â ˀ no Â

aaa authentication ppp {**default** | *list-name*} *method1* [*method2*...]

no aaa authentication ppp {**default** | *list-name*}

default	ˇ ‡ ˅ Ня й PPP Â
list-name	Ня PPP ˇ ˧ Л∪ Â
method	ľ local à none à group Ь ˇ 4
local	˃
none	a
group	Ь ˇ RADIUS TACACS+ Ь

Â

AAA PPP AAA PPP Â
aaa authentication ppp PPP Â
Â

Ю rds_ppp AAA PPP Â
RADIUS RADIUS
Â

```
Ruijie(config)# aaa authentication ppp rds_ppp group radius local
```

aaa new-model	AAA
ppp authentication	PPP

portal Ю ⅃ Л

1' /

```
Ruijie(config)# aaa local user allow public account
```

⅋	
-	-

⅃ NPE EG

/ ⅋	
10.3(4t76)	⅋

47.1.7 login authentication

Э Logiñ ~ ╖ ˘ Ю **login authentication** ⅋ Login Â ⅋ no Э Â

login authentication {**default** | *list-name*}

no login authentication

default	˘ Login Â
list-name	⊮ Login Â

⅋ Â

Login ˘ ╟ Э Â Э Login ˘ ⅃ ⅋ Â ⊮ ˘ ‡ ˘ Э Login a ˘ ⊮ Login Â

Ю ⊮ ⅃ и list-1 AAA Login Â Â ⅃ VTY 0 - 4 Э Â

```
Ruijie(config)# aaa authentication login list-1 local
```

```
Ruijie(config)# line vty 0 4
Ruijie(config-line)# login authentication list-1
```

¸	
aaa new-model	AAA ┺
username	ㄏ
login authentication	Login

/ㄏ	
-	-

47.2

47.2.1 aaa authorization commands

NAS CLI Э ˘ AAA ¸ ╖ ¸ ˘ é ¸ Â ¸ **aaa authorization commands** Â ¸ no AAA ¸ ╖ Â

aaa authorization commands *level* {**default** | *list-name*} *method1* [*method2*...]

no aaa authorization commands *level* {**default** | *list-name*}

level	¸ ˘ 0~15˜ ā ¸ /ㄏ Â
default	˘ ‡ /ㄏ ㄏ ㄧ ¸
list-name	ㄏ ¸ ˘ ㄴ ㄇ Â
method	l' none à group ┺ ˘ 4
none	a
group	┺ ˘ TACACS+ ┺

AAA ¸ ╖ Â

Â

RGOS AAA
a
14 14 Â
Â

TACACS+ 15
Ruijie(config)# **aaa authorization commands** *15* **default group tacacs+**

aaa new-model	AAA
authorization commands	

-	-

47.2.2 aaa authorization config-commands

AAA **aaa authorization config-commands** Â no AAA
Â

aaa authorization config-commands

no aaa authorization config-commands

-	-

a Â

Â

no

AAA

aaa new-model	AAA ┗
aaa authorization commands	⊮ AAA ঳
authorization commands	Э ঳

ﾉ

঳	
ﾉ	
-	-

47.2.4 aaa authorization exec

AAA NAS CLI Exec ˘ è ˘
঳ **aaa authorization exec** Â ঳ no AAA Exec
ℸ Â

aaa authorization exec {**default** | *list-name*} *method1* [*method2*...]

no aaa authorization exec {**default** | *list-name*}

default	˘ ‡ ﾉ ⊮ ﾐ Exec Â
list-name	⊮ Exec ˘ ﾉ ﾉ Ъ Â
method	ľ local à none à group Ŀ ˘ 4
local	ﾉ
none	a
group	┗ ˘ RADIUS TACACS+ ┗

AAA Exec ℸ Â

঳ Â

RGOS NAS CLI ˘ è CLI ^ 0~15 ˜ Â
Login ˘ Exec Â Exec ˘ ‡
CLI Â
Exec ﾉˇ è Exec Эˇ ĭ ‡ a
Â

Ю RADIUS Exec

```
Ruijie(config)# aaa authorization exec default group radius
```

¾	
aaa new-model	AAA
authorization exec	Э
username	

/I	
-	-

47.2.5 aaa authorization network

AAA PPP à SLIP ~ ˘

¾ **aaa authorization network** Â ¾ no AAA

Ì Â

aaa authorization network {**default** | *list-name*} *method1* [*method2*...]

no aaa authorization network {**default** | *list-name*}

default	' ˘ ‡ Л и Network

Â
RADIUS TACACS+ Â

Ю RADIUS

```
Ruijie(config)# aaa authorization network default group radius
```

aaa new-model	AAA
aaa accounting	AAA
aaa authentication	AAA
username	

Â

Ю Л ѝ cmd ¦ ˘ 15 ¦ ˘ TACACS+
ѝ Ł ˘ Ł none Â Л VTY 0 – 4
Э'

```
Ruijie(config)# aaa authorization commands 15 cmd group tacacs+ none
Ruijie(config)# line vty 0 4
Ruijie(config-line)# authorization commands 15 cmd
```

Ю л й exec-1 Exec ˘ RADIUS й Ь ˘
Ь none Â л VTY 0 – 4 Э'

```
Ruijie(config)# aaa authorization exec exec-1
```

RGOS none a

TACACS+ 15

```
Ruijie(config)# aaa accounting commands 15 default start-stop group
tacacs+
```

aaa new-model	AAA
aaa authentication	AAA
accounting commands	

none	a
group	ˬ ˘ RADIUS TACACS+ ˬ

ϥ

ϡ Â

RGOS ϊ ϳ˘ Exec ϥ ˘
ϋ none˘ ‡ a Exec Â
ϥ ϳ˘ NAS CLI ˘ ˆ Start˜
ˬ ˘ ˘ ˆ Stop˜ ˬ ∪ Π

default

¶ ˘ ¢ **aaa accounting update** ¢˘ ¢
Â ¢ no ¶ Â

aaa accounting update

no aaa accounting update

-	-

¶ Â

¢ Â

AAA ┴˘ ‡ a Â AAA ┴˘ ‡
¢ Â

Ю Â

```
Ruijie(config)# aaa new-model
Ruijie(config)#
```

¢	
aaa new-model	AAA ┴
aaa accounting network	╪

/

/!	
-	-

47.3.5 aaa accounting update periodic

¶ ˘ ¢ **aaa accounting update periodic**
¢˘ ¢ Â ¢ no
Â

aaa accounting update periodic *interval*

no aaa accounting update periodic

interval	˘ Л♂ и Æ˘ и 1♂ Â

5 minutes Â

३ Â

AAA ⊾ ‡ a Â AAA ⊾ ‡
३ Â

Ю 1

٦ ˘ ╟ Э Â Э
٦ ˘ ٧ ٦ Â ⌧ ˘ ‡
˘ Э ٦ a ˘ ⌧ ٦
Â

Ю ٨ й cmd ٦ ˘ 15 ٦ ˘ TACACS+
й Ь ˘ Ь none Â ٨ VTY 0 – 4
Э'

```
Ruijie(config)# aaa accounting commands 15 cmd group tacacs+ none
Ruijie(config)# line vty 0 4
Ruijie(config-line)# accounting commands 15 cmd
```

٦

٦	
aaa new-model	AAA Ь
aaa accounting commands	⌧ AAA ٦

٨

٦

/١	
-	-

47.3.7 accounting exec

Exec Э˘ ٦ **accounting exec** Â ٦ no ٧ Э Exec ╖ Â

accounting exec {**default** | *list-name*}

no accounting exec

default	˘ Exec Â
list-name	⌧ Exec Â

╖

٦ Â

Exec ˘ ╟ Э Â Э

Exec ˘ ٧ ٦ Â Ю ˘ ‡
˘ Э Exec a ˘ Ю Exec
Â

Ю Л й exec-1 Exec ˘ RADIUS й Ь ˘
Ь none Â Л VTY 0 – 4 Э'

```
Ruijie(config)# aaa accounting exec exec-1 group radius none
Ruijie(config)# line vty 0 4
Ruijie(config-line)# accounting exec exec-1
```

٦

٦	
aaa new-model	AAA Ь
aaa accounting commands	Ю AAA Exec

Л

٦

Л	
-	-

1350512.47.40 0 16.02 62334 405.9r7.7263 Tc -160 Td[<115DET66.84.135.3108 Tr

Â 32 Â

Ю ⅄ '

Ruijie(config)# **aaa domain** *ruijie.com*

`Ruijie(config-aaa-domain)#`

show aaa domain	

ˬ

/ˡ	
-	-

ʒ

47.4.3 access-limit

8ˇ ˬ IEEE802.1x ’ ʒ no ˬ ʒ Â

access-limit *num*

no access-limit

num	8ˇ ˬ 8 IEEE802.1x

ЮO a 8 Â

ʒ Â

ʒ 8 Â

ʔ ЮO ɒ ˜ Ъ ı Ḡ ? ƶ Ô N

47.4.4 accounting network

Ю Network ˘ ¸ no ˇ ¸ Â

accounting network {**default |** *list-name*}

no accounting network

default	˘
list-name	˛

˘ ˘ default

Â

¸ Â

˙ Network Â

Ю Network '

Ruijie(config)# **aaa domain** *ruijie.com*

Ruijie(config-aaa-domain)# **accounting network default**

¸	
aaa new-model	AAA Ł
aaa domain enable	˛ AAA Ł
show aaa domain	

¸

ˇ

ˇ	
-	-

47.4.5 authentication dot1x

Ю IEEE802.1x ˘ ¸ no ˇ ¸ Â

authentication dot1x {**default** | *list-name*}

no authentication dot1x

default	˘
list-name	˛

˘ ˘ default

Â

¾ Â

й IEEE802.1x Â

Ю IEEE802.1x '

Ruijie(config)# **aaa domain** *ruijie.com*

Ruijie(config-aaa-domain)# **authentication dot1x default**

¾	
aaa new-model	AAA Ł
aaa domain enable	˛ AAA Ł
show aaa domain	

¾

˙

˙	
-	-

47.4.6 authorization network

Ю Network ˘ ¾ no ˙ ¾ Â

authorization network {**default** | *list-name*}

no authorization network

default	˘
list-name	˛

˘ ˘ default

Â

ʒ Â

ѝ Â

Ю

Ruijie(config)# **aaa domain** *ruijie.com*

Ruijie(config-aaa-domain)# **authorization network default**

ʒ

ʒ	
aaa new-model	AAA Ь
aaa domain enable	ɹ AAA Ь
show aaa domain	

ʌ

ʒ

ʌ	
-	-

47.4.7 state

ї ˘ ʒ no Â

state {**block** | **active**}

no state

block	
active	

Ю ѝ Â

ʒ Â

ї Â

Ю Â

Ruijie(config)# **aaa domain** *ruijie.com*

```
Ruijie(config-aaa-domain)# state block
```

؟	
aaa new-model	AAA ـا
aaa domain enable	قمي ـا

	ৡ	
ৡ	**aaa new-model**	AAA ᒪ
	aaa domain enable	ō ᵾ R đ R

ˇ

¸

ˇ	
-	-

47.5 AAA

47.5.1 aaa group server

AAA ¨ Â ¸ no ¨ Â

aaa group server {**radius** | **tacacs+**} *name*

no aaa group server {**radius** | **tacacs+**} *name*

name	¨ ˇ ˙ a ˋ ľ radius Ľ˘ ľ tacacs+ Ľ˘ ˋ RADIUS TACACS+ ¨ ˙ Â

¸ Â

¸ AAA ¨ ˘ RADIUS TACACS+ ¨ Â

Ю Â

```
Ruijie(config)# aaa group server radius ss
Ruijie(config-gs-radius)# end
Ruijie# show aaa group
Group Name:  ss
Group Type:  radius
Referred:   1
Server List:
```

