RGOS®

V10.3(5b5)

! ?Ô

(AÈ â

Q ¸ –5× Í h,XEC Ê(ÖRGOS ®10.3 Ä5b5 Å(Ä

AÏ5Ù ÍB5

3. Ø2O Û «

:E¬G›*ü Ø/¡Gf,Â Û « 9></ ü ¡ 0E›/ß hA¹(M ÿ"¼ ã,X • ÈE- o Û «,X ã V ß Ö

a _ É Ö "¼ ã ÃA: Ã ¤Gf ¡ 0 h"¼ ã,X _NM Ä

**** Ö AÈ â Ã ¤/ Ã0aK¼ Ã Í ¡ 0 Y •,X £EÄE¯> ™?U,X>9 `AÈ â Ä

RGOS™ Q ¸ –5× `

Î. G!5B

1 ÔF¼ Ú

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1 A0´

ÿ á ·><,X Q ¸ Ø,X Q ¸ õ ã ' !2Ï4³ , ü,X Q ¸ õ ã È ü <
G!5B õ ã ß ÈEg 9 alias ? Ã ¹ ë Î ' ! Ã ¹G!5B ÿ á,X <F¼ Q ¸ õ ã Ö

Ruijie(config)# alias ?
aaa-gs AAA server group mode
acl acl configure mode
bgp Configure bgp Protocol
config globle configure mode
.....

Q ¸ ÿ á Õ } µ C È ü ÿ á !M6 î / Ô þ ó Ë Ä * ÅÈ J è î*ü ¹ ß
ã / Ö

* command-alias =original-command

_ V Èü EXEC õ ã ß ÈT¬Ax,X Q ¸ ÿ á ”s”></ ”show” GK + ÄíEg 9 ”s?”
Ã ¹9‹ ª ’s’ Ô ,X GK + ` ÿ á,X } µ C Ö

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

V p ÿ á ·><,X Q ¸ á!6 Ô þ)A¡ Èí î S*ü é Ë Ú Q ¸ Ù ÀCK 9 Ä_
V È ü EXEC õ ã ßG!5B ÿ á ”sv” · Ó Q ¸ ”show version ” È í Ö

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

ÿ á ™NO ¢Eg 9,X Q ¸> ,X1 Ô þ +0ú Ô Ÿ È!M6 á6Ñ Ý0N ÄV ÞM6,X
_ $ È V p ü Q ¸ !Eg 9 Z0N È á6Ñ></ Ü"©,X ÿ á Ö

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

Q ¸ ÿ á 3 Ã ¹ Õ9‹ ª Q ¸,X – D,X } µ C È _ VG!5B y · õ ã ß,X
Q ¸ ÿ á ”ia” ·>< ”ip address” È í ü y · õ ã ß Ö

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

Ruijie(config-if)# ip address

E-G ë Î Z ” ip address ” Q ¸ âM6,X – D µ C È J è Ú ÿ á Ó 6 ä rL
,X Q ¸ Ä

Q ¸ ÿ á ü S*ü Ê ™NO ` HEg 9 È ú í á6Ñ>•Aš ÿ Ä

S*ü show aliases Q ¸ Ã ¹ ¹,ß2Ï4³ ,X ÿ áA’5B Ä

2.1.2 line vty

A¹ Q ¸ Ã ¹ r t ' ! Ã ¹ S*ü,X VTY E² y D,Â ÄEîE›A¹ Q ¸,X no – D Ã ¹ £ å ' ! Ã ¹ S*ü,X VTY E² y D,Â Ä

line vty line-number

no line vty line-number

Ï5 ,ÕA'5B Ð

È5 ,Õ ™ ‰ ßÃ*ü,X VTY E² y D,Â 5 È4ê Ë 0--4 Ä

Ï Q ¸ õ ã Ð

< G!5B õ ã

Ï S*ü Û + Ð

'LÔ?U r t ê5Ù £ å Ã*ü,X VTY E² y D,Â Ê È Ã ¹ S*ü ÞEÄ Q ¸ r)„ Ä

Ï _ Ð

Ú Ã*ü,X VTY E² y D,Â r t 20 È Ã*ü VTY 4ê Ë8× È 0--19 Ä

Ruijie(config)#line vty 19

Ú Ã*ü,X VTY E² y D,Â £ å 10 È Ã*ü VTY 4ê Ë8× È 0—9 Ä

Ruijie(config)#line vty 10

Ï,Ì G Q ¸ Ð

´

2.1.3transport input

A'5B Line ß Ã ¹EîAƒ,X Û n #A, È S*ü transport input Q ¸A'5B Line ß Ã ¹EîAƒ,X #A, Ä S*ü default transport input 6 á LINE ß AŒEîAƒ,X #A, 5 ,Õ Ä

transport input {all | ssh | telnet | none }

default transport input

Ï – DAÈ â Ð

– D	£EÄ
all	G!5BA¹ / L Q H ‰ŒÈ Ý,X #A,EîAƒ Ä
ssh	G!5BA¹ / L Q H ³‰ ÈŒ 6 6 + #A,EîAƒ Ä

access-list-number	Û n+ access-list n ,XA“KÂ { ë >< Ä
in	Í y «E² yE¯> A“KÂ { E›$¸ Ä
out	Í ê ÎE² yE¯> A“KÂ { E›$¸ Ä

Ï5 ,ÕA’5B Ð

5 ,ÕA’5B Ê È Line ß"u ÝG!5B Ï)A“KÂ { ë>< Ä y ÝE² y È J AŒ Ý ê Î,XE² y Ä

Ï Q ¸ õ ã Ð

Line G!5B õ ã

Ï S*ü Û + Ð

A¹ Q ¸G!5B Line ß,XA“KÂ { ë>< ÄT¬Ax ™ ‰ ß AŒ y « ÝE¯ 9,XE² y â ê Î,XE² y È áE¯> E² yE›$¸ Ä 'G!5B Z access-class â È ¾ ÝEî E› access list E›$¸,XA“KÂ È ! Ã ¹E² y ä s Ä S*ü show running Q ¸ ¹,ß Line ß,XG!5B µ C Ä

Ï _ Ð

A’5B ü line vty 0 4 ß È Í b y «,XE² yG!5B access-list 10 Ö

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

Ï,Ì G Q ¸ Ð

Q ¸	AÈ â
show running	¹,ß,X(Š Õ µ C Ä

Ï(AÈ â Ð

EC Ê(RGOS10.1 ¹ Þ Ä

1 Ý0´ 4{4È x Q ¸

3.1 4{G!5B,Ì G Q ¸

!8 Ø Ÿ4¡,X ü /ß c,X CLI)ƒ W ßEîE› COPY Q ¸E¯> 4{4È x Ä

- EîE› Xmodem #A, 4{4È x Ö copy xmodem Q ¸
- EîE›Tftp Ö #A, 4{4È x copy tftp Q ¸

3.1.1 copy xmodem

EîE› xmodem #A,E¯> 4{4È x Q ¸ È ê5ÙAÈ EîE› xmodem #A,E¯> Þ ô ` ßEQ Ä

copy flash : filename xmodem

copy xmodem flash : filename

---

a _ É !

V p [Ê á Ý0N ÈLÔ?U Ú [Ê á t Þ é Ë È _ V Ö

copy xmodem flash: ”filename” ê5Ù copy flash: ”filename” xmodem

---

Ï – DAÈ â Ð

filename ÖCÃ+ < Þ,X [Ê á

Ï5 ,Õ ™ ‰ Ð

´5 ,Õ Ä

Ï Q ¸ õ ã Ð

(M *ü õ ã

Ï S*ü Û + Ð

V p ä s ôEg È í / ôEg [Ê,XKS z Ä ú í È / Bù µ C Ä EîE› Xmodem #A, Ã ¹ ôEg Ï) [Ê ÈV /ß c [Ê Ã– D [Ê1 Ä Xmodem ôEg ¾6ÑEîE› ú ê Ä · Å 9E¯> Ä

ßM6 ø þ _ $:1 Ô þ ¢ 0ÃEîE› xmodem #A, ôEÕ [Ê A’ Û ×

1 ` þ ÚA’ Û Þ,XG!5B [ÊEîE› xmodem #A, ÞEQ 0Ã Ä

Ï _ Ð

ßM6 ø þ _ $AÈ â : 1 Ô þ ¢ Ä ip 192.168.12. 1 ÅÈ ôEg Û Ñ – D [Ê Ä config.bak Å A' Û ;1 ` þ ¢A' Û ôEg [Ê Ä switch.bin Å Ä ip 192.168.12.1 Å:

Ruijie# copy tftp :// 192.168.12.1 / config.bak flash : config.text
Ruijie# copy flash : switch.bin tftp :// 192.168.12.1 / config.bak

Ï,Ì G Q ¸ Ð

´,Ì G Q ¸

S*üA¹ Q ¸ ¢(M *ü õ ãEÔ BEî*ü õ ã ÄV p t Þ L$1 4{ Èí Ú ' ! L$1 4{L! " Û n,X L$1 4{ Ä

\ !

disable Q ¸ âM6 C³ L$1 4{ ™NO ã b ' ! L$1 4{ Ä

Ï _ Ð

ßM6,X/ _G!5BCÃ+ < Ú ' ! L$1 4{L! " 1 4{ Ö

Ruijie# disable 10

Ï,Ì G Q ¸ Ð

Q ¸	AÈ â
enable	¢ BEî*ü õ ãE¯ 9 (M *ü õ ã È ê5Ù,O) ÈP¬4{ ÿ L$ Ä

4.1.2 enable

?UE¯ 9(M *ü õ ã ÈAË ;> BEî*ü G!5B Q ¸ enable Ä

A¹ Q ¸,XAº4š µ CAË –5× É] <G!5B Q ¸ –5× Ê Ä

4.1.3 enable password

?UG!5B á à L$4{ ÿ,X · ¸ ÈAË ;> < G!5B Q ¸ enable password Ä
A¹ Q ¸,X no ôL8 Û n4{ ÿ,X · ¸ Ä

enable password [level level] {password | [0|7] encrypted-password}

no enable password

Ï – DAÈ â Ð

Password	*ü E¯ 9(M EXEC G!5B ,X · ¸ Ä
Level	*ü ,X4{ ÿ Ä
0|7	· ¸,X t š2O _ È 0 ´ t š È 7 1T) t š Ä
encrypted-password	· ¸ [Ä

Ï Q ¸ õ ã Ð

< G!5B õ ã

Ï S*ü Û + Ð

Eî ´NOEg 9 t š2O _ ÄÔ8 ™ ‰ ß È¾ Ý ' á J2lC Æ4£+ CÃ+ < t šE› âA¹ Q ¸,X · ¸ Ê È !LÔ?UEg 9 t š2O _ Ä

Ý · ¸ n V ß Ö

- ™NO Ù ÿ1 26 þ û ã m +!¡ ` D + +0ú Ä
- · ¸ !M6 Ã ¹ Ý ! Ð0N È >• Ñ+9 Ä KÈ ž4§ ,X0N í 0 · ¸ ,X ÔF¼ Ú Ä

---

a _ É !

V p Û n Z t š2O _ È' âEg 9 Ô 5 â [· ¸ È í á6ÑG¡ „E¯ 9(M EXEC õ ã Ä á6Ñ 6 á*ü Ï ã •"© t š,X Æ ö · ¸ Ä ¾6ÑG¡ „G!5BCÃ+ < · ¸ Ä

Ï _ Ð

ßM6,X/ _A'5B · ¸ pw10 Ö

Ruijie(config)# enable password pw10

Ï,Ì G Q ¸ Ð

Q ¸	AÈ â
enable secret	A'5B] <,X · ¸ Ä

4.1.4 enable secret

?UG!5B á à L$4{ ÿ,X] <,X · ¸ È AË ;> < G!5B Q ¸ enable secret Ä A¹ Q ¸,X no ôL8 Û n4{ ÿ,X · ¸ Ä

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

no enable secret

Ï – DAÈ â Ð

Secret	*ü E¯ 9(M EXEC G!5B ,X · ¸ Ä
Level	*ü ,X4{ ÿ Ä
0|5	· ¸,X t š2O _ È 0 ´ t š È 5] < t š Ä
encrypted-password	· ¸ [Ä

Ï Q ¸ õ ã Ð

< G!5B õ ã

Ï S*ü Û + Ð

· ¸ Ú password ` security · ¸ ø/¡ Ä password 1T ) t š,X · ¸ È ¾6ÑA'5B 15 4{ · ¸ Ä security · ¸ ] < t š · ¸ È Ã ¹ 0 15 4{ A'5B · ¸ Ä V p2Ï4³ È à4{ ÿ à Ê , ü ¹ Þ ø/¡ · ¸ È í password · ¸ á*ó Ä V pA'5BM2 15 4{,X password · ¸ È í î4- ÎA: ¤/ È J 7¾ |E@ security · ¸ × V pA'5B 15 4{,X password · ¸ ` security · ¸ ` <,Ì à È í î4- ÎA: ¤/ × · ¸ ™NO ¹ t š 6 ã ± , È password · ¸ S*ü1T) t š È security · ¸ S*ü] < t š Ä

Ï _ Ð

ßM6,X/ _A'5B] < · ¸ pw10 Ö

Ruijie(config)# enable secret 0 pw10

Ï,Ì G Q ¸ Ð

Q ¸	AÈ â
enable password	A'5B á à L$4{ ÿ,X · ¸ Ä

4.1.5 service password-encryption

?U Í · ¸E¯> t š ÈAË ;> service password-encryption Q ¸ ÈA¹ Q ¸,X no 6 á 5 ,Õ(Š Õ È Æ4£ ¬ ä š [,X á î 6 á â [Ä service password-encryption

Ï – DAÈ â Ð

´

Ï Q ¸ õ ã Ð

< G!5B õ ã

Ï S*ü Û + Ð

S*üservice password-encryption Q ¸E¯> { ÈA¹ Q ¸T¬Ax GKÁ,X È ´ !8 Ø/¡ password ¹ â [/ ÈL8M2 ,È y S*ü š [G!5B,X × ' Ô service password-encryption Q ¸ ¹ â È£¯> show running êwrite ± , ¹ â È,Ì G password ¬ ä š [× V p a õ GKÁ

Ï,Ì G Q ¸ Ð

Q ¸	AÈ â
enable password	A'5B á à L$4{ ÿ,X · ¸ Ä

4.1.6 password

?UG!5Bline 4"CÃ,O) · ¸ ÈAË ;> line G!5B Q ¸ password ÄA¹ Q ¸,X no 6 ã ôL8 line ,O) · ¸ Ä

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

no password

Ï – DAÈ â Ð

password E°/ß*ü line 4"CÃ,X · ¸ Ä

0|7 · ¸,X t š2O _ È 0 ´ t š È 7 1T) t š Ä

encrypted-password · ¸ [Ä

Ï Q ¸ õ ã Ð

line G!5B õ ã

Ï S*ü Û + Ð

A¹ Q ¸*ü bG!5B ÍE°/ß*ü A© Ò,O) line 4"CÃE¯> AxA•,X · ¸ Ä

Ï _ Ð

ßM6,X/ _ Û n line ,O) · ¸ red Ö

Ruijie(config)# line vty 0
Ruijie(config-line)# password red

Ï,Ì G Q ¸ Ð

Q ¸	AÈ â
login	¢ BEî*ü õ ãE¯ 9 (M *ü õ ã È ê5Ù,O) ÈP¬4{ ÿ L$ Ä

4.1.7 login

ü AAA GKÁ,X ™ ‰ ß È V p?U ü y · ÞE¯> 1T),X,O) · ¸ õP` ÈAË ; > y ·G!5B Q ¸ login ÄA¹ Q ¸,X no 6 ã ª#\,O ) · ¸ õP` Ä

login

Ï _ Ð

ßM6,X/ _$è/ ü VTY ÞA'5B,O) AxA• Ä

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

Ï,Ì G Q ¸ Ð

Q ¸	AÈ â
username	A'5B *ü µ C Ä

4.1.9 login ukey

V p?U ü y · ÞE¯> ukey *ü AxA• ÈAË ;> y ·G!5B Q ¸ login ukey Ä A¹ Q ¸,X no 6 ã ª#\,O) ukey *ü AxA• Ä

login ukey {md5 | sha1}

no login ukey

Ï – DAÈ â Ð

md5 Ö G›*ü md5 t š • ã Ä

sha1 Ö G›*ü sha1 t š • ã Ä

Ï Q ¸ õ ã Ð

line G!5B õ ã

Ï S*ü Û + Ð

A¹ Q ¸*ü b,O)AxA• Ê 0 ukey *ü AxA• ÄE-G ,X ukey *ü Û ± , ü usb key ,X*ü µ C Ä Ô º S*ü ukey ,O) È J W,X,O) • ã á Ã*ü Ä

Ï _ Ð

ßM6,X/ _$è/ ü VTY ÞA'5B,O) ukey *ü AxA• È t š • ã md5 Ä

```
Ruijie(config)#          line vty        0
Ruijie(config-line)#              login ukey md5
```

4.1.10 login authentication

ü AAA ' Ô,X ™ ‰ ß È¸O)AxA• ™NOG›*üAAA á u 9E¯> AxA• ÈS*üA¹

Q ¸ G6(,O)AxA• •"© ë>< ÄA¹ Q ¸,X no 6 ã ôL8,O)AxA• •"© ë>< Ä

login authentication {default | list-name}

no login authentication {default | list-name}

Ï – DAÈ â Ð

default T¬Ax,XAxA• •"© ë>< á

list-name ÃEÝ,X •"© ë>< á

Ï Q ¸ õ ã Ð

line G!5B õ ã

Ï S*ü Û + Ð

V p *ü AAA] < á u È íA¹ Q ¸*ü b,O)AxA• Ê S*ü n,X •"© ë>< E¯> AxA• Ä

Ï _ Ð

ßM6,X/ _$è/ ü VTY Þ G6(•"© ë>< J*ü radius E¯> ,O)AxA• Ä

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

Ï,Ì G Q ¸ Ð

Q ¸	AÈ â
aaa new-model	S6ÑAAA] < á u
aaa authentication login	G!5B,O)AxA• •"© ë><

4.1.11 username

?UA’5B *ü á ÈAË ;> < G!5B õ ã Q ¸ username Ä

username name {nopassword | password { password | [0|7] encrypted-password }} username name privilege privilege-level

no username name

Ï – DAÈ â Ð

name *ü á Ä

password *ü · ¸ Ä

0|7 · ¸,X t š2O _ È 0 ´ t š È 7 1T) t š Ä

encrypted-password ·¸[Ä

privilege-level *ü 4¥ n L$1 4{ Ä

Ï Q ¸ õ ã Ð

< G!5B õ ã

Ï S*ü Û + Ð

A¹ Q ¸*ü b Î0Ÿ *ü D B g È oAxA• S*ü Ä

Ï _ Ð

ßM6,X/ _G!5B Ô þ*ü á ` · ¸ È J4¥ n*ü 4{ ÿ 15 4{ Ö

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

Ï,Ì G Q ¸ Ð

Q ¸	AÈ â
login local	E¯> AxA• Ä

4.1.12 lock

?U ü4œ0Ã ÞA'5B Ô þ V Ê,X · ¸ ÈAË ;> EXEC õ ã Q ¸ lock Ä

lock

Ï – DAÈ â Ð

´

Ï Q ¸ õ ã Ð

(M *ü õ ã

Ï S*ü Û + Ð

4EîE›A'5B Ê · ¸,X • ã Èü ± ÕE² y îA±,X à Ê ÈJÕ #4œ0Ã+ M6 ¹L !6A"KÂ ÄEîE› ¹ ß!9PxJÕ #4œ0Ã+ M6 Ö

1. Eg 9 lock Q ¸ È2Ï4³ î ¤/ Eg 9 · ¸ ×
2. Eg 9 · ¸ È Ã ¹ Ï ã +0ú Ä Eg 9 â È2Ï4³ î ¤/ .BAxEg 9,X · ¸ È ' â È2Ï4³ î#ÙL8 #) È J / Locked µ C ×
3. ?U ÇG¡ „E¯ 94œ0Ã ÈLÔ?UEg 9A'5B,X Ê · ¸ ×

?U ü4œ0Ã Þ S*üJÕ #4œ0Ã,X s6Ñ È 4LÔ?UEîEnü G!5B õ ã ß ;> lockable Q ¸ È ü,Ì h,X line Þ ' Ô ÕJÕ #4œ0Ã,X(M û Ä

Ï _ Ð

ßM6,X/ _ JÕ # Ô þ4œ0Ã+ M6 Ö

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

Ï,Ì G Q ¸ Ð

Q ¸	AÈ â
lockable	ü4“CÃ ÞA’5B ÕJÕ #4œ0Ã,X(M û Ä

4.1.13 lockable

?U Õ ü4œ0Ã Þ S*ülock Q ¸ È Ã ¹ ü line G!5B õ ã ß ;> lockable Q ¸ È4œ0Ã ü5 ,Õ ™ ‰ ß á Õ lock Q ¸ Ä S*ü no Q ¸ ª#\A’5B Ä

lockable

no lockable

Ï – DAÈ â Ð

´

Ï Q ¸ õ ã Ð

line G!5B õ ã

Ï S*ü Û + Ð

A¹ Q ¸*ü b ü,Ì h4“CÃ Þ ÕJÕ #4œ0Ã,X(M û È?UJÕ #4œ0Ã Ã ¹EîE› ü EXEC õ ã ß ;> lock Q ¸ Ä

Ï _ Ð

ßM6,X/ _ ü { Ä · Þ ' ÔJÕ #4œ0Ã,X s6Ñ È JJÕ # { Ä Ö

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

4.2.2 clock update-calendar

*üEC Êclock 9 È „.@ Ê clock È ü privileged EXEC õ ã ß ;> clock update-calendar E- þ Q ¸ ÈEC Ê clock î?Z,ª.@ Ê clock ,X Ä

clock update-calendar

Ï – DAÈ â Ð

´ – D

Ï Q ¸ õ ã Ð

(M *ü õ ã

Ï S*ü Û + Ð

Ô o G Ä S*ü.@ Ê ÊJs Äcalendar Å 9>9 EC Ê ÊJs È.@ Ê ÊJs áKÈ • Õ4ÁE¤E@,X È´ .@ Ê ÊJs CD+ "4,X ÈG SA' Û GKÁ êG¡ (Š Õ ß 3 ü E¤E@ Ä

V p.@ Ê ÊJs `EC Ê ÊJs á à!9 ÈEC Ê ÊJs !¨EW2'.B,X ÈG›*üA¹ Q ¸ Ú EC Ê ÊJs,X ¹ ó ` ÊKÈ á 4-.@ Ê ÊJs Ä

‚Â ! È"u Ý ¤ o.@ Ê ÊJs,X5%4°A' Û Ý Ö S2026G ÃS2026F ÃS2028 Ã RSR10 Ä

Ï _ Ð

S*ü V ß Q ¸ Ã ¹ Ú ' !EC Ê clock ,X ÊKÈ ` ¹ ó á .@ Ê clock Ä

Ruijie# clock update-calendar

Ï‚Ì G Q ¸ Ð

Q ¸	AÈ â
clock read-calendar	*ü.@ Ê ÊJs 9A'5BEC Ê ÊJs

4.2.3 exec-timeout

?UG!5BLINE ß,X !8A' Û,XE² yCY Ê ÊKÈ È S*ü exec-timeout Q ¸ Ä EîE› no exec-timeout Q ¸ È ª#\ LINE ß,XE² yCY Ê ÈE² y" áCY Ê Ä

exec-timeout minutes [seconds]

no exec-timeout

Ï – DAÈ â Ð

minutes Ö Û n,XCY Ê ÊKÈ,X ÚJs D ×

seconds ÖÄ ÃEÝ – D Å Û n,XCY Ê ÊKÈ,X/¦ D ×

Ï – DAÈ â Ð

string Ö Q ¸ ¤/ 0ú +0ú È ÔKS Ã ¹G!5B 32 þ +0ú

Ï Q ¸ õ ã Ð

< G!5B õ ã

Ï S*ü Û + Ð

V p 4"u ÝG!5B Q ¸ ¤/ 0ú È í2Ï4³ á/Ä . ¤/ 0ú È ¤/ 0ú ÚLc
- 2Ï4³ á/Ä,X ¬ ê5à ¬ ê Ä Q ¸ ¤/ 0ú ¾ Í EXEC õ ã Ý Ä

Ï _ Ð

ßM6,X/ _ ÚG!5B Q ¸ ¤/ 0ú RGOS Ö

Ruijie(Config)#prompt RGOS

4.2.13 banner login

?UG!5B,O) ÛNl µ C ÈAË ü < G!5B õ ã ß ;> Q ¸ banner login Ä?U ª#\,O) ÛNl µ C,XG!5B È S*ü no banner login Q ¸ Ä

banner login c message c

Ï – DAÈ â Ð

c Ö ,O) ÛNl µ C,X ÚLh0ú È!£ ¹Eî µ KÈ á AŒ Î)„KÈLh0ú message ÖG!5B,O) ÛNl µ C Y •

Ï Q ¸ õ ã Ð

< G!5B õ ã

Ï S*ü Û + Ð

S*üA¹ Q ¸ Ã ¹G!5B,O) ÛNl µ C È'*ü ,O)2Ï4³ Ê ÈE- o µ C î>• / Î 9 ÄV pK 94§ 3,X ÚLh0ú â ¡' Eg 9 +0ú ÈíE- o +0ú Ú>•2Ï4³ ö × Ä

Ï _ Ð

ßM6,X/ _E¯> ,O) ÛNl µ C,XA'5B Ö

```
Ruijie(config)
Ruijie(config)# banner login $ enter your password $
```

4.2.14 speed

?UG!5B4œ0ÃA' Û,XEó)[È ü4"CÃG!5B õ ã ß È ;> Q ¸ speed speed Ä ?U 6 á4œ0ÃA' ÛEó)[,XT¬AxG!5B È S*üo speed Q ¸ Ä

speed speed

Ï – DAÈ â Ð

Speed 4œ0ÃA' Û,X ôEgEó)[È) ! bps Ä Í b > y · È ¾6Ñ Ú ô EgEó)[A'5B 9600 Ã19200 Ã38400 Ã57600 Ã115200 ,X Ô þ È5 ,Õ ,XEó)[9600 Ä

Ï Q ¸ õ ã Ð

< G!5B õ ã

Ï5 ,ÕA'5B Ð

5 ,Õ,XEó)[9600

Ï S*ü Û + Ð

Total output: 395756 bytes
Data overflow: 27697 bytes
stop rx interrupt: 0 times

4.2.16 write

?U ÍCÃ+ <G!5B Ä |G!5B ê2Ï4³G!5B ÅE¯> AÏ m ¡ 0 ÈAË ;> (M *ü õ ã Q ¸ write Ä

write [memory | network | terminal]

Ï – DAÈ â Ð

memory Ö Ú2Ï4³G!5B Ärunning-config Å m 9 NVRAM È1 à b copy running-config startup-config Ä

network Ö Ú2Ï4³G!5B ±, TFTP á u < Þ È1 à b copy running-config tftp Ä

terminal Ö / 2Ï4³G!5B È1 à b show running-config Ä

Ï Q ¸ õ ã Ð

(M *ü õ ã

Ï S*ü Û + Ð

A¹ Q ¸<Q' Ý Ó · Q ¸ È + b J S"¯,X S*ü `>• û ŠAx Ã È ¹ q' ± +- ß 9 È • "*ü S*ü Ä

A¹ Q ¸ á tEÝNM1 à b t memory EÝNM Ä

Ï _ Ð

ßM6,X/ _ ±,CÃ+ <G!5B Ö
Ruijie# write
Building configuration...
[OK]

Ï,Ì G Q ¸ Ð

Q ¸	AÈ â
show running-config	¹,ß2Ï4³G!5B
copy	ÍCÃ+ <G!5B [ÊE¯> á

4.2.17 show powers

?U / Ø þ+ $d,X(Š Õ ÈAË ;> (M *ü õ ã Q ¸ show powers Ä

show powers

Ï – DAÈ â Ð

´

Ï Q ¸ õ ã Ð

(M *ü õ ã

Ï S*ü Û + Ð

S*üA¹ Q ¸ Ã ¹ ¹,ß ' !2Ï4³ Ø þ+ $d,X(Š Õ Ä

+ $d(Š Õ Ö"u Ý y+ $d / NoLink × Ý+ $d + $d á6Ñ o+ / LinkAndNoPower ×!7 o+ / LinkAndPower Ä

Ï _ Ð

ßM6,X/ _ ;> show powers Q ¸,X Ô þE¤> 4§ p Ö

```
Ruijie#  show powers
Device  Power  State
------  -----  ---------------
1       1      LinkAndPower
1       2      NoLink
1       3      LinkAndNoPower
```

Ï,Ì G Q ¸ Ð

´

4.2.18 show fans

?U / Ø þN¢ ,X(Š Õ ÈAË ;> (M *ü õ ã Q ¸ show fans Ä

show fans

Ï – DAÈ â Ð

´

Ï Q ¸ õ ã Ð

(M *ü õ ã

Ï S*ü Û + Ð

S*üA¹ Q ¸ Ã ¹ ¹,ß ' !2Ï4³ Ø þN¢ ,X(Š Õ Ä

N¢ (Š Õ Ö!7 ¹ 0 / ok È á!7 ¹ 0 ê á , ü / stop Ä

Ï _ Ð

ßM6,X/ _ ;> show fans Q ¸,X Ô þE¤> 4§ p Ö

```
Ruijie#  show fans
```

```
Device  Fan   State
------  ----  ------
1       1     ok
1       2     stop
```

Ï,Ì G Q ¸ Ð

´

4.2.19 show temperature

?U / 2Ï4³#ý z ÈAË ;> (M *ü õ ã Q ¸ show temperature Ä

show temperature

Ï – DAÈ â Ð

´

Ï Q ¸ õ ã Ð

(M *ü õ ã

Ï S*ü Û + Ð

S*üA¹ Q ¸ Ã ¹ ¹,ß2Ï4³ ' !#ý z Ä

Õ#ý z / ,XA' Û,È y / K '#ý z È á Õ#ý z / ,XA' Û / N/A Ä

Ï _ Ð

ßM6,X/ _ ;> show temperature Q ¸,X Ô þE¤> 4§ p Ö

```
Ruijie#      show temperature
Device  Temperature(C)
------  --------------
 CM       27
```

Ï,Ì G Q ¸ Ð

´

1 h0´ 5%4°E²Eî ûG!5B

5.1 G!5B,Ì G Q ¸

5%4°E²Eî û# A© ¹ KG!5B Ù À ¹ ß Q ¸ Ö

- ping
- traceroute

5.1.1 ping

A¹ Q ¸*ü 9# A©5%4°,XE²Eî û ÈÃ ¹ Ý ,X }*ü Až • Ãn !5%4° ,X E²Eî ûKÂNl Ä Q ¸ ã V ß Ö

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

Ï – DAÈ â Ð

– D	£EÄ
vrf-name	VRF á +
ip-address	Û n IPv4 Ä
length	Û n ¥EÕ D B Ù,XKS z
times	Û n ¥EÕ D B Ù,X þ D
timeout	Û nCY Ê,X ÊKÈ
data	*Û n ? D B*
source	Û n$d IPv4

Ï5 ,Õ ™ ‰ Ð

5 ,Õ ü Û n,X ÊKÈ Ä5 ,Õ 2 /¦ Å Y ÈEÕ 5 þKS z 100Byte ,X D B Ù Û n,X IP Ä

Ï Q ¸ õ ã Ð

(M *ü õ ã

Ï S*ü Û + Ð

Ping Q ¸E¤> ü BEî*ü õ ã `(M *ü õ ã ß È ü BEî*ü õ ã ß È ¾6ÑE¤> Î ,X ping s6Ñ È5à ü(M *ü õ ã ß È íE¬ Ã ¹E¤> ping ,X

=) s6Ñ Ä BEî,X ping s6Ñ È Ã ¹ ü BEî*ü õ ã `(M *ü õ ã ß ;
> È5 ,Õ ü Û n,X ÊKÈ Ä5 ,Õ 2 /¦ Å Y ÈEÕ 5 þKS z 100Byte ,X D
B Ù Û n,X IP È V p Ý h1(È í / Ô þ þ ! ÿÈ V p"u Ý h1(È
í / Ô þ þ . ÿÈ Ô âEg Î Ô þ4³Au µ C Ä =) ping s6Ñ È ¾6Ñ ü(M
*ü õ ã ß ;> È ü =) ping È Ã ¹ Û n ¥EÕ D B Ù,X þ D ÃKS z È
CY Ê,X ÊKÈ1 1 È ` BEî,X ping s6Ñ Ô È Ô â 3Eg Î Ô þ4³Au µ C Ä
?U S*ü ³ á s6Ñ È í?U G!5B ³ á á u < È K 'G!5BAË –5× DNS G!5BF¼
Ú ÄVRF s6Ñ ¾ ü RSR A' Û Þ ! Ý Ä

Ï _ Ð

BEî ping ,X r _ Ö

```
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 ,X r _ Ö

```
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
```

Ï G ÄAÈ â Ð

A¹ Q ¸ ü ÝA' Û Þ Õ Ä

5.1.2 Traceroute

;> traceroute Q ¸ È Ã ¹ / *ü b# A©,X D B Ù ¢$d ,Â,X
4£E›,X Ý5% G. .

– D	£EÄ
vrf-name	VRF á +
Ip-address	Û n IPv4 Ä
number	Û n ¥EÕ,X v# ,X DG£
source-address	Û n$d IPV4
seconds	Û nCY Ê ÊKÈ
minimum maximum	Û n Ô ã ` Ô û TTL

Ï Q ¸ õ ã Ð

(M *ü õ ã

Ï S*ü Û + Ð

traceroute Q ¸ ?U*ü b ” ¹5%4°,XE²Eî û È J ü5%4° Lp ¥*ó Ê È š.B ,X n ! Lp ¥*ó,X !5B Ä?U S*ü ³ á s6Ñ È í?U G!5B ³ á á u < È K ' G!5BAË –5›ÐNS G!5BF¼ Ú ŸRF s6Ñ ¾ ü RSR A’ Û Þ ! Ý Ä

Ï _ Ð

¹ ß h*ü traceroute ,X ø þ _ $ È Ô þ 5%4°E² y+ Eî È Ô þ 5%4°E² y , ü ¤ o5% G áEî,X ™ ‰ Ä

1 Ã5%4°+ Eî,X traceroute _ $ Ö

```
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#
```

¢ ÞM6,X4§ p È Ã ¹#Ù . ,ß È ¢$d ?UA“KÂ IP 61.154.22.36 ,X È5%4° D B ÙFÑ4£E› Z ¾ o5% G Ä1 É6 ÅÈ à Ê4- Î Z E’A¹5% G 8…C ,X ÊKÈ ÈE- Í b5%4° Ú d È M2 Ý*ü,X Ä

2 Ã5%4° ¤ o5% G áEî,X traceroute _ $ Ö

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

16 222.35.15.109 50 msec 50 msec 50 msec
17 * * *
18 61.233.3.212 40 msec 40 msec 40 msec

Ï G ÄAÈ â Ð

´ Ä

1 A0´ [Ê2Ï4³ Q ¸

6.1 G!5B,Ì G Q ¸

[Ê2Ï4³ ¤ o,X Q ¸ V Ý Ö

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

6.1.1 cd

,Â) Û 6 ÈE¯ 9 Û n,X,Â)

cd DIRECTORY

Ï – DAÈ â Ð

DIRECTORY Ö Û n,X,Â)

Ï5 ,Õ ™ ‰ Ð

´5 ,Õ Ä

Ï Q ¸ õ ã Ð

(M *ü õ ã Ä

Ï S*ü Û + Ð

Ú ÞEÄ – D ?UE¯ 9,X,Â) È J Þ Ô4{,Â)*ü "..">< È 4{,Â)*ü "." >< ÈJ ª,X Ã ¹ B ' ! ü,X !5B 9.B n È ¡ 0 Õ,Ì Í,Â) `4±
Í,Â),XEg 9 •"© Ä üE¯ 9 Û n,Â) â Ã ¹EîE› âM6 Ÿ4¡,X ls Q ¸P`A• Ä

Ï _ Ð

ßM6 Ô þE¯ 9 ' !,Â),X tmp $,Â),X | 0 Ö

Ruijie# cd tmp

Ï,Ì G Q ¸ Ð

6.1.3 ls

/ ' !,Â) ß,X [Ê,Â) µ C Ä

ls PATHNAME

Ï – DAÈ â Ð

PATHNAME Ö ÃEÝ – D È?U / ,Â),XCÃ X È5 ,Õ ™ ‰ ' !,Â) ß,X µ C

Ï5 ,Õ ™ ‰ Ð

5 ,Õ ¾ î / ' ! ¹ 0CÃ X ß,X µ C Ä

Ï Q ¸ õ ã Ð

(M *ü õ ã Ä

Ï S*ü Û + Ð

Eg 9 Û n,X,Â)CÃ X / A¹,Â) ß,X Ý [Ê µ C È 5 ,Õ ´ – D Ê / ,X ,Â) ß,X [Ê µ C Ä

"¼ ãA¹ ¡ 0 à á ÕEîG!0ú .

Ï _ Ð

/ ' !,Â) ß,X Ý [Ê,X µ C

Ruijie# ls

/ tmp ,Â) ß,X Ý [Ê µ C

Ruijie# ls tmp

Ï,Ì G Q ¸ Ð

´,Ì G Q ¸

6.1.4 makefs

ã ê [Ê2Ï4³?U ÖEQ ê?U1u)Ú,XA’ Û

makefs dev DEVNAME fs

Ï5 ,Õ ™ ‰ Ð

´5 ,Õ Ä

Ï Q ¸ õ ã Ð

(M *ü õ ã Ä

Ï S*ü Û + Ð

A¹ Q ¸,X S*üEî ü ½/¡ ™ ‰ ß Ö a ÃA’ Û ¢ þ S*üE›!8 [Ê2Ï4³ ÈFw Z!7 ,X üA’ Û Þ S*üA¹ [Ê2Ï4³LÔ?U ü ñ õ S*ü ! ã ê Ô õ È ¹ â í ´LÔ × b Ã [Ê2Ï4³ ü S*ü Ô!‰ ÊKÈ ¹ â È*ü Ç?U ôL8 ÝA’ Û Þ,X [Ê D B È Ã ¹ S*ü!8 Q ¸#Ù0N H þA’ Û Þ,X Ý D B Ä

Ï _ Ð

ßM6 _ Ö8¹ jffs2 ?U S*ü,X [Ê2Ï4³ È dev/mtdblock/1 A¹ [Ê2Ï4³ ?U1u)Ú,XA’ Û Ö

Ruijie#

Ï,Ì G Q ¸ Ð

´

6.1.6 mv

/Ï | Û n,X [Ê º Ô þ [Ê ê5Ù,Â)

mv sour SOURCE_FILE dest {DESTINE_FILE | DIRECTORY}

mv dest {DESTINE_FILE | DIRECTORY} sour SOURCE_FILE

Ï – DAÈ â Ð

SOURCE_FILE Ö?U/Ï |,X [Ê

DESTINE_FILE/DIRECTORY Ö?U/Ï ,X [Ê ê5Ù,Â)

Ï5 ,Õ ™ ‰ Ð

´5 ,Õ

Ï Q ¸ õ ã Ð

(M *ü õ ã

Ï S*ü Û + Ð

Ú Û n2O _,X [Ê,X Y •Eg Î Û šEg Î ÈEîE› Q ¸> ÞEg 9,X – D
ø
Ö S*ü Ê"¼ ã ½&•aK +,XEg 9 G Ã(Vtype ` file);b Ã'?'
Ã ¹K 9 È ü á-¹F'A¹Eg 9 " ,X – D Ê È }K ,X S*ü '? '
9 / Q ¸ ¤/ µ C , Ä ¹!7.B kK 9 Q ¸

Ï _ Ð

ßM6,X _ $ Ú log.txt /Ï | Þ Ô4{,Â) , á config.txt, V p Ý à á
[Ê , í Ó 6] s Ý à á [Ê Ö

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

ßM6,X _ $ Ú log.txt /Ï | tmp ,Â) ß Ö

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

Ï,Ì G Q ¸ Ð

´,Ì G Q ¸

6.1.7 pwd

/ ' ! ¹ 0CÃ X

pwd

Ï _ Ð

ôL8 ' !,Â) ß,X log.txt [Ê Ö

Ruijie# rm log.txt

Ï,Ì G Q ¸ Ð

Q ¸	AÈ â
rmdir	ôL8 Û n,X0N,Â), ´ Q ¸ Õt¦Ö ,

1 ×0´ 2Ï4³ ¹ « Q ¸

7.1 G!5B,Ì G Q ¸

7.1.1 logging on

?U AŒ ¹ « µ C ü á àA' Û Þ,X / ÈAË S*üA¹ < Q ¸ Ä?U/U!6 ¹ « µ C,X / ÈAË S*üA¹ Q ¸,X no 6 ã Ä

logging on

no logging on

Ï – DAÈ â Ð

´ – D

Ï5 ,ÕA'5B Ð

AŒ ¹ « µ C ü á àA' Û Þ / Ä

Ï Q ¸ õ ã Ð

< G!5B õ ã

Ï S*ü Û + Ð

RGOS á ™ Ã ¹ Ú ¹ « µ C / ü Console 0k · Ã VTY 0k · Þ È 3 Ã ¹ Ú ¹ « µ CA„) ü á à,XA' Û Þ Ö Y ,4ç † Ã FLASH ÃSyslog Server Ä A¹ Q ¸ ¹ « Ô G ÈV p GKÁ ¹ « Ô G È Ý ¹ « µ C Ú á>• / êA„) ÈL8 Z ùG¡ û4{ ÿ û b 1 ,X Log Ä

Ï _ Ð

ßM6,X/ _ üA' Û Þ GKÁ ¹ « Ô G Ö

Ruijie(config)# no logging on

Ï,Ì G Q ¸ Ð

Q ¸	AÈ â
logging buffered	Ú ¹ « µ CA„) Y ,4ç †
logging	Ú ¹ « µ C ¥4- Syslog Server

) ¹ « µ C Ä

logging buffered [buffer-size | level]

no logging buffered

Ï – DAÈ â Ð

buffer-size Ö4ç † û ã È ª 8× È ¢ 4K 128K Bytes Ä

levelI Ö ¹ « µ C,X ùG¡ û È ¢ 0 7 Ä Ã ¹ S*ü4{ ÿ á/Ä È 3 Ã ¹,È y S*ü D + Ä

Ï5 ,ÕA'5B Ð

4ç † T¬Ax û ã 4k Bytes Ä

¹ « µ C,X ùG¡ û 7 Ä

Ï Q ¸ õ ã Ð

< G!5B õ ã

Ï S*ü Û + Ð

Y ,4ç † 0NKÈ ~)ƒ S*ü,X ÈV p Û n û ã,X Y , >• m$µ Èí Ô ½,X ¹ « µ C Ú>•?Z,ª Ä?U ¹,ß Y ,4ç † ,X ¹ « µ C ÈAË S*ü(M *ü Q ¸ show logging Ä

Y ,4ç † ,X ¹ « µ C Ê û,X ÈA' ÛG¡ ê5Ù ;> (M *ü Q ¸ clear logging È4ç † ,X ¹ « µ C Ú>•#ÙL8 Ä V p?UC³CþKÂNl È hA¹ Ú ¹ « m FLASH ê5Ù ¥EÕ4-Syslog Server Ä

RGOS ,X ¹ « µ C Ú ¹ ß 8 þ4{ ÿ Ö

><1

GK +	1 4{	£EÄ
Emergencies	0	2û ù ™ ‰ È2Ï4³ á6Ñ!7 E¤>
Alerts	1	LÔ?U0Ÿ GG› ª ~ ' !7,XKÂNl
Critical	2	G¡?U ™ ‰
Errors	3	JíAÃ µ C
warnings	4	A: µ C
Notifications	5	BEî2O _ È áE›LÔ?U G"¼,XG¡?U µ C
informational	6	AÈ â û,X µ C
Debugging	7	A×A© µ C

C^ ã È4{ ÿC^P¬ È G 0 4{ ÿ,X µ C ÔP¬4{ ÿ,X µ C Ä

' Û nA' Û AŒ / ,X ¹ « µ C4{ ÿ ¹ â È 1 b ê " b A'5B 4{ ÿ,X ¹ « µ C Ú>• AŒ / Ä

Ï _ Đ

ßM6/ _A'5B ¾ AŒ4{ ÿ 6 ¹ ž " b 6 ,X ¹ « µ CA„) ü û ã 10000 +8V,X Y ,4ç † Ö

Ruijie(config)# logging buffered 10000 6

Ï,Ì G Q ¸ Đ

Q ¸	AÈ â
logging on	' Ô ¹ « Ô G
show logging	¹,ß4ç † ¹ « y [
clear logging	#ÙL8 ¹ «4ç † ,X ¹ « y [

7.1.4 logging server

?U Ú ¹ «A„) Û n,X Syslog Sever ÈÆË ü < G!5B õ ã ß S*üA¹ Q ¸ Ä
?U ôL8Syslog server ë>< ,X Û n ,X Syslog Server ÈÆË S*üA¹ Q ¸,X no 6 ã Ä

logging server {ip-address [vrf vrf-name] | ipv6 ipv6-address}

no logging server {ip-address [vrf vrf-name] | ipv6 ipv6-address}

Ï – DAÈ â Đ

ip-address y ¹ « µ C,X IP ×

vrf vrf-name Û nE² y ¹ « ,X VRF ÄVPN CÃ+ E@ ¥>< Å r _ ×

ipv6 ipv6-address Û n y ¹ « µ C,X IPV6 ×

Ï5 ,ÕA'5B Đ

T¬Ax á å Ï) syslog server ¥EÕ ¹ « µ C

Ï Q ¸ õ ã Đ

< G!5B õ ã

Ï S*ü Û + Đ

A¹ Q ¸ Û n Ô þ Syslog server 9 y A' Û,X ¹ « µ C Ä RGOS AŒG!5B îE' 5 þ Syslog Server Ä¹ « µ C Ú à Ê ¥4-G!5B,X Ý Syslog Server Ä

Ï _ Đ

ßM6,X/ _ Û n Ô þ 202.101.11.1 ,X syslog server Ö

Ruijie(config)# logging server 202.101.11.1

ßM6,X/ _ Û n Ô þ IPV6 AAAA:BBBB::FFFF

Ruijie(config)# logging server ipv6 AAAA:BBBB::FFFF

Ï,Ì G Q ¸ Đ

Q ¸	AÈ â
logging on	' Ô ¹ « Ô G
show logging	¹,ß4ç † ¹ « y [È ¹ ž,Ì G ¹ «G!5B – D
logging trap	A'5B AŒ ¥EÕ4syslog server ,X ¹ « µ C4{ ÿ

7.1.5 logging file flash

?U Ú ¹ « µ C ± , ü FLASH ÈAË ü < G!5B õ ã ß ;> A¹ Q ¸ Ä ª#\ ü FLASH A„) ¹ « µ C È S*üA¹ Q ¸,X no 6 ã Ä

logging file flash: filename [max-file-size] [level]

no logging file

Ï – DAÈ â Đ

filename Ö ¹ « [Ê á Ä á ú [Ê2O _ È Î n txt 2O _ Ä

max-file-size Ö ¹ « [Ê,X Ô û Ä ¢ 128K 6M bytes È5 ,Õ û ã 128K Ä

levelI Ö AŒ>•A„) ¹ « [Ê ,X ¹ « µ C4{ ÿ Ä Ã ¹ S*ü4{ ÿ á/Ä È 3 Ã ¹,È y S*ü D + Ä5 ,Õ m FLASH ,X ¹ «4{ ÿ 6 Ä G b ¹ « µ C,X4{ ÿ ÈAË –5×>< 1 Ä

Ï5 ,ÕA'5B Đ

á6Ñ Ú ¹ « µ CA„) FLASH Ä

Ï Q ¸ õ ã Đ

< G!5B õ ã

Ï S*ü Û + Đ

V p"u Ý Syslog Server È ê5Ù Î b Ø/¡] <5×<% á à ï ü5%4° ôEg ¹ « µ C È Ã ¹EÝ ½ Ú ¹ « µ C(4@ ODVq»• V ´¹EÝ ½ Ú "(4@ ODVq È ê5Ù Î bƒD

a _ É !

!£ þ ¹ « [ÊFÑ Ý Ô ûKS zL$ È„,X ¹ « µ C ü m 9 Ô þ [Ê ! ÈV p ø • J îCYE› ¹ « [Ê,X Ô ûKS z È í Ö

1. V p îCYE› È í ï Î Ô þ „,X ¹ « [Ê
2. „ [Ê,X á/Ä ü s [Ê á ¦ 94ê Ë È ã Ö [Ê á _4ê Ë È â 4Ô ¡ txt ×
3. Ô û4ê Ë 15 È V p E’ Ô û È íG¡ „ Ô Ÿ?Z,ª1 Ô þ [Ê Ä´!8 È G!5B Ô 5 ¹ « µ CA„) FLASH ,X Q ¸ È Ô î î ü FLASH *ó ä 16 þ [Ê ×

Ï _ Ð

ßM6/ _ Ú ¹ « µ CA„) ü FLASH È [Ê á trace.txt È [Ê û ã 128K,

< G!5B õ ã

Ï S*ü Û + Ð

A'5B Ô þ ¹ « ùG¡ û ¹ â È ü D Þ1 b ê " bA¹ ùG¡ û4{ ÿ,X ¹ « y [Ú>• / ü { Ä Þ Ä

EîE› show logging Q ¸ Ã ¹ ¹,ß ¹ «A'5B,X,Ì G – D `4³Au Ä

Ï _ Ð

ßM6/ _A'5B AŒ ü { Ä / ,X ¹ « µ C4{ ÿ 6 Ö

Ruijie(config)# logging console informational

Ï,Ì G Q ¸ Ð

Q ¸	AÈ â
logging on	' Ô ¹ « Ô G
show logging	¹,ß4ç † ¹ « y [È ¹ ž,Ì G ¹ «G!5B – D

7.1.7 logging monitor

?UA'5B AŒ üVTY 0k · Ä telnet 0k · Ã SSH 0k ·1 Å Þ / ,X ¹ « µ C 4{ ÿ ÈAË ü < G!5B õ ã ß ;> A¹ Q ¸ ÄA¹ Q ¸,X no 6 ã/U!6 ü VTY 0k · Þ ' D ¹ « y [Ä

logging monitor level

no logging monitor

Ï – DAÈ â Ð

level Ö ¹ « y [,X ùG¡ û Ä Ã ¹ S*ü4{ ÿ á/Ä È 3 Ã ¹,È y S*ü D + Ä G b ¹ « µ C ùG¡ û,XAº4šAÈ â ÈAË –5×>< 1 Ä

Ï5 ,ÕA'5B Ð

Debugging (7)

Ï Q ¸ õ ã Ð

< G!5B õ ã

Ï S*ü Û + Ð

?U ü VTY 0k · Þ ' D ¹ « µ C ÈOj ;> (M *ü Q ¸ terminal monitor AŒ ü ' ! VTY 0k · ' D ¹ « µ C Ä AŒ>• / ,X ¹ « µ C4{ ÿ í+ logging monitor n Ä

Logging monitor n ,X ¹ « µ C4{ ÿ J\ Í Ý VTY 0k · Ä

Ï _ Ð

ßM6/ _G!5B AŒ ü VTY 0k · Þ ' D,X ¹ « µ C4{ ÿ 6 Ö

Ruijie(config)# logging monitor informational

Ï,Ì G Q ¸ Ð

Q ¸	AÈ â
logging on	' Ô ¹ « Ô G
show logging	¹,ß4ç † ¹ « y [È ¹ ž,Ì G ¹ «G!5B – D

7.1.8 logging trap

?UA'5B AŒ ¥EÕ4-Syslog Server ,X ¹ « µ C4{ ÿ ÈAË ü < G!5B õ ã ß ;> A¹ Q ¸ ÄA¹ Q ¸,X no 6 ã/U!6 Ú ¹ « y [¥EÕ4- Syslog Server Ä

logging trap level

no logging trap

Ï – DAÈ â Ð

level Ö ¹ « y [,X ùG¡ û Ä Ã ¹ S*ü4{ ÿ á/Ä È 3 Ã ¹,È y S*ü D + Ä G b ¹ « µ C ùG¡ û,XAº4šAÈ â ÈAË –5×>< 1 Ä

Ï5 ,ÕA'5B Ð

Informational(6)

Ï Q ¸ õ ã Ð

< G!5B õ ã

Ï S*ü Û + Ð

?U Ú ¹ « µ C ¥EÕ4- Syslog Server ÈOj ?U S*ü < G!5B Q ¸ logging G!5BSyslog Server Ä' â È S*ü logging trap Û n ¥EÕ4- ¹ « µ C,X ù G¡ û4{ ÿ Ä

EîE› show logging Q ¸ Ã ¹ ¹,ß ¹ «A'5B,X,Ì G – D `4³Au Ä

Ï _ Ð

ßM6,X _ $G!5B Ú4{ ÿ 6 ,X ¹ « µ C ¥EÕ4- 202.101.11.22 ,X Syslog Server Ö

Ruijie(config)# logging 202.101.11.22
Ruijie(config)# logging trap informational

7.1.10 logging source ip| ipv6

?UA’5B ¹ « y [,X$d ÈAË ü < G!5B õ ã ß ;> A¹ Q ¸ ÄA¹ Q ¸,X no 6 ã ª#\ Û n y [,X$d0Ã ·A’5B Ä

logging source {ip ip-address | ipv6 ipv6-address}

no logging source {ip | ipv6 }

Ï – DAÈ â Ð

ip-address Û n å IPV4 ¹ « ¥EÕ ¹ « y [,X$d IPV4 ×

ipv6-address Û n å IPV6 ¹ « ¥EÕ ¹ « y [,X$d IPV6 ×

Ï5 ,ÕA’5B Ð

´

Ï Q ¸ õ ã Ð

< G!5B õ ã

Ï S*ü Û + Ð

T¬Ax ™ ‰ ß¥ÆÕ4-Syslog Server

facility-type ÖSyslog A' Û È K ',XA'5B AË –5× S*ü Û + Ä

Ï5 ,ÕA'5B Ð

Local7(23)

Ï Q ¸ õ ã Ð

< G!5B õ ã

Ï S*ü Û + Ð

ß>< Ä><2 Å Syslog Ã6Ñ,XA' Û Ö

><2

Numerical Code	Facility
0	kernel messages
1	user-level messages
2	mail system
3	system daemons
4	security/authorization messages
5	messages generated internally by syslogd
6	line printer subsystem
7	network news subsystem
8	UUCP subsystem
9	clock daemon
10	security/authorization messages
11	FTP daemon
12	NTP subsystem
13	log audit
14	log alert
15	clock daemon
16	local use 0 (local0)
17	local use 1 (local1)
18	local use 2 (local2)
19	local use 3 (local3)

20	local use 4 (local4)

Ï,Ì G Q ¸ Ð

Q ¸	AÈ â
show logging count	¹,ß2Ï4³ Ø õ + ¹ « µ C
show logging	¹,ß ¹ « õ +,X Î G!5B µ C â ¹ «4ç † ,X ¹ « µ C

7.1.13 logging rate-limit

?U ' Ô ¹ «Eó)[L$ s6Ñ È£$!£/¦ Y AŒEg Î,X ¹ « µ C ÈAË ü < G! 5B õ ã ß ;> A¹ Q ¸ Ä?U GKÁ ¹ «Eó)[L$ s6Ñ ÈAË S*üA¹ Q ¸,X no 6

á>• ' •

Ï¸Ì G Q ¸ Ð

Q ¸	AÈ â
show running-config	¹,ß2Ï4³,XG!5B µ C

7.1.15 service sequence-numbers

?U ü ¹ « µ C t Þ c Ë ÈAË ü < G!5B õ ã ß ;> A¹ Q ¸ ÄA¹ Q ¸,X no 6 ã ª#\ ü ¹ « µ C ,X c Ë Ä

service sequence-numbers

no service sequence-numbers

Ï – DAÈ â Ð

´

Ï5 ¸ÕA'5B Ð

¹ « µ C á ú c Ë Ä

Ï Q ¸ õ ã Ð

< G!5B õ ã

Ï S*ü Û + Ð

L8 Z ü ¹ « µ C t Þ ÊKÈ µ C ¹ ê ÈE¬ Ã ¹ ü ¹ « µ C t Þ c Ë È c Ë ¢ 1 Ô Ÿ Ät Þ c Ë ¹ â È Ã ¹M2 #Ù . -¹F' ¹ « µ C Ý"u Ý ö È ¹ ž ¹ « {*ó,X âNN c Ä

Ï _ Ð

ßM6/ _G!5B ü ¹ « µ C t Þ c Ë Ö

Ruijie(config)# service sequence-numbers

Ï¸Ì G Q ¸ Ð

Q ¸	AÈ â
logging on	' Ô ¹ « Ô G
service timestamps	*ü ¹ « µ C ,X ÊKÈ

7.1.16 service timestamps

?U ü ¹ « µ C t Þ ÊKÈ µ C ÈÆË ü < G!5B õ ã ß ;> A¹ Q ¸ ÄA¹ Q ¸,X no 6 ã ª#\ ü ¹ « µ C ' Þ ÊKÈ µ C Ä default 6 ã 6 á ¹ « µ C,X ÊKÈ T¬Ax Ä

service timestamps message-type [uptime | datetime [msec | year]]

no service timestamps message-type

default service timestamps message-type

Ï – DAÈ â Ð

message-type Ö ¹ «2O _ È Ý ø/¡ log ` debug Älog µ C Û ü ùG¡ û4{ ÿ ü 0 É6 KÈ,X ¹ « µ C È debug µ C ùG¡ û4{ ÿ 7 ,X ¹ « µ C Ä

uptime ÓA' Û | ÊKÈ È ã Ö * ý * ã Ê * Ú*/¦ È _ Ö 07:00:10:41

datetime Ö' !A' Û ¹ ó È ã Ö Ü ¹ ó Ê ÖÚ Ö¦ È _ ÖJul 27 16:53:07

msec ' !A' Û ¹ ó Õ!¿/¦ / È ã Ö Ü ¹ ó Ê: Ú:/¦ .!¿/¦ _ Ö Jul 27 16:53:07.299

year ' !A' Û ¹ ó Õ H Ñ / È ã Ö H Ü ¹ ó Ê: Ú:/¦ _ Ö2007 Jul 27 16:53:07

Ï5 ¸ÕA'5B Ð

¹ « µ C ,X ÊKÈ È ' !A' Û ÊKÈ Ä V pA' Û"u Ý RTC È í7¾ |A× H A' Û | ÊKÈ Ä

Ï Q ¸ õ ã Ð

< G!5B õ ã

Ï S*ü Û + Ð

S*ü Uptime EÝNM,X ÊKÈ ã A' Û7¾ ¢ Þ õ | ,Â !,XE¤> ÊKÈ È) ! /¦ ÄS*ü Datetime EÝNM,X ÊKÈ ã ' !A' Û,X ¹ ó È H É Ü É ¹ ã Ê Ö ÚJs Ö/¦ Ä

Ï _ Ð

ßM6/ _G!5B *ü Log µ C ` Debug µ C,X ÊKÈ È ã Datetime ÖÈ J è Õ!¿/¦ / Ö

```
Ruijie(config)#          service timestamps debug datetime msec
Ruijie(config)#          service timestamps log datetime msec
Ruijie(config)#          end
Ruijie(config)#          Oct     8 23:04:58.301 %SYS-5-CONFIG_I:
Configured from console by console
```

Ï,Ì G Q ¸ Ð

Q ¸	AÈ â
logging on	' Ô ¹ « Ô G
service sequence-numbers	*ü ¹ « µ C ,X c Ë

7.1.17 service sysname

?U ü ¹ « µ C t Þ2Ï4³ á ÈAË ü < G!5B õ ã ß ;> A¹ Q ¸ ÄA¹ Q ¸,X no 6 ã ª#\ ü ¹ « µ C ,X2Ï4³ á Ä

service sysname

no service sysname

Ï – DAÈ â Ð

´

Ï5 ,ÕA'5B Ð

¹ « µ C á ú2Ï4³ á Ä

Ï Q ¸ õ ã Ð

< G!5B õ ã

Ï S*ü Û + Ð

EîE›!8 Q ¸ È Ã ¹ BLÔ?U È ‡ n ü ¹ « µ C ú#Ï t2Ï4³ á Ä

Ï _ Ð

ßM6/ _G!5B ü ¹ « µ C t Þ2Ï4³ á Ö

```
Mar 22 15:28:02 %SYS-5-CONFIG: Configured from console
by console
Ruijie#      config terminal
Enter configuration commands, one per line. End with
CNTL/Z.
Ruijie(config)#          service sysname
Ruijie(config)#          end
Ruijie#
Mar 22 15:35:57 S3250 %SYS-5-CONFIG: Configured from
console by console
```

Ï,Ì G Q ¸ Ð

Q ¸	AÈ â

show logging

C Ä

Ï _ Ð

ßM6/ _#ÙL8 Y ,4ç † ¹ « y [Y • Ä

Ruijie# clear logging

Ï,Ì G Q ¸ Ð

Q ¸	AÈ â
logging on	' Ô ¹ « Ô G
show logging	¹,ß4ç † ¹ « y [
logging buffered	Ú ¹ « µ CA„) Y ,4ç †

7.2 / ,Ì G Q ¸

7.2.1 show logging

?U ¹,ß ¹ «G!5B,X – D Ã4³Au µ C È¹ ž Y ,4ç † ,X ¹ « y [ÈAË ü (M *ü ;> A¹ Q ¸ Ä

show logging

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

¹ « µ CAÈ â Ö

+!‰	AÈ â
Syslog logging	¹ « Ô G Ö ' Ô / enabled , GKÁ / disabled
Console logging	' D ü { Ä Þ ¹ « µ C,X4{ ÿ È ¹ ž4³Au
Monitor logging	' D ü VTY 0k · Þ ¹ « µ C,X4{ ÿ È ¹ ž4³Au
Buffer logging	A„) ü Y ,4ç † ¹ « µ C,X4{ ÿ È ¹ ž4³Au
Timestamp debug messages	Debug µ C ÊKÈ ã
Timestamp log messages	Log µ C ÊKÈ ã
Sequence log messages	c Ë Ô G
Trap logging	¥EÕ4-Syslog Server ¹ « µ C,X4{ ÿ È ¹ ž4³Au
Log Buffer	A„) ü Y ,4ç † ,X ¹ « y [

Ï,Ì G Q ¸ Ð

Q ¸	AÈ â
logging on	' Ô ¹ « Ô G
clear logging	#ÙL8 ¹ «4ç † ,X ¹ « y [

7.2.2 show logging count

?U ¹,ß2Ï4³ Ø õ + ¹ « µ C {*ó,X õ D È ¹ ž Ô â {*ó,X ÊKÈ1 4³Au µ C ÈAË ü(M õ ã ß ;> A¹ Q ¸ Ä

show logging count

Ï – DAÈ â Ð

´

Ï Q ¸ õ ã Ð

(M õ ã

Ï S*ü Û + Ð

Z S*ü ¹ « y [4³Au s6Ñ ÈLÔ?U ü < G!5B õ ã ß È ;> logging count Q ¸ Ä show logging count Q ¸ È Ã ¹ / ¤ 5 ¹ « µ C È {*ó ,X õ D È Ô â Ô õ Î)„,X ÊKÈ Ä

EîE› show logging Q ¸ È Ã ¹,ß ¹ « µ C4³Au s6Ñ ú ' Ô Ä

Ï _ Ð

ßM6/ _ ;> show logging count ,X4§ p Ö

```
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
```

Ï,Ì G Q ¸ Ð

Q ¸	AÈ â
logging count	' Ô ¹ «4³Au s6Ñ Ô G
show logging	/ ¹ « õ +,X Î G!5B µ C â ¹ «4ç † ,X ¹ « µ C
clear logging	#ÙL8 ¹ «4ç † ,X ¹ « µ C

7.2.3 show logging reverse

A¹ Q ¸ s6Ñ â show logging ,Ì à È Ý ¢ „ »,XNN c / Y ,4ç † ,X ¹ « y [ÄAË ü(M *ü ;> A¹ Q ¸ Ä

show logging reverse

Ï – DAÈ â Ð

show logging	/ ¹ « õ +,X Î G!5B µ C â ¹ «4ç † ,X ¹ « µ C

1 ?0´ G!5BSNMP Q ¸

8.1 G!5B,Ì G Q ¸

SNMP G!5B Ù À ¹ ß,Ì G Q ¸ Ö

- no snmp-server
- show snmp
- snmp-server chassis-id
- snmp-server community
- snmp-server contact
- snmp-server enable traps
- snmp-server host
- snmp-server location
- snmp-server packetsize
- snmp-server queue-length
- snmp-server system-shutdown
- snmp-server trap-source
- snmp-server trap-timeout
- snmp-server user
- snmp-server group
- snmp-server view
- snmp-server if-index persist

8.1.1 no snmp-server

?U #; A' Û SNMP ·)Ú s6Ñ ÈAË ;> < G!5B Q ¸ no snmp-server Ä

no snmp-server

Ï5 ,ÕA'5B Đ

#; SNMP ·)Ú s6Ñ

Ï Q ¸ õ ã Đ

< G!5B õ ã

Ï S*ü Û + Đ

A¹ Q ¸ GKÁA' Û Õ,X Ý(SNMP ,X ·)Ú á u Ä

Ï _ Đ

1 ÔF¼ Ú Î. G!5B Q ¸

Ï – DAÈ â Ð

string Ö ¶ ' +0ú È,Ì ' b NMS ` SNMP ·)Ú KÈ,XEî µ š-Õ Ä

view-name Ö Û n?š Ò,X á/Ä È*ü b Î b?š Ò,X1u)Ú Ä

ro Ö Û n NMS Í MIB ,X ¬G£ ¾6ÑAÏ È á6Ñ Â Ä

rw Ö NMS Í MIB ,X ¬G£ ÃAÏ Ã m Ä

number Ö A“KÂ ë>< c ë Ë Ä 0-99 ÅÈ G6(Û n,XA“KÂ ë>< È Û n6ÑA“ KÂMIB ,X NMS 8× È Ä

ipaddr Ö G6(NMS È Û nA“KÂ MIB ,X NMS Ä

Ï5 ,ÕA’5B Ð

Ý ¶ '5 ,Õ ¾AÏ

Ï Q ¸ õ ã Ð

< G!5B õ ã

Ï S*ü Û + Ð

A¹ Q ¸ *üA’ Û SNMP ·)Ú s6Ñ,X1 Ô þG¡?U Q ¸ È Û n Z ¶ ',X 2 û Ã ACEA“KÂMIB ,X NMS 8× È1 1 Ä

?U GKÁSNMP ·)Ú s6Ñ È ;> no snmp-server Q ¸ G Ã Ä

Ï _ Ð

ßM6,X/ _ S*üA“KÂ ë><L$ Í MIB ,XA“KÂ È¼ ACE 192.168.12.1 ,X NMS Í MIB ,XA“KÂ Ö

```
Ruijie(config)#  access-list  2  permit  192.168.12.1
Ruijie(config)#  access-list  2  deny any
Ruijie(config)#  snmp-server community public ro  2
```

Ï,Ì G Q ¸ Ð

Q ¸	><

Ï S!L€Q1ïL ™).ñSB'&GCh.ð ðU0$t ôÂ !U"'ï 4"rb R"ŽñP ðUR"b $'& ™

Ï – DAÈ â Ð

text Ö £EÄ2Ï4³6(2Ï • ã,X +0ú

Ï5 ,ÕA'5B Ð

2Ï4³6(2Ï • ã 0N Ä

Ï Q ¸ õ ã Ð

< G!5B õ ã

Ï _ Ð

ßM6,X/ _ Û n SNMP ,X2Ï4³6(2Ï • ã i-net800@i-net.com.cn Ö

Ruijie(config)# snmp-server contact i-net800@i-net.com.cn

Ï,Ì G Q ¸ Ð

Q ¸	AÈ â
show snmp-server	¹,ß SNMP ,X µ C
no snmp-server	GKÁSNMP ·)Ú s6Ñ

8.1.5 snmp-server enable traps

?U *ü SNMP |4- NMS ¥EÕTrap #\ C È*ü b y Ô o2û ù5àG¡?U,X _ Ê,X ¥*ó ÈAË ;> < G!5B Q ¸ snmp-server enable trap s ÄA¹ Q ¸ ,X no 6 ã/U!6 SNMP å NMS | ¥EÕ Trap #\ C Ä

snmp-server enable traps [snmp]

no snmp-server enable traps

Ï – DAÈ â Ð

snmp Ö *ü SNMP _ Ê,XLKL Eî-¹ Ä

Ï5 ,ÕA'5B Ð

5 ,Õ ß È/U!6 ¥EÕLKL #\ C

Ï Q ¸ õ ã Ð

< G!5B õ ã

Ï S*ü Û + Ð

A¹ Q ¸ ™NO â < G!5B Q ¸ snmp-server ÔCK S*ü È6Ñ ¥EÕLKL #\ C Ä

Ï _ Ð

ßM6,X/ _ *ü | ¥EÕ SNMP _ ÊLKL #\ C Ö

```
Ruijie(config)#          snmp-server enable traps snmp
Ruijie(config)#          snmp-serverhost       192.168.12.219       public
snmp
```

Ï¸Ì G Q ¸ Ð

Q ¸	AÈ â
snmp-server host	Û n SNMP

8.1.6 snmp-server host

?U Û n ¥EÕLKL #\ C,XSNMP Ä NMS ÅÈAË ;> < G!5B Q ¸ snmp-server host ÄA¹ Q ¸,X no 6 ã ª#\ Û n SNMP Ä

snmp-server host {host-addr| ipv6 ipv6-addr} traps [vrf vrfname] [version {1 | 2c | 3 [auth | noauth | priv]] community-string [udp-port port-num][notification-type

A¹ Q ¸ â < G!5B Q ¸ snmp-server enable traps ÔCK S*ü È |4-NMS ¥EÕLKL #\ C Ä

Ã ¹G!5B î þ á à,X SNMP *ü b y LKL #\ C È Ô þ Ã ¹ S*ü á àLKL 2O _4˜ Ü È á à,X0Ã · È á à,X vrf

Q ¸	AÈ â
snmp-sever contact	SNMP 2Ï4³6(2Ï • ã

8.1.8 snmp-server packetsize

?U { SNMP Ô û,X D B Ù û ã ÈAË ;> < G!5B Q ¸ snmp-sever packetsize ÄA¹ Q ¸,X no 6 ã 6 áT¬Ax Ä

snmp-server packetsize byte-count

no snmp-server packetsize

Ï – DAÈ â Ð

byte-count D B Ù û ã È ¢ 484 +8V 17876 +8V Ä

Ï5 ,ÕA'5B Ð

1500 +8V

Ï Q ¸ õ ã Ð

< G!5B õ ã

Ï _ Ð

ß M6,X/ _ Û n SNMP Ô D B Ù û ã 1492 Ð

Ruijie(config)# snmp-server packetsize 1492

Ï,Ì G Q ¸

-length

Q ¸	AÈ â
snmp-server queue-length	SNMP Kó ë û ã

/C2_02 Tc 0.002- 5.57d -re 8(SNMP)-length

1 ÔF¼ Ú Î. G!5B Q ¸

8.1.11 snmp-server trap-source

? U Û nSNMP , X $ d È A Ë ; > < G ! 5 B Q sɲmp-server trap-source ÄA¹ Q ¸,X no 6 ã 6 á5 ,ÕA'5B Ä

snmp-server trap-source interface

no snmp-server trap-source

Ï – DAÈ â Ð

interface Ö *ü b 0 SNMP $d ,X y ·

Ï5 ,ÕA'5B Ð

SNMP y [¢ ¾ þ y · Î • È S*ü ¾ þ y ·,X IP 0 $d Ä

Ï Q ¸ õ ã Ð

< G!5B õ ã

Ï S*ü Û + Ð

5 ,Õ ™ ‰ ß ÈSNMP y [¢ ¾ þ y · Î • È S*ü ¾ þ y ·,X IP 0 $d È Z " b1u)Ú `Aš ÿ È Ã ¹ S*üA¹ Q ¸ Î n S*ü Ô þ IP 0 SNMP ,X$d Ä

SNMP

Ï5 ,ÕA'5B Ð

30 /¦

Ï Q ¸ õ ã Ð

< G!5B õ ã

Ï _ Ð

ßM6,X/ _ Û nCY Ê ÊKÈ 60 /¦ Ö

Ruijie(config)# snmp-server trap-timeout 60

Ï,Ì G Q ¸ Ð

Q ¸	AÈ â
snmp-server queue-length	Û nLKL #\ CKó ëKS z
snmp-server enable host	Û n NMS ,X

8.1.13 snmp-server user

?UA'5BSNMP *ü ÈAË ;> < G!5B Q ¸ snmp-server user ÄA¹ Q ¸,X no 6 ã ôL8*ü Ä

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 }

Ï – DAÈ â Ð

username Ö *ü á Ä

groupname *Ö* A¹*ü Í h,X4˜ á

v1 | v2 | v3 Ö Û â SNMP (Ä ¾ Ý v3 Õ âM6,X] < – D Ä

encrypted Ö Û nA'5B,X šJy ü / Ê È / š [È"u ÝA'5B í / â [Ä V pEÝ ½ Z ¹ š [Eg 9 È íLÔ?UEg 9E²4Á,X 16 E¯ D + +0ú></ ,X šJy Ä"¼ ã S*ü MD5 ,XAxA• šJyKS z 16 +8V È5à SHA AxA• #A, š JyKS z 20 +8V Ä ¹ ø þ +0ú></ Ô þ +8V Ä t š></ ,X šJy ™ Í é ¢ Ý Ä

auth Ö Û n ú S*üP`A• Ä md5 Û n S*ü MD5 AxA• #A, Äsha Û n S *ü SHA AxA• #A, Ä

auth-password:A'5BAxA• #A, S*ü,X · ¸ +0ú Ä áCYE› 32 þ +0ú ÅÄ2Ï 4³ ÚE- o · ¸E@ 6 ä,Ì h,XAxA• šJy Ä

5 ,Õ"u ÝA'5B*ü 4˜

Ï Q ¸ õ ã Ð

< G!5B õ ã

Ï _ Ð

ßM6,X/ _A'5B Ô þ*ü 4˜ Ö

Ruijie(config)# snmp-servergroup mib2user v3privread mib2

Ï,Ì G Q ¸ Ð

Q ¸	AÈ â
show snmp group	/ SNMP *ü 4˜G!5B µ C

8.1.15 snmp-server view

?UA'5BSNMP ?š Ò ÈAË ;> < G!5B Q ¸ snmp-server view ÄA¹ Q ¸ ,X no 6 ã ôL8?š Ò Ä

snmp-server view view-name oid-tree {include | exclude }

no snmp-server view view-name [oid-tree]

Ï – DAÈ â Ð

view-name Ö?š Ò á Ä

oid-tree Ö ?š Ò G6(,X MIB ÍB5 È Ô É MIB $ å Ä

include Ö Û âA¹ MIB ÍB5 $ å>• Ù ÿ ü?š Ò Y Ä

exclude Ö Û âA¹ MIB ÍB5 $ å>• fL8 ü?š Ò ê Ä

Ï5 ,ÕA'5B Ð

5 ,ÕA'5B Ô þ default ?š Ò È AŒA"KÂ Ý,X MIB ÍB5 Ä

Ï Q ¸ õ ã Ð

< G!5B õ ã

Ï _ Ð

ßM6,X/ _A'5B Ô þ?š Ò È Ù À Ý,X MIB-2 $ å Ä oid 1.3.6.1 ÅÖ

Ruijie(config)# snmp-server view mib2 1.3.6.1 include

Ï,Ì G Q ¸ Ð

Q ¸	AÈ â
show snmp view	/ SNMP ?š ÒG!5B µ C

8.1.16 snmp-server if-index persist

?U ' Ô y ·2ö é4È Õ,X s6Ñ S*ü snmp-server if-index persist
Q ¸ ÄA¹ Q ¸,X no 6 ã GKÁA¹ s6Ñ Ä

snmp-server if-index persist

no snmp-server if-index persist

Ï – DAÈ â Ð

´

Ï5 ,ÕA'5B Ð

A¹ s6ÑT¬Ax GKÁ Ä

Ï Q ¸ õ ã Ð

< G!5B õ ã

Ï _ Ð

ßM6,X/ _ ' Ô y ·2ö é4È Õ s6Ñ Ö

Ruijie(config)# snmp-server if-index persist

Ï,Ì G Q ¸ Ð

Q ¸	AÈ â
show run	/ ,Ì G,XG!5B µ C

8.2 / ,Ì G Q ¸

8.2.1 show snmp

?U ¹,ß SNMP ,X(Š Õ µ C ÈAË ;> (M *ü õ ã Q ¸ show snmp Ä

show snmp [mib | user | view | group]

Ï Q ¸ õ ã Ð

(M *ü õ ã

Ï S*ü Û + Ð

show snmp Q ¸ / SNMP ,X,Ì G4³Au µ C ×

show snmp mib / 2Ï4³ Õ,X snmp mib µ C ×

show snmp user / snmp *ü µ C ×

show snmp view / snmp ?š Ò µ C ×

show snmp group / snmp *ü 4˜ µ C ×

Ï _ Đ

ßM6,X/ _ SNMP ,X Ô þ4³Au µ C Ö