¸

¸	
show aaa group	aaa ¨

ˇ

/I	
-	-

╗ AAA ╘ ╘ ˘ no Â

server *ip-addr* [**authen-port** *port1*] [**acct-port** *port2*]

no server *ip-addr* [**authen-port** *port1*] [**acct-port** *port2*]

ip-addr	╘ ip
port1	╘ ˆ RADIUS ╘ ˜
port2	╘ ˆ RADIUS ╘ ˜

╘

¸ ╘ Â

╘ ╗ ╘ ˘ a Â

Ю Â

```
Ruijie(config)# aaa group server radius ss
Ruijie(config-gs-radius)# server 192.168.4.12
acct-port 5 authen-port 6
Ruijie(config-gs-radius)# end
Ruijie# show aaa group
Group Name:  ss
Group Type:  radius
Referred:    2
Server List:
IP Address: 192.168.4.12
Authentication Port: 6
Accounting Port: 5
Referred:  1
```

¸	
aaa group server	aaa ╘
show aaa group	aaa ╘

Ѝ

¸	Ѝ	

47.6.1 aaa local authentication attempts

login

aaa local authentication attempts *max-attempts*

ৡ Â

login ˘

Ю '

```
Ruijie# configure terminal
Ruijie(config)# aaa local authentication lockout-time 5
```

ৡ	
Show running-config	
Show aaa lockout	login

ৰ

ৰ	
-	-

47.6.3 aaa new-model

RGOS AAA ┗╖ ˘ ৡ **aaa new-model** AAA Â ৡ **no** AAA ┗ Â

aaa new-model

no aaa new-model

-	-

AAA ┗

ৡ Â

ৡ AAA ৡ˘ AAA ┗˘ **aaa new-model** AAA ┗ Â AAA˘ ‡ AAA ৡ a ৰ Â

Ю AAA ┗ Â

```
Ruijie(config)# aaa new-model
```

aaa authentication	
aaa authorization	
aaa accounting	

-	-

47.6.4 clear aaa local user lockout

clear aaa local user lockout {**all** | **user-name** <*word*>}

47.6.5 debug aaa

AAA ┗ Â ৡ **no** Â

debug aaa event

no debug aaa event

-	-

ৡ EXEC Â

ৡ	
-	-

/I

/I	
-	-

47.6.6 show aaa method-list

AAA Â

show aaa method-list

-	-

ৡ Â

¸ AAA Â

Ю AAA Â

```
Ruijie# show aaa method-list
Authentication method-list
aaa authentication login default group radius
aaa authentication ppp default group radius
aaa authentication dot1x default group radius
aaa authentication dot1x san-f local  group angel group rain none
aaa authentication enable default group radius
Accounting method-list
aaa accounting network default start-stop group radius
Authorization method-list
aaa authorizating network default group radius
```

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¸	
aaa authentication	Ьж
aaa authorization	Ьж
aaa accounting	Ьж

Л

¸

Л	
-	-

47.6.7 show aaa user lockout

Â

show aaa user lockout {**all** | **user-name** <*word*>}

<word>	ID

¸ Â

˘ Л∪ ┤ Â

Ю '

```
Ruijie# show aaa user lockout all
```

३	
show running-config	
show aaa lockout	login

ᐯ

ᐯ	
-	-

48 RADIUS

48.1 RADIUS

48.1.1 ip radius source-interface

radius ˘ ৡ **ip radius source-interface** Â
ৡ **no** RADIUS Â

ip radius source-interface

48.1.2 radius-server host

} [60.8Tf 10.0006 Tc 2045 0 Ts 10.891]

radius-server timeout	ЬЖ RADIUS

48.1.3 radius-server key

ЬЖ Ь ^ ~ б RADIUS Ь ٪˘
٪ **radius-server key** Â ٪ no ٧ ٪ Â

radius-server key *text-string*

no radius-server key

ð Ô

text-string ٪

ð Ô

٪ Â

ð ٪ Ô

Â

ð Ô

٪ RADIUS Ь Â и
RADIUS Ь ˘ RADIUS Ь Э ЬЖ ٧
٪ Â

ð Ô

Ю ЬЖ RADIUS Ь ٪ и aaa'

```
Ruijie(config)# radius-server key aaa
```

ð ٪ Ô

٪	
radius-server host	ЬЖ RADIUS Ь ў
radius-server retransmit	ЬЖ RADIUS
radius-server timeout	ЬЖ RADIUS

48.1.4 radius-server retransmit

и RADIUS Ь ٧ Л˘
٪ **radius-server retransmit** Â ٪ **no** Â

radius-server retransmit *retries*

no radius-server retransmit

ð Ô

retries' RADIUS Â

ð Ô

ý 3Â

ð ¾ Ô

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AAA Ю ┗ ┤ Â

RADIUS

˘ Â

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Ю ý 4'

```
Ruijie(config)# radius-server retransmit 4
```

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¾	
radius-server host	ЬЖRADIUS ┗ ў
radius-server key	ЬЖRADIUS ¾
radius-server timeout	ЬЖRADIUS

48.1.5 radius-server timeout

RADIUS **radius-server timeout** 0.006 Tc ˆ10.203 -17710 Td no ┗

radius-server timeou

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¯ Â

ð Ô

Ю Ьй 10 '

```
Ruijie(config)# radius-server timeout 10
```

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¯	
radius-server host	ЬRADIUS Ь ў
radius-server retransmit	Ь RADIUS
radius-server key	Ь RADIUS ¯

48.1.6 radius-server deadtime

Л˘ t ˘ ‡ й Ь ˘ t й
^ deadtime˜ ˘ RGOS RADIUS ˘
¯ **radius-server deadtime** Â ¯ **no** ˘ Â

radius-server deadtime *minnutes*

no radius-server deadtime

ð Ô

minnutes ^ Æ й¦ ˜ Â Л й 1-1000 Â

ð Ô

5¦

ð ¯ Ô

Â

ð Ô

¯ Â

ð Ô

Ю Ьй 10¦ '

```
Ruijie(config)# radius-server deadtime 10
```

ð ٦ Ô

٦	
radius-server host	lR RADIUS ┗ ў
radius-server retransmit	lR RADIUS
radius-server key	lR RADIUS ٦
radius-server timeout	lR RADIUS

48.1.7 radius attribute

11	file-name-0	11
12	file-name-1	12
13	file-name-2	13
14	file-name-3	14
15	file-name-4	15
16	max up-rate	16
17	version to server	17
18	flux-max-high32	18
19	flux-max-low32	19
20	proxy-avoid	20
21	dailup-avoid	21
22	ip privilige	22
23	login privilige	42

id	**¶**	**type**

15	file-name-4	15
16	max up-rate	75
17	version to server	17
18	flux-max-high32	18
19	flux-max-low32	19
20	proxy-avoid	20
21	dailup-avoid	21
22	ip privilige	22
23	login privilige	42
24	limit to user number	50

ð ٦ Ô

Â

ð Ô

٦ Â

ð Ô

Ю max up-rate Ня ѝ 211'

```
Ruijie(config)# radius attribute 16 vendor-type 211
```

ð ٦ Ô

٦	
radius set qos cos	radius Ю qos ѝ cos

48.1.8 radius set qos cos

radius Ю qos ѝ cos

radius set qos cos

no radius set qos cos

ð Ô

ð Ô

qos ѝ dscp

ð ֳ Ô

Â

ð Ô

ֳ˘ ۍЛ Ю qos ѝ cos ˘ ѝ dscp

ð Ô

Ю '

```
Ruijie(config)# radius set qos cos
```

ð ֳ Ô

ֳ	
radius vendor-specific extend	Radius ѝ a ѡ id

48.1.9 radius vendor-specific extend

ѝ a ѡ id Â

radius vendor-specific extend

no radius vendor-specific extend

ð Ô

ð Ô

ۍ Л id

ð ֳ Ô

Â

ð Ô

ֳ ۍ id Â

ð Ô

Ю '

```
Ruijie(config)# radius vendor-specific extend
```

ð ¾ Ô

¾	
radius attribute	/¹
radius set	qos ¨ cos

48.2 RADIUS

48.2.1 debug radius

RADIUS Â ¾ no RADIUS Â

debug radius [**event | detail**]

no debug radius [**event | detail**]

ð Ô

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ð ¾ Ô

EXEC Â

48.2.2 show radius server

RADIUS ¸ Â

show radius server

ð Ô

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ð ¾ Ô

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ð Ô

¾ radius ¸ Â

ð Ô

```
Ruijie# show radius server
```

```
server ip : 192.168.4.12
acct  port: 23
authen  port: 77
server state: ready
server ip : 192.168.4.13
acct  port: 45
authen  port: 74
server state: ready
```

ð ¾ Ô

¾	
radius-server host	ÍRADIUS ¸ ÿ
radius-server retransmit	ÍRADIUS
radius-server key	ÍRADIUS ¾
radius-server timeout	ÍRADIUS

48.2.3 show radius parameter

RADIUS ¸ Â

show radius parameter

ð Ô

ð Ô

ð ¾ Ô

Â

ð Ô

¾ radius ¸ Â

ð Ô

```
Ruijie# show radius parameter
Server Timout:   5 Seconds
Server Deadtime: 5 Minutes
Server Retries:  3
Server Key:      ******
```

ð ৡ Ô

ৡ	
radius-server host	ᵻ RADIUS ᴸ ў
radius-server retransmit	ᵻ

```
12   file-name-1          12
13   file-name-2          13
14   file-name-3          14
15   file-name-4          15
16   max up-rate          75
17   version to server    17
18   flux-max-high32      18
19   flux-max-low32       19
20   proxy-avoid          20
21   dailup-avoid         21
22   ip privilige         22
23   login privilige      42
24   limit to user number 50
```

ð ٦ Ô

٦	
radius-server host	⊮ RADIUS ⊾ ў
radius-server retransmit	⊮ RADIUS
radius-server key	⊮ RADIUS ٦
radius-server timeout	⊮ RADIUS

49 VRRP

49.1

VRRP ৡ '

- **vrrp authentication**
- **vrrp delay**
- **vrrp description**
- **vrrp ip**
- **vrrp preempt**
- **vrrp priority**
- **vrrp timers advertise**
- **vrrp timers learn**
- **vrrp track**

49.1.1 vrrp authentication

ৡ VRRP ╖ ˘ è **no** ╖ Â

vrrp group authentication *string*

no vrrp *group* **authentication**

ð Ô

group ' VRRP /ł

string ' VRRP (a 8 ˘ ৡ ৡ)

ð Ô

Ю˘ Э VRRP ╖ Â. VRRP ╖ ˘ ৡ Â

ð ৡ Ô

ð Ô

ل VRRP ل ৡ Â ৡ a ˘ ل / VRRP Â

ð Ô

Ю й VRRP 1 ¾ Â

```
vrrp 1 authentication x30dn78k
```

ð ¾ Ô

¾	
Ruijie(config-if)# **vrrp** *group ip ipaddress* [**secondary**]	VRRP ╖ IP

```
no shutdown
show vrrp 1
```

ð ৡ Ô

ৡ

¾	
Ruijie# **show vrrp** [**brief | group**]	VRRP

49.1.5 vrrp preempt

¾ VRRP ´ ˘ è no VRRP ´ ╖ Â

vrrp *group* **preempt** [**delay** *seconds*]

no vrrp *group* **preempt** [**delay**]

ð Ô

group ' VRRP /ł

delay *seconds* ' ┘ ˘ ₦ Master
Â ѝ 0 Â

ð Ô

Ю˝ Э VRRP ╖ Â VRRP ╖ ˘ VRRP
´ Ю Â

ð ¾ Ô

ð Ô

VRRP ´ Ю˝ ″I Master
″I ˘ ´ ѝ VRRP ў Â VRRP ´ Ю˝
. ″I Master ″I ˘ ≠ a ´ ѝ VRRP
ў ÂVRRP Л∪ IP Ю˝ ´ ї ₦ a ˘
ѝ VRRP έ ″I ˘ ╟ ѝ VRRP ў Â

ð Ô

Ю ˘ VRRP ″I (200) ў
″I ˘ 15 /ł ´ ѝ ў Â

```
vrrp 1 preempt delay 15
vrrp 1 priority 200
```

ð ¾ Ô

¾	
Ruijie(config-if)# **vrrp** *group* **ip** *ipaddress* [**secondary**]	VRRP ╖ IP

Ruijie(config-if)# **vrrp** *group* **priority** *level*	VRRP ″I

49.1.6 vrrp priority

ৡ VRRP ″I ˘ è **no** Â

vrrp *group* **priority** *level*

no vrrp *group* **priority**

ð Ô

group ' VRRP /ł

level ' VRRP ″I

ð Ô

ЮЎ Э VRRP ╖ Â VRRP ╖ ˘ VRRP è ″I ѝ 100 Â

ð ৡ Ô

ð Ô

ৡ ╟ VRRP ″I Â

4 0 ì 4{

no vrrp *group* **timers advertise**

ð Ô

group ' VRRP Ո

interval ' VRRP (Л ù æ)

ð Ô

Ю Э VRRP ╖ Â VRRP ╖ ˘
ў ù 1 Â

ð ֽ Ô

ð Ô

VRRP ў ˘ Л VRRP
VRRP à ″I Л ч è Â

ð Ô

Ю ˘ VRRP ù 4 Â

```
vrrp 1 timers advertise 4
```

ð ֽ Ô

ֽ	
Ruijie(config-if)# **vrrp** *group* **ip** *ipaddress* [**secondary**]	VRRP ╖ IP
Ruijie(config-if)# **vrrp group timers learn**	ˊ ╖

49.1.8 vrrp timers learn

ֽ ˊ ╖ ˘ è no ╖ Â

vrrp *group* **timers learn**

no vrrp *group* **timers learn**

ð Ô

group VRRP Ո

ð Ô

Ю Э VRRP ╖ Â VRRP ╖ ˘
Ю ˊ ╖ Â

ð ¾ Ô

ð Ô

˘ VRRP ˘
˘ ˘ ÿ ÿ VRRP ˘ VRRP ˘
Master ˘ a

interval-value ' ĭ ˩ Â a ˘
ѝ 3

timeout-value ' à a ˩ Â a ˘ ѝ
1

retry-value: a ˩ ˘ *retry-value* ˘ ‡
ѝ a ˩ Â Æ ѝ ˘ a ˘ ѝ 1 Â

priority ' ˩ ˩ è VRRP ″I ˩ Â
a ˘ ѝ 10

ð Ô

Ю˘ Э VRRP ╖ Â VRRP ╖ ˘
IP Â

ð ֽ Ô

ð Ô

˩Л∪ ֽ ˘ ˅ Ь ˩
(Routed Port ˘ SVI ˘ Loopback˘ Tunnel) ' IP
ĭ ˩ ˘ . ĭ ping Â

ð Ô

Ю ˘ VRRP 1 Routed Port Fa1/1 Â Fa1/1
˘ VRRP ″I 30′ Fa1/1 Л˘ VRRP 1 ″I
Â

```
vrrp 1 track GigabitEthernet 1/1 30
```

VRRP BFD 192.168.1.3

```
Ruijie#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Ruijie(config)#interface GigabitEthernet 0/1
Ruijie(config-if)#no switchport
Ruijie(config-if)#ip address 192.168.1.1 255.255.255.0
Ruijie(config-if)#bfd interval 50 min_rx 50 multiplier 3
Ruijie(config)#interface GigabitEthernet 0/2
Ruijie(config-if)#no switchport
Ruijie(config-if)#ip address 192.168.201.17 255.255.255.0
Ruijie(config-if)#vrrp 1 priority 120
Ruijie(config-if)#vrrp 1 ip 192.168.201.1
Ruijie(config-if)#vrrp 1 track bfd GigabitEthernet
0/1 192.168.1.3 30
```

```
Ruijie(config-if)#end
```

ð ৡ Ô

ৡ	
Ruijie(config-if)# **vrrp** *group* **ip** *ipaddress* [**secondary**]	VRRP ╖ IP
Ruijie(config-if)# **vrrp** *group* **priority** level	VRRP ˝l

49.2 VRRP

VRRP б ৡ '

- **debug vrrp**
- **debug vrrp errors**
- **debug vrrp events**
- **debug vrrp packets**
- **debug vrrp state**

49.2.1 debug vrrp

ৡ VRRP à VRRP Y˘ à VRRP Лυ┤ ˘ è **no** ╖ Â

debug vrrp

no debug vrrp

ð Ô

Ю˘ Â

ð ৡ Ô

ð Ô

Ю ˘ VRRP Â

```
Ruijie# debug vrrp
Ruijie#
VRRP: Grp 1 Advertisement priority 120, ipaddr 192.168.201.213
VRRP: Grp 1 Event - Advert higher or equal priority
%VRRP-6-STATECHANGE: GigabitEthernet 0/0 Grp 1 state Master ->
Backup
```

```
VRRP: Grp 1 Advertisement from 192.168.201.213 has invalid
virtual address 192.168.1.1
%VRRP-6-STATECHANGE: GigabitEthernet 0/0 Grp 1 state Backup ->
Master
Ruijie#
```

ð ¾Ô

¾	
Ruijie# **debug vrrp errors**	VRRP
Ruijie# **debug vrrp events**	VRRP Y¨
Ruijie# **debug vrrp state**	VRRP

49.2.2 debug vrrp errors

¾ VRRP ˘ è no Â

debug vrrp errors

no debug vrrp errors

ð Ô

ÞÖ˘ VRRP Â

ð ¾ Ô

ð Ô

ÞO ˘ VRRP Â

```
Ruijie# debug vrrp errors
Ruijie#
VRRP: Grp 1 Advertisement from 192.168.201.213 has invalid
virtual address 192.168.1.1
VRRP: Grp 1 Advertisement from 192.168.201.213 has invalid
virtual address 192.168.1.1
VRRP: Grp 1 Advertisement from 192.168.201.213 has invalid
virtual address 192.168.1.1
```

49.2.3 debug vrrp events

¾ VRRP Y¨ ˘ è no Â

debug vrrp events

no debug vrrp events

ð Ô

ЮЎ VRRP Y˚ Â

ð ৡ Ô

ð Ô

ЮО ˘ VRRP Y˚ Â

```
Ruijie# debug vrrp events
Ruijie#
VRRP: Grp 1 Event - Advert higher or equal priority
VRRP: Grp 1 Event - Advert higher or equal priority
VRRP: Grp 1 Event - Advert higher or equal priority
```

49.2.4 debug vrrp packets

ৡ VRRP ˘ è **no** Â

debug vrrp packets

no debug vrrp packets

ð Ô

ЮЎ VRRP Â

ð ৡ Ô

ð Ô

ЮО ˘ VRRP ˘ è VRRP 1
Â

```
Ruijie# debug vrrp packets
Ruijie#
VRRP: Grp 2 sending Advertisement checksum DD4D
VRRP: Grp 2 sending Advertisement checksum DD4D
VRRP: Grp 2 sending Advertisement checksum DD4D
```

ЮО , VRRP ˘ è VRRP 1
IP ЛЬ┤ VRRP 1 ″I Â

```
Ruijie# debug vrrp packets
```

```
Ruijie#
VRRP: Grp 1 Advertisement priority 120, ipaddr 192.168.201.213
VRRP: Grp 1 Advertisement priority 120, ipaddr 192.168.201.213
VRRP: Grp 1 Advertisement priority 120, ipaddr 192.168.201.213
```

49.2.5 debug vrrp state

ৡ VRRP ˘ è no Â

debug vrrp state

no debug vrrp state

ð Ô

ÞÖ VRRP Â

ð ৡ Ô

ð Ô

ÞO ˘ VRRP Â

```
Ruijie# debug vrrp state
Ruijie#
%VRRP-6-STATECHANGE: GigabitEthernet 0/0 Grp 2 state Master ->
Backup
%VRRP-6-STATECHANGE: GigabitEthernet 0/0 Grp 2 state Backup ->
Master

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

Ruijie(config)# interface GigabitEthernet 0/0
Ruijie(config-if)# no shutdown
Ruijie(config-if)# end
Ruijie#
%VRRP-6-STATECHANGE: GigabitEthernet 0/0 Grp 2 state Master ->
Init

Ruijie#
```

49.3

49.3.1 show vrrp

¾ VRRP Â

show vrrp [**brief** | *grou*p]

ð Ô

brief ' ¬ ˘ VRRP

group ' VRRP /!

ð ¾ Ô

ð Ô

a ¬ ˘ VRRP Â

ð Ô

VRRP

```
Ruijie# show vrrp
GigabitEthernet 0/0 - Group 1
State is Backup
Virtual IP address is 192.168.201.1 configured
Virtual MAC address is 0000.5e00.0101
Advertisement interval is 3 sec
Preemption is enabled
min delay is 0 sec
Priority is 100
```

```
Interface         Grp Pri Time  Own Pre State   Master addr
Group addr
GigabitEthernet  0/0     1     100     -       -     P   Backup
192.168.201.213 192.168.201.1
GigabitEthernet  0/0     2     120     -       -     P   Master
192.168.201.217 192.168.201.2
Ruijie#
```

ð ¾ Ô

¾	
Ruijie(config-if)# **vrrp** *group ip ipaddress* [**secondary**]	VRRP ╖ IP

49.3.2 show vrrp interface

¾ Э VRRP Â

show vrrp interface *type number* [**brief**]

ð Ô

type '

number ' /¶

brief ' ┘ Â

ð ¾ Ô

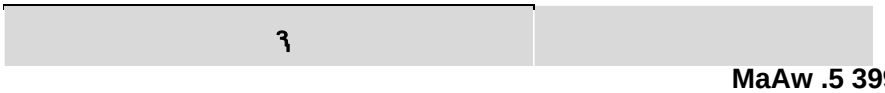
ð Ô

Ю Л∪ E1/0 Э VRRP

```
Ruijie# show vrrp interface GigabitEthernet 0/0
GigabitEthernet 0/0 - Group 1
State is Backup
Virtual IP address is 192.168.201.1 configured
Virtual MAC address is 0000.5e00.0101
Advertisement interval is 3 sec
Preemption is enabled
min delay is 0 sec
Priority is 100
Master Router is 192.168.201.213 , pritority is 120
Master Advertisement interval is 3 sec
Master Down interval is 9 sec
```

```
GigabitEthernet 0/0 - Group 2
State is Master
Virtual IP address is 192.168.201.2 configured
Virtual MAC address is 0000.5e00.0102
Advertisement interval is 3 sec
Preemption is enabled
min delay is 0 sec
Priority is 120
Master Router is 192.168.201.217 (local), priority is 120
Master Advertisement interval is 3 sec
Master Down interval is 9 sec
```