```
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
```

Ï,Ì G Q ¸ Đ

Q ¸	AÈ â
snmp-server chassis-id	SNMP 2Ï4³ c ë Ë

1 10´ G!5BUSB Q ¸

NI ` Q Tr 2.003 0 Td8SB

Lun 0:
ID: 0
Disk Partitions:
1: /dev/uba/disc0/part1 --> /mnt/uba
size : 131072000B(125MB)

µ C ÿ V ß Ö

USB Mass Storage Device Ö A' Û á/Ä

ID Ö A' Û,X ID Ë Äremove Ê Ý*ü Å

Lun Ö A¹A' Û,X Ô þF Ee) Ë È i ß,X ID F Ee) ,X id Ë Ä

Disk Partitions Ö A' Û,X Ú µ C Ä V ÞM6,XEg Î ÈA¹A' Û Ý Ô þ Ú È Ú [Ê /dev/uba/disc0/part1 È ÖEQ Z,Â) /mnt/uba Ä Ã*ü [Ê2Ï4³ Q ¸ cd /mnt/uba A¹,Â) ß È ¡ 0 Ú Y • Ä

Ï,Ì G Q ¸ Ð

´,Ì G Q ¸

9.1.2 usb remove

usb remove Device_ID

Ï – DAÈ â Ð

Device_ID Ö?U/ÏL8,X USB A' Û Ë

Ï5 ,Õ ™ ‰ Ð

´5 ,Õ Ä

Ï Q ¸ õ ã Ð

(M *ü õ ã

Ï S*ü Û + Ð

ü ¨ Î usb A' Û ! ÈLÔ?U*ü Q ¸/ÏL8A' Û È ¹L 2Ï4³!7 ü S*üA' Û5à Ð7ÈJíAÃ Ä V pA' Û/ÏL8 ä s È2Ï4³ î ' D Î ¤/ ÈE- Ê • Ã ¨ ÎA' Û Ä V p/ÏL8 Bù ÈAÈ âA¹ Ê 2Ï4³ Ý S*üA¹ USB A' Û È íNO1 Y Ô î a ; > /ÏL8 ¡ 0 Ä

Ï _ Ð

ßM6 /ÏL8 ÞM6 _ $ / ,X usb A' Û Ä

Ruijie# usb remove 778
OK, now you can pull out the device 778.
0:1:1:38 Ruijie: USB-5-USB_DISK_REMOVED:USBDevice <USB

Mass Storage Device> Removed!

E- Ê í Ã ¹ Ú usb A’ Û ¨ Î Z Ä

Ï,Ì G Q ¸ Ð

´,Ì G Q ¸

1 0´ Y , µ C ¹,ß Q ¸

10.1 Î Y , µ C ¹,ß,Ì G Q ¸

s6Ñ Ù À Ý þ Q ¸ Ö

show memory
memory-lack exit-policy
show memory protocols

10.1.1 show memory

?U ¹,ß2Ï4³ ' ! Y , S*ü ™ ‰ µ C ÈAË ;> (M *ü õ ã Q ¸ show memory Ä

show memory

Ï – DAÈ â Đ

´

Ï5 ,ÕA'5B Đ

+9

Ï Q ¸ õ ã Đ

(M *ü õ ã Ä

Ï S*ü Û + Đ

S*üA¹ Q ¸ Ã ¹ ¹,ß2Ï4³ ' !,X Y ,(Š Õ ` Y , S*ü ™ ‰ È Ù À2Ï4³,X(=)Ú Y , G£ È ¹ ž ' !2Ï4³,X0NKÆNI D Ã0NKÆ Y , G£ Ä

Ï _ Đ

ßM6,X/ _ ;> show memory ,X Ô þE¤> 4§ p Ä

Ruijie# show memory
System Memory Statistic:
Free pages: 1079

" 4“	AÈ â

Y , U0Ã áC‡ È ™ ó4È Õ Î ,X Y E¤> È

min

ÒñG) F-q5B€ß g) " ˜, qvÖyR =DkÀ}@

CPU utilization in five42<e42mes:10.%

42	0%	0%	0%	tunrt6
43	0%	0%	0%	ef6_rcv_msg
44	0%	0%	0%	ef6_inconsistent_daemon
45	0%	0%	0%	imid
46	0%	0%	0%	nsmd
47	0%	0%	0%	ripd
48	0%	0%	0%	ripngd
49	0%	0%	0%	ospfd
50	0%	0%	0%	ospf6d
51	0%	0%	0%	bgpd
52	0%	0%	0%	pimd
53	0%	0%	0%	pim6d
54	0%	0%	0%	pdmd
55	0%	0%	0%	dvmrpd
56	0%	0%	0%	vty_connect
57	0%	0%	0%	aaa_task
58	0%	0%	0%	Tlogtrap
59	0%	0%	0%	dhcp6c
60	0%	0%	0%	sntp_recv_task
61	0%	0%	0%	ntp_task
62	0%	0%	0%	sla_deamon
63	0%	3%	1%	track_daemon
64	0%	0%	0%	pbr_guard
65	0%	0%	0%	vrrpd
66	0%	0%	0%	psnpd
67	0%	0%	0%	igsnpd
68	0%	0%	0%	coa_recv
69	0%	0%	0%	co_oper
70	0%	0%	0%	co_mac
71	0%	0%	0%	radius_task
72	0%	0%	0%	tac+_acct_task
73	0%	0%	0%	tac+_task
74	0%	0%	0%	dhcpd_task
75	0%	0%	0%	dhcps_task
76	0%	0%	0%	dhcpping_task
77	0%	0%	0%	dhcpc_task
78	0%	0%	0%	uart_debug_file_task
79	0%	0%	0%	ssp_init_task
80	0%	0%	0%	rl_listen
81	0%	0%	0%	ikl_msg_operate_thread
82	0%	0%	0%	bcmDPC
83	0%	0%	0%	bcmL2X.0
84	3%	3%	3%	bcmL2X.0
85	0%	0%	0%	bcmCNTR.0

86 0% 0% 0% bcmTX
87 0% 0% 0% bcmXGS3AsyncTX
88 0% 2% 1% bcmLINK.0
89 0% 0% 0% bcmRX
90 0% 0% 0% mngpkt_rcv_thread
91 0% 0% 0% mngpkt_recycle_thread
92 0% 0% 0% stack_task
93 0% 0% 0% stack_disc_task
94 0% 0% 0% redun_sync_task
95 0% 0% 0% conf_dispatch_task
96 0% 0% 0% devprob_task
97 0% 0% 0% rdp_snd_thread
98 0% 0% 0% rdp_rcv_thread
99 0% 0% 0% rdp_slot_change_thread
100 4% 2% 1% datapkt_rcv_thread
101 0% 0% 0% keepalive_link_notify
102 0% 0% 0% rerp_msg_recv_thread
103 0% 0% 0% ip_scan_guard_task
104 0% 0% 0% ssp_ipmc_hit_task
105 0% 0% 0% ssp_ipmc_trap_task
106 0% 0% 0% hw_err_snd_task
107 0% 0% 0% rerp_packet_send_task
108 0% 0% 0% idle_vlan_proc_thread
109 0% 0% 0% cmic_pause_detect
110 1% 1% 1% stat_get_and_send
111 0% 1% 0% rl_con
112 75% 80% 90% idle

ü ÞM6,X ë>< È Ô ,X 3 > Ú ÿ></ 2Ï4³ ü ÔE¥ 5 /¦Js Ã ÔE¥ 1 ÚJs Ã ÔE¥5 ÚJs Y ,X CPU ý*ü)[™ ‰ Ä Ù À LISR ÃHISR ` Ï u Å Ä ßM6 í K ',X CPU ý*ü)[Ú × ™ ‰ Ä J È!£ Ô ë,X ÿ V ß Ö

z No Ö c Ë

z 5Sec Ö!£ Ô> ></ ,X Ï u ÔE¥ 5 /¦Js Y,X CPU ý*ü)[

z 1Min Ö!£ Ô> ></ ,X Ï u ÔE¥ 1 ÚJs Y,X CPU ý*ü)[

z 5Min Ö!£ Ô> ></ ,X Ï u ÔE¥ 5 ÚJs Y,X CPU ý*ü)[

>< ,X ! 2 > !¨EW(M!^ ÈÚ ÿ></ Ý LISR ,X CPU ý*ü)[` Ý HISR ,X CPU ý*ü)[È ¢1 3 > Ô Ÿ È ></ Ï u,X CPU ý*ü)[Z Ä Ô â Ô > idle 4“/ß,X CPU ý*ü)[ÈC³ Windows ß,X System Idle Process Ô È></ 2Ï4³,X0NKÆ(Š Õ Ä ü ÞM6,X _ $ È idle 4“/ß 5 /¦ Y,X CPU ý*ü)[75% ÈAÈ â ' ! CPU Ý 75% Ø b0NKÆ(Š Õ Ä

11.1.2 cpu-log

?U ¹G!5B CPU ý*ü)[¹ « µ C?º ¥ *ü cpu-log Ä

cpu- log log-limit low_num high_num

Ï – DAÈ â Ð

log-limit 8× È ¤/ ,X Q ¸0ú

low_num CPU ý*ü)[?º ¥ "K¼L$

high_num CPU ý*ü)[?º ¥P¬K¼L$

Ï5 ,ÕA'5B Ð

T¬Ax ™ %2U3A¹Ð:5B¼L$

RGOS™ Q ¸ –5× `

y ·G!5B

,Â)

RGOS™ Q ¸ –5× ` 0
1 Ô0´ G!5B y · Q ¸ 1
1.1 y ·G!5B Q ¸ 1
1.1.1 async mode 2
1.1.2 bandwidth 3
1.1.3 carrier-delay 4
1.1.4 channel-group 4
1.1.5 clear controller e1 5
1.1.6 clear counters 6
1.1.7 clear interface 7
1.1.8 clear vlan 7
1.1.9 clock source 8
1.1.10 clock rate 9
1.1.11 controller e1 9
1.1.12 debug vlan 10
1.1.13 description 10
1.1.14 duplex 11
1.1.15 encapsulation 12
1.1.16 encapsula3(10)]TJ/TT3 1 Tf0 Tc 304.669 0 T30.5 112 EMC /Sn.v.0deTwt 5.503 0 Td[(ip.1)8(.....

1 `F¼ Ú y ·G!5B Q ¸ –5×) , Â

- loopback
- loopback local
- mac-address
- media-type
- mtu
- nrzi-encoding
- ratecontrol
- shutdown
- speed
- tunnel checksum
- tunnel destination
- tunnel key
- tunnel mode
- tunnel sequence-datagrams
- tunnel source
- using
- vlan port
- show controller e1
- show interface
- show vlans

1.1.1 async mode

ü y ·G!5B õ ã ß S*ü async mode Q ¸G!5B Ö!9 ·,X ¼ Ë ¹ 0 • ã È S*ü Q ¸,X no 6 ã ª#\!8NMG!5B Ä

async mode dedicated

no async mode

Ï – DAÈ â Đ

dedicated Ö 7¾ | õ ã

Ï Q ¸ õ ã Đ

y ·G!5B õ ã

Ï5 ,ÕA'5B Đ

þA'5B Ö!9 ·,X ¼ Ë ¹ 0 • ã

Ï S*ü Û + Đ

ü7¾ | õ ã ß È Ý,X #A, # 7¾ | ` ä Ä

ü S*ü V p4“CÃG›*ü Ö!9,ÈE²,X • ã ÈG!5B!8 Q ¸ Ê Ã6ÑF V ß ¤
/ Ö

1.1.3 carrier-delay

ü y ·G!5B õ ã ß S*ü Q ¸ carrier-delay ü y ·A'5BEQ"¶ Ê Ê È S*ü Q ¸,X no 6 ãE¨ ²5 ,Õ Ä

carrier-delay [*seconds*]

no carrier-delay

Ï – DAÈ â Ð

seconds Ö ÃEÝ – D È ¹/¦) ! È8× È 0 60 /¦

Ï5 ,ÕA'5B Ð

EQ"¶ Ê Ê5 ,Õ 2 /¦

Ï Q ¸ õ ã Ð

y ·G!5B õ ã

Ï S*ü Û + Ð

A¹ – D Û y ·JÒCÃ,XEQ"¶ "# µ Ë DCD ¢ Down (Š Õ Up (Š Õ,X Ê KÈ Ê Ê È V p DCD ü Ê Ê Y ¥*ó ¬ ê ÈFw 2Ï4³ Ú Ñ+9E-/¡,X(Š Õ,X ¬ ê5à á7Ç b Þ ,X D BJÒCÃ G¡ „ # Ä V p – DA'5B ,X!¨EW û ÈFw ´ "!£ õ-€KÈ DCD ¬ ê Ú ´"©>• "# ×¸Ì ¡ ÈV p – DA'5B ä 0 È Fw !£ õ , ã,X DCD µ Ë CÇ ¬FÑ Ú>•2Ï4³ "# ÈE- 2Ï4³ 3 Ú r t á0 n û Ä

V p DCD EQ"¶ • ÊKÈ!¨EWKS ÈFw ÚA¹ – DA'KS o È Ã ¹ ¿ tEóCÃ + " 6. È ¹ "CÃ+ >< Ã ¹EW ¿,X / Ä V p,Ì ¡ ÈDCD EQ"¶ • ÊKÈ ã bCÃ+ " 6. 8…,X ÊKÈ ÈFw hA¹ ÚA¹ – DA'5B,Ì Í,X û o È¹ !Eô ä"u Ý ™?U,XCÃ+ 95 Ä

Ï _ Ð

¹ ß,X _ $/ 8×G!5B · 0 ,XEQ"¶ Ê Ê 5 /¦ Ö

```
Ruijie(config)#          interface serial          0
Ruijie(coinfig)#          carrier-delay          5
```

1.1.4 channel-group

ü CE1 ¹ 0 õ ã ß ÈÚ CE1 ,X ÊLm ÚG!4- Û n,XEîF'4˜ channel-group È Q ¸,X no 6 ã ª#\ Û n,XEîF'4˜,X ÊLm ÚG! Ä

channel-group *channel-group* timeslots *timeslot-range*

no channel-group *channel-group*

´

Ï S*ü Û + Ð

Ô8 ™ ‰ ß áLÔ?UE¯> á ! ¡ 0 Ä

Ï _ Ð

V?U á ! 1 Ë Ñ0Ã · Ë 0 ,X E1 { < Ä

Ruijie# clear controller e1 1/0

Ï,Ì G Q ¸ Ð

´

1.1.6 clear counters

ü(M *ü õ ã ß S*ü Q ¸ clear counters #ÙL8 y ·,XEîA*ƒ* – D,X4³Au Au D Ä

clear counters [*interface-type slot-number/interface-numbe*r]

Ï – DAÈ â Ð

interface-type Ö y ·2O _ È _ V Öserial Èasync 1 È?• y ·2O _ ë >< Ä

Slot-number/interface-number Ö ¤/¡ y ·2O _,X Ñ Ë/ 0Ã · Ë Ä

Ï Q ¸ õ ã Ð

(M *ü õ ã

Ï S*ü Û + Ð

y · Þ,X4³Au µ CLc- EîA*ƒ*,X ¬ ê á • ¬ ê ÈÝ Ê È ZFS ! ¹ TEîA*ƒ* 4³Au µ C F D ÈÚ y · 4³Au µ C#ÙL8 ÈŒ- ' ! 4³Au µ C Ã ¹ V r ¡ ô ' ! y · Ê,XEîA*ƒ*(Š ‰ Ä

Ï _ Ð

#ÙL8 · 1/0 ,X4³AuAu D È*ü V ß,X Q ¸ Ö

Ruijie# clear counters serial 1/0

Ï,Ì G Q ¸ Ð

Q ¸	S*üAÈ â
show interface	/ ¤ þ y ·,X.@ Ê4³Au µ C ¹ žJÒCÃ EîA*ƒ*(Š Õ

1 `F¼ Ú y ·G!5B Q ¸ –5×

1 Ô0´ y ·G!5B Q ¸

VLANID Ö ?U#ÙL8 Û nVLAN 4³Au µ C,X4ê Ë È Ý 1 4095
KÈ,X H D Ä

"u Ý Û n *vlanid* #ÙL8 Ý VLAN ,X4³Au µ C Ä

1.1.10 clock rate

ü y ·G!5B õ ã ß S*ü Q ¸ clock rate ü y · ÞA'5B YF¼ ÊJsEó)[Ä

clock rate *bps*

no clock rate

Ï – DAÈ â Ð

bps Ö ?U Û n,X"¶(M ÊJs È) ! !¨(M!£/¦ Äbps Å

Ï Q ¸ õ ã Ð

y ·G!5B õ ã

Ï5 ,ÕA'5B Ð

y ·"u ÝA'5B YF¼ ÊJsEó)[

Ï S*ü Û + Ð

RGOS 2Ï ëA' Û Õ EIT/TIA-232 ÃV.35 ÃRS-449 1 DTE ` DCE ,X+ 4Ú4" È J S*ü DCE + 4Ú4" Ã ¹ ¤ o YF¼ ÊJs o ·E² y ÈDCE ê5Ù DTE + 4Ú4" Ã ¹>•7¾ |Aš ÿ È V p DCE + 4Ú4" È ™NOG!5B ÊJs – D È ÊJsEó)[ª 8× È Ö 1200 Ã2400 Ã4800 Ã9600 Ã19200 Ã38400 Ã 57600 Ã64000 Ã115200 Ã128000 Ã 256000 Ã512000 Ã1024000 Ã 2048000 Ã4096000 Ã8192000 Ä

J È V p S*ü EIT/TIA-232 + 4Ú4" È J ÊJs á Ã ¹CYE› 128000 Ä

Ï _ Ð

¹ ß,X _ $/ 8× ü à!9 > y · ÞA'5B ÊJs

```
Ruijie(config)#          interface serial          1/0
Ruijie(config-if)#              clock rate       64000
```

1.1.11 controller e1

*ü bE¯ 9 Û n,X CE1 { < y ·G!5B Ä

controller e1 *slot/port*

Ï – DAÈ â Ð

slot Ö ?UA'5B,XE1 { < ü,X Ñ Ë

port Ö?UA'5B,XE1 { < ü Ñ ,X0Ã · c Ë

Ï Q ¸ õ ã Ð

< G!5B õ ã

Ï5 ,ÕA'5B Đ

´

Ï S*ü Û + Đ

ü < G!5B ß È S*üA¹ Q ¸E¯ 9 Û n,X CE1 y ·G!5B õ ã Ä

Ï _ Đ

V?U Í ü 1 Ñ0Ã · c Ë 1 ,X CE1 y ·E¯> G!5B Ä

Ruijie(config)# contr e1 1/1
Ruijie(config-controller)#

Ï,Ì G Q ¸ Đ

´

1.1.12 debug vlan

ü(M *ü õ ã ß S*ü debug vlan Q ¸ ' Ô VLAN ,XA×A© Ô G ÈS*ü Q ¸,X no 6 ã GKÁ VLAN ,XA×A© Ô G Ä

debug vlan

no debug vlan

Ï Q ¸ õ ã Đ

(M *ü õ ã

Ï _ Đ

ßM6,X/ _ ' Ô VLAN ÙA×A© Ô G Ö

Ruijie# debug vlan

1.1.13 description

ü y ·G!5B õ ã ß S*ü description Q ¸A'5B y ·,X £EÄ ÈS*ü Q ¸,X no 6 ã ôL8 y ·,X £EÄ Ä

description *string*

no description

Ï – DAÈ â Đ

string Ö A¹ y ·,X £EÄ +0ú

Ï Q ¸ õ ã Đ

y ·G!5B õ ã

Ï5 ,ÕA'5B Đ

´ y · £EÄ

Ï _ Đ

ü à!9 > y · Þ È ÛAš ÎA¹ y ·E² y*üEè Ö 2M ú ‘ ÈE² y E ð Ä

1.1.15 encapsulation

ü à!9 · ê5Ù Ö!9 · y ·G!5B õ ã ß S*ü Q ¸ encapsulation G!5B JÒCÃ #A,,X Õ>™ Q ¸ È S*ü Q ¸,X no 6 ã 6 á y ·,X #A, Õ>™ ê5Ù ª #\ y ·,X #A, Õ>™ Ä

encapsulation *encapsulation-type*

no encapsulation

Ï – DAÈ â Ð

encapsulation-type	**– DAÈ â**
frame-relay	Õ>™ û 4»JÒCÃ #A,
Hdlc	Õ>™P¬4{ D BJÒCÃ { #A, ÉHigh Data Link Control
Lapb	Õ>™X.25 1 ` #A, È G>5 ãJÒCÃA“KÂ?˜ /ß ÉLink Access Protocol ÈBalanced
Ppp	Õ > ™ & • & • J Ò C Ã # A , É Point-to-Point Protocol
Slip	Õ>™ > f6(#A, É Serial Line Internet Protocol
x25	Õ>™X.25 Ú4˜ x 6 #A,

Ï5 ,ÕA'5B Đ

5 ,ÕA'5B crc4

Ï S*ü Û + Đ

CE1 y · Õ Í CE1 (=)Ú ûE¯> crc4 õP` Ä

Ï _ Đ

A'5B CE1 y · áE¯> CE1 (=)Ú û,X crc4 õP` Ä

Ruijie(config-controller)# framing no-crc4

Ï,Ì G Q ¸ Đ

Q ¸	S*üAÈ â
using { e1 | ce1 }	G!5BCE1 y ·,X E1 ê CE1 ¹ 0 õ ã

1.1.18 hold-queue

ü y ·G!5B õ ã ß S*ü hold-queue Q ¸A'5B y · Ô û,XKó ë#Å z ÈS*ü Q ¸,X no 6 ã 6 á5 ,Õ Ä

hold-queue *length* { in | out }

no hold-queue { *length* | in | out }

Ï – DAÈ â Đ

length Ö y · y [Kó ë ± Õ,X Ô û,XKS z È ª 8× È Ö0 4096 Ä

in Ö Û n *length* A¹ y ·Eg 9Kó ë Ô û,XKS z È5 ,Õ 75 Ä

out Ö Û n *length* A¹ y ·Eg ÎKó ë Ô û,XKS z È5 ,Õ 40 Ä

Ï Q ¸ õ ã Đ

y ·G!5B õ ã

Ï5 ,ÕA'5B Đ

Eg ÎKó ëKS z ¹ þ5% 40 È à!9 Ö!9 · 64 ÈEg 9Kó ë 75

Ï S*ü Û + Đ

A' nEg 9Kó ëKS z ZL !6E› î,X D B y [´ E› =,X5%4°# G£5à$² +- ü4ç † ÈCY Î2Ï4³ y «6Ñ o,X y [Ú>• ö × Ä ¹ ü show inter face Ê Ã ¹,ß 4ç † ,X S*ü ™ ‰ Input queue: 0/75/ È0 drops (siz e/max/drops) È></ ' ! S*ü ™ ‰/ Ô ûKS z/ ö y [D Ä

V p üKó ëEg Î,X1*+9A'Au Þ h*ü Z ì 1 4{ ÈÆw Eg ÎKó ëKS z,XA' n

Ú á aCK 0*ü ÄEg ÎKó ë Ú+ Kó ë ì 4{1*+9 9 ‡ n Ä

Kó ëEg 9Eg Î,XA’5B ´ ú ‘ û ã5à Ö Äü!¨ "Eó ú ‘,XJÒCÃ y · ÈÎA, A’5B!¨EW ã,XEg ÎKó ë,XKS z ÈE- Ã ¹L !6 y [, |Eó)[CY ÎJÒCÃ,X ô EgEó)[×üP¬Eó,XJÒCÃ ú ‘ È ÎA,A’5B!¨EW û,XEg ÎKó ëKS z È<Q' + bJÒCÃ4 - ÈÝ Ê 9 á ž ¥EÕ D B È Ô ºJÒCÃ0NKÆ4ç † ,X D B \ • ç>• ¥EÕ Î • ÈFS ! ´ Kó ëKS z áC‡5àNe4 ö Ù Ä

Ï _ Ð

¹ ß,X _ $/ 8× ü · 0 A’5BEg 9Kó ë,X Ô ûKS z 256 Ö

```
Ruijie(config)#          interface serial          1/0
Ruijie(config-if)#             hold-queue      256 in
```

Ï,Ì G Q ¸ Ð

Q ¸	S*üAÈ â
show interface	

1.1.20 interface

ü < G!5B õ ã ß S*ü interface Q ¸E¯ 9 y ·G!5B õ ã Ä

interface *type slot-number/interface-number* [.sub-interface-number] [multipoint | point-to-point]

Ï – DAÈ â Ð

type Ö y ·2O _ ÈÂ ! Õ,X Ý Ehternet ÈFastEthernet ÈSerial ÈAsync Ã Loopback ÃNull ÃGroup-Async ÃDialer ÃBri 1 1 Ä

Slot-number/port-number Ö y · Ë È+ Ñ Ë/ 0Ã · Ë4˜ ä È Ñ Ë></ A¹ y · üA' Û,X ¾ þ Ñ Þ Ä S Þ y ·,X Ñ Ë 0 ÅÈ0Ã · Ë></ A¹ y · ü ¤ þ Ñ Þ,XNN c Ë Ä

.sub-interface-number ÖEÖ*ü b û 4» ê5Ù X.25 ,X $ y · Ë Ä

multipoint Ö $ y · &• î&•2O _ Ä

point-to-point Ö $ y · &• &•2O _ Ä

Ï Q ¸ õ ã Ð

< G!5B õ ã

Ï _ Ð

ü à!9 > y · Õ>™ PPP #A,

```
Ruijie(config)#          interface serial          1/0
Ruijie(config-if)#             encapsulation ppp
```

ü à!9 > y · Õ>™ û 4» È $ y · serial1/0.1 Õ>™&• î&• $ y · È $ y · seiral 1/0.2 Õ>™&• &• $ y ·

```
Ruijie(config)#          interface serial          1/0
Ruijie(config-if)#             encapsulation frame-relay ietf
Ruijie(config-if)#             exit
Ruijie(config)#          interface serial          1/0.1     multipoint
Ruijie(config-subif)#             ip address       10.1.1.1 255.255.255.
0
Ruijie(config-subif)#             frame-relay interface-dlci                22 b
roadcast
Ruijie(config-subif)#             exit
Ruijie(config)#          interface serial          1/0.2     point-to-point
Ruijie(config-subif)#             frame-relay interface-dlci                33 b
roadcast
Ruijie(config-subif)#             exit
```

Ï,Ì G Q ¸ Ð

Q ¸	S*üAÈ â
show interface	/ ¤ þ y ·,X.@ Ê4³Au µ C ¹ žJÒCÃ EîA ƒ(Š Õ

1.1.21 interface group-async

ü < G!5B õ ã S*ü Q ¸ interface group-async 9 ï Î Ö!9 > 4˜ y · È S*ü Q ¸,X no 6 ã ª#\!8NMG!5B Ä

interface group-async *unit-number*

no interface group-async unit *-number*

Ï – DAÈ â Ð

unit-number Ö ?U ï Î,X Ö!9 > y ·4˜,X4˜ Ë Ä ' !2Ï4³ Ã ¹ ï Î ,X Ö!94˜ y ·,X DG£ áCYE›2Ï4³ Ö!9 ·,X DG£ Ä

Ï Q ¸ õ ã Ð

< G!5B õ ã

Ï5 ,ÕA'5B Ð

A¹ y · ï Î Ê ! {*ó È5 ,Õ "u ÝE- þ y ·

Ï S*ü Û + Ð

Ö!9 · Ã6Ñ Ý \ î,X y ·,X><)„> FÑ Ô ,X È _ V Ö 8 Ö!9 > y ·,X õ + üE°/ß ¼ 9,X • È V p*ü 4»4“CÃE² y PSTN È Ú y « à Ô þ ¼ 9 Ë-Õ ÈLÔ?U Û n à Ô þ IP È ¹*ü Ö!9 ·4˜ y · 9 4¥ Ý ¼ Ë> (M û Ô7È,X y ·!¨EW ÜEÖ Ä ü Ö!9 > 4˜ y · È*ü group-range Q ¸ 9 Û n>• 4¥,X Ö!9 > y · Ä à Ô ÄA' Û Ã ¹ ï Î á à,X Ö!9 > 4˜ È¹EÖ h á à(M û,X ¼ 9 • È Ö!9 > y · ¾6Ñ à Ê>• 4¥ Ö!9 > 4˜ Ô õ È á6Ñ á*ü Ä

Ï _ Ð

ßM6,X Q ¸ Ú ï Î Ö!9 > 4˜ y · È*unit-number* 1 Ö

Ruijie(config)# interface group-async 1

Ï,Ì G Q ¸ Ð

,Ì G Q ¸	S*üAÈ â
group-range	Û n>• 4¥,X Ö!9 > 4˜,X ä , ë><
member	Û n Z ¤ þ4˜ ,,X Ö!9 > y ·,X>

1.1.22 invert txclock

V p ü à!9 y · ÞG!5B ¥EÕ ¡E@ ÊJs*ü Q ¸ invert txclock È S*ü Q ¸ ,X no 6 ã ª#\!8NMG!5B Ä

invert txclock

no invert txclock

Ï Q ¸ õ ã Ð

y ·G!5B õ ã

Ï5 ,ÕA'5B Ð

¥EÕ ÊJs áE¯> ¡E@

Ï S*ü Û + Ð

V p à!9 > y · áE¯> ÊJs,X ¡E@ ÈÆw D B µ Ë,X ÊJsG› Ú *ü Ê Js µ Ë,X Þ '"“ È V pG›*ü ¡E@ ÊJs ÈG› D B ÚG›*ü ßL!'"“ È 3 ÊJs Ú ¡E@ 180 z Ä ü ¤ o MODEM ` à!9 ·E² y Ê È Ý Ê Ý ™?U S *ü ¡E@ ÊJs 9 P • MODEM ,X ÊJs D B,XG› Ä

Ï _ Ð

¹ ß,X _ $/ 8× ü à!9 > y · 0 G›*ü ¡E@ ÊJs

Ruijie(config)# interface serial 1/0

y ·"u ÝG!5B IP

Ï S*ü Û + Ð

L8M2 á S*üIP #A, È ú í Ô þ y · áAŽ (=)Ú,X ê5Ù F Ee,X y · ÈFÑ ™NO ÝP e Ä S*ü ip address " J Ô *ü,X •"© Ä

üA'5B IP Ê È?U" ™NO 0ú Ü IP ,XG!5B?˜ í È ™NO ` J W y · á ü à Ô þ5%!‰ È™NO ` à Ô þ ³5%,X J W ê5Ù Ý A' Û á à Ô þ IP È ú í Ú Î)„5%4°EîA*ƒ*KÂNl Ä

à Ô þ y · Ã ¹ à ÊG!5B î þ IP È5à è á ™ ™ ¾ Ý ø þ ÈE-&• Ã ¹ *ü secondary – D 9G!5B Ä

Ï _ Ð

¹ ß,X _ $ ü ¹ þ5% y · ÞA'5B IP Ö

Ruijie(config)# interface fastethernet *0/0*
Ruijie(config-line)# ip address *192.168.12.1 255.255.255.0*

Ï,Ì G Q ¸ Ð

,Ì G Q ¸	S*üAÈ â
ip unnumbered	ó*ü J W y ·,X IP

1.1.24 ip unnumbered

ü y ·G!5B õ ã ß S*ü ip unnumbered Q ¸A'5B ó*ü J W y · IP ,X Q ¸ È S*ü Q ¸,X no 6 ã ª#\!8NMG!5B Ä

ip unnumbered *type interface-number*

no ip unnumbered

Ï – DAÈ â Ð

type Ö y ·2O _ Ä

Interface-number Ö ¤/¡ y ·2O _ Í h,X y · Ë Ä

Ï Q ¸ õ ã Ð

y ·G!5B õ ã

Ï S*ü Û + Ð

IP Ã ¹ ü á à,X y · KÈ ó*ü È ü ¤ o • È _ V ¼ õ ÕìÍ 6 ã º% aÍ h

type	y ·2O _
async	Ö!9 > y ·
dialer	F Ee ¼ Ë y ·
Fastethernet	10/100M ¿Eó ¹ þ5% y ·
loopback	Loopback y ·
null	0N y ·
serial	à!9 > y ·
Bri	ISDN ·

Ï _ Ð

¹ ß,X _ $/ 8× Ú Loopback 0 y ·,X IP *192.168.12.1/24* ó*ü4-· 0 Ö

```
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
```

1.1.25 keepalive

Q ¸ *ü y · keepalive y [¥EÕ s6Ñ È ?U *ü 9 ¥EÕ keepalive y [Ä J no 6 ã Ú/U!6 keepalive s6Ñ Ä

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

no keepalive

Ï – DAÈ â Ð

keep-period Ö RGOS ¥EÕ keepalive y [,X < ó È) ! /¦ Ä V pA¹ 0 ÈAÈ â RGOS Ú á ¥EÕ keepalive y [Ä2Ï4³T¬Ax,X5 ,Õ 10 /¦ Ä

Í b ¹ þ · ÈA¹ Q ¸E¬ Ã ¹ ú ßM6 Ý þEÝNMÄ*ü b7¾ | "# ¹ þ ·,XJÒCÃ (Š Õ ÅÖ

dns *ip* Ö A¹ Q ¸ – D*ü 9 ` äE°0Ã,X dns á u < "# È2Ï4³ Ú ü!£ þ keepalive ÊKÈ < ó ,X Ê í åE- þG!5B,X ip ¥EÕ dns AË" ÈV pE² 4Á3 õFÑ k á ² h È í î • Ô,Ì h,X ¹ þ · Ä

ping *ip* Ö A¹ Q ¸ – D*ü 9 ` äE°0Ã,X ¤ þ ip ,X ping "# È2Ï4³ Ú ü!£ þ keepalive ÊKÈ < ó ,X Ê í åE- þG!5B,X ip ¥EÕ ping "# AË" È V pE²4Á 3 õFÑ k á ² h È í î • Ô,Ì h,X ¹ þ · Ä

Ï5 ,ÕA'5B Ð

5 ,Õ ™ ‰ ß È ¹ þ5% · "u Ý *ü keepalive s6Ñ,X Ä

5à Í b J ª S ³5% y · È+ b!£/¡ S ³5%JÒCÃ #A,,X5 ,Õ keepalive < ó ÊKÈ á à ÈE-G á Ô Ô ë Z Ä

Ï Q ¸ õ ã Ð

y ·G!5B õ ã

Ï S*ü Û + Ð

üEî ,X S ³5% y · Þ ÈÕ>™,XJÒCÃ #A, Î ÞFÑLÔ?U keepalive È *ü ¹4È xJÒCÃ #A,,X!7 ¹ 0 ÈÆîE›G!5BA¹ Q ¸ È Ã ¹A'5BJÒCÃ #A, ,X keepalive < ó ÊKÈ È ¢5à { ¥EÕ keepalive y [,X ÊKÈ Ä

ü ¹ þ5% y · Þ ÈA¹ Q ¸ Ã ¹EîE› =)EÝNM È 9EÝ ½ ¥EÕ ping y [E¬ dns y [È*ü 9 "# A¹ ¹ þ5% · `E°0Ã,X ¤ þ ip úEîAƒ!7 Ä

=) Q ¸ ¥EÕ ping y [ê5Ù dns y ["# È Ý Ô n,X S*ü 5 ÊL$ Ö

1. ¾EÖ*ü b ¹ þ5% y · Ä
2. ¹ þ5% y · Þ S*üM- Õ IP Ä
3. ' ¥EÕ ping ê dns y [,X,Â Û IP C³ y · á ü à Ô þ5%!‰,X Ê í È?U" ÝG!5B üA¹ y · Þ,XM- Õ5 ,ÕCÃ+ Ä

Ï _ Ð

¿ ü ¹ þ5% · Fastethernet 0/0 ÞA'5B ¹ þ5% · ping y [7¾ | "# s6Ñ

Ruijie#

1.1.26 linecode

A’5B CE1 y ·,X4“CÃ4ê?··Õ ã È Q ¸,X no 6 ã 6 á5 ,Õ,X4“CÃ4ê ?··Õ ã Ä

linecode {ami | hdb3 }

no linecode

Ï – DAÈ â Ð

ami ÖA’5B4“CÃ4ê?··Õ ã AMI

hdb3 Ö A’5B4“CÃ4ê?··Õ ã HDB3

Ï Q ¸ õ ã Ð

CE1 y ·G!5B

Ï5 ,ÕA’5B Ð

5 ,ÕA’5B Öhdb3

Ï S*ü Û + Ð

CE1 y · Õ ø/¡4“CÃ4ê?··Õ ã ÖAMI ` HDB3 Ä

Ï _ Ð

A’5B CE1 y ·,X4“CÃ4ê?··Õ ã AMI

Ruijie(config-controller)# linecode ami

Ï,Ì G Q ¸ Ð

´

1.1.27 load-interval

ü y ·G!5B õ ã ß S*ü load-interval Q ¸ Û n Ô þ y ·,XBóEQAu1k,XKÈ Lh ÊKÈ È S*ü Q ¸,X no 6 ã 6 á5 ,ÕG!5B Ä

load-interval *seconds*

no load-interval

Ï – DAÈ â Ð

seconds Ö /¦ È ª 8× È 30 600

Ï Q ¸ õ ã Ð

y ·G!5B õ ã

Ï5 ,ÕA'5B Ð

300 /¦

Ï S*ü Û + Ð

ü y · *ü!8 Q ¸ Ã ¹ Û n!£Lh î å ÊKÈAu1k y [Eg 9Eg Î,XBóEQ ™ ‰ È Ô8 !£Lh 5 ÚJsAu1k Ô õ!£/¦ Eg 9Eg Î,X y [D `!¨(M D Ä þ _ $ È V p ü y · serial 0 Ú!8 – D È ä 180 /¦ È*ü show interface serial 1/0 Ã ¹,ß Ö

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

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

Q ¸ ´ Ä

Ï _ Ð

¹ ß,X _ $/ 8× ü à!9 · 0 ÞA'5B Q ¸ loopback Ö

Ruijie(config)# interface serial 1/0
Ruijie(config-if)# loopback

Ï,Ì G Q ¸ Ð

Q ¸	S*üAÈ â
show interface	/ ¤ þ y ·,X.@ Ê4³Au µ C ¹ žJÒCÃ EîA ƒ(Š Õ

1.1.29 loopback local

A'5B E1 y ·,X7¾)ƒ • ã È,Â ! ¾ Õ 7¾)ƒ Ô/¡ • ã È Q ¸,X no 6 ã ª#\ E1 y ·,X7¾)ƒ ¹ 0 • ã È 6 á!7 ¹ 0 • ã Ä

loopback {local }

no loopback

Ï – DAÈ â Ð

local ></ 7¾)ƒ Ä

Ï Q ¸ õ ã Ð

E1 y ·G!5B

Ï5 ,ÕA'5B Ð

5 ,Õ /U!6 7¾)ƒ Ä

Ï S*ü Û + Ð

üE¯> ¤ o(M!^ s6Ñ,X# A© Ê È!LÔ?U Ú E1 y ·G!5B ä 7¾)ƒ ¹ 0 • ã Ä ¾ Ý Ú controller ·G!5B E1 õ ã ! Ã ¹ S*üA¹ Q ¸ Ä

Ï _ Ð

A'5B AŒE1 y · 7¾)ƒ Ä

Ruijie(config-controller)# loopback local

Ï,Ì G Q ¸ Ð

´

1.1.30 mac-address

S*ü mac-address Q ¸ ü y · ÞA’5B(=)Ú MAC ÈS*ü Q ¸,X no 6 ã ª#\ MAC ,XA’ n Ä

mac-address *H.H.H*

no mac-adderss

Ï – DAÈ â Ð

H.H.H Ö MAC È*ü 16 E¯ Eg 9 È£ þ H Ã ¹Eg 9,X 2 þ +8V È ¹E- þ – D *ü 6 þ +8V È48 !¨(M Ä

Ï Q ¸ õ ã Ð

y ·G!5B õ ã

Ï5 ,ÕA’5B Ð

2Ï4³ ÚG›*ü Î V,XA’5B

Ï S*ü Û + Ð

!£ þ ¹ þ5% ·FÑ Ý Ô þ <)× Ô,X MAC Ä V pLÔ?U È ¹ þ5% y ·,X MAC Ã ¹ Â È ™NO ±A• à Ô ³5% Þ MAC ,X Ô û Ä MAC ,XG!5B Ã6Ñ î E ¡ Z ³5% YF¼,XEîA*ƒ* È'u Ý ™?U,X ™ ‰ ß Èá ÎA, *ü 7¾> G!5B MAC Ä

Ï _ Ð

¹ ß,X _ $/ 8× ü ¹ þ5% y · G!5B MAC Ö

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

basex force

MTU ,XA’5B Ã6Ñ î E ¡5%4°,X ò äG£ ` Ê Ê È5à è MTU ,XA’5B Ô8 ?U ,ß î u h*ü ` ú ‘ û ã4Ð Ü5×<% ÄV p î/¡ î u#Ë Ü S*ü ÈJ Ô/¡ î u ,X r Ê û?U" !¨EWP¬5à è D BKS z!¨EW ã È¨ VAÁMÇ ôEg È5à º ê Ô/¡ î u,X D B á K Û r Ê?U" ¡5à D BKS z!¨EW û 4*ü!¨EW û,X ú ‘C $d È¨ V FTP D B ôEg Ä!8 Ê È Ú MTU A’5B k!¨EW ã È Ú Ý ý b á à î u D B Í b ú ‘,X G ÚG! Ä

Ï _ Ð

ü à!9 · y · 0 KÈMTU A’5B ä 576

```
Ruijie(config)#          interface serial          1/0
Ruijie(config-if)#             mtu 576
```

1.1.33 nrzi-encoding

ü y ·G!5B õ ã ß S*ü nriz-encoding Q ¸ Ã ¹A} à!9 > y ·,X4ê-Õ • ãA’ ä ¡E@M2 &LÊ NRZI ÄNonReturen-to-Zero Invert Å õ ã Ä S*ü Q ¸,X no 6 ã 6 á ä5 ,ÕG!5B NRZ ÄNonReturen-to-Zero Å4ê-Õ • ã Ä

nrzi-encoding

no nrzi-encoding

Ï Q ¸ õ ã Ð

y ·G!5B õ ã

Ï5 ,ÕA’5B Ð

NRZ M2 &LÊ õ ã

Ï S*ü Û + Ð

ûF¼ Ú,X à!9 y ·FÑ Õ NRZI ` NRZ 4ê-Õ õ ã È¨ü NRZ ,X4ê-Õ õ ã ÈÊ a Ð,@0cj5ÙÐ,@0

1.1.34 ratecontrol

ü(M G!5B õ ã ß S*ü ratecontrol Q ¸ Ã ¹L$ LAN ·,XEg ÎEg 9 ú ‘ Ä

Ratecontrol lan *port-number* in *rate-value* out *rate-value*

no ratecontrol lan *port-number*

Ï – DAÈ â Ð

port-number Ö <0,3> È0Ã · Ë È></ LAN0 LAN3 ,X ¤ þ · Ä

Rate-value Ö Eó)[ÈÔ å 64Ä></ 64K ÅÈÔ û 102400Ä G 100M ÅÄ ü 64 1792 KÈ È ÃA’5B,XEó)[¹ 64 Eæ r È ü 2048 102400 KÈ È Ã A’5B,XEó)[¹ 1024 Eæ r Ä

Ï Q ¸ õ ã Ð

(M G!5B õ ã

Ï5 ,ÕA’5B Ð

LAN ·,XEg ÎEg 9 ú ‘FÑ 100M Ä

Ï S*ü Û + Ð

Q ¸ ¾EÖ*ü b NBR1000

Fw Û/ &C Ú GKÁ Ä5à üA’ Û,X à!9 · Û/ &C 3 î&A] Ä

V p Ô þ y · G K Á , X A ± È * ü Q show interface Ã ¹ , ß is administratively down ,X ¤/ Ä

Ï _ Ð

¹ ß,X _ $/ 8× GKÁ à!9 · 0

Ruijie(config)# interface serial 1/1
Ruijie(config-if)# shutdown
%LINK CHANGED: Interface serial 1/1, changed state to administratively down

Ï,Ì G Q ¸ Ð

Ï S*ü Û + Ð

ü S*ü5% ·7¾EÖ h,X s6ÑA'5B Ê ÈL8 ZA'5Bspeed – D ¹ ê ÈE¬ hA¹A' 5B dulpex È 3 ¹ õ ã ` 10/100M Eó)[7¾EÖ h Ä J dulpex ` speed Q ¸ s6Ñ,X S*ü V ß>< Ö

dulpex	speed	**¹ 0 õ ã**
full	10	> ¹ 0 ü 10M < ¹ õ ã
Full	100	> ¹ 0 ü 100M < ¹
Half	10 < Pš,;•	> ¹ 0 ü 10M ¹ 0019 Tc 5.251 0 Td(17.4]4 re98 r ref501

ü tunnel 0 y · ÞG!5B checksum Q ¸

Ruijie(config)# interface tunnel 0
Ruijie(config-if)# tunnel checksum

Ï,Ì G Q ¸ Ð

Q ¸	S*üAÈ â
show interface tunnel	/ tunnel y ·,Ì G,X µ C s

1.1.39 tunnel key

1.2 / ,Ì G Q ¸

1.2.1 show controller e1

/ CE1 y ·,X,Ì G µ C

show controller e1 [*slot/port*]

Ï – DAÈ â Ð

slot Ö E1 { < ü,X Ñ Ë

port Ö E1 { < ü Ñ ,X0Ã · c Ë

Ï Q ¸ õ ã Ð

(M *ü õ ã

Ï5 ,ÕA'5B Ð

´

Ï S*ü Û + Ð

Q ¸ / Ý,X CE1 y · ê Û n CE1 y ·,X,Ì G µ C È- o µ C Ù À Ö CE1 y ·(=)Ú(Š Õ Ã ¹ 0 õ ã Ã û õP` • ã Ã4"CÃ4ê?··Õ ã ¹ ž à!9 ÊJs$d1 µ C Ä

V p þ Û n K ',X CE1 y · È íE¬ / ' ! 15 ÚJs žE› • 24 ã Ê Y ,X4³Au µ C Ä

V p Û n K ',X CE1 y · È íE¬ / ' ! 15 ÚJs ÃE› • 24 ã Ê Y!£ 15 ÚJs žE› • 24 ã Ê ,X4³Au µ C Ä

Ï _ Ð

/ Ý CE1 y ·,X,Ì G µ C Ä

```
Ruijie#      show controller       e1
E1 1/0 is down.
Applique type is Channelized E1 - balanced
Receiver has no alarms.
Framing is crc4, Line Code is hdb3, Clock Source is line
Data in current interval (446 seconds elapsed):
0 Line Code Violations, 0 Path Code Violations
0 Slip Secs, 0 Fr Loss Secs, 0 Line Err Secs, 0 Degraded
Mins
0 Errored Secs, 0 Bursty Err Secs, 0 Severely Err Secs,
0 Unavail Secs
Total Data (last 9 fifteen minute intervals):
```

0 Line Code Violations, 0 Path Code Violations
0 Slip Secs, 0 Fr Loss Secs, 0 Line Err Secs, 0 Degraded Mins
0 Errored Secs, 0 Bursty Err Secs, 0 Severely Err Secs, 0 Unavail Secs
E1 1/1 is down.
Applique type is Channelized E1 - balanced
Receiver has no alarms.
Framing is crc4, Line Code is hdb3, Clock Source is line
Data in current interval (446 seconds elapsed):
0 Line Code Violations, 0 Path Code Violations
0 Slip Secs, 0 Fr Loss Secs, 0 Line Err Secs, 0 Degraded Mins
0 Errored Secs, 0 Bursty Err Secs, 0 Severely Err Secs, 0 Unavail Secs
Total Data (last 9 fifteen minute intervals):
0 Line Code Violations, 0 Path Code Violations
0 Slip Secs, 0 Fr Loss Secs, 0 Line Err Secs, 0 Degraded Mins
0 Errored Secs, 0 Bursty Err Secs, 0 Severely Err Secs, 0 Unavail Secs
E1 1/2 is down.
Applique type is Channelized E1 - balanced
Receiver has no alarms.
Framing is crc4, Line Code is hdb3, Clock Source is line
Data in current interval (446 seconds elapsed):
0 Line Code Violations, 0 Path Code Violations
0 Slip Secs, 0 Fr Loss Secs, 0 Line Err Secs, 0 Degraded Mins
0 Errored Secs, 0 Bursty Err Secs, 0 Severely Err Secs, 0 Unavail Secs
Total Data (last 9 fifteen minute intervals):
0 Line Code Violations, 0 Path Code Violations
0 Slip Secs, 0 Fr Loss Secs, 0 Line Err Secs, 0 Degraded Mins
0 Errored Secs, 0 Bursty Err Secs, 0 Severely Err Secs, 0 Unavail Secs
E1 1/3 is down.
Applique type is Channelized E1 - balanced
Receiver has no alarms.
Framing is crc4, Line Code is hdb3, Clock Source is line
Data in current interval (446 seconds elapsed):
0 Line Code Violations, 0 Path Code Violations
0 Slip Secs, 0 Fr Loss Secs, 0 Line Err Secs, 0 Degraded

0 Errored Secs, 0 Bursty Err Secs, 0 Severely Err Secs,
0 Unavail Secs
Data in Interval 5:
0 Line Code Violations, 0 Path Code Violations
0 Slip Secs, 0 Fr Loss Secs, 0 Line Err Secs, 0 Degraded
Mins
0 Errored Secs, 0 Bursty Err Secs, 0 Severely Err Secs,
0 Unavail Secs
Data in Interval 6:
0 Line Code Violations, 0 Path Code Violations
0 Slip Secs, 0 Fr Loss Secs, 0 Line Err Secs, 0 Degraded
Mins
0 Errored Secs, 0 Bursty Err Secs, 0 Severely Err Secs,
0 Unavail Secs
Data in Interval 7:
0 Line Code Violations, 0 Path Code Violations
0 Slip Secs, 0 Fr Loss Secs, 0 Line Err Secs, 0 Degraded
Mins
0 Errored Secs, 0 Bursty Err Secs, 0 Severely Err Secs,
0 Unavail Secs
Data in Interval 8:
0 Line Code Violations, 0 Path Code Violations
0 Slip Secs, 0 Fr Loss Secs, 0 Line Err Secs, 0 Degraded
Mins
0 Errored Secs, 0 Bursty Err Secs, 0 Severely Err Secs,
0 Unavail Secs
Data in Interval 9:
0 Line Code Violations, 0 Path Code Violations
0 Slip Secs, 0 Fr Loss Secs, 0 Line Err Secs, 0 Degraded
Mins
0 Errored Secs, 0 Bursty Err Secs, 0 Severely Err Secs,
0 Unavail Secs
Total Data (last 9 fifteen minute intervals):
0 Line Code Violations, 0 Path Code Violations
0 Slip Secs, 0 Fr Loss Secs, 0 Line Err Secs, 0 Degraded
Mins
0 Errored Secs, 0 Bursty Err Secs, 0 Severely Err Secs,
0 Unavail Secs

Ï¸Ì G Q ¸ Ð

´

1.2.2 show interface

ü(M *ü õ ã ê BEî*ü õ ã ß S*ü show interface Q ¸ 9 / ¹,ß (M n y ·,X(Š Õ Æ4£4³Au µ C Ä

show interface *type interface-number*

Ï – DAÈ â Ð

type Ö Û y ·2O _

interface-number Ö Û(M n y ·,X0Ã · Ë

Ï Q ¸ õ ã Ð

(M *ü õ ã ê BEî*ü õ ã

Ï S*ü Û + Ð

S*ü show interface Q ¸ Ã ¹ ¹,ß,X µ C Ù À Ý Ö y · ` #A,,X(Š Õ Ã MTU ÃBandwidth ÃLoopback (Š Õ Ã y ·Kó ë,X1*+9 `Kó ë S*ü ™ ‰ Ã #A,EîA*ƒ*,X ™ ‰ Ãy · Þ,X y [Eg 9Eg Î ¹ ž ÂJí1 EîA*ƒ* ™ ‰ ÈJÒCÃ,X(=)Ú(Š Õ ÄÃ ¹,ß Î ø • Ô þ y ·,X D BJÒCÃ ¹ ß,X S*ü ™ ‰ È- þ Q ¸ Ô *ü,X Ä

ü "Eó y · Þ È y ·T¬Ax,XKó ë1*+95 ,Õ WFQ Ä

üP¬Eó y · Þ Èy ·T¬AxG›*ü FIFO Kó ë1*+9Ä 3 E¯ ÎKó ë ÅÊ È S*ü show interface Q ¸ Ã ¹,ß ÎKó ë,X S*ü ™ ‰ Ö Queueing strategy: fifo Output queue 0/40, 0 drops; input queue 0/75, 0 drops ÈEg ÎKó ë ' ! S*ü 0 È Ô û 40 È ö Ù 0 ÈEg 9Kó ë ' ! S*ü 0 È Ô û 75 È ö Ù 0

Ï _ Ð

/ ¿Eó ¹ þ5% y · FastEtheret 0 ,X µ C

```
Ruijie# show interface fastEthernet 0/0
FastEthernet 0/0 is UP , line protocol is UP
Hardware is Nat-Semi DP83815DVNG FastEthernet, 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
```

(M *ü õ ã

Ï5 ,ÕA'5B Đ

V p"u Ý Û n VLAN

1 `0´ CE1 y ·G!5B Q ¸

0´,X Q ¸ Ý G b CE1 y · Q ¸F¼ Ú Ä

2.1 y ·G!5B Q ¸

y ·,Ì G,XG!5B Q ¸ V ß ë Ö

- channel-group
- clear controller e1
- clock source
- controller e1
- framing
- linecode
- loopback local
- show controller e1
- using

2.1.1 channel-group

ü CE1 ¹ 0 õ ã ß ÈÚ CE1 ,X ÊLm ÚG!4- Û n,XEîF'4˜ channel-group È Q ¸,X no 6 ã ª#\ Û n,XEîF'4˜,X ÊLm ÚG! Ä

channel-group *channel-group* timeslots *timeslot-range*

no channel-group *channel-group*

Ï – DAÈ â Ð

channel-group A¹ CE1 y · Þ,XEîF'4˜ Ë È ª 8× È 0-30 Ä

timeslot-range ÊLm8× È È Ã ¹ Û n) þ ÊLm È 3 Ã ¹ Û n î þ ÊLm È î þ ÊLm KÈ á Ô n?UE²4Á Ä ÊLm ª 8× È 1-31 Ä

Ï Q ¸ õ ã Ð

CE1 y ·G!5B õ ã

Ï5 ,ÕA'5B Ð

5 ,Õ þA'5B Ï) channel-group Ä

Ï S*ü Û + Ð

ü CE1 ¹0 õ ã ß ÈCE1 y·,X D B û Ú 32 þ ÊLm È4ê Ë 0-31 È ÊLm0 *ü b ôEg û à!9 µ Ë È ÊLm 1-31 ,X <F¼ êF¼ Ú Ã Ú ä8¹ F þEî F'4˜(channel-group) È!£ þEîF'4˜(channel-group) 0 Ô þ y · S*ü È JF Ee(M û â à!9 ·,Ì à Ä

Ï _ Ð

A'5B CE1 y·,X 1-3 È5 È7-10 ÊLm ÚG!4˜EîF'4˜ 1 Ä

Ruijie(config-controller)# channel-group 1 timeslots 1-3,5,7-10

Ï,Ì G Q¸ Ð

Q¸	AÈ â
using { e1 | ce1 }	G!5BCE1 y·,X E1 ê CE1 ¹0 õ ã

2.1.2 clear controller e1

á ! E1 { < ÈE1 { <,XG!5B ± Õ á ¬ Ä

clear controller e1 *slot*/*port*

Ï – DAÈ â Ð

slot ?U á !,X E1 { < ü,X Ñ Ë

port E1 { < ü Ñ ,X0Ã · c Ë

Ï Q¸ õ ã Ð

(M *ü õ ã

Ï5 ,ÕA'5B Ð

´

Ï S*ü Û + Ð

Ô8 ™ ‰ ß áLÔ?UE¯> á ! ¡ 0 Ä

Ï _ Ð

V?U á ! 1 Ë Ñ0Ã · Ë 0 ,X E1 { < Ä

Ruijie# clear controller e1 1/0

Ï,Ì G Q¸ Ð

´

2.1.3 clock source

A'5B CE1 y ·,X à!9 ÊJs$d È Q ¸,X no 6 ã 6 á5 ,Õ,X à!9 ÊJs$dA' 5B Ä

clock source { line | internal }
no clock source

Ï – DAÈ â Ð

line A'5B CE1 y ·,X à!9 ÊJs$d ¢ D B y 4" Þ9‹ ª Ä

Internal A'5B CE1 y ·,X à!9 ÊJs$d YF¼ {*ó Ä

Ï Q ¸ õ ã Ð

CE1 y ·G!5B õ ã

Ï5 ,ÕA'5B Ð

5 ,ÕA'5B line

Ï S*ü Û + Ð

' CE1 y · ¹ 0 Ê È?U Ý Ô • ¤ o ¹ 0,X à!9 ÊJs Ä ' ø þ CE1 y ·,È E² Ê È™NO Ý Ô0Ã ¤ o à!9 ÊJs Èº Ô0ÃA'5B ¢ y D B4" Þ9‹ ª à!9 ÊJs × ' CE1 y · â x 6 A' Û,ÌE² y Ê ÈEî + x 6 0Ã ¤ o à!9 Ê Js È5àCÃ+ <0Ã,XCE1 y ·A'5B ¢ y D B4" Þ9‹ ª à!9 ÊJs Ä

Ï _ Ð

A'5B YF¼ ¤ o à!9 ÊJs Ä

Ruijie(config-controller)# clock source internal

Ï,Ì G Q ¸ Ð

´

2.1.4 controller e1

*ü bE¯ 9 Û n,X CE1 { < y ·G!5B Ä

controller e1 *slot*/*port*

Ï – DAÈ â Ð

slot ?UA'5B,XE1 { < ü,X Ñ Ë

port ?UA'5B,XE1 { < ü Ñ ,X0Ã · c Ë

Ï Q ¸ õ ã Ð

< G!5B õ ã

Ï5 ,ÕA'5B Ð

´

Ï S*ü Û + Ð

ü < G!5B ß È S*üA¹ Q ¸E¯ 9 Û n,X CE1 y ·G!5B õ ã Ä

Ï _ Ð

V?U Í ü 1 Ñ0Ã · c Ë 1 ,X CE1 y ·E¯> G!5B Ä

Ruijie(config)# controller e1 1/1
Ruijie(config-controller)#

Ï,Ì G Q ¸ Ð

2.1.5 framing

A'5B CE1 y ·,X û õP` • ã È Q ¸,X no 6 ã 6 á5 ,Õ,X û õP` • ã Ä

ü E1 ¹ 0 õ ã ß ÈA¹ Q ¸ ´ Ä

Q ¸	AÈ â

CE1 y ·G!5B

Ï5 ,ÕA'5B Ð

5 ,Õ /U!6 7¾)ƒ Ä

Ï S*ü Û + Ð

üE¯> ¤ o(M!^ s6Ñ,X# A© Ê È !LÔ?U Ú CE1 y ·G!5B ä 7¾)ƒ ¹ 0 • ã Ä

Ï _ Ð

A'5B AŒCE1 y · 7¾)ƒ Ä

Ruijie(config-controller)# loopback local

Ï,Ì G Q ¸ Ð

´

2.1.8 show controller e1

/ CE1 y ·,X,Ì G µ C

show controller e1 [*slot/port*]

Ï _Ð

/ Ý CE1 y ·,X,Ì G µ C Ä

Ruijie# show controller e1

E1 1/0 is down.
Applique type is Channelized E1 - balanced
Receiver has no alarms.
Framing is crc4, Line Code is hdb3, Clock Source is line
Data in current interval (446 seconds elapsed):
0 Line Code Violations, 0 Path Code Violations
0 Slip Secs, 0 Fr Loss Secs, 0 Line Err Secs, 0 Degraded Mins
0 Errored Secs, 0 Bursty Err Secs, 0 Severely Err Secs, 0 Unavail Secs
Total Data (last 9 fifteen minute intervals):
0 Line Code Violations, 0 Path Code Violations
0 Slip Secs, 0 Fr Loss Secs, 0 Line Err Secs, 0 Degraded Mins
0 Errored Secs, 0 Bursty Err Secs, 0 Severely Err Secs, 0 Unavail Secs
E1 1/1 is down.
Applique type is Channelized E1 - balanced
Receiver has no alarms.
Framing is crc4, Line Code is hdb3, Clock Source is line
Data in current interval (446 seconds elapsed):
0 Line Code Violations, 0 Path Code Violations
0 Slip Secs, 0 Fr Loss Secs, 0 Line Err Secs, 0 Degraded Mins
0 Errored Secs, 0 Bursty Err Secs, 0 Severely Err Secs, 0 Unavail Secs
Total Data (last 9 fifteen minute intervals):
0 Line Code Violations, 0 Path Code Violations
0 Slip Secs, 0 Fr Loss Secs, 0 Line Err Secs, 0 Degraded Mins
0 Errored Secs, 0 Bursty Err Secs, 0 Severely Err Secs, 0 Unavail Secs
E1 1/2 is down.
Applique type is Channelized E1 - balanced
Receiver has no alarms.
Framing is crc4, Line Code is hdb3, Clock Source is line
Data in current interval (446 seconds elapsed):
0 Line Code Violations, 0 Path Code Violations
0 Slip Secs, 0 Fr Loss Secs, 0 Line Err Secs, 0 Degraded

Mins
0 Errored Secs, 0 Bursty Err Secs, 0 Severely Err Secs,
0 Unavail Secs
Total Data (last 9 fifteen minute intervals):
0 Line Code Violations, 0 Path Code Violations
0 Slip Secs, 0 Fr Loss Secs, 0 Line Err Secs, 0 Degraded
Mins
0 Errored Secs, 0 Bursty Err Secs, 0 Severely Err Secs,
0 Unavail Secs
E1 1/3 is down.
Applique type is Channelized E1 - balanced
Receiver has no alarms.
Framing is crc4, Line Code is hdb3, Clock Source is line
Data in current interval (446 seconds elapsed):
0 Line Code Violations, 0 Path Code Violations
0 Slip Secs, 0 Fr Loss Secs, 0 Line Err Secs, 0 Degraded
Mins
0 Errored Secs, 0 Bursty Err Secs, 0 Severely Err Secs,
0 Unavail Secs
Total Data (last 9 fifteen minute intervals):
0 Line Code Violations, 0 Path Code Violations
0 Slip Secs, 0 Fr Loss Secs, 0 Line Err Secs, 0 Degraded
Mins
0 Errored Secs, 0 Bursty Err Secs, 0 Severely Err Secs,
0 Unavail Secs

/ Û n CE1 y ·,X,Ì G µ C Ä

Ruijie# show controller e1 1/0

E1 1/0 is down.
Applique type is Channelized E1 - balanced
Receiver has no alarms.
Framing is crc4, Line Code is hdb3, Clock Source is line
Data in current interval (458 seconds elapsed):
0 Line Code Violations, 0 Path Code Violations
0 Slip Secs, 0 Fr Loss Secs, 0 Line Err Secs, 0 Degraded
Mins
0 Errored Secs, 0 Bursty Err Secs, 0 Severely Err Secs,
0 Unavail Secs
Data in Interval 1:
0 Line Code Violations, 0 Path Code Violations
0 Slip Secs, 0 Fr Loss Secs, 0 Line Err Secs, 0 Degraded
Mins
0 Errored Secs, 0 Bursty Err Secs, 0 Severely Err Secs,

0 Unavail Secs
Data in Interval 2:
0 Line Code Violations, 0 Path Code Violations
0 Slip Secs, 0 Fr Loss Secs, 0 Line Err Secs, 0 Degraded Mins
0 Errored Secs, 0 Bursty Err Secs, 0 Severely Err Secs, 0 Unavail Secs
Data in Interval 3:
0 Line Code Violations, 0 Path Code Violations
0 Slip Secs, 0 Fr Loss Secs, 0 Line Err Secs, 0 Degraded Mins
0 Errored Secs, 0 Bursty Err Secs, 0 Severely Err Secs, 0 Unavail Secs
Data in Interval 4:
0 Line Code Violations, 0 Path Code Violations
0 Slip Secs, 0 Fr Loss Secs, 0 Line Err Secs, 0 Degraded Mins
0 Errored Secs, 0 Bursty Err Secs, 0 Severely Err Secs, 0 Unavail Secs
Data in Interval 5:
0 Line Code Violations, 0 Path Code Violations
0 Slip Secs, 0 Fr Loss Secs, 0 Line Err Secs, 0 Degraded Mins
0 Errored Secs, 0 Bursty Err Secs, 0 Severely Err Secs, 0 Unavail Secs
Data in Interval 6:
0 Line Code Violations, 0 Path Code Violations
0 Slip Secs, 0 Fr Loss Secs, 0 Line Err Secs, 0 Degraded Mins
0 Errored Secs, 0 Bursty Err Secs, 0 Severely Err Secs, 0 Unavail Secs
Data in Interval 7:
0 Line Code Violations, 0 Path Code Violations
0 Slip Secs, 0 Fr Loss Secs, 0 Line Err Secs, 0 Degraded Mins
0 Errored Secs, 0 Bursty Err Secs, 0 Severely Err Secs, 0 Unavail Secs
Data in Interval 8:
0 Line Code Violations, 0 Path Code Violations
0 Slip Secs, 0 Fr Loss Secs, 0 Line Err Secs, 0 Degraded Mins
0 Errored Secs, 0 Bursty Err Secs, 0 Severely Err Secs, 0 Unavail Secs
Data in Interval 9:

0 Line Code Violations, 0 Path Code Violations
0 Slip Secs, 0 Fr Loss Secs, 0 Line Err Secs, 0 Degraded Mins
0 Errored Secs, 0 Bursty Err Secs, 0 Severely Err Secs, 0 Unavail Secs
Total Data (last 9 fifteen minute intervals):
0 Line Code Violations, 0 Path Code Violations
0 Slip Secs, 0 Fr Loss Secs, 0 Line Err Secs, 0 Degraded Mins
0 Errored Secs, 0 Bursty Err Secs, 0 Severely Err Secs, 0 Unavail Secs

Ï,Ì G Q ¸ Ð

´

2.1.9 using

A'5B CE1 y ·,X ¹ 0 õ ã È Q ¸,X no 6 ã 6 á5 ,Õ,X ¹ 0 õ ã Ä

using { e1 | ce1 }

no using

Ï – DAÈ â Ð

e1 ></ E1 ¹ 0 õ ã

ce1 ></ CE1 ¹ 0 õ ã

Ï Q ¸ õ ã Ð

CE1 y ·G!5B

Ï5 ,ÕA'5B Ð

5 ,Õ CE1 ¹ 0 õ ã

Ï S*ü Û + Ð

'A'5B E1 ¹ 0 õ ã Ê ÈCE1 y ·,Ì ' b Ô þ á Ú ÊLm È y · ú ‘ 2048000bps ,X y · È JF Ee(M û â à!9 ·,Ì à Ä

'A'5B CE1 ¹ 0 õ ã Ê È CE1 y · Ã Ú 32 þ ÊLm Ĕ h4ê Ë 0-31 È J 0 ÊLm*ü b ôEÕ û à!9 µ Ë È1-31 ÊLm Ã ÚG!4-8¹ F Û n,XEîF'4˜ (channel-group) ÈÚG! Ý ÊLm,X8¹ F þEîF'4˜,Ì ' b8¹ F þ y · ÈJF Ee (M û â à!9 ·,Ì à Ä

Ï _ Ð

A'5B CE1 y · ¹ 0 b E1 õ ã

Ruijie(config-controller)# using e1

Ï,Ì G Q ¸ Ð

RGOS™ Q ¸ –5× `

G!5BlP â á u

,Â)

RGOS™ Q ¸ –5× ` 1
1 Ô0´ G!5BIP Q ¸ 1
1.1 y · G!5B Q ¸ 1
1.1.1 ip address 1
1.1.2 ip unnumbered 2
1.2 ?· d #A,G!5B Q ¸ 3
1.2.1 arp 4
1.2.2 arp retry interval 5
1.2.3 arp retry times 5
1.2.4 arp unresolve 6
1.2.5 arp gratuitous-send interval 7
1.2.6 arp timeout 8
1.2.7 ip proxy-arp 9
1.3 S • y [Ø)ÚG!5B Q ¸ 9
1.3.1 ip broadcast-addresss 10
1.3.2 ip directed-broadcast 10
1.4 IP ,¥?š `4È x Q ¸ 11
1.4.1 clear arp-cache 12
1.4.2 show arp 13
1.4.3 show arp counter 15
1.4.4 show arp timeout 15
1.4.5 clear ip route 16
1.4.6 show ip arp 16
1.4.7 show ip interface 18
1 `0´ G!5BIPá u Q ¸ 20
2.1 IP á uG!5B Q ¸ 20
2.1.1 ip mask-reply 20
2.1.2 ip mtu 21
2.1.3 ip redirects 21
2.1.4 ip source-route 22
2.1.5 ip unreachables 23
1 Ý0´ VRF G!5B Q ¸ 25
3.1 VRFG!5B Î Q ¸ 25
3.1.1 show ip route vrf 25
3.1.2 clear ip route vrf 26
3.1.3 ip vrf 27
3.1.4 ip vrf forwarding 27
3.1.5 show ip vrf 28
1 ¯0´ G!5BIPv4 REFQ ¸ 30
4.1 G!5B,Ì G Q ¸ 30
4.1.1 ip ref load-sharing original 30
4.1.2 ref parameter 31

1 ÝF¼ Ú G!5BIP â á u Q ¸ –5× ,Â)

1 Ô0´ G!5BIP Q ¸

1.1 y · G!5B Q ¸

y · G!5B Ù À ¹ ß Q ¸ Ö

z ip address

z ip unnumbered

1.1.1 ip address

A¹ Q ¸*ü 9G!5B y ·,X IP È Ã ¹*ü no 6 ã ôL8 Û n y ·,X IP Ä Q ¸ ã V ß Ö

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

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

Ï – DAÈ â Ð

– D	£EÄ
ip-address	32 þ!¨(M ! IP È8 ! Ô4˜ È ¹ E¯ • ã ></ È4˜ KÈ*ü&•Lh Ô Ä
network-mask	32 þ!¨(M !5%4° }-Õ È“1”></ }-Õ ! È“0”></ ! Ä!£ 8 ! Ô4˜ È ¹ E¯ • ã></ È4˜ KÈ*ü&•Lh Ô Ä
secondary	></ G!5B,X õ IP Ä

Ï5 ,Õ ™ ‰ Ð

y ·"u ÝG!5B IP Ä

Ï Q ¸ õ ã Ð

y ·G!5B õ ã

Ï S*ü Û + Ð

Ô þA’ Û ¾ ÝG!5B Z IP È ! Ã ¹ y ` ¥EÕ IP D B y È y ·G!5B Z IP ÈAÈ âA¹ y · AŒE¤> IP #A, Ä

5%4° }-Õ 3 Ô þ 32 !!¨(M,X D È ÛAš- A¹ IP ,X ¾ ´ þ!¨(M 5%4°F¼ Ú Ä5%4° }-Õ È 1 ,X!¨(M Í h,X IP !¨(M ! 5%4°F¼ Ú È 0 ,X!¨(M Í h,X IP !¨(M ! F¼ Ú Ä V A 2O5%4° Í h,X5%4° }-Õ 255.0.0.0 Ä 4 Ã ¹ ý*ü5%4° }-Õ Í Ô

þ5%4°E¯> $5% æ Ú È $5% æ Ú Ú Ô þ F¼ Ú,X Ô o!¨(M ! 3 0 5%4°F¼ Ú È4ý ã •G£ È r t5%4°,X DG£ ÈE- Ê,X5%4° }-Õ /Ä $5% }-Õ Ä

RGOS EC Ê Ã ¹ Õ Ô þ y ·G!5B î þ IP ÈJ Ô þ IP È J - <F¼ õ IP Ä õ IP ,XG!5B)ÚAŽ Þ"u Ý D,ÂL$ È Ã ¹Lc ãG!5B È ¾ ÝG!5B Z IP â !6ÑG!5B õ IP Ä õ IP Ã ¹ â IP 2 b à Ô þ5%4° ê5Ù á à Äü5%4° ÎA' ÈÎ4£ S*ü õ IP ÈEî ü ¹ ß ™ ‰ ß hA¹5×<%A©*ü õ IP Ö

- Ô þ5%4°"u ÝC‡ ó î,X Ä)„ ü Ô8 ³5%LÔ?U Ô þ C 2O5% 4° È Ã ÚG! 254 Ä Ä ' ³5% CYE› 254 Ä Ê È Ô þ C 2O5%4° Ú á ó ÚG! È Ý ™?U ÚG! º Ô þC 2O5%4° ÄE- A' Û LÔ?UE² y ø þ5%4° È ¹ LÔ?UG!5B î þ IP Ä
- AŒ î »,X5%4° Î b1 ` ,X 9 y5%4° È"u ÝE¯> $5%,X æ Ú Ä õ IP ,X S*ü Ã ¹ SA¹5%4° \ • ç 4{ Î b IP ,XCÃ+ 5%4° Ä Í b!£ þ $5% ÈA' ÛFÑG!5B Ô þ IP Ä
- Ô þ5%4°,X ø þ $5%>• º ê Ô þ5%4°Lh/• Ô È 4 Ã ¹ ï Î Ô þ>•Lh /•5%4°,X $5% ÈEîE›G!5B õ IP ,X • ã È ÚLh/•,X $5%E² yCK 9 Ä Ô þ $5% á6Ñ üA' Û,X ø þ ê ø þ ¹ Þ y · Î)„ Ä

Ï _Ð

¹ ß _ $ ÈG!5B Z y · IP 10.10.10.1 È5%4° }-Õ 255.255.255.0 Ä