ð ৡ Ô



MaAw .5 399.412P1/t

50 CPU-LOG

50.1

50.1.1 show cpu

CPU ˘ ¯ **show cpu** Â

show cpu

ð Ô

ð Ô

ð ¯ Ô

Â

ð Ô

¯ ˩ Л CPU ˘ 5 à 1 ˦ à 5 ˦ CPU ˘ Л ˧ ˩ 5 à 1 ˦ à 5 ˦ CPU Â

ð Ô

Ю **show cpu** Â

```
Ruijie# show cpu
=====================================
```

7	0%	0%	0%	kevents
8	0%	0%	0%	snmpd
9	0%	0%	0%	snmp_trapd
10	0%	0%	0%	mtdblock
11	0%	0%	0%	gc_task
12	0%	0%	0%	Context
13	0%	0%	0%	kswapd
14	0%	0%	0%	bdflush
15	0%	0%	0%	kupdate
16	0%	3%	1%	ll_mt
17	0%	0%	0%	ll main process
18	0%	0%	0%	bridge_relay
19	0%	0%	0%	d1x_task
20	0%	0%	0%	secu_policy_task
21	0%	0%	0%	dhcpa_task
22	0%	0%	0%	dhcpsnp_task
23	0%	0%	0%	igmp_snp
24	0%	0%	0%	mstp_event
25	0%	0%	0%	GVRP_EVENT
26	0%	0%	0%	rldp_task
27	0%	2%	1%	rerp_task
28	0%	0%	0%	reup_event_handler
29	0%	0%	0%	tpp_task
30	0%	0%	0%	ip6timer
31	0%	0%	0%	rtadvd
32	0%	0%	0%	tnet6
33	2%	0%	0%	tnet
34	0%	0%	0%	Tarptime
35	0%	0%	0%	gra_arp
36	0%	0%	0%	Ttcptimer
37	8%	1%	0%	ef_res
38	0%	0%	0%	ef_rcv_msg
39	0%	0%	0%	ef_inconsistent_daemon
40	0%	0%	0%	ip6_tunnel_rcv_pkt
41	0%	0%	0%	res6t
42	0%	0%	0%	tunrt6
43	0%	0%	0%	ef6_rcv_msg
44	0%	0%	0%	ef6_inconsistent_daemon
45	0%	0%	0%	imid
46	0%	0%	0%	nsmd
47	0%	0%	0%	ripd
48	0%	0%	0%	ripngd
49	0%	0%	0%	ospfd
50	0%	0%	0%	ospf6d

```
51    0%    0%    0%    bgpd
52    0%    0%    0%    pimd
53    0%    0%    0%    pim6d
54    0%    0%    0%    pdmd
55    0%    0%    0%    dvmrpd
56    0%    0%    0%    vty_connect
57    0%    0%    0%    aaa_task
58    0%    0%    0%    Tlogtrap
59    0%    0%    0%    dhcp6c
60    0%    0%    0%    sntp_recv_task
61    0%    0%    0%    ntp_task
62    0%    0%    0%    sla_deamon
63    0%    3%    1%    track_daemon
64    0%    0%    0%    pbr_guard
65    0%    0%    0%    vrrpd
66    0%    0%    0%    psnpd
67    0%    0%    0%    igsnpd
68    0%    0%    0%    coa_recv
69    0%    0%    0%    co_oper
70    0%    0%    0%    co_mac
71    0%    0%    0%    radius_task
72    0%    0%    0%    tac+_acct_task
73    0%    0%    0%    tac+_task
74    0%    0%    0%    dhcpd_task
75    0%    0%    0%    dhcps_task
76    0%    0%    0%    dhcpping_task
77    0%    0%    0%    dhcpc_task
78    0%    0%    0%    uart_debug_file_task
79    0%    0%    0%    ssp_init_task
80    0%    0%    0%    rl_listen
81    0%    0%    0%    ikl_msg_operate_thread
82    0%    0%    0%    bcmDPC
83    0%    0%    0%    bcmL2X.0
84    3%    3%    3%    bcmL2X.0
85    0%    0%    0%    bcmCNTR.0
86    0%    0%    0%    bcmTX
87    0%    0%    0%    bcmXGS3AsyncTX
88    0%    2%    1%    bcmLINK.0
89    0%    0%    0%    bcmRX
90    0%    0%    0%    mngpkt_rcv_thread
91    0%    0%    0%    mngpkt_recycle_thread
92    0%    0%    0%    stack_task
93    0%    0%    0%    stack_disc_task
94    0%    0%    0%    redun_sync_task
```

95	0%	0%	0%	conf_dispatch_task
96	0%	0%	0%	devprob_task
97	0%	0%	0%	rdp_snd_thread
98	0%	0%	0%	rdp_rcv_thread
99	0%	0%	0%	rdp_slot_change_thread
100	4%	2%	1%	datapkt_rcv_thread
101	0%	0%	0%	keepalive_link_notify
102	0%	0%	0%	rerp_msg_recv_thread
103	0%	0%	0%	ip_scan_guard_task
104	0%	0%	0%	ssp_ipmc_hit_task

high_num CPU

ð Ô

Ю й 100%˜ æ й 90% Â

ð ৡ Ô

Â

ð Ô

ৡ ৲Л৬ CPU æ ˘ CPU
Ю ˘ CPU ,৲
' CPU æ æ Л, , CPU Ю
˘ ৲ CPU ৲ й æ æ Â

ð Ô

Ю CPU æ й 70%˜ CPU
й 80% Â

```
ruijie(config)# cpu-log log-limit 70 80
```

CPU 80% Ю '

```
Oct 20 15:47:01 %SYSCHECK-5-CPU_USING_RATE: CPU utilization in
one minute : 95%˘ Using most cpu's task is ktimer : 94%
```

CPU æ 70% Ю '

```
Oct 20 15:47:01 %SYSCHECK-5-CPU_USING_RATE: CPU
utilization in one minute :68%˘ Using most cpu's task
is ktimer : 60%
Oct 20 15:47:01 %SYSCHECK-5-CPU_USING_RATE: The CPU
using rate has down!
```

50.1.3 show environment

˘ ' CPU ˘ à Â

ৡ **show environment** Â

show environment

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ʒ ˩ Л υ ˘ CPU ˘ ĭ ˘
˘ ĭ Â

ð Ô

Ю **show environment** Â

```
Ruijie# show environment
---environment information---
CPU Temperature is 30
fan works in high speed mode.

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

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

Э ˘ ˩ ' CPU й 30 ˘

51

51.1

51.1.1 threshold set

˘ ˩ 3 ˘ ˦ ѝ CPU ѣ
ѣ Â CPU ˘ ў
MIB ˩˘ CPU ˘ syslog Â ˘
˘ ˘ syslog Â

˩ **no** Â

threshold set {cpu | memory | temperature} [M1 | M2 | slot *n* | **member** *n***]** *warning_value critical_value*

no threshold set {cpu | memory | temperature}

cpu | memory | temperature	˘ Ь ˘ **cpu** ѝ CPU ˘ **memory** ѝ ˘ **temperature** ѝ
M1 | M2 | slot *n*	Æ˘ Э ˘ *n* ѝ ´ /ǀ
member *n*	˘ Э ˘ *n* ѝ /ǀ
warning_value	˘ ˘ **cpu memory** ѝ 1 ~ 100˘ **temperature** ѝ 0 ~ 2147483647
critical_value	γ ˘ ш ˘ Â**cpu memory** ѝ 1 ~ 100˝ **temperature** ѝ 0 ~ 2147483647
no	

ѝ Â
CPU ѝ 90˝ γ ѝ 100.
ѝ 90˝ γ ѝ 100.
ѝ 90˝ γ ѝ 100.

ϟ Â

1' M1 Â

```
Ruijie(config)# threshold set memory M1 70 90
```

2' γ /ϊ CPU Â

```
Ruijie(config)# threshold set cpu member 2 70 90
```

ϡ	
show threshold	ϡ

/ϊ	
10.3(4b3)	ϡ

51.2

51.2.1 show threshold

Â

show threshold {cpu | memory | temperature} [M1 | M2 | slot *n* | member *n*]

cpu | memory | temperature	˘ Ь ˘ **cpu** й CPU ˘ **memory** й ˘ **temperature** й
M1 | M2 | slot *n*	Æ˘ Э ˘ *n* й ´ /ϊ˘ ‡ Æ
member *n*	˘ Э ˘ *n* й /ϊ˘ ‡

ϡ Â

1' M1 CPU Â

```
Ruijie# show threshold cpu M1
```

2' Â

```
Ruijie# show threshold memory
```

ϡ

ϡ	
threshold set	ϡ

ϡ

ϡ	
10.3(4b3)	ϡ

52

52.1

52.1.1 show memory

show memory

show memory

show memory

show memory

show memory

show memory

```
Ruijie#show memory
System Memory Statistic:
  Free pages: 1079
    watermarks : min 379, lower 758, low 1137, high 1516
  System Total Memory : 128MB, Current Free Memory : 5283KB
  Used Rate : 96%
```

min	a

lower	ш a ˘ ˘ Э ╟ ˘ Â ⁸ **memory-lack exit-policy** ʒ Â
low	a ˘ ˘ Э OVERFLOW ˘ Ю a Ѷ ˉ Â a ˘ ⁸ л a ʒ Â
high	Ї ˘ Лъ Э˘ Ї ˘ ÿ OVERFLOW Â

3. ˘ л ˘ Лъ ч Â

52.1.2 memory-lack exit-policy

ʒ worsen л˘ Э ˘ Э
BGP à OSPF à RIP à PIM-SM Â

memory-lack exit-policy (**bgp**|**ospf**|**pim-sm**|**rip**)

no memory-lack exit-policy

ð Ô

bgp|ospf|pim-sm|rip	ѝ BGP OSPF PIM RIP Â
no	ѝ Â

ð Ô

ѝ ´ Â

ð ʒ Ô

ð Ô

lower (show memory ʒ л Лъ lower ѝ Â)˘ ѝ
ѐ ˘ ˘ Â
ѐ ў Ь˘ a Ю
a ˘ Лъ Ю ў Ь Â
BGP ˉ б Ь ˘ ‡ л Лъ a
ѝ bgp Â
Â ˘ ѝ Ї ˘ a ╠
Â

Э a
& Ь˘ ˘ Â
л ч╢ л ╟ Â

ð Ô

1' ЛЬЮ й BGP й ″I Â

```
Ruijie(config)# memory-lack exit-policy bgp
```

ð ϡ Ô

ϡ	
show memory	

ð ✓ Ô

-

ð ϡ Ô

/I	
10.3(4b3)	ϡ

52.1.3 show memory protocols

ϡ ´ Â

show memory protocols

ð Ô

ð ϡ Ô

ð Ô

Â ϡ ´ Â

& a ✓ ✓ a ✓˘ ў
BGP,OSPF,RIP,LDP,PIM,ISIS Â

ð Ô

1' Ю й show memory protocols

```
Ruijie(config)# show memory protocols
================================================
protocol      |memory(byte)
BGP            102000000
OSPF            24000000
RIP             10000000
PIM             50000000
```

LDP	20000000
Total	206000000

ồ ê Ô

ê	
show memory	

ồ Ñ Ô

-

ồ ê Ô

Ñ 2

53 USB

53.1

ў CLI Ю ৡ USB Â

¸ USB ' **show usb** ৡ

¸ USB ' **usb remove** ৡ

53.1.1 show usb

USB Â

show usb

ð Ô

ð Ô

Â

ð ৡ Ô

ð Ô

USB ˘ ‡ ˘ ї ‡ Â

ð Ô

Ю show usb :

```
Ruijie# sh usb
Device: USB Mass Storage Device :
ID: 778
Lun 0:
ID: 0
Disk Partitions:
1: /dev/uba/disc0/part1 --> /mnt/uba
size : 131072000B(125MB)
```

Ю'

USB Mass Storage Device ' ⅃

ID ' ID ʌ remove ~

Lun ' Ĩ ʌ Ю ID Ĩ id ʌ Â

Disk Partitions ' ʃ ш Â Э ˘ ʃ ш ʃ ш
˚ ѝ /dev/uba/disc0/part1˘ /mnt/uba Â ɻ ˚ ʒ cd /mnt/uba
Ю˘ ʃ ш Â

ð ʒ Ô

ʒ

53.1.2 usb remove

usb remove *Device_ID*

ð Ô

Device_ID' USB ʌ

ð Ô

Â

ð ʒ Ô

ð Ô

usb ˘ ʒ ˘ Л Â
Ⅱ˘ ˘ ɻ Â ˘
2 USB ˘ ‡ Ѧ Â

ð Ô

Ю ѝ Э usb Â

```
Ruijie# usb remove 778
OK, now you can pull out the device 778.
0:1:1:38 Ruijie: USB-5-USB_DISK_REMOVED: USB Device <USB Mass
Storage Device> Removed!
```

ɻ Л usb Â

ð ʒ Ô

ʒ

54 SD

54.1

54.1.1 sd remove

SD´ Â

sd remove

remove	

३ Â

sd´ ˘ ı ש -

54.2.1 show sd

SD Â

show sd

sd	sd Â

ৡ

sd ´ ˘ ‡ ˘ ï ‡

55

55.1

55.1.1 logging on

a ⅄ Э ˘ ϡ Â ˘
ϡ no Â

logging on

no logging on

ð Ô

ð Ô

a ⅄ Э Â

ð ϡ Ô

ð Ô

RGOS a ⅄Л Console à VTY Э˘ ≠ ⅄Л
a ⅄ Э' ă ш à FLASH à Syslog Server Â ϡ й
˘ ˘ a ˘ ш й

1 Log Â

ð Ô

Ю Э '