```
ip address 10.10.10.1 255.255.255.0
```

Ï,Ì G Q ¸ Ð

Q ¸	AÈ â
show interface	/ y ·,XAº4š µ C

Ï G ÄAÈ â Ð

ü ` A' Û Þ È¾ Ý Ý ·!6ÑG!5B IP È J è á Õ `4{ È G "u Ý secondary EÝNM

1.1.2 ip unnumbered

A¹ Q ¸*ü 9G!5B ´4ê Ë y · È Ô þ y ·G!5B ´4ê Ë y · â ÈAÈ âA¹ y · Þ AŒE¤> IP #A, ÈA¹ y · Ã ¹ ¥ IP D B Ù Ä Ã ¹*ü no 6 ã ª #\A¹G!5B Ä

ip unnumbered *interface-type interface-number*

no ip unnumbered *interface-type interface-number*

Ï – DAÈ â Ð

– D	£EÄ
interface-type	G6(y ·2O _
interface-number	G6(y ·4ê Ë

Ï5 ,Õ ™ ‰ Ð

5 ,Õ ™ ‰ ß È"u ÝG!5B ´4ê Ë y · Ä

Ï Q ¸ õ ã Ð

y ·G!5B õ ã

Ï S*ü Û + Ð

´4ê Ë y · ¾ ü y · | IP #A, È á ÚG! IP È ´4ê Ë y ·LÔ?U G6(Ô þ K Ý IP ,X y · Ä ´4ê Ë y · {*ó,X IP D B Ù ÈA¹ D B Ù,X$d IP G6(y ·,X IP Ä º êCÃ+ #A,E¯/ß 3 B G 6(y ·,X IP È‡ n ú T ´4ê Ë y · ¥EÕCÃ+ È „ y [Äh*ü ´4ê Ë y · ÈLÔ?U"¼ ã ¹ ßL$ Ö

- ¹ þ5% y · á6ÑG!5B ä ´4ê Ë y · Ä
- ' > · Õ>™ SLIP ÃHDLC ÃPPP ÃLAPB ÃFrame-relay Ê È Ã ¹ G!5B ä ´4ê Ë y · Ä Õ>™ û 4» Ê È ¾ Ý&• &• $ y · ! AŒ G!5B ´4ê Ë y · ÄX.25 Õ>™ á AŒG!5B ´4ê Ë y ·,X Ä
- á6Ñ*ü pin g Q ¸ 9 ”# ´4ê Ë y · ú ¹ 0!7 È ´ ´4ê Ë y ·"u Ý IP Ä EîE› SNMP Ã ¹E°/ß,¥# ´4ê Ë y ·(Š Õ Ä
- á6ÑEîE› ´4ê Ë y ·E¯> 5%4° | Ä

Ï _ Ð

¹ ßG!5B È Ú y ·G!5B ´4ê Ë y · È G6(y · FastEthernet 0/1 Ä G6(,X y · ™NO?UG!5BÞP Ä

```
ip unnumJ36282C5d fhernet 0/1
```

- *z* arp retry interval
- z arp retry times
- z arp unresolved
- z arp gratuitous-send interval
- z arp timeout
- z ip proxy-arp

1.2.1 arp

S*üA¹ Q ¸ È Ã ¹ ü ARP 4ç †>< r t" û,X IP ` MAC ô Ø ÄA¹ Q ¸,X no 6 ã Ã ¹ ôL8M- Õ MAC ô Ø Ä

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

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

Ï – DAÈ â Ð

– D	£EÄ
ip-address	â MAC Í h,X IP È Ú ¯4˜ E¯ >< / ,X D È4˜ KÈ*ü&•Lh Ô Ä
MAC-address	D BJÒCÃ È48 þ!¨(M !4˜ ä
type	ARP Õ>™2O _ Ä Í b ¹ þ5% y · È GK + arpa Ä
alias	Ä ÃEÝ Å n ZA¹ – D â ÈRGOS Ú ¡ hA¹ IP ,X arp AË" Ä

Ï5 ,Õ ™ ‰ Ð

ARP 4ç †>< "u Ý Ï)M- Õ ô ØA„) Ä

Ï Q ¸ õ ã Ð

< G!5B õ ã

Ï S*ü Û + Ð

RGOS S*ü ARP 4ç †>< È B 32 þ!¨(M ! IP ¹ R 48 þ!¨(M !,X MAC Ä

+ b û î D Õ | Õ ARP ?· d È ¹Eî áLÔ?UG!5BM- Õ ARP ô Ø Ä ý*ü clear arp-cache Q ¸ Ã ¹ ôL8 | Õ : 4 ,X ARP ô Ø Ä

Ï _ Ð

¹ ßG!5B È ¹ þ5% Þ,X A'5B Z ARP M- Õ ô ØA„) Ä

```
arp 1.1.1.1 4e54.3800.0002 arpa
```

Ï,Ì G Q ¸ Ð

Q ¸	AÈ â
clear arp-cache	#ÙL8ARP 4ç †><

1.2.2 arp retry interval

S*üA¹ Q ¸ È Ã ¹A'5B ¥EÕ arp AË" y [,XNe)[È G?· d à Ô þ IP ÈE²4Á ¥EÕ 2 õ ARP AË" ,X ÊKÈKÈLh Ä S*ü!8 Q ¸,X no 6 ã Ã ¹ 6 áT¬Ax,X!£/¦G¡ ô 1 õ ARP AË" Ä

arp retry interval *seconds*

no arp retry interval

Ï – DAÈ â Ð

– D	£EÄ
seconds	<1-3600>,ARP AË" ,XG¡ ô ÊKÈ Ã ¹A'5B 1 /¦ ü ü3600 /¦ ÈT¬Ax 1 /¦

Ï5 ,Õ ™ ‰ Ð

ARP AË" G¡ ô ÊKÈKÈLh 1 /¦ Ä

Ï Q ¸ õ ã Ð

< G!5B õ ã

Ï S*ü Û + Ð

' ¥)„ A' Û ÝNe4 ,X å ê ¥EÕ ARP

,XG¡ ô 5 õ ARP AË" Ä

arp retry times *number*

no arp retry times

Ï – DAÈ â Ð

– D	**£EÄ**
number	à Ô þ ARP AË" ,X ¥EÕ õ D È8× È<1-100> Ä 'A'5B 1 Ê È></ áG¡ ô ARP AË" È ¾ ¥ EÕ1 õ ARP AË" y [

Ï5 ,Õ ™ ‰ Ð

V p"u Ý ARP h1(y [ÈARP AË" y [î ¥EÕ 5 õ È' âCY Ê Ä

Ï Q ¸ õ ã Ð

< G!5B õ ã

Ï S*ü Û + Ð

' ¥)„ A' Û ÝNe4 ,X å ê ¥EÕ ARP AË" È éCK5%4°4 -1 J WKÂNl A5 AË" È éCK5¥

number	þ?· d ARP ><NM,X Ô û þ D È ª 8× È < 1-8192 > ÄT¬Ax 8192

Ï5 ,Õ ™ ‰ Ð

ARP 4ç †>< Ô î Ã ¹ •4‡ 8192 þ þ?· d><NM Ä

Ï Q ¸ õ ã Ð

< G!5B õ ã

Ï S*ü Û + Ð

' ¥)„ ARP 4ç ,>< Î)„ ûG£ þ?· d><NM È J è Ô!‰ ÊKÈ âE¬"u Ý#\ Ê È Ã ¹*ü!8 Q ¸L$ þ?· d><NM,X þ D Ä

Ï _ Ð

¹ ßG!5B ÈA'5B ,X þ?· d><NM,X Ô û þ D 500 Ä

```
arp unresolve 500
```

Ï,Ì G Q ¸ Ð

´

1.2.5 arp gratuitous-send interval

S*üA¹ Q ¸ È Ã ¹ ü Û n5%4° y · n Ê ¥EÕ !C arp AË" ÄA¹ Q ¸,X no 6 ã GKÁ y · Þ,X!8 s6Ñ

arp gratuitous-send interval *seconds*

no arp gratuitous-send

Ï – DAÈ â Ð

Ï _ Ð

¹ ßG!5B ÈA'5B å SVI 1 !£/¦Js ¥EÕ Ô õ !C ARP AË" Ä

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

¹ ßG!5B È 0!6 n Ê å SVI 1 ¥EÕ !C ARP AË"

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

Ï¸Ì G Q ¸ Ð

´

1.2.6 arp timeout

G!5BARP 4ç † ARP M- Õ ô ØA„),XCY Ê ÊKÈ È Ã ¹ ;> A¹ Q ¸ Ä A¹ Q ¸,X no 6 ã Ã ¹ 6 á5 ,ÕG!5B Ä

arp timeout *seconds*

no arp timeout

Ï – DAÈ â Ð

– D	£EÄ
seconds	CY Ê ÊKÈ È ¹/¦ Au1k) ! È8× È 0-2147483

Ï5 ¸Õ ™ ‰ Ð

5 ¸ÕCY Ê ÊKÈ 3600 /¦ Ä

Ï Q ¸ õ ã Ð

y ·G!5B õ ã

Ï S*ü Û + Ð

ARP CY ÊA'5B ¾ Í | Õ : 4 ¸X IP ` MAC ô ØCK 0*ü ÄCY Ê ÊKÈA'5B kC^-Á ÈARP4ç † ± ,,X ô Ø>< C^,ó r È ARP #\5ë 5%4° ú ' 3C^ î È ¹LÔ?U >5 ý Þ ÄL8M2 Ý(M ÿ,XLÔ?U È ú í Ô8 á LÔ?UG!5BARP CY Ê ÊKÈ Ä

Ï _ Ð

¹ ßG!5B ÈÚ ¢ ¿Eó ¹ þ5% FastEthernet 0/1 : ¸X | Õ ARP ô ØA„) ¸XCY Ê ÊKÈA' 120 /¦ Ä

```
interface fastEthernet 0/1
arp timeout 120
```

1.3.1 ip broadcast-addresss

?U n Ô þ y ·,X S • Ëü y ·G!5B Q ¸ ip broadcast-addresss Ä
A¹ Q ¸,X no 6 ã Ã ¹ ª#\ S • G!5B Ä

ip broadcast-addresss *ip-address*

no ip broadcast-addresss *ip-address*

Ï – DAÈ â Ð

– D	£EÄ
ip-address	IP 5%4°,X S •

Ï5 ,Õ ™ ‰ Ð

5 ,Õ IP S • 255.255.255.255 Ä

Ï Q ¸ õ ã Ð

y ·G!5B õ ã

Ï S*ü Û + Ð

,Â ! IP S • y [,X,Â Û Ô8 < 1 È></ 255.255.255.255 Ä
RGOS d{ # J W ,"Q 7Â ðÁ Ó!Ä • y Å,Ì"ðà^ è ª#\ à Ê }×G! 255.257<02C235C149E37BE1

access-list-number	Ä ÃEÝ ÅA“KÂ ë>< Ë È8× È ¢1-199 È1300 - 2699 ÄV p n ZA“KÂ ë>< Ë È¾ Ý G!A¹A“ KÂ ë><,XIP n å S • y [!E@ 6 Ä

1 ÝF¼ Ú G!5BIP

1.4.2 show arp

/ ?· d #A, ÄARP Å4ç †><

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

Ï – DAÈ â Ð

– D	£EÄ
ip	ip È / Û n ip ,X ARP ><NM
ip mask	/ ip mask Ù À,X5%!‰,X ARP ><NM
mac-address	/ Û n mac ,X ARP ><NM
static	/ ÝM- Õ arp ><NM
complete	/ Ý Æ4£?· d,X	Õ arp ><NM
incomplete	/ Ý þ?· d,X	Õ arp ><NM

Ï Q ¸ õ ã Ð

´?U"

Ï _ Ð

¹ ß show arp Eg Î4§ p Ö

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

Ï G ÄAÈ â Ð

A¹ Q ¸ ü ` A' Û Þ á Õ Ä

1.4.5 clear ip route

?U H þ ôL8 IP CÃ+ >< ê5ÙP CÃ+ >< ,X ¤ þCÃ+ A„) È Ã ¹ ü(M *ü õ ã ;> clear ip route Q ¸ Ä

clear ip route { * | *network* [*netmask*] }

Ï – DAÈ â Ð

– D	£EÄ

Ï Q ¸ õ ã Ð

(M *ü õ ã

Ï S*ü Û + Ð

' ¥)„CÃ+ >< Ý ´ CÃ+ È Ã ¹0Ÿ G „CÃ+ >< k Ô „,XCÃ+ Ä ™NO"¼ ã V p ôL8 H þCÃ+ >< È ÚEô ä H þ5%4°,X-Á VEî µ Lp Ä

Ï _ Ð

¹ ß _ $ È ¾ ôL8 192.168.12.0 ,XCÃ+ Ä

```
clear ip route 192.168.12.0
```

Ï,Ì G Q ¸ Ð

Q ¸	AÈ â
show ip route	/ IP CÃ+ ><

Ï G ÄAÈ â Ð

A¹ Q ¸ ü ` A' Û Þ á Õ Ä

1.4.6 show ip arp

3 /

Ï – DAÈ â Ð

´

Ï Q ¸ õ ã Ð

(M *ü õ ã

Ï _ Ð

¹ ß show ip arp Eg Î4§ p Ö

```
Ruijie# show ip arp
Protocol Address        Age(min)Hardware         Type
Interface
Internet 192.168.7.233  23      0007.e9d9.0488   ARPA
FastEthernet 0/0
Internet 192.168.7.112  10      0050.eb08.6617   ARPA
FastEthernet 0/0
Internet 192.168.7.79   12      00d0.f808.3d5c   ARPA
FastEthernet 0/0
Internet 192.168.7.1    50      00d0.f84e.1c7f   ARPA
FastEthernet 0/0
Internet 192.168.7.215  36      00d0.f80d.1090   ARPA
FastEthernet 0/0
Internet 192.168.7.127  0       0060.97bd.ebee   ARPA
FastEthernet 0/0
Internet 192.168.7.195  57      0060.97bd.ef2d   ARPA
FastEthernet 0/0
Internet 192.168.7.183  --      00d0.f8fb.108b   ARPA
FastEthernet 0/0
```

ARP 4ç †>< Ø +!‰,X ÿ £EÄ V ß Ö

+!‰	£EÄ
Protocol	5%4° ,X #A, ÈA¹ +!‰ Internet Ä
Address	â.@ Ê Í h,X IP Ä
Age (min)	ARP 4ç †A„) , ü,X ÊKÈ È ¹ ÚJsAu Ä V p ,X ê5ÙM- ÕG!5B,X ÈA¹ +!‰ *ü-Á4“”-”></ Ä
Hardware	â IP Í h,X.@ Ê Ä
Type	.@ Ê 2O _ È ¹ þ5% ARPA Ä
Interface	â IP G6(,X y · Ä

Ï G ÄAÈ â Ð

A¹ Q ¸ ü ` A’ Û Þ á Õ Ä

1.4.7 show ip interface

A¹ Q ¸ Ã ¹ / y ·,X IP (Š Õ µ C Ä Q ¸ ã V ß Ö

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

Ï – DAÈ â Ð

– D	£EÄ
Interface-type	Û n y ·2O _
Interface-number	Û n y ·4ê Ë

Ï Q ¸ õ ã Ð

(M *ü õ ã

Ï S*ü Û + Ð

Ô þ y · Ø b Ã*ü,X(Š Õ ÈRGOS Ú î üCÃ+ >< ï Î Ô 5,ÈE²CÃ+ Ä Ã*ü,X y · Û RGOS EC ÊEîE›A¹ y · Ã ¹ ¥ D B Ù ÄV p y · ¢ Ã *ü(Š Õ ¬ á Ã*ü(Š Õ È RGOS EC Ê Ú î ¢CÃ+ >< ôL8,Ì h,X,ÈE²CÃ + Ä

V p y · Ø b Ã*ü(Š Õ È G AŒ åEî µ(Š Õ È4“CÃ #A,(Š Õ î / UP × V p ™(=)Ú4“CÃ Ø b Ã*ü(Š Õ È y ·(Š Õ î / UP Ä

á à,X y ·2O _ È / ,X4§ p Ã6Ñ á Ô È ´ Ý o Y • ¤ o y ·(M Ý,XEÝNM Ä

Ï _ Ð

¹ ß show ip interface ,XEg Î4§ p Ä

```
Ruijie# show ip interface
FastEthernet 0/0
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.
```

J y5B

/ 4§ p Ø +!‰,X £EÄ V ß Ö

CúF·)¥ n å Q¨ -`

+!‰	£EÄ
IP interface state is:	5%4° y · Ø b Ã*ü(Š Õ ÈJ y ·.@ Ê (Š Õ `4“CÃ #A,(Š Õ “UP” f305.7 637.64 50.32 1MC /P <</M

IP5BÑ@-`

1 ÝF¼ Ú

redirects ÄA¹ Q ¸,X no 6 ã Ã ¹ GKÁ ICMP G¡ n å s6Ñ Ä

ip redirects

no ip redirects

Ï5 ,Õ ™ ‰ Ð

5 ,Õ *ü Ä

Ï Q ¸ õ ã Ð

y ·G!5B õ ã

Ï S*ü Û + Ð

'CÃ+ á Ô ì Ê È Ý Ã6Ñ S kA' Û ¢ Ô þ y · y ,X D B Ù ÈE¬?U ¢A¹ y · ¥EÕ Î • Ä V pA' Û Ú D B Ù ¢ y y ·G¡ „ ¥EÕ Î • ÈA' Û î4- D B$d ¥EÕ Ô þ ICMP G¡ n å#\ C È A• D B$d A¹,Â Û ,X 5% G à Ô $5% Þ,X º ê Ô ÄA' Û ÄE- D B$d î Ú â4Á,X D B Ù Ý '; Ô G,XCÃ XE¯> ¥EÕ Ä

RGOS EC Ê5 ,Õ *ü ICMP G¡ n å Ä

Ï _ Ð

¹ ßG!5B _ $ ÈFastEthernet 0/0 y · GKÁ Z ICMP G¡ n å Ä

```
interface fastEthernet 0/0
no ip redirects
```

Ï,Ì G Q ¸ Ð ´ Ä

Ï G ÄAÈ â Ð

A¹ Q ¸ ü ` A' Û Þ á Õ Ä

2.1.4 ip source-route

?U AŒRGOS EC Ê Ø)Ú ú Ý$dCÃ+ µ C,XlP y [È*ü < G!5B Q ¸ ip source-route ÄA¹ Q ¸,X no 6 ã GKÁ$dCÃ+ µ C,X Ø)Ú s6Ñ Ä

ip source-route

no ip source-route

Ï5 ,Õ ™ ‰ Ð

5 ,Õ *ü Ä

Ï Q ¸ õ ã Ð

< G!5B õ ã

Ï S*ü Û + Ð

RGOS Õ IP $dCÃ+ Ä 'A' Û y IP D B Ù Ê È î Í IP y ,X ù $dCÃ+ Ã‘ R$dCÃ+ Ã„)CÃ+ 1 EÝNME¯> ” ¹ È- oEÝNM ü RFC 791 ÝAº4š £EÄ Ä V p ”# A¹ D B Ù *ü Z J Ô þEÝNM È î ;> ¡ h,X | 0 × V p ”# ´ ,XEÝNM È î4- D B$d ¥EÕ Ô þ ICMP – D KÂNl#\ C È' â ö ×A¹ D B Ù Ä

RGOS EC Ê5 ,Õ ™ ‰ ß ÕIP $dCÃ+ (M û Ä

Ï _ Ð

¹ ßG!5B _ $ È GKÁ Z IP $dCÃ+ (M û Ä

```
no ip source-route
```

Ï,Ì G Q ¸ Ð ´ Ä

Ï G ÄAÈ â Ð

A¹ Q ¸ ü ` A' Û Þ á Õ Ä

2.1.5 ip unreachables

?UA}RGOS EC Ê6Ñ ó {*ó ICMP ,Â Û á ÃE' y [È*ü y ·G!5B Q ¸ ip unreachables Ä¹ Q ¸,X no 6 ã Ã ¹ GKÁ ¥EÕ ICMP ,Â Û á ÃE' y [Ä

ip unreachables

no ip unreachables

Ï5 ,Õ ™ ‰ Ð

5 ,Õ *ü Ä

Ï Q ¸ õ ã Ð

y ·G!5B õ ã

Ï S*ü Û + Ð

V p RGOS EC Ê y Ô þ,Â Û 7¾D•,X) • y [Èœ á6Ñ Ø)ÚA¹ y [,X Þ #A, È î ¥EÕ Ô þ ICMP ,Â Û á ÃE'#\ C Ä

V p RGOS EC Ê+ b"u ÝCÃ+ È5à á6ÑE@ ¥ Ô þ D B Ù È î å D B$d ¥EÕICMP á ÃE'#\ C Ä

A¹ Q ¸ E ¡ Ý ICMP ,Â Û á ÃE'#\ C Ä

Ï _ Ð

¹ ßG!5B _ $ È GKÁ Z FastEthernet 0/0 y · ¥EÕ ICMP ,Â Û á ÃE'#\ C Ä

```
interface fastEthernet 0/0
no ip unreachables
```

1 Ý0´ VRF G!5B Q ¸

3.1 VRF G!5B Î Q ¸

VRFG!5B Q ¸ Ý Ö

- **show ip route vrf**
- **clear ip route vrf**
- **ip vrf**
- **ip vrf forwarding**
- **show ip vrf**

3.1.1 show ip route vrf

/ Û n VRF ,XCÃ+ µ C

show ip route vrf *vrf-name* [*network[mask]*]

Ï – DAÈ â Ð

– D	£EÄ
vrf-name	VRF á +
network	Ä ÃEÝ Å Û n5%4°
mask	Ä ÃEÝ Å Û n5%4° }-Õ

Ï5 ,ÕA'5B Ð

/ Û n VRF ,X ÝCÃ+ µ C

Ï Q ¸ õ ã Ð

(M *ü õ ã

Ï S*ü Û + Ð

¹,ß VRF ,XCÃ+ µ C

Ï _ Ð

```
Ruijie# show ip route vrf redvrf
```

Ï,Ì G Q ¸ Ð

Q ¸	ÆÈxâ
clear ip route vrf	ôL8 VRF

Ï(AÈ â Ð

RGOS10.1 ¹ Þ

3.1.2 clear ip route vrf

ôL8 Û n VRF ,XCÃ+ µ C

clear ip route vrf *vrf-name* {* | *network* [*mask*

3.1.3 ip vrf

ï Î VRF × ôL8 Ô þ VRF ÈAË S*ü J no 6 ã

ip vrf *vrf-name*

no ip vrf *vrf-name*

Ï – DAÈ â Ð

vrf-name ï Î VRF Ê Û n,X á +

Ï Q ¸ õ ã Ð

< G!5B õ ã

Ï S*ü Û + Ð

S*üA¹ Q ¸ ï Î Ô þ VRF

Ï _ Ð

```
Ruijie(config)# ip vrf redvrf
```

Ï(AÈ â Ð

RGOS10.1 ¹ Þ

3.1.4 ip vrf forwarding

y · Ä $ y · Å t 9 ¤ þ VRF;?UEÔ Î ¤ þ VRF ÈAË S*üno 6 ã

ip vrf forwarding *vrf-name*

no ip vrf forwarding *vrf-name*

Ï – DAÈ â Ð

vrf-name A¹ y ·?U t 9,X VRF á +

Ï5 ,ÕA'5B Ð

5 ,Õ ™ ‰ ß È y · á 2 b Ï) VRF

Ï Q ¸ õ ã Ð

y ·G!5B õ ã

Ï S*ü Û + Ð

Ú ¤ þ y · t 9 VRF

Ï _ Ð

```
Ruijie(config-if)# ip vrf forwarding redvrf
```

Ï(AÈ â Ð

RGOS10.1 ¹ Þ

3.1.5 show ip vrf

/ VRF µ C

show ip vrf

1 ÝF¼ Ú G!5BIP â á u Q ¸ –5×

S*ü Î b y [,Â,X ,X >5EÝCÃ1k"©

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

,Ì G Q ¸	Q ¸	£EÄ
	-	-

G ÄAÈ â ™ üCÃ+ < Þ Õ Q ¸ Ä

[redacted]

Q ¸ Z Æ	[illegible]	[illegible]
	-	-

4.1.2 ref parameter

G!5B ¿E@ Äref û6Ñ – D Ö

ref parameter *{20-95} [200-1000]*

– DAÈ â	– D		£EÄ
	1 Ô þ ™EÝ – D J8× È	*{20-95}*	></ ¿E@ ÄrefÅ 4*ü cpu ,X!¨ _ Ä
	1 ` þ ÃEÝ – D J8× È	*[200-1000]*	></ ¿E@Äref Å4*ü cpu !¨ _,XAu1k < óKS y 'A @ . 1

G ÄAÈ â

```
product  supported  bal: 2048
----------------------end-------------------------:
```

/ 4§ p Ø +!‰ £EÄ Ö

+!‰ +!‰

S*ü Û Ð A¹ Q ¸ Ã ¹ / ' ! REF õ + ,XF• y>< µ C È Ã ¹ Û n / Lš ÜF• y Ã F• y Ã Û n IP

4.2.3 show ip ref exact-route

A¹ Q ¸ Ã ¹ / ¤ Ô IP y [,X.B ÛE@ ¥CÃ X Ä J Q ¸ ã V ß Ö

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

– DAÈ â

– D	£EÄ
vrf	<. ³CÃ+ E@ ¥
source-ipaddress	y [,X$d IP
dest_ipaddress	y [,X,Â,X IP

5 ,ÕG!5B ´ Ä

Q ¸ õ ã (M *ü õ ã Ä

S*ü Û Ð EîE›A¹ Q ¸ È Û n IP y [,X$d IP â,Â,X IP È Ã ¹ / Î ' !A¹ y [EîE› REF E@ ¥ Ê ÈA¹ y [,XE@ ¥CÃ X Ä

G!5B _

_ 1 Ö

```
Ruijie#show ip ref exact-route 192.168.50.122 192.168.50.123
192.168.50.122 --> 192.168.50.123 (vrf global):
id    state       type    rfct chg ip              interface
linklayer(header data)
6     unresolve   glean   1    0   0.0.0.0       FastEthernet 0/0
```

,Ì G Q ¸

Q ¸	£EÄ
show ip ref route	/ ' ! 5 ( ) õ + ,X ÝCÃ+ µ C

G ÄAÈ â ™ üCÃ+ < Þ Õ Q ¸ Ä

Q ¸ Z Æ

(Ë	AÈ â
-	-

4.2.4 show ip ref route

A¹ Q ¸ Ã ¹ / ' ! REF õ + ,X ÝCÃ+ µ C È J Q ¸ ã V ß Ö

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

– D	£EÄ
vrf	<. ³CÃ+ E@ ¥
default	Û nT¬AxCÃ+
ip	Û nCÃ+ ,Â,X , 3
mask	Û nCÃ+ }-Õ
statistic	4³Au µ C

– DAÈ â

5 ,ÕG!5B

´ Ä

Q ¸ õ ã

(M *ü õ ã Ä

S*ü Û Ð

Ã¹ / '! REF >< ,X,Ì GCÃ+ µ C È Ã¹ Û n / T¬AxCÃ+ Ã Û n IP/MASK G! ,XCÃ+ Ã ÝCÃ+ µ C Ä

G!5B _

_ 1 Ö / REF >< ÝCÃ+ µ C

```
Ruijie#show ip ref route
Codes: * - default route
      # - zero route
 ip     mask    weight  path-id     next-hop       interface
 255.255.255.255 255.255.255.255 1  4   0.0.0.0    Local 0
 224.0.0.0       240.0.0.0       1  1   224.0.0.0
 224.0.0.0     255.255.255.0    1  4    0.0.0.0    Local 0
 192.168.50.0  255.255.255.0     1  6   0.0.0.0 FastEthernet 0/0
 192.168.50.255  255.255.255.255 1  2      0.0.0.0
 192.168.50.200 255.255.255.255 1 7 192.168.50.200 FastEthernet 0/0
 192.168.50.122  255.255.255.255 1 4 0.0.0.0        Local 0
 192.168.50.78  255.255.255.255 1 9                              1 9
```

G ÄAÈ â ™ üCÃ+ < Þ Õ Q ¸ Ä

Q ¸ Z Æ

(Ë	AÈ â
-	-

1 h0´ G!5B ¿E@# >< $ G Ä

5.1 ¿E@# >< $ G Ä Î G!5B Q ¸

5.1.1 show ip fpm flows

V p?U ¹,ß ' !2Ï4³# >< µ C Ä

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

Ï – DAÈ â Ð

– D	£EÄ
filter	E›$¸# >< µ C ÛA„ È ¾ / G!,X# µ C
ip_protocol_number	#A, Ë
source_ip	$d IP
source_ip_mask_len	$d IP }-ÕKS z
dest_ip	,Â,X IP
dest_ip_mask_len	,Â,X IP }-ÕKS z

Ï5 ,Õ ™ ‰ Ð

´ Ä

Ï Q ¸ õ ã Ð

< G!5B õ ã Ä

Ï S*ü Û + Ð

ü < õ ã ß S*ü show ip fpm flow ¹,ß ' !2Ï4³# >< µ C Ä

Ï _ Ð

5 X L M L H V K R Z L S I S P I O R Z V
3 U 6 U F $ G G U ' V W $ G G U 6 U F 3 R U W '
9 U I 6 H Q G % \ W H V 5 H F Y % \ W H V 6 W

5 X L M L H V K R Z L S I S P I O R Z V I L O W H U

3 U 6 U F $ G G U ' V W $ G G U 6 U F 3 R U W '
9 U I 6 H Q G % \ W H V 5 H F Y % \ W H V 6 W

/ 4§ p Ø +!‰ £EÄ Ö

+!‰	£EÄ
3 U	#A, Ë
6 U F $ G G U	$d IP
' V W $ G G U	,Â,X IP
6 U F 3 R U W	$d0Ã ·
' V W 3 R U W	,Â,X0Ã ·
9 U I	Vrf 2ö é
6 H Q G % \ W H V	¥EÕ +8V D
5 H F Y % \ W H V	y +8V D
6 W	# (Š Õ

5.1.2 show ip fpm counters

V p?U ¹,ß ' !2Ï4³# G Ä ö × y [,X4³Au ™ ‰ Ä

show ip fpm counters

Ï – DAÈ â Ð

"u Ý – D ê GK + Ä

Ï5 ,Õ ™ ‰ Ð

´ Ä

Ï Q ¸ õ ã Ð

< G!5B õ ã Ä

Ï S*ü Û + Ð

ü < õ ã ß S*ü show ip fpm counters ¹,ß ' !2Ï4³# G Ä ö × y [,X4³Au ™ ‰ Ä

Ï _ Ð

5 X L M L H V K R Z L S I S P F R X Q W H U V

'URSHG SDFNHW FRXQWHUV
&RXQW 5HDVRQ
1RQ ,3Y SDFNHW
%DG ,3Y KHDGHU OHQJWK
%DG ,3Y WRWDO OHQJWK
,3Y IUDJPHQW ZLWK ') ELW VHW
7RR VPDOO ,3Y IUDJPHQW
%DG ,3Y IUDJPHQW RIIVHW
,3Y IUDJPHQW WLPHRXW
%DG ,3Y FKHFNVXP
,QYDOLG ,3Y DGGUHVV
,QYDOLG 7&3 IODJV
,QYDOLG 7&3 LQLWLDO IODJV
,QYDOLG 7&3 LQLWLDO $&. QXPEHU
,QYDOLG 7&3 LQLWLDO ZLQGRZ
,QYDOLG 7&3 VHTXHQFH
,QYDOLG ,&03 PHVVDJH W\SH
,QYDOLG ,&03 LQLWLDO PHVVDJH W\SH
([FHSWLRQDO FRQQHFWLRQ VWDWH
'URSHG E\ SROLF\
2XW RI FDSDELOLW\
HQG!
5HMHFWHG RU WHUPLQDWHG FRQQHFWLRQ FRXQWHU
&RXQW 5HDVRQ
2XW RI OLIH WLPH
([FHSWLRQDO 7&3 FRQQHFWLRQ
([FHSWLRQDO 8'3 FRQQHFWLRQ
([FHSWLRQDO ,&03 FRQQHFWLRQ
([FHSWLRQDO 5DZ,3 FRQQHFWLRQ
5HMHFWHG E\ SROLF\

/ 4§ p Ø +!‰ £EÄ Ö

+!‰	£EÄ
& R X Q W	4³Au D,Â
5 H D V R Q	s ´

5.1.3 show ip fpm statistics

V p?U ¹,ß ' !2Ï4³# G Ä < µ C Ä

show ip fpm statistics

Ï – DAÈ â Ð

"u Ý – D ê GK + Ä

Ï5 ,Õ ™ ‰ Ð

´ Ä

Ï Q ¸ õ ã Ð

< G!5B õ ã Ä

Ï S*ü Û + Ð

ü < õ ã ß S*ü show ip fpm statistic ¹,ß ' !2Ï4³# G Ä < µ C Ä

Ï _ Ð

5XLMLH VKRZ LS ISP VWDWLVWLFV
7KH FDSDFLW\ RI WKH IORZ WDEOH
1XPEHU RI DFWLYH IORZV
1XPEHU RI WKH GHIUDJPHQW FRQWH[WV
1XPEHU RI WKH EXIIHUV KROG E\ )30
(YHQW FRXQW

/ 4§ p Ø +!‰ £EÄ Ö

+!‰	£EÄ
7KH FDSDFLW\ RI WKH IO	
1XPEHU RI DFWLYH IOR	
1XPEHU RI WKH GHIUDJP	
1XPEHU RI WKH EXIIHUV	
(YHQW FRXQW	# G Ä _ Ê4³Au D,Â

5.1.4 show ip fpm users

p?U ¹,ß ' #,ú4²1QDpœB¯ U C \@

Ï Q ¸ õ ã Ð

< G!5B õ ã Ä

Ï S*ü Û + Ð

ü < õ ã ß S*ü show ip fpm users ¹,ß ' !2Ï4³# G Ä*ü µ C Ä

Ï _ Ð

5 X L M L H V K R L S I S P X V H U V
$ F W L Y H 8 V H U V
, 3 D G G U H V V $ F W L Y H W L P H & R Q Q H F W L R Q V

/ 4§ p Ø +!‰ £EÄ Ö

+!‰	£EÄ
, 3 D G G U H V V	*ü IP
$ F W L Y H W L P H	Ý õ D
& R Q Q H F W L R Q V	âA¹*ü ,Ì G# D,Â

1 A0´ G!5B TCP Q ¸

6.1 TCP ‚Ì GG!5B Q ¸

„ **JíAÃ ½ þ R é*ü$d Ä**

6.1.1 ip tcp adjust-mss

?UA× H4£E›CÃ+ < ‰SYN Û «‚X tcp y [‚X MSS(ÄMaximum Segment Size ÈÔ û D B!‰ û ã) ‚X û ã Èü y · õ ã ß S*ü ip tcp adjust-mss Ä ?U GKÁ‚XA± È ü Q ¸ !M6 t no ÄA¹ Q ¸‚XAÁ"© V ß Ö

ip tcp adjust-mss max-segment-size

no ip tcp adjust-mss

– DAÈ â	**– D**	**£EÄ**
	max-segment-size	max-segmet-size +8V) ! È8× È ¢ 500-1460 È V p"u ÝG!5BA¹ Q ¸ È í á Â y [mss EÝNM Ä
5 ‚ÕG!5B	A¹ s6Ñ þ *ü Ä	
Q ¸ õ ã	y ·G!5B õ ã	
S*ü Û Ð	MSS ÖTCP y [D BEQ9K Ô û TCP ‚XCÃ X Ô û ôEg) ¥)„ s6Ñ Ý RFC1191 r)„‚X ÈE- þ s6Ñ Ã ¹ ¤P¬5%4° ú ‘ ‚X ý*ü)[Ä '*ü S*ü TCP 9 MG£ ôEg û + D B Ê ÈA¹ s6Ñ Ã ¹ S ôEg û6Ñ k â ¤ Ä ' v 0Ã ¥CK Ô þ tcp E² y Ê È WEîE›TCP SYN y [‚X MSS EÝNM +!‰ # TCP y [D BEQ9K‚X Ô û Èv 0Ã SYN y [‚X MSS ></ â4Á á u <0Ã ¥EÕ TCP y [D BEQ 9K‚X Ô û È ¡ à)Ú Ä v 0Ã‚X MSS û ã ª ‡ b W G!5B‚X MTU û ã‚ MSS Ô8 ?U ã b MTU Ä Ô8 ™ ‰ ß v 0Ã TCP SYN y [‚X MSS 1460 ÄV p ¤ þ y · Õ‚X MSS á ó 1460 È Fw ™NOA× H v 0ÃSYN y [‚X MSS ã b1 b y · Õ‚X MSS Äy · Õ‚X MSS y · Ä MTU - IP 20 +8V – TCP 20 +8V – J ª t š F¼ ÈL{F'1 Å Ä Q ¸A’5B ü y · Þ È ¾ 0*ü b y [‚X Î • å È Í b y [‚X 9 • å í á Â MSS Ä ÎA, TCP SYN y [‚X 9 • å ` Î • åFÑG!5B Q ¸ È J èG!5B‚X hA¹ Ô Ä E- þ s6Ñ‚X *ü â GKÁ È Í b Æ4£ Î0Ÿ‚X TCP E² y á*ó È ¾ Í â 9 Î0Ÿ‚X TCP E² y *ó Ä Q ¸J\ Í IPv4 ‚X TCP *ó Ä	

G!5B –

y ·G!5B õ ã |A× H TCP MSS s6Ñ

```
Ruijie(config-if)# ip tcp adjust-mss 1000
```

¸Ì G Q ¸

Q ¸	£EÄ
´	

G ÄAÈ â

Ý G ÄFÑ Õ Ä

Q ¸ Z Æ

(Ë	AÈ â
RGOS 10.3(5b5)	„ r

RGOS™ ʒ ”Ą

RGOS™ 0
..... 0
..... 1
DNS 1
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DNS

1.1 DNS

1.1.1 ip domain-lookup

DNS **no** DNS

ip domain-lookup

no ip domain-lookup

DNS

DNS DNS

DNS

Ruijie(config)# ip domain-lookup

show hosts	DNS

RGOS10.1

1.1.2 ip name-server

IP **no**

ip name-server *ip-address*

no ip name-server [*ip-address*]

ð Ô

ip-address	IP

ð Ô

ð Ô

ð Ô

DNS Server IP DNS Server DNS Server DNS

6 DNS Server *ip-address* DNS

ð Ô

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

ð Ô

show hosts	DNS

ð Ô

RGOS10.1

1.1.3 ip host

IP

ð Ô

ў ˘ ˩Л∪ **no ip host** *host-name ip-address* ʒ

ð Ô

```
Ruijie(config)# ip host switch 192.168.5.243
```

ð ʒ Ô

ʒ	
show hosts	DNS Â

ð Ô

ʒ RGOS10.1 Э Â

1.1.4 clear host

ў ˌ ă ˘ ˩Л∪ ʒ Â

clear host [*host-name*]

ð Ô

host-name	˩Л∪ ў ˌ ă Â "*" ʒ ў ˌ ă Â

ð ʒ Ô

ð Ô

ў ˌ ă ˘ ч ' 1˜ **ip host** ' 2˜
DNS ˜ Â ʒ˘ DNS ˜
ў ˌ Â

ð Ô

ЛЬЮ ˘ ў ˌ-IP ă ˜ Â

```
clear host *
```

ð ʒ Ô

ʒ	
show hosts	ў ɹ ă

ð Ô

ʒ RGOS10.1 Э Â

1.1.5 show hosts

DNS Â

show hosts

ð ʒ 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 ʒ Ô

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

ð Ô

ʒ RGOS10.1 Э Â

DHCP

2.1. DHCP G5ÈBQ

DHCP ЛЪЮ

- **bootfile**
- **client-identifier**
- **client-name**
- **default-router**
- **dns-server**
- **domain-name**
- **hardware-address**
- **host**
- **ip address dhcp**
- **ip dhcp excluded-address**
-

ð Ô

file-name	˚ ȷ Â

ð Ô

˚ ȷ Â

ð ȝ Ô

DHCP

ð Ô

DHCP Ю à ˚ ˘ DHCP
Ł ˚ ȷ˘ DHCP ȷ Ƨ
Ł ^ TFTP˜ Ю ˚ Â è Ł **next-server** ȝ
Â

ð Ô

ƧЮ ˘ router.conf ѝ ˚ ȷ Â

```
bootfile router.conf
```

ð ȝ Ô

ȝ	
ip dhcp pool	DHCP ȷ ˘ DHCP Â
next-server	DHCP Ю Ł IP Â

2.1.2 client-identifier

DHCP ^ Ƨ Ό ⁸ ˜˜ DHCP
ȝ **client-identifier** Â ȝ **no** ȷ Ƨ
Â

client-identifier *unique-identifier*

no client-identifier

ð Ô

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

ð Ô

Â

ð ʒ Ô

DHCP

ð Ô

DHCP DHCP Ł IP ˘
˚ ʒ Â à MAC
ɻ ˘ MAC ỳ 00d0.f822.33b4 à ɻ ỳ GigabitEthernet 0/1 ỳ
0100.d0f8.2233.b467.6967.6162.6974.4574.6865.726e.6574.302f.31˘
è 01 ʒ Ʌυ ˘
67.6967.6162.6974.4574.6865.726e.6574.302f.31 ỳ

GigabitEthernet0/1 Ώ ⁸ Â ʒ ˘ ɻ Ʌυ RFC1700 ľ Address Resolution Protocol Parameters Ł Â

DHCP ˘ ɻ Ʌυ ʒ Â

ð Ô

ɅυЮ ˘ MAC ỳ 00d0.f822.33b4 Ʌυ DHCP Â

```
client-identifier
0100.d0f8.2233.b467.6967.6162.6974.4574.6865.726e.65
74.302f.31
```

ð ʒ Ô

ʒ	
hardware-address	DHCP ˚ Â
host	IP Â DHCP Â
ip dhcp pool	DHCP ɻ ˘ DHCP Â

2.1.3 client-name

DHCP ɻ ˘ DHCP ʒ **client-name** Â
ʒ no DHCP ɻ Â

client-name *client-name*

no client-name

ð Ô

client-name

ð ʒ Ô

DHCP

ð Ô

Ю˝ DHCP ÿ DHCP Ł Â
DHCP Ł й IP ˘ б
ﻝ Â

ð Ô

ЛЮ ˘ 192.168.12.1 й Â

```
default-router 192.168.12.1
```

ð ʒ Ô

ʒ	
ip dhcp pool	DHCP ﻝ ˘ DHCP Â

2.1.5 dns-server

DHCP DNS Ł ˘ DHCP ʒ
dns-server Â ʒ **no** ﻝ Лυ DNS Ł Â

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

no dns-server

ð Ô

ip-address	DNS Ł IP Â Â
ip-address2…ip-address8	ˆ ﻝ ~ ﻝ Лυ 8 DNS Ł Â
use-dhcp-client *interface-type* *interface-number*	RGOS ˇ DHCP DNS Ł ˘ й DHCP DNS Ł Â

ð Ô

DNS Ł Â

ð ʒ Ô

DHCP

ð Ô

ʒ	
client-identifier	DHCP ˆ Л∪ Ώ ¸ ~ Â
host	IP Â DHCP Â
ip dhcp pool	DHCP ˬ ˘ DHCP Â

2.1.8 host

DHCP ў IP ˘ DHCP ʒ **host** Â ʒ **no** ˬ Л∪ DHCP IP Â

host *ip-address* [*netmask*]

no host

ð Ô

ip-address	DHCP ў IP Â
netmask	DHCP ў Â

ð Ô

ў IP Â

ð ʒ Ô

DHCP

ð Ô

˘ DHCP Ł IP ÂA й 255.0.0.0ơ B й 255.255.0.0ơ C й 255.255.255.0 Â

DHCP ˘ ˬ Л∪ ʒ Â

ð Ô

Л∪ Ю ˘ IP й 192.168.12.91˘ й 255.255.255.240 Â

```
host 192.168.12.91 255.255.255.240
```

ð ʒ Ô

client-identifier	DHCP
hardware-address	DHCP
ip dhcp pool	DHCP DHCP

2.1.9 ip address dhcp

PPP àHDLC àFR DHCP IP

ip address dhcp **no**

ip address dhcp

no ip address dhcp

a DHCP IP

RGOS DHCP IP DHCP

1 DHCP 1 2 DHCP

3 DNS

4 DHCP 15 5 DHCP 44

2.1.10 ip dhcp excluded-address

IP DHCP a DHCP **ip dhcp excluded-a**

ip dhcp pool	DHCP DHCP DHCP Â ?

2.1.13 ip dhcp ping timeout

DHCP Ł ping ă ˘ ˘
ʒ **ip dhcp ping timeout** Â ʒ **no** ˩ Л
Â

ip dhcp ping timeout *milli-seconds*

no ip dhcp ping timeout

ð Ô

milli-seconds	DHCP Ł ping ˆ Л ˜ Â ˩ и 100 1000 Â

ð Ô

и 500 Â

ð ʒ Ô

ð Ô

ping Â

ð Ô

ЛЮ ˘ ping и 600ms Â

```
ip dhcp ping timeout 600
```

ð ʒ Ô

ʒ	
clear ip dhcp conflict	DHCP ă Â
ip dhcp ping packets	DHCP Ł ˘ ă ping Â
show ip dhcp conflict	DHCP Ł ˘ ă Â

2.1.14 ip dhcp pool

DHCP ˩ DHCP ˘
ʒ **ip dhcp pool** Â ʒ **no** ˩ Л DHCP Â

ip dhcp pool *pool-name*

no ip dhcp pool *pool-name*

ð Ô

pool-name	˧ Л Â mypool 1 Â

ð Ô

DHCP Â

ð ɜ Ô

ð Ô

ɜ˘ DHCP ˘ и'

Ruijie(dhcp-config)#

˘ ˧ Л IP à DNS Ł à

ip-address	WINS Ь IP Â Â
ip-address2…ip-address8	ˆ ˩ ˜ ˩Л 8 WINS Ь Â

ð Ô

WINS Ь Â

ð ʒ Ô

DHCP

ð Ô

WINS Ь ˇ ˇ DHCP б
WINS Ь ˇ Ю WINS Ь Â

ð Ô

ЛЪЮ ˇ й DHCP WINS Ь 192.168.12.3 Â

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

ð ʒ Ô

ʒ	
ip address dhcp	DHCP ˫ IP Â
ip dhcp pool	DHCP ˩ ˇ DHCP Â

2.1.17 netbios-node-type

DHCP ў NetBIOS ˇ DHCP ʒ **netbios-node-type** Â ʒ **no** ˩Л NetBIOS Â

netbios-node-type *type*

no netbios-node-type

ð Ô

type	NetBIOS — 1 b-node — 2 p-node — 4 m-node — 8 h-node — b-node — p-node — m-node — h-node

NetBIOS

DHCP

DHCP NetBIOS 1 Broadcast NetBIOS 2 Peer-to-peer WINS NetBIOS 3 Mixed WINS 4 Hybrid WINS NetBIOS NetBIOS

WINS WINS NetBIOS Hybrid

netbios-node-type h-node

ip dhcp pool	DHCP DHCP

2.1.18 networkˆ DHCP˜

DHCP ˘ DHCP ʒ
network Â ʒ **no** ˩ Л∪ Â

network *net-number net-mask*

no network

ð Ô

net-number	DHCP IP Â
net-mask	DHCP IP Â ˘ ѝ Â

ð Ô

Â

ð ʒ Ô

DHCP

ð Ô

è ˘ ѝ DHCP Ł ˩ Â ˘ ˩ Â DHCP ˘ ˘ DHCP ˘ Ю ˘ Â

˩ **show ip dhcp binding** ʒ ˘ ă ˩ **show ip dhcp conflict** ʒ Â

ð Ô

ЛЮ ˘ DHCP ѝ 192.168.12.0ˇ ѝ 255.255.255.240 Â

```
network 192.168.12.0 255.255.255.240
```

ð ʒ Ô

ʒ	

no ˩Л∪ option Â

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

no option

ð Ô

code	DHCP ʒ Â
ascii *string*	ASCII Â
hex *string*	Ὼ ⁸ Â
ip *ip-address*	IP Â

ð Ô

Â

ð ʒ Ô

ð Ô

DHCP ⁸˘ TCP/IP ў Â
DHCP ж option ˘ ὶ ˩ ˩ ˘ ˩Л∪
˘ DHCP 312 option
DHCP Â DHCP ≠ ὶ Â
DHCP option ˘ RFC 2131 Â

ð Ô

ЛυЮ ˘ ʒ 19 ˘ ᾱ DHCP
IP Â0 IP ’ 1 IP ÂЛυ
Ю ˘ DHCP IP Â

```
option 19 hex 1
```

ЛυЮ ˘ ʒ 33 ˘ 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 ʒ Ô

ip dhcp pool	DHCP DHCP

2.1.21 service dhcp

Э DHCP **service dhcp** **dhcp** **no** DHCP

service dhcp

no service dhcp

DHCP

DHCP

DHCP

DHCP DNS DHCP DHCP DHCP DHCP DHCP

DHCP

DHCP

```
service dhcp
```

2.2

- **clear ip dhcp binding**
- **clear ip dhcp conflict**
- **debug ip dhcp client**
- **debug ip dhcp server**
- **clear ip dhcp server statistics**
- **show dhcp lease**
- **show ip dhcp binding**
- **show ip dhcp conflict**
- **show ip dhcp server statistics**

2.2.1 clear ip dhcp binding

DHCP ˘ **clear ip dhcp binding** ʒ Â

clear ip dhcp binding { * | *ip-address* }

ð Ô

*	DCHP Â
ip-address	IP Â

ð Ô

ѝ Â

ð ʒ Ô

ð Ô

ʒ DHCP ˘ DHCP Л Ъ **no ip dhcp pool** ʒ Â

ð Ô

ЛЪЮ ˘ IP ѝ 192.168.12.100 DHCP Â

```
clear ip dhcp binding 192.168.12.100
```

ð ʒ Ô

ʒ	
show ip dhcp binding	DHCP Ŀ Â

2.2.2 clear ip dhcp conflict

DHCP ă ˘ **clear ip dhcp conflict** ʒ Â

clear ip dhcp conflict { * | *ip-address* }

ð Ô

*	DCHP ă Â
ip-address	IP ă Â

ð Ô

ѝ Â

ð ʒ Ô

ð Ô

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

ð Ô

ЛЦЮ ˘ ă Â

```
clear ip dhcp conflict *
```

ð ʒ Ô

ʒ	
ip dhcp ping packets	DHCP Ŀ ˘ ă ping Â
show ip dhcp conflict	DHCP Ŀ ˘ ă Â

2.2.3 clear ip dhcp server statistics

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

clear ip dhcp server statistics

ð Ô

ѝ Â

ð ʒ Ô

ð Ô

DHCP Ł ˘ DHCP à à

˘ DHCP Âclear

ip dhcp server statistics ʒ ˩ Л∪ ˘ Â

ð Ô

ЛЮ ˘ DHCP Ł Â

```
clear ip dhcp server statistics
```

ð ʒ Ô

ʒ	
show ip dhcp server statistics	DHCP Ł Â

2.2.4 debug ip dhcp client

DHCP Client ˘ **debug ip dhcp client**

ʒ Â

debug ip dhcp client

no debug ip dhcp client

ð Ô

ð Ô

ð ʒ Ô

ð Ô

ʒ б dhcp client Ł ў ˘ Л∪

Â

ð Ô

ЛЮ ˘ Э dhcp Â

ð Ô

IP ˘ Â IP ˘
IP Â

ð Ô

ЛЬЮ ѝ **show dhcp lease** Â

Ruijie# show dhcp lease

```
Temp IP addr: 192.168.5.71  for peer on Interface:
FastEthernet0/0
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
```

2.2.7 show ip dhcp binding

DHCP ˘ EXEC ҁ **show ip dhcp binding** Â

show ip dhcp binding [*ip-address*]

ð Ô

ip-address	ˆ ˩ ˜ IP Â

ð Ô

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IP ˘ Â IP ˘
IP Â

ð Ô

ЛЬЮ ѝ **show ip dhcp binding** Â

Ruijie# show ip dhcp binding

IP address Client-Id/ Lease expiration Type

Hardware address

192.168.1.2 00d0.f866.4777 IDLE Manual

ЮÂ

IP address	DHCP IP Â
Client-Id/ Hardware address	DHCP client identifier ˚ Â
Lease expiration	Â Infinite 8' IDLE ˘ ˩ DHCP ў Â
Type	Â Automatic ' Manual Â

ð ʒÔ

ʒ	
clear ip dhcp binding	DHCP

2.2.8 show ip dhcp conflict

DHCP Ł ă ˘ EXEC ʒ **show ip dhcp conflict** Â

show ip dhcp conflict

ð Ô

ð Ô

ѝ Â

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ð Ô

ʒ ˩Л DHCP Ł ă Â

ð Ô

ЛЮ ѝ **show ip dhcp conflict** ʒ Â

Ruijie# show ip dhcp conflict

```
IP address    Detection Method
 192.168.12.1    Ping

dhcp excluded ipaddress
 192.168.12.100
```

ÞO Â

IP address	a ˩ DHCP IP Â
Detection Method	ă Â
dhcp excluded ipaddress	Â

ved

Ь DHCP ʒ

3.1 DHCP 4G5Ę

DHCP ЛЬЮ ʒ'

z **Service dhcp**

z Ip helper-address

3.1.1 service dhcp

DHCP ʒ ˘ ʒ **service dhcp** Â ʒ **no** ˩ Л Ь DHCP ʒ Â

service dhcp

no service dhcp

ð Ô

DHCP ʒ Â

ð ʒ Ô

ð Ô

DHCP ˩ Л Ь DHCP è Ł ˘ DHCP Ą DHCP ˘ DHCP Â

ð Ô

ЛЬЮ ˘ DHCP Ł Â

```
service dhcp
```

ð ʒ Ô

ʒ	
Ip helper-address [vrf] *A.B.C.D*	╕ DHCP server

3.1.2 ip helper-address

ֽ ˩ Л ╗ DHCP ┗ Â ֽ no ˘
┗ Â

┗ ˩ Л ˘ ≠ ˩ Л Â ֽ ˩ Л
Ю ≠ ˩ Л Ю ˘ ╗ Ю DHCP
┗ Â

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˩ Л DHCP ┗ ˘ DHCP
┗ Â ˩ Л ÿ Â

vrf ˘ a ˩’
a vrf ˘ ┗ a
vrf ┗ ’ a vrf ˘ ┗
˩ vrf

ð Ô

ЛЮ ˘ ч ┗ ˘ ˩ vrf ┗ й
61.154.26.49 Л vrf ˩ й local ┗ й 192.168.197.1 Â

```
ip helper-address  61.154.26.49

ip helper-address vrf local 192.168.197.1
```

ð ֽ Ô

ֽ	
Service dhcp	DHCP ֽ

NTP

4.1 NTP

NTP

- **no ntp**
- **ntp access-group**
- **ntp authenticate**
- **ntp authentication-key**
- **ntp disable**
- **ntp master**
- **ntp server**
- **ntp synchronize**
- **ntp trusted-key**
- **ntp update-calendar**

4.1.1 no ntp

ntp

no ntp

ЛЪЮ ˘ NTP Ł Â

no ntp

ð ʒ Ô

ʒ	
ntp server	NTP Ł

4.1.2 ntp access-group

NTP Ł ⁸ ˘ ʒ 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 ’ ѝ 1 99 1300 1999
access-list-name	IP ⁸ ˩ Â

ð Ô

Ю NTP ⁸ Â

ð ʒ Ô

Â

ð Ô

NTP Ł ⁸ Â
˘ NTP ⁸ Â

NTP ÿ
Л ù Â ù peer à
serve à serve-only à query-only Â

a É

Э
б Â

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ð Ô

ЛЮ 1
à 2
Â

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

ð Ô

ip access-list	IP Â

4.1.3 ntp authenticate

NTP NTP Â

ntp authenticate

no ntp authenticate

ð Ô

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Ю NTP Â

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a Â

md5 key-id

ntp trusted-key key-id

1024

ð Ô

ID 6

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

ð Ô

ntp authenticate	
ntp trusted-key	
ntp server	NTP

4.1.5 ntp disable

NTP

ntp disable

ð Ô

ð Ô

NTP

ð Ô

ð Ô

NTP

NTP

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a É

IP

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ð Ô

ЛЬЮ ⅃ ˘ è ѝ 12 Â

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

ð ʒ Ô

4.1.7 ntp server

ѝ NTP NTP ⊾ Â

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

no ntp server *ip-addr*

ð Ô

ЛЬЮ ˘ NTP Â

```
show ntp status
```

UDP-Helper

5.1 G5ÈBQ

5.1.1 udp-helper enable

udp-helper enable UDP Â **no**
udp-helper enable UDP Â

ÐÓ UDP Â

udp-helper enable

no udp-helper enable

ð Ô

ð Ô

UDP

UDP-Helper ˇ 69,53,37,137,138,49
DP Â

UDP :

```
ijie(config)# udp-helper enable
```

ard- udocol elper e le

5.1.2 ip helper-address

UDP Â no UDP
Â

ip helper-address *address*

no ip helper-address *address*

Ô

address	UDP 20 Â

Ô

UDP Â

Ô

Ô

20 Â Â
Э , UDP-Helper
UDP Э
Э Â

no ip helper-address Â

Ô

Ю UDP Â :

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

Ô

ip forward-protocol	UDP

Ô

RGNOS10.1 Э Â

5.1.3 ip forward-protocol

UDP **no**
UDP

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**]

port	a 69,53,37,137,138,49
tftp	Trivial File Transfer Protocol(69) UDP 69
domain	Domain Name System(53) UDP 53
time	Time service(37) UDP 37
netbios-ns	NetBIOS Name Service(137) UDP 137
netbios-dgm	NetBIOS Datagram Service(138) UDP 138
tacacs	TAC Access Control System(49) UDP 49

UDP

UDP-Helper 69,53,37,137,138,49 UDP
a

```
Ruijie(config)# ip forward-protocol udp 134
```

udp-helper enable	UDP

ip forward-protocol

Ὼ URPF ʒ

6.1 G5ȖBQ

6.1.1 ip verify unicast source reachable-via any

ð ʒ Ô

ip verify unicast source reachable-via any [**allow-default** | *acl_num*]

ð Ô

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ƙƱ ƒ ƙƱ BGP ƒ 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 ƙƱ ƒ Ô

ƙƱ ƒ	
match community	ƒ ƒ
set comm-list delete	ƒ BGP ƒ
show ip community-list	ƒ
show ip bgp community-list	ƒ ƒ BGP

ð Ô

1.1.2 ip default-network

ƙƱ ƒ **ip default-network** Â ƙƱ ƒ no Ô Â

ip default-network *network*

no ip default-network

ð ƕ ƚ Ô

Â

ð ´ Ô

ƞ ˘ **default-network**
ЛЮ ˚ ' a ƛ ˘ ƣ
ƙ Â

Л“*” ƚ ˘ Â
connected Ո ЮЮ ˘ Â

ð Ô

ЛЮ ˘ 192.168.100.0 ƞ ˘
˘ Л ╟ Â

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

Л Ю ˘ 200.200.200.0 ƞ ˘ ƛ
200.200.200.0 ƣ ˘ ƞ Â

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

ð ƕ ƚ Ô

ƕ ƚ	
show ip route	IP Â

ð ƙ Ô

ƕ ƚ ƣ Э a Â

1.1.3 ip prefix-list

╕ ˘ **ip prefix-list** ƕ ƚ Â ƕ ƚ **no** Â

ip prefix-list *prefix-lis-name* [**seq** *seq-number*] { **deny** | **permit** } *ip-prefix* [**ge** *minimum-prefix-length*][**le** *maximum-prefix- length*]

no ip prefix-list *prefix-lis-name*[**seq** *seq-number*] { **deny** | **permit**} *ip-prefix* [**ge** *minimum-prefix- length*][**le** *maximum-prefix- length*]

ð ƛ Ô

prefix-lis-name	ɻ
seq-number	Л υ ٨ Â è تن 1 2147483647 Â ɬυ ɜ Ü ٨ ˘ ы ɬ ٨ Â ٨ 5 ˉ ɻ ٨ ٨ 5
deny	٦
permit	٦
ip-prefix	فخ سم Л υ ٦ Â فخ سم ٦ Л υ IP فخ سم Â ÿ 0 128
minimum-prefix-length	ˆ ٦ ~ تن (تن) ' **ge** ɜ
maximum-prefix-length	ˆ ٦ ~ تن (تن) ' **le** ɜ

Ä

```
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
```

1.1.4 ip prefix-list sequence-number

ὶ ╗ ˘ **ip prefix-list description** ƚ ƕ Â ƚ ƕ **no** Â

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

ð ƛ Ô

prefix-lis-name	ɻ
descripton-text	

ð Ô

╗

ð ƚ ƕ Ô

ð ´ Ô

ð Ô

ЛЪЮ ὶ IP ╗ **Deny routes from Net-A'**

```
Ruijie# configure terminal
Ruijie(config)# ip prefix-list pre description Deny
routes from Net-A
```

1.1.5 ip prefix-list sequence-number

ὶ ὖ ╗ ˘ **ip prefix-list description** ƚ ƕ Â ƚ ƕ **no** ƙ ╗ Â

ip prefix-list sequence-number

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ð Ô

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ð ƕ ɣ Ô

ð ´ Ô

ð Ô

ЛЬЮ ѝ ѽ ɕ '

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

ð ´ Ô

ỳ 1˜ ˘ ٧ Л Ъ ╟
˘ ٧ ╟ a ˘ Â
٧ Л Ъ ˘ ˘
٧ ỳ ╟ Â OSPF ỳ 110˜ ٧ Л Ъ
ỳ 125˜ OSPF ˘
٧ Л Ъ Э Â

٧ Л Ъ vrf˜ ╗ vrf Â

ỳ 1˜ ٧ Л Ъ **show ip route weight** ƙʊ ʒ
Â ٧ weight WCMP ╗ ˘ ج
ك ٧ فخ سم ˘ ٨ ƚ
˘ weight ƚ ˘ ƚ
Â ٧ WCMP ٨ ỳ 32˜ ٨
a ٧˘ Л Ъ è WCMP ٨ б ص ٨ ' ك
Ո ٨ ˘ ٨ a Â

٨ ĭ ˘ a ٧ Â
٧ ˘ ˘ ĭ ج Â

Л Ъ ٧ ˘ Ю ỳ ٧^ ip route 0.0.0.0 0.0.0.0 Fastethernet 0/0˜ Â
˘ ج Fastethernet 0/0 ٧˘ ج ў ٧ ARP ˘ ´ CPU Ո Â Л Ъ a
٧ Л Ъ ٧ Â

ð Ô

ЛЪЮ ˘ ╗ 172.16.100.0/24 ˘
Ю ỳ 192.168.12.1˜ ỳ 115 Â

```
ip route 172.16.100.0 255.255.255.0 192.168.12.1 115
```

٧˘ ٧ ٧ ˘ ٧
ÿ è ٧ ٧ Â ٧ ˘ ٧ ÂЛЪЮ
˘ 172.16.100.0/24 ٧ ÿ fastethernet 0/0
٧ ٧ Â

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

ð ƙʊ ʒ Ô

1.1.7 ip routing

Ù RGOS ˚ IP ╖ ˘ ج Ю ÌU ¾ Â ÌU ¾
no ┘Л IP ╖ Â

ip routing

no ip routing

ð Ô

Ù IP Â

ð ÌU ¾ Ô

ð ´ Ô

┘ й ˘ ┘ й VOIP ˘ ┘Л a
RGOS ˚ IP ┘╖ Â ┘Л RGOS IP ╖ Â

ð Ô

ЛЮ ˘ RGOS ˚ IP ╖ Â

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

ð ┘ Ô

ÌU ¾ ج Э a Â

1.1.8 ip static route-limit

Э ˘ ÌU ¾ **ip static route-limit** Â
ÌU ¾ no ┘Л ھ Â

ip static route-limit *number*

no ip static route-limit

ð ¶ Ô

¶	
number	Э ˘ تن 1-10000

ð Ô

й 1000 Â

ð ÌU ¾ Ô

Â

ð ´ Ô

Э ѝ ⁸ ˘ **ip static route-limit** Э ѧ Ю ˘ a Э Â **show running-config** ϡ Л Э Â

ð Ô

ЛЮ ˘ Э ѝ 900 ˘ ѧ Â

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

ð ѧ Ô

ƕ ϗ Э a Â

1.1.9 ipv6 prefix-list

IPv6 ╗ ˘ **ipv6 prefix-list** ƕ Â ƕ **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 ϟ Ô

prefix-lis-name	ѧ Â
seq-number	Л Âè تن 1 2147483647 Â ƕ ΰ ѧ˘ ѝ ϯ ѧ Â ѧ 5˘ ѧ ѧ 5
deny	┑
permit	┑
ipv6-prefix	فخ سم Л ϟ Â فخ سم ϡ Л IP فخ سم Â ÿ 0 128

minimum-prefix-length	^ ˩ ~ ƭƱ (ƭƱ) ' **ge** ƨ
maximum-prefix- length	^ ˩ ~ ƭƱ (ƭƱ) ' **le** ƨ

ð Ô

Â

ð ƙƱ ƨ Ô

Â

ð ´ Ô

ipv6 prefix-list ƙƱ ƨ IPv6 Â permit deny ā ج ך ЮО Ո ˩ ╠ Â

ⱷ ך ƭƱ ך Âge le ⱷ ך ƭƱ˘ ´

ipv6-prefix ╗ ך Â ƙƱ ƨ ge le ˘ ipv6-prefix ƭƱ ך Â ge˘ ך ƭƱ minimum-prefix-length 32 Â le˘ ך ƭƱ ipv6-prefix maximum-prefix- length Â ˘ ך ƭƱ ÿ minimum-prefix-length maximum-prefix- length Â . ˘ ipv6-prefix à minimum-prefix-length Ո maximum-prefix-length ' ipv6-prefix < minimum-prefix-length < maximum-prefix-length <= 128 Â

ð Ô

ЛЪЮ ѝ ƚ ˩ ˘ RIP ƚ ˩ OSPF 1 ƚ ˩ IP ˘ ج IPv6 ⱷ(˩ IP ج 2222::/64 ƚ ˩ ˩)˘ ЮО '

```
Ruijie# configure terminal
Ruijie(config)# ipv6 prefix-list pre permit 2222::/64
Ruijie(config)# ipv6 router rip
Ruijie(config-router)# redistribute ospf 1
Ruijie(config-router)# distribute-list prefix pre out
Ruijie(config-router)# end
```

1.1.10 ipv6 prefix-list sequence-number

ѝ IPv6 ╗ ˘ **ipv6 prefix-list description** ƙƱ ƨ Â ƙƱ ƨ **no** Â

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

ð ɸ Ô

prefix-lis-name	IPv6 ɻ
descripton-text	IPv6

ð Ô

╕

ð ƀʊ ɜ Ô

ð ´ Ô

ð Ô

1.1.12 match as-path

ƚ AS_PATH ˇ في ƕ
match as-path Â ƕ **no** Â

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

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

ð ٧ Ô

٧	
as-path-acl-list-num	٨ Â ٨ تن 1…500

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في Â

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match as-path ƕ ٨ ٦ Ʌ ٨ Â

في ˇ ٦ Ʌ 1 **match** ƕ Ո 1
set ƕ Â **match** ƕˇ ٦ ’ **set** ƕˇ
a Â

ð Ô

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

ð ƕ Ô

ƕ	
match community	٦ يخ
match metric	٦
match origin	٦ ٦
set as-path prepend	ƚ AS_PATH
set metric	ƚ

1.1.13 match community

ƚ COMMUNITY ˇ ڧي
ƙʊ ɮ **match community** Â ƙʊ ɮ **no** Â

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**] …]

ð ɳ Ô

ɳ	
community-list-number	ڀ ʃ ڀ ' ʃ تن ؤ 1-99 ڀ ' ʃ تن ؤ 100-199
communitys-list-name	ڀ ɻ ڀ ɻ a 80
exact-match	٦

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match community ƙʊ ɮ ɻ ɻ ʃ ڀ ʃ ڀ ɻ ˇ Ո a 6 Â

exact-match ˇ a ٦ Â

ڧي ˇ ɻ ʃ 1 **match** ƙʊ ɮ Ո 1 **set** ƙʊ ɮ Â **match** ƙʊ ɮˇ ٦ ' **set** ƙʊ ɮˇ a Â

ð Ô

```
Ruijie(config)# ip community-list 1 permit 100:2 100:30
Ruijie(config)# route-map set_lopref
Ruijie(config-route-map)# match community 1 exact-match
Ruijie(config-route-map)# set  local-preference 20
```

ð ƕ ǯ Ô

ƕ ǯ	
ip community-list	˙
match as-path	˥ AS_PATH
match metric	˥
match origin	˥ ˧
set as-path prepend	ǂ AS_PATH Â
set comm-list delete	˥ ˙
set community	˙
set metric	ǂ

1.1.14 match interface

ج ɬ ˘ ﻲﻔ route maps˜ ˘ ﻪﻫ
ɬ ˚ ⁸ Â

ﻲﻔ ˘ ⅄ Ɔ 1 **match** ƕ ʒ Ո 1
set ƕ ʒ Â **match** ƕ ʒ˘ ך ’ **set** ƕ ʒ˘
a Â

ð Ô

ﻲﻔ ɬ ˘ ⅄ Ɔ ج ɬ Ո Ǝ Â a

1.1.15 match ip address

ƚ ˘ ڧي

ƕ **match ip address** Â ƕ **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 ٧ Ô

٧	
access-list-number	٨ ˘1-99 ' تن ٨ 1300-1999 ˘100-199 ' تن ٨ 2000-2699
access-list-name	٦
prefix-list *prefix-list-name*	٦ ٦

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match ip address ƕ ٨ ٦ Ո Ո ٨ ٦ Â

٦ Ո ÿ ƚ ٨ ٦ Â ٦
Ո OSPF ƞ ƚ ٨ RIP ƞ ˘ ≠ ٦ Ո RIP
ƞ ƚ ٨ OSPF ƞ Â ƚ ٦
Ո ج IP Â

ج ƚ ˘ ڧي route maps˜ ˘ ƞ
ƚ ˚ ⁸ Â

ڧي ˘ ٦ Ո 1 **match** ƕ ƞ Ո 1
set ƕ Â **match** ƕ˘ ٦ ' **set** ƕ˘
a Â

ð Ô

ϕϕ ϯ ˇ ϗ Λυ ϳϳ ϯ Ω Э Âa
ϕϕ ˇ ϗ ƕυ ϗ a ϗ Â
ϕϕ ˇ ϳϳ ϗ Э ˇ a ϗ ϳϳ ϯ ϳϳ ϗ .
ƕυ ϗ ≠ a ϗ Â

ΛυЮ ˇ OSPF ϯ RIP ˇ ϗ ϯ
ϗ v6acl RIP ˇ ϳϳ OSPF ϳϳ ˇ й 30 Â

```
Ruijie(config)# router ospf
Ruijie(config-router)#  redistribute rip subnets
route-map redrip
Ruijie(config-router)# network 192.168.12.0 0.0.0.255
area 0
Ruijie(config-router)# exit
Ruijie(config)#  access-list 10 permit 200.168.23.0
0.0.0.255
Ruijie(config)# route-map redrip permit 10
Ruijie(config-route-map)# match ip address 10
Ruijie(config-route-map)# set metric 40
Ruijie(config-route-map)# set metric-type type-1
```

ð ƕυ ϗ Ô

ƕυ ϗ	
access-list	ЮЖ
match interface	ϩ ЮО ϟ
match ip next-hop	ϩ ЮО ϕϕ ϫϭ
match ip route-source	ϩ ϕϕ ϫϭ
match metric	ϩ
match route-type	ϩ ϭϭ
match tag	ϩ
set metric	ϯ
set metric-type	ϯ ϭϭ
set tag	ϯ

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show ip ospf	ospf	Â

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4.1.45 router-id

ID,

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4.1.46 summary-address

OSPF ϡ ˘ ħυ ϡ
summary-address Â ħυ ϡ **no** ϡ ħ Â

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

ð ϒ Ô

ϒ	
ip-address	IP ϡ فخ Â
net-mask	Â
not-advertise	a ˆ ˘ ϳ ˆ Â

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ÿ è ϡ ˘ OSPF ˘ ϡ
ϡ ´ Ʌυ ˆ OSPF Â
ϡ فخ ˘ ϡ ϡ Ʌυ ϡ ˆ
˘ ÿ Â

б **area rang** ħυ ϡ ϡ a ϡ˘ area range OSPF ϡ ϡ˘ ˍ
summary OSPF se

1
Ruijie(config-router)# **network** *172.16.24.0 0.0.0.255* area *0*
Ruijie(config-router)# **area** *1* **nssa**

ð ƕ ƚ Ô

ƕ ƚ	
area range	ج OSPF ש ش Э Â

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4.1.47 timers lsa-group-pacing

ƕ ƚ LSA ƚ ƛ ⁹ Ʌ ƛ
˘ ƕ ƚ **no** Â

timers lsa-group-pacing *seconds*

no timers lsa-group-pacing

ð ƾ Ô

ƾ	
seconds	LSA ˘ Ɲ ˘ Â تن: 10-1800

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: 240 Â

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ˆ LSA˜ ˘ Ɲ ˘ ˘
Ʌ ش Â й 4ƚ Â ƾ a Â
б LSA ƙ Â ˘
10000 LSA˜ æ Â ƙ 40~100 ˘
10~20ƚ ƙ Â

ð Ô

ɅЮ ˘ й 120 Â

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

ƕ ٧	
show ip ospf	ospf

ð ٨ Ô

ð Ô

4.1.49 timers throttle spf

OSPF ج ل ˘ SPF à
SPF à ˘ ƕ ٧
timers throttle spf Â ƕ ٧ no Â

timers throttle spf *spf-delay spf-holdtime spf-max-waittime*

no timers throttle spf

ð ٧ Ô

٧	
spf-delay	ƙ SPF ˘ Ո ى ´ Æ˘ ل تن' 1-600000 Â OSPF ل ˘ ل SPF ج spf-delay ٨ Â
spf-holdtime	ƙ SPF ˘ Ո ى ´ Æ˘ ل تن' 1-600000 Â
spf-max-waittime	ƙ SPF ˘ Ո ى ´ Æ˘ ل تن' 1-600000 Â

ð Ô

spf-delay' 1000 '

spf-holdtime' 5000 '

spf-max-waittime' 10000 Â

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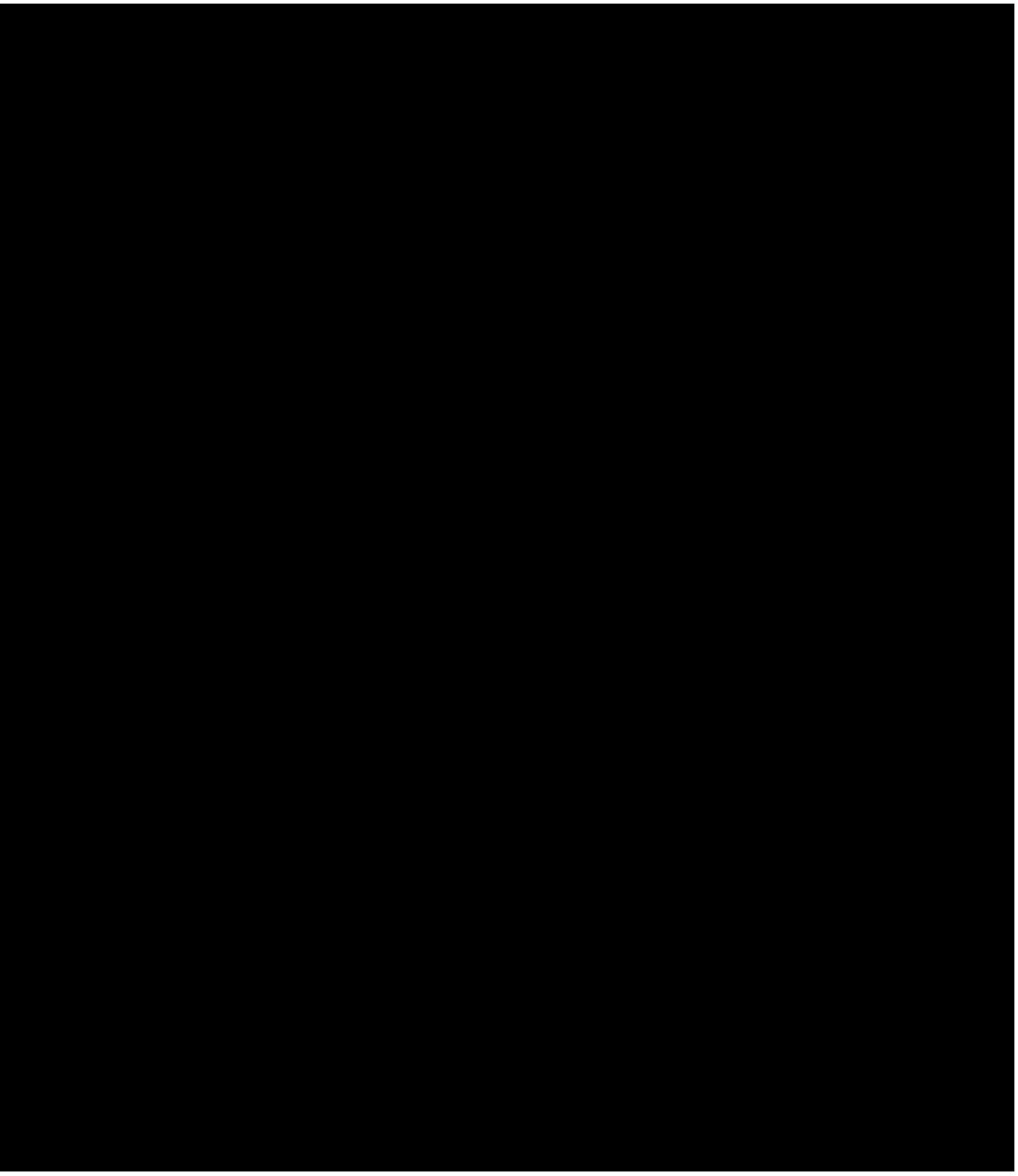
ð ´ Ô

spf-delay ÿ ل ل SPF ˘ Â
ل SPF ل SPF ى
spf-holdtime˘ ٨˘ ل SPF ى Э
˘ *spf-max-waittime* ٨˘ a ¨Ą ╗ Â
SPF ˘ ƙ SPF
ÿ *spf-holdtime* Â



```
External LSA database is unlimited.
Number of LSA originated 6
Number of LSA received 2
Log Neighbor Adjency Changes : Enabled
Number of areas attached to this router: 1
Area 0 (BACKBONE)
Number of interfaces in this area is 1(1)
Number of fully adjacent neighbors in this area is 1
Area has no authentication
SPF algorithm last executed 00:01:26.640 ago
SPF algorithm executed 4 times
Number of LSA 3. Checksum 0x0204bf
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
```

LsaGroupPacing	LSA ˇ Ո ˇ
Incomming current DD exchange neighbors	ج ˇ incomming exstart
Outgoing current DD exchange neighbors	ج ˇ outgoing ÿ ھ exstart
Number of external LSA	LSA

NSSA Translator State	ï NSSA LSA ù External LSA' NSSA Ø˘ ABR OSPF '

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4.2.2 show ip ospf border-routers

ABR/ASBR OSPF ˘ ÞU Ç

show ip ospf border-routers Â

show ip ospf [*process-id*] **border-routers**

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process-id	ospf Ë

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ÞU Ç˘ Ë Ú ææ ABR ASBR OSPF ÂOSPF a Ë **show ip route** ˘ OSPF ææ ƒ ù OSPF ˘ a Â

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ÚÙЮ ù **show ip ospf border-routers** ÞU Ç '

```
Ruijie# show ip ospf border-routers
OSPF internal Routing Table

Codes: i - Intra-area route, I - Inter-area route

i 1.1.1.1 [2] via 10.0.0.1, FastEthernet 0/1, ABR, ASBR,
Area 0.0.0.1 select
```

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Codes	ص Ç ÌÆ Âi Ø ææ ˘ I Ø ææ Â
I	ù Ø ææ Â

Cksum	Ո Â
Link-Count	
Route	LSA ΰ
Tag	Â

ЛЬЮ ѝ **show ip ospf database asbr-summary** ħυ ҙ '

```
Ruijie# show ip ospf database asbr-summary
OSPF Router with ID (1.1.1.35) (Process ID 1)
```

TOS	TOS ˘ ٧ ѝ 0 Â
Metric	Â

ЛЬЮ ѝ **show ip ospf database external** ƕ ٧ '

```
Ruijie# show ip ospf database external
OSPF Router with ID (1.1.1.35) (Process ID 1)
AS External Link States
LS age: 752
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 ƕ ٧ ٨ ЮÂ

OSPF Router with ID	ЛЬЮ б OSPF ٨ ÂÂ
Type-5 AS External Link States	ЛЬЮ ѝ ﻫ Â
LS age	ﺟ Â
Options	Â
LS Type	ﺻ Â
Link State ID	Â
Advertising Router	ˆ Â
LS Seq Number	٨ Â
Checksum	Ո Â
Length	˘ Лu ѝ´ Æ Â
Network Mask	Â
Metric Type	ﺻ Â

TOS	TOS ˘ ٧ ѝ 0 Â

Checksum	Ո Â
Length	˘ Ո ѝ´ Æ Â
Network Mask	Â
Attached Router	Э Â

ՈЮ ѝ **show ip ospf database router** ƕ

```
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
```

Checksum	Ո Â
Length	˘ Л ѝ ´ Æ Â
Number of Links	Â
Link connected to	˘ Л ٦ صر Â
(Link ID)	Â
(Link Data)	Â
Number of TOS metrics	TOS ˘ ٧ TOS0 Â
TOS 0 Metrics	TOS Â

ЛЬЮ ѝ **show ip ospf database summary** ƕ ƺ '

```
Ruijie# show ip ospf database summary
OSPF Router with ID (1.1.1.1) (Process ID 1)
Summary Link States (Area 0.0.0.0)
LS age: 499
Options: 0x2 (*|-|-|-|-|-|E|-)
LS Type: summary-LSA
Link State ID: 10.0.0.0 (summary Network Number)
Advertising Router: 1.1.1.1
LS91.88 0.4w ip ospf datcess I.tv5 25)
3(TT2 1 Tf-0.1Tc 0 Tw 9.874 0.006 Td<4104B82C581C12>-6≥2D6>F0E33B341
```

˘ Л ѝ ´

Length

Length	˘ ЛЧ ѝ ´ Æ Â
Network Mask	Â
Metric Type	صر Â

LS Type	صر Â
Link State ID	Â
Advertising Router	˜ Â
LS Seq Number	٨ Â
Checksum	Ո Â
Length	˘ Лυ ий´ Æ Â
Network Mask	Â
Metric Type	صر Â
TOS	TOS ˘ ٧ ий 0 Â
Metric	Â
Forward Address	˘ ٧ IP فذسم Â فذسم ий 0.0.0.0 ٧ Â
External Route Tag	˘ 32 Â OSPF a ˘ جم è ƚ OSPF Â

ЛЬЮ ий **show ip ospf database database-summary** ƕ ƚ '

```
Ruijie# show ip ospf database database-summary
OSPF process 1:
Router Link States      : 4
Network Link States     : 2
Summary Link States     : 4
ASBR-Summary Link States : 0
AS External Link States  : 4
NSSA-external Link States: 2
```

show ip ospf database database-summary ƕ ƚ ٨ ЮÂ

OSPF Process	ЛЬЮ ٨
Router Link	جم Ш ىف ˘ OSPF LSA Â
Network Link	جم Ш ىف ˘ OSPF LSA Â
Summary Link	جم Ш ىف ˘ OSPF LSA Â
ASBR-Summary Link	جم Ш ىف ˘ OSPFASBR LSA Â

ĺ ƕ ɜ ৭

```
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
```

Crypt Sequence Number	ƛ md5 ƚ
Hello received send	б ƙ HELLO Â
DD received send	б ƙ DD Â
LS-Req received send	б ƙ LS Â
LS-Upd received send	б ƙ LS Â
LS-Ack received send	б ƙ LS ː Â
Discard	OSPF Â

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4.2.5 show ip ospf neighbor

OSPF ˘ ƕ **show ip ospf neighbor** Â

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

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ЛЬЮ ѝ **show ip ospf neighbor** ƕ

```
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   FastEthernet 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 FastEthernet 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 ƕ ϰ ЮЪ

Neighbor ID	Â
Pri	ˆ DR ˜
State	
Dead Time	Dead
Address	ϰ ѫ ف
Interface	ϰ
interface address	ϰ ѫ ف
In the area	˜ ѭ ѭ
via interface	ϰ Â
Neighbor priority	OSPF Â

State	OSPF ÂFULL ' DR ѝ ' BDR ѝ ' DROTHER a DR/BDR Â صر DR BDR Â
State changes times	٦
Dead Time	'
DR	DR ٨ سم ڤڅ(Hello DR)
BDR	BDR ٨ سم ڤڅ(Hello BDR)
Options	Hello E ˘ 0 Ш ؏ѝ STUB' ˘ Ш ؏ a STUB Ш ؏ Â
Dead timer due in	Â
Neighbor up time	٦ جم
Database Summary List	DD
Link State Request List	LS
Link State Retransmission List	
Crypt Sequence Number	Ш ؏ MD5
Thread Inactivity Timer	٪
Thread Database Description Retransmission	٨ DD ٪
Thread Link State Request Retransmission	٨ LS ٪
Thread Link State Update Retransmission	٨ LS ٪
Thread Poll Timer	˘ Poll Timer ŭ ╟

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ð Ô

4.2.6 show ip ospf route

ospf Â

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

show ip ospf summary-address

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ƕ ƚ ٩ ƙ NSSA ABR Э ˘ ٩ ƙ سم
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ЛЬЮ ƞ **show ip ospf summary-address** ƕ ƚ '

```
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	فخ سم
Summary Mask	تن Â
Advertise	ˆ ĭ
Status	تن ĭ
Aggregated subnets	تن ƙ

ð ٧ Ô

ð Ô

4.2.8 show ip ospf virtual-link

OSPF ˘ ƕ ƚ **show ip ospf virtual-link** Â

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

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Â **show ip ospf neighbor** ƕ ٧ a Â

ð Ô

ɅƱƟ ƙ **show ip ospf virtual-links** ƕ ٧ '

```
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 FastEthernet 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
```

٨ ƱÂ

Virtual Link VLINK0 to router	Ʌ ٦
Virtual Link state	.
Transit area	Ʊ ٠ Â
via interface	٨ Â
Local address	ف ٠ ٨
Remote Address	ف ٠ ٨

Time intervals configured	٧ Hello˘ Dead˘ Wait˘ Retransmit
Adjacency State	Â FULL ѝ Â

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BGP CLI

5.1 G5BGQ

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a RSR10 p Â

5.1.1 address-family ipv4

address-faimly IPv4 BGP Â
exit-address-family BGP Â

address-family ipv4 [**unicast**]

no address-family ipv4 [**unicast**]

Ô

unicast	IPv4

Ô

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BGP Â

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BGP Â IPv4 Â
BGP **exit-address-family** Â

Ô

```
Ruijie(config)# router bgp 65000
Ruijie(config-router)# address-family ipv4
```

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5.1.3 address-family vpnv4

ƕ ٩ PE VPN ˘
address-family VPN فخ سم Â **exit-address-family** ƕ ٩
address-family VPN Â

address-family vpnv4 [**unicast]**

no address-family vpnv4 [**unicast**]

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٩	
unicast	٦ ˘ IPv4 ´ فخ سم

ð Ô

ƕ vpn فخ سم

ð ƕ ٩ Ô

BGP Â

ð ´ Ô

ƕ ٩ vpn فخ سم ƗŎ PE
vpn

ھى BGP ˘ ٦ ΠƱ ƕ ٩ **exit-address-family** Â

ð Ô

```
Ruijie(config)# router bgp 65000
Ruijie(config-router)# address-family vpnv4
```

ð ƕ ٩ Ô

ƕ ٩	
exit-address-family	

ð ٧ Ô

5.1.4 aggregate-address ˆ IPv4˜

ƕ ٩ BGP IPv4 ٨ Â ƕ ٩ **no**
٦ Â

aggregate-address *ip-address mask* {**as-set**|**summary-only**}

no aggregate-address *ip-addres mask* {**as-set**|**summary-only**}

ð ɳ Ô

ɳ	
ip-address	ɲ فخ سم فخ سم
mask	ɲ فخ سم
as-set	ɲ فخ سم تن AS Â
summary-only	ɲ ˆ ɲ ɲ

ð Ô

ɲ Â

ð ƙυ ɂ Ô

BGP ˇ BGP IPv4 فخ سم ˇ BGP IPv4 VRF فخ سم

ð ´ Ô

BGP ɲ ˆ ɲ ɲ ˇ ɳ ˆ ɲ ɲ
ˇ **aggregate-address summary-only** ƙυ ɂ Â

ð Ô

```
Ruijie(config)# router bgp 65000
Ruijie(config-router)# aggregate-address 10.0.0.0
255.0.0.0 as-set
```

ð ƙυ ɂ Ô

ƙυ ɂ	
router bgp	BGP Â

ð ɲ Ô

5.1.5 auto-summary

ƙυ ɂ BGP ╟ Â ƙυ ɂ **no**
╗ Â

auto-summary

no auto-summary

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ЮЎ BGP a ╟

ð ħu ʒ Ô

BGP ˇ BGP IPv4 فخ سم Â

ð ´ Ô

╟ ѝ

ð Ô

```
Ruijie(config)# router bgp 65000
Ruijie(config-router)# auto-summary
```

ð ħu ʒ Ô

ħu ʒ	
router bgp	BGP Â

ð ٨ Ô

5.1.6 bgp always-compare-med

ħu ʒ BGP Multi Exit Discriminatoî MED˜ Â
ħu ʒ **no** ╖ Â

bgp always-compare-med

no bgp always-compare-med

ð ٧ Ô

ħu ʒ ٧

ð Ô

ЮЎ ٨ AS MED Â

ð ħu ʒ Ô

BGP Â

ð ´ Ô

ЮЎ ٧ ٨ AS MED ˇ
a ٨ AS MED ˇ ħu ʒ Â
٨ جم فخ سم ˇ MED Â
a ٨ ٨ IGP ∩ ˇ ĭ

a ħu ʒ

ð Ô

```
Ruijie(config)# router bgp 65000
Ruijie(config-router)# bgp always-compare-med
```

ð ħu ʒ Ô

ħu ʒ	
show ip bgp	BGP
bgp bestpath med confed	˘ AS MED
bgp bestpath med missing-as-worst	˘ MED ˥ æ Â
bgp deterministic-med	˘ ˩ AS

ð ˩ Ô

5.1.7 bgp bestpath as-path ignore

˘ ħu ʒ a AS Â ħu ʒ

no ˥ Â

bgp bestpath as-path ignore

no bgp bestpath as-path ignore

ð ٩ Ô

ħu ʒ ٩ Â

ð Ô

ƗƠ æ AS Â

ð ħu ʒ Ô

BGP

ð ´ Ô

(RFC1771) ˘ BGP a AS

Â ƗƠ a AS

```
Ruijie(config-router)# bgp bestpath as-path ignore
```

ð Þu ¾ Ô

Þu ¾	
show ip bgp	BGP

ð ¿ Ô

5.1.8 bgp bestpath compare-confed-aspath

˘ Þu ¾ ¿ ASPATH
˘ ASPATH ˘ Â Þu ¾ **no**
¶ Â

bgp bestpath compare-confed-aspath

no bgp bestpath compare-confed-aspath

ð ¶ Ô

Þu ¾ ¶ Â

ð Ô

ÞØ ج ˘ a ¿ ebgp peer
ASPATH˝ è ˚ Â

ð Þu ¾ Ô

BGP Â

ð ´ Ô

ÞØ ج EBGP peer ¿ ˘
ASPATH a ˘ Þu ¾ ASPATH
Â

ج Þu ¾ ˘ Ü ASPATH˝ a
ASPATH Â

ð Ô

```
Ruijie(config)# router bgp 65000
Ruijie(config-router)# bgp bestpath
compare-confed-aspath
```

ð Þu ¾ Ô

Þu ¾	
show ip bgp	BGP

bgp router-id	BGP Router ID

ð ƙ Ô

5.1.9 bgp bestpath compare-routerid

א

5.1.10 bgp bestpath med confed

˘ ƕυ ϗ AS

MED Â ƕυ ϗ **no** ╖ Â

5.1.11 bgp bestpath med missing-as-worst

˘ ƕ ɣ MED ƙ
æ Â ƕ ɣ no ╖ Â

bgp bestpath med missing-as-worst

no bgp bestpath med missing-as-worst

ð ɳ Ô

ƕ ɣ ɳ Â

ð Ô

ƗƟ MED ˘ MED
ƙ 0 Â MED ˘ ɯ ˘
Â

ð ƕ ɣ Ô

BGP Â

ð ´ Ô

ƗƟ MED ˘ MED
ƙ Ơ MED ˘ ˘ ɅƱ MED
Â MED ƙ
æ˘ ƕ ɣ Â

ð Ô

```
Ruijie(config)# router bgp 65000
Ruijie(config-router)# bgp bestpath med
missing-as-worst
```

ð ƕ ɣ Ô

ƕ ɣ	
show ip bgp	BGP
bgp bestpath always-compare-med	˘ a ɻ AS MED
bgp bestpath med confed	˘ AS MED
bgp deterministic-med	˘ ɻ AS

ð ɻ Ô

5.1.12 bgp client-to-client reflection

Ъυ ҳ ٧ ╖ Â Ъυ ҳ **no**
٧ ╖ Â

bgp client-to-client reflection

no bgp client-to-client reflection

ð ٧ Ô

Ъυ ҳ ٧ Â

ð Ô

╖ ˘ ٧ Â

ð Ъυ ҳ Ô

BGP Â

ð ´ Ô

Ю˘ ٧ Ы a ˘
٧ Ы ٧ Â ˘
˘ ٧Л٧ ٧ Ы ٧ ╖ Â

٧ ٧ ╖ ˘ Ъυ ҳ **no bgp client-to-client reflection** Â

ð Ô

```
Ruijie(config)# router bgp 65000
Ruijie(config-router)# no bgp client-to-client
reflection
```

ð Ъυ ҳ Ô

Ъυ ҳ	
bgp cluster-id	٧ Ы
neighbor route-reflector-client	٧ Ы й ٧ Ы

ð ٨ Ô

5.1.13

bgp cluster-id *cluster-id*

no bgp cluster-id [*cluster-id*]

ð ƴ Ô

ƴ	
cluster-id	ƙ ƚ ˇ IP فذ سم ´ 4 (Ʌυ ip)

ð Ô

ƙ ƚ

as-number	AS Â تتن 1..65535

ð Ô

Â

ð ĥυ ŗ Ô

BGP Â

ð ´ Ô

٩ IBGP Â

ĺ ŕ ˘

ID(AS ٩) Â ˘

Ÿ ŕ AS˝ ٩ AS ٩ ٦ Âجه ˘

BGP speakers Ÿ IBGP ˘

BGP speaker EBGP Â جه

BGP speakers EBGP ˘ ˘ Ю

à MED Л٥ ٩ سم Ÿ a ٦ Â

ð Ô

```
Ruijie(config-router)# bgp confederation identifier
65000
```

ð ĥυ ŗ Ô

ĥυ ŗ	Ga@@2O8A20f0K€A¸%E9ó[illegible]

ð Ô

˜ Â

ð Ъu ҙ Ô

BGP Â

ð ´ Ô

IBGP Â

ƕ ٧ Â

ð Ô

ipv4-unicast ف س Â

ð ƕ Ô

BGP Â

ð ´ Ô

ƕ BGP **address family ŋ ipv4** ´ ف س Â

ð Ô

```
Ruijie(config-router)# bgp default ipv4-unicast
```

ð ƕ Ô

ƕ	
address-family ipv4	IPv4 ف س

ð ٨ Ô

5.1.17 bgp default local-preference

BGP speaker ɻ IBGP peers ╗ ѫ
Â

ð Ô

```
Ruijie(config-router)# bgp default local-preference 200
```

ð ƕ ɂ Ô

ƕ ɂ	
show ip bgp	BGP
bgp bestpath always-compare-med	˘ a ɻ AS MED
bgp bestpath med confed	˘ AS MED
bgp bestpath med missing-as-worst	˘ MED й æ

ð ɻ Ô

5.1.18 bgp deterministic-med

ƕ ɂ ɻ AS MED ˘ Ю
˘ Â **no** ƕ ɂ è
Â

bgp deterministic med

no bgp deterministic med

ð ɂ Ô

ƕ ɂ ɂ Â

ð Ô

╗

ð ƕ ɂ Ô

BGP

ð ´ Ô

Ю˘ ˘ ˘
ɻ AS ˘ ƕ ɂ Â

ð Ô

```
Ruijie(config-router)# bgp deterministic med
```

ð ƕ ɂ Ô

ƕ ٩	
show ip bgp	BGP
bgp bestpath always-compare-med	˘ a ٫ AS MED
bgp bestpath med confed	˘ AS MED
bgp bestpath med missing-as-worst	˘ MED ٪ æ

ð ٫ Ô

5.1.19 bgp enforce-first-as

ƕ ٩ AS_PATH a AS ٨ UPDATE Â no ƕ ٩ è Â

bgp enforce-first-as

no bgp enforce-first-as

ð ٩ Ô

ƕ ٩ ٩ Â

ð Ô

٦

ð ƕ ٩ Ô

BGP

ð ´ Ô

ƗÖ æ UPDATE ˘ AS ٨ Â

ð Ô

```
Ruijie(config-router)# bgp enforce-first-as
```

ð ƕ ٩ Ô

ƕ ٩	
show ip bgp	BGP

ð ٫ Ô

time	ج б GR ٨˘ Ÿ stale Â ن ٭ 1 3600

٭ 360

ƕ BGP

ƕ GR Helper ٧ Â stalepath-time ٭ GR Helper ج б GR Restarter ٨˘ Restarter EOR Âج GR Helper б GR Restarter Restarter ٧ ٭ ľ Stale Ŀ˘ Ÿ б ٤ Â GR Helper GR Restarter ٤ ľ Stale Ŀ ˘ ج stalepath-time ˘ ľ Stale Ŀ ˘ Â ⁸ GR Helper GR Restarter EOR Â

```
Ruijie(config)# router bgp 500
Ruijie(config-router)# bgp graceful-restart
Ruijie(config-router)# bgp graceful-restart stalepath-time 240
Ruijie(config-router)# no bgp graceful-restart stalepath-time
```

ƕ

bgp graceful-restart	ŭ BGP ŭ

٤

ƕ ٦ ٤ Gt)1ß70Œ

ð ƕ ƚ Ô

BGP Â

ð ´ Ô

ƕ ƚ BGP ID——IP فذسه Â

ð Ô

```
Ruijie(config-router)# bgp router-id 10.0.0.1
```

ð ƕ ƚ Ô

ƕ ƚ	
show ip bgp dampening dampened-paths	
bgp dampening	ƫ ƛ

ð ƙ Ô

5.1.25 bgp update-delay

BGP Speaker ƙ ƚ ˘ **bgp update-delay** ƕ ƚ Â ƕ ƚ no ƚ **bgp update-delay** ˘ ƙ Â

ƙ BGP ƀ ˘ Â

bgp update-delay *delay-time*

no bgp update-delay

	ƛ	
	ƛ	ƙ BGP Speaker ƚ è ˘ ´ Æ ƙ ˘ ƫ 0
	delay-time	3600 ƙ 120 Â ƙ BGP ƀ ˘ ƙ EOR Â ƫ 1 3600 Â

5.1.27 clear bgp ipv4 unicast dampening

ƕ ϟ Ո ⁸ ⁸ Â

clear bgp ipv4 unicast dampening [*address* [*mask*]]

ð ϟ Ô

ϟ	
address	IP فذ سم Â
mask	Â

ð Ô

ð ƕ ϟ Ô

ð ´ Ô

ƕ ϟ BGP ˘ ⁸ ⁸ Â
ƕ ϟ ˩ Ɲ ŭ ╟ BGP Â

ð Ô

```
Ruijie# clear bgp ipv4 unicast dampening 192.168.0.0
255.255.0.0
```

ð ƕ ϟ Ô

ƕ ϟ	
show ip bgp dampening dampened-paths	
bgp dampening	╖ ϟ

ð ˩ Ô

5.1.28 clear bgp ipv4 unicast external

ƕ ϟ EBGP Æ

clear bgp ipv4 unicast external [[**soft**] [**in** | **out**]]

ð ϟ Ô

ϟ	

in	a ╗ ٩	soft˝	Æ	ў ╟	Â
out	a ╗ ٩	soft˝	Æ	BGP speaker	ў ╟	Â

ð ƕ ϡ Ô

Â

ð ´ Ô

ƕ ϡ ˇ ≠ a
Â ˇ ϡ ʃƱ
clear ip bgp dampening ƕ ϡ

ð Ô

```
Ruijie# clear bgp ipv4 unicast flap-statistics
```

ð ƕ ϡ Ô

ƕ ϡ	
bgp dampening	╖ ϡ
show ip bgp	BGP

ð ϳ Ô

5.1.30 clear bgp ipv4 unicast peer-group

ƕ ϡ Æ Ո ˜ Â

clear bgp ipv4 unicast peer-group *peer-group-name* [[**soft**] [**in** | **out**]]

ð ϡ Ô

ϡ	
peer-group-name	ɻ
in	a ╖ ϡ soft˝ Æ ў ╟ Â
out	a ╖ ϡ soft˝ Æ BGP speaker ў ╟ Â
soft	Æ˘ Ո ϡ Æ Â
soft in	Æ˘ Æ Â
soft out	Æ˘ ᛚ ϡ Æ Â

ð Ô

ð ƕ ϡ Ô

Â

ð ´ Ô

Ъυ ҳ٩ Æ Ո- ˜ BGP Â

ð Ô

```
Ruijie# clear bgp ipv4 unicast peer-group my-group in
```

ð Ъυ ҳ٩ Ô

Ъυ ҳ٩	
clear ip bgp	Æ BGP
show ip bgp	BGP

ð ٨ Ô

5.1.31 clear ip bgp

Ъυ ҳ٩ BGP Æ Â

clear ip bgp {* | **ipv4 unicast** *address* | *as number* } [**soft** [**in** | **out**]]

ð ٩ Ô

٩	
*	Æ BGP ˘ Л٥ ٩ BGP ipv4 unicast فخ سم OVERFLOW Â
ipv4	Æ peer ipv4 فخ سم Â
address	Æ б peer BGP Â
as number	Æ Ո- AS ˜
in	Æ Â
out	Ĵ ٦ Æ Â
soft	Æ˘ Ո- ٦ Æ Â
soft in	Æ˘ Æ Â
soft out	Æ˘ Ĵ ٦ Æ Â

ð Ô

ð Ъυ ҳ٩ Ô

Â

ð ´ Ô

a É

ħu ɻ BGP router ⁹ ╖ Â p
⁹ ╖ Â

ѫ ˘ ৭ BGP ৭ ৶˘
Â Ạ
BGP Л Â

p BGP Æ˘ ѭ a BGP Ю˘
Â

a ⁹ ╖ peer˘ ৶ Л ħu ɻ **neighbor soft-reconfiguration inbound** ѝ BGP ѭ BGP speaker Э Ɣ Â Ì Â

৶ Л **show ip bgp neighbors** ħu ɻ BGP ĩ
⁹ ˘ ˘ ѭ ৭ ৶
neighbor soft-reconfiguration inbound ħu ɻ Â

ð Ô

```
Ruijie# clear ip bgp *
```

ð ħu ɻ Ô

ħu ɻ	

address	IP ﻓﻎ ﺳﻡ Â
mask	Â

ð Ô

ð Ъu ъ Ô

ð ´ Ô

Ъu ъ BGP ˘ ⁸ ⁸ Â
Ъu ъ ٬ Л∪ ŭ ╟ BGP Â

ð Ô

```
Ruijie# clear ip bgp dampening 192.168.0.0 255.255.0.0
```

ð Ъu ъ Ô

Ъu ъ	
show ip bgp dampening dampened-paths	
bgp dampening	ℸ ٩

ð ٬ Ô

5.1.33 clear ip bgp external

Ъu ъ EBGP Æ

clear ip bgp external [**ipv4 unicast**] [[**soft**] [**in** | **out**]]

ð ٩ Ô

٩	
ipv4 unicast	ipv4 ´

ð ƕυ ϡ Ô

Â

ð ´ Ô

ƕυ ϡ BGP Æ Â

ð Ô

```
Ruijie# clear ip bgp external in
```

ð ƕυ ϡ Ô

ƕυ ϡ	
clear ip bgp	Æ BGP
show ip bgp neighbors	BGP

ð ϡ Ô

5.1.34 clear ip bgp flap-statistics

ƕυ ϡ Â

clear ip bgp flap-statistics [*address*[*mask*]]

ð ϰ Ô

ϰ	

```
Ruijie# clear ip bgp flap-statistics
```

ð ƕ ɂ Ô

ƕ ɂ	
bgp dampening	╗ ɳ
show ip bgp	BGP

ð ɻ Ô

5.1.35 clear ip bgp peer-group

ƕ ɂ Æ Ո ˜ Â

clear ip bgp peer-group *peer-group-name* [**ipv4 unicast**] [[**soft**] [**in** | **out**]]

ð ɳ Ô

ɳ	
peer-group-name	ɻ
ipv4 unicast	ipv4 ´
in	a ╗ ɳ **soft˜** Æ ў ╠ Â
out	a ╗ ɳ **soft˜** Æ BGP speaker ў ╠ Â
soft	Æ˘ Ո ɻ Æ Â
soft in	Æ˘ Æ Â
soft out	Æ˘ ǂ ɻ Æ Â

ð Ô

ð ƕ ɂ Ô

Â

ð ´ Ô

ƕ ɂ Æ Ո ˜ BGP Â

ð Ô

```
Ruijie# clear ip bgp peer-group my-group in
```

ð ħυ ϡ Ô

ħυ ϡ	
clear ip bgp	Æ BGP
show ip bgp	BGP

ð ϳ Ô

5.1.36 clear ip bgp vrf

ħυ ϡ Æ ₰ vrf ˜ Â

clear ip bgp vrf *vrf-name* [* | *address*] [[**soft**] [**in** | **out**]]

ð ϒ Ô

ϒ	
vrf-name	vrf ϳ

* Æ vrf ĦO BGP Â

ð Ħυ ϡ Ô

Ħυ ϡ	
clear ip bgp	Æ BGP
show ip bgp	BGP

ð ϳ Ô

5.1.37 default-informnation originate

Ħυ ϡ Ĵ ϒ ˘ Ĵ Â
Ħυ ϡ no ˘ Ĵ ϒ Â

[**no**] **default-informnation originate**

ð ϒ Ô

Ħυ ϡ ϒ Â

ð Ô

Ħυ ϡ no ˘ a Ĵ ϒ Â

ð Ħυ ϡ Ô

BGP Â

ð ´ Ô

Ħυ ϡ ⁸ Ĵ ϒ ÂϒϪ Ĵ ϒ Ϫ
˘ Ħυ ϡ Â

Ħυ ϡ Ո **network** Ħυ ϡ Â a ϳ ϟϟ ' **default-informnation originate** Ħυ ϡ ⁸ Ĵ ϒ ˘ network Ħυ ϡ ϒ IGP Ϫ ϳ Ո Â

ð Ô

```
Ruijie(config-router)# default-informnation originate
```

ð Ħυ ϡ Ô

Ħυ ϡ	
network	˜
redistribute	Ĵ ϒ è

5.1.38 default-metric

ĥυ ŗ BGP ĺ ٩ metric Â ĥυ ŗ **no** ˘ ˘ Â

default-metric number

no default-metric

ð ٩ Ô

٩	
number	metric Â ںتن 1.. 4294967295

ð Ô

ĥυ ŗ **no** ˘ default-metric Â

ð ĥυ ŗ Ô

BGP ˘ ٨ فخ سم Â

ð ´ Ô

ĥυ ŗ ĺ ٩ BGP ھ metric Â ā ĺ ٩ Э metric a Â

---

a _É

ĥυ ŗ metric ˘ a ĥυ ŗ **redistribute metric** metric Â

default-metric جھ ĺ ٩ connected Э ˘ metric 0 Â

ð Ô

```
Ruijie(config-router)# default-metric 45
```

ð ĥυ ŗ Ô

ĥυ ŗ	
redistribute	ĺ ٩ è

ð ٨ Ô

5.1.39 distance bgp

Ъυ ϡ ϳй a ϡ ص BGP a ϡ Â **no** Ъυ ϡ Â

distance bgp *external-distance internal-distance local-distance*

no distance bgp

ð ϟ Ô

ϟ	
external-distance	ÿ EBGP peers ¯ Â تتن 1..255
internal-distance	ÿ IBGP peers ¯ Â تتن 1..255
local-distance	ÿ peers ¯ ˘ й ˘ جھ ϡ ЛЪ ÿ IGP ¯ **network backdoor** Ъυ ϡ Â تتن 1..255

ð Ô

ϡ ϟ ЮЎ

external-distance: *20*

internal-distance: *200*

local-distance: *200*

ð Ъυ ϡ Ô

BGP Â

ð ´ Ô

a ϡ BGP Â ˘ جھ ЛъЮ '

1. external-distance è IGP (OSPF à RIP) æ'
2. internal-distance Ո local-distance è IGP Â

ð Ô

```
Ruijie(config-router)# distance bgp 20 20 200
```

ð Ъυ ϡ Ô

Ъυ ϡ	

neighbor soft-reconfiguration inbound	ᚢ BGP session ᚷ BGP ( ) ᚾ

a ƛ فخ سم ЮO a ƛ'

IPv4 VRF˜ VPNv4 فخ سم Ю˜ ий 10000.

IPv4 unicast فخ سم Ю ий 4294967295 Â

ƕ

BGP ˘ BGP IPv4 فخ سم ˘ BGP IPv4 VRF ˘ BGP VPNv4 فخ سم

BGP فخ سم Ю ƛ redistribute ˘ ≠ ƛ ÿ ˘ a ف ˘ فخ سم Ю BGP ˘ فخ سم a ¨Ą , فخ سم overflow Â

show bgp { *addressfamily* | **all** } **summary** ƛ Â

bgp˘ **clear bgp** { *addressfamily* | **all** } * Æ فخ سم Â

فخ سم overflow ˘ a maximum-prefix Â

1

¶	
peer-address	فخ سم ˘فخ سم IPv4 سم فخ Â
peer-group-name	ل Â ل a 32 Â

ð Ô

فخ سم جم ipv4 ŀO

ð ħu ʒ Ô

BGP ˘ BGP IPv4 فخ سم ˘ BGP IPv4 VRF
˘ BGP VPNv4 فخ سم

ð ´ Ô

ipv4 فخ سم ħu ʒ ˘ ٤ فخ سم صر˘
ħu ʒ Â

ð Ô

```
Ruijie(config)# router bgp 60
Ruijie(config-router)# neighbor 10.0.0.1 remote-as 100
Ruijie(config-router)# address-family vpnv4
Ruijie(config-router-af)# neighbor 10.0.0.1 activate
```

ð ħu ʒ Ô configd[8w(Xig-135421]F514E30 [10 BA BC91 C1 nfig

peer-group-name	ɹ Â ɹ a 32 Â
seconds	ɻ Â تن: 1..600

ð Ô

IBGP : 15seconds

EBGP : 30seconds

ð ƕ ƚ Ô

BGP

ð ´ Ô

BGP ƾ

number	AS ¶ ' ¾ 3' ¶ جم تن [1,10]

ð Ô

allowas-in ¶

ð Ìu ¸ Ô

BGP ˇ BGP IPv4 فخ سم ˇ BGP IPv4VRF فخ سم

ð ´ Ô

ή صر جم spoke_hub صر ˇ جم PE Э Ìu ¸ˇ PE ¶ Л∪ Ä ¶ ˆ فخ سم Â جم PE Э vrf è vrf PE ˇ ˆ CE ¶ vrf CE ˆ ˇ ¶ PE ˆ Â

جم IBGP EBGP ¶ Л∪ Â

ð Ô

```
Ruijie(config)# router bgp 60
Ruijie(config-router)# neighbor 10.0.0.1 remote-as 100
Ruijie(config-router)# address-family ipv4 vrf vpn1
Ruijie(config-router-af)# neighbor 10.0.0.1 allowas-in
```

ð Ìu ¸ Ô

Ìu ¸	
router bgp	BGP
neighbor remote-as	BGP Â

ð ¶ Ô

5.1.46 neighbor as-override

Ìu ¸ PE AS ¶ Â Ìu ¸ **no** ¶ Л∪ Â

neighbor {*peer-address* | *peer-group-name*} **as-override**

no neighbor {*peer-address* | *peer-group-name*} **as-override**

ð ¶ Ô

¶	
peer-address	فخ سم Â
peer-group-name	¸ Â

	ϳ a 32 Â

ð Ô

as-override ╖

ð ħυ ϡ Ô

BGP ˘ BGP IPv4 فخ سم ˘ BGP IPv4VRF فخ سم

ð ´ Ô

ЮЎ BGP a έ Ո- ىش ϳ AS ϰ ˘
ħυ ϡ ϳ Л Ʊ AS ϰ˘ BGP ϳ Л Ʊ ÿ ϳ AS ϰ
Â

ج vpn ˘ ή صر ج CE έ ϳ AS ϰ˘ ж
ЮЎ CE ┐ ˘ ج PE Э Э ħυ ϡ ϰ˘
ϳ Л Ʊ PE CE AS ϰ˘ ϟ CE ϳ Л Ʊ Â
ϟ EBGP ╖ Â

ð Ô

```
Ruijie(config)# router bgp 60
Ruijie(config-router)# neighbor 10.0.0.1 remote-as 100
Ruijie(config-router)# address-family ipv4 vrf vpn1
Ruijie(config-router-af)# neighbor 10.0.0.1
as-override
```

ð ħυ ϡ Ô

ħυ ϡ	
router bgp	BGP
neighbor remote-as	BGP Â

ð ϰ Ô

5.1.47 neighbor default-originate

ħυ ϡ BGP speaker ϳ ( ) ˆ ˘ ħυ ϡ **no** ϳ Л Ʊ ϰ ϟ Â

neighbor {*peer-address* | *peer-group-name*} **default-originate** [**route-map** *map-tag*]

no neighbor {*peer-address* | *peer-group-name*} **default-originate** [**route-map** *map-tag*]

ð ϟ Ô

ƙ	
peer-address	ƒ Â
peer-group-name	ƚ Â ƚ a 32 Â
map-tag	route map ƚ Â route map ƚ a 32 Â

ð Ô

a ƙ Â

ð ƕ ƞ Ô

BGP Â

ð ´ Ô

ƕ ƞ ƒ ƙ ƒ ˘ ƚ ƙ Â
BGP ˘ ƒ ˘ ƕ ƞ
Â ƙ ˘ ƕ ƞ˘ è ƒ

ð Ô

```
Ruijie(config)# router bgp 60
Ruijie(config-router)# neighbor 10.1.1.1 remote-as 80
Ruijie(config-router)# neighbor 10.1.1.1
default-originate
```

ð ƕ ƞ Ô

ƕ ƞ	
router bgp	BGP
neighbor remote-as	BGP Â

ð ƛ Ô

5.1.48 neighbor description

ƕ ƞ ƙ ( ) ƙ Â ƕ ƞ **no** ƚ Ƨ ƚ Â

neighbor {*peer-address* | *peer-group-name*} **description** *text*

no neighbor {*peer-address* | *peer-group-name*} **description**

ð ƙ Ô

ƙ	

peer-address	فخ سم Â
peer-group-name	ﻝ Â ﻝ a 32 Â
text	( ) Â تن' 80 Â

ð Ô

╗ Â

ð ƕ ƚ Ô

BGP Â

ð ´ Ô

ƕ ƚ ƙ ˆ ˜ ╗ Â ﻝ ﾉ ∪ ╠
ˆ ˜ ∩ Â

ð Ô

```
Ruijie(config)# router bgp 60
Ruijie(config-router)# neighbor 10.1.1.1 remote-as 80
Ruijie(config-router)# neighbor 10.1.1.1 description
xyz.com
```

ð ƕ ƚ Ô

ƕ ƚ	
router bgp	BGP
neighbor remote-as	BGP ( ) Â

ð ﻝ Ô

5.1.49 neighbor distribute-list

ﺟ ﻝ BGP ﻝ ˇ ACL Â
ƕ ƚ no ﻝ ACL Â

neighbor {*peer-address* | *peer-group-name*} **distribute-list** *access-list-number* {**in** | **out**}

no neighbor {*peer-address* | *peer-group-name*} **distribute-list** *access-list-number* {**in** | **out**}

ð ƴ Ô

ƴ	
peer-address	فخ سم ˇفخ سم فخ سم IPv4 سم فخ Â

peer-group-name	¿ Â ¿ a 32 Â
access-list-number	ACL Á
in	ACL Â
out	ACL Ì ¼ ½ Â

ð Ô

¶ Â

ð hu ¾ Ô

BGP ˇ BGP IPv4 ¹Ø BGP IPv4 VRF ˇ BGP VPNv4 ¹Ø

ð ´ Ô

(in) (out)˘ ˇ hu ¾ Ò neighbor prefix-list ¤

BGP ˇ ¤ ´

neighbor distribute-list˘

è ¹ Â

¹ ¹Ø ˇ ¼ ¸ Â

Ruijie(config)# **router bgp** *60*
Ruijie(config-router)# **neighbor** *10.1.1.1* **remote-as** *80*
Ruijie(config-router)# **neighbor** *10.1.1.1*
distribute-list bgp-filter in

ð hu ¾ Ô 7ĥAC[illegible]Ô

neighbor remote-as	BGP Â
ip access-list	IP ACL IP ACL

ð ¿ Ô

5.1.50 neighbor ebgp-multihop

hu ¾ ¿ EBGP BGP Â hu ¾ no ¼ Â

neighbor {*peer-address* | *peer-group-name*} **ebgp-multihop** [*ttl*]

no neighbor {*peer-address* | *peer-group-name*} **ebgp-multihop**

ð ɳ Ô

ɳ	
peer-address	IPv4 ˘ Â
peer-group-name	Â a 32 Â
ttl	1..255 Â

ð Ô

ɳ б EBGP BGP Â

ebgp-multihop ˘ a ɳ ˘ ttl 255 Â

ð ƕ ɣ Ô

BGP ˘ BGP IPv4 BGP IPv4 VRF ˘

ð ´ Ô

й Ո ˘ BGP EBGP peers Â

BGP ˘ ˜ ƕ ɣ ˘ й ˜ ƕ ɣ ˘ è

Â

ð Ô

```
Ruijie(config)# router bgp 65000
Ruijie(config-router)# neighbor 10.0.0.1 remote-as 65100
Ruijie(config-router)# neighbor 10.0.0.1 ebgp-multihop
```

ð ƕ ɣ Ô

ƕ ɣ	
router bgp	BGP
neighbor remote-as	BGP Â

ð ɻ Ô

5.1.51 neighbor filter-list

Ìu ¾ æ ¿ BGP ¼ ˘ Â
Ìu ¾ no ¿ Â

neighbor {*peer-address* | *peer-group-name*} **filter-list** *access-list-number* {**in** | **out**}

no neighbor {*peer-address* | *peer-group-name*} **filter-list** *access-list-number* {**in** | **out**}

ð ¶ Ô

¶	
peer-address	˘fà æ fà æ IPv4 æ fà Â
peer-group-name	¿ Â ¿ a 32 Â
access-list-numbe	as-path list Ñ
in	as-path list Â
out	as-path list Ì ¼ ¾ Â

ð Ô

¶ Â

ð Ìu ¾ Ô

BGP ˘ BGP IPv4 fà æ ˘ BGP IPv4 VRF ˘ BGP VPNv4 fà æ

ð ´ Ô

BGP ˘ ¾ ˘ Ìu ¾ ˘ ¹ ˘ **neighbor filter-list** è æ Â

æ fà æ ˘ ¼ Æu æ a ¿ fà æ ¿ Э a ¿ ˘ ª Â

ð Ô

```
Ruijie(config)# ip as-path access-list 1 deny _123_
Ruijie(config)# router bgp 65000
Ruijie(config-router)# neighbor 10.0.0.1 remote-as 65100
Ruijie(config-router)# neighbor 10.0.0.1 filter-list 1 out
```

ð Ìu ¾ Ô

Ъυ ҳ	
router bgp	BGP
neighbor remote-as	BGP Â
ip as-path access-list	AS_PATH list
match as-path	٦ AS_PATH list

ð ৸ Ô

5.1.52 neighbor maximum-prefix

Ъυ ҳ ⁸ ÿ BGP Â Ъυ ҳ **no** ৸ ⁸ Â

neighbor {*peer-address* | *peer-group-name*} **maximum-prefix** *maximum* [*threshold*] [**warning-only**]

no neighbor {*peer-address* | *peer-group-name*} **maximum-prefix**

ð ৭ Ô

৭	
peer-address	ѫ ҙ˘ ѫ ҙ IPv4 ѫ ҙ Â
peer-group-name	ɻ Â ɻ a 32 Â
maximum	Э Â
threshold	ˆ Ո Ĵ
warning-only	Э a BGP ˘ Â

ð Ô

Ⅶ Â

ð Ъυ ҳ Ô

BGP ˘ BGP IPv4 ѫ ҙ ˘ BGP IPv4 VRF ˘

ð ´ Ô

Ю˝ Э ˘ BGP Â
a ˘ ѫ ৸ Л৬ warning-only ⁸ Â

BGP ˘ ѫ ˜ Ъυ ҳ
˘ ѝ ˜ Ъυ ҳ˘ è ѭ

Â

ð Ô

```
Ruijie(config)# router bgp 65000
Ruijie(config-router)# neighbor 10.0.0.1
maximum-prefix 1000
```

ð Ìu ¯ Ô

Ìu ¯	
router bgp	BGP
neighbor remote-as	BGP Â

ð ¸ Ô

5.1.53 neighbor next-hop-self

æ ¸ BGP Ì ¶ ˘ Ìu ¯ Ю
ù BGP speaker Â Ìu ¯ **no** ¸ Â

neighbor {*peer-address* | *peer-group-name*} **next-hop-self**

no neighbor {*peer-address* | *peer-group-name*} **next-hop-self**

ð ¶ Ô

¶	
peer-address	¾ ˘ ¾ IPv4 ¾ ¾ Â
peer-group-name	¸ Â ¸ a

BGP ˘ ϗ ˜ Ъυ ϡ
Â

ð Ô

```
Ruijie(config)# router bgp 65000
Ruijie(config-router)# neighbor 10.0.0.1 next-hop-self
```

ð Ъυ ϡ Ô

Ъυ ϡ	
router bgp	BGP
neighbor remote-as	BGP Â

ð ϟ Ô

5.1.54 neighbor password

ϫ ϟ BGP BGP ˘ Ъυ ϡ ΰ ╟ TCP MD5
˘ Â Ъυ ϡ **no** ϟ MD5 Â

neighbor {*peer-address* | *peer-group-name*} **password** [| **0** | **7**] *string*

no neighbor {*peer-address* | *peer-group-name*} **password**

ð ϰ Ô

ϰ	
peer-address	ϡϭ ˘ϡϭ ϡϭ IPv4 ϡ ϡϭ Â
peer-group-name	ϟ Â ϟ a 32 TCP MD5 ϡ ϒ 80 T

ð ´ Ô

Ъч TCP MD5 ˘ BGP BGP
˙ ˘ ĭ ˘ Â Ъч ˙˘ BGP speaker
˙ BGP BGP Â

BGP ˘ ж ˜ Ъч
˘ и ˜ Ъч˘ è ы
Â

a ф ю Ю ˘ password ч ˘ a
фъ ы Â

ð Ô

```
Ruijie(config)# router bgp 65000
Ruijie(config-router)# neighbor 10.0.0.1 password
Red-Giant
```

ð Ъч Ô

Ъч	
router bgp	BGP
neighbor remote-as	BGP Â

ð ˙ Ô

5.1.55 neighbor peer-group (assigning members)

Ъч BGP и BGP ˜ Â Ъч
no BGP ÿ Â

neighbor *peer-address* **peer-group** *peer-group-name*

no neighbor *peer-address* **peer-group** *peer-group-name*

ð ч Ô

ч	
peer-address	˘фъ ы фъ ы IPv4 ы фъ Â
peer-group-name	˙ Â ˙ a 32 Â

ð Ô

ю a ю Â

ð Ъч Ô

BGP

ð ´ Ô

ð ч Ô

ч	
peer-group-name	Ù Â Ù a 32 Â

ð Ô

BGP Â

ð Ъу Ô

BGP

ð ´ Ô

BGP Ч Л Ù Ч ˘ ж Ч Л Ù й
ж ˘ ÿ Э Ո Э Â

ð Ô

```
Ruijie(config)# router bgp 65000
Ruijie(config-router)# neighbor Red-Giant peer-group
```

ð Ъу Ô

Ъу	
router bgp	BGP
neighbor remote-as	BGP Â
neighbor peer-group (assigning members)	BGP й BGP ˘
show ip bgp peer-group	BGP

ð Ч Ô

5.1.57 neighbor prefix-list

ж Ù BGP Ч ˘ Ъу
Â Ъу **no** Ч prefix-list Â

neighbor {*peer-address* | *peer-group-name*} **prefix-list** *prefix-list-name* {**in** | **out**}

no neighbor {*peer-address* | *peer-group-name*} **prefix-list** {**in** | **out**}

ð ч Ô

ч	
peer-address	˘ IPv4

	ɸ Â
peer-group-name	ɻ Â ɻ a 32 Â
prefix-list-name	prefix-list ɻ Â ɻ a 32 Â
in	prefix list Â
out	prefix list Ɨ ɬ ɭ Â

ð Ô

ɱ Â

ð ƫ ɂ Ô

BGP ˘ BGP IPv4 ɸ ɜ BGP IPv4 VRF ˘ BGP VPNv4 ɸ ɜ

ð ´ Ô

(in) (out)˘ ˘ ƫ ɂ Ո **neighbor distribute-list** a ˘ . ɬ ƫ ɂ Â

BGP ˘ ƛ ˘ ƫ ɂ ˘ ŋ ˘ neighbor prefix-list in˘ è ɜɜ Â

ɜɜ ɸ ɜ ˘ ɬ Ʌƫ ɟ a ɻ ɸ ɜ Ɔ a ɻ ˘ ˢ Â

ð Ô

```
Ruijie(config)# ip prefix-list bgp-filter deny
10.0.0.1/16
Ruijie(config)# router bgp 65000
Ruijie(config-router)# neighbor 10.0.0.1 prefix-list
bgp-filter in
```

ð ƫ ɂ Ô

ƫ ɂ	
router bgp	BGP
neighbor remote-as	BGP Â
ip prefix-list	ip

ð ɻ Ô

5.1.58 neighbor remote-as

Ìu ¸ BGP ( )Â Ìu ¸ **no** ( )Â

neighbor {*peer-address* | *peer-group-name*} **remote-as** *as-number*

no neighbor {*peer-address* | *peer-group-name*} **remote-as** *as-number*

ð ¶ Ô

¶	
peer-address	¸ IPv4 ¸ ¸ ¸ Ã ¸
peer-group-name	¸ Â ¸ a 32 Â
as-number	BGP ( ) /¹ Â 1..65535 ¸

ð Ô

BGP Â

ð Ìu ¸ Ô

BGP BGP IPv4 ¸ BGP IPv4 VRF

ð ´ Ô

BGP ¸ Ìu ¸ Â

ð Ô

```
Ruijie(config)# router bgp 65000
Ruijie(config-router)# neighbor 10.0.0.1 remote-as 80
```

ð Ìu ¸ Ô

Ìu ¸	
router bgp	BGP

ð ¼ Ô

5.1.59 neighbor remove-private-as

Ìu ¸ ¬ EBGP AS AS /¹ Â Ìu ¸ **no** ¼ Â

neighbor {*peer-address* | *peer-group-name*} **remove-private-as**

no neighbor {*peer-address* | *peer-group-name*} **remove-private-as**

ð ƙ Ô

neighbor {*ip-address* | *peer-group-name* } **route-reflector-client**

no neighbor {*ip-address* | *peer-group-name* } **route-reflector-client**

ð ٩ Ô

٩	
ip-address	فذ سم Â
peer-group-name	ɻ Â ɻ a 32 Â

ð Ô

Ͳ

ð Ħu ʒ Ô

BGP

ð ´ Ô

ЮЎ IBGP speakers
Ў BGP speaker a ÿ IBGP peer ˜ ٤ è
IBGP peersЎ Л IBGP Â

٤ Л Ħu ʒ ٤ ٪Ў a Ạ IBGP speakers
Ў ٤ ٪ ˜ IBGP ٤
è IBGP peers Â

ð Ô

```
Ruijie(config)# router bgp 65000
Ruijie(config-router)# neighbor 10.0.0.1
route-reflector-client
```

ð Ħu ʒ Ô

Ħu ʒ	
router bgp	BGP
neighbor remote-as	BGP Â
bgp cluster-id	٤ ٪ جه ID Â
bgp client-to-client reflection	٤ Ͳ Â

ð ٨ Ô

5.1.62 neighbor send-community

Ħu ʒ ڍ BGP Â Ħu ʒ **no**

neighbor {*peer-address* | *peer-group-name*} **send-community** [**both**|**standard**|**extended**]

no neighbor {*peer-address* | *peer-group-name*} **send-community** [**both**|**standard**|**extended**]

peer-address	IPv4
peer-group-name	a 32
both	
standard	
extended	

BGP BGP IPv4 BGP IPv4 VRF BGP VPNv4

```
Ruijie(config-router)# neighbor 10.1.1.1
send-community both
```

router bgp	BGP
neighbor remote-as	BGP
ip community-list	

5.1.63 neighbor shutdown

ƕ ƛ ƚ BGP BGP Â ƕ **no** ǔ ╟ BGP ( ) Â

neighbor {*peer-address* | *peer-group-name*} **shutdown**

show ip bgp neighbors	BGP
clear ip bgp	Æ BGP

ð ✓ Ô

5.1.65 neighbor soo

router bgp	BGP
timers bgp	ɯ *keepalive* Ո *holdtime*

ð ɻ Ô

5.1.66 neighbor timers

ɱ BGP BGP ˘ ƕ ɣ BGP keepalive Ո holdtime Â ƕ ɣ no Â

neighbor [*peer-address* | *peer-group-name*] **timers** *keepalive holdtime*

no neighbor [*peer-address* | *peer-group-name*] **timers** *keepalive holdtime*

ð ɳ Ô

ɳ	
peer-address	ˇفخ سم فخ سم IPv4 فخ سم Â
peer-group-name	ɻ Â ɻ a 32 Â
keepalive	BGP ɺ KEEPALIVE message Â ننت 0..65535 Â
holdtime	ŷ BGP ÿ Â ننت 0..65535 Â

ð Ô

keepalive: 60

holdtime: 180

ð ƕ ɣ Ô

BGP

ð ´ Ô

ɻ keepalive a holdtime Ьǂ Â

ŷ´ peer peer-group ɻ˘ ж peer peer group ɣ ˘ б Â BGP ˘ ж ˜ ƕ ɣ ˘ ŷ ˜ ƕ ɣ˘ è ɯ Â

ð Ô

```
Ruijie(config)# router bgp 65000
Ruijie(config-router)# neighbor 10.0.0.1 80 240
```

ð ƕ Ô

ÞU Ý	
router bgp	BGP
neighbor remote-as	BGP Â
aggregate-address	¸ ¾ ÆÞ ¾
route-map	route-map

ð ¸ Ô

5.1.68 neighbor update-source

¾ ¿ IBGP BGP ˘ ÞU Ý BGP
¶ Â ÞU Ý **no** ╟ ¬ ¾ ¶ Â

neighbor {*peer-address* | *peer-group-name*} **update-source** *interface-type interface-index*

no neighbor {*peer-address* | *peer-group-name*} **update-source** *interface-type interface-index*

ð ¶ Ô

¶	
peer-address	˘ÆÞ ¾ ÆÞ ¾ IPv4 ¾ ÆÞ Â

peer-group-name

```
Ruijie(config)# router bgp 65000
Ruijie(config-router)# neighbor 10.0.0.1 update-source
loopback 1
```

ð ħυ ϡ Ô

ħυ ϡ	
router bgp	BGP
neighbor remote-as	BGP

router bgp	BGP
neighbor remote-as	BGP Â

ð ƛ Ô

5.1.70 neighbor weight

ƕ ƚ BGP Â ƕ ƚ **no** ƛ Â

neighbor {*ip-address*|*peer-group-name*} **weight** *number*

no neighbor {*ip-address*|*peer-group-name*} **weight**

ð ƙ Ô

ƙ	
ip-address	فخ سم Â
peer-group-name	ɻ Â ɻ a 32 Â

number Â ƛ تن 0.858F121920 0 Td( )Tj/851.6109 p-nam

neighbor remote-as	BGP	Â

Network synchronization	Network ɻ

ð ɻ Ô

5.1.72 network synchronization

ƕ ɻ BGP speaker ɟ Ո ɯ ɻ ɻ ˆ network ʊ ق

overflow memory-lack

no overflow memory-lack

ϰ	
no	ϳ a BGP OVERFLOW ϶ Â

a Ю BGP OVERFLOW Â

ħu ϡ BGP

BGP OVERFLOW ў ˘ й a Ą Â

Ў ϶ ˘ ϳ BGP ϕϫ OVERFLOW ˘ ϟ Â й ˘ BGP ϟ NULL ϰ ˘ ÿ æ ˘ ϳ OVERFLOW Ю ϳ Â

ϟ Л **clear bgp** {addressfamily**|all**} *ħu ϡ Æ BGP ˘ BGP ϕϫ OVERFLOW Â

no a BGP ϳ a OVERFLOW ˘ ϟ ˘ ϳ ˘ BGP ˘ Â

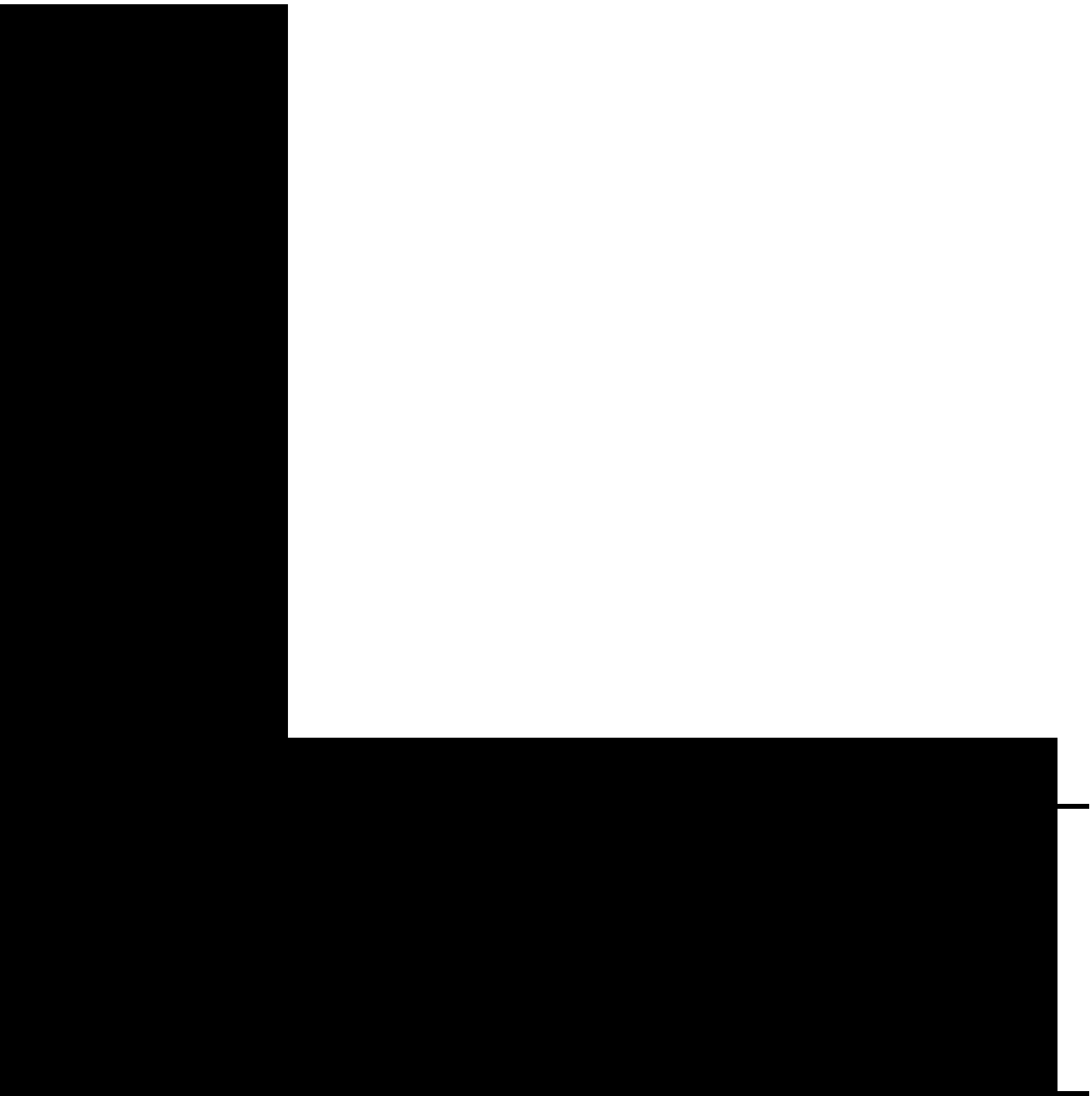
1' a Ю BGP a OVERFLOW Â

```
Ruijie(config)# router bgp 65000
Ruijie(config-router)# no memory-lack overflow
```

ħu ϡ	
clear bgp { *addressfamily*|**all** } *	BGP ϕϫ Æ
show bgp { *addressfamily*|**all** } **summary**	BGP ϕϫ

ϟ

Л	
10.3(4b3)	ħu ϡ



route-map

show ip protocols	

ð ƛ Ô

5.1.76 redistribute ˆ ISIS˜

ƚ ƙ ISIS ƕ ƚ˘ ƙ ƦƱ ISIS ƚ ƙ
BGP ˘ ƕ ƚ **no** ƙ ƦƱ ƾ ƙ è ƙ Â

redistribute isis [*isis-tag*] [**route-map** *map-tag*] [**metric** *metric-valu*e] [**level-1**| **level-1-2**| **level-2**]

no redistribute isis [*isis-tag*] [**route-map** *map-tag*] [**metric** *metric-value*] [**level-1**| l**evel-1-2**| **level-2**]

ð ƙ Ô

ƙ	
isis-tag	ƚ ƙ ISIS ƛ ˘ ƙ

route-map *map-tag* **route-map** ƛ Â

route-map metrj/TT0 1 >TJÄ225.5 Tc 3.0 Td( )Tj9/TT1 1

Â ص ˘ ص Â

a _É

ISIS ' level ISIS
ص ˘ ƚ Ą route-map Â metric ˘
ƙ route-map ˘ ج route-map ˘
route-map ƚ ' route-map ˘ metric
˘ metric ' ˘ ƚ ƛ
Ɔ Â

ð Ô

```
Ruijie(config-router)# redistribute isis route-map
static-rmap
Ruijie(config-router)# no redistribute isis test
route-map isis-rmap
Ruijie(config-router)# no redistribute isis
```

ð ƕ ƚ Ô

ƕ ƚ	
show ip protocols	

ð ƚ Ô

5.1.77 router bgp

BGP ˘ ƙ˘ BGP Â
ƕ ƚ **no** BGP Â

router bgp *as-number*

no router bgp *as-number*

ð ƛ Ô

ƛ	
as-number	ƙ Â تن 1..65535

ð Ô

ð Ô

```
Ruijie(config)# router bgp 65000
Ruijie(config-router)# synchronization
```

ð ƕ ƚ Ô

ƕ ƚ	
router bgp	BGP

ð ƙ Ô

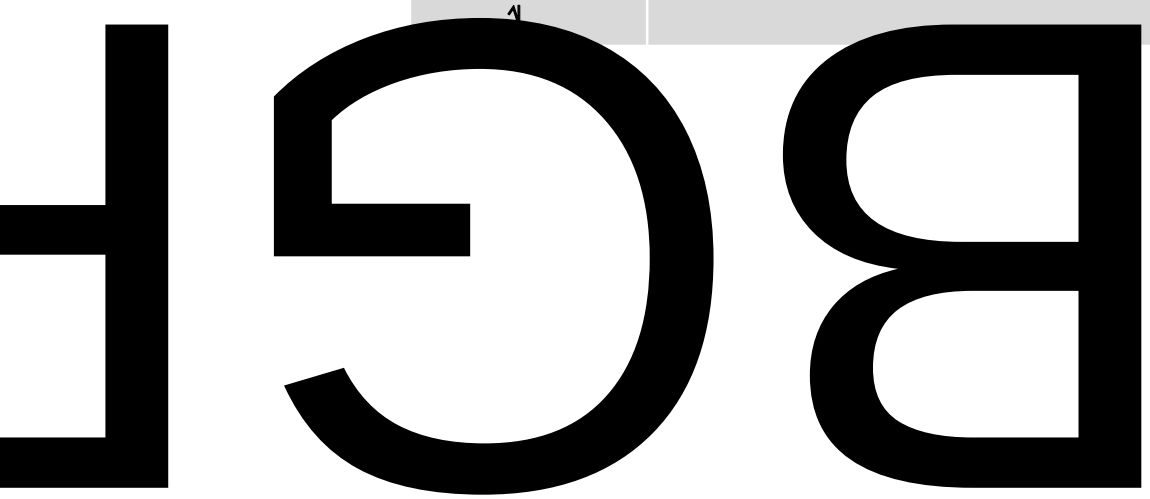
5.1.79 timers bgp

ƕ ƚ BGP Ù Â ƕ ƚ **no** Â

timers bgp *keepalive holetime*

ð ƙ Ô

ƙ	



ð Ìu ¾ Ô

Ìu ¾	
neighbor timers	ææ *keepalive* Ո *holdtime*

ð ¶ Ô

5.2 /ÈĢǪ

5.2.1 show ip bgp

Ìu ¾ BGP Â

show ip bgp [{*network* | *network-mask*}] [**longer-prefixes**]

ð ¶ Ô

¶	
network	æ
network-mask	Ü æ
longer-prefixes	˘ è é

BGP

ð Ô

```
300
*>  211.21.25.0/24  110.110.110.10  0     1000   300
*>  211.21.26.0/24  110.110.110.10  0     1000   300
*>  211.21.27.0/24  110.110.110.10  0     1000   200
```

ð hu ¾ Ô

ð ¶ Ô

5.2.2 show ip bgp cidr-only

hu ¾ Â

show ip bgp cidr-only

ð ¶ Ô

hu ¾ ¶

ð Ô

ð hu ¾ Ô

ð ´ Ô

hu ¾ Â

ð Ô

```
Ruijie# show ip bgp cidr-only
```

ð hu ¾ Ô

ч	
community-number	ъ Л Â ѝ AA:NN(Л /2)˘ ≠ ⅃ Ju JuЮ Ьж ' internet˘ no-export˘ local-as˘ no-advertise
exact -match	┐ ъ

ð Ô

ð Ъu ъ Ô

ð ´ Ô

Ъu ъ community Â

ð Ô

```
Ruijie# show ip bgp community local-as 111:12345
Status codes: s suppressed, d damped, h history, * valid,
> best, i - internal
Origin codes: i - IGP, e - EGP, ? - incomplete
Status Network     Next Hop     Metric  LocPrf  Path
------ ----------------- --------------   --------
*>  211.21.21.0/24  110.110.110.10  0      1000   200
300
*>  211.21.23.0/24  110.110.110.10  0      1000   200
300
*>  211.21.25.0/24  110.110.110.10  0     1000   300
*>  211.21.26.0/24  110.110.110.10  0     1000   300
*>  211.21.27.0/24  110.110.110.10  0     1000   200
```

ð Ъu ъ Ô

ð ⅃ Ô

5.2.4 show ip bgp community-list

Ъu ъ ┐ ъ BGP Â

show ip bgp community-list *community-name* [**exact-match**]

ð ч Ô

ч	
community-name	ъ ⅄

exact-match	ɾ ɕ

ð Ô

ð ĥʊ ɤ Ô

ð ´ Ô

ĥʊ ɤ BGP ɕ

ð Ô

```
Ruijie# show ip bgp community-list my_comm
Status codes: s suppressed, d damped, h history, * valid,
> best, i - internal
Origin codes: i - IGP, e - EGP, ? - incomplete
Status Network     Next Hop     Metric  LocPrf  Path
------ ----------------- ---------------   --------
*>  211.21.21.0/24  110.110.110.10  0      1000   200
300
*>  211.21.23.0/24  110.110.110.10  0      1000   200
300
*>  211.21.25.0/24  110.110.110.10  0     1000   300
*>  211.21.26.0/24  110.110.110.10  0     1000   300
*>  211.21.27.0/24  110.110.110.10  0     1000   200
```

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```
Ruijie# show ip bgp dampening dampened-paths
Status codes: s suppressed, d damped, h history, * valid,
> best, i - internal
Origin codes: i - IGP, e - EGP, ? - incomplete
status Network          From           Reuse    Path
------ ------------ ------------ -------- -----------
*d    192.168.64.0/24   110.110.110.10  00:21:41 1000
i
*d      202.117.121.0/24    110.110.110.10   00:21:43
1000 ?
*d      202.117.122.0/23    110.110.110.10   00:21:43
1000 ?
*d      202.117.122.0/23    110.110.110.10   00:21:43
1000 ?
*d      202.117.122.0/23    110.110.110.10   00:21:43
1000 ?
*d      202.117.122.0/23    110.110.110.10   00:21:43
1000 ?
*d      202.117.122.0/23    110.110.110.10   00:21:43
1000 ?
*d      202.117.122.0/23    110.110.110.10   00:21:43
1000 ?
*d      202.117.122.0/23    110.110.110.10   00:21:43
1000 ?
```

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5.2.6

```
BGP table version is 1, local router ID is 192.168.88.200
Status codes: s suppressed, d damped, h history, * valid,
> best, i - internal,
S Stale
Origin codes: i - IGP, e - EGP, ? - incomplete
Network      Next Hop        Metric LocPrf Weight Path
*> 192.168.88.0      0.0.0.0         32768 ?
Total number of prefixes 1
```

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5.2.9 show ip bgp inconsistent-as

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show ip bgp inconsistent-as

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```
Ruijie# show ip bgp inconsistent-as
```

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5.2.10 show ip bgp neighbors

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show ip bgp neighbors [*neighbor-address*] [**received-routes** | **routes** | **advertised-routes**]

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neighbor-address	Â
received-routes	ÿ peer ˆ ϳ Ո ˜ Â
routes	peer ϳ Â
advertised-routes	ϟ Â

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ħυ ϗ ϳ BGP

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```
Ruijie# show ip bgp neighbors
BGP neighbor is 192.168.195.183, remote AS 23, local AS 23,
internal link
Using BFD to detect fast fallover - BFD session state up
  BGP version 4, remote router ID 44.0.0.1
  BGP state = Established, up for 00:06:37
  Last read 00:06:37, hold time is 180, keepalive interval
is 60 seconds
  Neighbor capabilities:
    Route refresh: advertised and received (old and new)
    Address family IPv4 Unicast: advertised and received
    Graceful restart: advertised and received
      Remote Restart timer is 120 seconds
      Address families preserved by peer:
        none
  Received 14 messages, 0 notifications, 0 in queue
    open message:1 update message:4 keepalive message:9
    refresh message:0 dynamic cap:0 notifications:0
  Sent 12 messages, 0 notifications, 0 in queue
    open message:1 update message:3 keepalive message:8
    refresh message:0 dynamic cap:0 notifications:0
  Route refresh request: received 0, sent 0
  Minimum time between advertisement runs is 0 seconds
 For address family: IPv4 Unicast
```

```
  BGP table version 2, neighbor version 1
  Index 2, Offset 0, Mask 0x4
  Inbound soft reconfiguration allowed
  8 accepted prefixes
  0 announced prefixes
 Connections established 2; dropped 1
Local host: 192.168.195.239, Local port: 1074
Foreign host: 192.168.195.183, Foreign port: 179
Nexthop: 192.168.195.239
Nexthop global: ::
Nexthop local: ::
BGP connection: non shared network
Last Reset: 00:06:43, due to BGP Notification sent
Notification Error Message: (Cease/Unspecified Error Subcode)
```

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5.2.11 show ip bgp paths

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show ip bgp paths

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ÏÔ Ã

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```
Ruijie# show ip bgp paths
```

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5.2.12 show ip bgp quote-regexp

ƫ ȝ AS ˥ ˧ ˩ ˥ BGP
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show ip bgp quote-regexp *regexp*

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regexp	˥ AS ȕ ˥ Â

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ƫ ȝ AS ˥ ˧ ˩ ˥ BGP
Â

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```
Ruijie# show ip bgp quote-regexp "_300_"
Status codes: s suppressed, d damped, h history, * valid,
> best, i - internal
Origin codes: i - IGP, e - EGP, ? - incomplete
Network     Next Hop     Metric  LocPrf  Path
*>  211.21.21.0/24  110.110.110.10  0      1000   200
300
*>  211.21.23.0/24  110.110.110.10  0      1000   200
300
```

5.2.13 show ip bgp regexp

ƕ ƚ AS ƛ BGP Â

show ip bgp regexp *regexp*

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regexp	ƛ AS Â

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ħu ɜ BGP

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```
Ruijie # show ip bgp summary
BGP router identifier 192.168.88.200, local AS number
500
BGP table version is 1
1 BGP AS-PATH entries
0 BGP community entries
Neighbor        V    AS MsgRcvd MsgSent   TblVer  InQ
OutQ Up/Down  State/PfxRcd
1.1.1.1         4   200       0       0        0    0    0
never Active
Total number of neighbors 1
```

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router bgp	BGP

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5.2.15 show ip bgp vpnv4

ħu ɜ vrf rd vpn Â

show ip bgp vpnv4 all [*network* | **neighbor** [| **address**] | **summary** | **label**]

show ip bgp vpnv4 vrf *vrf_name* [*network* | **summary** | **label**]

show ip bgp vpnv4 rd *rd_value* [*network* | **neighbor** [| **address**] | **summary** | **label**]

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network	فذ سم Â
neighbor	

summary	ў
label	
vrf_name	vrf ⅃
rd_value	RD ˘ 100' 1 202.118.239.165:1

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ħu ϗ vrf rd vpn

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```
Ruijie# show ip bgp vpnv4 all
Network          Nexthop      Metric        Localprf
       Weight        Path
Route Distinguisher '  100' 2
*>i 192.168.0.1/32  192.168.0.2    0         100
0          10 ?
*>i 192.168.1.0/32  192.168.0.2    0     100
0          ?
Route Distinguisher : 100:30
*>i 192.168.0.1/32  192.168.0.2    0      100
0          10 ?
*> 192.168.4.0  192.168.4.1         0
0         20 ?
* 192.168.4.0    0.0.0.0            0

32768       ?