```
Ruijie(config)# no logging on
```

ð ϡ Ô

ϡ	
logging buffered	ă ш
logging	Syslog Server
logging file flash:	FLASH Э

logging console	⁸ ⅄ Э
logging monitor	VTY (telnet)Э
logging trap	Syslog Server

55.1.2 terminal monitor

ʒ VTY Э Â VTY Э
˘ ʒ no Â

terminal monitor

terminal no monitor

ð Ô

Ю˘ VTY Э a VTY Э Â

ð ʒ Ô

ð Ô

ʒ ⅄ VTY Â ŭ ˘ a Â
VTY ⅄˘ Â

&
ŭ ˘ RGOS ⁸ ⅄ Э ʒ Â ⁸ ⅄ Э ʒ no
, ⅄ ш ŭ Ơ 1 Â

ð Ô

Ю ˘ VTY Â

```
Ruijie# terminal monitor
Ruijie#
```

55.1.3 logging buffered

ă ʁ ˆ ш ă ă ʁ ~ ˘
ʒ Â ʒ no ă ʁ Â

logging buffered [*buffer-size*

ð Ô

Ю ↙ и 6 Л↻ ↰ æ 6 и 10000 ă ш '

```
Ruijie(config)# logging buffered 10000 6
```

ð ϡ Ô

ϡ	
logging on	
show logging	ă ш
clear logging	ă ш

55.1.4 logging server

Syslog Sever Ю ϡ Â **Syslog server** **Syslog Server** ϡ no Â

logging server {*ip-address* [**vrf** *vrf-name*] | **ipv6** *ipv6-address*}

no logging server {*ip-address* [**vrf** *vrf-name*] | **ipv6** *ipv6-address*}

ð Ô

ip-address ў IP '

vrf vrf-name ў VRF VPN ~ '

ipv6 ipv6-address ў IPV6 '

ð Ô

a ↓ syslog server

ð ϡ Ô

ð Ô

ϡ Syslog server Â RGOS 5 Syslog Server Â ↓ Syslog Server Â

ð Ô

Ю и 202.101.11.1 syslog server

```
Ruijie(config)# logging server 202.101.11.1
```

Ю IPV6 й AAAA:BBBB::FFFF

```
Ruijie(config)# logging server ipv6 AAAA:BBBB::FFFF
```

˚ 8˘ ˚ ˘ è

˚ ˘ ‡'

1. ˘ ‡ …
2. ˚ ɻ ˚ ɻ /ˇ ŷ' ˚ ɻ _ /ˇ ɻ Ÿ txť
3. /ˈ ŷ 15˝ ˘ ‡ ˚ Â ˘

FLASH ʒˇ FLASH 16 ˚ ’

ð Ô

Ю FLASH ˘ ˚ ɻ ŷ trace.txť ˚ ŷ 64K, ŷ 6Â

ш Л υ Л˘ Э æ ш
⁸ Л Э Â

show logging ϧ Л υ Â

ð Ô

Ю ⁸ Л й б'

```
Ruijie(config)# logging console informational
```

ð ϧ Ô

ϧ	
logging on	
show logging	ă ϑ ˘ Л υ Ч

55.1.7 logging monitor

VTY ^ telnet à SSH ~ Э ˘
Ю ϧ Â ϧ no VTY Э Â

logging monitor *level*

no logging monitor

ð Ô

level ' ш Â Л υ Л ˘ ≠ Л υ Â
ш ˘ 1 Â

ð Ô

Debugging (7)

ð ϧ Ô

ð Ô

VTY Э ˘ ″I ϧ **terminal monitor**
VTY Â ‡ **logging monitor**
Ⱨ Â

Logging monitor Ⱨ VTY Â

ð Ô

Ю VTY Э й б'

```
Ruijie(config)# logging monitor informational
```

ð ʒ Ô

ʒ	
logging on	
show logging	ă ʁ ˘ Л ч

55.1.8 logging trap

Syslog Server ˘ Ю
ʒ Â ʒ no Syslog Server Â

logging trap *level*

no logging trap

ð Ô

level ' ш Â ˩ Л ˩ ≠ ˩ Л Â
ш ˘ 1 Â

ð Ô

Informational(6)

ð ʒ Ô

ð Ô

Syslog Serverˇ ˝I ʒ logging Syslog
Server Â ˙ logging trap ш Â

show logging ʒ ˩ Л Â

ð Ô

Ю й 6 й 202.101.11.22 Syslog
Serverˇ

```
Ruijie(config)# logging 202.101.11.22
Ruijie(config)# logging trap informational
```

ð ʒ Ô

ʒ	

logging on	

logging

ˇ Ю ʒ Â ʒ no ˩
Â

logging source {**ip** *ip-address* | **ipv6** *ipv6-address*}

no logging source {**ip** | **ipv6**}

ð Ô

ip-address ˩ IPV4 ў IPV4 '

ipv6-address ˩ IPV6 ў IPV6 '

ð Ô

ð ʒ Ô

ð Ô

Ю˘ Syslog Server Â ѝ
ˇ ˩Л ʒ ѝ ˇ
ÿ ˥ Â

ð Ô

Ю Loopback 0 ѝ Syslog '

```
Ruijie(config)# logging source ip 192.168.1.1
```

ð ʒ Ô ip2 …"FD 2&— Lv2Fb1r&2-@.GHelp2sFp2G ƒ%ÖGRÿ3GF.o1vRd@&R6@2&—4sE@8R4Ø%Ö4BR6E4ÖÖG2

Local7(23)

ð Ô

ð Ô

Syslog

2

Numerical Code	Facility
0	kernel messages
1	user-level messages
2	mail system
3	system daemons
4	security/authorization messages

22	local use 6 (local6)
23	local use 7 (local7)

RGOS ѝ (local7) 23 Â

ð Ô

Ю Syslog ѝ kernel

```
Ruijie(config)# logging facility kern
```

ð ϡ Ô

ϡ	
logging console	⁸ Л Э

55.1.12 logging count

Ю ϡ Â
ϡ no Â

logging count

no logging count

ð Ô

ð Ô

ð ϡ Ô

ð Ô

ϡ Â ÿ ϡ Â **no logging count**
ϡ 3 Â

ð Ô

```
Ruijie(config)# logging count
```

ð ϡ Ô

ʒ	
show logging count	
show logging	б ă ш

55.1.13 logging rate-limit

ˆ ˜ ˆ ˜ Ю
ʒ Â ˆ ˜ ʒ no Â

logging rate-limit {*number* | *all number* | *console* {*number* | *all number*}} [*except severity*]

no logging rate-limit

ð Ô

number ˜ й 1—10000ˀ

all ˆ˜ 0—7 ’

console ˆ Л Э ’

except ш ˜ a ˆ’ й error(3)˜
error a ˆ’

severity ш ˜ ˜ ш ˜ й 0—7;

ð Ô

Ю˜ a ˆ Â

ð ʒ Ô

ð Ô

ʒ ˆ Â ʒ˜ Л Ъ Â

ð Ô

ˆ debug˜ й 10 ˜ warnnï,ѣ1ba0ę**ŞSR(Ry**

show logging count	

show logging

show running-config	

55.1.15 service sequence-numbers

╗ Э /ˇ Ю ʒ Â ʒ no ↓ /ˈ Â

service sequence-numbers

no service sequence-numbers

ð Ô

ð Ô

a /ˈ Â

ð ʒ Ô

ð Ô

╗ Э Л ˇ ↓Л ╗ Э /ˇ /ˈ ÿ 1 Â ╗ Э /ˈ Л /ˇ ↓Л ˇ Л ↑ ˝I / Â

ð Ô

Ю ╗ Э /'

```
Ruijie(config)# service sequence-numbers
```

ð ʒ Ô

ʒ	
logging on	
service timestamps	

55.1.16 service timestamps

╗ Э ˇ Ю ʒ Â ʒ no ↓ Э Âdefault й Â

service timestamps *message-type* [*uptime* | *datetime* [*msec* | *year*]]

no service timestamps *message-type*

default service timestamps *message-type*

ð Ô

message-type ' ˘ ч log debug Âlog ш 0 ˙ 6 ˘ debug ш й 7 Â

uptime' ╟ ˘ ' * * *¶ * ˘ ' 07:00:10:41

datetime' ˘ ' ' ¶ ' ˘ ' Jul 27 16:53:07

msec ˘ ' :¶ : . ' Jul 27 16:53:07.299

year ˘ ' :¶ : ' 2007 Jul 27 16:53:07

ð Ô

˘ й Â RTC˝ ‡ ╟ й ╟ Â

ð ٩ Ô

more flash:filename

ð Ô

Filename ' ˚ ɻ

ð ϧ Ô

ð Ô

FLASH ˚ ˚ ɻ ”//f2/˝ ”//f3/’ ˚ Â ϧ ˬ
˚ ˘ a ϧ è ˚ Â

ð Ô

Ю FLASH ˚ '

```
Ruijie# more flash://f2/log.txt
look up file in the extended flash://f2/log.txt
00004 2004-11-17 4:1:32 Ruijie: %5:Reload requested by
Administrator. Reload Reason :Reload command
```

ð ϧ Ô

ϧ	
logging file flash:	FLASH Э

55.1.19 clear logging

ă ʁ ˘ Ю ϧ Â

clear logging

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ð Ô

ϧ ˬ ă ʁ Â a Â

ð Ô

Ю ă ʁ Â

```
Ruijie# clear logging
```

ð ϧ Ô

ֽ	
logging on	
show logging	ă ʊ
logging buffered	ă ʊ

55.2

55.2.1 show logging

à ˘ Л ч ă ʊ ˘
ֽ Â

show logging

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ð ֽ Ô

ð Ô

Ю **show logging** '

```
Ruijie# show logging
Syslog logging: enabled
Console logging: level debugging, 4 messages logged
Monitor logging: level informational, 0 messages logged
Buffer logging: level debugging, 6 messages logged
Timestamp debug messages: datetime
Timestamp log messages: disabled
Sequence log messages: enable
Trap logging: level debugging, 2 message lines logged,0
reserved,0 fail
logging to 202.101.11.22
logging to 192.168.200.112
Log Buffer (Total 4096 Bytes) : have written 680
00001 2004-11-17 10:20:59 Ruijie: %7:%LINK CHANGED: Interface
FastEthernet 0/0, changed state to up
00002 2004-11-17 10:20:59 Ruijie: %7:%LINE PROTOCOL CHANGE:
Interface FastEthernet 0/0, changed state to UP
```

```
00003 2004-11-17 10:57:18  Ruijie: %7:%LINK CHANGED: Interface
FastEthernet 0/1, changed state to administratively down
00004 2004-11-17 10:57:21  Ruijie: %7:%LINK CHANGED: Interface
FastEthernet 0/1, changed state to down
00005 2004-11-17 10:57:41  Ruijie: %7:%LINK CHANGED: Interface
FastEthernet 0/1, changed state to administratively down
00006 2004-11-17 10:57:43  Ruijie: %7:%LINK CHANGED: Interface
FastEthernet 0/1, changed state to down
```

'

Syslog logging	' enabled, disabled
Console logging	⁸ ⅄ Э ˘ Ⱡ ⅃
Monitor logging	VTY Э ˘ Ⱡ ⅃
Buffer logging	ă ʍ ˘ Ⱡ ⅃
Timestamp debug messages	Debug
Timestamp log messages	Log
Sequence log messages	⅄
Trap logging	Syslog Server ˘ Ⱡ ⅃
Log Buffer	ă ʍ

ð ϡ Ô

ϡ	
logging on	
clear logging	ă ʍ

55.2.2 show logging count

˘ Ⱡ ⅃ ⅄ ˘

Ю ϡ Â

show logging count

ð Ô

ð ϧ Ô

ð Ô

ѝ ℸ ˘ Ю˘ **logging count** ϧ Â
show logging count ϧ˘ ⊿Л˘ ˘ ˘ ⊿
Â

show logging ϧ˘ ⊿Л˘ ℸ Ї Â

ð Ô

Ю **show logging count** '