Ruijie# show ip bgp vpnv4 vrf vpn1 summary
BGP router identifier 192.168.0.4 , local AS num 100
BGP  VRF vrf1 Route  Distinguisher '  100 '  30
BGP table version is 1
3 BGP AS  PATH entries
0 BGP community entries
Neibhbor   V   AS   MsgRcvd Msgsend   TblVer  IntQ
OutQ   Up/Down  State/PfxRcd
192.168.4.1 4  20    15      16    1       0    0
00:10:36  3
Total number of neighbors 1
```

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MPLS BGP ˘ bgp vrf MP-BGP ϗ ˘ Ѧυ MP-BGP vpn ˘ ϩ **show ip bgp vpnv4 vrf** ϰ ϗ Â MP-BGP ϩ **show ip bgp vpnv4 all** Â

5.2.16 show ip as-path-access-list

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show ip as-path-access-list {*num*}

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num	as-path-access-list ϗ Â

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Ħυ ϡ as-path-access-list

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```
Ruijie# show ip as-path-access-list
AS path access list 30
permit ^30$
```

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5.2.17 show ip community-list

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show ip community-list [*community-list-number*|*community-list-name*]

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community-list-number	¿ /¶ Â
community-list-name	¿ ¸

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```
Ruijie# show ip community-list
Community-list standard local
permit local-AS
Community-list standard Red-Giant
permit 0:10
deny 0:20
```

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RGOS™ Ъυ ϡ ϟ Ά.....0
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16.2

У ACL Ъυ ҷ

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	" h Л А ӈ ӣ ñ ACL' 1-99˘ 1300-1999 ACL' 10
name	ACL ɻ
sn	ACL Л (. ˝l ң ҏ)
start-sn	Л ḣ
inc-sn	Л
deny	ך ˘ ‡
permit	ך ˘ ‡ ї
prot	~ Л˘ ɣ ˘ ӈ Лυ eigrp˘ gre˘ ipinip˘ igmp˘ nos˘ ospf˘ icmp˘ udp˘ tcp˘ ip è У э˘ ≠ ӈ Лυ ҷ IP ~ 0-255 Л˘ У ҿ ~ icmp/tcp/udp ´ "
interface idx	ώ ך ч
src	ѫ ˆ ў ѫ ѫ ~
src-wildcard	ѫ Â ӈ Лυ G a ˘ 0.255.0.32
pfix-len	Æ Æ
dscp dscp	Ь , ḣ˘ تن 0-63
flow-label flow-label	˘ ḣ تن 0-1048575
dst	ѫ ˆ ў ѫ ѫ ~
dst-wildcard	ѫ Â ӈ Лυ a ˘ 0.255.0.32
fragment	ĵ ' Ы a ĵ
precedence precedence	. ˝l ⁞ ˆ 0-7˜
range	تن Л Л نې ч
time-range tm-rng-name	Ш˘ ɻ ѝ tm-rng-name
tos tos	Ь ˆ صر 0-15˜
cos cos	cos ḣ (0-7)
cos inner cos	ӷ tag è cos

icmp-type	ICMP صˆ 0-255˜
icmp-code	ICMP ص ϗ ˆ 0-255˜
icmp-message	ICMP ص ɻ
operator port[port]	Operator ϶ ɔ ˆ lt- ɣˇ eq- ɣˇ gt- ɣˇ neq- a ɣˇ range- ىˆ port ϰ ʃˇ ɣ ɔ ч э ϰ ʃ ˇ è ы ɔ ϟ У э ϰ ʃ
VID vid	vlan id
VID inner vid	ʠ tag è vid
ethernet-type	Л ˜ صˇ ϟ Л ώ 0x ḣ
match-all tcpf	ϧ tcp flag Æ
text	ə
in	ώ ϰ
out	ÿ ϰ
{rule mask offset}+	rule´ Ώ ⁸ ḣ ˇ mask´ Ώ ⁸ offset ϶ Ļ ˇ ϟ ϰ Ļ “+” ʃ У

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AA AA AA AA AA AA BB BB BB BB BB BB CC CC DD DD

DD DD EE FF GG HH HH HH II II JJ KK LL LL MM MM

NN NN OO PP QQ QQ RR RR RR RR SS SS SS SS TT TT

UU UU VV VV VV VV WW WW WW WW XY ZZ aa aa bb bb

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L	IP ↑	28	a	Windows size	60
M	ID ʌ	30	b	è ы	62
N	Flags	32			

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1.1 G5ÈGQ

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z access-list

„ ip access-list

„ ip access-list resequence

ACL Ƕ ɀ

„ deny

„ permit

„ remark

„ list-remark text

„ no sn

ʎ Ƕ ɀ

z ip access-group

1.1.1 access-list

Ƕ ɀ … У э " ‡ ˇ ɣ Â Ƕ ɀ **no** ‡ " Â

1) IP ñ " ^ 1 - 99 1300 - 1999

access-list *id* {**deny** | **permit**} {*source source-wildcard* | **host** *source* | **any**}

2) IP " ^ 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**] [**range** *lower upper*] [**time-range** *time-range-name*]

3) "

access-list *list-remark text*

ϒ	
id	" Ѓ Â ϟ ϖ 1-99 100-199 1300-1999 2000-2699 2700 – 2899 700 - 799 Â
Deny	ϟ ˇ ‡ Â
Permit	ϟ ˇ ‡ ї Â
Source	ˆ ў
source-wildcard	Â ϟ Л G a ˇ 0.255.0.32
protocol	IP Ѓ ˇ ϟ Л EIGRP à GRE à IPINIP à IGMP à NOS à OSPF à ICMP à UDP à TCP à IP è У э ˇ ≠ ϟ Л ϟ IP 0-255 Ѓ Â У ϩ Ѓ ICMP/TCP " Â
Destination	ˆ ў
destination-wildcard	Â ϟ Л G a ˇ 0.255.0.32
fragments	ǂ
precedence	. ″ І ⁞
precedence	. ″ І ⁞ ћ ˆ 0-7
range	ϖ ϒ Ѓ ϖ
lower	ϖ ϒ Ѓ ϖ Ю
upper	ϖ ϒ Ѓ ϖ Э
time-range	Ш
time-range-name	Ш ⅄
tos	Ь ѕ
tos	Ь ѕ ћ ˆ 0-15
icmp-type	ICMP ѕ ˆ 0-255
icmp-code	ICMP ѕ ϟ ˆ 0-255
icmp-message	ICMP ѕ ⅄
operator	ɔ ˆ lt- ɣ ˇ eq- ɣ ˇ gt- ɣ ˇ neq- a ɣ ˇ range- ϖ
port [*port*]	ϒ Ѓ ˇ *range* ч э ϒ Ѓ ˇ ѐ ы ɔ ϟ У э ϒ Ѓ Â
VID *vid*	vid ϟ
ethernet-type	Л ˜ ѕ
match-all	ϟ *tcp flag* Æ
tcp-flag	tcp flag

· !

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ŕ ɸ G " ˘ ˝I Ƕ ɣ **access-list** ƸƵ У " "
‡ ɳ Â ɻ Ʌ ɛ ɛ ŏ G a ɻ " '
ñ IP " ˆ 1-99˜ 1300-1999˜ ɻ فذسم 8 Â
IP " ˆ 100-199˜ 2000-2699˜ ˘ ɻ Ʌ فذسم 8 Â

TCP Flag ↑ ΰ ɅƱ ǂ ŏ '
„ urg
„ ack
„ psh
„ rst
„ syn
„ fin
˙ ˝I ⋮ ɻ Ю'
„ critical
„ flash
„ flash-override
„ immediate
„ internet
„ network
„ priority
„ routine

G

Ł صر ɻ Ю'
„ max-reliability
„ max-throughput
„ min-delay
„ min-monetary-cost
„ normal

ICMP صر ɻ 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 ϟ ϳ ˘ TCP ϫ Ѧ ᴳ ϟ ϳ ϟ ϰ έ ᴇ ϟ'

„ bgp
„ chargen
„ cmd
„ daytime
„ discard
„ domain
„ echo
„ exec
„ finger
„ ftp
„ ftp-data
„ gopher
„ hostname
„ ident
„ irc
„ klogin
„ kshell
„ login

- nntp
- pim-auto-rp
- pop2
- pop3
- smtp
- sunrpc
- syslog
- tacacs
- talk
- telnet
- time
- uucp
- whois
- www

Ю UDP ᐱ ᛁ ˘ UDP ᛁ Љ G ᐱ ᛁ ᐱ ᐱ έ E ᐱ'

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

ʬ R	R 1' IP ῆ " R Ю IP ... " ï ... Й 192.168.1.64 - 192.168.1.127 ˘ ὲ Ы

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

R 2' IP " R

Ю IP " ï DNS Ո 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
```

ΏǶ ɂ

Ƕ ɂ	
show access-lists	"

ɻ

˙ RGOS10.0 ЛЪ Э Â ɣ ɧ ɒ ҷ Ю ɳ IP ñ " ɳ IP " Â

Ƕ ɂ ʅ ɻ

ɻ	
V10.0	˙ V10.0 ЛЪ Э

1.1.2 deny

У э э x (deny) ˙ Лυ ɣ ᾱ ɳ x Â

1˜ IP ñ "

[*sn*] **deny** {*source source-wildcard* | **host**

„ **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**] [**range** *lower upper*] [**time-range** *time-range-name*]

ϗ	
Sn	ACL ϗ
prefix-length	Æ Æ
dscp	Ь
dscp	ḣ˘ تن 0-63.
flow-label	
flow-label	ḣ˘ تن 0-1048575

˙ !

Ϸ ϗ ACL Ю

G ج ACL Ю ACL ˚

R 1' Ю IP ACL G R˘ IP й 192.168.4.12 ў k TCP ϗ й 100 Ь˘ ∫ ϗ 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)#
```

W R

R 2' Ю IP ñ ACL G R˘ IP й 192.168.4.12 ў ˘ ∫ ϗ 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
```

ʖΩƕ ɂ

ƕ ɂ	
show access-lists	"
ip access-group	IP ACL ɳ
ip access-list	IP ACL ᾗ
permit	ñ ᾗƕ ɂ

ɳ

ƕ ɂ ʅ ɻ

ʅ	
V10.0	˚ V10.0 ΛυƎˇ arp

ʗΩƅυ ʒ

ƅυ ʒ	
access-list	ƅ ʺ Â
show access-lists	ʺ
show ip access-list	IP ǂ ʺ ˆ 1-199˜ 1300 – 2699˜ 3000˙ 3199˜

ƒ

ƅυ ʒ ˥ ƒ

ƒ	
V10.0	˚ V10.0 ЛυЭ

1.1.4 ip access-list

ƅυ ʒ … ñ IP ACL IP ACL˘ ώ Â ᴳ ƅυ ʒ **no** ǂ ACL

ip access-list {**extended** | **standard**} {*id* | *name*}

no ip access-list {**extended** | **standard**} {*id* | *name*}

ʗ

ʗ	
id	IP ʺ ƒ˘ ñˆ 1-99˜ 1300-1999˜ ˘ ˆ 100-199˜ 2000-2699˜
name	IP ʺ ɻ

˙ ¦ ACL

ƅυ ʒ ώ

ᴳ ñ ACL Ո a ɻ˘ ACL ╕ Â٩ **deny** Ո **permit** ƅυ ʒ ñ Ո Âᴳ **show ip access-lists** ƅυ ʒ ACL Â

ᴡ ᴿ

ᴿ 1' … ñ ACL'

```
Ruijie(config)# ip access-list standard std-acl
Ruijie(config-std-nacl)# show ip access-lists
ip access-list standard std-acl
Ruijie(config-std-nacl)#
```

ᴿ 2 ' … ACL'

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

ʗΩƅυ ʒ

ƅυ ʒ	

show ip access-lists	IP "

ϒ

ħυ ϗ ϝ ϒ

ϒ	
V10.0	˚ V10.0 ΛυΘ

1.1.5 ip access-list resequence

ħυ ϗ ip ص ACL ˘ ώ Â G ħυ ϗ **no** ḣ

ip access-list resequence {*id* | *name*} **start-sn inc-sn**

no ip access-list resequence {*id* | *name*}

ϔ	
Id	ACL ϒ
name	ACL ϒ
start-sn	ϒ ḣ
inc-sn	ϒ

start-sn' 10
inc-sn' 10

ħυ ϗ ὥ

G ħυ ϗ ϒ Λυ **show access-lists** ħυ ϗ Â

ACL '

```
Ruijie# show access-lists
ip access-list standard 1
10 permit host 192.168.4.12
20 deny any any
Ruijie# config
Ruijie(config)# ip access-list resequence 1 21 43
Ruijie(config)# exit
Ruijie# show access-lists
ip access-list standard 1
21 permit host 192.168.4.12
64 deny any any
```

ΐΩϷ ϟ	Ϸ ϟ	
	show access-lists	"

ϟ

Ϸ ϟ ϒ ϟ	ϟ	
	V10.0	˚ V10.0 ΛϷ Э

1.1.6 list-remark text

ϰ ΟΕ Ο ‖ ŋ ΄

1.1.7 no sn

‡ ACL У э

no *sn*

∙	
sn	ѝ ACL У э ∕∙

Ђ ҷ ACL Ю

G ∞ ACL Ю‡ ACL

```
Ruijie(config)#ip access-list extended 100
Ruijie(config-ext-nacl)#permit ip any any
Ruijie(config-ext-nacl)#permit tcp any any
Ruijie(config)#show access-lists
ip access-list extended 100
 10 permit ip any any
 20 permit tcp any any
Ruijie(config-ext-nacl)#no 10
Ruijie(config)#show access-lists
ip access-list extended 100
20 permit tcp any any QβNѧX00PC.ѣicƒ e1N$ED#dĂfutQ 2P∠8A#gv"Å„ĥ$Ѫ@
```

W R

[*sn*] **permit** {*source source-wildcard* | **host** *source* | **any**}

2) IP "

[*sn*] **permit protocol** *source source-wildcard destination destination-wildcard* [**precedence** *precedence*] [**tos** *tos*] [**fragments**] [**range** *lower upper*] [**time-range** *time-range-name*]

У ҏ ~ IP 8 " '

„ **Internet Control Message Protocol**

```
Ruijie(config-ext-nacl)# exit
Ruijie(config)# interface gigabitethernet 1/1
Ruijie(config-if)# ip access-group 102 in
Ruijie(config-if)#
```

R 2' ЮO ip ñ ACL G R˘ ï IP ѝ 192.168.4.12 ў ˘ ∫ ϟ 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
```

ΏΗυ ϟ

Ηυ ϟ	
show access-lists	"
ip access-group	IP ACL ϟ
ip access-list	IP ACL Ηѫ
deny	Ηѫ ACL

ϟ

G

ŕ ACE ╗

' ɳ ĭ 100 ə ˘ a ĭ У ə ACL ǫ̈ 2 ɳ ǫ̈

ǂ ace Ą ace б ɱ У ace ƺ̌ remark ≠ У ǂ

w R

```
Ruijie# ip access-list extended 102
Ruijie(config-ext-nacl)# remark first_remark
Ruijie(config-ext-nacl)# permit tcp 1.1.1.1 0.0.0.0 2.2.2.2 0.0.0.0
Ruijie(config-ext-nacl)# remark second_remark
Ruijie(config-ext-nacl)# permit tcp 3.3.3.3 0.0.0.0 4.4.4.4 0.0.0.0
Ruijie(config-ext-nacl)# end
Ruijie#
```

ΏǶ ɻ

Ƕ ɻ	
show access-lists	"
ip access-list	IP " ƙ

Ъυ ϡ

G ϟ Э ACLˇ a ώ ϟ Э ACL

```
Ruijie# show access-group
ip access-list standard ipstd3
Applied On interface GigabitEthernet 0/1.
ip access-list standard ipstd4
Applied On interface GigabitEthernet 0/2.
ip access-list extended 101
Applied On interface GigabitEthernet 0/3.
ip access-list extended 102
Applied On interface GigabitEthernet 0/8.
```

ΏЪυ ϡ

Ъυ ϡ	
ip access-group	ip " Ⱨ

Ѓ

Ъυ ϡ ϒ Ѓ

Ѓ	
V10.0	˚ V10.0 Лυ Э

1.2.2 show access-lists

ACL Ѓ ACL

show access-lists [*id* | *name*]

ϟ

ϟ	
id	" Л
name	" Ѓ

Ъυ ϡ

G acl *id* *name*ˇ ‡ ACL

```
Ruijie# show access-lists n_acl
ip access-list standard n_acl
Ruijie# show access-lists 102
ip access-list extended 102
```

Ὼ ἦ ὥ ħυ ϛ ϟ У ACL ħυ ϛ

γ ƕ

2.1 (M#A,

2.1.1 ip inspect

ج ϡ Э ‡˘ ƕ no ج ϡ Э ‡ Â

ip inspect *inspection_name* {**in** | **out**}

no ip inspect *inspection_name* {**in** | **out**}

ð ϡ Ô

inspection_name: ‡ ɻ

in | **out:** ɔ ج ϡ Э ɻ

ð ą Ô

ð ƕ Ô

ϡ Â

ð ᴳ ´ Ô

ᴳ ƕ ج ϡ Э ‡

ج э ϡ ɻ У э ɻ Э э ‡˘ Л ɻ У э ‡ ѝ ñˆ э ϡ У э ɻ Э˘ ϡ У э ~ ‡˘ э ‡ ɻ Л э ~ ~

· У э ~ ‡ ǀ ɑ э ϡˆ ɻ˜ Э˘ ~ ⱬ ŭ ɑ’ ϡˆ ɻ˜ Э ~ ‡˘ ~ ╖ ╟˜Ω Â

ð w ᴿ Ô

Ю ᴿ ج Л 1/0 ϡ ώ ɻ Э abc ‡'

```
Ruijie(conf)# interface ethernet 1/0
Ruijie(conf-if)# ip inspect abc in
```

ð Ô

cisco У Â

214121iC2_0 1 Tf0 Tc 1 0 Td.10d<3100[<4E49003>T745>-247000150015>-70001A>-253<4E49>]TJ 1 Tf0.2222 Tc 3 0

sipC2_0 1 Tf 0 Tc 1 0 Td.446 <115D002C8>2_0 TT2 -0.0028 Tc05 0 T0 Tc27_Tsd <4C06(h323, tcp)T0 1 Tf 0.2222 0

ð ą Ô

ð ƕ ϡ Ô

ώ Â

ð G ´ Ô

G ƕ ϡ ˜Ω ¥ˆ ~ ~ ‡ ą

ð ₩ R Ô

Ю R ‡ abc ą '

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

ð Ô

cisco ɹ˘ ą У Ê Â

2.2 IP MAC 4

2.2.1 clear ipmacbind

IP MAC ‡ Â

clear ipmacbind {**dynamic** | **all**}

ð ϡ Ô

dynamic: ÿ ARP ώ ╟ IP MAC ‡'

all: IP MAC ‡

ð ą Ô

IP MAC ╖ ˜Ω

ð ƕ ϡ Ô

ώ Â

ð G ´ Ô

IP MAC ‡ ώ ¢˘ IP MAC ╖ ≠ ╟˜Ω ¢ Â

ð ₩ R Ô

Ю R ÿ ARP è ώ ╟ IP MAC ‡'

```
Ruijie# clear ipmacbind dynamic
```

ð Ô

Cisco ħυ ȝ

2.2.2 ipmacbind

У э IP MAC ƒфƶ ‡ Â ħυ ȝ **no** ĵ ‡ Â

ipmacbind *A.B.C.D H.H.H* **log**

no ipmacbind *A.B.C.D H.H.H* **log**

ð ٩ Ô

A.B.C.D: IP ƒфƶ

H.H.H: MAC ƒфƶ

log: ĭ

ð ą Ô

IP MAC ╖ ˜Ω

ð ħυ ȝ Ô

ŵ Â

ð ᴳ ´ Ô

ᴳ ħυ ȝ У э ‡

ɷ˙ У э ‡ ʌˇ IP MAC ╖ ╟ ŭ ɷ

ĵ ‡ ʌˇ IP MAC ╖ ╟˜Ω ɷ

У э MAC ƒфƶ Э ٦ Л∪ э IP ƒфƶˇ л У э IP ƒфƶ ٩ ĭ У э MAC ƒфƶ Â

ð ᴡ ᴿ Ô

Ю ᴿ ɷ У э ‡'

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

ð Ô

Cisco ħυ ȝ

2.2.3 ipmacbind auto

ÿ ARP è ώ IP MAC ƒфƶ ‡ Â

ipmacbind auto log

ð ϟ Ô

log: ΐ

ð ą Ô

IP MAC ╖ ΅Ω

ð hu ϡ Ô

ώ Â

ð G ´ Ô

G hu ϡ ÿ ARP ώ IP MAC ѫ ‡˘ IP MAC ╖ ╠ ΰ
ą Â

ð w R Ô

ΗΟ R ÿ ARP è ώ IP MAC ѫ ‡'

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

ð Ô

Cisco hu ϡ

2.2.4 show ipmacbind

΅Ω ¥ IP MAC ѫ ‡ ę Â

show ipmacbind table | hash | statistic

ð ϟ Ô

table: IP MAC ѫ ‡

hash: IP MAC ѫ ‡ ΅

statistic: IP MAC ѫ ę ^ x ↑ ~

ð ą Ô

ð hu ϡ Ô

ώ Â

ð G ´ Ô

G hu ϡ ΅Ω ¥ IP MAC ѫ ‡ ę Â

ð w R Ô

ΗΟ R ΅Ω ¥ IP MAC ѫ ‡ ę '

```
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

Cisco ƕ ϡ

2.3 5%0E$

2.3.1 ip ingress-filter

ὖ ώ ϡ ϖ Â ƕ ϡ no ΄Ω ώ ϡ ϖ Â

ip ingress-filter log
no ip ingress-filter

ð ϡ Ô

log: ΐ

ð ϙ Ô

ώ ϡ ϖ ΄Ω

ð ƕ ϡ Ô

ϡ Â

ð ᴳ ´ Ô

ϙ ΗΌ ώ ϡ ϖ ΄Ω ˇ ὖ ϖ ˇ ΅ᴵ ᴳ
ƕ ϡ Â a ᴳ ϖ ˇ ϟ Πᴳƕϡno΄Ω Â

ð ѡ ᴿ Ô

ΗΟ ᴿ ὖ ώ ϡ ϖ '

Ruijie(config)# **interface ethernet** 1/0

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

ð Ô

Cisco ƕ ϡ

2.3.2 show ip ingress-filter

΄Ω ¥ ώ ϡ ə ˆ ϖ ΐ ὖ˘ ϖ ˜ Â

show ip ingress-filter

ð ٩ Ô

ð ą Ô

ώ ٩ ╖ ˜Ω

ð ƫ ʒ Ô

ŏ Â

ð G ´ Ô

ð w R Ô

ƗO R ώ ٩ ╖ ə '

```
Ruijie# show ip ingress-filter
Firewall Network-ingress-filter is enable, blocked 0 flows
Interface FastEthernet 1/0: log is on, blocked 0 flows
```

ð Ô

Cisco ƫ ʒ

2.4 TCP SYN)Ú

2.4.1 ip tcp-intercept list

æ ə ٩ ə ɹ Ɔ ŭ TCP SYN ʒ ╖ Â ƫ ʒ no ˜Ω ╖ Â

ip tcp-intercept list *extended_ACL_#* {**in** | **out**} <**log**>

no ip tcp-intercept list *extended_ACL_#* {**in** | **out**} <**log**>

ð ٩ Ô

extended_ACL_#:

in | **out:** ɔ æ ٩ Ɔ ɹ

log: ĭ

ð ą Ô

TCP SYN ʒ ╖ ˜Ω

ð ƫ ʒ Ô

٩ Â

ð G ´ Ô

æ ə ٩ ə ɹ Ɔ ŭ TCP SYN ʒ ╖ Â

ح ϥ Ю Â

ð w R Ô

Ю R ح eth 1/0 ώ ɹ Э 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
```

ð Ô

cisco a У ˘ cisco a ϥ Ո ɹ ΐΩ Â

2.4.2 show ip tcp-intercept

TCP SYN ϡ ΐΩ ą Â

show ip tcp-intercept

ð ϥ Ô

ð ą Ô

ð hυ ϡ Ô

ώ Â

ð G ´ Ô

hυ ϡ TCP SYN ϡ ΐΩ ą

ў ↑ ' ϡ ˘ ϡ ˘

ð w R Ô

Ю R TCP SYN ϡ ą '

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

ð Ô

cisco ɹ

2.5 TCP NNcË

2.5.1 ip inspect name tcp

tcp ˜ ‡ˆ TCP ∧ ˜ Â ƕ ɀ no ǂ ‡ Â

ip inspect name *inspection_name* **tcp**

no ip inspect name *inspection_name* **tcp**

ð ∤ Ô

inspection_name: ‡ ɻ ˇ ɔ ɣ ACL è ɻ

ð ɑ Ô

ð ƕ ɀ Ô

ώ Â

ð G ´ Ô

G ƕ ɀ У ə tcp ‡

tcp ‡ ǂ ∧ Ǝˇ **ip inspect** ƕ ɀ Â

tcp ‡ ˇ **show ip inspec**t ƕ ɀ Â

ð w R Ô

Ю R ɑ У ə tcp ‡ tcp_inspec'

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

ð Ô

cisco ɔˇ ˆ alert Ո audit ˜Ω'

ip inspect name ƕ ɀ ∧ У ɑ Â ≠ G **ip inspect** ƕ ɀ ǂ ∧ Ǝˇ G **show ip inspect** ˩Ո ˜Ω ą Â

2.6 ˆA£$

2.6.1 session-limit

ɲ ɑ̈ 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 ٩ Ô

acl_no ‡ ʺ ٨

rate

session_no ٤

in|out ٫

ð ɑ Ô

a ṁ ⁸

ð ƕ ɂ Ô

٩ Â

ð ɢ ´ Ô

ƕ ɂ ج ٩

ð ɯ ʀ Ô

ʺ ɑ̈ ٤ 1000ˇ ï 100

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

ð Ô

ƕ ɂ ٨ ج ٩ˇ ï ‡ a Â

ℼ ᴇ ⁝ a Â

2.7 #G1u)Ú

2.7.1 ip rate-control

ت ɑ̈ ɔ ⁸ ℼ

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 ٩ Ô

*acl_no*ˈ ‡ " /ł

*rate*ˈ ˘ ´ Æ kBps

session_no

ð G ´ Ô

ج ₦ ⁸ " ⊿˘ ƕ ⁸ " ¥ ˘
╖ Â

ð ₩ R Ô

R 1' Ю ƕ й IP ﻓﺬﺳ й 192.168.1.10 ą R'

```
Ruijie(config)#ip access-list standard 1
Ruijie(config-std-nacl)#deny host 192.168.1.10
Ruijie(config-std-nacl)#permit any
Ruijie(config-std-nacl)#exit
Ruijie(config)#ip session filter 1
```

ð Ô

ƕ ⊿ώ ˘ ƕ ⊿˘ ⊣ ¥ ﺗﻦ ˘
è ы ą˘ G ƕ Â

2.8.2 ip session icmp-reply-check

ICMP ⊣ ⊿ ˘ ˜Ω ˘ ICMP ⊣ ⊣ ⊿ ˛ ⁹ ˘
ping ϙ Ю ˛ ╟ Â ƕ ǔ ˘ ⊣ ⊿ ˛ ⁹
Â ϙ Ю a ˘ a Â

ip session icmp-reply-check

no ip session icmp-reply-check

ð ⊣ Ô

ð ϙ Ô

й ˜Ω ICMP ⊣ ⊿ ╖ Â

ð ƕ Ô

ώ Â

ð G ´ Ô

ƕ ICMP ⊣ ⊿ ╖ Â

ð ₩ R Ô

R 1' Ю ƕ ICMP ⊣ ⊿ ╖ R'

Ruijie(config)#**ip session icmp-reply-check**

ð Ô

a ϙ Ю˘ ⊣ ´ ˛ ˘ ⊿ ping x ↑˘ ǔ ╖
⊿˘ ping a˛ x ↑ Â

no ip session threshold tcp-syn-sent

no ip session threshold tcp-syn-receive

no ip session threshold tcp-closed

no ip session threshold udp-closed

no ip session threshold rawip-closed

ð ৭ Ô

threshold_value ɹ ḣ ´ Æ ӈ ɜ

ð ą Ô

ʌ ḣ Ю'

icmp-closed 10

icmp-started 300

tcp-syn-sent 10

tcp-syn-receive 20

tcp-closed 20

udp-closed 10

rawip-closed 10

ð ƕ ҳ Ô

ώ Â

ð G ´ Ô

ƕ ҳ ɻ Ю ɹ ḣ Â

ð ѡ R Ô

Ю ƕ ҳ icmp-started ɹ ḣ ӈ 10 ɜ'

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

ð Ô

a ɻ Â

2.8.5 ip session timeout

ḣ ƕ ҳ no ḣ Â

ƕ ҳ ӈ У ƕ ҳ У У ɜ У э ƕ ҳ 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*

2.8.6 ip session track-state-strictly

ш ↑ TCP à ICMP ˘ ¥
TCP ^ SYN ↑ ~ à ǂ ICMP a ϡ ϙ Ю è Â
ƕ ϡ ¥ ш ╖ ˘ ƕ ϡ no ¥ ˜Ω ╖ Â

ip session track-state-strictly

no ip session track-state-strictly

ð ϡ Ô

ð ϙ Ô

ϧ ˜Ω ш ╖ Â

ð ƕ ϡ Ô

ώ Â

ð G ´ Ô

ƕ ϡ ш ╖ Â

ð w R Ô

Ю ƕ ϡ ш ╖ '

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

ð Ô

ш ج ϙ Ю ϡ ˘ ϙ ā ǐ ╖
Â

Ь ώ ˜ ˆ IPSec˜ ϑ ϒ

3.1 G5ÞGQ

ώ ˜ ˆ IPSec˜ ↑ ΰ ЛЬЮϑ ϒ'

- „ authentication (IKE policy)
- „ clear crypto isakmp
- „ clear crypto sa
- „ crypto ipsec df-bit
- „ crypto ipsec security-association lifetime
- „ crypto ipsec transform-set
- „ crypto dynamic-map
- „ crypto isakmp enable
- „ crypto isakmp key
- „ crypto isakmp keepalive
- „ Crypto isakmp mode-detect
- „ crypto isakmp policy
- „ crypto map (global IPSec)
- „ crypto map (interface IPSec)
- „ crypto map local-address
- „ crypto software
- „ debug crypto engine
- „ debug crypto ipsec
- „ debug crypto isakmp
- „ encryption (IKE policy)
- „ group (IKE policy)
- „ hash (IKE policy)
- „ lifetime (IKE policy)
- „ match address (IPSec)
- „ mode (IPSec)
- „ self-identity
- „ set exchange-mode

„ set peer (IPSec)

„ set security-association lifetime

„ set session-key

„ set transform-set

3.1.1 authentication (IKE policy)

IKE ˘ IKE Ђ ҷ **authentication** Â Ђ ҷ **no** Â

authentication {**pre-share**|**rsa-sig**}

no authentication

¶	
pre-share	Ώ м
rsa-sig	ﻝ

RGOS 8.31 Л ﻝ ﻝ Â RGOS8.31 м Ώ м .

Ђ ҷ IKE ╗ Â

G м IKE ˜ ك è ﻝ ˘ б Cisco ﻝˇ Ώ м ‡ ╗ У э IKE ˆ Ώ м ˜ Â

w R ˘

Ђ ҷ	
crypto isakmp enable	G IKE Â

3.1.2 clear crypto isakmp

ȷ IKE ŏ ˇ G EXEC ƕ ɻ **clear crypto isakmp** Â

clear crypto isakmp [*connection-id*]

ɲ		
	connection-id	IKE ŏ ID ʎ Â
	G *connection-id* ɲ ˇ ‡ ƕ ɻ ȷ IKE ŏ	
ƕ ɻ	EXEC Â	
G	У ɋ ЮЎ ɴ ɜ ɛ ɛ IKE ŏ ˇ ɻ Ло ЎI G **show crypto isakmp sa** ƕ ɻ ŏ ID ʎ˘ ɻ ЎĄ G **clear crypto isakmp** ID ɜ ɛ ɛ IKE ŏ Â	
ш R	Â	
ЎΩƕ ɻ	ƕ ɻ	
ɻ		
ƕ ɻ ˥ ɻ	ʎ	
	-	-

3.1.3 clear crypto sa

IPSec ŏ ˇ ЛЬЮ EXEC ƕ ɻ **clear crypto sa**

Map-name	╗ ﻝ
Destination-address	ﺳ E IP ﺳ ﻓ
Spi	У э ŏ ٧

a **peer** à **map** à **spi** э IPSec ŏ " ˘ ‡ IPSec ŏ Â

Ъυ ʒ EXEC Â

G

1. Э Ъυ ʒ ɣ IPSec ŏ ˘ G **peer** à **map** à **spi** ˜Ω ˘ ‡ IPSec ŏ ĵ Â
2. ŏ IKE ˘ ѫ ъ ˘ ٧ ĵ IPSec ˘ IPSec ˜ ك ŏ Â ŏ ˘ ѫ ŏ з . Â
3. ѽ ٧ ˘ ٧ ﻝ ˜ ك ŏ ɔ ˘ a ¸ ⁝ ŏ Â й ѽ ٧ ɔ ɣ ŏ ˘ ﻝ Ъυ ʒ ŏ ˘ ˜ ك Â
4. ŏ ˘ ąè ˘ й ѽ a G ѐ ы IPSec ąè ˘ G **peer** à **map** à **spi** ŏ Â
5. ˘ ٧ У э ŏ ˘ ѐ ы ŏ ӣ ѫ ﺝ ą˘ ﻝ Л ŏ ˜ ك Â

w R

R 1' Ю R ŏ '

```
Ruijie# clear crypto sa
```

Ъυ ʒ	
	IKE

	copy	˙ ϓ DF Bit ή ɔ ϙ DF Bit ή˘ copy
	Ϸ ϟ	
Ϸ ϟ	ώ Â	
G	ϡ IPSEC Ю **clear** ˘ æ ϟ MTU ή ˆ˘ æ a MTU ί Â ə Ϸ ϟ ή ΰ ˘ **copy** ɔ ϙ ή Â	
W R	R 1' ЛЮR ϡ ϟ DF Bit **crypto ipsec df-bit clear**	

ΏϷ ϟ	**Ϸ ϟ**	
	-	-

ϟ		
Ϸ ϟ ˥ ϟ	**ϟ**	
	-	-

3.1.5 crypto ipsec security-association lifetime

g IPSec ώ ˜ ϳ G ώ Ϸ ή˘ ϟ Л G **cryptoipsec security-association lifetime** ώ Ϸ ϟ Â Ϸ ϟ **no** Ϸ ή Â

crypto ipsec security-association lifetime {**seconds** *seconds* | **kilobytes** *kilobytes*}

no crypto ipsec security-association lifetime {**seconds** | **kilobytes** }

ϟ		
	seconds *seconds*	ώ ˆ ˜ Â ή ϙ 3600 ˆ 1 ˜ Â
	kilobytes *kilobytes*	ώ ą ˆ Л˜ ˜ Â ϙ 4,608,000KB
	3600 ˆ 1 ˜ Ո 4,608,000KB˜ Л 10MB ą 1 ə ˜ Â	
Ϸ ϟ	ώ Â	

1.Sec ώ ╗ ą ▄ G ΏМ ▀ Э Âй ф ф ώ ώ ▄ У ą ʖ ʌ ˘ ˜ ˇ G ΏМ Â ▄ ώ ˜ ˇ ˘ G Е Ո ▀ Ϸ Ḣ è ɔ й ώ Ϸ Â

2. ч ' Ϸ à ą Ϸ Â ч э Ϸ è ф э ΅ǂ ˘ ώ Â ʖ ф ώ Ϸ ˘ ʖ ʖ ɔ ɣ ʌ ˜ ˇ ώ ˘ a˛ ː ώ Â ˘ ʖ Л G **clear crypto sa** Ϸ ϟ ǂ ώ ώ ϕ Â

3. ώ Ϸ ˘ G Ϸ ϟ **crypto ipsec security-association lifetime seconds** Â Ϸ ф ώ ▄ ф У ʌ Â g ώ ą Ϸ ˘ G Ϸ ϟ **crypto ipsec security-association lifetime kilobytes** Â ą Ϸ ф ώ G ώ ╗ ą ˆ Л KB ˜ ǂ ф У Л ʌ Â

G

4. Ḣ ˘ ‡ ╗ ˘ ҷ й ǂ ʖ У ╗ Â п ˘ Ϸ ˘ ɣ ώ CPU Â▄ ώ Ϸ Â

5. ɔ ɬ ' ф У ˆ **seconds** ΏΩ ˜ ą ф У ą ˆ **kilobytes** ΏΩ ˜ ˘ ч ˚ Y ف ˚ ΅ ʖ ˘ ώ ˆ Л ʖ ˜ Â ώ ▄ ɬ ώ Ϸ Ḣ ǂ Лпґ ˜ ˇ˘ Л ф ɬ ώ Ą˘ У э ώ ʖ Л G ф Â ώ ▄ **seconds** Ϸ ґґ 30 ˘ ą **kilobytes** Ϸ 256KB ˜ ˇ˘ ف э ΅ ʖ ˜ Â ▄ У э ώ э Ϸ è ą ˘ ѫ ώ Ą a˛ ώ ˜ ˇ Â ▀˘ ώ ʖ IPSec ʖ ǂ ф ǂ ˜ ˇ Â

Ϸ ϟ	
-	-

Л	
Ϸ ϟ ˥ Л	-

3.1.6 crypto ipsec transform-set

Ѭ k ώ G ʖ Л˘ G Ϸ ϟ **crypto ipsec transform-set** Â Ϸ ϟ **no** ǂ У э ʖ Л Â

crypto ipsec transform-set *transform-set-name transform1*

[transform2 [transform3]]

no crypto ipsec transform-set *transform-set-name*

٩	
transform-set-name	ل ر
transform1 ă **transform2** ă **transfrom3**	ώ G Â ώ ˜ Ո ˘ ε E ٩ ώ

ل ر ÂĝP̂ŧrT ĝLŐl ŘĸᵡĽ

dynamic-map-name	╗ ⅄
dynamic-seq-num	╗ Ⅎ

╟ ╗ ⌀ Â

ƕ ϡ ώ Â

╟ ╗ … ⌀À¥Åa T ö ˘ … ɔ-98 -4.006 98 -7.2_0w ѣNäìZ ÑÀÐ

G

Ὼ ἦ

Ϸυ ϗ	ώ Â
G	ϙ ЮЎ IKE ˘ G IKE IPSec ώ ˜ ЏЎ G Ϸυ ϗ Â a G IKE IPSec ώ ˜ ЏЎ ϟ Л G Ϸυ ϗ **no** ΎΩ IKE Â
ѡ R	R 1' Ю R G IKE' `Ruijie(config)#` **`crypto isakmp enable`**

ΎΩϷυ ϗ

Ϸυ ϗ	
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Ϸυ ϗ ϒ ϻ

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3.1.9 crypto isakmp key

Â

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ᴿ 1' Ю ᴿ б ᴇ 172.16.1.1 IKE ˜ ك Ώ ϻ ϔ Mysecreť

```
Ruijie(config)# crypto isakmp key 0 mysecret address 172.16.1.1
Ruijie(config)# crypto isakmp key 0 mysecret address 172.16.1.0
255.255.255.0
```

Ώƕ ϩ

ƕ ϩ	
crypto isakmp enable	ᴳ IKE Â
encryption {**des | 3des | aes-128 | aes-192 | aes-256 | sm1**}	╗
hash {**sha | md5**}	HASH
authentication {**pre-share | rsa-sig**}	
group {**1 | 2**}	Diffie-Hellman
lifetime	IKE ώ ƕ Â

ϡ

ƕ ϩ ϒ ϡ

ϡ	
-	-

3.1.10 crypto isakmp keepalive

ϔ ϖ ϟ ᴇ ᴇ˘ ج ώ **crypto isakmp keepalive** ƕ ϩ Â **keepalive** ϡ 8.2 ƕ ϩ ϡ ˜

crypto isakmp keepalive *secs*

crypto isakmp keepalive *secs* **on-demand**

crypto isakmp keepalive *secs* **periodic**

crypto isakmp keepalive *secs retries*

crypto isakmp keepalive *secs retries* **on-demand**

crypto isakmp keepalive *secs retries* **periodic**

no crypto isakmp keepalive

ϡ

ϡ	
secs	˘ تن 10 ί 3600
retries	ϟ ˘ تن 2 ί 60

à

a ٤ ٤

ħυ ȝ ŏ

G G **crypto isakmp keepalive** G ٤ ٤ ٤˘ ٤
Ĭ ٤ Â

w R R 1' ŷ 60 ˘ ٤ ŷ 5 ˘ **on-demand** '

```
crypto isakmp keepalive 60 5
crypto isakmp keepalive 60 5 on-demand
```

ˇΩħυ ȝ

ħυ ȝ	
-	-

٨

ħυ ȝ ٦ ٨

٨	
-	-

3.1.11 crypto isakmp nat keepalive

RFC3947˝ IPSEC NAT-ť G ╗ UDP ˘ ā nat Â ŷ ¢ ó nat ˘ Л G keepalive ٤ Â

crypto isakmp nat keepalive *secs*

no crypto isakmp nat keepalive

٩

٩	
secs	˘ ت 5 ĵ 3600

à

5ĵ

ħυ ȝ ŏ

G crypto isakmp nat keepalive ħυ ȝ keepalive ٤ ˘ a
ą ЮO G 5ĵ

w R R 1' keepalive ٤ 1ĵ

```
crypto isakmp nat keepalive 60
```

ˇΩħυ ȝ

ħυ ȝ	

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ϗ		
Ϸ ϗ ϒ ϗ	ϗ	
	-	-

3.1.12 crypto isakmp mode-detect

ϔ ѕѕ ώ ΐΩ ў ϟ IKE ˜ ك ˇ ╟ ˜ ك Â

crypto isakmp mode-detect

no crypto isakmp mode-detect

ϟ	ϟ	
	-	-
	ϙ Ю˘ ϟ ў ˜ ك	
Ϸ ϗ	ώ Â	
G	ϻ ϡ ώ ϧ ϱ ˜ ك ˇ ѧ ϑ ك ϩ Э a У ˇ Л IKE ˜ ك è У ɔ ϟ ч ˇ Лυ ϧ ϖ ϥ ò ˇ ЛυЭ Ϸ ϗ ϟ IKE ˜ ك ϙ˘ ╟ ˜ ك Â	
ѡ R	R 1' Ю R ϟ ˜ ك ╟ ⁞ ' Ruijie(config)#**crypto isakmp mode-detect**	
ΐΩ Ϸ ϗ	Ϸ ϗ	
	-	-
ϗ		
Ϸ ϗ ϒ ϗ	ϗ	
	-	-

3.1.13 crypto isakmp policy

Ⱨ IKE ϑ ˝I ˇ ώ Ϸ ϗ **crypto isakmp policy**

ώ IKE Â ƕ ʒ **no** ǂ ɔ ˝I Â

crypto isakmp policy *priority*

no crypto isakmp policy *priority*

٧	
priority	IKE . ˝I Â G 1ǂ 10000 ˘ 1 . ˝I 10000 æ. ˝I Â

. ˝I Â

ƕ ʒ ώ Â

G ƕ ʒ ج IKE ˜ ك IKE ώ ٧ Â ƕ ʒ ώ IKE Â ج IKE è˘ ٦ Л∪ Л∪Ю ٧ '

encryption(IKE policy) ' ḣ =56 DES-CBC

hash(IKE policy) ' ḣ =SHA-1

authentication(IKE policy) ' ḣ =RSA ٦

group(IKE policy) ' ḣ =768

Diffie-Hellmanl lifetime(IKE policy) ' ḣ =86400 ˆ 1 ˜

ɔ ٧ ḣ ˘ ‡ G ٧ ḣ Â ج Э ٦ Л∪ ɔ IKE Â ج IKE ˜ ك ˘ ڤي ǂ ج ч Ώ˝Ώ ˘ ÿ ɛ Э . ˝I Â

R 1' Ю R У ɔ ˝I й 100 IKE '

```
Ruijie(config)# crypto isakmp policy 100
Ruijie(config-isakmp)# authentication pre-share
Ruijie(config-isakmp)# encryption des
Ruijie(config-isakmp)# group 2
Ruijie(config-isakmp)# hash sha
Ruijie(config-isakmp)# ^Z
Ruijie# show crypto isakmp policy
Protection suite of priority 100
encryption algorithm:   DES - Data Encryptin Standard (56 bit keys).
hash algorithm:         Secure Hash Standard
authentication method:  Pre-Shared Key
Diffie-Hellman group:   #2 (1024 bit)
lifetime:               3600 seconds
Default protection suite
encryption algorithm:   DES - Data Encryption Standard (56 bit keys).
hash algorithm:         Secure Hash Standard
authentication method:  Rsa-Sig
Diffie-Hellman group:   #1 (768 bit)
lifetime:               3600 seconds
```

w R

Ƕ ϡ	
crypto isakmp enable	ᴳ IKE Â
encryption {**des | 3des | aes-128 | aes-192 | aes-256 | sm1**}	╗
hash {**sha** | **md5**}	HASH
authentication {**pre-share** | **rsa-sig**}	
group {**1** | **2**}	Diffie-Hellman
lifetime	IKE ŏ Ƕ Â

ϡ

Ƕ ϡ ˥ ϡ	
-	-

3.1.14 crypto map (global IPSec)

… ᵍ У э ╗ ˘ ŏ Ƕ ϡ **crypto map** Â Ƕ ϡ **no** ϡ У э ╗ Â

crypto map *map-name seq-num ipsec-manual*

crypto map *map-name seq-num ipsec-isakmp* [**dynamic**

dynamic-map-name]

no crypto map *map-name* [*seq-num*]

ϡ	
map-name	╗ ϡ ϳ
seq-num	╗ ″ ϡ
ipsec-manual	¥ IPSec ŏ Â
ipsec-isakmp	¥ IKE ˜ ك IPSec ŏ Â
dynamic-map-name	ɔ ὴ ╟ ╗ ϳ

a ᵆ ╗

Ƕ ϡ ŏ ˘ ᴳ Ƕ ϡ ώ ╗ Â

I P S e c IPSec

	Ƕ ɀ	

	show crypto map	╕ ϑ

ϟ

ϒ ϗ ϖ ϟ	ϟ	
	-	-

3.1.16 crypto map local-address

IPSec ϡ ϡϡϡϡϡ ϋ ϒ ϗ **crypto map local-address** Â
ϒ ϗ **no** ϟ IPSec ϡϡϡϡϡ Â

crypto map *map-name* **local-address** *interface-type interface-number*

no crypto map *map-name* **local-address**

	ϟ	
map-name	map-name	IPSec ╕ QŽÆ map-nam tSÂ3

hash {**sha**	**md5**}	HASH
authentication {**pre-share**	**rsa-sig**}	
group {**1**	**2**}	Diffie-Hellman
lifetime	IKE ώ Ƕ Â

ϡ

Ƕ ϡ ϡ	ϡ	
	-	-

3.1.17 crypto software

ϕ ˚ ╕ ´ ˘ Ÿ G ˚ ╕ ˘ G Ƕ ϡ **crypto software**

ϡ		
	-	-

ώ ϕ ˚ ╕ ⁄ ˘ ╟ G ˚ ╕

Ƕ ϡ ώ Â

G ╕ ´ ˘ Ƕ ϡ ╟ G ˚ ╕ ' ╕ ´ ˘ Ɜ Ɜ ϡ ‡ ϡ ‡ G ˚ ╕ Â

ϣ R Â

no debug crypto engine

٩	
connection-id	IKE ώ ID ٨ Â

Â

ƅυ ʒ Â

G Â

w R Â

ƅυ ʒ	

ƅ

ƅυ ʒ ٦ ƅ	٨	
	-	-

3.1.19 debug crypto ipsec

˜Ω ɣ IPSec ˜Ω **debug** Â

debug crypto ipsec

no debug crypto ipsec

٩	
-	=

Â

ƅυ ʒ Â

G Â

w R Â

˜ΩƅυʒΩ	ƅυ ʒ	

ϟ

ђυ ϗ ϒ ϟ	ϟ	
	-	-

3.1.20 debug crypto isakmp

˜Ω ϔ IKE Y ˙ **debug** Â

debug crypto isakmp

no debug crypto isakmp

ϟ	ϟ	
	-	-

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ђυ ϗ	
G	Â
w R	Â

˜Ωђυ ϗ	ђυ ϗ	

ϟ

ђυ ϗ ϒ ϟ	ϟ	
	-	-

3.1.21 encryption (IKE policy)

IKE ╗ ˘ IKE ђυ ϗ **encryption** Â ђυ ϗ no ḣ Â

encryption {**des**|**3des**|**aes-128**|**aes-192**|**aes-256**|**sm1**}

no encryption

ɳ

ɳ	
des	56 DES-CBC ɔ ƞ ╗ Â
3des	168 3DES-CBC ɔ ƞ ╗ Â
aes-128	ƞ 128 AES ɔ ƞ ╗ Â
aes-192	ƞ 192 AES ɔ ƞ ╗ Â
aes-256	ƞ 256 AES ɔ ƞ ╗ Â
sm1	ƞ 128 SM1 ɔ ƞ ╗ Â

ˆ **AES- Advanced Encryption Standard˜** Â

56 DES-CBC ╗ Â

ƫ ɣ IKE Â

G ƫ ɣ ╗ ¥ IKE ώ ╗ ˘ a ɻ ¥ IPSec ώ ╗ Â

w R R 1' ƗO R IKE ╗ ƞ DES'

```
Ruijie(config)# crypto isakmp policy 10
Ruijie(config-isakmp)# encryption des
```

ƫ ɣ	
crypto isakmp enable	G IKE Â
hash {**sha**	**md5**}	HASH
authentication {**pre-share**	**rsa-sig**}	
group {**1**	**2**}	Diffie-Hellman
lifetime	IKE ώ ƫ Â

ɻ

ɻ	
-	-

3.1.22 group (IKE policy)

IKE è Diffie-Hellman ˘ G IKE ƫ ɣ **group** Â
ƫ ɣ **no** Diffie-Hellman ƞ ƙ Â

group {**1|2**}

no group

ϟ	
1	768 Diffie-Hellman Â
2	1024 Diffie-Hellman Â

768 Diffie-Hellman ˆ group 1˜

ђυ ϗ IKE Â

G G ђυ ϗ IKE è G Diffie-Hellman Â

ψ R R 1' Ю R IKE Diffie-Hellman ϧ 1024 '

```
Ruijie(config)# crypto isakmp policy 10
Ruijie(config-isakmp)# group 2
```

ђυ ϗ	
crypto isakmp enable	G IKE Â
encryption {**des | 3des | aes-128 | aes-192 | aes-256 | sm1**}	╗
hash {**sha | md5**}	HASH
authentication {**pre-share | rsa-sig**}	
lifetime	IKE ώ ђυ Â

˝Ωђυ ϗ

ϻ

ђυ ϗ ϒ ϻ

ϻ	
-	-

3.1.23 hash (IKE policy)

IKE è HASH ˇ G IKE ђυ ϗ **hash** Â ђυ ϗ **no** hash ϧ ϱ Â

hash {**sha | md5**}

no hash

ϟ	
sha	SHA-1(HMAC ϒ ε) ɔ ϧ HASH Â

Ὼ ἦ

Ƕ ɻ IKE Â

G G Ƕ ɻ IKE ŏ Ƕ Â IKE ˜ ك ˘ ṁ У˚ Y
ṅ ὲ ج ŏ ɭ Э У Â ҷ У ɭ ج ə Ɛ Э IKE ŏ
˘ ج ə Ɛ Э ɖ ǂ IKE ŏ Ƕ Â
SA ج ṁ SA ڑ ṁ ˜ ك Â
ɣ IPSec ŏ ˜ ك ج IKE ŏ ش Э ˘ ڃ ˘ ˜ ك IPSec
ŏ ˘ IKE ŏ Ƕ Â ˘ ɻ Ո Ƕ
˘ . Ƕ ˘ ɻ ˘ Ƕ ˘ ɻ
˘ ڃ У ə ʎ Ƕ ˆ ` ˜ Â

ɯ R R 1' Ю R IKE ŏ Ƕ ṅ 1000 '

```
Ruijie(config)# crypto isakmp policy 10
Ruijie(config-isakmp)# lifetime 1000
```

ʕΩƶ ɻ

Ƕ ɻ	
crypto isakmp enable	G IKE Â
encryption {**des | 3des | aes-128 | aes-192 | aes-256 | sm1**}	╗
hash {**sha | md5**}	HASH
authentication {**pre-share | rsa-sig**}	
group {**1 | 2**}	Diffie-Hellman

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Ƕ ɻ ˥ ʃ

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-	-

3.1.25 match address (IPSec)

╗ " ˘ ╗ Ƕ ɻ **match address** Â Ƕ ɻ **no** ǂ ╗ è " Â

match address *access-list-number*

no match address

ɭ

ɭ	
access-list-number	" ʃˆ 100-199˜ ˘ ╗ ɻ G IP " Â

╗ " Â

Ὼ ἦ ὦ ϧυ ϛ ϟ

E˘ 3 ϖ· ˘ ϡ ϩ ˜ ك ˘ · ˘ Π ϟ ϟ·
ϟ ϟ ϟ Â ϖ ˘ ϡ ˘ 3 ϟ
ϟ Â

R 1' Ю R ϟ ϗ й '

w R

```
Ruijie(config)# crypto ipsec transform-set  myset
Ruijie(cfg-crypto-trans)# mode tunnel
```

ΏϷ ϗ

Ϸ ϗ	
crypto ipsec transform-set	Ыϡ╗ ϟ ϗ

ϗ

Ϸ ϗ ϒ ϟ

ϗ	
-	-

3.1.27 self-identity

¥ ϩϩ ` '

self-identity {**address** | **fqdn** *fqdn* | **user-fqdn** *user-fqdn*}

no self-identity

ϟ

ϟ	
address	ϩϩ IP ϩϩ ϕϩ
fqdn	ϩϩ ϩϩ ϟ
user-fqdn	ϩϩ Ω ϩϩ ϟ

address ' ϩϩ IP ϩϩ ϕϩ

Ϸ ϗ

ώ Â

G

ў ¥ ϟ ˜ ك è ` ˘ ϟ Λ ϩϩ ϟ ϩϩ ` ˘ ≠ ϟ
Λ ϩϩ ϕϩ ϩϩ ` Â

R 1' ΛЮ R ` '

w R

```
Ruijie(config)# self-identity fqdn www.vpdn.com
Ruijie(config)# self-identity user-fqdn
zj@www.vpdn.com
Ruijie(config)# self-identity address
```

ΏϷ ϗ

Ϸ ϗ	

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∀

	∀	
Ђ ҷ ˥ ∀	-	-
	-	-

3.1.28 set exchange-mode

ɣ е IKE ˜ ك è У ɔ Â

set exchange-mode {**main | aggressive**}

no set exchange-mode {**main | aggressive**}

	∀	
∀	**main**	ў
	aggressive	

ў

╕

IKE ˜ ك è ǂ й ч э '
У э Í Í ж ч э ISAKMP е Ƶ ѿ à ę˘ ў Ո Â
ɣ э Í Í ў ˜ ك ҷ Ь ѿ ˆ SA˜
ж У э è ч ɔ ˘ ∤ ˘ ж ϙ Ю˘
ъ ў ˘ Л ж IP فخسه a ش ϙ Ю˘ ∤ Л ᴳ Â

ᴿ 1' ЛЬЮ ᴿ ɣ ɔ ( )'
Ruijie(config)# **crypto map mymap** *10* **ipsec-isakmp**
Ruijie(config-crypto-map)# **set exchange-mode aggressive**

	Ђ ҷ	
˝ΩЂ ҷ	**crypto map(interface IPSec)**	╕ ɣ ∀
	match address	й ╕ " У э " Â
	Set peer	е
	Set transform-set	∤ ∧

show crypto map

seconds *seconds*	ŏ ˆ ˜ Â
kilobytes *kilobytes*	ŏ ą ˆ Ѭ ˜ Â

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ج ą Ю˘ IPSec ŏ ŏ Ƕ ḣ ˜ ك˘
ə ففسسم a ل ɣ ŏ Ƕ ḣ Ƕ ˜ ك˘ ل Ѭ ج б ففسسم
˜ ك ╗ è G Ƕ ϟ g Ƕ ḣ Â

a	Ƕ ϟ g Ƕ ḣ ل ل ə έ ɛ IPSec ŏ ˜ ك Ƕ ḣ˘ a ː ŏ Ƕ ḣ Â

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R 1' Ю R g ╗ Mymap 5 Ƕ й 2500 '

```
Ruijie(config)# crypto map mymap 5 ipsec-isakmp
Ruijie(config-crypto-map)# set security-association lifetime
seconds 2500
```

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crypto map(global IPSec)	₦╗
show crypto map	╗ ą
crypto map(interface IPSec)	ج ل Э˜Ώ ╗
crypto ipsec security-association lifetime	ŏ Ƕ

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no set session-key { inbound | outbound} esp

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spi	ώ ۷

dynamic-map Â

show crypto dynamic-map [*map-name*]

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map-name	╗ ɻ Â

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```
R 1' Ruijie# show crypto dynamic-map
      Crypto Map Template "mydmap" 1
No matching address list set.
Security association lifetime: 4608000 kilobytes/3600
seconds(id=34)
PFS (Y/N): N
Transform sets = { }
```

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3.2.2 show crypto ipsec sa

ɱ ╟ IPSec ώ έ ɛ ə ˘ EXEC Ϸ ϟ **show crypto ipsec sa** Â

show crypto ipsec sa

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```
R 1' Ю R ħυ ҳ У э '
Ruijie# show crypto ipsec sa
Interface: Serial0
Crypto map tag:mymap, local addr 2.2.2.2
// ɱń ╗ ɻ mymaр˘ G ѫѫѩѧ 2.2.2.2
media mtu 1500
local ident (addr/mask/prot/port):
(192.168.202.0/0.0.0.255/0/0))
remote ident (addr/mask/prot/port):
(192.168.12.0/0.0.0.255/0/0))
PERMIT
// ɖ 192.168.202.0/24 Ո 192.168.12.0/24 ʖ ą
current_peer: 2.2.2.1
( Е ѫѩѧ й 2.2.2.1)
#pkts encaps: 3, #pkts encrypt: 3, #pkts digest 3
#pkts decaps: 3, #pkts decrypt: 3, #pkts verify 3
#send errors 0, #recv errors 0
// ˘ ŋ й' ↑ ˘ ╗ ↑ ˘ ↑ ˘ ↑ ˘ ╗ ↑ ˘ ↑ ˘
ↄ ˘
inbound esp sas:
// ώ ↑ ώ ˘ ˜ й ESP
spi:0x43D3C7 (4445127)
//spi ĥ й 4445127
transform: esp-des esp-md5-hmac
//ↄ ɻ й esp-des-md5
in use settings={Tunnel,}
//
sa timing: remaining key lifetime (k/sec): (4607999/3578)
// ώ ħυ ƒ ' 4607999 /3578
IV size: 8 bytes
//IV ɻ й 8
Replay detection support:Y
//
outbound esp sas:
// ↑ ώ ˘ ˜ й ESP
spi:0x106A0DFA (275385850)
//spi ĥ й 275385850
transform: esp-des esp-md5-hmac
//ↄ ɻ й esp-des-md5
in use settings={Tunnel,}
//
sa timing: remaining key lifetime (k/sec): (4607999/3577)
```

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3.2.4 show crypto isakmp policy

IKE ə ˘ EXEC ƕ Ҙ **show crypto isakmp policy**Â

show crypto isakmp policy

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```
Ruijie# show crypto isakmp p
Protection suite of priority 9
encryption algorithm:   3DES - Data Encryption Standard (56 bit keys).
hash algorithm:        Message Digest 5
authentication method:  Pre-Shared Key
Diffie-Hellman group:   #2 (1024 bit)
lifetime:             1000 seconds
Protection suite of priority 10
encryption algorithm:   DES - Data Encryption Standard (56 bit keys).
hash algorithm:        Message Digest 5
authentication method:  Pre-Shared Key
Diffie-Hellman group:   #2 (1024 bit)
lifetime:             1000 seconds
Default protection suite
encryption algorithm:   DES - Data Encryption Standard (56 bit keys).
hash algorithm:        Secure Hash Standard
authentication method:  Rsa-Sig
Diffie-Hellman group:   #1 (768 bit)
lifetime:             86400seconds
```

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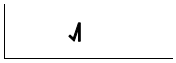

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map-name	╗ ɻ Â

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ƕ ɀ EXEC Â

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```
Ruijie# show crypto map mymap
Crypto Map:"mymap" 1 ipsec-isakmp
Peer = 0.0.0.0
No matching address list set.
Security association lifetime: 2304000 kilobytes/2500
seconds(id=32)
PFS (Y/N): N
Transform sets = {  }
Crypto Map:"mymap" 4 ipsec-isakmp
Peer = 2.2.2.2
Extended IP access list 101
Security association lifetime: 2304000 kilobytes/2500
seconds(id=35)
PFS (Y/N): N
Transform sets = { myset,  }
Crypto Map:"mymap" 5 ipsec-isakmp
Peer = 2.2.2.2
No matching address list set.
Security association lifetime: 2304000 kilobytes/2500
seconds(id=36)
PFS (Y/N): N
Transform sets = { myset,  }
```

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ني VPDN ϧ ϩ

4.1 VPDN G5ϩ

VPDN ώ ϧ ϩ '

- z **vpdn enable**
- **z vpdn domain-delimiter**
- **z vpdn authorize**
- **z vpdn ignore_source**
- **z vpdn session-limit**
- **z vpdn source-ip**

4.1.1 vpdn authorize

ϧ ϩ ϑ VPDN ˘ è **no** ϟ VPDN Â

vpdn authorize domain [split]

no vpdn authorize domain

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	domain	ϩ ΩϿ
	split	ϩ Ω ΩϿ

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G	ϟ vpdn enable ΛϪ ϧ ϩ ϟ ΛϪ ϩ ж ϩ ϩ ϧ ϩ Ω ˘ ϩ ϧ ϩ ϟ Ω ˘ ϟ Ю ϧ · ϡ

w R	R 1' ϑ VPDN ϩ ϧ ╗
	`Ruijie(config)# vpdn authorize domain split`
	`Ruijie(config)#`

ΩϦϧ ϩ	ϧ ϩ	
	vpdn domain-delimiter	ϩ ϧ
	domain	ϩ ϧ

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	vpdn authorize	ѫ ɻ Ω
	domain	ѫ ɻ

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4.1.3 vpdn enable

ƕ ὖ VPDN ╖ ˘ è **no** VPDN ╖ Â

vpdn enable

no vpdn enable

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ϙ ƗŐ˘ VPDN ╖ Â

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ϖ ϟ (Client-Initiated Tunnel) L2TP a ὖ VPDN ╖ ˘ RGOS ᵏ LAC LNS ╖ ˘ G PPTP G L2TP ˜ ϰ ὖ VPDN ╖ Â ƕ ϡ ˩ . ѭ ѕ ѫ ˜Ω ў ╠ ⁸ Â

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ὖ VPDN ╖

```
Ruijie(config)#vpdn enable
Ruijie(config)#
```

4.1.4 vpdn ignore_source

ƕ ὖ VPDN ѕ ╖ ˘ ὖ ƕ ɻ ϟ a ѕ ѣ ϗ ϙ˘ è **no** ш ѕ ѣ Â

vpdn ignore_source

no vpdn ignore_source

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G	ƫ ɤ ŭ VPDN ɯ ˘ ŭ ƫ ɤ ɻ ɻ a ɯ ɲ ɋ Â Θ Â
w R	R 1' ŭ VPDN ɯ ɲ ˘ Ruijie(config)# **vpdn ignore_source** Ruijie(config)#
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ɻ	Â
ƫ ɤ ɼ ɻ	ɻ | **-** | -

4.1.5 vpdn session-limit

ƫ ɤ ɱɲ k VPDN ˘ ĭ ˘ è **no** Â

vpdn session-limit *sessions*

no vpdn session-limit

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sessions k VPDN ˘ ĭ

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ɋ ƬƟ ɧ ɲ k ˘ è è 36 " ɲ 300 Â

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ɱɲ ɻ ɲ 100

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

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PPTP б L2TP)’ Θ Θ ~ ˘ ʁ 8 ~
’ ɷ ў ɻ ˘ ʁ 8 ~ ˜Ω è
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ج 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
```

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ϻ Э VPDN ą

```
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#
```

ϻ Э VPDN ą

```
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     192.168.12.213   1701   1
1
 %No active PPTP tunnels
 Ruijie#
```

ϻ Э VPDN˳ ą

```
Ruijie#show vpdn session
L2TP Session Information Total sessions 1
LocID      RemID      TunID      Username, Intf/      State  Last
Chg
                                 Vcid, Circuit
1           1           4           ms,Vi1                 est
00:37:03
%No active PPTP tunnels
Ruijie#
```

4.2.3 debug vpdn

ƕ ϡ ΪΩ vpdn ą Â

debug vpdn [error | event | l2x-data | l2x-errors | l2x-events | l2x-packets | packet]

no debug vpdn [error | event | l2x-data | l2x-errors | l2x-events | l2x-packets | packet]

ð ϡ Ô

```
                Framing Type 0x1
                Bearer Type 0x1
                Maximum Channels 0x0
                Firmware Revision 0x893
                Host Name:
                Vendor 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 è . й ᴿˇ **debug vpdn error** ą Ю

```
VPDN: PPTP session Virtual-Access1 wait pak ack timeout(wait
seq=37, ack=36), decrease send window to half of current = 33!
```

```
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 ↓ ώ (↑ б˳) è **debug vpdn l2x-data** R'

```
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** R'

```
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 ↓ ώ (↑ б˳) è **debug vpdn**

l2x-events R'

```
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-for-service-sel
ection-iccn
Vi1 Tnl/Sn 20/1 L2TP: Session state change from wait-for-service-selection- iccn to established
%UPDOWN: Interface Virtual-Access1, changed state to up
%UPDOWN: Line protocol on Interface Virtual-Access1, changed state to up
```

! LNS ϻ ώ (↑ б) è **debug vpdn l2x-packets** R'

```
L2TP: I SCCRQ from C3640 tnl 18889
L2X: Parse  AVP 0, len 8, flag 0x8000 (M)
L2X: Parse SCCRQ
L2X: Parse  AVP 2, len 8, flag 0x8000 (M)
L2X: Protocol Ver 1
L2X: Parse  AVP 6, len 8, flag 0x0
L2X: Firmware Ver 0x1130
L2X: Parse  AVP 7, len 11, flag 0x8000 (M)
L2X: Hostname C3640
L2X: Parse  AVP 8, len 25, flag 0x0
L2X: Vendor Name Cisco Systems, Inc.
L2X: Parse  AVP 10, len 8, flag 0x8000 (M)
L2X: Rx Window Size 800
L2X: Parse  AVP 11, len 22, flag 0x8000 (M)
L2X: Chlng
```

```
L2X: No missing AVPs in SCCRQ
L2X: I SCCRQ, flg TLS, ver 2, len 130, tnl 0, ns 0, nr 0 contiguous
pak, size 130
        C8 02 00 82 00 00 00 00 00 00 00 80 08 00 00
        00 00 00 01 80 08 00 00 00 02 01 00 00 08 00 00
        00 06 11 30 80 0B 00 00 00 07 43 33 36 34 30 00
        19 00 00 00 08 43 69 73 63 6F 20 53 79 73 74 65
        6D 73 2C 20 49 6E 63 2E ...
Tnl 22 L2TP: O SCCRP  to C3640 tnlid 18889
Tnl 22 L2TP: O SCCRP, flg TLS, ver 2, len 140, tnl 18889, ns
0, nr 1
        C8 02 00 8C 49 C9 00 00 00 00 00 01 80 08 00 00
        00 00 00 02 80 08 00 00 00 02 01 00 80 0A 00 00
        00 03 00 00 00 01 80 0A 00 00 00 04 00 00 00 00
        00 08 00 00 00 06 11 30 80 0A 00 00 00 07 52 36
        32 31 00 0E 00 00 00 08 ...
Tnl 22 L2TP: O ZLB ctrl ack, flg TLS, ver 2, len 12, tnl 18889,
ns 1, nr 1
```

```
        C8 02 00 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
```

∤

ƕ ɂ ˥ ∤

∤	
10.3ˆ 5˜	У э ƕ ɂ

5.2 domain

ƕ ɂ group ᵴᵴ ᾳ

domain *domain-name* [**vrf** *vrf-name*]

no domain *domain-name*

∤

∤	
domain-name	ᵴᵴ ɻ
vrf	صر vrf

5.3 accept-dialin

ƕ ϡ ɔ ὶ ϟ ώ˘ è **no** Â

accept-dialin

no accept-dialin

ð Ô

ɑ Ю˘ ɔ Â

ð ƕ ϡ Ô

VPDN-Group ϰ

ð ᴳ ´ Ô

ɑ Ю˘ ὶ VPDN-Group ˙ ¡ ɔ Â ˝I

ɔ У ɔ ˜ б ϰ Â ƕ ϡ ϟ˛

. ᴈ ѕѕ ᴈ ˜Ω ў ╟ ⁸ Â

ð ᴡ ᴿ Ô

ɔ ὶ ϟ ώ

```
Ruijie(config-vpdn)#accept-dialin
Ruijie(config-vpdn)#
```

5.4 force-local-chap

ƕ ϡ ɣ ⁸ PPP ˘ ᴈ Client ϟ LAC ϗ ˘ LAC˛ ϡ LNS Client ˘ ƕ ᴈ L2TP ϗ Client Â ƕ ϡ ϟ ᴈ LNS Э Â

force-local-chap

no force-local-chap

ϰ	
-	-

	ɑ Ю˘ LNS a Ą Clinet Â
ƕ ϡ	VPDN-Group ϰ
ᴳ	ᴈ Client ϟ LAC ϗ ˘ LAC˛ ϡ LNS Client ˘ ƕ ᴈ L2TP ϗ Client Â ƕ ϡ ϟ ᴈ LNS Э Â
ᴡ ᴿ	ᴿ 1' PPP LCP Â Ruijie(config-vpdn)# **force-local-chap** Ruijie(config-vpdn)#

ˁΩƕ ɜ	ƕ ɜ	
	-	-

```
Ruijie(config-vpdn)#
```

5.6 ip tos

ђ ϡ IP TOS(Type of Service) ѐ **no** Â

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

no ip tos

ð ϟ Ô

tos-value TOS ѐ ђ ϟ ђ ن ѝ 0~15

max-reliability TOS ѐ ђ ѝ 2

max-throughput TOS ѐ ђ ѝ 4

min-delay TOS ѐ ђ ѝ 8

min-monetary-cost TOS ѐ ђ ѝ 1

normal TOS ѐ ђ ѝ 0

reflect G IP ↑ TOS ɔ ѝ IP TOS ѐ

ð Ô

ą Ю IP TOS ѐ ѝ Â

ð ђ ϡ Ô

VPDN-Group ϟ

ð G ´ Ô

TOS ϟ Л υ G ђ ϡ Â ђ ϡ ˛ . ˸

· ˘ л a ˛ ΐΩ ў ╠ 8 Â

ð ѡ R Ô

TOS ѝ **min-delay** Â

```
Ruijie(config-vpdn)#ip tos min-delay
Ruijie(config-vpdn)#
```

5.7 lcp renegotiation always

ђ ϡ ɣ ϟ a л RFC L2TP 8 ˘ G ˜ ك ϟ Л υ Â

lcp renegotiation always

no lcp renegotiation always

	ϙ ЮЎ L2TP ϐ ш ϕ Â
ƕ ϗ	VPDN-Group ϔ
G	¥ ϔ a ϕ RFC L2TP ϐ ˘ G ˜ ϫ ϔ Л
w R	R 1' PPP LCP Â Ruijie(config-vpdn)# **lcp renegotiation always** Ruijie(config-vpdn)#

ЎΩƕ ϗ		
	ƕ ϗ	
	-	-

ϕ	
ƕ ϗ ϒ ϕ	
	ϕ	
	-	-

5.8 local name

ƕ ϗ ѕѕ ў ϕ ˘ è **no** Â

local name *local-hostname-string*

no local name

ð ϔ Ô

local-hostname-string ѕѕ ў ϕ

ð Ô

ϙ ЮЎ G Ы ϕ ɔ и ѕѕ ў ϕ s Â

ð ƕ ϗ Ô

VPDN-Group ϔ

ð G ´ Ô

ϔ Л ѥ Ы Э ѕѕ ў ϕ Л ғ Â ƕ ϗ

ϔ¸ . ѥ ѕѕ ЎΩ ў ╠ ϐ Â

ð w R Ô

ѕѕ ў ϕ и ”LNS”

```
Ruijie(config-vpdn)#local name LNS
Ruijie(config-vpdn)#
```

5.9 protocol

ƀ ҳ G ~ Â ƀ ҳ **no** Â

protocol {any | l2tp | pptp}

no protocol

ð ч Ô

any ҵ ҷ ~

l2tp ҵ ~ L2TP

pptp ҵ ~ PPTP

ð Ô

ϙ ЮЎ й ~ Â

ð ƀ ҳ Ô

VPDN-Group ɔ ч

ð G ´ Ô

G ~ ˘ ! ~

ҷ

ώ VPDN G ( ) VPDN-Group G
( ) б Ж У Â hu ч ч. Ω
ў ╠ 8 Â

ð w R Ô

VPDN-Group G 202.101.92.73

```
Ruijie(config-vpdn)#source-ip 202.101.92.73
Ruijie(config-vpdn)#
```

5.11 terminate-from

hu ч ў ы ˘ è **no** Â

terminate-from hostname *remote-hostname-string*

no terminate-from

ð ч Ô

remote-hostname-string ў ы

ð Ô

ąЮ˘ ў ы Â

ð hu ч Ô

VPDN-Group ч

ð G ´ Ô

ч Л∪ G hu ч 8 ώ ў ы ˘ ў ы ˘
VPDN-Group a 8 ώ ў ы Â ¦ ў ы
VPDN-Group 8 ў ╠ Â

ð w R Ô

ў ы "LAC"

```
Ruijie(config-vpdn)#terminate-from hostname LAC
Ruijie(config-vpdn)#
```

5.12 virtual-template

hu ч VPDN-Group ч˘ è **no** Â

virtual-template *number*

no virtual-template

ð ч Ô

number ч Л

ð Ô

ąЮ˘ ¦ чЇ VPDN-Group Э Â

ð ƕ ϡ Ô

VPDN-Group]Tp00 1 Tf 0 Tc 6.137 0 Td <1 5 MA41FF5156F( )51740 /TF34]TJ16E3C2E1979

Ώ PPTP Ƕ ȝ

PPTP Ƕ ȝ '

- z **Pptp flow-control receive-window**
- z **Pptp flow-control static-rtt**
- z **Pptp tunnel echo**

6.1 pptp flow-control receive-window

Ƕ ȝ ƙ pptp ̧ ѫ ǂ ack ʖ ɱ ĭ ϒ ˘ ѝ ϒ˘ è **no** Â

Pptp flow-control receive-window *timeout-interval*

No pptp flow-control receive-window

ð ϒ Ô

packets pptp ̧ ѫ ǂ ack ʖ ɱ ĭ ϒ Â ϒ ḣ ىن 1---64 Â

ð Ô

PNS ḣ ѝ 64˝ PAC ḣ ѝ 16 Â

ð Ƕ ȝ Ô

vpdn-group

ð ᴳ ´ Ô

PPTP ˜ ж Ƕ ȝ˘ Ո ″l protocol pptp protocol any Ƕ ȝ ˄˘ ĭ Ո- Ƕ ȝ Â

PPTP ˜ RFC2637 ˘ ̧ ϒ ˜ ك è ǂ ϒ У ` ɔ ѝ ˥ ϒ ϒ Â ϒ ϒ ˘ ɱ ̧ ˄ ϒ ϒ ϒ ˝ ` ǂ ѝ 1˘ ѫ ǂ ϒ ACK ˄ ϒ Â ˄ ϒ ɱ ϒ ə ə ACK ɑ ˘ ‡ ϒ ϒ ╗ 1˘ ǂ ¥ ϒ ḣ Â ACK ˘ RFC2637 ˘ ᴳ ж Â

ð ᴡ ᴿ Ô

pptp ̧ ѫ ϒ ´ ə ˄ ACK ϒ ѝ 200 '

```
Ruijie(config-vpdn)#accept-dialin
Ruijie(config-vpdn-acc-in)#protocol pptp
Ruijie(config-vpdn-acc-in)#exit
Ruijie(config-vpdn)#pptp flow-control receive-window 32
Ruijie(config-vpdn)#
```

ð ђ ғ Ô

vpdn-group

ð ᴳ ´ Ô

PPTP ˜ ж ђ ғ˘ Л PI protocol pptp protocol any ђ ғ Л˘ ї Ґ ђ ғ Â *echo-packet-interval* и 0 ˘ a ў ╠ ч echo Â

echo-packet-interval a и 0 ˘ PPTP ѫ *echo-packet-interval* ΐ ˙ ¦ Л ˜ ˘ ‡ ў ╠ ч У э echo request Л ˘ echo reply Â] и 1 ˘ У ˘ ‡ . ч γ э echo requesť ѫ ґ́ У ѭ Э У˝ ˘ Â 5 a ΐ echo reply ‡ и ˘ ч è ↑ ΰ ˚ ΐΩ Â