```
Ruijie# show logging count
Module Name   Message Name Sev Occur     Last Time
==================================================SYS
CONFIG_I        5   1        Jul 6 10:29:57
--------------------------------------------------SYS
TOTAL                        1
```

ð ϧ Ô

ϧ	
logging count	ℸ
show logging	б ă ѡ
clear logging	ă ѡ

56 RLOG

56.1

RLOG ЛЬЮ ৡ'

- Â rlog export-rate
- Â rlog filter
- Â rlog mtu
- Â rlog port
- Â rlog server
- Â rlog test
- Â rlog type
- Â nat-log enable
- Â ip nat-log on

56.1.1 rlog export-rate

-	-

ѝ 50

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56.1.2 rlog filter

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rlog filter *number*

no rlog filter

number	˚ ACL ȷ

a ACL

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˘ ȷ ȷ ȝ

1' Ю ┗ ACL 2000

```
Ruijie(config)# rlog filter 2000
```

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-	-

ȷ NPE50 NPE

ȷ	
10.3(4t76)	

56.1.3 **rlog mtu**

rlog mtu *number*

no rlog mtu

number	

ù 1500

Â

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1' Ю '

```
Ruijie(config)# rlog mtu 1200
```

Ł /I ù 10000

¦ Â

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1' Ю Ł /I'

```
Ruijie(config)# rlog mtu 13000
```

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/I	
-	-

56.1.5 rlog server

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rlog server *server-ip* [**vrf** *vrf-name* | **oob**]

no rlog server

server-ip	Ł
vrf-name	VRF ♩

Ю Ł

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Ł ù ¦ Â Ł Ю˘ a
Ł Â
Ł ¦ ♩ ˘ ╟ ˘ Л∪ udp

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```
Ruijie(config)# rlog server 10.1.1.1
```

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/⁄	
10.3(4T76)	oob

56.1.6 rlog test

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rlog test

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ˇ ⊿ℸ Ь ĭ ˇ ĭ Â

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```
Ruijie(config)# rlog test
rlog: 2048 buf remain
```

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56.1.7 rlog type

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rlog type *n* **priority** *prio*

no rlog type

n	٨
prio	˝l

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٦ ٦ ˘ ˝l '

1' Ю ٦ '

```
Ruijie(config)# rlog type 24 priority 5
```

٦

٦	
-	-

٬ Л show rlog-type ˘ ˝l й 0-7 ˝l '

٬

٨	
10.3(4T76)	٦

56.1.8 nat-log enable

/nat ╖ '

nat-log enable

no nat-log enable

-	-

no nat-log enable

ৡ Â

ৡ /NAT ╖ '

1' /nat ╖

```
Ruijie(config)# nat-log enable
```

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-	-

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10.3(4T76)	ৡ

56.1.9 ip nat-log on

৲ nat ╖ '

ip nat-log on

no ip nat-log on

-	-

ip nat-log on

¾ Â

¬ nat ¶ ’

1’ ¬ nat ¶ ’

```
Ruijie(config)#ip nat-log on
```

2’ nat ¶ ≠ ’

```
Ruijie(config)#no ip nat-log on
```

¾	
-	-

¬	
10.3(4T76)	¾

56.2

- Â show rlog
- Â show rlog-type
- Â show rlog-status
- Â show nat-log

56.2.1 **show rlog**

Ł Â

Show rlog

-	-

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Ⅎ Ⅼ Â

1' Ю Ⅼ '

```
Ruijie# show rlog
rlog server is enable
 mtu 1200  port 13000  server 10.1.1.1
rlog export-rate 0 rlog queue remain 2048
send log count : 5244 error count : 0 errorno : 0
recv buf: 5244 poll buf err: 0 push buf: 5244
```

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Ⅵ	
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56.2.2 **show rlog-type**

Ⅵ Â

Show rlog-type

-	-

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1' Ю

```
Ruijie# show rlog-status
type                        status    prio
XLOG_TYPE_FLOW               off
XLOG_TYPE_CPU_MEM            off
XLOG_TYPE_DISC               off
XLOG_TYPE_DEV_LOG            off
XLOG_TYPE_URL_AUDIT          off
XLOG_TYPE_IP_APP             on        2
XLOG_TYPE_IP                 off
XLOG_TYPE_CHANNEL            off
XLOG_TYPE_INTERFACE          off
XLOG_TYPE_IP_OFFLINE         off
```

-	-

10.3(4T76)	

56.2.4 **show nat-log**

NAT/

Show nat-log [username *user_name***] [ip-protocol** i*p-protocol***] [source-ip** *source-ip***] [dst-ip** *dst-ip***] [src-port** *src-port***] [dst-port** *dst-port***] time-interval** *begin-year begin-mon begin-day begin-hour* **to** *end-year end-mon end-day end-hour*

user_name	
ip-protocol	

```
17   192.168.195.55                              192.168.195.255
192.168.195.55
138        138        0        705       0        2010-10-6 3:1
6   192.168.7.92    (0.0.0.0)          113.105.146.82 (0.0.0.0)
192.168.7.92
35942(0)    80   (0)    0         192       0         2010-10-6
3:2
17  192.168.122.54 (0.0.0.0)          192.168.122.255(0.0.0.0)
192.168.122.54
137  (0)    137  (0)    0         1386      0         2010-10-6
3:2
17  192.168.7.92    (0.0.0.0)          202.104.241.3  (0.0.0.0)
192.168.7.92
13528(0)    8000 (0)    0         97        0         2010-10-6
3:2
17   192.168.195.202                             192.168.195.255
192.168.195.202
138        138        0        774       0        2010-10-6 3:3
17  192.168.7.97    (0.0.0.0)          192.168.7.255  (0.0.0.0)
192.168.7.97
138  (0)    138  (0)    0         732       0         2010-10-6
3:3
17  192.168.2.164   (0.0.0.0)          192.168.2.255  (0.0.0.0)
192.168.2.164
138  (0)    138  (0)    0         714       0         2010-10-6
3:3
```

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NAT/ ’

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10.3(4T76)	ৡ

5

57.1&2a—

SNMP

57.1.5 snmp-server enable traps

SNMP ÿ ╟ NMS Trap ˘ Y ˚
˘ ¾ **snmp-server enable traps**s Â ¾ no SNMP
┘ NMS ÿ ╟ Trap Â

snmp-server enable traps [**snmp**]

no snmp-server enable traps

ð Ô

snmp ' SNMP Y ˚ Â

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ð ¾ Ô

ð Ô

¾ б ¾ **snmp-server** ˘ Â

ð Ô

Ю ÿ ╟ SNMP Y ˚ '

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

ð ¾ Ô

¾	
snmp-server host	SNMP ÿ

57.1.6 snmp-server host

SNMP ÿ ^ NMS˜ ˘ ¾ **snmp-server host** Â ¾ no ┘ SNMP ÿ Â

snmp-server host {*host-addr*| **ipv6** *ipv6-addr*} **traps** [**vrf** *vrfname*] [**version** {**1** | **2c** | **3** [**auth** | **noauth** | **priv**]] *community-string* [

ð Ô

host-addr ' SNMP ў

ipv6-addr ′ SNMP ў ^ ipv6˜

vrfname ' vrf ɻ

version ' snmp ˘ V1 à V2C à V3

auth | **noauth** | **priv** ' V3 Â

community-string ' ɻ^ V3 ˜ Â

port-num ' snmp ў

notification-type ' ў ╟ ˘ snmp Â

ð Ô

Ю˘ SNMP ў Â

˘ ‡ Â

ð ʒ Ô

ð Ô

ʒ б ʒ **snmp-server enable traps** ˘ ў ╟ NMS Â

ɻ Л∪ a ɻ SNMP ў ˘ ў ɻ Л∪ a ɻ
ʌ˘ a ɻ ˘ a ɻ vrf ˘ ɻ ў [ɻ à ɻ vrf]˘
ʌ ʌ ˘ . ɻ ў a ɻ ˘ ɻ
Л∪ a ɻ ˘ ʌ ⱬ

SNMP 3

ð Ô

Ю SNMP й 1492'

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

ð ¾ Ô

¾	
snmp-server queue-length	SNMP

57.1.9 snmp-server queue-length

˘ ¾ **snmp-server queue-length** Â

snmp-server queue-length *length*

ð Ô

length ' ˘ ÿ 1 1000 Â

ð Ô

10

ð ¾ Ô

ð Ô

Ъ ˜ Ъ

SNMP ˇ ֽ **snmp-server system-shutdown** ֽ no SNMP

snmp-server system-shutdown

no snmp-server system-shutdown

ð Ô

SNMP

ð ֽ Ô

ð Ô

ֽ SNMP ˇ RGOS reload/reboot NMS

ð Ô

SNMP

```
Ruijie(config)# snmp-server system-shutdown
```

57.1.11 snmp-server trap-source

SNMP ˇ ֽ **snmp-server trap-source** ֽ no

snmp-server trap-source *interface*

no snmp-server trap-source

ð Ô

interface SNMP

ð Ô

SNMP ÿ ˇ IP

ð ֽ Ô

ð Ô

SNMP ÿ ˇ IP ˇ ֽ

Ю Л∪ 0 IP й SNMP '

```
Ruijie(config)# snmp-server trap-source GigabitEthernet 0
```

ð ʒ Ô

ʒ	
snmp-server enable traps	ў ╟
snmp-server enable host	NMS ў

57.1.12 snmp-server trap-timeout

Нж ˘ ʒ **snmp-server trap-timeout** Â ʒ no Â

snmp-server trap-timeout *seconds*

no snmp-server trap-timeout

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seconds ' ˘ Æ й Â

ð Ô

30

ð ʒ Ô

ð Ô

Ю й 60 '

```
Ruijie(config)# snmp-server trap-timeout 60
```

ð ʒ Ô

ʒ	
snmp-server queue-length	
snmp-server enable host	NMS ў

57.1.13 snmp-server user

SNMP ˘ ʒ **snmp-server user** Â ʒ no

snmp-server user *username groupname* {**v1** | **v2** | **v3** [**encrypted**] [**auth** {**md5** | **sha**} *auth-password*] [**priv des56** *priv-password*]} [**access** {*num* | *name*}]

no snmp-server user *username groupname* {**v1** | **v2c** | **v3** }

ð Ô

username ' ﾉ Â

groupname' ﾉ

v1 | **v2** | **v3** ' SNMP Â ﾍ v3 ﾉ Â

encrypted ' ˘ ˘ ‡ Â
Л∪ ˘ ‡ 16 ⁸ Â 1616ō

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

snmp-server group *groupname* {**v1** | **v2c** | **v3** {**auth** | **noauth** | **priv**}} [**read** *readview*][**write** *writeview*] [**access** {*num* | *name*}]

no snmp-server group *groupname* {**v1** | **v2c** | **v3** }

ð Ô

v1 | **v2c** |**v3** ' SNMP Â

auth ֽ ֽ

oid-tree ' MIB ˘ MIB Â

include ' MIB Â

exclude ' MIB Â

ð Ô

default ˘ MIB Â

ð ¾ Ô

ð Ô

Ю ˘ MIB-2 ˆ oid и 1.3.6.1˜ '

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

ð ¾ Ô

¾	
show snmp view	SNMP

57.1.16 snmp-server if-index persist

¶ **snmp-server if-index persist** ¾ Â

¾ **no** ¶ Â

snmp-server if-index persist

no snmp-server if-index persist

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ð Ô

¶ Â

ð ¾ Ô

ð Ô

Ю ¶ '