ð ѡ ᴿ Ô

pptp echo request и 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)#
```

Ц L2TP Ϸ ϗ

L2TP Ϸ ϗ '

- z **authentication (L2TP)**
- **z encapsulation (L2TP)**
- **z hello**
- **z hostname (L2TP)**
- **z ip dfbit set**
- **z ip local interface**
- **z ip ttl**
- **z l2tp ip udp checksum**
- **z l2tp tunnel authentication**
- **z l2tp tunnel hello**
- **z l2tp tunnel password**
- **z l2tp tunnel receive-window**
- **z l2tp tunnel retransmit**
- **z l2tp tunnel timeout**
- **z l2tp-class**
- **z password (L2TP)**
- **z protocol (L2TP)**
- **z pseudowire**
- **z pseudowire-class**
- **z vpdn**
- **z receive-window**
- **z retransmit**
- **z timeout setup**

7.1 authentication (L2TP)

Ϸ ϗ ΰ ╖ ˘ è **no** Â

authentication

no authentication

ð Ô

ϙ ϷΌ ╖ Â

ð Ϸ ϗ Ô

L2TP-Class ϟ

ð ᴳ ´ Ô

ϝ Ϻ ΰ ╖ Â ╖ ϝ ˛

L2TP-Class ΐΩ ў ╟ ⁸ Â

ð ѡ ᴿ Ô

ΰ ΰ ϟ Ẅ Ẅ й Ń

ð ƕ ϡ Ô

L2TP-Class ϟ

ð ᴳ ´ Ô

ϡ Ո Hello ϡ Ո L2TP ĭ ŋ ϡ Â ᵩ

L2TP-Class

ð ƕ ϡ Ô

Pseudowire-Class ᛋ

ð ᴳ ´ Ô

ᛦ Ո ǐ ǐ ᛁ ᛋ Â˙ ¡ ᛁ ᛋ ╗
╟ ˚ . ᛋ ᛁ · Э˘ Л a˚ L2TP

ð Ô

ϙ Ю˘ IP TTL ϧϧ ϶ 255 Â

ð Ηυ ϗ Ô

Pseudowire-Class ϟ

ð G ´ Ô

ϟ Л IP TTL ϧϧ Â˙ ¦ IP TTL ϧϧ ╟ ˬ . ϟ ΐ · Э˘ п a ˬ L2TP ⁸ Â

ð w R Ô

IP TTL ϧϧ ϶ 253

```
Ruijie(config-pw-class)#ip ttl 253
Ruijie(config-pw-class)#
```

7.8 l2tp ip udp checksum

Ηυ ϗ UDP ΄I Checksum ϧϧ˘ è **no** Â

l2tp ip udp checksum

no l2tp ip udp checksum

ð Ô

ϙ Ю˘ UDP Checksum ϧϧ ϶ (϶) Â

ð Ηυ ϗ Ô

VPDN-Group ϟ

ð G ´ Ô

ϟ Л ŋ ΐ˝ UDP ΄I Checksum ϧϧ Â · ¦ UDP Checksum ϧϧ ╟ ˬ . ϟ ΐ · Э˘ п a ˬ L2TP ⁸ Â

ð w R Ô

UDP ᵏ Checksum

```
Ruijie(config-vpdn)#l2tp ip udp checksum
Ruijie(config-vpdn)#
```

7.9 l2tp tunnel authentication

Ηυ ϗ ΰ ╖ ˘ è **no** Â

l2tp tunnel authentication

no l2tp tunnel authentication

ὃ Ô ᾄ ϙ \ ˘ ℼ Dz Ā ϖ FÕ8ÿG!5AỌN4 À Ô

no l2tp tunnel retransmit {**retries** | **timeout** {**min**|**max**}}

ð ϟ Ô

number ⁸ ·

seconds ⁸ ·

ð Ô

ϙ Ю ⁸ · ϰ 5 ⁸ · ϰ 1 ˘ ϰ 8
Â

ð Ηυ ϗ Ô

VPDN-Group ϟ

ð ᴳ ´ Ô

· ¦ ⁸ · ϟ ᵍ ˬ L2TP ⁸ ў ╟
Â

ð ᴡ ᴿ Ô

⁸ · ϰ 10

```
Ruijie(config-vpdn)#l2tp tunnel retransmit retries 10
Ruijie(config-vpdn)#
```

7.14 l2tp tunnel timeout

Ηυ ϗ L2TP ï ˬ / ⁸ ˘ è **no**
Â

l2tp tunnel timeout {**no-session**| **setup**} *seconds*

no l2tp tunnel timeout {**no-session** | **setup**}

ð ϟ Ô

no-session Л ˬ

setup ⁸ ( )

seconds ˘ ´ Æ ϰ

ð Ô

ϙ Ю ï ˬ ϰ 600 ˘ ï ⁸
( ) ϰ 300 Â

ð Ηυ ϗ Ô

VPDN-Group ϟ

ð ᴳ ´ Ô

· ¦ ï ˬ / ⁸ ϳ ˬ
˜Ω L2TP ⁸ ў ╟ Â

˘ Ѫ ч Ǖ ╖ G ⅃ ⱶ
ꞔ Ȃ ! ⱶ ꞔ ⅃ ᵥ L2TP 8 ў ╟ Â

ð ш R Ô

ⱶ ꞔ ӥ "share"

```
Ruijie(config-l2tp-class)#password share
Ruijie(config-l2tp-class)#
```

7.17 protocol (L2TP)

ƕ ꞔ L2TP 8 ⱶ ˘ ἐ **no** Â

protocol l2tpv2 [*l2tp-class-name*]

no protocol

ð ⱶ Ô

l2tpv2 G L2TP ɔ ӥ ˜

l2tp-class-name L2TP-Class ⱶ ⅃

ð Ô

ą Ю̆ G L2TPv2 ɔ ӥ L2TP ˜ Â

ð ƕ ꞔ Ô

Pseudowire-Class ⱶ

ð G ´ Ô

˙ ! 8 ⱶ ⅃ ᵥ L2TP 8 ў ╟ Â

ð ш R Ô

˜ ӥ l2tpv2 L2TP-Class l2x 8 ⱶ

```
Ruijie(config-pw-class)#protocol l2tpv2 l2x
Ruijie(config-pw-class)#
```

7.18 pseudowire

ƕ ꞔ pseudowire ‡˘ ἐ **no** Â ƕ ꞔ ⅃ Ꞃ ⅃
5 ˘ ἐ ы ˥ ‡ ӥ У ‡ ῇ м ` Â 10.3̆ 5b3˜ ῇ м
` ˜ Â

pseudowire *peer-ip-address vcid* {**encapsulation l2tpv2** [**pw-class** *pw-class-name*] | **pw-class** *pw-class-name* }

no pseudowire

hostname ⱶ **pseudowire**

pseudowire hostname *peer-hostname vcid* {**encapsulation l2tpv2** [**pw-class** *pw-class-name*] | **pw-class** *pw-class-name* }

no pseudowire

ϒ	
peer-ip-address	L2TP Server(LNS)ف ز س
peer-hostname	L2TP Serveȓ LNS˜ ج DNS Э Ά Ω ٤ ف ز س hostname
vcid	**pseudowire** ώ
l2tpv2	G l2tpv2(RFC 2661) ɔ ѝ ˜
pw-class-name	pseudowire-class ´ Ї ɻ

ϙ Ю˘ ˙ ¡ pseudowire ‡ Â

Ƕ ϡ ϒ

pseudowire ‡ ϟ ج virtual-ppp ϒ Э Å ¡ virtual-ppp ϒ Э pseudowire ‡ ϟ ¸ L2TP¸ ⁸ ў ╟ Â

G pseudowire ‡ ╗ LNS ђ̈ м ` ╗ ˘ ϟ Л ج ϒ Э 5 pseudowire ‡˘ Л ѝ , ŋ ɻ ^ LNS˜ L2TP ˘ ǀ

ΐΩƕ ɂ	ƕ ɂ	
	-	-

ϡ

ƕ ɂ ϗ ϡ	ϡ	
	-	-

7.19 pseudowire-class

ƕ ɂ ɻ pseudowire-class ϟ˘ a ج ɻ pseudowire- class ϟ … Ʌυ ɻ ὶ ɻ pseudowire-class ϟ˘ è **no** ǐ ɻ pseudowire-class ϟ Â

pseudowire-class *pseudowire-class-name*

no pseudowire-class *pseudowire-class-name*

ð ϟ Ô

pseudowire-class-name pseudowire-class ϟ ɻ

ð Ô

ɑ ЮΆ Э ˙ ¦ pseudowire-class ϟ Â

ð ƕ ɂ Ô

ώ

ð ᴳ ´ Ô

ϡ Ʌυ pseudowire-class ϟ L2TP ɔ ϟ Â

ð ᴡ ᴿ Ô

… ɻ ὶ ”pw” pseudowire-class ϟ

```
Ruijie(config)#pseudowire-class pw
Ruijie(config-pw-class)#
```

7.20 vpdn

ƕ ɂ ɣ L2tp ج vrf

vpdn vrf *vrf-name*

no vpdn vrf

ϟ	ϟ	
	vrf	ص vrf
	vrf-name	vrf ɻ

```
Ruijie(config-l2tp-class)#
```

7.22 retransmit

Ъυ ҳ 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 ы ⁸ ·

timeout è ы ⁸ ·

ð Ô

ą Ю˝ SCCRQ · й 2˝ è ы ⁸ · й 5

ð ᴳ ´ Ô

· ¦ ĭ ⁸ ᵍ ˛ ˜Ω L2TP
⁸ ў ╟ Â

ð ᴡ ᴿ Ô

ĭ ⁸ и 240

```
Ruijie(config-l2tp-class)#timeout setup 240
Ruijie(config-l2tp-class)#
```

Ti /TT0 1 Tf -0.gF44444444<4721354C.8 46

interface *interface*	ɣ NAT ə outside ϟ ɑ Â Pool ϶ϗ ϟ ϗ ϟ ϗ ˘ У ɣ ϟ ϗ ˜ ك˘ • ɑ Â б ϳ match interface interface ϳ ˘ з ч э interface У Â ї ‡ ϟ NAT a Â
match interface *interface*	ɣ NAT ə outside ϟ ɑ Â ɑ ɷ ϟ ϳ˘ NAT Ä ə ϟ ϟ pool è б ϗ ϟ ϗ Â

ð ɑ Ô

϶ϗ ϗ ϗ Â

ð Ϸ ϗ Ô

NAT ϗ

ð G ´ Ô

У ə ϗ ϶ϗ ə ϗ ˘ ″I ώ NAT ϗ ˘ ϳ NAT ϗ ϗ ϶ϗ Â

' NPE80 ϧ ϱ **match** ″Ω a ϟ ˘. Ϸ ϗ 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*

ð w R Ô

ЛыЮ R ˘ … ɷ У э mulnets ϗ ˘ ϶ϗ ɷ ч э ϗ ϗ 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
```

ð ″ΩϷ ϗ Ô

Ϸ ϗ	
ip nat pool	϶ϗ IP NAT ϗ

8.1.2 clear ip nat config-rules

interface .40>Ec 0.28 0 T -142.38 -1϶8.62 reW*ϩ0.852 g1

ϟ	
	ǂ interface NAT Â

ð ƫ ϡ Ô

ð G ´ Ô

ƫ ϡ˘ ϡ ΠǂΠ ǂ ϕ interface nat Â

ð ΐΩƫ ϡ Ô

ƫ ϡ	
ip nat	ƫ ϟ NAT Â
ip nat inside destination	ὖ ὐ ƒ NAT Â
ip nat inside source	ὖ ὐ ƒ NAT Â
ip nat outside source	ὖ ƒ NAT Â
ip nat pool	ƫ IP NAT ƒ

8.1.3 ip nat application

NAT ˘ ϡ ΠǂΠ ώ ƫ ϡ **ip nat application** Â ƫ ϡ **no** ϡ ΠǂΠ ϡ Â

ip nat application source list *list-num* **destination** *dest-ip* { **dest-change** | **src-change** } *ip-addr*

ip nat application source list *list-num* **destination** { **tcp** | **udp** *dest-ip port-num*} { **dest-change** *ip-addr port-num* | **src-change** *ip-addr* }

no ip nat application source list *list-num* **destination** *dest-ip* { **dest-change** | **src-change** } *ip-addr*

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* }

ð ϟ Ô

ϟ	
list-num	ὖ ƒ ƒ ϡ ƒ ˚

dest-ip	¬ ǫ ŵ ѫ ƒ ѫ . ѫ ƒ ѫ ¬ ˚ ˘ ∜ ѫ ƒ ѫ ¬ ѫ ƒ ѫ 3 ѫ ƒ ѫ ¬ ɱ ѭ " ˘ ˚ … NAT Â
tcp *dest-ip port-num*	¬ ǫ ŵ ѫ ƒ ѫ ⅃ ∜ ∧ ˘ ∜ tcp ѫ ƒ ѫ ∩ ∧ ∜ ¬ ѭ ˚ 3 ѫ ƒ ѫ ¬ ɱ ѭ " ˘ ˚ … NAT Â
udp *dest-ip port-num*	¬ ǫ ŵ ѫ ƒ ѫ ⅃ ∜ ∧ ˘ ∜ udp ѫ ƒ ѫ ∩ ∧ ∜ ¬ ѭ ˚ 3 ѫ ƒ ѫ ¬ ɱ ѭ " ˘ ˚ … NAT Â
dest-change *ip-addr port-num*	g ˚ ѫ ƒ ѫ ⅃ ∜ ∧ ∜
src-change *ip-addr*	g ˚ ѫ ƒ ѫ

ð ɑ Ô

ѭ ‡ Â

ð ƫ ɀ Ô

ŵ

ð G ´ Ô

ѧ У Ҿ NAT ѧ ѓ ˘ g У Ҿ IP ѫ ƒ ѫ ѫ ƒ ѫ Â ∜ ⅃ ∩ ǂ ƫ ɀ ÂЮ R ƫ ɀ ѭ ∜ è Ь(DNS relay) Â ƫ ɀ Θ ѧ Ы Э Â

ð ш R Ô

ѧ ⅃ ∩ Ю è ї ǫ 192.168.1.0 ў DNS Ь Ы ∟ NAT inside ∧ IP' 192.168.1.1 ˘ Ы NAT ╖ ǫ ў DNS ∜ DNS Ь Ы 202.101.98.55 ˘ DNS ∜ ǫ ў ÂG ip nat application ƫ ɀ ╖ ˘ ѭ ' ѫ ƒ ѫ access-list 1 à ѫ ƒ ѫ 192.168.1.1 à ∧ 53 UDP ˘ ‡ g э IP ѫ ƒ ѫ и 202.101.98.55 à ∧ и 53 Â έ ɛ ƫ ɀ Ю'

```
!
access-list 1 permit 192.168.1.0 0.0.0.255
!
interface FastEthernet 0/0
 ip address 192.168.1.1 255.255.255.0
 ip nat inside
!
interface FastEthernet 1/0
 ip address 200.168.12.1 255.255.255.0
ip nat outside
```

```
!
ip nat pool net200 200.168.12.2 200.168.12.10 netmask
255.255.255.0
!
ip nat inside source list 1 pool net200
ip nat application source list 1 destination udp 192.168.1.1 53
dest-change 202.101.98.55 53
!
```

ð ΩƕϞÔ

ƕ	
address	
ip nat	NAT Â
ip nat inside destination	NAT Â
ip nat inside source	NAT Â
ip nat outside source	NAT Â
show ip nat translations	IP NAT Â

8.1.4 ip nat inside destination

NAT **ip nat inside destination** Â ƕ **no** NAT Â

ip nat inside destination list *access-list-number* **pool** *pool-name*

no ip nat inside destination list *access-list-number* **pool** *pool-name*

ð ϟ Ô

ϟ	
list *access-list-number*	" IP " è pool è IP Â G ϧ IP и IP 100-199 ə ACL Â G ϧ IP и IP 100-199 ə ACL Â
pool *pool-name*	è ϡ ÿ è† Â

ð ą Ô

Â

ð ƕ ϗ Ô

ώ

ð G ´ Ô

ϔ ѫѭѩ ˘ ϟ Л TCP ѯ Â ϔ ϟ ў
TCP ˘ ϟ ϟ ў TCP н Ь ѯ Â ˘ æ ϟ
Л NAT TCP ѯ ˘ NAT … ϖ У ϟ ў k TCP
Ь˘ ў ϔ ϟ ў ˘ ϟ ѫѭѩ ˘ ǂ
ǂ Â п ϥ è IP ˘ a ṁ ˙ ị ϟ˘ NAT ɔ ϖ è
Â

NAT TCP ѯ ˘ ϔ ѫѭѩ ϟ Л ϟ ώ ѫѭѩ˘ ≠ ϟ Л
ѫѭѩ Â п ў ѫѭѩ ѝ ϟ ώ ѫѭѩ Â

ð ѡ R Ô

ЛЮ R ˘ ϔ k ϖ У э ў ѫѭѩ 10.10.10.100˝
ѫѭѩ WWW Ь˘ ϔ ѭѫ k Ь Э ч ϟ ѫѭѩ ѝ 10.10.10.1 à
10.10.10.2 ў Â NAT

8.1.5 ip nat inside source

ὖ ᾄ ѫѭѩ NAT ϩ ϟ ϡ ƕ ϥ **ip nat inside source** Â ƕ ϥ **no** ϩ ϟ ϡ ╟ NAT Â

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

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

ip nat inside source static *local-ip global-ip* [**permit-inside**]

no ip nat inside source static *local-ip global-ip* [**permit-inside**]

ip nat inside source static *protocol local-ip local-port global-ip global-port* [**permit-inside**]

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

ip nat inside source static *local-ip* **interface** *interface-type interface-number*

no ip nat inside source static *local-ip* **interface** *interface-type interface-number*

ip nat inside source static *protocol local-ip local-port* **interface** *interface-type interface-number global-port*

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

ð ϟ Ô

ϟ	
list *access-list-number*	ѫѭѩѫѭѩ " Âϡ ѫѭѩ ϧ " ˘ ˚ … NAT Â
interface *interface-type interface-number*	¯ outside ϟ ώ ѫѭѩ ṁ NAPT ѫѭѩ ϟ ~~ ≠ ϩ NAT Â
pool *pool-name*	¯ ѫѭѩ è ώ ѫѭѩ ṁ NAT Â
Overload	ˆ ϡ ˜ pool è ɜ ώ ѫѭѩ ϡ Ʌ˘ ṁ NAPT Â ṁ ɜ ϟ ˘ ώ ѫѭѩ ≠ Â Ƶ Ʌ ╕ ɜ ϟ й ѽ cisco ƕ ϥ ò Â
static *local-ip global-ip*	ⱻ ´ NAT Â local-ip й ѫѭѩ˘ global-ip й ώ ѫѭѩ Â
static *protocol*	ⱻ NAT Â protocol ϡ Ʌ˘ й TCP UDP Â
local-port	ѫѭѩѫѭѩ Ь ϟ ϱ ÂTCP UDP ϟ ϱ˘ Ь у у ɜ Ь ϟ Â
global-port	ώ ѫѭѩ Ь ϟ ϱ Â ϟ ᾄ ў Ь Â ϟ ϱ ϡ Ʌ˘ б local-port a ϡ Â

permit-inside	ϰ ѫ ip nat inside source static ƫ ϡ è˘ ɣ ǐ ą Л global-ip local-ip ў Â ˜Ω Θ ѫ Ы Э Â

ð ą Ô

ą ѫ NAT ϰ Â

ð ƫ ϡ Ô

ώ

ð G ´ Ô

ą IP ѫ й ѫ ˘ ϰ б ˘ NAT˘ ą IP ѫ ώ ر У IP ѫ Â

ɣ У Ҫ ǐ ´ н ´ Æ˘ Θ Θ й ѭ Э ˘ à ϰ ˚ àЮ ˚ ˘ a k Ь˘ ϡ Л ¯ outside ϰ IP ѫ ṁ ώ ѫ ˘ Л NAPT ѫ Â a ɔ NAT˘ ǂ ѫ ą . G Э б ѭ ц ˘ л ц Ƶ . ц a ѭ ˘ ҷ й ѫ Â

ɣ k Ь ą ў ˘ NAT NAPT Â ǂ Ь k ϡ ˘ a ¯ outside ϰ ѫ ṁ NAPT˘ ҷ й ѫ й б ISP ц ѫ ˘ ϡ ϡ Â ąЮ˘ ą Ҫ ą ў k Ь˘ ϰ ą IP ϡ Л ѭ Â л Ҫ Ь˘ ą Лώ IP Ь Â ą ѫ NAT ą ѫ NAPT ˘ ╗ ώ permit-inside ˜Ω Â ≠ ѫ inside ϰ Э Э no ip redirects˘ inside ϰ ϡ ϳ Â

ð ш R Ô

ЛЮ R ˘ ϡ Л 192.168.12.0/24 ą ў ˘ ╟ ǂ ώ ѫ 200.168.12.0/28 Â ą è ў a ǐ ṁ NAT Â

```
!
interface FastEthernet0
 ip address 192.168.12.6 255.255.255.0
 ip nat inside
!
interface FastEthernet1
 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
```

ð ΩƫƱʒ Ô

ƫ ʒ	
ip nat	ƫ ∀ NAT Â
ip nat inside destination	ŭ ǫ ƒ NAT Â
ip nat outside source	ŭ ƒ NAT Â
ip nat pool	ƫ IP NAT ƒ Â
show ip nat translations	IP NAT Â

8.1.6 ip nat outside source

ƒ NAT˜ ∀ Л ŏ ƫ ʒ **ip nat outside source** Â ƫ ʒ **no** ∀ Л ∀ ƒ NAT Â

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

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

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

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

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

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

ð ∀ Ô

∀	
list *access-list-number*	ŏ ƒ " Â∀ ƒ ˥ " ˘ ˚ … NAT Â
pool *pool-name*	¯ ƒ è ƒƒ ṁ NAT Â
static *global-ip local-ip*	ƫ ´ NAT Â local-ip ŷ ƒ˜ global-ip ŷ ŏ ƒ Â
static *protocol*	ƫ NAT˜ protocol ∀ Л ŷ TCP UDP Â
local-port	ƒƒ Ł ∀ ∕ ÂTCP UDP ∀ ∕˜ Ł У У э Ł ∀ Â ∀ ∕ ∀ Л б global-port а У Â
global-port	ŏ ƒ Ł ∀ ∕ Â

ð ɑ Ô

ƒ NAT ∀ Â

ð ƫ ʒ Ô

ŏ

ð G ´ Ô

NAT ў ϳ

IP ў У э Ω ϊ ώ IP ў

ά й ў ϳ Â ч э ϳ ў Ѯ а ѧ ˘ ҷ й ъ

ц й ў ϳ NAT ж ϳ Ѯ

ѧ ˘ ϳ NAT˘ ў ҷ ά й ϳ У э

ў ў ˘ ϟ Ѯ У Â

ϳ NAT ˘ è ϊ й ч э ϊ ά ' 1˘ ά NAT ' 2˘

NAT ˘ ϟ б ά ў ϳ ў ˘

ў ϟ Л NAT ╟ NAT Â

ά ϊ ϖ Ά ώ IP ў б ц ˘ ˛ ϟ

ў ϳ ά Â ά У ϟ ў ˘ ҷ Ы

DNS NAT Â

ð w R Ô

ЛЬЮ R ˘ ά 92.168.12.0/24 б ў ϳ Â ϳ˘ ά

ў ϟ Л 192.168.12.0/24 ў 92.168.12.0/24 ў Â

```
interface FastEthernet0/0
 ip address 92.168.12.55 255.255.255.0
 ip nat inside
!
interface Serial0/1
 ip address 92.168.100.1 255.255.255.0
 ip nat outside
 encapsulation ppp
!
ip nat pool net200 200.168.12.1 200.168.12.15 prefix-length 28
ip nat pool net192 192.168.12.1 192.168.12.254 prefix-length 24
ip nat inside source list  1 pool net200
ip nat outside source list 1 pool net192
access-list 1 permit 92.168.12.0 0.0.0.255
!
ip route 192.168.12.0 255.255.255.0 92.168.100.2
```

ц ÿ inside ϊ outside ϟ ↑˘ ″I ″ ā ĭ NAT˘

ҷ Â

ð ΏЬ Ô

Ϸ	

ip nat pool	ƻ IP NAT
show ip nat translations	IP NAT Â

8.1.7 ip nat pool

ƻ NAT ˇ ϟ ώ ƫ **ip nat pool** Â ƫ no ϟ

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

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

no ip nat pool *pool-name*

ð ϡ Ô

ϡ	
pool-name	NAT ϟ Â
start-ip	NAT IP Â
end-ip	NAT IP Â
netmask *netmask*	NAT Â
Prefix-length *prefix-length*	NAT Â
Type	NAT ص Â rotary ˇص Â rotary ώ rotary ϡ б cisco ƫ ò Â

ð ɑ Ô

Â

ð ƫ Ô

ώ

ð G ´ Ô

У ƻ ˇ ‡ ″I … У ƻ ˇ ϟ ƻ

Â

ð w R Ô

ЛЬЮ R ˇ … ɷ ϟ й net192 ˇ й 192.168.12.1˝ й 192.168.12.254˝ й 24 ə Æ Â

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

ð ˝Ωƫ Ô

Ƕ ϡ	
address	ⅈ ϡ ϭ ϡ ϭ ϡ ϭ ϡ ϭ ن
ip nat	ⅈ ϟ NAT Â
ip nat inside destination	ŭ ǫ ϡ ϭ NAT Â
ip nat inside source	ŭ ǫ ϡ ϭ NAT Â
ip nat outside source	ŭ ϡ ϭ NAT Â
show ip nat translations	IP NAT Â

8.1.8 ip nat keepalive

Ƕ ϡ nat ў ╟ ϟ ϡ ϭ ϡ ϭ ȯ arp

Ip nat keepalive *time-interval*

no Ip nat keepalive

ð ϟ Ô

ϟ	

time-interval

8.1.9 ip nat translation

ƫ ϡ ~ G ΩΫ ҏ ~ ъ ˇ no ƫ ϡ ϩ ΠΩ ҏ ~ ˇ ƫ ϡ ϩ Π G ҏ ~ Â

Ip nat translation {ftp|h323|pptp|rtsp|sip|tftp}

no Ip nat translation {ftp|h323|pptp|rtsp|sip|tftp}

ð ϥ Ô

ϥ	
ftp	ftp G Ω
h323	h323 G Ω
pptp	pptp G Ω
rtsp	rtsp G Ω
sip	sip G Ω
tftp	tftp G Ω

ð ϙ Ô

~ Â

ð ƫ ϡ Ô

ώ

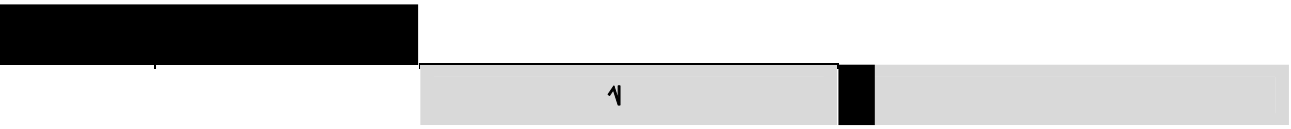
ð G ´ Ô

ƫ ϡ ь ~ ϗ

8.1.10 show ip nat translations

NAT ˘ ۾ **show ip nat translations** ђυ ғ Â

show ip nat translations [**gre|icmp** | **tcp** | **udp**] [**verbose**]



Inside global	ϱ ώ ϡ ϟ ϟ Â
Inside local	ϱ ϡ ϟ ϟ Â
Outside local	ϡ ϟ ϟ Â
Outside global	ώ ϡ ϟ ϟ Â
timeout	NAT ˘ ´ Æ Â
ESTABLISHED	TCP ˘ ESTABLISHED à SYN_SENT à SYN_RECV à FIN_WAIT à TIME_WAIT à CLOSE à CLOSE_WAIT à LAST_ACK à LISTEN Â

ð ΩƕϡÔ

ƕ ϡ	
ip nat	⊮ ϟ NAT Â
ip nat inside destination	ὖ ϱ ϡ NAT Â
ip nat inside source	ὖ ϱ ϡ NAT Â
ip nat outside source	ὖ ϡ NAT Â
ip nat pool	⊮ IP NAT ϡ

8.1.11 debug ip nat

nat Y˚ debug ƕ ϡ Â

debug ip nat [event]

ð ϟ Ô

ϟ

ð ƕ ϡ Ô

ð G ´ Ô

ƕ ϡ ϟ Ո nat ϟ Y˚ Â

ð w R Ô

Ruijie#debug ip nat event
Ruijie#debug ip nat

Ϛ AAA ƕ ɂ

9.1 DÑxA¸ÈĢQ

- **aaa authentication**

9.1.1 aaa authentication

G AAA ط

aaa authentication {**dot1x** | **enable** | **ppp** | **login**} **default group radius**

ð ђυ ѓ Ô

ð ϟ Ô

method1 ' Ю " ΐΩ ΐ У'

ΐΩ	
local	G ѕѕ ɻ
none	a
group	G Ł ɣ ` ˘ ɱ RADIUS Ł ɣ

ð ą Ô

ΐΩ AAA ╖ Â

ð Ϸ ϗ Ô

ώ Â

ð G ´ Ô

RGOS ΐΩ Ł PPP à SLIP ˜ Â
ɷ ˘ ‡ ϟ ╟ Â

ϟ Л Ь a ɻ ˘ б ` У ˘ ϟ ɱ ϟ ˘
G ɻ ˘ ɱ ˘ ‡ a Ά G è ы ɻ
Â

RADIUS Ł ɣ ѽ У " Â Л
RADIUS ѿ RADIUS ѕѕ Э ˘ ϟ RADIUS ɷ ϟ
ϟ RADIUS Â

ð ѡ R Ô

Ю R G RADIUS Ł ɣ Ł '

```
Ruijie(config)# aaa authorization network default
radius
```

ð ΐΩϷ ϗ Ô

Ϸ ϗ	

9.3 AäGQ

RGOS ɱ G RADIUS ˘ ↑ ЛЬЮ ˜Ωƫɮ΄

- **aaa accounting network**
- **aaa accounting update**
- **aaa accounting update periodic**
- **show aaa method-list**
- **debug aaa**

9.3.1 aaa accounting network

¥ ╟˘ ╟ ˘ ŵ
ƫ ɮ **aaa accounting network** Â ƫ ɮ no ɳ ╖ Â

aaa accounting network {**default** | *list-name*} **start-stop group radius**

no aaa accounting network {**default** | *list-name*}

ð ɳ Ô

network ΄ ˜Ω Ł ˘ ↑ DOT1X˝ PPP Â

resource ΄ ˜Ω Â

list-name ΄ " ɻ Â

start-stop ΄ ﻩ ╟ Ո ɼ ɳ ˘
ǐ ╖ ǔ ˘ ǐ Â

group ΄ G Ł ɹ

radius ΄ G RADIUS Ł ɹ

ð ɑ Ô

˜Ω ╖

ð ƫ ɮ Ô

ŵ Â

ð G ´ Ô

RGOS ŵ Ł ɹ ɳ ╟ Â G ˜Ω
start-stop˘ 8 Â

ð ɯ R Ô

ЮR G RADIUS Ł ˘ ﻩ Ո ɳ
΄

```
Ruijie(config)# aaa accounting network start-stop group radius
```

ð ΈΩƫ ϡ Ô

ƫ ϡ	
aaa new-model	G AAA ώ Ŀ
aaa authorization network	ƗŘ AAA
aaa authentication	ƗŘ AAA `
username	ƗŘ ѫ

9.3.2 aaa accounting update

ŭ ℸ ˘ ώ ƫ ϡ **aaa accounting update** ƫ ϡ˘ ƫ ϡ ¥ G ώ Â G ƫ ϡ no ΈΩ ℸ Â

aaa accounting update

no aaa accounting update

ð ϡ Ô

ϡ

ð ą Ô

ℸ ΈΩ Â

ð ƫ ϡ Ô

ώ Â

ð G ´ Ô

ŭ AAA ώ Ŀ˘ ‡ a G Â ŭ AAA ώ Ŀ˘ ‡ ƫ ϡ Â

ð w R Ô

ƗO R G Â

```
Ruijie(config)# aaa new-model
Ruijie(config)# aaa accounting update
```

ð ΈΩƫ ϡ Ô

ƫ ϡ	
aaa new-model	AAA ώ Ŀ
aaa accounting network	ƗŘ "

9.3.3 aaa accounting update periodic

ŭ ˘ ŏ ƕ ɮ **aaa accounting update periodic** ƕ ɮˇ ƕ ɮ ¥ ÂG ƕ ɮ no Â

aaa accounting update periodic *interval*

no aaa accounting update periodic

ð ɮ Ô

interval ' ˇ Ʌŭ ǐ ´ Æˇ ǐ 1ǂ Â

ð ɑ Ô

5 minutes Â

ð ƕ ɮ Ô

ŏ Â

ð G ´ Ô

ŭ AAA ŏ Ŀˇ ‡ a G Â ŭ AAA ŏ Ŀˇ ‡ ƕ ɮ Â

ð w R Ô

ƗO R 1ǂ Â

```
Ruijie(config)# aaa new-model
Ruijie(config)# aaa accounting update
Ruijie(config)# aaa accounting update periodic 1
```

ð ˜Ωƕ ɮ Ô

ƕ ɮ	
aaa new-model	AAA ŏ Ŀ
aaa accounting network	ƗŘ "

9.3.4 show aaa method-list

ɱɲ " ˇ EXEC ƕ ɮ **show aaa methold-list** Â

show aaa method-list

ð ɮ Ô

˜Ω Ո ɮ Â

ð ƕ ɮ Ô

EXEC Â

ð ɯ ᴿ Ô

```
Ruijie# show aaa method-list
```

9.4 AAA á<4Ǫ

- **show aaa group**
- **aaa group server**
- **server ip-addr authen-port port1 acct-port port2**
- **ip vrf forwarding**

9.4.1 show aaa group

AAA ᴸ ɻ Â

show aaa group

ð ɳ Ô

ƕ ɮ ɳ ˜Ω Â

ð ɑ Ô

ð ƕ ɮ Ô

Â

ð ᴳ ´ Ô

ƕ ɮ AAA ᴸ ɻ Â

ð ɯ ᴿ Ô

ƗO ᴿ Â

```
Ruijie# show aaa group
Group Name:  ss
Group Type:  radius
Referred:    2
Server List:
IP Address: 192.168.217.64
Authentication Port: 1812
Accounting Port: 1813
Referred:  1
```

ð ΅Ωƕ ϡ Ô

ƕ ϡ	
aaa group server	AAA ┗ ϰ

9.4.2 aaa group server

ώ AAA ┗ ϰ Â ƕ ϡ no ǂ ┗ ϰ Â

aaa group server radius *name*

no aaa group server radius *name*

ð ϡ Ô

name ' ┗ ϰ ϟ ϳ˘ ɱή a ή΅Ω ”radius”˝ ”tacacs+”

ð ƕ ϡ Ô

ώ Â

ð G ´ Ô

ƕ ϡ AAA ┗ ϰ ˘ ɱή Radius ┗ ϰ Â

ð ѡ R Ô

ΗΟ R 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:
```

ð ΅Ωƕ ϡ Ô

ƕ ϡ	
show aaa group	aaa ┗ ϰ

9.4.3 server ip-addr authen-port port1 acct-port port2

╗ AAA ┗ ϰ ┗ ϰ˘ no ǂ Â

server *ip-addr* [**authen-port** *port1*] [**acct-port** *port2*]

no server *ip-addr* [**authen-port** *port1*] [**acct-port** *port2*]

ð ϟ Ô

ip-addr ' Ł ɣ ip فخ سه

port1 ' Ł ɣ ϟ

port2 ' Ł ɣ ϟ

ð ɑ Ô

Ł ɣ

ð ƅυ ϡ Ô

Ł ɣ Â

ð G ´ Ô

Ł ɣ è ╗ Ł ˘ a ϟ G ḣ Â

ð w R Ô

Ю R 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
```

ð ΅Ωƅυ ϡ Ô

ƅυ ϡ	
aaa group server	aaa Ł ɣ
show aaa group	aaa Ł ɣ

9.4.4 ip vrf forwarding

ϗ AAA Ł ɣ vrf no ǂ Â

9.5.3 show aaa method-list

AAA " Â

show aaa method-list

ð ɳ Ô

ƕ ɮ ɳ ˜Ω Â

ð ą Ô

ð ƕ ɮ Ô

Â

ð G ´ Ô

ƕ ɮ AAA " Â

ð w R Ô

ƗO R 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 Atication
```

```
ruijie# configure terminal
S3250(config)# aaa local authentication lockout-time 5
```

ð ΈΩƅυ ʒ Ô

ƅυ ʒ	
Show running-config	ɱή
Show aaa lockout	ɱή login ٩

9.5.6 show aaa user lockout

ɱή " Â

show aaa user lockout {**all** | **user-name** <*word*>}

ð ٩ Ô

ID

ð ɑ Ô

ð ƅυ ʒ Ô

Â

ð G ´ Ô

ɱή " ˘ Πυ ٦ ΙΑ Â

ð w R Ô

ΗΟ R'

```
ruijie# show aaa user lockout all
```

ð ΈΩƅυ ʒ Ô

ƅυ ʒ	
Show running-config	ɱή
Show aaa lockout	ɱή login ٩

9.5.7 clear aaa local user lockout

"

clear aaa local user lockout {**all** | **user-name** <*word*>}

ð ٩ Ô

ID

ð ɑ Ô

ð ƕ ϡ Ô

Â

ð G ´ Ô

" ˘ ϟ Ѧ ώ ≠ ϟ Ѧ

ð w R Ô

Ю R '

```
ruijie# clear aaa local user lockout all
```

ð ΏƕϡÔ

ƕ ϡ	
Show running-config	ɱ
Show aaa lockout	ɱ login ϥ

Ω ⁞ ѽ ԉ ҳ ৭ ˜ ☼ ԉ ҳ

Â

ƕ ɀ ⁝ ˆ config-cert-chain˜ Â

G ɻ Ʌ ƫ G ƕ ɀ ₦ ж У ə ⁝ Â л ˘ G Â У Θ ƕ ɀ ǂ У ə ⁝ Â

ʀ 1' Ю ʀ ǂ ɭ ⁝ Â ʀ è G show ƕ ɀ ǂ ⁝ " Ⲗ'

```
Ruijie# show crypto pki certificate
Â Â Â˘ Â Â Â
%Router certificate info:
Certificate:
Data:
Version: 3 (0x2)
Serial Number:
16:2a:7a:1d:00:00:00:00:00:02
Signature Algorithm: sha1WithRSAEncryption
Â Â Â˘ Â Â Â
Ruijie# config t
Ruijie(config)# crypto pki certificate chain
Ruijie(config-cert-chain)# no certificate 162a7a1d000000000002
Ruijie(config-cert-chain)# exit
Ruijie(config)#
```

ƕ ɀ	
crypto pki certificate chain	⁝ ƕ ɀ

Â

Ⲗ	
-	-

10.1.2 crypto pki authenticate

ж G SCEP ˜ ɻ ɭ ⁝ Ą˘ ɻ CA ⁝ ˘ ж ώ Ю **crypto pki authenticate** ƕ ɀ Â

crypto pki authenticate *ca_name*

ɳ	
ca_name	*CA_name* ѝ ə ˙ CA Ω ɻ

Â

hu ϡ ώ Â

G

w R router(config)#crypto pki authenticate CA
Certificate has the following attributes:
MD5 fingerprint: B4DE1DD7 E9902423 5E6330D7 D750A432
SHA1 fingerprint: AD070162 672A7C57 BD5EE522 A95AAFA1 351524D0
% Do you accept this certificate?[yes/no]:yes // yes ϡ CA
Trustpoint CA certificate accepted.

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hu ϡ	
crypto pki trustpoint	trustpoint

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huϡ ϡ

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10.1.3 crypto pki certificate chain

ώ ͡ ^ config-cert-chain˜˜ ϑ ώ Ю **crypto pki certificate chain** hu ϡ Â ϑ ͡ Ю ϥ ͡ ˜ Л υ è **NO** ϡϥ ͡ ϟ è ↑ ΰ ͡ Â

crypto pki certificate chain

no crypto pki certificate chain

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hu ϡ ώ Â

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no crypto pki certificate chain hu ϡ˘ ϥ ͡ è ͡ Â

w R ϡ certificate hu ϡ Â

ʼΩƕ ɂ	ƕ ɂ	
	certificate	ː ƕ ɂ

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10.1.4 crypto pki crl request

ЮCRL ˚ ˘ ج ώ ЮCrypto pki crl request ƕ ɂ Â
ƕ ɂ **No** Â

crypto pki crl request

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	-	-

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ƕ ɂ	ώ Â

ƕ ɂ a ɻ ɖ ÂRGOS CRL ˚ й 1M˝ ‡ Ю ÂRGOS
http ˜ Ю CRL˘ è URL فخ سم ɻ Л υ ΰ ˘ . ˝I " Ю'

1.ƕ ɂ ˘ ' **crypto pki crl url**

http://www.myca.cn/CertEnroll/certcrl.crl

2. Э CA ː CRL† ɻ ά '

3. Э Ɣ ː CRL† ɻ ά Â

URL ɻ **crypto pki crl url** ƕ ɂ G ´ Â

R 1' ЛЮw R ƕ ɂ Ո ˘

w R

```
8    an  4301816 0x3e415b47 Jun 28 2005 15:03:46 RGOS.bin
27    an     5331 0xaf1d58ec Jun 29 2005 10:05:20 config.text
34    an      427 0x5bd43f32 Jun 29 2005 12:50:41 certcrl.crl
```

ϧυ ϗ	

```
http://www.myca.cn:1010/certsrv/
http://www.myca.cn:80/certsrv
http://www.myca.cn/certcrl.crl
http://www.myca.cn:80/
http://www.myca.cn:1220
http://www.myca.cn
http://www.myca.cn/CertEnroll/CA%20Server.crl
http://202.101.211.123/certsrv/certcrl.crl
```

ΐΩƕ ϡ

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crypto pki crl request	Ю CRL ˚ ƕ ϡ

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10.1.6 crypto pki enroll

ϩ G SCEP ˜ ϡ ϗ ⁖ Ą˘ ΅Ą˘ ϩ ώ Ю

crypto pki enroll ƕ ϡ Â

crypto pki enroll *ca_name*

ϡ

ϡ	
ca_name	*CA_name* ϧ ə˙ CA Ώ ϳ

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ƕ ϡ

ώ Â

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```
router(config)#crypto pki enroll CA
%
%Start certificate enrollment ..
%Create a challenge password. You will need to verbally provide this password to the
CA Administrator in order to revoke your certificate. For security reasons your
password will not be saved in the configuration.Please make a note of it.

Password:F4EEE4FEB3766007        //  ώ ÿ CA
Re-enter password:F4EEE4FEB3766007
%The subject name in the certificate will include: router
```

W R

crypto pki import pem terminal *passphrase*

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terminal	⁘ Ո ÿ ⁸ ٨ ώ
passsphrase	⁘ ¥ ɖ ˘ ج ώ ¥

Â

ƕ ʒ ώ Â

G ƕ ʒ a ٦ ɖ Â ٦ G ƕ ʒ ÿ PEM ˚ è ώ ⁘ Ո RSA Â Ҫ ˚ ٦ ¥ è PKI ˘ PC Â

R 1' ЛЬЮ w R ƕ ʒ ώ ⁘ Ո '

```
Ruijie# config t
Ruijie(config)# crypto pki import pem terminal Ruijie#
```

w R

```
% Do you accept this certificate? [yes/no]: yes
//
% Certificate successfully imported
% Enter PEM-formatted encrypted private key.
//      ώ PEM
% End with "quit" on a line by itself.
//      ώ ľ quit Ŀ      ώ
//          ˘ ⁂      ˘   ЮO
-----BEGIN RSA PRIVATE KEY-----
Proc-Type: 4,ENCRYPTED
DEK-Info: DES-EDE3-CBC,251F9D955610C376

GDG2s1mbs/MJCpo5w2bu972jK1OZYtv3RQunH4I29c9H5uq3LtyvNA9RwrlpRQ3t
iUmkvQrU3/6SBp4Rqx1EU2UWgv1KRqqYwRVbdPdBZYVJLrso3Ov/9eaS4TiD+4Dl
NfJ1sAA4OONdVKDCLcGZIB43Wq5rAlqzsyjcF6tx3fWsSankVjQfroTv7UvP+ijj
uGndmJwbXEiATxlt+Smvt2/CGjr8nIC55T1W+tW0itkBdZhnvBJekOFM4BdgoLZc
3vueTIHmTurHvvdLIytYjQHsxVsf3vRGMcQhohM98nAYsIDBil4OIh1hc+ZnhGsn
TFLPMmMuJnBWMYopfaMPNrcdbpu+n4Qj2QiRoVTEoI7P1IAY/Oa2uc+kDuUX3KlW
sQQPnFNiU0Q/T9BrsolxI2Wkak7cvaNxbmhuU+5wNUGybQfcfP3CWg==
-----END RSA PRIVATE KEY-----
quit
% RSA private key successfully imported
EBM#(thybQEsDK21Cey. UohM9o3Ov Tc 0 2e 64Tj/od ths
          -----B4.37>6<0739>Tc 2.407 0 Td[<1E1014E3>6<2C5102954A79>6<1B5B1
```

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	-	-

10.1.10 crypto pki trustpoint

ώ trustpoint ˆ ca-trustpoint˜˜ ج ώ Ю **crypto pki trustpoint** ƕ ɀ Â Л ὲ **NO** ɲ˥ trustpoint ɳ ὲ ↑ ΰ ⁘ Â

crypto pki trustpoint *ca_name*

no crypto pki trustpoint *ca_name*

ɳ	ɳ	
	ca_name	*ca_name* и ę˙ ˆ trustpoint˜ CA Ώ ɻ

	Â

ƕ ɀ	ώ Â

G	ɲ Л G ƕ ɀ ώ trustpoint ˘ ج ɔ è˘ ɲ Л trustpoint ɳ Â **no crypto pki trustpoint** *ca_name* ƕ ɀ˘ ˥ ę˙ ɳ ὲ ⁘ Â

w R

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10.1.11 enrollment offline subject

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10.1.14 enrollment url

G SCEP ϡ ϡ G URL ˇ ϑ trustpoint Ю

enrollment url ƕ ϡ Â Л υ è **NO** ǂ URL Â

enrollment url *url_string*

no enrollment url

ϡ	ϡ	
	url_string	Л υ http:// URL s ˇ a 255
	Â	
ƕ ϡ	trustpoint Â	
G		
ϡ R		

˝Ωƕϡϡƕϡϡƕ ϡ	ƕ ϡ	
	crypto pki trustpoint	ώ trustpoint

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10.1.15 enrollment auto-enroll

trustpoint □ ˇ ϑ trustpoint Ю

enrollment auto-enroll ƕ ϡ Â Л υ è **NO** Â

enrollment auto-enroll *percentage*

no enrollment auto-enroll

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percentage	*percentage* ϧ У ϑ 1ί 100 ˘ ⁘ ϧυ ί ί ϯ Ą ⁘ Â

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ϧυ ϩ	trustpoint Â

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	crypto pki trustpoint	ώ trustpoint

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10.1.16 enrollment renewable

trustpoint CA Ϟ ϰ ⁘ ɔ˘ ϫ trustpoint Ю **enrollment renewable** ϧυ ϩ Â Πυ è **NO** ΐ URL Â

enrollment renewable

no enrollment renewable

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ϧυ ϩ	trustpoint Â

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	crypto pki trustpoint	ώ trustpoint

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10.1.17 debug crypto pki

pki ΅Ω ΅Ω΄ ₰ EXEC ЮО **debug crypto pki** Ϸ ϗ Â G è **no** ΅Ω ΅Ω Â

debug crypto pki {**event** | **error**}

no debug crypto pki {**event** | **error**}

	ϟ	
ϟ	**event**	pki ɔ Y˚ ə
	error	pki ɔ ə

	΅Ω΅Ω

Ϸ ϗ

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10.2 /,ȂǪ

↑ ΰ ЛЬЮϷ ϗ '

„ show crypto pki certificate

„ show crypto pki crls

„ show crypto pki trustpoints

„ show crypto pki trustpoints ***name_string*** status

10.2.1 show crypto pki certificate

⁝ ə ˘ ² EXEC Ю **show crypto pki certificate** ħυ ȝ Â

show crypto pki certificate

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```
Ruijie# show crypto pki certificate
%CA certificate info:                          //CA ⁝ ə
Certificate:
Data:
Version: 3 (0x2)                               //X.509 v3
Serial Number:                                   // ⁝   " Л
7f:ff:bb:39:97:39:b4:81:4b:e1:6b:4f:f9:06:7a:4b
Signature Algorithm: sha1WithRSAEncryption    //  ɹ
Issuer: emailAddress=wlcpyjwb@star-net.cn, C=CN, ST=fj, L=fuzhou,
O=Red Giant, OU=Department 5, CN=CA Server
                  //  ٦  DN ɹ
Validity                                       // ⁝       ə
Not Before: Jun 22 05:46:32 2005 GMT     //          UTC
Not After : Jun 22 05:54:45 2007 GMT    //          UTC
Subject: emailAddress=wlcpyjwb@star-net.cn, C=CN, ST=fj, L=fuzhou,
O=Red      Giant,      OU=Department      5,      CN=CA      Server
// ⁝ ў ɛ DN ɹ
Subject Public Key Info:                       //ў ɛ Ω  ə
Public Key Algorithm: rsaEncryption          //Ω      : и RSA ╗
RSA Public Key: (512 bit)                   //512 Æ  RSA Ω
Modulus (512 bit):
00:be:d1:e8:14:27:7a:30:2b:5e:11:ca:43:fd:2f:
```

W ᴿ

2b:7e:a9:8a:07:96:a2:cf:fe:9d:b7:d3:da:54:c3:
03:4a:a8:44:b3:f0:11:dc:8a:bb:72:53:97:58:b1:
3f:df:6b:8a:9e:5f:46:d3:00:40:2e:24:d3:85:a7:
41:42:55:f7:75
Exponent: 65537 (0x10001)
X509v3 extensions: // ⁘ ə
X509v3 Key Usage: //
Digital Signature, Non Repudiation, Certificate Sign, CRL Sign
//↑ ɹ˘ ˘ ⁘ ɹ˘ CRL ɹ
X509v3 Basic Constraints: critical
CA:TRUE
X509v3 Subject Key Identifier: // ў ɛ
64:46:12:C0:27:A4:9E:01:0C:65:DA:F8:6E:E7:FE:C6:56:EC:AD:D4
X509v3 CRL Distribution Points: //CRLǂ ˩ ə
URI:http://zj-router/CertEnroll/CA%20Server.crl
URI:file://\\zj-router\CertEnroll\CA%20Server.crl
1.3.6.1.4.1.311.21.1:
...
Signature Algorithm: sha1WithRSAEncryption
// ɹ
34:2f:8d:93:68:43:60:7b:68:5f:f0:7e:91:0c:5c:e3:58:98:
7c:53:95:ae:c2:b8:1c:ff:82:a4:ae:95:a8:81:a8:8a:ff:f9:
6f:92:72:3e:fa:6f:84:7d:83:47:93:0f:85:76:48:ae:68:b9:
5a:72:cf:09:50:be:1b:a7:e1:87 // ⁘ ɹ
%Router certificate info: //ЛЬЮ ѝ ⅄ ⁘ ə
Certificate:
Data:
Version: 3 (0x2) //X.509 v3
Serial Number: // ⁘ " Ո
16:2a:7a:1d:00:00:00:00:00:02
Signature Algorithm: sha1WithRSAEncryption
// ɹ
Issuer: emailAddress=wlcpyjwb@star-net.cn, C=CN, ST=fj, L=fuzhou,
O=Red Giant, OU=Department 5, CN=CA Server
// ˩ DN ɹ
Validity // ⁘ ə
Not Before: Jun 22 05:50:48 2005 GMT // UTC

```
00:c6:e2:7a:e8:8d:6d:d8:bb:56:a8:9c:03:62:14:
e5:2e:23:e5:a5:26:31:3d:b2:24:65:b1:f2:cc:07:
e3:ef:cc:02:3c:d0:6e:00:8d:fc:ce:3a:b6:45:7a:
cb:a0:87:94:1f:c3:92:43:36:6a:b2:7c:9c:d5:ca:
7e:83:ba:76:49:7f:be:f4:1f:4a:a1:0b:98:22:96:
e2:79:54:a0:ed:1c:62:30:b7:ee:6a:6e:cb:72:e9:
9c:d9:e8:b0:dc:f5:c6:19:8f:2b:2a:85:fa:bf:ff:
08:40:7e:f2:a1:df:d1:8b:ef:68:32:1e:1a:45:fa:
16:de:33:b0:62:90:bd:9c:8e:ec:7c:6e:49:48:75:
e6:5c:ce:b1:8e:1c:80:f3:5b:79:6c:a1:31:b2:a9:
48:37:9f:ed:45:95:85:ba:98:0f:42:c5:78:4c:3d:
```

```
1.3.6.1.4.1.311.21.1:...
Revoked Certificates:                    //ЛЬЮ й ѧ  ⁜ "
Serial Number: 162A7A1D000000000002      //ѧ  ⁜  " Ѧ
Revocation Date: Jun 22 06:19:53 2005 GMT    //ѧ
CRL entry extensions:                      //CRL
X509v3 CRL Reason Code:                  //CRL ѧ  Ѵ ⍨ ϡ
Key Compromise                                 //
Serial Number: 1635E5E3000000000003
Revocation Date: Jun 22 06:19:53 2005 GMT
CRL entry extensions:
X509v3 CRL Reason Code:
Key Compromise                                 //
Signature  Algorithm:  sha1WithRSAEncryption       //    ѧ
5d:a2:ab:07:ff:7e:0e:9a:af:b2:25:11:7f:31:86:aa:21:48:
37:e7:22:99:e3:b2:15:e0:f9:80:63:66:5e:2f:f2:d6:c0:ea:
ef:46:7e:d1:c1:b2:66:0e:0b:d3:74:d1:55:bc:5c:13:46:e8:
56:ec:40:83:7b:1b:75:f2:68:87                 //  ѧ ḣ
Ruijie#
```

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10.2.3 show crypto pki trustpoints

trustpoint ə ˇ ⁂ EXEC Ю **show crypto pki trustpoints** ƕ ϡ Â

show crypto pki trustpoints

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ˋ У TACACS+ƕ ϩ

11.1 TACACS+G5ÈGQ

TACACS+ ↑ ЛυЮ ˜Ωƕ ϩ'

- z **aaa group server tacacs+**
- **z server(TACACS+)**
- **z ip vrf forwarding(TACACS+)**
- **z ip tacacs source-interface**
- **z tacacs-server host**
- **z tacacs-server key**
- **z tacacs-server timeout**

11.1.1 aaa group server tacacs+

ƕ ϩ TACACS+ Ŀ ˘ a ɹ TACACS+ Ŀ , ǂ ↑ a ɹ Â

aaa group server tacacs+ *group-name*

no aaa group server tacacs+ *group-name*

ð ϡ Ô

group-name' TACACS+ Ŀ ɹ

ð ą Ô

TACACS+ Ŀ Â

ð ƕ ϩ Ô

ώ Â

ð G ´ Ô

TACACS+ Ŀ ǂ ˘ à à ɻЛυ G a ɹ Ŀ Â

ð ѡ R Ô

Ю R У э ɻ й tac1 TACACS+ Ŀ ˘ з ج è У э 1.1.1.1 TACACS+ Ŀ لا سم فذ'

```
Ruijie(config)# aaa group server tacacs+ tac1
Ruijie(config-gs-tacacs+)#server 1.1.1.1
```

ð ΐΩƕ ϥ Ô

ƕ ϥ	
server	TACACS+ Ł ϰ server "
ip vrf forwarding	TACACS+ Ł ϰ VRF ϳ

11.1.2 server(TACACS+)

ƕ ϥ TACACS+ Ł ϰ è Ł ϰ ϩ ϭ Â

server *ip-address*

no server *ip-address*

ð ϟ Ô

ip-address TACACS+ Ł ϰ è Ł ϰ ϩ ϭ

ð ą Ô

ð ƕ ϥ Ô

TACACS+ Ł ϰ Â

ð G ´ Ô

ƕ ϥ ϱΐ ƕ ϥ **aaa group server tacacs+** ώ TACACS+ Â

TACACS+ Ł ϰ è Ł ϰ ϩ ϭ ˇ ϫ ώ ЮΐΟ **tacacs-server host** ƕ ϥ Ł ϰ Â

Ł ϰ è TACACS+ Ł ϰ ϩ ϭ ˇ У э Ł ϰ : ˇ ˛ ϳ Ю У э Ł ϰ ч Â

ð w R Ô

Ю R У э ϳ й tac1 TACACS+ Ł ϰ ˇ з ϫ è У э 1.1.1.1 TACACS+ Ł ϰ ϩ ϭ'

```
Ruijie(config)# aaa group server tacacs+ tac1
Ruijie(config-gs-tacacs+)# server 1.1.1.1
```

ð ΐΩƕ ϥ Ô

ƕ ϥ	
aaa group server tacacs+	TACACS+ Ł ϰ
ip vrf forwarding	TACACS+ Ł ϰ VRF ϳ

11.1.3 ip vrf forwarding(TACACS+)

ƕ ϡ TACACS+ ᛒ ᛯ ᴳ vrf ᛇ (VRF ᚫ ƕ ϡ) Â

Ὼ ἦ ὤ ħυ ҙ ৭ ˊ ע TACACS+

ð ѡ R Ô

ЮO R ЊЖ У ə TACACS+ ŏ Ł Ы ў '

```
Ruijie(config)# tacacs-server host 192.168.12.1
```

ð ΐΩЪυ ϡ Ô

Ъυ ϡ	
aaa authentication	ЊЖ AAA ` "
tacacs-server key	ŏ ЊЖ TACACS+ ŏ Ł Ы ΐΩ м ϟ ϡ
tacacs-server timeout	ŏ ЊЖ TACACS+ Ł Ы : Ы

11.1.6 tacas-server key

Ъυ ϡ TACACS+ ŏ Â

tacacs-server key [*0* | *7*] *string*

no tacacs-server key

ð ϟ Ô

string ΐΩ м ϟ ϡ

0 | *7* ϟ ϡ ╗ ص˘ 0 ╗ ˘ 7 ´ ╗ Â

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ΐΩ м ϟ ϡ Â

ð Ъυ ϡ Ô

ŏ Â

ð G ´ Ô

ΐΩ м ϟ ϡ Ո TACACS+ ŏ Ł Ы ə ѫ Â ѝ ѽ G Ո TACACS+ ŏ Ł Ы ə˘ ѧ Ո TACACS+ ŏ Ł Ы Э ЊЖ ˩ ΐΩ м ϟ ϡ Â т ѝ э Ł Ы a ˩ G˘ т G tacacs-server host Ъυ ϡ è key ˘ ˩ Л ŏ key Ł Ы У э key Â

ð ѡ R Ô

ЮO R ЊЖ TACACS+ ŏ Ł Ы ΐΩ м ϟ ϡ ѝ aaa'

```
Ruijie(config)#tacacs-server key aaa
```

ð ΐΩЪυ ϡ Ô

Ъυ ϗ	
tacacs-server host	Ѭ TACACS+ ѽ Ь Ы ў
tacacs-server timeout	Ѭ TACACS+ Ы

11.1.7 tacacs-server timeout

Ъυ ϗ б TACACS+ Ь Ы ˘ Ь Ы ѽ Â

tacacs-server timeout *seconds*

no tacacs-server timeout

ð ϟ Ô

seconds ' ˆ ´ Æ й ˜ Â ˩ h ىت й 1-1000 Â

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G Ъυ ϗ ! Â τ й э Ь Ы a ˩ ˘ G tacacs-server host Ъυ ϗ è timeout ˘ ˩Л ѽ timeout Ь Ы У э timeout Â

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11.2.1 debug tacacs+

TACACS+ ˜Ω Â ƕ ʒ no ˜Ω TACACS+ ˜Ω Â

debug tacacs+

no debug tacacs+

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EXEC Â

11.2.2 show tacacs

Ո ٨ TACACS+ Ꮂ ϗ Ꮋ ц ą Â

show tacacs

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ᴳ ƕ ʒ Ո ٨ TACACS+ Ꮂ ϗ Ꮋ ц ą Â

ð ᴡ ᴿ Ô

```
Ruijie# show tacacs
Tacacs+ Server : 172.19.192.80/49
Socket Opens: 0
Socket Closes: 0
Total Packets Sent: 0
Total Packets Recv: 0
Reference Count: 0
```

ð ˜Ωƕ ʒ Ô

ƕ ʒ	

tacacs-server host	ϧϞ Ω ϳ TACACS+ Ε Ϫ Ή ϯ ϙ ϖ Ε Ϫ ў

΄ γ RADIUS Ƕ ȝ

12.1 RADIUS G5ȝGQ

RADIUS ↑ ЛЬЮ ˜ΏǶ ȝ'

- z **ip radius source-interface**
- **z radius-server attribute 31**
- **z radius-server host**
- **z radius-server key**
- **z radius-server retransmit**
- **z radius-server timeout**
- **z radius-server dead-time**
- **z radius attribute**
- **z radius set qos cos**
- **z radius vendor-specific extend**

12.1.1 ip radius source-interface

radius ѫѕ ˇ ώ Ƕ ȝ **ip radius source-interface** Â
Ƕ ȝ **no** ǂ RADIUS ѫѕ Â

ip radius source-interface *interface*

no radius source-interface

ð ϟ Ô

Interface' radius ѫѕ ϟ

ð ą Ô

radius ѫѕ Â

ð Ƕ ȝ Ô

ώ Â

ð ᴳ ´ Ô

и ф ˜ ѫ radius Ь Ж Э nas ą ɔ ˇ ˩ Л Ƕ ȝ
radius ѫѕ Â Ƕ ȝ ϟ У э ip ѫѕ ɔ и radius ѫѕ
ˇ Ƕ ȝ ѫ Ь ᴳ Â

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ð ΩƕɮÔ

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radius-server host	ƗŦ RADIUS Ł ɭ

12.1.3 radius-server host

RADIUS ŏ Ł ɭ ў ˘ ŏ ƕ ɮ **radius-server** Â ƕ ɮ

radius-server key	ƾ RADIUS ώ Ɛ ɻ ΏѪ ˄ ϡ
radius-server retransmit	ƾ RADIUS ˅
radius-server timeout	ƾ RADIUS ɻ

12.1.4 radius-server key

ƾ Ɛ ɻˆ ˜ б RADIUS ώ Ɛ ɻ ə ΏѪ ˄ ϡ˘
ώ Ƕ ϡ **radius-server key** Â Ƕ ϡ no ˅ ΏѪ ˄ ϡ Â

radius-server key *text-string*

no

ƫ ʒ **radius-server retransmit** Â ƫ ʒ **no** ٩ Â

radius-server retransmit *retries*

no radius-server retransmit

ð ٩ Ô

retries' RADIUS ٩ Â

ð ą Ô

٩ ŕ 3 Â

ð ƫ ʒ Ô

ŏ Â

ð G ´ Ô

AAA ج G ЮУ ə ɱ ɱ ŏ Ŀ ٨ ٩ Â
" ŏ Ŀ ٨ ٩ ñ ŏ Ŀ ٨ ج ٩ RADIUS
ƙ ˘ ٩ ʓ Â

ð w R Ô

Ю R ٩ ŕ 4'

```
Ruijie(config)# radius-server retransmit 4
```

ð ΩƫʒÔ

ƫ ʒ	
radius-server host	ƕ RADIUS ŏ Ŀ ٨ ў
radius-server key	ƕ RADIUS Ω ɱ ٩ ʒ
radius-server timeout	ƕ RADIUS ٨

12.1.6 radius-server timeout

٩ RADIUS ŏ Ŀ ٨ ˘ ŏ ƫ ʒ
radius-server timeout Â ƫ ʒ **no** ˘ ƕ Â

radius-server timeout *seconds*

no radius-server timeout

ð ٩ Ô

seconds' ^ ´ Æ ŕ ~ Â ٩ ƕ ت ŕ 1-1000 Â

ð ą Ô

5

ð Ϸ ϟ Ô

ώ Â

ð G ´ Ô

G Ϸ ϟ ϟ Â

ð w R Ô

Ю R Ϸ й 10 '

```
Ruijie(config)# radius-server timeout 10
```

ð ΄Ωϟ ϟ Ô

Ϸ ϟ	
radius-server host	Ϸ RADIUS ώ Ь ў
radius-server retransmit	Ϸ RADIUS ϟ
radius-server key	Ϸ RADIUS ΄Ω м ϟ ϟ

12.1.7 radius-server deadtime

ϟ Л˘ ж t тп ф ǂ ы ˘ ‡ й Ь Ы ъ˘ t й
ъ ^ deadtime˜˜ RGOS ɔ RADIUS ъ ˘
ώ Ϸ ϟ **radius-server deadtime** Â Ϸ ϟ **no** ˘ ή Â

radius-server deadtime *minnutes*

no radius-server deadtime

ð ϟ Ô

minnutes ъ ^ ´ Æ й ǂ ˜ Â ϟ ή тп й 1-1000 Â

ð ϙ Ô

5ǂ

ð Ϸ ϟ Ô

ώ Â

ð G ´ Ô

G Ϸ ϟ ϟ Â

ð w R Ô

Ю R ъ Ϸ й 10ǂ '

```
Ruijie(config)# radius-server deadtime 10
```

ð ΄Ωϟ ϟ Ô

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

α

id	Ⅱ	type
1	max down-rate	76
2	qos	77
3	user ip	3
4	vlan id	4
5	version to client	5
6	net ip	6
7	user name	7
8	password	8
9	file-diractory	9
10	file-count	10
11	file-name-0	11
12	file-name-1	12
13	file-name-2	13
14	file-name-3	14
15	file-name-4	15
16	max up-rate	75
17	version to server	17
18	flux-max-high32	18
19	flux-max-low32	19

ЮО R'

```
Ruijie(config)# radius set qos cos
```

ð ΐΩђυ ϗ Ô

ђυ ϗ	
radius vendor-specific extend	Radius ϧ a ϣ ⁞ ˝ ك id

12.1.10 radius vendor-specific extend

ϧ a ϣ ⁞ ˝ ك id Â

radius vendor-specific extend

no radius vendor-specific extend

ð ϒ Ô

ð ϙ Ô

ϡ ⁞ Ν ˝ ك id

ð ђυ ϗ Ô

ώ Â

ð G ´ Ô

G ђυ ϗ ϡ ˝ ك id صر ⁞ Â

ð ϣ R Ô

ЮО R'

```
Ruijie(config)# radius vendor-specific extend
```

ð ΐΩђυ ϗ Ô

ђυ ϗ	
radius attribute	صر Ν
radius set	qos ΐ΄ G cos

12.2 RADIUS (MϘ

- **debug radius** [**event | detail**]
- **show radius server**

z **show radius parameter**

z show radius vendor-specific

12.2.1 debug radius

RADIUS ΅Ω Â Ϸ ϗ no ΅Ω RADIUS ΅Ω Â

debug radius [**event | detail**]

no debug radius [**event | detail**]

ð ϒ Ô

ϒ ΅Ω Â

ð Ϸ ϗ Ô

EXEC Â

12.2.2 show radius server

RADIUS Ε ϰ ϙ Â

show radius server

ð ϒ Ô

Â

ð ϙ Ô

ð Ϸ ϗ Ô

Â

ð G ΄ Ô

G Ϸ ϗ radius Ε ϰ ϙ Â

ð w R Ô

```
Ruijie# show radius server
server ip : 192.168.4.12
acct  port: 23
authen  port: 77
server state: ready
server ip : 192.168.4.130001 Tc 3.989 -2.114 Td(Ruijie# )Tj/TT5 1 Tf4.
```

ð ΅Ωƫ ɻ Ô

ƫ ɻ	
radius-server host	ƙ RADIUS ŏ Ŀ ɭ ў
radius-server retransmit	ƙ RADIUS ٬
radius-server key	ƙ RADIUS ΅Ω ɱ ٩ ɻ
radius-server timeout	ƙ RADIUS

12.2.3 show radius parameter

RADIUS Ŀ ɭ ŏ ٩ Â

show radius parameter

ð ٩ Ô

12.2.4 show radius vendor-specific

RADIUS صر Â

show radius vendor-specific

ð ϡ Ô

Â

ð ɑ Ô

ð ƕ ϡ Ô

Â

ð G ´ Ô

G ƕ ϡ radius صر

ð w R Ô

```
Ruijie# show radius vendor-specific
id    vendor-specific       type-value
----- -------------------- ----------
1     max down-rate         76
2     qos                   77
3     user ip                3
4     vlan id                4
5     version to client      5
6     net ip                 6
7     user name              7
8     password               8
9     file-diractory        9
10    file-count             10
11    file-name-0            11
12    file-name-1            12
13    file-name-2            13
14    file-name-3            14
15    file-name-4            15
16    max up-rate            75
17    version to server      17
18    flux-max-high32        18
19    flux-max-low32        19
20    proxy-avoid            20
21    dailup-avoid           21
22    ip privilige           22
23    login privilige        42
24    limit to user number   50
```

ð ΐΩħυ ϗ Ô

ħυ ϗ	

radius-server host

ˊ Ь SSH ƕ ়

13.1 SSH G5B̀GQ

SSH ᛏ ЛЮƕ ়'

- crypto key generate
- crypto key zeroize
- ip ssh version
- ip ssh time-out
- ip ssh authentication-retries
- transport input

13.1.1 crypto key generate

Ŀ ӆ Ώ῎Ώ ˘ ῴ Ю̆ ƕ ়'

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

ð ֈ Ô

ֈ	

zeroize ƕ ʒǂ Â

ð ʬ ᴿ Ô

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

ð ʺΩƕ ʒ Ô

ƕ ʒ	
show ip ssh	SSH Server ɱɲ ə Â
crypto key zeroize {**rsa	dsa**}	ǂ DSA ϭ RSA ˘ ʺΩ SSH Server ╖ Â

ð Ô

˚ RGOS10.1 Л Э

13.1.2 crypto key zeroize

ǂ SSH Ł ʯ Ώ″Ω ˘ ﻩ ώ ƗƠ ƕ ʒ'

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

ð ˥ Ô

˥	
rsa	ǂ RSA
dsa	ǂ DSA

ð Ô

ð ƕ ʒ Ô

ώ

ð ᴳ ˊ Ô

ƕ ʒ ǂ Ł ʯ Ώ″Ω Â ǂ Л˘ SSH Server ϰ ϰ DISABLE Â ʺΩ SSH Serverˇ **no enable service ssh-server** ƕ ʒ Â

ð ʬ ᴿ Ô

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

Ὼ ἦ ὦ ϧυ ϛ ϟ

13.2 SSH /ąQ

SSH ᛏ ЛЬЮƕ ᛍ'

- z **show ip ssh**
- **z show ssh**
- **z show crypto key mypubkey**
- **z disconnect ssh**

13.2.1 show ip ssh

13.2Ih

˚ RGOS10.1 Л Э

13.2.2 show ssh

SSH э ą Â

show ssh

ð ϒ Ô

ð Ô

ð Ƕ ǯ Ô

ð ᴳ ´ Ô

SSH ą Â ↑ ' ´ VTY Л à SSH à ╗ à à à ⅄ Â

ð ᴡ ᴿ Ô

Ruijie# **show ssh**

ð ΏǶ ǯ Ô

ð Ô

˚ RGOS10.1 Л Э Â

13.2.3 show crypto key mypubkey

SSH Server ΏΏ Ώ ǂ ą Â

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

ð ϒ Ô

ϒ	
rsa	RSA Ώ ǂ
dsa	DSA Ώ ǂ

ð Ô

ð ƕ ɀ Ô

ð G ´ Ô

SSH Server ΏΏ Ώ ǂ ą Â ↑ '
à ɻ à Ώ ǂ ą Â

ð ш R Ô

Ruijie# **show crypto key mypubkey rsa**

ð ΏƕɀÔ

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

ð Ô

˙ RGOS10.1 Л Э

13.2.4 disconnect ssh

SSH ˛ Â

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

ð ɳ Ô

ɳ	
session-id	SSH ˛ Л Â

ð Ô

ð ƕ ɀ Ô

ώ SSH ˛ Л˘ SSH Â ώ VTY
˛ Л˘ SSH Â ɲ SSH ص Â

ð ш R Ô

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

ð ΏƕɀÔ

Ƕ ɀ	
show ssh	SSH ˚ ə Â
Clear line vty *line_number*	ɱ VTY ˚ Â

ð Ô

˚ RGOS10.1 Л ъ Э Â

ˉ ني IP Accounting ԋ ϡ

14.1 IP Accounting G5ᚱ

14.1.1 ip accounting

ᴈ ϟ ЮˇG ԋ ϡ G ϟ IP Accounting ╖ ˇ G ԋ ϡ no ϟ IP Accounting ╖ Â

ip accounting {ingress | egress} list *acl_list_number*

no ip accounting {ingress | egress} < list *acl_list_number* **>**

ð ϟ Ô

acl_list_number … ACL ID Â

ð Ô

ɣ ﾉ ɜ ϟˇ ᷉Ω

ð ԋ ϡ Ô

ϟ

ð G ´ Ô

IP Accounting ╖ ᴈ ϟ ώ ﾉ Ɔ ˇ ᴝ G IP Accounting ╖ ϟ Ո ﾉ’ ﾉ ˇ ᴈ G IP Accounting ╖ ﾉ ˇ ﾉ Ո У ɜ ᛁ ‡ˇ ﾉ ‡ Ո a ﾉ ‡ ᛁ ⁞ Â

ð w R Ô

Ю R ¦ ϟ gi0/1 IP Accounting ╖ Â

```
Ruijie(config)# conf t
Ruijie(config)# interface gi0/1
Ruijie(config-if)# ip accounting egress list 10
```

ð ᷉Ωԋ ϡ Ô

ԋ ϡ	
show ip accounting config	ϟ IP Accounting ə

14.1.2 clear ip accounting

ѫ ӇӦ ˠ ԋ ϗ ϟ IP Accounting ə ˆ Â

clear ip accounting interface *interface-type interface-number* **{ingress | egress}**

ð ϟ Ô

interface-type ϟ ϴ´ ص

ϼ o

Ӈ ≠ Ô **4ƎuϾÄ**

Dz

interface-type ϰ ϰ ص

interface-number ϰ ϰ ϱ

ð Ô

ð ƕ ϡ Ô

ϰ

ð ϶ ˊ Ô

΅ ώ ϰ ˘ ώ/ ˘ ϧ / a ϧ IP Accounting ą ˘

ð ϣ ᴿ Ô

```
Ruijie# config terminal
Ruijie(config)# interface gigabitEthernet 0/1
Ruijie(config-if)# show ip accounting interface gigabitEthernet
0/1 ingress interior
```

ð ΅Ωƕ ϡ Ô

ƕ ϡ	
clear ip accounting	è ϰ IP Accounting ą

14.2.2 show ip accounting config

ج ΗΌ ᴳ ƕ ϡ ϰ IP Accounting ą Â

show ip accounting config

ð ϰ Ô

ð Ô

ð ƕ ϡ Ô

ð ϶ ˊ Ô

ƕ ϡ ᴳ ϖ IP Accoounting ϰ Â

ð ϣ ᴿ Ô

```
Ruijie# show ip accounting config
GigabitEthernet 0/1
```

```
  ip accounting ingress list 20
GigabitEthernet 0/1
  ip accounting egress list 10
```

ð ΐΩƅυ ϗ Ô

ƅυ ϗ	
ip accounting {ingress | egress} list acl_list_number	G ϟ IP Accounting ╖

Ω ɟ

ƕ ʒ	ʅ Â
G	ɻ ʅ UP ˇ ת ɻ ˇ Â ɻ Л υ ŭ ɖ ╗ ˇ ʅ ɻ Â

w R	R 1' ح interface tunnel 1 ʅ˘ ɖ ╗ ˇ ɻ й 3 ˇ й 5 Â
	`Ruijie(config)# interface tunnel 1`
	`Ruijie(config)# keepalive 3 5`

˜Ωƕ ʒ	ƕ ʒ	
	show interface tunnel	tunnel ʅ Â

ɻ	
ƕ ʒ ˥ ɻ	ʃ ʅ

15.1.2 tunnel checksum

ح ʅ ЮG **tunnel checksum** ƕ ʒ ɖ turnnel ʅ ˇ G ƕ ʒ no ɻ Â

tunnel checksum

no tunnel checksum

ʅ	ʅ	
	-	-

	a .
ƕ ʒ	ʅ Â
G	ƕ ʒ ʅ ɣ GRE˜ Generic Route Encapsulation˜ ʅ˘ ɸ ˜ ح ╗ ώ ϖ ӯ ╟ ╗ checksum Â tunnel ʅ ≠ ṁ checksum ˇ ж x Â
w R	R 1' ح tunnel 0 ʅ Э checksum ƕ ʒ . `Ruijie(config)# interface tunnel 0`

Ruijie(config-if)# **tunnel checksum**

ˇΩƕ ǯ

ƕ ǯ	
show interface tunnel	tunnel ʎ ˇΩ ǫ

ɻ

ɣ Э Â a Â

ƕ ǯ ˥ ɻ

ʃ	
-	-

15.1.3tunnel destination

ж ʎ Ю G **tunnel destination** ƕ ǯ й tunnel ʎ
ˇфѕж G ƕ ǯ no ǂ tunnel ʎ фѕж Â

tunnel destination *ip-address*

no tunnel destination

ʅ

ʅ	
ip-address	IP фѕж

й фѕж Â

ƕ ǯ

ʎ Â

G

ƕ ǯ ˇфѕж Э ˘ Â

ш R

R 1' ж tunnel 0 ʎ Э IP фѕж 61.154.101.3'

```
Ruijie(config)# interface tunnel 0
Ruijie(config-if)# tunnel destination 61.154.101.3
```

ˇΩƕ ǯ

ƕ ǯ	
show interface tunnel	tunnel ʎ ˇΩ ǫ

ɻ

ƕ ǯ ˥ ɻ

ʃ	
-	-

15.1.4tunnel key

ǰ tunnel ƞ ŵ ˘ **tunnel key** ƫ ǯ У ə ˘ G ƫ ǯ no ǐ Â

tunnel key *value*

no tunnel key

ƞ	ƞ	
	value	tunnel ĥ˘ ƙ ĥ ǰ ƭ 0-4294967295 Â
	˙ ¡ Â	
ƫ ǯ	ƞ Â	
G	У ҷ ɖ ˘ ɻ ƙǐ ώ φ Â ف ɖ Â **tunnel key** ƫ ǯ ƙ ǰ GRE ɻ Ʌ Â	

ẇ R	R 1' ǰ tunnel 0 ƞ è 1234'
	`Ruijie(config)# interface tunnel 0`
	`Ruijie(config-if)# tunnel key 1234`	

˜Ωƫ ǯ	ƫ ǯ	
	show interface tunnel	tunnel ƞ ˜Ω ə

ƙ	Â

ƫ ǯ ˥ ƙ	ƾ	
	-	-

15.1.5tunnel mode

ǰ tunnel ƞ è ƫ ǯ **tunnel mode**˘ G ƫ ǯ no Â

tunnel mode {

Ω ɟ

G	ϧ ϕ ϟ ϰ Â Э ϟ ϫ ϟ Â ϫ a ↑ ˘ ш : Â ϧ ϖ Э ϟ ˘ RGOS ˚ ╟ ╖ Â ϙ Ю˘ ϰ ї 4 Â ϟ Л Ħυ ϟ g ḣ Â Ħυ ϟ ϧ ϕ ϰ Â

w R	R 1' interface tunnel 1 GRE 8 ϧ 5 Â Ruijie(config)# **interface tunnel 1** Ruijie(config)# **tunnel nested-limit 5**

ΏĦυ ϟ		
	Ħυ ϟ	
	show interface tunnel	tunnel ϰ Â

ϰ	
	ϫ ϟ ϱ ˘ ϟ ϱ a

Ħυ ϟ ϒ ϟ		
	ϰ	

15.1.7tunnel path-mtu-discovery

ϧ ϰ Ю G Ħυ ϟ **tunnel path-mtu-discovery** PMTUD ╖ ˘ G Ħυ ϟ no Â

tunnel path-mtu-discovery [**age-timer** {*aging-mins* | **infinite** } |

min-mtu *mtu-bytes*]

no tunnel path-mtu-discovery

ϰ		
	ϰ	
	age-timer	^ ϟ ~ ϰ MTU ϫ ˘ ˘ ˚ ϟ MTU' *aging-mins* ϫ ˘ تن 10-30↑ ˘ ḣ ϋ 10↑ ' infinite' MTU ϫ ϫ Â
	min-mtu	^ ϟ ~ ϰ ϟ PMTUD MTU Ю
	mtu-bytes	MTU Ю ˘ تن 92-65535 ˘ ḣ ϋ 92

	ϧ IP a PMTUD ╖ Â

Ħυ ϟ	
	ϰ Â

G	˜ ʃ ʅ ¸ ʎ MTU˘ ǂ ˘ . G IP è ɷ DF˜ Don't Fragment˜ Æ ÂRGNOS ج ʎ Ю k ɷ **tunnel path-mtu-discovery** ƕ ȝ˘ ╟ ↑ PMTU˘ tunnel ʎ mtu ˘ ÿ ȯ ǂ Â

w R	R 1' ج tunnel 0 ʎ Э PMTUD ╖
	`Ruijie(config)# interface tunnel 0`
	`Ruijie(config-if)# tunnel path-mtu-discovery`

˜Ωƕ ȝ

ƕ ȝ	
show interface tunnel	tunnel ʎ ˜Ω ə

ʅ

Â

ƕ ȝ ˥ ʅ

ʃ	

15.1.8tunnel source

ج ʎ Ю G **tunnel source** ƕ ȝ tunnel ʎ فذ سم˘ G ƕ ȝ no ǂ tunnel ʎ فذ سم Â

tunnel source { *ip-address* | *interface-type interface-number* }

no tunnel source

ʎ

ʎ	
ip-address	tunnel فذ سم IP فذ سم˘ ج ⅄ Э è ʎ IP فذ سم Â
interface-type	ʎ صر˘ R ' s ʎ Async à ʃ ʎ Dialer à Л ʎ Ethernet à Л ʎ FastEthernet à Loopback ʎ à Null ʎ à Л ˥ è Tunnel ʎ Â
nterface-number	ʎ ʃ

فذ سم Â

ƕ ȝ ʎ Â

G G tunnel ʎ˘ فذ سم Â

ɯ R

ᴿ 1' ج tunnel 0 ʎ Э Ƕ ɀ **tunnel source** s ʎ 1/0 ŷ فخ سم ʎ

```
Ruijie(config)# interface tunnel 0
Ruijie(config-if)# tunnel source serial 1/0
```

ˇΩƶ ɀ

Ƕ ɀ	
show interface tunnel	tunnel ʎ ˇΩ ą

ʎ

ƶ ɀ ˥ ʎ

ʎ	
-	-

15.1.9tunnel tos

ج tunnel ʎ Ю · ˜ IPv4 ToS ˇ IPv6 traffic class 8 э Â

tunnel tos [*num*]

no tunnel tos

ʎ

ʎ	
num	· ˜ IPv4 ToS ḣˇ IPv6 traffic class 8 э ḣ Âʎ ḣ تن 0˙ 255 Â

ą б ˇ IPv4 ˜ ˇ ‡ ą IPv4 tos ǀ IPv4 Â ą б ˇ IPv6 ˜ ˇ ‡ ą IPv6 traffic class8 ǀ IPv6 Â è ы ą˘ IPv4 tos / IPv6 traffic class, ŷ 0 Â

Ƕ ɀ ʎ Â

G

ɯ R

ᴿ 1' interface tunnel 1 GRE ˜ ToS 20˝ γ ⁸ 00010100 Â

```
Ruijie(config)# interface tunnel 1
Ruijie(config)# tunnel tos 20
```

ˇΩƶ ɀ

Ƕ ɀ	
show interface tunnel	tunnel ʎ Â

tunnel vrf [*vrf-name*]

no tunnel vrf

ϟ	ϟ	
	vrf-name	· ˜ IPv4 G VRF ɻ Â
	IPv4 G ŏ VRF ˘ ɬ Â	
Ƅ ɂ	ϟ Â	
G	IP б IP˘ ج ɻ У э VRF Â VRF è˘ IP ɻ ˘ ӂ э ϟ down Â	

w R	R 1' interface tunnel 1 GRE IPv4 ¦ VRF blue è Â
	`Ruijie(config)# **interface tunnel 1**`
	`Ruijie(config)# **tunnel vrf** *blue*`	

ˇΏƄ ɂ	ɜ¦ ℍ	

Â

ħυ ʒ

Â

G

˘ ϒ ΈΩ ɷ GRE ˘ a ÿ show running ɋ è ϒ¦ Â G ħυ ʒ. ˩ Â

w R

R 1' ɷ GRE ˘ ΠυϤ ϗ ə Â

```
Ruijie# show tunnel gre
Tunnel1:
Mode:GRE/IP, Destination 192.168.2.2, Source vlan 100
```

ΈΩħυ ʒ

ħυ ʒ	
show interface tunnel	tunnel ϒ Â

˩

ϗ	

ħυ ʒ ˥ ˩

ˉ Ώ Ƕ ȝ

16.1 G5ƥGǪ

ˆ ǖ ЛЬЮǶ ȝ'

- acpp
- arp-car
- control-plane
- ef-rnfp
- glean-car
- management-interface
- port-filter
- scpp

16.1.1 acpp

è ⁸ ɖ ˆ ACPP˜˜ ₰ control-plane Ю ᴳ Ƕ ȝ acpp

ᴳ Ƕ ȝ no ǂ acpp ‡

acpp bw-rate *rate* **bw-burst-rate** *burst-rate*

no acpp

ʎ	
rate	⁸ˆ ´ Æ и pps˜
burst-rate	↓ ⁸ˆ ´ Æ и pps˜

ɋ Ю˘ ACPP Â

Ƕ ȝ control-plane ˘ ↓ Л ₰ Ь э ʎ

ᴳ Â

w R	R 1' ΛυЮ R ˘ н Ь й 200pps˘ ї ϟ ή й 300pps˙ Ruijie(config)# control-plane data Ruijie(config-cp)# acpp bw-rate 200 bw-burst-rate 300

ΏΗυ ϗ		
	Ruijie(config)# control-plane [protocol | manage | data]	ώ control-plane ˘ ϟ Λυ ώ ϟ

ϟ

Ηυ ϗ ϒ ϟ		
	-	-

16.1.2 arp-car

ί ARP ˘ ARP-CAR ˘ ج control-plane ЮG Ηυ ϗ arp-car

G Ηυ ϗ no ΐ arp-car ‡

arp-car *packet_rate_per_group*

no arp-car

ϟ		
	packet_rate_per_group	ή ΄ Æ й pps˜

	ą ЮЎ ARP-CAR Â
Ηυ ϗ	control-plane ˘ ϟ ج ϟ
G	Â
w R	R 1' ΛυЮ R ˘ ج ϟ Э˘ ΰ ί ϟ У э ˆ ˜ ϟ ARP й 10pps˙ Ruijie(config)# control-plane manage Ruijie(config-cp)# arp-car 10

ΏΗυ ϗ		
	Ruijie(config)# control-plane [protocol | manage | data]	ώ control-plane ˘ ϟ Λυ ώ ϟ

ϰ	
Ͱυ ϗ ϒ ϰ	

ϰ	
-	-

16.1.3 control-plane

ώ control-plane ˘ ϧ Ϡ G Ͱυ ϗ control-plane

G exit control-plane

control-plane [**protocol** | **manage** | **data**]

ϰ	ϰ	
ϰ	protocol	ώ ˜ 8 ϰ
	manage	ώ ϰ
	data	ώ н Ꝉ ϰ

Ͱυ ϗ	ὥ
G	˙ ¡ ϰ ώ control-plane ϧ Ϡ ΰ ‡ ΎΩ
ϣ R	R 1' ΛυЮ R ˘ ώ control-plane ˘ ώ ˜ 8 ϰ' `Ruijie(config)# control-plane protocol` `Ruijie(config-cp)#`

ΎΩͰυ ϗ	Ͱυ ϗ	
	-	-

ϰ	
ϰ	Â

Ͱυ ϗ ϒ ϰ	ϰ	
	-	-

16.1.4 ef-rnfp

ᴳ ‡ Ո ŏ ˇ ᒧ Ո ᴳ Ƕ ɂ ef-rnfp enable

ˁΩ ‡ˇ ᒧ Ո ᴳ Ƕ ɂ ef-rnfp disable

ef-rnfp enable

ef-rnfp disable

ϟ	
-	-

ϙ ЮˇǶ

Ƕ ɂ control-plane

ᴳ

ᵂ ᴿ

ᴿ 1' ՈЮ ᴿ ˇ ˁΩ ‡'

```
Ruijie(config)# control-plane
Ruijie(config-cp)# ef-rnfp disable
```

ˁΩƶ ɂ

Ƕ ɂ	
Ruijie(config)# control-plane [protocol | manage | data]	ώ control-plane ˇ ᒧ Ո ώ ϟ

ᒧ

Ƕ ɂ ˥ ᒧ

ᒧ	
-	-

16.1.5 glean-car

ᒧ ˩ ǂ ת IP ˇ

Glean-CAR ˇ ֵ control-plane ЮᴳƶǶ ɂ glean-car

ᴳ Ƕ ɂ no ǂ glean-car ‡

glean-car *packet_rate_per_group*

no glean-car

ϟ	ϟ	
	packet_rate_per_group	ḣˆ ´ Æ ѝ pps˜

ą ЮЎ Glean-CAR Â

ħυ ʒ control-plane ˘ ϟ ѫ н Ь ϟ

G Â

ѡ R R 1' ЛЬЮ R ˘ Ѵ ἦ ˩ У э ˆ ˜ ч ך ἦ Glean ѝ 10pps'

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

ʔΩħυ ʒ

ħυ ʒ	
Ruijie(config)# **control-plane** [**protocol** | **manage** | **data**]	ώ control-plane ˘ ˩Лъ ώ ϟ

˩ Â

ħυ ʒ ך ˩

ʎ	
-	-

16.1.6 management-interface

ɖ ˆ MPP˜ ╖ ї ˜ У э э ϟ ѝ ᾳ ϟˆ ї ˘ ϟ ч н Ь ϟ˜ Â ὗ ȹ MPP ╖ Лъ ʎ˘ ϟ ᾳ ϟ ї ˜ Â MPP ˘ ѫ control-plane Ю G ħυ ʒ management-interface

G ħυ ʒ no ῑ ᾳ ϟ

management-interface *interface* **allow** {**ftp** | **http** | **https** | **ssh** | **snmp** | **telnet** | **tftp**}

no management-interface *interface*

ϟ	ϟ	
	Interface	ϟ ˆ ϟ ˜

ą ЮЎ MPP ╖ ʔΩ

Ϸ ϗ	control-plane ΅ ϗ ϫ ϗ

Ὼ ᾽ ὅ ὧ ᾗ ᾔ ῀ ᾕ Tunnel ᾖ

ɲ Э TCP ˜ ˇ й 100pps˘ ǐ ɥ ĥ й 150pps˙ ǐ
й 30 э˘ й 5 э ˇ ɥ й 7 э '

```
Ruijie(config)# access-list 100 permit tcp 192.168.52.0 0.0.0.255
any
Ruijie(config)# control-plane manage
Ruijie(config-cp)# scpp list 100 bw-rate 100 bw-burst-rate 150
conn-total 30 conn-create-rate 5 conn-create-burst-rate 7
```

/ˊ |C

```
Aggregate control plane protection information:  //ACPP    Ո
ą
  Data subinterface: enable
    RULE:
      bandwidth rate limit: 20(pps), burst: 30(pps)
          STATISTIC:
      dropped 0 packets
  Manage subinterface: enable
    RULE:
      bandwidth rate limit: 1000(pps), burst: 2000(pps)
    STATISTIC:
      dropped 0 packets
  Protocol subinterface: disable
Segregate control plane protection information:  //SCPP    Ո
ą
  Data subinterface: disable
  Manage subinterface: enable
    RULE: acl: 1, id: 1011a4f
      bandwidth rate limit: 20(pps), burst: 300(pps)
     STATISTIC:
      bandwidth rate limit dropped 0 packets
    TOTALLY dropped 0 packets
  Protocol subinterface: disable
ARP CAR information: //ARP-CAR    Ո    ą
  Manage subinterface: enable
    RULE:
      allow packet rate per source: 30(pps)
        STATISTIC:
      dropped 181 packets
Glean CAR information:   //Glean-CAR    Ո    ą
  Data subinterface: disable
Port Filter information:
  Manage subinterface: disable
Management plane protection information:  //MPP    Ո    ą
  Manage subinterface: disable


--------------------------------------------------
```

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ɻ

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	-	-

RGOS™ 1
QOS 1
1.1 QOS 1
1.1.1 bandwidth (policy-map class) 2
1.1.2 class (policy-map)

1.1.40 random-detect dscp-based 40
1.1.41 random-detect prec-based 41
1.1.42 random-detect precedence 42
1.1.43 random-detect exponential-weighting-constant 43
1.1.44 service-policy 44
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1.1.47 shape average 46
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1.1.50 traffic-shape group 49
1.1.51 traffic-shape rate 50
1.2 51
1.2.1 show class-map 51
1.2.2 show ip rtp header-compression 52
1.2.3 show ip tcp header-compression 53
1.2.4 show rate-limit 53
1.2.5 show policy-map 54
1.2.6 show queue 60
1.2.7 show traffic-shape 61
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- **queue-limit**
- **queue-list default**
- **queue-list interface**
- **queue-list protocol**
- **queue-list queue byte-count**
- **queue-list queue limit**
- **rate-limit**
- **random-detect**
- **random-detect dscp**
- **random-detect dscp-base**
- **random-detect prec-based**
- **random-detect precedence**
- **random-detect exponential-weighting-constant**
- **service-policy**
- **set ip dscp**
- **set ip precedence**
- **shape average**
- **shape peak**
-

bandwidth { *bandwidth-kbps* | **percent** *percent*}

no bandwidth

bandwidth-kbps (Kbps)

percent

Policy-map class

( )

1%

CBWFQ

, "polmap6" "acl22", 2000 kbps

```
policy-map polmap6
class acl22
bandwidth 2000
queue-limit 30
```

1.1.2 class (policy-map)

no

class *class-name*

no class *class-name*

class-name

Policy-map

Policy-map

CBWFQ

64

CBWFQ

, "1" "acl120" "acl121" "acl120" 600kbps CBWFQ 64( ) "acl121" 30% CBWFQ 40

```
policy-map 1
class acl120
bandwidth 600
class acl121
bandwidth percent 30
queue-limit 40
```

1.1.3 class-map

no

class-map *class-map-name* [**match-all | match-any**]

no class-map *class-map-name* [**match-all | match-any**]

class-map-name

match-all | match-any

class-map class-map

class-map

CBWFQ

class-map RGOS :

- **match access-group**
- **match input-interface**
- **match protocol**
- **match ip dscp**
- **match ip precedence**
- **match not match-type value**

class-map (match-rule)

access-list 101

class-map class1 CBWFQ

```
class-map match-all class1
match access-group 101
```

1.1.4 custom-queue-list

custom-queue-list

no

custom-queue-list [*list-number*]

no custom-queue-list [*list-number*]

list-number 1~16

```
Ruijie# debug qos cq
```

1.1.6 debug ip rtp

debug ip rtp rtp
no rtp

debug ip rtp { **header-compression | error** }
no debug ip rtp { **header-compression | error** }

header-compression rtp
error rtp

rtp

rtp

```
Ruijie# debug ip rtp header-compression
```

1.1.7 debug ip tcp

debug ip tcp tcp
no tcp

debug ip tcp {**header-compression** }
no debug ip tcp { **header-compression** }

header-compression tcp

tcp

tcp

```
Ruijie# debug ip tcp header-compression
```

1.1.8 drop

drop,

drop

no drop

Policy-map

policy-map drop

policy-map class c1

```
Ruijie(config)# class-map class1
Ruijie(config-cmap)# match access-group 101
Ruijie(config)# policy-map policy1
Ruijie(config-pmap)# class c1
Ruijie(config-pmap-c)# drop
Ruijie(config-pmap-c)# interface s2/0
Ruijie(config-if)# service-policy output policy1
Ruijie(config-if)# exit
```

1.1.9 fair-queue

fair-queue

no

fair-queue [*congestive-discard-threshold* [*dynamic-queues*]]

no fair-queue

congestive-discard-threshold 64 1 4096 2

dynamic-queues 256 1 4096

FIFO

z X.25
z LAPB
z
z (Lookback)
z
z
z

fair-queue

0 ( ) 128

```
Ruijie(config)# interface Serial 0
Ruijie(config-if)# fair-queue 128 512
```

custom-queue-list	
priority-group	
priority-list default	
show interfaces	
show queue	

1.1.10 hold-queue

hold-queue FIFO

hold-queue *queue length* **in | out**

no hold-queue *queue length* **in | out**

queue length
75 40

FIFO 75
40

hold-queue FIFO

0
128 512

```
Ruijie(config)# interface Serial 0
Ruijie(config-if)# hold-queue 128 in
```

show interfaces	

1.1.11 ip rtp compression-connections

ip rtp compression-connections rtp

no

ip rtp compression-connections { *Number* }

no ip rtp compression-connections

Number

ip rtp compression-connections , ,

ppp

ip rtp header-compression {*iphc-format* / *passive*}

no ip rtp header-compression

iphc-format iphc

passive

rtp

ip rtp header-compression , iphc-format ,
ip tcp header-compression iphc-format

bandwidth-kbps (kbps)

rtp

Rtp (rtpq) llq rtp
rtp
udp

Rtp

Rtp llq Rtp
llq

rtp

```
interface Serial1
service-policy output policy1
ip rtp priority 16384 16383 40
```

service-policy	policy-map
priority	llq
bandwidth (policy-map class)	cbwfq
show queue rtp	ip rtp

1.1.14 ip tcp compression-connections

ip tcp compression-connections tcp
no

ip tcp compression-connections { *Number* }

no ip tcp compression-connections

Number

ip tcp compression-connections , ,
ppp hdlc 16, frame-relay 256

tcp

```
Ruijie(config)# interface serial 1/0
Ruijie(config-if)# ip tcp compression-connections 25
```

ip tcp header-compression	tcp
ip rtp compression-connections	rtp
Show ip tcp header-compression	ip tcp

1.1.15 ip tcp header-compression

ip tcp header-compression tcp
no tcp

ip tcp header-compression { *passive*}
no ip tcp header-compression

passive

tcp

ip rtp header-compression , iphc-format ,
ip tcp header-compression iphc-format

tcp

```
Ruijie(config)# interface serial 1/0
Ruijie(config-if)# ip tcp header-compression
```

ip rtp header-compression	rtp
ip rtp compression-connections	rtp
ip tcp compression-connections	tcp
Show ip tcp header-compression	ip tcp

1.1.16 match access-group

class-map (ACL) **no**

match access-group *access-list-number* 12C /P 7</ID 199ccess.502C8074A>w 10.5 0 0

access-list 101

class-map class1 CBWFQ

```
class-map class1
match access-group 101
```

1.1.17 match input-interface

class-map

no

match input-interface *interface-name*

no match input-interface *interface-name*

interface-name

Class-map

Class-map

CBWFQ

class-map (match-rule)

fastethernet1

class-map eth1

```
class-map eth1
match input-interface fastethernet1
```

1.1.18 match ip dscp

class-map ip tos

dscp **no**

match ip dscp *dscp-value, dscp-value…*

no match ip dscp *dscp-value, dscp-value…*

dscp-value dscp

Class-map

ip tos dscp

Class-map

CBWFQ

dscp 46 10 18

class-map a1

```
class-map a1
match ip dscp 46 10 18
```

1.1.19 match ip precedence

class-map ip tos

precedence **no**

match ip precedence *precedence-value, precedence-value…*

no match ip precedence *precedence-value, precedence-value…*

dscp-value precedence

Class-map

ip tos precedence

Class-map

CBWFQ

dscp 0 2 5

class-map a1

```
class-map a1
match ip precedence 0 2 5
```

1.1.20 match not

class-map

no

match [**not**] **match-type**

no match [**not**] **match-type**

Class-map

class-map (match-rule)

class-map class46 ip tos

dscp 46

```
class-map class46
match not ip dscp 46
```

1.1.21 match protocol

class-map

no

match protocol *protocol-name*

no match protocol *protocol-name*

protocol-name ( )

Class-map

Class-map

CBWFQ

class-map (match-rule)

IP 7<0F56Tj/T3FA119/P <</36]T

75% CBWFQ

CBWFQ

CBWFQ

CBWFQ

CBWFQ

Serial1 80% CBWFQ

```
interface serial1
max-reserved-bandwidth 80
```

1.1.23 policy-map

no

policy-map *policy-map-name*

no policy-map *policy-map-name*

policy-map-name

64

CBWFQ

CBWFQ

CBWFQ

CBWFQ

a_É

policy-map

policy-map

"policy1"

"class1"

101

"class1"

```
class-map class1
match access-group 101
```

, "class1"

```
policy-map policy1
class class1
bandwidth 2000
queue-limit 40
```

1.1.24 police

policy-map car service-policy

no

police cir *bps* {**pir** *bps*} *burst-normal burst-max* **conform-action***conform-action* **exceed-action** *exceed-action* {**violate-action** *violate-action*}

no police cir *bps* {**pir** *bps*} *burst-normal burst-max* **conform-action***conform-action* **exceed-action** *exceed-action* {**violate-action** *violate-action*}

cir bps

pir peak bps

Burst-normal burst-max token bucket

bytes

Conform-action

Exceed-action

```
class class1
police cir 80000 2000 2000 conform-action transmit
exceed-action drop violate-action drop
!
interface Serial1/0
ip address 192.168.20.3 255.255.255.0
encapsulation ppp
service-policy output police
```

1.1.25 priority

llq

no

priority { *bandwidth-kbps* | **percent** *percent*} {Burst bytes}

no priority

bandwidth-kbps (kbps)

percent-number (
)

1%

Burst bytes

priority

Policy-map class

llq CBWFQ

llq pq+cbwfq,
cbwfq

llq

"policy1"

"class1"

101

"class1"

```
class-map class1
match access-group 101
```

, "class1"

```
policy-map policy1
class class1
priority 2000 25000
```

1.1.26 priority-group

priority-group

Ω

priority-list interface	
priority-list protocol	
priority-list queue-limit	
show interfaces	
show queue	

1.1.27 priority-list default

priority-list default

no

priority-list *list-number* **default** { **high** | **medium** | **normal** | **low** }

no priority-list *list-number* **default**

list-number 1 16

high | **medium** | **normal** | **low**

normal

1 **low**

```
Ruijie(config)# priority-list 1 default low
```

priority-group	

priority-list interface	
priority-list protocol	
priority-list queue-limit	
show queue	

1.1.28 priority list interface

priority-list interface

no

priority-list *list-number* **interface** *interface-type interface-number* { **high** | **medium** | **normal** | **low** }

no priority-list *list-number* **interface** *interface-type interface-numbe r* { **high** | **medium** | **normal** | **low** }

list-number 1 16

interface-type

interface-number

high | **medium** | **normal** | **low**

RGOS

3 1

```
Ruijie(config)#priority-list 3 interface serial 1 medium
```

priority-group

tcp	port	IP TCP port
udp	port	IP UDP port

RGOS

2 IP

```
Ruijie(config)# priority-list 2 protocol ip high
```

7 IP 101

```
Ruijie(config)# priority-list 7 protocol ip high list
101
```

6 250 IP

```
Ruijie(config)# priority-list 6 protocol ip medium gt
250
```

11 250 IP

```
Ruijie(config)# priority-list 11 protocol ip medium lt
250
```

priority-group	
priority-list default	
priority-list interface	

priority-group

1.1.32 queue-list default

queue-list default

no

queue-list *list-number* **default** *queue-number*

no queue-list *list-number* **default**

list-number	1	16
queue-number	0	16

1

RGOS

0

show queue

1 16

```
Ruijie(config)# queue-list 1 default 16
```

custom-queue-list	
queue-list interface	
queue-list protocol	
queue-list queue byte-count	

queue-list queue limit	

1.1.33 queue-list interface

queue-list interface

no

queue-list *list-number* **interface** *interface-type interface-number queue-number*

no queue-list *list-number* **interface** *interface-type interface-number queue-number*

list-number	1 16
interface-type	
interface-number	
queue-number	1 16

Serial 1

3

```
Ruijie(config)# queue-list 1 interface serial 1 3
```

Custom-queue-list	
queue-list default	
queue-list protocol	

queue-list queue byte-count

RGOS

4 Telnet 2

```
Ruijie(config)# queue-list 4 protocol ip 2 tcp 23
```

1 UDP

3

```
Ruijie(config)# queue-list 1 protocol ip 3 udp 53
```

2 100

1

```
Ruijie(config)# queue-list 2 protocol ip 1 list 100
```

custom-queue-list	

queue-list default

list-number 1 16

queue-number 0 16

byte-count-number
0 16777215

byte-count 1500

2 5
1400

```
Ruijie(config)# queue-list 2 queue 5 byte-count 1400
```

custom-queue-list	
queue-list default	
queue-list interface	
queue-list protocol	
queue-list queue byte-count	
show queue	

1.1.36 queue-list queue limit

queue-list queue limit

no

queue-list list-number **queue** queue-number **limit** limit-number

no queue-list list-number **queue** queue-number **limit** limit-number

list-number 1 16

queue-number 0 16

limit-number <0
32767> 20

20

5 40

```
Ruijie(config)# queue-list 2 queue 5 limit 40
```

custom-queue-list	

queue-list default X

queue-listprotocolt

no rate-limit {**input** | **output**} {*bps* | **access-group** *acl-index* | | **dscp** *dscp-value* } *burst-normal burst-max* **conform-action** *conform-action*

rate-limit input 10000 1500 2000 conform-action transmit exceed-action continue

rate-limit input 2000000 1500 2000 conform-action transmit exceed-action drop

car

```
interface Serial1/0
ip address 192.168.20.3 255.255.255.0
encapsulation ppp
rate-limit output 300000 3000 3000 conform-action
transmit exceed-action  drop
```

acl car

```
interface Serial1/0
ip address 192.168.20.3 255.255.255.0
encapsulation ppp
rate-limit output access-group 101 256000 5000 5000
conform-action  transmit exceed-action
set-dscp-transmit 46
rate-limit output access-group 102 200000 3000 3000
conform-action  transmit exceed-action
set-prec-transmit 5
rate-limit output access-group 103 128000 3000 3000
conform-action  transmit exceed-action
set-prec-transmit 1
```

dscp car

```
interface Serial1/0
ip address 192.168.20.3 255.255.255.0
encapsulation ppp
rate-limit output dscp 46 256000 5000 5000 conform-action
transmit exceed-action  set-dscp-transmit 46
rate-limit output dscp 10 200000 3000 3000 conform-action
transmit exceed-action  set-prec-transmit 5
```

1.1.38 random-detect

ip

precedence no

random-detect

no random-detect

Policy-map class

WRED TCP —— TCP
TCP
TCP

ip precedence 8

ip precedence

```
interface Serial1/0
ip address 192.168.20.3 255.255.255.0
encapsulation ppp
random-detect
```

1.1.39 random-detect dscp

dscp no
dscp

random-detect dscp *dscp-value min-threshold max-threshold mark-prob-denominator*

no random-detect dscp *dscp-value min-threshold max-threshold mark-prob-denominator*

dscp-value dscp

min-threshold

max-threshold

mark-prob-denominator	10	1/10,

dscp

show queue interface

Ń Ż

ip precedence 8

```
interface Serial1/0
ip address 192.168.20.3 255.255.255.0
encapsulation ppp
random-detect prec-based
```

1.1.42

40-80

WRED

80% =

*40%

15

```
interface Serial1/0
ip address 192.168.20.3 255.255.255.0
encapsulation ppp
random-detect prec-base
random-detect exponential-weighting-constant 15
```

1.1.44 service-policy

CBWFQ

no

service-policy { **input | output** } *policy-map-name*

no service-policy { **input | output** } *policy-map-name*

policy-map-name

CBWFQ

Serial1 "policy9"

CBWFQ

```
interface serial1
service-policy output policy9
```

1.1.45 set ip dscp

ip tos

dscp no

Set ip dscp *dscp-value*

no Set ip dscp *dscp-value*

dscp-value dscp value

Policy-map class

"policy1" acl203
ip dscp 46

```
policy-map policy1
class acl203
set ip dscp 46
```

1.1.46 set ip precedence

ip tos
precedence no

Set ip precedence *dscp-value*

no Set ip precedence *dscp-value*

precedence-value precedence value

Policy-map class

"policy1" acl203
ip precedence 5

```
policy-map policy1
```

```
class acl203
set ip precedence 5
```

1.1.47 shape average

policy-map shape
service-policy no

shape average *bps [bc [be]]*

no shape average

```
!
interface Serial1/0
ip address 192.168.20.3 255.255.255.0
encapsulation ppp
service-policy output policy1
```

1.1.48 shape peak

policy-map shape peak
service-policy no

shape peak *bps [bc[be]]*

no shape peak *bps [bc[be]]*

bit-rate bps

bc interval bit

be interval bit

policy-map shape peak

Policy-map class

shape average bps shape peak bps

Peak average

Peak rate = cir (1+ bc/be)

Shape peak **service-policy input** **service-policy output** policy-map

"policy1"

"class1"

101 shape peak

```
access-list 101 permit tcp any any eq 2065

class-map match-all class1
```

```
match access-group 101

policy-map policy1
class class1class class1
shape  peak 100000
!
interface Serial1/0
ip address 192.168.20.3 255.255.255.0
encapsulation ppp
service-policy output policy1_peak
```

1.1.49 shape max-buffers

policy-map shape
service-policy no

shape max-buffers *number-of-buffers*

no shape max-buffers number-of-buffers

```
interface Serial1/0
ip address 192.168.20.3 255.255.255.0
encapsulation ppp
traffic-shape rate 256000 10240 10240 1000
```

1.2 ÐGQ¸

1.2.1 show class-map

class-map

show class-map [*class-map-name*]

class-map-name

class-map

```
Ruijie# show class-map
Class Map class-default
Match any
Class Map class6
Match protocol arp
Class Map class5
Match input-interface FastEthernet0
Class Map class4
Match none
Class Map class1
Match access-group 101
Class Map class2
Match access-group 102
Class Map class3
Match access-group 103
Ruijie#
```

"class1"

```
Ruijie# show class-map  class1
Class Map class1
Match access-group 101
Ruijie#
```

1.2.2 show ip rtp header-compression

show ip rtp header-compression

rtp

show ip rtp header-compression interface-name interface-number

interface-name

interface-number

rtp

serial 1/0 rtp

```
Ruijie# show ip rtp header-compression serial 1/0
RTP/UDP/IP header compression statistics:
Interface serial 1/0: active on
Rcvd:    407 total, 406 compressed, 0 errors
0 dropped, 406 buffer copies, 0 buffer failures
Sent:    406 total, 405 compressed,
14716 bytes saved, 8494 bytes sent
2.73 efficiency improvement factor
Connect: 256 rx slots, 256 tx slots, 0 long searches,
1 misses 99% hit ratio, five minute miss rate 0 misses
/sec, 0 max
```

rate-limit

```
Ruijie# show rate-limit
serial 1/0
Output
matches access-group 101
params:  256000 bps, 3000 limit, 3000 extended limit
conformed 0 packets, 0 bytes; action: transmit 0
exceeded 0 packets, 0 bytes; action: drop 0
cbucket 0, cbs 3000; ebucket 0 ebs 0


serial 1/0 (            )
Output (         )
matches access-group 101 (      ACL    )
params:  256000 bps(            ), 3000 limit(
     ), 3000 extended limit(            )
conformed 0 packets, 0 bytes(                      );
action: transmit(               ) 0(             )
exceeded 0 packets, 0 bytes(                      );
action: drop(               ) 0(             )
cbucket 0(               ), cbs 3000(               );
ebucket 0(
```

```
   Class 3
     Strict Priority
     Bandwidth 100 (kbps) Max Thresh 64 (packets), Burst
2500 (Bytes)
   Class 4
     Strict Priority
     Bandwidth 5 (%) Max Thresh 64 (packets), Burst
1250000 (Bytes)
   Class 5
     set ip dscp 1
     mark action order 0


   Class 6
     police cir 100000 2000 2000 conform-action transmit
exceed-action drop
     police action order 0



 Policy Map 2
   Class 1
     Bandwidth 2000 (kbps) Max Thresh 64 (packets)


 Policy Map 3
   Class 2
     set ip dscp 2
     mark action order 0
```

:

CBWFQ

Serial 0

Serial 0

service-policy output 1

```
Ruijie# show policy-map  interface serial 0
   Class 1
   Class 2
   Class 3
   Class 4
   Class 5
     set ip dscp 1
     mark count 0

   Class 6
     current token tbf: TC_ONETBF
     params:  100000 bps, 2000 limit, 2000 extended limit ,
0 pir
     conformed 0 packets, 0 bytes; action: transmit 0
     exceeded 0 packets, 0 bytes; action: drop 0
     violated 0 packets, 0 bytes; action: none 0
     cbucket 4000, cbs 4000; ebucket 0 ebs 0

gigabitEthernet 0/2  output : 1
   Weighted Fair Queueing
   Class 1
     Output Queue: queue_num 265
       Bandwidth 100 (kbps) Packets Matched 0 Sended 0
Max Thresh 64 (packets)
       (discards/tail drops) 0/0 , weight 16384
   Class 2
     Output Queue: queue_num 266
       Bandwidth 5 (%) Packets Matched 0 Sended 0 Max
Thresh 64 (packets)
       (discards/tail drops) 0/0 , weight 819
   Class 3
     Output Queue: queue_num 267
     Strict Priority
     Bandwidth 100 (kbps) Max Thresh 64 (packets), Burst
2500 (Bytes)
     cir 100000 bucket 0, cburst 0 cpkt 0, eburst 0 epkt
0, nbytes 0 npkt 0
       (discards/tail drops) 0/0 , weight 4096
   Class 4
     Output Queue: queue_num 268
     Strict Priority
     Bandwidth 5 (%) Max Thresh 64 (packets), Burst
1250000 (Bytes)
     cir 50000000 bucket 0, cburst 0 cpkt 0, eburst 0
```

```
epkt 0, nbytes 0 npkt 0
       (discards/tail drops) 0/0 , weight 4096
   Class 5
     Output Queue: queue_num 269
       (discards/tail drops) 0/0 , weight 4096
   Class 6
     Output Queue: queue_num 270
       (discards/tail drops) 0/0 , weight 4096
```

:

CBWFQ

CBWFQ

"1"

Serial 0

ip ref

service-policy output 1

```
Ruijie# show policy-map  interface serial 0
  Policy-map Output: 1
    Class 1
      Bandwidth 100 kbps
        conformed 0 packets, 0 bytes
        exceeded 0 packets, 0 bytes
        violated 0 packets, 0 bytes
        cbucket 128000, cbs 128000; ebucket 0 ebs 128000
    Class 2
      Bandwidth 5%
        conformed 0 packets, 0 bytes
        exceeded 0 packets, 0 bytes
        violated 0 packets, 0 bytes
        cbucket 128000, cbs 128000; ebucket 0 ebs 128000
    Class 3
      Strict Priority, Bandwidth 100 kbps
        conformed 0 packets, 0 bytes
        exceeded 0 packets, 0 bytes
        violated 0 packets, 0 bytes
        cbucket 128000, cbs 128000; ebucket 0 ebs 128000
    Class 4
      Strict Priority, Bandwidth 5%
        conformed 0 packets, 0 bytes
        exceeded 0 packets, 0 bytes
        violated 0 packets, 0 bytes
        cbucket 128000, cbs 128000; ebucket 0 ebs 128000
    Class 5
```

```
     set ip dscp 1
       mark count 0
   Class 6
     policy
       current token tbf: TC_ONETBF
       params:  100000 bps, 2000 limit, 2000 extended
limit , 0 pir
      conformed 0 packets, 0 bytes; action: transmit 0
       exceeded 0 packets, 0 bytes; action: drop 0
       violated 0 packets, 0 bytes; action: none 0
       cbucket 4000, cbs 4000; ebucket 0 ebs 0
```

"1"

```
Ruijie# show policy-map name 1
Policy Map 1
   Class 1
     Bandwidth 100 (kbps) Max Thresh 64 (packets)
   Class 2
     Bandwidth 5 (%) Max Thresh 64 (packets)
   Class 3
     Strict Priority
     Bandwidth 100 (kbps) Max Thresh 64 (packets), Burst
2500 (Bytes)
   Class 4
     Strict Priority
     Bandwidth 5 (%) Max Thresh 64 (packets), Burst
1250000 (Bytes)
   Class 5
     set ip dscp 1
     mark action order 0


   Class 6
     police cir 100000 2000 2000 conform-action transmit
exceed-action drop
     police action order 0
```

:

CBWFQ

"1" "class2"

```
Ruijie# show policy-map name 1 class 2
   Class 2
     Bandwidth 5 (%) Max Thresh 64 (packets)
```

:

CBWFQ

1.2.6 show queue

show queue

show queue interface-name interface-number [queue-number]

show queue {cq | pq | wfq}

speed auto

QoS

```
Ruijie# show queue interface gigabitEthernet 0/0

  Queueing strategy: cb weighted fair
  Output queue: 0/300/128/0 (size/max
total/threshold/drops)
   cb queue_num  0/0 (active/max active)
   wfq queue_num  0/0 (active/max active)
     Reserved queue_num 6/6 (allocated/max allocated)
     Llq is open
```

gigabitEthernet 0/0

ip ref

```
Ruijie# show queue interface gigabitEthernet 0/0
  Queueing strategy: GTS
    Interface CIR: 80000, Gap 12, Deta Bits 327
    Token Bucket Type 6, Token Bucket 2000, Current Token
Bucket 0
```

interface traffic-shape

traffic-shape

traffic-shape

```
Ruijie# show traffic-shape
Interface serial 1/0
Access   Target    Byte   Sustain    Excess    Interval
Increment   Adapt
VC    List    Rate    Limit   bits/int   bits/int   (m
s)    (bytes)     Active
-    -     300000       2250     9000     9000      3
0        1125    -
```

1.2.8 show traffic-shape queue

traffic-shape

show traffic-shape queue [*interface*]

interface traffic-shape

traffic-shape

traffic-shape

```
Ruijie# show traffic-shape  queue
Traffic queued in shaping queue on serial 1/0
Traffic shape group: null
```

```
Queueing strategy: weighted fair
Output queue: 0/1000/64/0 (size/max
total/threshold/drops)
Output queue num: 0/0 (now/max)
```

1.2.9 show traffic-shape statistics

traffic-shape

show traffic-shape statistics [*interface*]

interface traffic-shape

traffic-shape

traffic-shape

```
Ruijie# show traffic-shape statistics
Interface serial 1/0
Acc. Queue   Packets   Bytes   Packets   Bytes
Shaping
List  Depth  Delayed   Delayed    Active
-    0          0     0      0     0
```

RGOS™

4.1.28 show ip pim sparse-mode mroute.....63
4.1.29 show ip pim sparse-mode neighbor.....63
4.1.30 show ip pim sparse-mode nexthop.....64
4.1.31 show ip pim sparse-mode rp mapping.....65
4.1.32 show ip pim sparse-mode rp-hash.....65

1.1

- **clear ip mroute**
- **clear ip mroute statistics**
- **ip mroute**
- **ip multicast route-limit**
- **ip multicast ttl-threshold**
- **ip multicast-routing**
- **ip multicast boundary**
- **ip multicast static**
- **show ip mroute**
- **show ip rpf**
- **show ip mvif**

1.1.1 clear ip mroute

IP

clear ip mroute {***** | group-address [source -address]}

*	
group-address	
source -address	

```
Ruijie# clear ip mroute 230.0.0.1
```

1.1.3 ip mroute

no

ip mroute source-address mask [protocol as-number] {rpf-addrress | interface-type interface-number} [distance]

no ip mroute source-address mask [protocol as-number] {rpf-addrress | interface-type interface-number} [distance]

source-address	
mask	
protocol	
rpf-address	
interface-type interface-number	
distance	RPF 0 <0-255>

Distance Distance 0

RPF

ip

172.30.10.13

```
Ruijie(config)# ip mroute 172.16.0.0 255.255.0.0
```

172.30.10.13

1.1.4 ip multicast route-limit

ip multicast route-limit limit [threshold]

no ip multicast route-limit

limit	1~2147483647 1024
threshold	2147483647.

l Limit 1024

Threshold 2147483647

IP

a _É!

500

```
Ruijie(config)# ip multicast route-lif3 1f081f2f 80
```

no ip multicast ttl-threshold

ttl-value	TTL , 0~255

ttl-value 1

TTL TTL
TTL
TTL 0

TTL 5

```
Ruijie(config-if)# ip multicast ttl-threshold 5
```

1.1.6 ip multicast-routing

no

ip multicast-routing

no ip multicast-routing

IPv4 IPv4

a_É

IPv4 IGMP snooping

IGMP snooping

a _ É !

IP IGMP PIMSM

svi1 IP

Ruijie(config)# **ip access-list** extended mul-boun
Ruijie(config-std-nacl)# **permit ip any**233.3.3.0 0.0.0.255
Ruijie(config-std-nacl)#**exit**
Ruijie(config)# **interface vlan 1**
Ruijie(config-if)# **ip multicast boundary** mul-boun

1.1.8 show ip mroute

show ip mroute [group-address] [source-address] [**summary**] [**count**]

group-address	

```
Ruijie# show ip mroute
IP Multicast Routing Table
Flags: I - Immediate Stat, T - Timed Stat, F - Forwarder
installed
Timers: Uptime/Stat Expiry
Interface State: Interface (TTL)
(10.10.1.52, 224.0.1.3), uptime 00:00:31, stat expires
00:02:59
Owner PIM-SM, Flags: TF
Incoming interface: FastEthernet 2/1
Outgoing interface list:
FastEthernet 1/3


Ruijie# show ip mroute 10.10.1.52 224.0.1.3
IP Multicast Routing Table
Flags: I - Immediate Stat, T - Timed Stat, F - Forwarder
installed
Timers: Uptime/Stat Expiry
Interface State: Interface (TTL)
(10.10.1.52, 224.0.1.3), uptime 00:03:24, stat expires
00:01:28
Owner PIM-SM, Flags: TF
Incoming interface: FastEthernet 2/1
Outgoing interface list:
FastEthernet 1/3


Ruijie# show ip mroute count
IP Multicast Statistics
Total 1 routes using 132 bytes memory
Route limit/Route threshold: 2147483647/2147483647
Total NOCACHE/WRONGVIF/WHOLEPKT recv from fwd: 1/0/0
Total NOCACHE/WRONGVIF/WHOLEPKT sent to clients: 1/0/0
Immediate/Timed stat updates sent to clients: 0/0
Reg ACK recv/Reg NACK recv/Reg pkt sent: 0/0/0
Next stats poll: 00:01:10
Forwarding Counts: Pkt count/Byte count, Other Counts:
Wrong If pkts
Fwd msg counts: WRONGVIF/WHOLEPKT recv
Client msg counts: WRONGVIF/WHOLEPKT/Imm Stat/Timed Stat
sent
Reg pkt counts: Reg ACK recv/Reg NACK recv/Reg pkt sent
(10.10.1.52, 224.0.1.3), Forwarding: 2/19456, Other: 0
```

```
Fwd msg: 0/0, Client msg: 0/0/0/0, Reg: 0/0/0
```

```
Ruijie# show ip mroute summary
IP Multicast Routing Table
Flags: I - Immediate Stat, T - Timed Stat, F - Forwarder
installed
Timers: Uptime/Stat Expiry
Interface State: Interface (TTL)
(10.10.1.52, 224.0.1.3), 00:01:32/00:03:20, PIM-SM,
Flags: T
```

Flags	I- T- F-
Timers:Uptime/Stat Expiry	
Interface State	
Owner	
Incoming interface	
Outgoing interface list	
Forwarding Counts Pkt count/Byte count,	/
Other Counts: Wrong If pkts	

ip multicast-routing	
ip pim dense-mode	PIM-DM
ip pim sparse-mode	PIM-SM

1.1.9 show ip rpf

RPF

show ip rpf {source-address}

source-address	

192.168.1.54 RPF

```
Ruijie# show ip rpf 192.168.1.54
RPF information for 192.168.1.54
RPF interface: VLAN 1
RPF neighbor: 0.0.0.0
RPF route: 192.168.1.0/24
RPF type: unicast (connected)
RPF recursion count: 0
Doing distance-preferred lookups across tables
Distance: 0
Metric: 0 RPF information for 192.168.1.54
RPF interface: VLAN 1
RPF neighbor: 0.0.0.0
RPF route: 192.168.1.0/24
RPF type: unicast (connected)
RPF recursion count: 0
Doing distance-preferred lookups across tables
Distance: 0
Metric: 0
```

1.1.10 show ip mvif

show ip mvif { interface-type interface-number }

interface-type interface-number	

svi1

```
Ruijie# show ip mvif vlan
```

```
Ruijie# debug nsm mcast all
```

1.2.2 debug nsm mcast fib-msg

no

debug nsm mcast fib-msg

```
Ruijie# debug nsm mcast fib-msg
```

1.2.3 debug nsm mcast vif

no

debug nsm mcast vif

```
Ruijie# debug nsm mcast vif
```

1.2.4 debug nsm mcast register

no

debug nsm mcast register

IGMP

- z **clear ip igmp group**
- z **clear ip igmp interface**
- z **ip igmp access-group**
- z **ip igmp immediate-leave group-list**
- z **ip igmp last-member-query-count**
- z **ip igmp last-member-query-interval**
- z **ip igmp limit ( )**
- z **ip igmp querier-timeout**
- z **ip igmp query-interval**
- z **ip igmp query-max-response-time**
- z **ip igmp robustness-variable**
- z **ip igmp ssm-map enable**
- z **ip igmp ssm-map static**
- z **ip igmp version**
- z **ip igmp join-group**
- z **ip igmp static-group**
- z **ip igmp immediate-leave group-list**

2.1.3 ip igmp access-group

IP **no**

ip igmp access-group access-list

no ip igmp access-group

access-list	, <1-99>

ip igmp access-group

---

a _ É !

IP

S,G igmp report IP permit deny source destination igmp report S1,S2,S3…Sn,G (0,G) G igmp report G igmp report S G S.G igmp report

IP (0, G) S1,S2,S3…Sn,G

0 G *,G IP **permit host 0.0.0.0 host** group-number group-number **permit any host** group-number

---

Eth0 225.2.2.2.

```
Ruijie# configure terminal
Ruijie(config)# access-list 1 permit 225.2.2.2 0.0.0.0
Ruijie(config)# interface ethernet 0
Ruijie(config-if)# ip igmp access-group 1
```

2.1.4 ip igmp immediate-leave group-list

IGMPversion2 IGMPversion3

no

ip igmp immediate-leave group-list access-list

no ip igmp immediate-leave

access-list	

IGMP 2s

IGMP IGMP

```
Ruijie# configure terminal
Ruijie(config)# interface ethernet 0
Ruijie(config-if)# ip igmp immediate-leave group-list
34
Ruijie(config-if)# exit
```

```
Ruijie(config)# access-list 34 permit 225.192.20.0
0.0.0.255
```

ip igmp last-member-query-interval

2.1.5 ip igmp last-member-query-count

last-member-query-count **leave**
last-member-query-count

no

ip igmp last-member-query-count number

no ip igmp last-member-query-count

number	, <2-7>

last member query count 2

IGMPv2 **ip igmp last-member-query-count**

3.

```
Ruijie# configure terminal
Ruijie(config)# interface ethernet 0
Ruijie(config-if)# ip igmp last-member-query-count 3
```

2.1.6 ip igmp last-member-query-interval

no

ip igmp last-member-query-interval interval

no ip igmp last-member-query-interval

interval	<1-255> 0.1s

0.1s

IGMPv2 **ip igmp last-member-query-count**

2

```
Ruijie# configure terminal
Ruijie(config)# interface eth0
Ruijie(config-if)# ip igmp last-member-query-interval 200
```

ip igmp immediate-leave

2.1.7 ip igmp limit ( )

igmp states

no

ip igmp limit number [**except** access-list]

no ip igmp limit

number	IGMP 1-2097152
except access-list	

IGMP

IGMP

300

```
Ruijie(config-if)# ip igmp limit 300
```

2.1.8 ip igmp query-interval

no

ip igmp query-interval seconds

no ip igmp query-interval

seconds	s 1 18000

125

Ethernet 0 120s

```
Ruijie(config-if)# ip igmp query-interval 120
```

Ethernet 0

```
Ruijie(config-if)# no ip igmp query-interval
```

2.1.9 ip igmp query-max-response-time

no

ip igmp query-max-response-time seconds

no ip igmp query-max-response-time

seconds	s 1 25

10s

IGMPv2

Ethernet 0 20s

```
Ruijie(config-if)# ip igmp query-max-response-time 20
```

Ethernet 0

```
Ruijie(config-if)# no ip igmp query-max-response-time
```

2.1.10 ip igmp query-timeout

no

ip igmp query-timeout seconds

no ip igmp query-timeout

seconds	60 300

255s

IGMPv2

ip igmp query-interval Ruijie 255s

3

```
Ruijie# configure terminal
Ruijie(config)# interface ethernet 0
Ruijie(config-if)# ip igmp robustness-variable 3
```

2.1.12 ip igmp version

IGMP

no

ip igmp version {**1** | **2** | **3**}

no ip igmp version

{**1**	**2**	**3**}	, <1-3>

2.

IGMP IGMPv3lite URD IGMP
IGMP

2

```
Ruijie# configure terminal
Ruijie(config)# interface ethernet 0
Ruijie(config-if)# ip igmp version 2
```

ip igmp access-group

ip igmp limit

ip multicast rate-limit

no ip igmp static-group group-address

group-address	

join-group

report

```
Ruijie# configure terminal
Ruijie(config)# interface fast 0/1
Ruijie(config-if)# ip igmp static-group 233.3.3.3
```

2.1.15 ip igmp immediate-leave group-list

IGMPversion2 IGMPversion3

no

ip igmp immediate-leave group-list access-list

no ip igmp immediate-leave

access-list	

IGMP 2s

IGMP IGMP

```
Ruijie# configure terminal
Ruijie(config)# access-list 1 permit 225.192.20.0
0.0.0.255
Ruijie(config)# interface ethernet 0/1
Ruijie(config-if)# ip igmp immediate-leave group-list
1
Ruijie(config-if)# exit
```

ip igmp last-member-query-interval

2.1.16 ip igmp li.0e ( )

igmp

no

ip igmp limit number [**except** access-list]

no ip igmp limit

number	12144721 1 Tf ( )Tj ET E1( )Tj ET EMC 146.34 229.46 0.48061536

IGMP
IGMP

300

```
Ruijie  config  # ip igmp limit 300
```

2.1.17 ip igmp proxy-service

mroute-proxy
mroute-proxy

ip igmp proxy-service

no ip igmp proxy-service

proxy-service

32

proxy-servicer 255
proxy-service
proxy-service mroute-proxy
proxy-service
.

switchport ip igmp
mroute-proxy interface

proxy-service

```
Ruijie(config-if)# ip igmp proxy-service
```

2.1.18 ip igmp mroute-proxy

ip igmp mroute-proxy interfname

no ip igmp mroute-proxy

interfname	

proxy-servicer

igmp

mroute-proxy

```
Ruijie(config-if)# ip igmp mroute-proxy fa 0/1
```

2.1.19 ip igmp ssm-map enable

igmp ssm-map

ip igmp ssm-map enable

no ip igmp ssm-map enable

ip igmp ssm-map static

igmp ssm-map

```
Ruijie(config)# ip igmp ssm-map enable
```

2.1.20 ip igmp ssm-map static

ssm-map

ip igmp ssm-map static access-list a.b.c.d

no ip igmp ssm-map static access-list a.b.c.d

access-list	Acl <1-99> |<1300-1999> |WORD
a.b.c.d	

ip igmp ssm-map enable

v3

ACL 11 192.168.2.2,

```
Ruijie(config)# ip igmp ssm-map static 11 192.168.2.2.
```

2.1.21 show ip igmp groups

IGMP

show ip igmp groups [group-address | interface-type interface-number] [**detail**]

group-address	32 IP D 8

detail	

```
Ruijie# show ip igmp groups
IGMP Connected Group Membership
Group Address Interface Uptime Expires Last Reporter
224.0.1.1  eth2  00:00:09   00:04:17   10.10.0.82
224.0.1.24  eth2  00:00:06   00:04:14   10.10.0.84
224.0.1.40 eth2  00:00:09   00:04:15   10.10.0.91
224.0.1.60  eth2  00:00:05   00:04:15   10.10.0.7
239.255.255.250 eth2 00:00:12  00:04:15   10.10.0.228
239.255.255.254 eth2 00:00:08   00:04:13   10.10.0.84
```

```
Ruijie# show ip igmp groups 224.1.1.1 detail
Interface: eth1
Group: 224.1.1.1
Uptime: 00:00:42
Group mode: Include
Last reporter: 192.168.50.111
TIB-A Count: 2
TIB-B Count: 0
Group source list: (R - Remote, M - SSM Mapping)
Source Address Uptime v3 Exp Fwd Flags
192.168.55.55 00:00:42 00:03:38 Yes R
192.168.55.66 00:00:42 00:03:38 Yes R
```

2.1.22 show ip igmp interface

Show ip igmp interface [interface-type interface-number]

interface-type	
interface-number	

ssm-map

```
Ruijie# sh ip igmp ssm-mapping
SSM Mapping : Enabled
Database    : Static mappings configured
      233.3.3.3
Ruijie#show ip igmp ssm-mapping 233.3.3.3
Group address: 233.3.3.3
Database    : Static
Source list  : 192.3.3.3
             : 3.3.3.3
```

PIM-DM

3.1 PIM-DM

PIM-DM

- **ip pim dense-mode**
- **ip pim neighbor-filter**
- **ip pim query-interval**
- **ip pim state-refresh disable**
- **ip pim state-refresh origination-interval**
- **show ip pim dense-mode interface**
- **show ip pim dense-mode neighbor**
- **show ip pim dense-mode nexthop**
- **show ip pim dense-mode mroute**

3.1.1 ip pim dense-mode

PIM-DM **ip pim dense-mode** **no** PIM-DM

ip pim dense-mode

no ip pim dense-mode

PIM-DM

```
Ruijie# configure terminal
Ruijie(config)# interface fastethernet 0/1
Ruijie(config-if)# ip pim dense-mode
```

\!

PIM-DM

PIM-DM

PIM-DM IGMP

“ Failed to enable PIM-DM on < >, resource temporarily unavailable, please try again ”

“ PIM-DM Configure failed! VIF limit exceeded in NSM!!! ”

PIM-SM DVMRP

3.1.2 ip pim neighbor-filter

ip pim neighbor-filter

PIM-DM

Peering

no

ip pim neighbor-filter access-list

no ip pim neighbor-filter access-list

2. peering PIM
PIM
PIM

3.1.3 ip pim query-interval

hello interval **ip pim query-interval**

no **hello interval**

ip pim query-interval seconds

no ip pim query-interval

Hello

Hello SR Cap

PIM

```
Ruijie# configure terminal
Ruijie(config)# ip pim state-refresh disable
```

aÉ

ip pim state-refresh disable

PIM-DM

3.1.5 ip pim state-refresh origination-interval

PIM-DM **ip pim state-refresh origination-interval**

no

ip pim state-refresh origination-interval interval-seconds

no ip pim state-refresh origination-interval

seconds	<1-100>

```
Ruijie# configure terminal
Ruijie(config)# interface fastethernet 0/1
Ruijie(config-if)# ip pim state-refresh
origination-interval 65
```

3.1.6 show ip pim dense-mode interface

PIM-DM **show ip pim dense-mode interface**

show ip pim dense-mode interface [interface-type interface-number] [**detail**]

interface-type interface-number	
detail	

PIM

/ /

show ip pim dense-mode interface

```
Ruijie# show ip pim dense-mode interface
Address       Interface        VIFIndex  Ver/   Nbr
                                         Mode   Count
10.10.10.10   FastEthernet 0/45    3     v2/D    1
50.50.50.50   VLAN 4               2     v2/D    1
```

Address	PIM-DM IP
Interface	PIM-DM
VIF Index	VIF ID
Ver/Mode	PIM /
Nbr Count	PIM-DM

show ip pim dense-mode neighbor	PIM-DM

3.1.7 show ip pim dense-mode neighbor

PIM-DM

Ruijie# **show ip pim dense-mode mroute**

```
PIM-DM Multicast Routing Table
(1.1.1.111, 229.1.1.1)
  MRT lifetime expires in 205 seconds
  RPF Neighbor: 50.50.50.1, Nexthop:50.50.50.1,VLAN 4
  Upstream IF: VLAN 4
    Upstream State: Pruned, PLT:200
    Assert State: NoInfo
  Downstream IF List:
    FastEthernet 0/45:
      Downstream State: NoInfo
      Assert State: Loser, AT:170
```

PIM-SM

4.1 PIM-SM

PIM-SM

- **clear ip mroute**
- **clear ip mroute statistics**
- **clear ip pim sparse-mode bsr rp-set**
- **ip multicast-routing**
- **ip pim accept-register list**
- **ip pim bsr-candidate**
- **ip pim cisco-register-checksum**
- **ip pim dr-priority**
- **ip pim ignore-rp-set-priority**
- **ip pim jp-timer**
- **ip pim mib**
- **ip pim neighbor-filter**
- **ip pim query-interval**
- **ip pim register-rate-limit**
- **ip pim register-rp-reachability**
- **ip pim register-source**
- **ip pim register-suppression**
- **ip pim rp-address**
- **ip pim rp-candidate**
- **ip pim rp-register-kat**
- **ip pim sparse-mode**
- **ip pim spt-threshold**
- **ip pim ssm**
- **show debugging**
- **show ip pim sparse-mode bsr-router**
- **show ip pim sparse-mode interface**
- **show ip pim sparse-mode local-members**
- **show ip pim sparse-mode mroute**
- **show ip pim sparse-mode neighbor**
- **show ip pim sparse-mode nexthop**
- **show ip pim sparse-mode rp mapping**

z **show ip pim sparse-mode rp-hash**

4.1.1 clear ip mroute

clear ip mroute {* | group_address [source_address]}

*	pimsm
group_address	pimsm
group_address source_address	pimsm

pimsm

```
Ruijie# clear ip mroute *
Ruijie# clear ip mroute 224.2.2.2
Ruijie# clear ip mroute 224.2.2.2 2.2.2.2
```

4.1.2 clear ip mroute statistics

clear ip mroute statistics {* | group_address [source_address]}

*	pimsm
group_address	pimsm
group_address source_address	pimsm

pimsm بم - ƈ υ ώ ᾠ

4.1.6 ip pim bsr-candidate

ip pim bsr-candidate interface-type interface-number [hash-mask-length][priority-value]

interface-type interface-number	
hash-mask-length	<0-32> RP HASH 10

priority-value

G5B)€3¥4

priority-value	<0-4294967294> 1

DR 1

```
Ruijie# configure terminal
Ruijie(config)# ip pim mib dense-mode
```

4.1.12 ip pim neighbor-filter

ip pim neighbor-filter access_list

access_list	access-list acl 1-99 acl

PIM

PIM-SM peering

interval-seconds	<1-65535>

hello 30s

Hello Hello
Hello
Hello Hello Hello
3.5 Hello

```
Ruijie# configure terminal
Ruijie(config)# interface g 0/3
Ruijie(config-if)# ip pim query-interval 123
```

4.1.14 ip pim register-rate-limit

ip pim register-rate-limit rate

rate	register <1-65535>

S G
DR RP PIM-SM S G

```
Ruijie# configure terminal
```

```
Ruijie(config)# ip pim register-rate-limit 3000
```

4.1.15 ip pim regi

IP

RP Register-Stop

PIM

```
Ruijie# configure terminal
Ruijie(config)# ip pim register-source 192.168.195.80
Ruijie(config)# ip pim register-source g 0/3
```

4.1.17 ip pim register-suppression

ip pim register-suppression seconds

seconds	<11-21843>

60

DR DR ip pim rp-register-kat RP RPkeepalive

```
Ruijie# configure terminal
Ruijie(config)# ip pim register-suppression 100
```

4.1.18 ip pim rp-address

ip pim rp-address rp-address[access_list]

rp-address	RP ip
access_list	access-list acl <1-99> <1300-1999> acl

rp

RP RP BSR

z BSR RP

z RP ACL
ACL RP

z RP RP

z ACL ACL
224/4

z RP RP
RP
IP RP
IP

z RP
RP

```
Ruijie# configure terminal
Ruijie(config)# is[illegible]
```

4.1.19 ip pim rp-candidate

ip pim rp-candidate interface-type interface-number [**priority** priority-value][**interval** interval-seconds][**group-list** access_list]

Tm<01CF4 70472135420A5.6( )TjETEMC /PDC BT/C289.tPT146.00 646.52 mT146.00 626.04 l236.52

4.1.20 ip pim rp-register-kat

ip pim rp-register-kat seconds

seconds	KAT <1-65535>

RP KAT 210s

rp kat

```
Ruijie# configure terminal
Ruijie(config)# ip pim rp-register-kat 250
```

4.1.21 ip pim sparse-mode

ip pim sparse-mode

pimsm

pim sm

```
Ruijie# configure terminal
```

```
Ruijie(config)# interface g 0/3
Ruijie(config-if)# ip pim sparse-mode
```

\!

PIM-SM
PIM-SM
PIM-SM IGMP

" Failed to enable PIM-SM on <
>, resource temporarily unavailable, please try again "

" PIM-SM Configure failed! VIF limit exceeded in NSM!!! "
PIM-DM DVMRP

4.1.22 ip pim spt-threshold

ip pim spt-threshold [**group-list** access-list]

access-list	access-list acl 1-99 1300-1999 acl **group-list** access-list

```
Ruijie# configure terminal
Ruijie(config)# ip pim spt-threshold
Ruijie(config)# ip pim spt-threshold group-list
```

4.1.24 show debugging

show debugging

/ /

```
Ruijie #show debugging
```

show debugging

```
Ruijie #show debugging
ip packet debug:
ip packet debug debugging is on, acl: 0
```

4.1.25 show ip pim sparse-mode bsr-router

show ip pim sparse-mode bsr-router

BSR

/ /

BSR .