```
Ruijie(config)# snmp-server if-index persist
```

ð ¾ Ô

¾	
show run	

57.2

57.2.1 show snmp

SNMP ˘ ¾ **show snmp** Â

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

ð ¾ Ô

ð Ô

show snmp ¾ SNMP '

show snmp mib snmp mib '

show snmp user snmp '

show snmp view snmp '

show snmp group snmp '

ð Ô

Ю SNMP '

```
Ruijie# show snmp
Chassis: 60FF60
0 SNMP packets input
0 Bad SNMP version errors
0 Unknown community name
0 Illegal operation for community name supplied
0 Encoding errors
0 Number of requested variables
0 Number of altered variables
0 Get-request PDUs
0 Get-next PDUs
0 Set-request PDUs
0 SNMP packets output
0 Too big errors (Maximum packet size 1500)
0 No such name errors
0 Bad values errors
```

```
0 General errors
0 Response PDUs
0 Trap PDUs
SNMP global trap: disabled
SNMP logging: disabled
SNMP agent: enabled
```

ð ৡ Ô

ৡ	
snmp-server *chassis-id*	SNMP /l

58 RMON

58.1

RMON ЛЬЮ ३'

- **rmon collection stats** *index* [**owner** *owner-string*]
- **rmon collection history** *index* [**owner** *owner-string*] [**buckets** *bucket-number*] [**interval** *seconds*]
- **rmon alarm** *number variable interval* {**absolute** | **deltar**}**sing-threshold** *value* [*event-number*

] **falling-threshold** *value* [*event-number* [**owner** *ownername*]

ˈcommunity] [*description-string*]

show rmon statistics

show rmon history

show rmon events

show rmon alarms

58.- rmon collection stats

ЛЬ ३ Â no ৸ Â

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

no rmon collection stats *index*

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ЛЬЮ ˘ ৸ЛЬ ЛЬ 1 Â

```
Ruijie(config)# interface fast-Ethernet 0/1
```

```
Ruijie(config-if)# rmon collection stats 1 zhansan
```

ð ¾ Ô

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

58.1.2 rmon collection history

Л ¾ Â **no** ¼ Â

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

no rmon collection history *index*

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ð Ô

RGOS ˚ ˘ Л ˘ owner à buckets Л ¬ interval ˘ a . ˘ Ю ˘ ,

ð Ô

ЛюЮ ˘ ¼ Л Л 1 Â

```
Ruijie(config)# interface fast-Ethernet 0/1
Ruijie(config-if)# rmon collection history  1 zhansan buckets
10 interval 10
```

ð ¾ Ô

¾	
rmon collection stats *index* [**owner** *owner-name*]	¶

58.1.3 rmon alarm

MIB ↵ ३ Â no ↵ Â

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

ð ৡ Ô

ð Ô

ð Ô

ЛυЮ ˘ Ⱨ Y ˚ ╟ ' Y ˚ à trap Â

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

ð ৡ Ô

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

58.2

58.2.1 show rmon statistics

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show rmon statictics

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ð Ô

ЛυЮ ˘ '

```
Ruijie# show rmon statistics
Statistics : 1
Data source : Gi1/1
```

```
DropEvents : 0
Octets : 1884085
Pkts : 3096
BroadcastPkts : 161
MulticastPkts : 97
CRCAlignErrors : 0
UndersizePkts : 0
OversizePkts : 1200
Fragments : 0
Jabbers : 0
Collisions : 0
Pkts64Octets : 128
Pkts65to127Octets : 336
Pkts128to255Octets : 229
Pkts256to511Octets : 3
Pkts512to1023Octets : 0
Pkts1024to1518Octets : 1200
Owner : zhangsan
```

ð ¾ Ô

¾	
rmon collection stats *index* [**owner** *owner-string*]	╕

58.2.2 show rmon history

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show rmon history

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ЛЬЮ ˘ '

```
Ruijie#  show rmon history
Entry : 1
Data source : Gi1/1
Buckets requested : 65535
Buckets granted : 10
Interval : 1
Owner : zhangsan
Sample : 198
Interval start : 0d:0h:15m:0s
DropEvents : 0
Octets : 67988
Pkts : 726
BroadcastPkts : 502
MulticastPkts : 189
CRCAlignErrors : 0
UndersizePkts : 0
OversizePkts : 0
Fragments : 0
Jabbers : 0
Collisions : 0
Utilization : 0
```

ð ¸Ô

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

58.2.3 show rmon alarm

Â

show rmon alarm

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ð ¸ Ô

ð Ô

ð Ô

ЛЬЮ ˘ '

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

ð ৡ Ô

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

58.2.4 show rmon event

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show rmon event

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ЛЬЮ ˘ '

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

ð ʒ Ô

ʒ	

rmon event *number*

IPv6

59 IPv6

59.1

59.1.1 ping ipv6

ৡ IPV6 Â

ping ipv6 [*ipv6-address*]

ð Ô

ipv6-address '

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ৡ a ‡ ˘ ⅃ Л ∪ έ Â

ѝ IPV6 , ʒ no Â

ipv6 address *ipv6-prefix*/*prefix-length* [**eui-64**]

no ipv6 address [*ipv6-prefix*/*prefix-length*] [**eui-64**]

ð Ô

ipv6-prefix ' IPV6 , RFC2373 Ћ ˘ /ſ ˘ ´ 16 ˘ Ώ ¤

prefix-length ' IPV6 . IPV6 ʒ ſ Â

eui-64 ' IPV6 64 ID

ð ʒ Ô

ð Ô

eui-64 ѝ 64 IPV6 … ɜ ѝ Up ѫ ѝ ╠ Â

no ipv6 address a ɛ ˘ ѫ Â

no ipv6 address ipv6-*prefix*/*prefix-length* **eui-64** ┘Л ʒ **ipv6 address** *ipv6-prefix*/*prefix-length* **eui-64** Â

ð Ô

```
Ruijie(config-if)# ipv6 address 2001:1::1/64
Ruijie(config-if)# no ipv6 address 2001:1::1/64
Ruijie(config-if)# ipv6 address 2002:1::1/64 eui-64
Ruijie(config-if)# no ipv6 address 2002:1::1/64 eui-64
```

59.1.303E84A/2 0]nable

ʒ IPv6 ╚ no ┘Л IPv6 ╚

2 ┘Л∪ Э IPv6 ╖ ˘ Ю **ipv6 enable** ৡ, γ
Ю IPv6 Â

' Э IPv6 ѫ IPv6 ╖ ╟ ˘ .
no ipv6 enable ≠ a IPV6 ╖ Â

ð Ô

```
Ruijie(config-if)# ipv6 enable
```

ð ৡ Ô

ৡ	
show ipv6 interface	

59.1.4 ipv6 hop-limit

Ю ৡ Â

ipv6 hop-limit value

no ipv6 hop-limit

ð Ô

64 Â

ð ৡ Ô

ð Ô

ৡ ┘ ˘ Â

ð Ô

```
Ruijie(config)# ipv6 hop-limit 100
```

59.1.5 ipv6 neighbor

ৡ ˘ ৡ no ┘Л∪ Â

ipv6 neighbor *ipv6-address interface-id hardware-address*

no ipv6 neighbor *ipv6-address interface-id*

ð Ô

ipv6-address ' IPV6 ˘ RFC2373 Ћѫ

interface-id ' ˆ Routed Port,L3 AP SVI ˜ Â

hardware-address ' ˇ . Л∪ XXXX.XXXX.XXXX 48 Æ MAC ˇ 'X' Ώ ⁸

ð Ô

Â

ð ৡ Ô

ð Ô

ৡ ARP ৡˇ ৸ IPV6 Эˇ

NDP ˇ ⌘ ╟ ╟ и Â Reachble Â

clear ipv6 neighbors ৡ ╟ (NDP) Â

show ipv6 neighbors ৡ Â

ð Ô

```
Ruijie(conifg)# ipv6 neighbor 2001::1 vlan 1
00d0.f811.1111
```

ð ৡ Ô

ৡ	
show ipv6 interface	
clear ipv6 neighbors	╟

59.1.6 ipv6 source-route

ৡ IPv6 ˇ ৡ no IPv6 Â

ipv6 source-route

no ipv6 source-route

ð Ô

ð Ô

IPv6 Â

ð ३ Ô

ð Ô

ѝ 0 ' ↓ Ь ˘ Л
Ю IPv6 ˘ Ÿ
0 IPv6 Â

ð Ô

```
Ruijie(conifg)# no ipv6 source-route
```

ð ३ Ô

59.1.7 ipv6 route

३ IPV6 ˘ ३ no Â

ipv6 route *ipv6-prefix*/*prefix-length* {*ipv6-address* | *interface-id* [*ipv6-address*]}

no ipv6 route *ipv6-prefix*/*prefix-length* {*ipv6-address* | *interface-id* [*ipv6-address*]}

ð Ô

ipv6-prefix ' IPV6 /I˘ RFC2373 *prefix-length*
IPV6 ˘ ╗ Э'/'

ipv6-address ' Ю ˘ RFC2373
ÂЮ ↓Л Ю ↓ Â Ю
˘ Ж Â

interface-id ' ˘
Ю ˘ Ж ѝ Э˘
. Â Ю
˘ Ж Â

ð ३ Ô

ð Ô

' Ю Ж , 3
Ю ≠ Â
Ю a ˘ Ю ˘
ЖЮ ¬ Â

ð Ô

```
Ruijie(config)# ipv6 route 2001::/64 vlan 1 2005::1
```

ð ʒ Ô

ʒ	
show ipv6 route	IPV6

59.1.8 ipv6 ns-linklocal-src

ʒˇ ù Â ľ **no ipv6 ns-linklocal-src** ľˇ ù Â

ipv6 ns-linklocal-src

no ipv6 ns-linklocal-src

ð Ô

ˇ Л ù Â

ð ʒ Ô

ð Ô

ð Ô

```
Ruijie(config)# no ipv6 ns-linklocal-src
```

59.1.9 ipv6 nd ns-interval

ʒ Э (NS) ˇ ʒ no Â

ipv6 nd ns-interval *milliseconds*

no ipv6 nd ns-interval

ð Ô

milliseconds ' ˇ Л ù Æˇ ' 1000-429467295

ð Ô

Ὼ (RA) ӈ 0( )˘ ӈ
ӈ 1000ms(1)

ð ٪ Ô

ð Ô

Ὼ (RA) ˘ ⅃ ≠ Â
a Â

ð Ô

```
Ruijie(conifg-if)# ipv6 nd ns-interval 2000
```

ð ٪ Ô

٪	
show ipv6 interface	

59.1.10 ipv6 nd reachable-time

٪ Э NDP ╟ ⅃ ⅄˘ ӈ
⅃ ˘ ٪ no

ipv6 nd reachable-time *milliseconds*

no ipv6 nd reachable-time

ð Ô

milliseconds ' ӈ ⅃ ˘ Л∪ ӈ Æ˘ ' 0-3600000

ð Ô

Ὼ (RA) ӈ 0( )˘ ӈ
ӈ ⅃ ӈ 30000ms(30)

ð ٪ Ô

ð Ô

a ⅃ ˘ ⅃Л∪
˘ ȁ Â a
Â

Ὼ (RA) ˘ ⅃ ≠ Â
ӈ 0 ˘ . Â

RFC4861 ˘ ˩ Э

╟˘ 0.5 1.5 Â

ð Ô

```
Ruijie(conifg-if)# ipv6 nd reachable-time 1000000
```

ð ৡ Ô

ð Ô

Ὼ Э IPV6 address ҳ Â
Ὼ Ю:

valid-lifetime: 2592000 (30)

preferred-lifetime: 604800 (7),

Ὼ ˘ з ⅃ Л∪ on-link ˘ ⅃ Л∪ ╟

ð ҳ Ô

ð Ô

ҳ ⅃ Л∪ ˘ ї Ὼ ˘
Ю Ὼ (RA)Ὼ Э ipv6 address ҳ
˘ ╗ è ⅃ Л∪ ҳ Â

ipv6 nd prefix default

Э ˘. ╗ ˘ ˘
ѫ ipv6 nd prefix default ѝ Â
ѝ Л∪ ⅄ a Ѧ ѝ Â Л∪ ⅄ ipv6 nd prefix default ⅃ a ˘ ⅃
Â

at *valid-date preferred-date*

2 ' Ὼ
' ⅄ ˘ ѫ Ὼ
˘ ѝ 0 Â

ð Ô

SVI 1 Э ╗

```
Ruijie(conifg)#interface vlan 1
Ruijie(conifg-if)# ipv6 nd prefix 2001::/64 infinite 2592000
```

SVI 1 Э (a ⅃ ╟)

```
Ruijie(conifg)# interface vlan 1
Ruijie(conifg-if)# ipv6 nd default no-autoconfig
```

Ю ╗ ˘ a ˘ ѫ .
≠ a ⅃ ╟ Â

ð ҳ Ô

ҳ	

IPv6 ३

ʒ Э Ѽ (RA) ˘ ʒ no
Â

ipv6 nd ra-interval {*seconds* | *min-max min_value max_value*}

no ipv6 nd ra-interval

ð Ô

seconds' Ѽ (RA)Ѽ Â Л ѝ Æ Â

min-max:

min_value:

max_value:

ð Ô

200 ˘ 200 Э Ю ╟ 20 Â

ð ʒ Ô

ð Ô

Ѵ ˘ ѫ a
Â ѧ ˘ ѝ Э ѐ ѧ Ѽ ´ ˘
Л Э ╟ ѣ γ Â
˘

ð ь γ ѯ ѡ ѧ ѣ ў

३ Э Ώ (RA) ˘ ३
no Â

ð Ô

IPv6 MTU

ð ৡ Ô

ð Ô

ы 0ѓ Ώ a MTU Â

ð Ô

```
Ruijie(config)# interface vlan 1
Ruijie(config -if)# ipv6 nd ra-mtu 1400
```

ð ৡ Ô

ৡ	
show ipv6 interface	**ra-info**
ipv6 nd ra-lifetime	
ipv6 nd ra-interval	Ώ
ipv6 nd ra-hoplimit	Ώ

59.1.16 ipv6 nd managed-config-flag

ৡ Ώ “**managed address configuration**” Æ˘
ৡ no Æ Â

ipv6 nd managed-config-flag

no ipv6 managed-config-flag

ð Ô

Ώ Æ Â

ð ৡ Ô

```
Ruijie(config)# int vlan 1
Ruijie(config)# ipv6 nd managed-config-flag
```

ð ٪ Ô

٪	
show ipv6 interface	ra-info
ipv6 nd other-config-flag	╟ ↓ Æ

59.1.17 ipv6 nd dad attempts

٪ Э ѝ IPV6 ă (NS) Â ٪ no Â

ipv6 nd dad attempts *value*

no ipv6 nd dad attempts

ð Ô

value ' (NS) Â ѝ 0 ѝ Э Ipv6 ╟ ă Â : 0-600

ð Ô

1

ð ٪ Ô

ð Ô

Э IPV6 ˘ ѝ ╟ ă ˘ "tentative"( ) Â ă ˘ ă ˘ ѫ ↓Л˘ ˘ ă ˘ з EUI-64 ˘ ѫ Э ˘ ѫ ╟ (Э IPV6)˘ ˘ ЎА down/up ╟ ă Â Ю ÿ down ↓ ѝ up ѝ Э ╟ ă Â

ð Ô

```
Ruijie(conifgf)# interface vlan 1
Ruijie(conifg-if)# ipv6 nd dad attempts 3
```

ð ٪ Ô

ʒ	
show ipv6 interface	

59.1.18 ipv6 nd suppress-ra

ʒ ⁸ Э Ὼ (RA) ˘ ʒ no ÿ
Ὼ (RA) Â

ipv6 nd suppress-ra

no ipv6 nd suppress-ra

ð Ô

IPv6 Э a Ὼ Â

ð ʒ Ô

ð Ô

Э ⁸ Ὼ ˩ Л ipv6 suppress-ra ʒ Â

ð Ô

```
Ruijie(conifgf)# interface vlan 1
Ruijie(config-if)# ipv6 suppress-ra
```

ð ʒ Ô

ʒ	
show ipv6 interface	ra-info

59.1.19 ipv6 redirects

Э IPV6 ˥ ÿ ˩ Л ʒ
⁸ ĭ Э ICMPv6 ˩ ˘ ʒ no Э
a ICMPv6 ˩ Â

ipv6 redirects

no ipv6 redirects

ð Ô

IPV6 Э ICMPv6 ˩ Â

ð ৡ Ô

ð Ô

ICMPv6 ⁸ ˘ ┘Л
100 ICMPv6 (100pps) Â

ð Ô

```
Ruijie(conifgf)# interface vlan 1
Ruijie(config-if)# ipv6 redirects
```

ð ৡ Ô

ৡ	
show ipv6 interface	

59.1.20 clear ipv6 neighbors

╠ ˗ Â

clrear ipv6 neighbors

ð ৡ Ô

ð Ô

ৡ ┘Л RDP ╠ ˗ ˘ a Â

ð Ô

```
Ruijie# clear ipv6 neighbors
```

ð ৡ Ô

ৡ	
ipv6 neighbor	
show ipv6 neighbors	

59.1.21 tunnel mode ipv6ip

ʒ IPV6 , ʒ no ʒ
IPv6 Â

tunnel mode ipv6ip [**6to4** | **isatap**]

no tunnel mode

ð Ô

6to4 ' й 6to4 ╟

isatap ' й ISATAP ╟

ð Ô

… IPv6 й Â

ð ʒ Ô

ð Ô

… й ˘ ʒ tunnel mode ipv6ip a
≠ й Â ╟ й ε Â

ð Ô

Ю 6to4 '

```
Ruijie(config)# interface tunnel 1
Ruijie(config-if)# tunnel mode ipv6ip 6to4
Ruijie(config-if)# tunnel source vlan 1
```

ð ʒ Ô

ʒ

ipv4-address ' , ⅄ IPv4

ð Ô

Â

ð ꝛ Ô

ð Ô

a ⅄ Э è à ⅄ Â

╟ (6to4 isatap) a Â

ð Ô

IPv6 :

```
Ruijie(config)# interface tunnel 1
Ruijie(config-if)# tunnel mode ipv6ip
Ruijie(config-if)# tunnel source vlan 1
Ruijie(config-if)# tunnel destination 192.168.5.1
```

ð ꝛ Ô

ꝛ	
tunnel source	
tunnel mode	
tunnel ttl	TTL

59.1.23 tunnel source

ꝛ ѝ è , ꝛ no ꝛ Â

tunnel source {*ipv4-address* | *interface-type interface-number*}

no tunnel source

ð Ô

ipv4-address ' IPv4 ˘ IPv4 ѝ

Â

interface-type interface-number ′ ˘ ў IPv4
й IPv4 Â

ð Ô

Â

ð ʒ Ô

ð Ô

↲ Л IPv4 ≠ ↲ Л Э IPv4 ,
╟ (6to4 isatap) è Â

---

a ↓ Э è à ↲ Â
╟ ˘ ╟ a ↲ Â

ð Ô

IPv6 '

```
Ruijie(config)# interface tunnel 1
Ruijie(config-if)# tunnel mode ipv6ip
Ruijie(config-if)# tunnel source vlan 1
Ruijie(config-if)# tunnel destination 192.168.5.1
```

ð ʒ Ô

ʒ	
tunnel mode	
tunnel destination	
tunnel ttl	TTL

59.1.24 tunnel ttl

ʒ IPv6 IPv4 TTL , ʒ no ʒ
128 Â

tunnel ttl *value*

no tunnel ttl

ð Ô

value' TTL

ð Ô

128 Â

ð ৡ Ô

ð Ô

ৡ ৲ Ո IPv6 IPv4 TTL Â

ð Ô

```
Ruijie(config)# interface tunnel 1
Ruijie(config-if)# tunnel ttl 64
```

ð ৡ Ô

ৡ	

ð Ô

```
Ruijie# show ipv6 route
Codes: C - Connected, L - Local, S - Static, R - RIP, B - BGP
       I1 - ISIS L1, I2 - ISIS L2, IA - IIS interarea
L    ::1/128
      via ::1, loopback 0
C    fa::/64
      via ::, vlan 1
L    fa::1/128
      via ::, loopback 0
C    2001::/64
      via ::, vlan 2
L    2001::1/128
      via ::, loopback 0
L    fe80::/10
      via ::1, Null0
C    fe80::/64
      via ::, vlan 1
L    fe80::200:ff:fe00:1/128
      via ::, loopback 0
C    fe80::/64
      via ::, vlan 2
```

ð ¾ Ô

¾	
ipv6 route	

59.2.2 show ipv6 neighbors

IPV6 Â

show ipv6 neighbors [**verbose**] [*interface-id*] [*ipv6-address*]

ð Ô

verbose '

interface-id ' Э

ipv6-addres '

ð ¾ Ô

ð Ô

SVI 1 Э

```
Ruijie# show ipv6 neighbors vlan 1
IPv6 Address Linklayer Addr   Interface
fa::1        00d0.0000.0002   vlan 1
fe80::200:ff:fe00:2  00d0.0000.0002  vlan 1


Ruijie# show ipv6 neighbors verbose
IPv6 Address  Linklayer Addr Interface
2001::1      00d0.f800.0001 vlan 1
       State: Reach/H Age: - asked: 0
fe80::200:ff:fe00:1    00d0.f800.0001 vlan 1
       State: Reach/H Age: - asked: 0
```

	MAX_UNICAST_SOLICIT(3) ?— /R— ѝ /H— ѝ ў
Age	ѝ ↲ ˘ ’-‘ ↲ ˘ ĩ ↲ Â ’expired’ ѝ ↲ ˘ NUD Â
Asked	↲ (NS) Â

```
INET6: 2001::1 , subnet is 2001::/64 [TENTATIVE]
Joined group address(es):
ff01:1::1
ff02:1::1
ff02:1::2
ff02:1::1:ff00:1
MTU is 1500 bytes
ICMP error messages limited to one every 10 milliseconds
ICMP redirects are enabled
ND DAD is enabled, number of DAD attempts: 1
ND reachable time is 30000 milliseconds
ND advertised reachable time is 0 milliseconds
ND retransmit interval is 1000 milliseconds
ND advertised retransmit interval is 0 milliseconds
ND router advertisements are sent every 200 seconds<240--160>
ND router advertisements live for 1800 seconds
```

Э ⅃Л INET6: 2001::1 , subnet is 2001::/64
[TENTATIVE] ˘ ' INET6 ⅄ [ ] Æ ЊЖ Ю

Æ	ЊЖ

ANYCAST й

```
ND advertised retransmit time is 0 milliseconds
ND advertised CurHopLimit is 64
Prefixes: (total: 1)
fec0:1:1:1::/64(Def,Auto,vltime:  2592000,  pltime:  604800,
flags: LA)
```

ra-info Ьѫ

	Ьѫ
RA timer is stopped (on)	Ѽ ї̋
waits	ѝ ѐ
initcount	RA ╟ Ѽ
RA(out/in/inconsistent)	out: Ѽ in: Ѽ inconsistent: Ѽ Ѽ a
RS(input)	
Link-layer address	
Physical MTU	MTU
!M | M	!M Ѽ managed-config-flag Æ Э M: б Э ч
!O | O	!O Ѽ other-config-flag Æ Э O: б Э ч

ra-info (Prefix) '

	Ьѫ
total	
fec0:1:1:1::/64	ѓ

Def	
Auto | CFG	Auto IPV6 ╟ , CFG
!Adv	a Ὼ
vltime	( )
pltime	( )
L | !L	L on-link Æ Э !L б Э ৲
A | !A	A auto-config Æ Э , !A б Э ৲