```
Ruijie# show ip pim sparse-mode bsr-router
```

show ip pim sparse-mode bsr-router

```
Ruijie# show ip pim sparse-mode bsr-router
```

PIMv2 Bootstrap information

This system is the Bootstrap Router (BSR)

BSR address: 192.1621127.1

Uptime: 01d23h14m, BSR Priority: 64, Hash mask length: 10

Next bootstrap message in 00:00:42

Role: Candidate BSR Priority: 64, Hash mask length: 10

State: Elected BSR

Candidate RP: 30.30.100.200(GigabitEthernet 0/3)

Advertisement interval 60 seconds

Next Cand_RP_advertisement in 00:00:32

4.1.26 show ip pim sparse-mode interface

show ip pim sparse-mode interface [

interface-type interface-number	
detail	

/ /

PIM SM

```
Ruijie#show ip pim sparse-mode interface
```

Ruijie#**show ip pim sparse-mode interface g** 0/3

show ip pim sparse-mode interface g 0/3 **detail**

```
Ruijie #sh ip pim sparse-mode interface g 0/3 detail
the max pim vif is 63,and now the pim vif already up
to 4
GigabitEthernet 0/3 (vif 2):
  Address 30.30.100.200, DR 30.30.100.200
  Hello period 30 seconds, Next Hello in 13 seconds
  Triggered Hello period 5 seconds
  Neighbors:
   30.30.100.1
```

4.1.27 show ip pim sparse-mode local-members

show ip pim sparse-mode local-members
[interface-type interface-number]

interface-type interface-number	

/ /

PIM SM IGMP

```
Ruijie# show ip pim local-members
Ruijie# show ip pim local-members g 0/3
```

sh ip pim sparse-mode local-members

```
Ruijie (config-if)#sh ip pim sparse-mode local-members
PIM Local membership information

GigabitEthernet 0/3:
   (*, 225.1.1.1) : Include

Loopback 1:
```

detail	

/ /

```
Ruijie#
```

4.1.31 show ip pim sparse-mode rp mapping

show ip pim sparse-mode rp mapping

/ /

rp

```
Ruijie#
```

RGOS™

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HDLC

1.1 HDLC

HDLC

- **encapsulation hdlc**
- **keepalive**
- **debug hdlc**

1.1.1 encapsulation hdlc

HDLC encapsulation hdlc

encapsulation hdlc

RGOS HDLC

HDLC
HDLC HDLC

1/0 HDLC

```
Ruijie(config)#interface serial 1/0
Ruijie(config-if)#encapsulation hdlc
```

1.1.2 keepalive

HDLC keepalive keepalive “ No keepalive ” HDLC keepalive keepalive

Keepalive *second*s

no Keepalive

Seconds keepalive

keepalive 10

HDLC
keepalive Ţ

keepalive
keepalive Ţ

HDLC keepalive 5

```
Ruijie(config-if)#keepalive 5
```

1.1.3 debug hdlc

HDLC debug hdlc r

debug hdlc { events | packets }

W HDLC

packets HDLC

r

HDLC HDLC Ţ Debug Events
HDLC HDLC keepalive
debug packets HDLC Ţ

HDLC RGOS

```
Ruijie#debug hdlc events
%Interface serial 1/0 : receive one HDLC keepalive packet.
%Interface serial 1/0 send one keepalive packet:
   my_seq = 21, my_seen = 20, your_seen = 16
   line protocol is UP, not in loopback state.
%Interface serial 1/0 : receive one HDLC keepalive packet.
%Interface serial 1/0 send one keepalive packet:
```

```
   my_seq = 22, my_seen = 21, your_seen = 17
   line protocol is UP, not in loopback state.
```

my_seq my_seen
HDLC keepalive your_seen

my_seq my_seen your_seen
HDLC

```
%Interface serial 1/0 : receive one HDLC keepalive packet.
%Interface serial 1/0 send one keepalive packet:
   my_seq = 21, my_seen = 20, your_seen = 16
   line protocol is UP, not in loopback state.
%Interface serial 1/0 send one keepalive packet:
   my_seq = 22, my_seen = 20, your_seen = 16
   line protocol is UP, not in loopback state.
%Interface serial 1/0 send one keepalive packet:
   my_seq = 23, my_seen = 20, your_seen = 16
   line protocol is UP, not in loopback state.
```

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

authentication ppp

error ppp

multilink ppp

negotiation ppp

packet ppp

PPP

PPP

```
Ruijie# debug ppp
PPP authentication debugging is on
```

2.1.2 encapsulation ppp

PPP **encapsulation ppp** **no** PPP

encapsulation ppp

no encapsulation ppp

HDLC

0 PPP

```
Ruijie(config)# interface serial 0
```

```
Ruijie(config-if)# encapsulation ppp
```

2.1.3 interface dialer

interface

dialer no

interface dialer *group-number*

no interface dialer *group-number*

group-number rotary dialer rotary-group number

dialer rotary-group

0

```
Ruijie(config)# interface dialer 0
```

dialer rotary-group	

2.1.4 interface multilink

interface

multilink no

interface multilink *group-number*

no interface multilink *group-numbe*

group-number group ppp multilink group group-number

ppp **multilink** **group**

0

```
Ruijie(config)# interface multilink 0
```

ppp multilink group *group-number*	

aaa new-model	AAA
encapsulation ppp	PPP
Username	

2.1.8 ppp chap hostname

CHAP **ppp chap hostname** no

ppp chap hostname *hostname*

no ppp chap *hostname*

hostname chap

chap

chap

/

ppp chap hostname CHAP

/

/

1 chap comhost

```
Ruijie(config)# int async 1
Ruijie(config-if)# ppp chap hostname comhost
```

aaa authentication ppp	AAA ppp
ppp authentication	ppp
ppp chap password	chap

2.1.9 ppp chap password

chap **ppp chap password** no chap

ppp chap password *encryption-type secret*

encryption-type

Secret CHAP

ppp chap hostname **ppp chap password** chap

ppp chap hostname **ppp chap password** chap

chap comword

```
Ruijie(config)# int as 1
Ruijie(config-if)# ppp chap  password  0 comword
```

aaa authentication ppp	AAA ppp
ppp authentication	ppp
ppp chap hostname	chap

2.1.10 ppp ignore peer-ip

IP

ppp ignore peer-ip.

IP .

no ppp ignore peer-ip

IP

.

PPP serial 0/1 IP

```
Ruijie(config)# interface serial 0/1
Ruijie(config-if)# ppp ignore peer-ip
```

2.1.11 ppp pap sent-username

PAP **ppp pap sent-username**

```
papuser password1 Tf0 T0001 Tc 8 1j/T513 0 T23.5 0 j/C2_0 1 Tf0.4001 T
```

ppp authentication	PPP
dialer load-threshold	
encapsulation ppp	PPP
Dialer idle-timeout	

2.1.13 ppp multilink endpoint

ppp multilink endpoint no

ppp multilink endpoint {**hostname** | **ip** *ip-address* | **mac** *lan-interface* | **none** | **phone** *telephone-number* | **string** *char-string*}

no ppp multilink endpoint

hostname

ip *ip-address* IP

mac *lan-interface* MAC

none

phone *telephone-number*

string *char-string*

chap hostname **pap sent-username**

PPP MP

ppp chap hostname **ppp pap sent-username** **hostname** **ppp multilink endpoint** **no**

no ppp multilink endpoint **ppp multilink endpoint** *hostname*

hostname string

no

MP MP

ppp multilink fragment delay MP

30

MTU

```
Ruijie(config-if)# ppp multilink fragment disable
```

4

```
Ruijie(config-if)# ppp multilink fragment maximum 4
```

```
Ruijie(config-if)# ppp multilink fragment size 128
```

ppp multilink fragment delay	
ppp multilink fragment disable	/

ppp multilink fragment size

interface multilink	

2.1.19 ppp multilink idle-link

ppp multilink

idle-link **no**

ppp multilink idle-link

no ppp multilink idle-link

links	1	255

16

dialer load-threshold **ppp multilink load-threshold** MP **dialer load-threshold**

MP 10

```
Ruijie(config-if)# ppp multilink load-threshold 10 inbound
```

dialer load-threshold	
ppp multilink links maximum	
ppp multilink links minimum	

2.1.23 ppp negotiation-timeout

ƀ ,X ,X25B,U6 ã î? âÍ_ BA ÜpØ A, À !bãßÅQ…%à pÑ b˜ ·BóH" p ØD óHåÒ À Qb)‡

PPP LCP IPCP LCP

ɔ PPP 10PP

dialer wait-for-carrier-time	
ppp timeout multilink link remove	MP

2.1.25 ppp timeout multilink link remove

MP

ppp timeout multilink link remove **no**

ppp timeout multilink link remove *wait-period*

no ppp timeout multilink link remove

wait-period 1 65535

no ppp timeout multilink link remove

ppp **multilink load-threshold** MP **ppp timeout multilink link remove**

MP **dialer idle-timeout** MP

dialer wait-for-carrier-time MP

MP 30

45

```
Ruijie(config-if)# ppp timeout multilink link remove 45
```

PPP

2.1.28 username

username

username *name* {**nopassword** | **password** *password* | **password** *encryption-type encrypted-password* }

username *name* **password** *secret*

username *name* [**access-class** *number*]

username *name* [**autocommand** *command*]

username *name* [**callback-dialstring** *telephone-number*]

username *name* [**callback-rotary** *rotary-group-number*]

username *name* [**callback-line** [**vty** | **aux** | **vty**] *line-number* [*ending-line-number*]]

username *name* [**nocallback-verify**]

username *name* [**noescape**] [**nohangup**]

username *name* [**privilege** *level*]

name

ID name

Nopassword autocommand

Password

Password

encryption-type

0 7

encrypted-password

Password

Secret

access-class

access-class

Number

Autocommand *Command*

username

callback-dialstring *telephone-number*

callback-rotary *rotary-group-number*
0-100 line

callback-line
line-number
0
ending-line-number
nocallback-verify EXEC
Noescape
Nohangup
autocommand

Privilege
Level 0 15

/

```
Ruijie(config)# username red password 0 redpw
```

3.1

- **debug frame-relay**
- **clear frame-relay-inarp**
- **encapsulation frame-relay**
- **frame-relay interface-dlci**
- **frame-relay intf-type**
- **frame-relay inverse-arp**
- **frame-relay lmi-n391dte**
- **frame-relay lmi-n392dce**
- **frame-relay lmi-n392dte**
- **frame-relay lmi-n393dce**
- **frame-relay lmi-n393dte**
- **frame-relay lmi-t392dce**
- **frame-relay lmi-type**
- **frame-relay local-dlci**
- **frame-relay map**
- **frame-relay route**
- **keepalive**
- **show frame-relay lmi**
- **show frame-relay map**
- **show frame-relay pvc**
- **show frame-relay traffic**

3.1.1 debug frame-relay

debug frame-relay

debug frame-relay {**events** | **lmi** | **packet**}

events

lmi

packet

```
Ruijie# debug frame-relay lmi
```

ietf CISCO

RGOS CISCO
ietf **ietf**

CISCO **ietf** CISCO 4
DLCI

ietf

```
Ruijie(config-if)# encapsulation frame-relay ietf
```

3.1.4 frame-relay interface-dlci

DLCI **frame-relay interface-dlci**
DLCI **no**

frame-relay interface-dlci *dlci*

no frame-relay interface-dlci *dlci*

dlci DLCI 16 1007

DLCI

DLCI DLCI
DLCI

ARP

ARP

DLCI

frame-relay inverse-arp [**protocol**] [*dlci*]

no frame-relay inverse-arp [**protocol**] [*dlci*]

protocol IP

dlci DLCI 16 1007

ARP

ARP RFC1293 IP

ARP DLCI

ARP DLCI DLCI

ARP

ARP DLCI

ARP ARP

ARP

```
Ruijie(config-if)# no frame-relay inverse-arp
```

clear frame-relay-inarp	arp
show frame-relay map	

3.1.7 frame-relay lmi-n391dte

PVC **frame-relay lmi-n391dte**

no

frame-relay lmi-n391dte *keep-exchanges*

no frame-relay lmi-n391dte

keep-exchanges 1 255

6

DTE

PVC **lmi-n391dte**

6

PVC 5

```
Ruijie(config-if)# frame-relay lmi-n391dte 5
```

3.1.8 frame-relay lmi-n392dce

DCE **frame-relay lmi-n392dce**
no

frame-relay lmi-n392dce *threshold*

no frame-relay lmi-n392dce

threshold 1 10

2

N393 N392

!
N393DCE N392DCE

DCE 4

```
Ruijie(config-if)# frame-relay intf-type dce
Ruijie(config-if)# frame-relay lmi-n392dce 4
```

Frame-relay lmi-n393dce	dce

3.1.9 frame-relay lmi-n392dte

DTE **frame-relay lmi-n392dte**
no

frame-relay lmi-n392dte *threshold*

no frame-relay lmi-n392dte

threshold 1 10

3

N393

3.1.10 frame-relay lmi-n393dce

DCE **frame-relay lmi-n393dce**

no

f**rame-relay lmi-n393dce** *events*

no frame-relay lmi-n393dce

events 1 10

2

LMI N392 RGOSame-r</TT2 >

N393 1

T392 DTE Keepalive

T392 20

```
Ruijie(config-if)# frame-relay lmi-t392dce 20
```

Keepalive(LMI)	LMI Keepalive

3.1.13 frame-relay lmi-type

(LMI) **frame-relay lmi-type**

frame-relay lmi-type {**ansi** | **cisco** | **q933a**}

ansi

cisco CISCO

q933a CCITT

q933a

RGOS LMI ANSI CISCO Q933A
LMI

---

a

LMI UP
show interface LMI

LMI ANSI

```
Ruijie(config-if)# frame-relay lmi-type ansi
```

3.1.14 frame-relay local-dlci

DLCI **frame-relay local-dlci**
no DLCI

frame-relay local-dlci *number*
no frame-relay local-dlci

number DLCI 16 1007

DLCI

DCE
DCE DTE DLCI
DCE DLCI

DLCI 20

```
Ruijie(config-if)# frame-relay local-dlci 20
```

3.1.15 frame-relay map

frame-relay map **no**

frame-relay map ip *address* **dlci** [**broadcast**] [**ietf** | **cisco**]
no frame-relay map ip *address*

address IP
dlci IP DLCI
broadcast IP
ietf **ietf**
cisco **cisco**

PVC

DLCI

ietf **cisco**

encapsulation frame-relay DLCI

\

encapsulation frame-relay

DLCI **encapsulation frame-relay**

broadcast

30.1.1.1 DLCI 30

```
Ruijie(config-if)# frame-relay map ip 30.1.1.1 30
```

DCE

In-dlci DLCI *number*

out-dlci PVC DLCI

0/0 DLCI 100

1 100 200 Aå

```
Ruijie# sh frame-relay map
serial 1/0 (up): ip 1.1.1.1
dlci 100(0x1840), dynamic,
broadcast,CISCO, status: ACTIVE
```

serial1/0(up)

ip 1.1.1.1

dlci 100(0x1840) DLCI 100 0x1840

dynamic

CISCO IETF CISCO

Active

3.2.3 show frame-relay pvc

PVC show frame-relay pvc

show frame-relay pvc [**interface** *interface*] [*dlci*]

interface

dlci DLCI

PVC DLCI

DLCI DLCI

DLCI 100

```
Ruijie# show frame-relay pvc 100
PVC Statistics for interface serial 1/0 (Frame Relay DTE)
DLCI = 100, DLCI USAGE = LOCAL, PVC STATUS = ACTIVE , INTERFACE
```

```
= serial 1/0
input pkts 100   output pkts 100   in bytes 2600
out bytes 3000   dropped pkts 0   in FECN pkts 0
in BECN pkts 0   out FECN pkts 0   out BECN pkts 0
in DE pkts 0      out DE pkts 0
```

3.2.4 show frame-relay traffic

show frame-relay traffic

show frame-relay traffic

```
Ruijie# show frame-relay traffic
Frame Relay Inverse Arp statistics:
Inarp requests sent 101, Inarp replies recvd 101
ARP request recvd 0, ARP replies sent 0
```

LAPB X.25

4.1 LAPB X.25

LAPB X.25

- **debug lapb**
- **debug x25**
- **encapsulation lapb**
- **encapsulation x25**
- **lapb k**
- **lapb modulo**
- **lapb n1**
- **lapb n2**
- **lapb t1**
- **lapb t4**
- **show x25 map**
- **show x25 vc**
- **x25 address**
- **x25 hic**
- **x25 hoc**
- **x25 htc**
- **x25 ips**
- **x25 lic**
- **x25 loc**
- **x25 ltc**
- **x25 lic**
- x25 loc

z x25 ips

z

- **x25 win**
- **x25 wout**
- **show x25 map**
- **show x25 vc**

4.1.1 debug lapb

LAPB **debug lapb**

debug lapb

LAPB

```
Ruijie# debug lapb
serial 1/3: LAPB I CONNECT (7) IFRAME 1 2
serial 1/3: LAPB O CONNECT (93) IFRAME 2 2
serial 1/3: LAPB I CONNECT (2) RR (R) 3
serial 1/3: LAPB I CONNECT (93) IFRAME 2 3
serial 1/3: LAPB O CONNECT (2) RR (R) 3
serial 1/3: LAPB O CONNECT (93) IFRAME 3 3
```

serial1/3 O output LAPB I Input
SABMSENT SAMB 2
SABM P Poll

4.1.2 debug x25

X25 **debug x25**

debug x25 [**events | packets**]

events x25

packets x25

x25

```
Ruijie# debug x25 pa
X25 packet debugging is on
serial 1/3: X25 O P3 CALL REQUEST (13) 8 lci 1
From(4):2222 To(4):3333
Facilities: (0)
Call User Data (4): 0xcc0 0 0  (ip)!
serial 1/3: X25 I P3 CALL CONNECTED (5) 8 lci 1
From(0): To(0):
Facilities: (0)
serial 1/3: X25 O P4 DATA (91) 8 lci 1 PS 0 PR 0
serial 1/3: X25 I P4 DATA (91) 8 lci 1 PS 0 PR 1
serial 1/3: X25 O D1 DATA (91) 8 lci 1 PS 1 PR 1!
```

4.1.3 encapsulation lapb

LAPB **encapsulation lapb**

encapsulation lapb [**dte** | **dce**]

dte DTE

dce DCE

HDLC

DTE

LAPB X25 LAPB

X25 X25

1 LAPB DCE

```
Ruijie(config)# int serial 1
Ruijie(config-if)# encapsulation lapb dce
```

encapsulation x25	x25

4.1.4 encapsulation x25

x25 **encapsulation x25** **no**

encapsulation x25 [**dte** | **dce**] [**ietf**]
no encapsulation x25 [**dte** | **dce**] [**ietf**]

dte dte
dce dce
ietf IETF

HDLC
X25 DTE CISCO

x25 DTE DCE DTE DCE

RGOS CISCO x25
x25

---

a _É

X25 DTE/DCE V35DTE/DCE

---

ietf x25 dte

```
Ruijie(config-if)# encapsulation x25 dte ietf
```

X25 map	x25

4.1.5 lapb k

LAPB **lapb k**

lapb k *window-size*

8

LAPB ,LAPB
Modulo-1 LAPB 8 128 I
0 1

LAPB X25
LAPB

LAPB LAPB

LAPB 128

```
Ruijie(config-if)# lapb modulo 128
Change held until LAPB is reset
```

lapb k	LAPB

4.1.7 lapb n1

LAPB **lapb n1** **no**

lapb n1 *bits*

no lapb n1

bits ë

LAPB 12000

```
Ruijie(config-if)# lapb n1 12000
```

mtu	MTU
show interface	LAPB

4.1.8 lapb n2

LAPB **lapb n2**
no

lapb n2 *tries*

no lapb n2

tries 1-255

20

LAPB N2 LAPB LAPB
UP Down

LAPB 30

```
Ruijie(config-if)# lapb n2 30
```

4.1.9 lapb t1

LAPB **lapb t1** no

lapb t1 *milliseconds*

no lapb t1

lapb t1	
lapb n2	

4.1.11 show x25 map

x25 **show x25 map**

show x25 map

```
Ruijie# sh x25 map
serial 1/3: X.121 3333 <--> ip 2.2.2.2
PERMANENT, 1 VC: 1
```

Serial 1 map

x.121 3333 x.121

ip 2.2.2.2 IP

permanent x25 permanent x25 map PVC x25 pvc

1 vc (SVC PVC)

1

4.1.12 show x25 vc

X25 SVC PVC **show x25 vc**

show x25 vc

LCN LCN

```
Ruijie# show x25 vc
SVC 1,  State: D1,  Interface: serial 1/3
Connects 3333 <--> ip 2.2.2.2
no Tx data PID
Window size input: 2, output: 2
Packet size input: 128, output: 128
PS: 5  PR: 5  ACK: 4  Remote PR: 5  RCNT: 1  RNR: FALSE
Retransmits: 0  Reassembly (bytes): 0
Held Fragments/Packets: 0/0
Bytes 440/440 Packets 5/5 Resets 0/0 RNRs 0/0 REJs 0/0 INTs 0/0
```

Svc 1 1024

State D1 ITU-TX25

Interface :serial1

Connects 3333 <--> ip 2.2.2.2 x.121 IP

Data pid none ietf

Window size

Packet size

PS

PR

ACK

Remote PR

RCNT

RNR

Retransmits

Timer (secs)

Reassembly (bytes)

Held Fragments/Packets

Bytes

Packets

Resets

RNRs “ ”

REJs

INTs

4.1.13 x25 address

x.121 **x25 address** **no** x.121

x25 address *x121-address*

no x25 address

x121-address x.121 X.25

x.121

X.25 x121

x121

x25 x.121

1 x121 1111

```
Ruijie(config)# interface serial 1
Ruijie(config-if)# x25 address 1111
```

4.1.14 x25 hic

X.25 **x25 hic**

x25 hic *circuit-number*

circuit-number 1 4095 0 HIC

0

DTE LTC HTC 0

X25 loc	

4.1.16 x25 htc

X.25 **x25 htc**

DTE LTC HTC 0
LIC HIC
LTC HTC LOC HOC
LIC

X25

HIC 10

```
Ruijie(config-if)# x25 lic 10
Parameter change held until a RESTART event
```


X25 hoc	

Address ip

X121-address x121

Option

X121 IP

X121

–× ð7 w ÂõS - a ÿQ@ ÈÝ s(n2LTJ wT 71ë 1 Tf 0 Tc 0 T3.692213 0 Tc

IPS OPS

IPS OPS 1024

```
Ruijie(config-if)# x25 pvc 12 ip 40.1.1.1 1111 broadcast
```

X25 map	x25

4.1.25 x25 t10

X.25 DCE T10 **x25 t10** **no**

x25 t10 *seconds*

no x25 t10

seconds

60

T10 40

```
Ruijie(config-if)# x25 t10 40
```

4.1.26 x25 t11

X.25 DCE T11 **x25 t11** no

x25 t11 *seconds*

no x25 t11

seconds

180

t11 140

```
Ruijie(config-if)# x25 t11 140
```

4.1.27 x25 t12

X.25 DCE T12 **x25 t12** **no**

x25 t12 *seconds*

no x25 t12

seconds

60

T12 30

```
Ruijie(config-if)# x25 t12 30
```

4.1.28 x25 t13

X.25 DCE T13 **x25 t13** **no**

x25 t13 *seconds*

no x25 t13

seconds

60

T13 30

```
Ruijie(config-if)# x25 t13 30
```

4.1.29 x25 t20

X.25 DTE T20 **x25 t20** **no**

x25 t20 *seconds*

no x25 t20

seconds

seconds

no

x25 t22 *seconds*

no x25 t22

seconds

180

T22 90

```
Ruijie(config-if)# x25 t22 90
```

4.1.32 x25 t23

X.25 DTE T23 **x25 t23**
no

x25 t23 *seconds*

no x25 t23

seconds

180

T23 30

```
Ruijie(config-if)# x25 t23 30
```

4.1.33 x25 win

x25 win **no**

x25 win *packets*

no x25 win

packets 1 x25 1

2

x25 th

---

a _É

x25 win **x25 wout**

5

```
Ruijie(config-if)# x25 win 5
```

x25 wout	x25
X25 th	
X25 modulo	x25

4.1.34 x25 wout

x25 wout **no**

x25 wout *packets*

no x25 wout

packets 1 x25 1

2

```
Ruijie# sh x25 map
serial 1/3: X.121 3333 <--> ip 2.2.2.2
PERMANENT, 1 VC: 1
```

Serial 1 map

x.121 3333 x.121

ip 2.2.2.2 IP

permanent x25 permanent x25 map PVC x25 pvc

1 vc (SVC PVC)

1

4.2.2 show x25 vc

X25 SVC PVC **show x25 vc**

show x25 vc

LCN LCN

```
Ruijie# show x25 vc
SVC 1,  State: D1,  Interface: serial 1/3
Connects 3333 <--> ip 2.2.2.2
no Tx data PID
Window size input: 2, output: 2
Packet size input: 128, output: 128
PS: 5  PR: 5  ACK: 4  Remote PR: 5  RCNT: 1  RNR: FALSE
Retransmits: 0  Reassembly (bytes): 0
Held Fragments/Packets: 0/0
Bytes 440/440 Packets 5/5 Resets 0/0 RNRs 0/0 REJs 0/0 INTs 0/0
```

Svc 1 1024

State D1 ITU-TX25

Interface :serial1

Connects 3333 <--> ip 2.2.2.2 x.121 IP

DataEÝ$

Window size

Packet size

PS

PR

ACK

Remote PR

RCNT

RNR

Retransmits

Timer (secs)

Reassembly (bytes)

Held Fragments/Packets

Bytes

Packets

Resets

RNRs “ ”

REJs

INTs

DLDP

5.1 DLDP

DLDP

z **dldp ip**

z dldp passive

5.1.1 dldp ip

dldp ip 100

no

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

no dldp ip [nexthopip]

ip ip

***nexthopip*:** ip

interval

retry

no dldp [illegible] dldp iface [illegible]

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

```
              ip   20.1.1.1        ip   10.1.1.1
```

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

Ä Ì"ÄAÈ Ruije(ld)

RGOS10.3 RGOS10.3

5.1.2 dldp passive

R

dldp passive dldp

	Multiplier *multiplier-value*	*PXOWLSOLHUBDCTXH*

BFD

BFD

OSPF RIP [**no**] **bfd all-interfaces**

BFD

ip ospf bfd [**disable**] **ip rip bfd** [**disable**]

OSPF RIP BFD

OSPF BFD

```
Ruijie(config)# router ospf 123
Ruijie(config-router)# bfd all-interface
```

bfd	BFD
ip ospf bfd	OSPF BFD
ip rip bfd	RIP BFD

10.3(4b3)	

6.1.3 bfd cpp

bfd cpp BFD **no** BFD

bfd cpp

no bfd cpp

BFD

BFD BFD BFD BFD BFD BFD BFD

BFD

```
Ruijie(config)# bfd cpp
```


10.3(4b3)	

6.1.4 bfd echo

bfd echo echo **no** echo

bfd echo

no bfd echo

BFD echo

BFD echo echo
Interval milliseconds **min_rx** *milliseconds*

L3 AP BFD ECHO , BFD **no ip** **redirects** ICMP **no ip deny land** DDOS (Land-based) Echo BFD

```
# Routed Port FastEthernet 0/2 echo
Ruijie(config)# interface fastEthernet 0/2
Ruijie(config)# no switchport
Ruijie(config-if)# bfd echo
```

bfd	BFD
ip redirects	ICMP
ip deny land	Land-based
bfd slow-timer	

10.3(4b3)	

6.1.5 bfd slow-timer

bfd slow-timer BFD ECHO
BFD BFD **no**

bfd slow-timer [*milliseconds*]

no bfd slow-timer

milliseconds	BFD 1000 30000, 1000

1000ms

slow-timer 14000
Ruijie(config)# **bfd slow-timer** 14000

bfd echo	BFD Echo

10.3(4b3)	

6.1.6 bfd up-dampening

, UP UP

no

bfd up-dampening [*milliseconds*]

no bfd up-dampening

milliseconds	( ) UP UP 0 300000, 0, DOWN UP .

6.1.7 ip ospf bfd

ip ospf bfd OSPF BFD **disable** **no**

ip ospf bfd [**disable**]

no ip ospf bfd

disable	( ) OSPF BFD

disable OSPF BFD

OSPF BFD

OSPF [**no**] **bfd all-interfaces** BFD

ip ospf bfd [disable] OSPF BFD

Routed Port FastEthernet 0/2 OSPF BFD .

```
Ruijie(config)# interface FastEthernet 0/2
Ruijie(config-if)# no switchport
Ruijie(config-if)# ip ospf bfd disable
```

bfd	BFD
bfd all-interfaces	BFD

10.3(4b3)	

6.1.8 ip rip bfd

ip rip bfd RIP BFD **disable** **no**

ip rip bfd [**disable**]

no ip rip bfd

disable	( ) RIP BFD

disable RIP BFD

RIP BFD

RIP [**no**] **bfd all-interfaces** BFD

ip rip bfd [disable] RIP BFD

Routed Port FastEthernet 0/2 RIP BFD

```
Ruijie(config)# interface FastEthernet 0/2
Ruijie(config-if)# no switchport
Ruijie(config-if)# ip rip bfd disable
```

bfd	BFD

10.3(4b3)	

6.1.9 ip route static bfd

ip route static bfd BFD **no**

ip route static bfd [**vrf** *vrf-name*] *interface-type interface-number gateway* [**source** *ip-address*]

no ip route static bfd [**vrf** *vrf-name*] *interface-type interface-number gateway* [**source** *ip-address*]

interface-type interface-number	
gateway	IP BFD IP BFD
source *ip-address*	( ) BFD IP , IP

BFD

a BFD

```
# BFD BFD 172.16.0.2
Ruijie(config)# interface FastEthernet 0/1
Ruijie(config-if)# no switchport
Ruijie(config-if)# ip address 172.16.0.1 255.255.255.0
Ruijie(config-if)# bfd interval 50 min_rx 50 multiplier 3
Ruijie(config-if)# ip route static bfd FastEthernet 0/1 172.16.0.2
```

```
Ruijie(config-if)# ip route 10.0.0.0 255.0.0.0 FastEthernet 0/1
172.16.0.2
```

bfd	BFD

10.3(4b3)	

6.1.10 ipv6 route static bfd

ipv6 route static bfd BFD **no**

Ipv6 route static bfd [**vrf** *vrf-name*] *interface-type interface-number gateway* [**source** *ipv6-address*]

no ipv6 route static bfd [**vrf** *vrf-name*] *interface-type interface-number gateway* [**source** *ipv6-address*]

a	BFD

#

a	IP BFD

BGP BFD BFD 172.16.0.2
```
Ruijie(config)# router bgp 44000

Ruijie(config-router)# bgp log-neighbors-changes

Ruijie(config-router)# neighbor 172.16.0.2 remote-as 45000

Ruijie(config-router)# neighbor 172.16.0.2 fall-over bfd

Ruijie(config-router)# end
```

bfd	BFD

10.3(4b3)	

6.1.12 vrrp bfd

vrrp bfd VRRP BFD master **no**

vrrp *group-number* **bfd** *ip-addess*

no vrrp *group-number* **bfd** *ip-addess*

group-number	VRRP BFD master
ip-addess	IP

VRRP BFD master

IP BFD

a VRRP ,
IP

VRRP BFD BFD

```
Ruijie#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Ruijie(config)#interface FastEthernet 0/1
Ruijie(config-if)#no switchport
Ruijie(config-if)#ip address 192.168.201.11 255.255.255.0
Ruijie(config-if)#bfd interval 50 min_rx 50 multiplier 3
Ruijie(config-if)#vrrp 1 priority 120
Ruijie(config-if)#vrrp 1 ip 192.168.201.1
Ruijie(config-if)#vrrp 1 bfd 192.168.201.12
Ruijie(config-if)#end
```

bfd	BFD

10.3(4b3)	

6.2

BFD

„ show bfd neighbors

6.2.1 show bfd neighbors

BFD

show bfd neighbors [**vrf** *vrf-name*] [**ipv4** *ip-addess* [**details**]| **ipv6** *ip-addess* [**details**] |

client {**bgp**|**ospf**|**rip**|**vrrp**|**static-route**} [**ipv4** *ip-addess* [**details**] | **ipv6** *ip-addess* [**details**]| **details**]]

vrf *vrf-name*	( ) VRF

Received Multiplier

Holdown (hits)

Hello (hits) *he l l o*

Rx Count *BFD*

Rx Interval (ms) min/max/avg

Tx Count *BFD*

Tx Interval (ms) min/max/avg

Registered protocols

Uptime *UP*

Last packet *BFD*

10.3(4b3)	

RGOS™ Ю ҙ ”Ą

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ƕ ƙ

1.1 ƕ ƙ

ЛЬЮƕ ƙ'

- async mode
- backup delay
- backup interface
- backup load
- chat-script
- clear counters
- clear dialer
- clear interface
- clear line
- debug async
- debug chat
- debug dialer
- debug isdn
- debug ppp
- dialer apn
- dialer auto-dial
- dialer callback-secure
- dialer enable-timeout
- dialer fast-idle
- dialer-group
- dialer hold-queue
- dialer idle-timeout
- dialer in-band
- dialer-list
- dialer load-threshold

- dialer map
- dialer pool
- dialer pool-member
- dialer priority
- dialer remote-name
- dialer rotary-group
- dialer string
- dialer watch-group
- dialer watch-list
- dialer watch-list delay
- group-range
- ip address negotiated
- ip address-pool
- ip route
- line
- map-class dialer
- modem dialin
- modem inout
- peer default ip address
- plmn search
- plmn selecet
- ppp callback
- ppp max-bad-auth
- ppp multilink
- pppoe-client
- pppoe enable
- script dialer
- snmp trap signalThreshold
- start-chat
- 3gbackup

1.1.1 async mode

Ђu ҳ **async mode** Â Ђu ҳ

no Â

async mode dedicated

no async mode

dedicated	

a Â

Ђu ҳ

Ђu ҳ

1' Ю 1 ѝ '

```
interface async 1
   async mode dedicated
```

Ђu ҳ	
-	-

ѵ Â

-	-

Ђu ҳ ѵ

1.1.2 backup delay

Ђu ҳ ў б ĺ è **no** Â

backup delay { *enable-delay-time*

enable-delay-time	ÿ ў ƚ ў ʌ (Л∪ ѝ æ) Â
interface-number	ÿ ƚ ў ў ʌ (Л∪ ѝ æ) Â
never	ў ↓ ( ) a ↓ (**active** **standby**) a ƚ Â

Ю ў б ƚ
Â ѝ ў è ж
Ю ÿ ў ƚ ѝ 0 ÿ ƚ
ў ѝ 0 Ю ў ↓ ʌ
ƚ Â

ƕ

Ю ў ↓ ʌ ƚ Â
Ь Â
ƚ Â

ў б ƚ Â ў up ѝ
down ʌ a ƚ Â
ʌ ў Ÿ ѝ down ƚ Â

ў a ƚ Â ↓ ў down
ѝ up ʌ a ƚ ў Â
ʌ ў Ÿ ѝ up ƚ ў Â ў
Ѝ ѝ down a ƚ Â
ў Э ʌ ў б ƚ
ЬЖ Â

1' ЛЬЮ ў Serial 1/0 Э ў б ƚ
' ў ʌ ƚ Э ' ў ʌ
20 ʌ ѝ **standby** ƚ ў Â

```
interface serial 1/0
 backup delay 0 20
```

ћ	
-	-

1.1.3 backup interface

ћ **backup** ћ no

backup interface

no backup interface

interface-name	й

1' Ю 1 й 0/0 '

```
interface  0/0
 backup interface Async 1
```

ћ	
-	-

ћ	
-	-

1.1.4 backup load

backup load { *enable-delay-percent* **| never** } { *disable-delay-percent* **| never** }

no backup load

enable-delay-percent	ĭ ў ´ è ɻ ĭ ĭ ў è ɻ ĭ Â
disable-delay-percent	ɻ ´ ў ɻ ĭ ў æ è ɻ ĭ Â
never	a ɻ ˆ **active** **standby** ˜ a Â

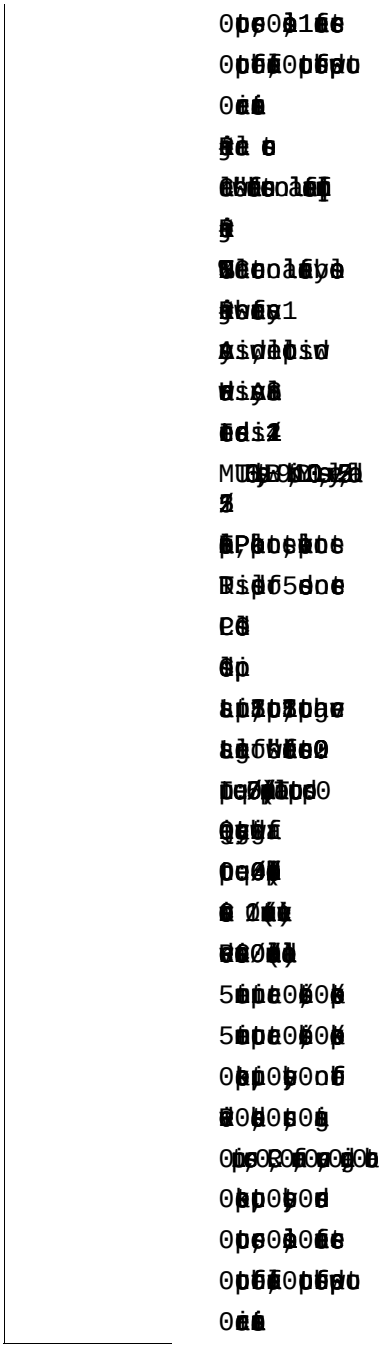
1.1.5 chat-script

MODEM ƕ **chat-script** Â
ƕ **no** Â

chat-script *script-name expect-send*

no chat-script

ɻ ԽՍ ՀՂ ԽՍ ՀՂ



ƙƱ ǯ	

ƙƱ ǯ

interface-number	

Â

ƕ Â

Â

1' ƗO 0 '

ƕ clear interface serial *1/0*

ƕ	
-	-

ƙ

ƕ ƙ	
-	-

1.1.9 clear line

ƙ ƚƱ ƕ **clear line** Â

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

line-type	Line **aux** à**console** à**vty** Â ù **tty** Â
line-number	Â

Â

ƕ Â

ƕ ƙ ƚƱ ^ **tty** à **aux**˜ à ^ **vty** à **console**˜ Â ƕ line Â

1' ƗO VTY 0 '

ƕ clear line vty *0*

ƚυ ϡ

ƚυ ϡ	
-	-

ƚυ ϡ ϡ

-	-

1.1.10 debug async

ƚυ ϡ **debug async** Â

debug async { **framing** | **packet** | **state** }

framing	
packet	
state	

Â

ƚυ ϡ Â

ƚυ ϡ Â

Â

ƚυ ϡ

ƚυ ϡ	
-	-

ƚυ ϡ ϡ

-	-

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Þu ¾ ¬ Ло Â

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Þu ¾	
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Þu ¾ ¬

-	-

1.1.13 debug isdn

BRI ¬ Ло Þu ¾ **debug isdn** Â

debug isdn {cc | packet_in | packet_out |process | q921|q931}

cc	L ¬
packet_in	isdn
packet_out	isdn
process	isdn
q921	q921
q931	q931

MSTP

Þu ¾ Â

Ю isdn q931 '

ƕ **debug isdn q931**

Â

ƕ	
-	-

ƙ

ƕ ƙ	
-	-

1.1.14 debug ppp

PPP ƙ Ƨ ƕ **debug ppp** Â

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

authentication	PPP
error	PPP
event	PPP
negotiation	PPP
packet	PPP

à

PPP Â

ƕ Â

ƕ ў PPP é ƙ Ƨ a
ƙ Â

1' Ю PPP '
ƕ **debug ppp event**

ƕ	
-	-

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15

Â

Ѓ Л Л Л Л

Ї Â

1' Ю й 10 '

```
interface async 1
   dialer enable-timeout 10
```

-	-

	-

Ћ ђ **dialer fast-idle** Â Ћ ђ

Â

dialer fast-idle *seconds*

no dialer fast-idle

seconds	^ ~ Â

20 Â

Ћ ђ Â

Â

Ѓ

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Æ Â

ƕ **dialer idle-timeout** ƕ ↓Ո

a Â

a Ė

Â

1' Ю ѝ 30 '

```
interface async 1
   dialer fast-idle 30
```

ƕ	
dialer idle-timeout	

↓

-	-

1.1.20 dialer-group

ƕ **dialer-group** Â ƕ ƕ no Â

dialer-group *group-number*

no dialer-group

group-number	

Â

ƕ Â

ﻲﻓ ѫ ↓Ո

ƕ **dialer-list** ∧ Э è Â

1

ƕ **dialer-list** *1* **protocol ip permit**
ƕ **interface async** *1*
ƕ **dialer-group** *1*

ƕ

ƕ	
dialer-list	ƕ

ƙ

ƕ ƙ

-	-

1.1.21 dialer hold-queue

ƕ **dialer hold-queue** Â ƕ ƕ **no** Â

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

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

packet	ƚ ƙ 0 100 Â
timeout *seconds*	ƚ ˆ ˜ 45s Â

ƕ

MODEM Â
ƙ Ƈ Ə Ƈ ƚ
Â

1' Ю ѝ 50'
ƕ **interface async** *1*
ƕ **dialer hold-queue** *50*

ƕ

ƕ	
-	-

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ƕ ǯ ǻ		
	-	-

1.1.22 dialer idle-timeout

ƕ ǯ **dialer idle-timeout**

1.1.23 dialer in-band

(DDR) **dialer in-band** ƕ ƚ Â
ƕ ƚ **no**

1.1.25 dialer load-threshold

ƕƛ

ƕ ƙ **dialer load-threshold** Â ƕ ƙ **no**

Â

dialer load-threshold load [**outbound** | **inbound** | **either**]

no dialer load-threshold

load	Â ƙ ƙ 1~255 255 ƙ 100% Â
outbound	ƙ Â
inbound	ƙ Â
either	ƙ ƙ Â

a .

ƕ ƙ Â

ƕ ƙ DDR ISDNBRI Â

ƙ ƛ ƙ Ƌ

ƙ Ƌ ƙ è Â Â

ÿ Â Э æ

Â

load ╗ 1 ƙ 255 ƙ Â ƙ

Ƌ **bandwith** ƕ ƙ Æ ƙ KB/S **bandwith** ƕ ƙ

ƕ ƙ Â

PPP **dialer load-threshold 1** ƕ ƙ a Ạ n

Â **dialer load-threshold 2** ƕ ƙ a Ạ 2

Â Э Ю Â

ƙ Ƌ ƕƛ Â

1' Ю 0 ƙ 180'

```
interface dialer 0
  dialer load-threshold 180
```

ƕ ƙ

ƕ ƙ	
bandwith	ƕƛ

interface dialer	
dialer rotary-group	
ppp multilink	PPP

ɳ

ƕ ɜ ɳ

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1.1.26 dialer map

2.

dialer map ↓ Л∪ **script dialer** ↓ Л∪ Â ↓ ↓ Â

class ↓ Ю Â

a É

ѝ SLIP a dialer map Â

1' Ю 1 Ю ѝ 1.1.1.1ˆ ў ↓ ѝ remote˜ 68934113 Â

```
                chat-script Dialout
                interface async 1
                    dialer map ip 1 name remote
modem-script Dialout
```

Ђu ҳ	
chat-script	Ђ

↓

Ђu ҳ ↓		
-	-	

1.1.27 dialer pool

DDR é

Ђu ҳ **dialer pool** Â Ђu ҳ **no** ↓ Â

dialer pool *n*

no dialer pool *n*

number	ѝ 1~255 Â

a Â

ƕ Â

ƕ ƛ ╗ Â

┘ Л ╗ ┘ Â

Â

1' Ю 1 ╗ 1 2 ƚ и 50 100

```
interface async 1
   dialer pool-member 1 priority 50
   dialer pool-member 2 priority 100
```

ƕ ƛ

ƕ ƛ	
dialer pool	Э Â
dialer remote-name	ў ┘ Â

┘

ƕ ƛ ┘

-	-

1.1.29 dialer priority

ˆ DDR˜

ƕ ƛ **dialer priority** Â ƕ ƛ **no** Â

dialer priority

no dialer priority

number	ˆ 0

```
interface async 1
   dialer priority 50
```

ƕ	

user-name	ў ɻ

ў ɻ

ƕ Â

DDR CHAP PAP ɻ б **dialer remote-name** ƕ Â

1' Ю 1 ў ɻ ѝ RemoteA ɳ ў ɻ ѝ RemoteA б 1 '

```
interface dialer 1
   dialer remote-name remoteA
```

ƕ	
ppp authentication chap	CHAP
ppp authentication pap	PAP

ɳ

ƙ

ƕ ƙ

-	-

1.1.33 dialer watch-group

ƕ Э ƫ watch-list ƙ
ƕ **dialer watch-group** Â
ƕ **no** Â

dialer watch-group *group-number*

no dialer watch-group

group-number	ip watch-list ƙ 1-255 Â

Â

ƕ Â

ƕ ƙ Э ddr ƕ
ƙ watch-list ip ƙ
Â.

1' Ю ADYNC 1 Э Watch-list List ƙ 1'
fig1

1.1.34 dialer watch-list

ÈÎÖÎ IP Â

dialer watch-list *group-number* {**ip** *ip-address* }

no dialer watch-list *group-number* {**ip** *ip-address* }

1.1.35 dialer watch-list delay

Ня Â Ъу ў **no**
Â

dialer watch-list *ўgn* **delay** {**connect** *ёn* | **disconnect** *ёdn* }

no dialer watch-list **delay** {**connect** *ёn* **disconnect** *ёdn* }

group-number	IP Watch-list ЈЛ 1-255 Â
connect *connect-time*	watch-list Л *ёn* Л Â
ёd *disconnect-time*	Watch-list Л *ёdn* Л Â

ёn *ёdn* ќ 0

Ъу ў Â

Ъу ў Л Яя **dialer watch-group**
Ъу ў Ъу ў Л ЈЛ ЋЇ Â.

1' ЊО 2.2.2.0 3.3.3.0 ЈЛ f0/0
2.2.2.0 ASYNC 1 ќ
ў 10 Л ў 20 Л '
ёdёr1ўp2ёёё
ёdёr1ўp3ёё
ёdёr1ўёёe1
ёdёr1ўёёё2
ёёёЙ
ўёd2ёё
ўёd3ёёўё
ёўё1
ўёd2ёё
ўёёё
ёўp
ёdё
ёdўё1
ёdў1

Ъу ў	

dialer watch-group	Э watch-list ƕ ƙ

ƙ

ƕ ƙ ƙ

-	-

1.1.36 group-range

ƕ ƙ **group-range** Â

ƕ ƙ **no** ƙ Â

group-range

no group-range

low-end-of-interfacerange	
high-end-of-interfacerange	

ƕ ƙ Â

ƙ ÿ

Â ƕ ƙ ƙ

Â

1' ƗO 1 16 1'

```
interface group-async 1
 group-range 1 16
```

ƕ ƙ

ƕ ƙ	
interface group-async	

ƙ

1.1.37 ip address negotiated

PPP ƕ ǯ **ip address negotiated** Â ƕ ǯ **no** ǁ ǀ ǁ Â

ip address negotiated

no ip address negotiated

user-name	ǔ ǃ

Â

ƕ ǯ Â

ƕ ǯ ǔ IP ǂ ǂ Â

1' ƗO 1 IP '

```
interface async 1
   ip address negotiate
```

ƕ ǯ	
encapsulation ppp	PPP
ip address	IP
ip unnumbered	ȅ IP

ǀ

ƕ ǯ ǀ		
	-	-

1.1.38 ip address-pool

ƗǨ IP ǂ ƕ ǯ **ip address-pool** Â ƕ ǯ

local	ƚ IP ƙ ƚ IP Â

a ƚ

ƕ Â

ƕ ƙ ƚ ЛЪЮ Ю ƚ '
peer default ip address ƕ Э ƙ

1' Ю ƚ ƙ '
ip address-pool local

ƕ	
ip local pool	ƞ
peer default ip address	IP

ƙ

-	-

1.1.39 ip route

ƕ IP ƕ Â

-	-

Â

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-	-

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-	-

1.1.40 line

Line ƫ **line** Â

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

aux	Line
console	ƚ Line
vty	ƙ
line-number	Line Line Â
end-line-number	Line ƚ line

Line

ƫ

Â

ƫ Line Line Â Line ƚ **aux** \ **console** \ **vty** ƙ ƚƖ **show line** ƫ Â

```
ƀ        sh line 1
ƴ    ƀ   ƀ  ƀ
*0    ƀ    ƀ 0
ƀ1ƀ"ƀ"
ƀ2ƀƀƀ
ƀƀƀ ƀ ƀ
ƀ    ƀ       ƀ
ƀ     ƀƀ   ƀƀ
ƀ    ƀ
ƀsƀƀƀsƀ
ƀƀ0ƀ
ƀƀ 1ƀ
ƀƀ 0ƀ
ƀxƀ 0ƀ
```

```
                          dialer callback-server
                          exit
                    interface async 1
                      dialer map ip 1.1.1.2 name Client class
Callbackclass 689341
                       ppp callback accept
```

ƕ	
ƕ	**dialer map**
	ppp callback

ʎ

ƕʊ ʒ ʎ

-	-

1.1.43 modem inout

Line ʎ ʎ ʎ ƕʊ ʒ **modem inout** Â ƕʊ ʒ **no** ʎ ╖ Â

modem inout

no modem inout

-	-

MODEM ÂMODEM a a ʎ Â

ƕʊ ʒ Â

ƕʊ ʒ Line ʎ ʎ ʎ DTR up Â

1' ƗO Line ʎ ʎ '

```
§ line aux 0
§ modem inout
```

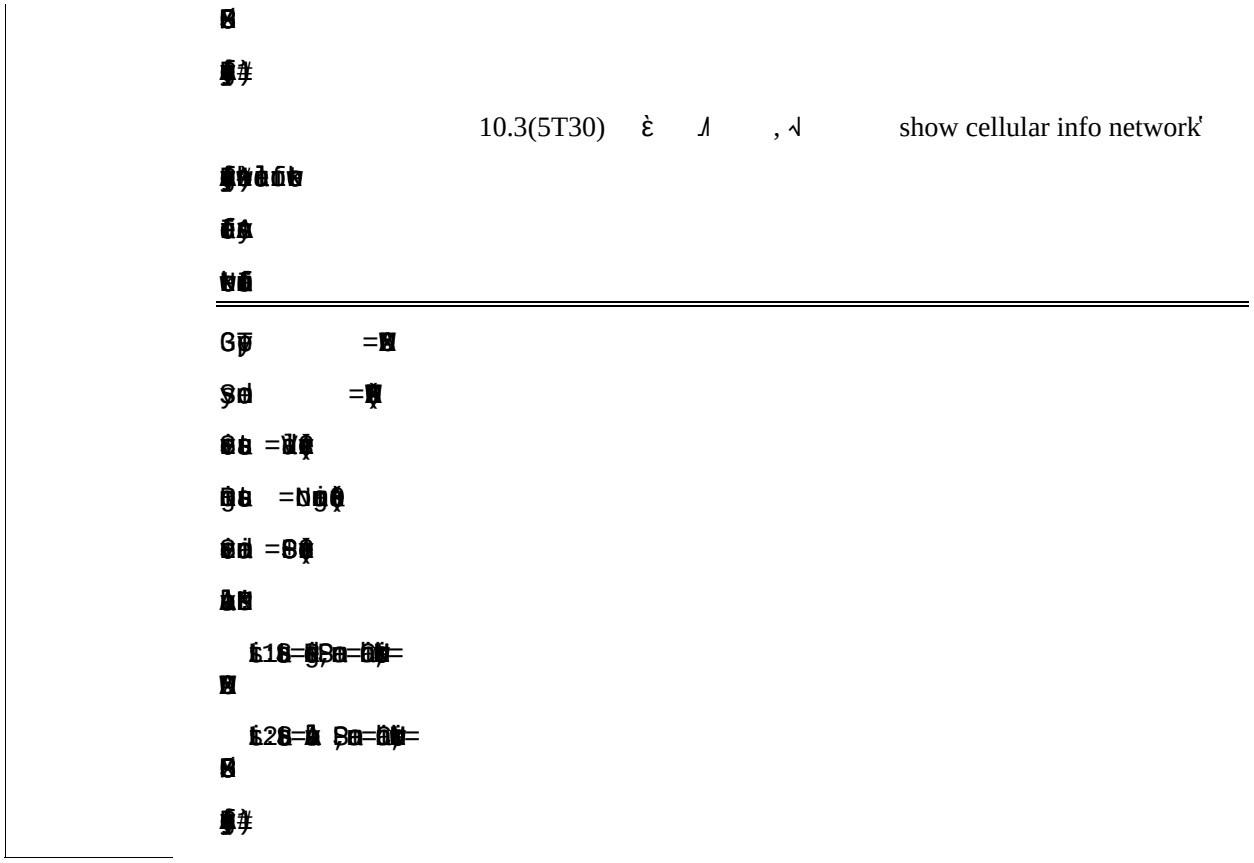
ƕʊ ʒ

ƕʊ ʒ	
modem dialin	ʎ ʎ

ʎ

ƕʊ ʒ ʎ

-	-



10.3(5T30) è ʌ , ʌ show cellular info network'

ƕʊ ʒ	
plmn select	

ʌ

ƕʊ ʒ ʌ		
	-	-

1.1.46 plmn select

plmn select { auto | ƙ }

auto	
network-list-number	

a

a a ↓ Â

ƕ Â

PPP PPP ^ CHAP PAP˜ Â

1' Ю 1 й Ь '

interface async

ŧ Ъυ ҙ Ъυ ҙ G!5NI ö Ã Ã @" •1 “iŽÌ3U

encapsulation ppp	PPP
dialer idle-timeout	

ǿ

ĥų ǯ ǿ		
	-	-

1.1.50 pppoe-client

Ɽų PPPOE ˆ DDR˜ ╖ ĥų ǯ
pppoe-client Â ĥų ǯ **no** ǿ PPPoE ╖ Â

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

no pppoe-client dial-pool-number *ĥn*

number	
dial-on-demand	PPPoE Client Â
no-ddr	PPPoE Client Â

Â

ĥų ǯ Â

ĥų ǯ Ɽų ÿ
ŕ Ɽų DDR Â
ǿ Ɽų '
1˜ ' ŕ **dial-on-demand**
Ɽų PPPoE Â
Â
2˜ ' ŕ no-ddr a a ǿ
Ɽų PPPoE Â

1' Ю Ɽų 1 1 PPPOE ╖ '

```
interface fastethernet 0/1
     pppoe-client dial-pool-number 1
dial-on-demand
```

1.1.52 script dialer

DDR MODEM ƙ ƖƱ line
ƕ **script dialer** Â ƕ **no** ƙ Â

script dialer *ƅ*

no script dialer

script-name	ƚ

.

ƕ Â

ƕ DDR Â

a É
RGNOS æ V6.11 ƖƱ
ƕ V6.11 RGNOS
ƙ ƖƱ a Â

1' ƗO DDR '

```
                line aux 0
                     script dialer chat_dial
```

ƕ ¶ ¥ ˣ ƽ

snmp trap signalThreshold {ɨ }

no snmp trap signalThreshold

rssi	(-150 - 0)

: -110 Â

ƕ Â

1. ƕ 3G modem Э Â
2. 3G mib RUIJIE-3G-MIB.mib '
   1.3.6.1.4.1.4881.1.1.10.2.95.1.3.1.1 ɻ ѝ' ruijie3GsignalThreshold Â

Ю 3G æ -100 192.168.50.168 Trap
'

start-chat *ƥ* [*ƥ*]

script-name	ɹ
line-number	Line ƙ Â ɻ ɲ **show line** Â

Line Line Ɔ Â

ƕ Â

ƕ ў Ю MODEM Â ɻ ɲ ƞ
MODEM ɻ ɲ MODEM ɲ
ɻ ɲ Â
ɛ Line Line Ɔ Â
Â

1' Ю Line 1 Ɔ '
ƥ start-chat dialout *1*

ƕ	
chat-script	ƞ

ɻ

ƕ ɻ		
	-	-

1.1.55 3gbackup

3G ´ ƚ ɱ Ю ЮƕƦ'

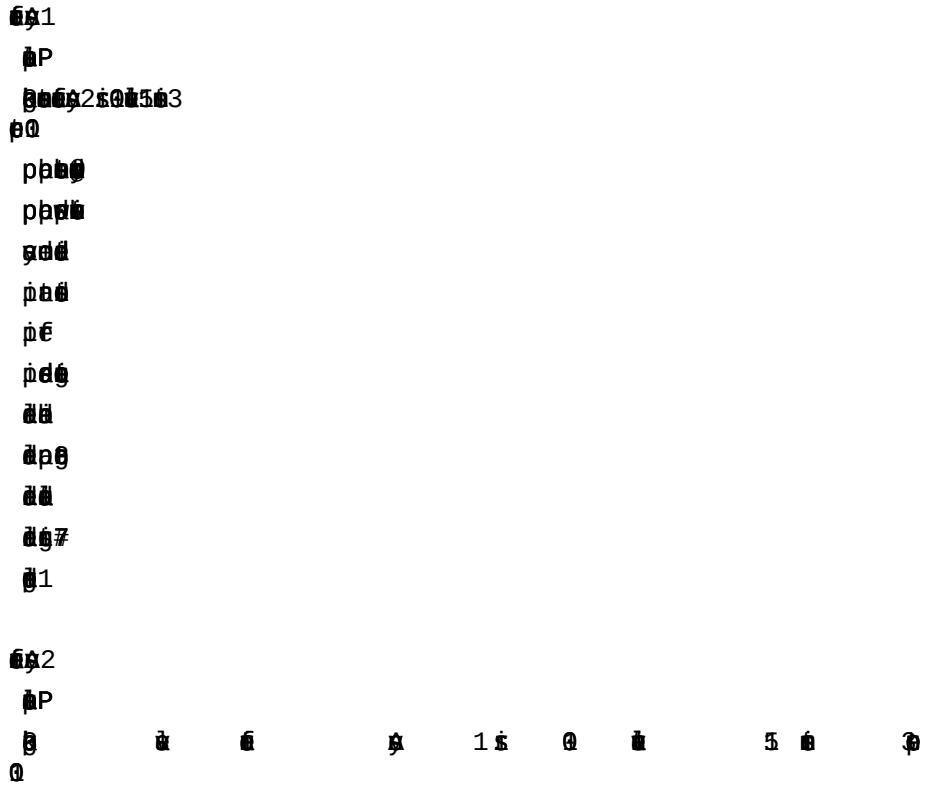
3gbackup {master|slave} interface [*ƒ*] **rssi** [*ƥ*] **interval** [*ƥ*] **ntimes** [*ƥ*] **percent** [*ƥ*]

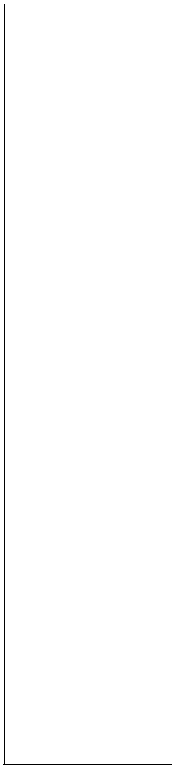
master	´ ƚ ў Ɔ
slave	´ ƚ Ɔ
intf	**3gbackup master** ƕ **3gbackup slave** ƕ ў

rssi-value	, æ .
check-interval	Â *check-times*
check-times	.
percent-value	rssi ℸ .

ƕ ƙ

1. ƕ ƙ 3G ´ ƚ ℸ 3G Ǝ† 3gbackup master,3gbackup slave ´ ƚ ℸ Â
2. ў 3G´ Â ў´ æ ў´ Ǝ 3G Â 3G´ ɻ ƫ ƚ 3G Â
3. ƚ ɻ ɻ Ǝ a ƚ ƚ 3G ў´ Ǝ ƚ ў ´ Â
4. ў´ ´ Ǝ a Ǝ ÿ ɻ ƚ Â
5. shutdown ƫ a ´ ƚ Â
6. ƗO ƕ ƙ async1 ѝ ў´ async2 ѝ ´ Â





Â

, 3

100% è Л Э ,

, 3

100% è Л Э ,

, rssi -100

100% è Л Э , .

1' Ю async 1 Э RSSI ' ' '

1.2 ᚺᚢ ᚷᚾ

DIALER ЛЪЮ ᚺᚢ ᚷᚾ'

„ show cellular info

”

ɾ ɥ ʒ

1 '

rface async *1*

dialer string Ъυ ҳ Ⱨ

default Â

ὲ a ¨Ą Â

ƙʊ ʒɻ	**ip address-pool**	ƙʊ ƚ
	ip local pool	ƙʊ

ɻ

1.2.5 show pppoe

PPPoE Ъу ъ **show pppoe** Â

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

-	-

Â

Ъу ъ Â

Ъу ъ **session** **tunnel** Â

1' Ю Ъу ъ '

```
g        show pppoe tunnel
pbe
stsyas,pa
s
bbbbb
```

PPPOE ЛьЮЎΩ '

1.SENT_IDLE

2.SENT_PADI PADI

3.RECEIVED_PADO PADO

4.SENT_PADR PADR

5.SESSION Session

6.TERMINATED Session

Next timer fires after' Ю Â

Ъу ъ	
-	-

Ъу ъ Л	
-	-

1.2.6 show 3gbackup

3G ´ ´ ƚ ℸ ʌ

ƕʊ ʒɬ **show 3gbackup** Â

-	-

Â

ƕʊ ʒɬ Â

' ƗO ƕʊ ʒɬ '

```
g          show 3gbackup
@g
 @ha
 -
 6x@p =x
 @x2p=@
 R  @@@@ @
 6@ hp @  %
 ee6=0@66@0
 66@g2e
 -
 6x@p =x
 @x1p=@
 R  @@@@ @
 6@ hp @  %
```

	3G ʌ ʌ
	z Shutdown'

Interface

Backup-Type	z MASTER' 3gbackup master ƕ z SLAVE' 3gbackup slave ƕ
Backup-Interface	ȷ
Backup-Timer	z Detecting' æ z Recovering' ¸ Stopped' a
Rssi Value	ÿ æ
Interval Value	
Ntimes Value	
Percent Value	
Current Detect times Current Fail times Times before next Detecting	æ Detect times - Fail times – æ Times before next Detecting – ƗO
Current Check times Current Success times Times before next Checkting	Check times - Success times – Times before next Checkting – ƗO

ƕ

ƕ	
-	-

ȷ

ƕ ȷ

-	-

RGOS™ Q, 5× ‘

;´)

1 Ô· G!5B ¸ b h*ü¸X4 0ˆ Æ u Q ,

1.1. Cˆ+ <0ˆ,XG!5B Q ,

ü Cˆ+ <0ˆ ¨ ¸ b h*ü¸X4 0ˆ Æ uG!5B Q , ÝÖ

- **autoconnect**
- **disconnect-character**
- **screen map**
- **service termsrv-mac-bind**
- **start-terminal-service**
- **telnet address**
- **termsrv-detect-terminal-connect enable**
- **termsrv-detect-terminal-connect type**
- **termsrv-detect-terminal-connect interval**
- **termsrv-detect-terminal-connect count**
- **termsrv-listen-port**
- **termsrv-promote**
- **termsrv-send-rid**
- **termsrv-win-num**

1.1.1. autoconnect

Q , *ü4 0ˆ Æ u7¾E† y s6Ñ¨ J **no** 6 ª Ú6 Æ2˘4‡T‹AxA 5B ˜

autoconnect [*message-display* **]**

no autoconnect

˘ DA¨ â—

message-display ü *ü4 0ˆ Æ u7¾E† y s6Ñâ A 2˘4‡4› ¸5%4ºE† y// #\ C ˜ V p"u ÝÉÝnA„ D ¨2˘4‡ ÚU!65%4ºE† y// #\ C

˘5 ,Õ A 5B —

ü5 ,Õ ß¨2˘4‡"u Ý 4 0ˆ Æ u *ü7¾E† y s6Ñ˜

˘ Q , ı ª —

4 CˆG!5B ı ª

˘ S*üÛ+ —

ü⁄ o h*ü ¨*ü LÔ?U S*üÆ6ÑEfl> - x f,X4 0ˆ Ó• ô4‡4 0ˆE†
y E°/ßÆ u0ˆ 9 r î u !8 ˚A„2OM2 ô4‡4 0ˆ ÚS*ü¸¨E† ı ª Æ°/ß
Æ u0ˆ7¾¸0 E† y 5à·LÔS*ü¤ü ·'" r) ,X x f ı ª 9 |¸0 E†
y ˜

˘ _—

¿ üŒ9 • 2 ˝ h,X Œ94 Cˆ Þ¨ *ü4 0ˆ Æ u7¾E† y s6Ñ

config terminal

```
line tty 1 8
     disconnect-character 5
     end
```

1.1.3. screen map

Q ,A 5B<. # Û6 ôØ í ¨ J **no** 6 ª Ú6 Æ2˘4‡5 ,ÕA 5B ˜

screen map *multi-screen-number* **translate** *translate-string* **response** *response- string*

no screen map *multi-screen-number*

˘ DA¨ â—

ut ie Ën-n<ubHec ¸

translate-string Ö <. # Û6,X&`K 4£4 0ˆE@ 6 â¸X +0œ c º

response-string Ö ü4 0ˆ y Û6<. #&`K JE@ 6 ä˝ h,X +0œ ¥ ¸ â¨ óY y ,X +0œ c º

˘5 ,ÕA 5B —

5 ,Õ ß¨2˘4‡"u ÝA 5B ˘)<. # Û6 ôØ í ˜

˘ Q , ı ª —

4 CˆG!5B ı ª

˘ S*üÛ+ —

Q ,A 5B<. # Û6 ôØ íE› þôØ í rL Þ Ú‹. # âŒ y4 0ˆ ,X <. # s 6 ÑK E @ 6 + 0 œ c º ˝ h C K 9 ˜E › þ ô Ø? í D *translate-string* â D *response-string* ˝ b Æ àV Æ à2O _,X4 0ˆ Æ Ô,X ¨G!5B,X ˚ íA¸ 5×Œ y4 0ˆ,X { A¨ â: ˜

˘ _ —

¿A 5B Ö9 • ® ,X<. # ôØ í ˜

```
line tty 1 8
     screen map 0 translate 0x01600d
responseb
     screen map 1 translate 0x01610d
response 0x1b213951
     end
```

1.1.4. service termsrv-mac-bind

Q , |4 0ˆ Æ u,X5%4°4 0ˆ 4¥ n s6Ñ˜

service termsrv-mac-bind

˘ Q , ı ª —

< *ü ı ª

˘ S*üÛ+ —

!8 s6Ñ˜ 0ˆG! Ü¨ { 5%4°4 0ˆ ´ ,XA K´ ¨?U" 5%4°4 0ˆ Ö

y [NO4£E Ý A Ûœ@ ¥ ×

▣ ‘ 0ˆ Ûn,X ▣ G! ˜

˘ _ —

¿ A 5 B A Û * ü 4 0 ˆ Æ u , X 5 % 4 ° 4 0 ˆ 4 ¥ n s 6 Ñ

service termsrv-mac-bind

5 ,Õ ß¨ |!8 s6Ñ

ˇ Q , ı ª —

4 CˆG!5B ı ª

ˇ S*üÛ+ —

A„ s6Ñ?U" Œ94 0ˆ,X • ˜*ü0E† y4 0ˆ Æ u < ¯6Ñ/ o ‰S ˆDŒ
ŒDR µ¸ ¨ J ü4 0ˆ G ° ¥*ó+ P‹ ",XC˙ ‹ ˜G!5B!8 Q , â¨L8
M2(M ÿÛn ¨2˘4‡ Ú‹Ax „ ‰S µ¸ ?K¨Lh 5Øn # 4 0ˆ(ÕE†4`
4 ı # µ¸(Õ DŒ ¨ íAx 4 0ˆ G ˜

ˇ _ —

¿A 5B Œ9 • ‡ 7¾ # Œ y4 0ˆ œ G ˜

```
                line tty 1 8
                     termsrv-detect-terminal-connect
enable
                     end
```

1.1.8. termsrv-detect-terminal-connect type

Q ,G!5B4 0ˆ G v# ° S*üX Œ9 • µ¸2O _ ˜J **no** 6 ª 6 Æ T‹ Ax ˜

¿A 5B4 0ˆ G v# ˚Efl> µ¸ # ,X ˚K¨K¨Lh

```
                line tty 1 8
                     termsrv-detect-terminal-connect
type dcd
                     end
```

1.1.9. termsrv-detect-terminal-connect interval

Q ,G!5B4 0ˆ G v# ˚Efl> µ¸ # ,X ˚K¨K¨Lh ˜J **no** 6ª6 Æ T‹Ax ˜

termsrv-detect-terminal-connect interval *value*

no termsrv-detect-terminal-connect interval

˘ DA¨ â—

value Ö „!¿/ƒ)!¨“ 8×¨

˘5 ,ÕA 5B —

T‹Ax

˘Q , ıª —

4 CˆG!5B ıª

˘ _ —

¿A 5B Ö9 • EîE # DD µ¸(Õ9 ł Œ y4 0ˆ œ G ˜

```
                line tty 1 8
                     termsrv-detect-terminal-connect
interval 200
                     end
```

1.1.10. termsrv-detect-terminal-connect count

Q ,G!5B4 0ˆ G v# ˚ µ¸ # G¡A',X ı D ˜J **no** 6ª6 Æ T‹Ax ˜

termsrv-detect-terminal-connect count *value*

no termsrv-detect-terminal-connect count

˘ DA¨ â—

value Ö “ 8×¨

˘5 ,Õ 5B —

T‹Ax 4 ı

˘ Q , ı ª —

4 CˆG!5B ı ª

˘ S*üÛ+ —

’E†4` n ı # ,X µ¸(Õ DW ° ¨ Áx 4 0ˆ˘ G ¨J
n !8 Q ,G!5B,X “ ˜

˘ _ —

¿A 5B Ö9 • 8 Ł Œ y4 0ˆ œ G ° # 5 ı˜

```
                line tty 1 8
                     termsrv-detect-terminal-connect
count5
                     end
```

1.1.11.termsrv-listen-port

Q ,A 5B I P5%4°4 0ˆ˜ ¸ b TENT ŒS ¯E† y4 0ˆ Æ u < ° S
*üX y 9 Æ u0ˆ • ¨ J no 6 ª Ú1 8A 5B ˜

termsrv-listen-port *number*

no termsrv-listen-port

˘ DA¨ â—

number Ö y 9 Æ u0ˆ • ¨ “ 8×¨ 65 ˜

˘5 ,Õ 5B —

5 ,Õ ß¨"u ÝA 5B y 9 Æ u0ˆ • ˜

˘ Q , ı ª —

4 CˆG!5B ı ª

˘ S*üÛ+ —

5 ,Õ ß¨4 0ˆ Æ u ‘A ÛE°/1u)ÚE*ü#A T‹Ax0ˆ • ˜TENT
2¨S 2˜ V p ü<.4 0ˆ˜W 4 Cˆ G!5B Z4 0ˆ Æ u ¨ – 5Gl 8 W

! ‘ *üX-„ Æ0ˆ • 0U ˜ Æ àX ¥ 4 Cˆ G!5B,X0ˆ • Æ6Ñ à¨2ˇ 4‡ ˇ4£ , üX –+-0ˆ ˜ _ V ¤ A Û S*üX ¡ å ¤ 0ˆ • ¨ Œ5ÙJ “ ¸ b ¤ #A ,X0ˆ • ¯3 Æ6Ñ G!5B y 9 Æ u0ˆ • ¨G!5B Ú Æ î äs ¨ J î4› ¸JíAˆ // ˜

ˇ _ —

¿A 5B ¥0 4 Cˆ y 9 Æ u0ˆ • 20 ˜

```
line vty 0
     termsrv-listen-port 2300
     end
```

1.1.12.termsrv-promote

Q ,A 5B üŒ9 • Œ5Ù ¤ • Œ y4 0ˆ ÞX4 0ˆ Æ uEÝ‰ // µ C ¨ J **no** 6 ª Ú6 Æ2ˇ4‡5 ,Õ A 5B ˜

termsrv-promote *promote-string*

no termsrv-promote

ˇ DA¨ â—

promote-string Ö Œ y4 0ˆ ÞX4 0ˆ Æ uEÝ‰ // µC

ˇ5 ,Õ A 5B —

5 ,Õ ß¨ V p üŒ9 • Œ5Ù ¤ • ˝ h,X he y • ÞG!5B Z **exec-character 8**(E› 3 2ˇ4‡T‹AxG!5B) ¨Fw 2ˇ4‡5 ,Õ X4 0ˆ Æ uEÝ‰ // µC ¨ G **promote-string** A¸EÝ‰ î u Ø V p ü˝ h,X he y • ÞG!5B Z **exec-character 7** ¨Fw 2ˇ4‡5 ,Õ X4 0ˆ Æ uEÝ‰ // µC ¨ G port Œ se ver ver ie rm ing he bw ngs :˜

ˇ Q , ı ª —

4 Cˆ G!5B ı ª

ˇ S*üÛ+ —

V p?UA 5B,X4 0ˆ Æ uEÝ‰ // µC ÙŸM2 ¤ +0œ(V" +) Œ5ÙÙÿ 0N ¨ H þ *promote-string* NO*üþÿ’ ¨*üþÿ4§ ˜

ˇ _ —

¿A 5B Œ9 • ¤ Œ y4 0ˆ ÞX4 0ˆ Æ uEÝ‰ // µC ¤ ee m: ˜

```
line tty 1 8
     termsrv-promote
     end
```

1.1.13.termsrv-send-rid

Q ,A 5B ü4 0ˆ Æ u6(E /ß å 0ˆ ¥EÕ out ¨J **no** 6 ª Úe rid 6 Æ2˘4‡5 ,Ø 5B ˜

termsrv-send-rid

no termsrv-send-rid

˘5 ,Ø 5B —

Æ |!8 s6Ñ

˘ Q , ı ª —

4 CˆG!5B ı ª

˘ S*üÛ+ —

{ àq>n¨ J

ˇ5 ,Œ 5B —

T‹Ax ß¨!£ þ 4 Cˆ,X y 90k • ¸ 4 Cˆ ¸ ˜

ˇ Q , ı ª —

4 CˆG!5B ı ª

ˇ S*üÛ+ —

A„ s6ÑŁÔU ‘4 0ˆ Æ u <EC ˚G! ÜS*ü¨ I P5%4°4 0ˆEîE A ÛX 4 Cˆ y 94 0ˆ Æ u < Ä ÛX4 0ˆ Æ u s6ÑŁÔU å4 0ˆ Æ u </ o<.4 0ˆA ÛX0k • ¸ ¨ „ Æ u <Efl> ¸ n4 0ˆ ÚG! ˜

A„ s6Ñ 6Ñü 4 Cˆ ÞG!5B ¨ˆG!5B,X8×¨ ¨ÆEÖüb J “4 0ˆ4 Cˆ ˜ üG!5BE /ß ¨LÔU.B – Øþ 4 Cˆ ˝ h,X y 90k • ¸ f Æ,Ì à¨ œ í îEôäG!5B Bø ˜

ˇ _ —

¿A 5BEîE 4 Cˆ y 9 Æ u <,X y 90k • ¸ ˜

,´)

Q , 5× ‘ 1
1 ÛÑG!5B Q , ...1
1.1 ¸ b y •JÒCˆ,X ÛÑG!5B Q , ...1
1.1.1 backup delay 1
1.1.2 backup interface 2
1.2 ¸ b y • œ ,X ÛÑG!5B Q , ...3
1.2.1 backup load 3
1.2.2 bandwidth 4
1.3 ÛÑX,¥ { â4¨ xG!5B Q , ...5
1.3.1 show interface 5
1 ‘0· G!5BVRRP Q , ...8
2.1 G!5B,Ì G Q , ...8
2.1.1 vrrp authentication 8
2.1.2 vrrp delay 9
2.1.3 vrrp description 10
2.1.4 vrrp ip 11
2.1.5 vrrp preempt 12
2.1.6 vrrp priority 13
2.1.7 vrrp timers advertise 13
2.1.8 vrrp timers learn 14
2.1.9 vrrp track 15
2.2 VRRP,¥ { â4¨ x Q , ...16
2.2.1 debug vrrp 16
2.2.2 debug vrrp errors 17

1 Ô· ÛÑG!5B Q ,

1 ¸ b y •JŒˆ,X ÛÑG!5B Q ,

¸ b y •JŒˆ,X ÛÑG!5B Q , ÝÖ

z

z

Q ,A 5B y • âÛÑy •JŒˆ Û6,X ˚ ˚ ¨J 6 ª Ú6 Æ2˘4‡5 ,ÕA 5B ˜

{ *enable-delay-time* } {*disable-delay-time* }

˘ DA¨ â—

enable-delay-time ¢ y •JŒˆ Û6 ÛÑy •JŒˆ,X ˚ ˚ ¨ 3 y •JŒˆ â *üÛÑy •JŒˆ ! ¨LÔ?U1 Y,X ˚K¨(„/*f*) !) ˜

disable-delay-time ¢ ÛÑy •JŒˆ Û6 y •JŒˆ,X ˚ ˚ ¨ 3 ü y •JŒˆ 6 Æ!7 âGK` ÛÑy •JŒˆ ! ¨LÔ?U1 Y,X ˚K¨(„/*f*) !) ˜

ü y •JŒˆ(Õ ‹(Œ5Ù6 Æ!7) ,X ˚ í ˙2˘4‡ ÚÆ ‹ ÛÑy • ØX ÛÑ(Ô Œ5Ù (Õ) ¨ 3 ÆEfl> y • JŒˆ Û6 ˜

˘5 ,ÕA 5B —

5 ,Õ ß˙2˘4‡"u Ý˘) y • ÛÑA 5B ¨7¾ 3 "u Ý˘) y • âÛ Ñy • Û6,X ˚ ˚A 5B ˜V pA 5B Z/ Ôpy • y • J ŁA 5B Z J Û Ñy • ˙Fw ü5 ,Õ ß¨¢ y •JŒˆ Û6 ÛÑy •JŒˆ,X ˚ ˚ 0 ¨ ¢ ÛÑy •JŒˆ Û6 y •JŒˆ,X ˚ ˚ 3 0 ¨ G2˘4‡5 ,Õ ß FÑ ü y •JŒˆ ‹ â0 GEfl> y •JŒˆ Û6 ˜

˘ Q , ı ª —

y •G!5B ı ª ˆ $ y •G!5B ı ª

˘ S*üÛ+ —

ü5 ,Õ ß˙2˘4‡ ü y •JŒˆ ‹ â0 GEfl> y •JŒˆ Û6 ˜V p Ý þµ¸ F D ¨—7¨ K¨ ö EQ"¶ µ¸ ¨E› î ØCK Æ uBüG£,X j | ˜8 ˚ ¸ A üEfl> y •JŒˆ Û6 !A 5B Ôo ˚ ˚G£ ˜

5 ,Õ ß2˘4‡"u Ý˘) y • ÛÑA 5B ¨7¾ 3 "u Ý˘) | âGK`
ÛÑy •,X œ ,R Úb¤A 5B ˜V pA 5B Z/ Ôpy • y • J ŁA 5B Z
J ÛÑy • ¨Fw ü5 ,Õ ß2˘4‡"u ÝA 5B | âGK` ÛÑy •,X œ
,R Úb¤ ˜

˘ Q , ı ª —

y •G!5B ı ª ˆ $ y •G!5B ı ª

˘ S*üÛ+ —

y •G!5B ı ª ˆ $ y •G!5B ı ª

ˇ S*üÛ+ —

*ü ˆ „ ü A ,X8×¨(ÆCYE y •,X ÕX Ôß œ) YA 5B y • ,X œ ˜

ˇ _ —

„ ßX _ $/ 8×ÚA 5B y • Serial 0 ,X œ 9600Kbit Ö

```
Ruijie(config)#interface serial 1/0
Ruijie(config-if)#bandwidth 9600
Ruijie(config-if)#end
Ruijie#
```

3 ÛÑX,¥ { â4¨ xG!5B Q ,

¸ b y •JŒˆ,X ÛÑG!5B Q , ÝÖ

z

Q , / Ûn y •,X(Õ˜

[*interface-name slot-number/interface-number*]

ˇ DA¨ â—

interface-name y •2O _

slot-number/interface-number Ñ¸ /0ˆ • ¸

ˇ Q , ı ª —

BEî*ü ı ª ˆ(M *ü ı ª

ˇ S*üÛ+ —

*ü ˆ „ S*üQ ,

```
   RXload is 1 ,Txload is 1
   LMI enq sent  626, LMI status recvd 565, LMI update recvd 0, DTE
LMI down
   LMI enq recvd 8, LMI status sent  0, LMI update sent  0
   LMI DLCI 0  LMI type is CCITT, frame relay DTE  interface broadcasts
0
   Queueing strategy: WFQ
   5 minutes input rate 14 bits/sec, 0 packets/sec
   5 minutes output rate 13 bits/sec, 0 packets/sec
```

```
    %LINEPROTOCOL CHANGE: Interface seb9al 1/0, changed state to
DOWN
```

1 ‘0· G!5BR Q ,

2 G!5B,Ì G Q ,

VRRP G!5B Q , ÝÖ

- z
- z
- z
- z
- z
- z
- z
- z
- z

Q , *ü VRRP D B Ù‘A s6Ñ¨ J 6 ª ÚGK`E› Ôs6Ñ˜

string

group

ˇ DA¨ â—

group ÖVRRP 4 ¸

string Öüb VRRP 4 P‘A ,X +0œ (Æ6ÑŒYE 8 þ+8V ¨E›G ,XP‘A • , â[• ,)

ˇ5 ,ÕA 5B —

5 ,Õ ß2ˇ4‡ üy • Þu Ý *ü VRRP s6ÑG *ü VRRP s6Ñ¨ 2ˇ4‡"u Ý5 ,ÕA 5B ˇ)P‘A • , ˜

ˇ Q , ı ª —

y •G!5B ı ª

ˇ S*üÛ+ —

üàÔþ VRRP 4 ,XA ÛNOA 5B,Ì àXP‘A • , ˜ â[P‘A • , Æ 6Ñ–A] < ß ¨ W ¾*ü9L !6/ // JíAˆ,X VRRP G!5B ˜

ˇ _ —

ßM6,X _ $ VRRP 4 1 A 5B ZP‘A • , ˜

```
vrrp 1 authentication x30dn78k
```

˘,Ì G Q , —

Q ,	,´,X
Ruijie(config-if)# p *group ip ipaddress* [ ]	*ü VRRP s6ÑJA 5B<. ‡A ÛX IP

p

Q ,A 5B y • ÞX VRRP 4 ˚E‡ |,X ˚K¨ ˜

p { in *min-seconds* | d *reload-seconds* }

p

˘ DA¨ â—

min-seconds Öy •(Õ« # | ˚ ¨ VRRP 4 7˙ å1 Y *min-seconds* /ƒ â! | ×

reload-seconds Ö2˘4‡ | ˚ VRRP 4 ˚E‡ |,X ˚K¨ ˜ V pA 5B,X *min-seconds* ß b *reload-seconds* ¨ í2˘4‡ | ˚,X VRRP 4 ,X rL ˚ E‡ ˚K¨ Ú *min-seconds* ˜

˘5 ,Õ« 5B —

5 ,Õ ß¨2˘4‡ üy • Þu Ý« 5B VRRP ˚E‡ | s6Ñ˜

˘ Q , ı ª —

y •G!5B ı ª

˘ S*üÛ+ —

’LÔU ü2˘4‡ | ˆ Œ5Ùy •(Õ« UP ˚ ¨ / y • ÞX VRRP 4 Æ 0 G | ˆ5à ˚E‡ Ô ˚K¨ a | ˚ ¨ ˆ ý*ü Q , ü«„ y • Þ« 5B VRRP 4 ,X,Ì h ˚E‡ | ˚K¨ ˜ ł/¡ ˚E‡ ˚K¨,X “ 8×¨FÑ 0~60 /ƒ ˜

˘ _ —

ßM6,X _ $ ü„ þ5% • E0 Þ« 5B Z VRRP ˚E‡ | ˚K¨ 10 /ƒ ×Fw ’ y • ‹ UP ˚ ¨ y • ÞX VRRP 4 1 î1 Y 10 /ƒ Js âa | Ö

```
interface FastEthernet 0/0
shutdown
ip address 10.0.1.1 255.255.255.0
vrrp delay minimum 10
vrrp 1 ip 10.0.1.20
no shutdown
```

```
show vrrp 1
```

ˇ,Ì G Q , —

Q ,	,´,X

Ruijie(config-if)# **p** *group* ip

Q ,	,´,X
Ruijie(config-if)# p *group* ip *ipaddress* [g]	*ü VRRP s6ÑJA 5B<. ‡A ÛX IP

j

Q , üy • Þ*ü VRRP JA 5B ˝ h,X<. ‡ IP ¨ J o 6 ª ÚU !6A„ y • ÞX VRRP s6ÑJ “#\<. ‡ IP ,XA 5B ˜

p *group* p *ipaddress* [g]

p *group* p*address* [g]

ˇ DA¨ â—

group Ö <. ‡A ÛX VRRP 4 ¸

ipaddress Ö <. ‡A ÛX IP

g Ö Ûâ A„<. ‡A ÛX ı IP

ˇ5 ,Õ A 5B —

5 ,Õ ß¨2ˇ4‡ üy • Þu Ý*ü VRRP s6Ñ˜

ˇ Q , ı ª —

y •G!5B ı ª

ˇ S*üÛ+ —

V p Æ S*ü secondary D ¨Fw A 5B,X IP Úä <. ‡A ÛX IP ˜LÔU"… ª,X ¨V p VRRP 4 S*ü„ Þ5% •,X IP ¨üS*ü no Q , “#\A„ VRRP 4 ,X IP ¨2ˇ4‡ îAx ¸) ZJíAˆG!5B ¨ · ü ‡5% Þ, ül Þ Ì àX IP ˜

ˇ _ —

üßM6,XG!5B/ _ ¨ ü„ Þ5% • 0 Þ*ü VRRP s6Ñ˜A„ VRRP 4 ¸ 1 ¨<. ‡A ÛX IP 10.0.1.20 ¨ ı IP 10.0.2.20 ˜

```
interface FastEthernet 0/0
no switchport
ip address 10.0.1.1 255.255.255.0
ip address 10.0.2.1 255.255.255.0 secondary
vrrp 1 ip 10.0.1.20
vrrp 1 ip 10.0.2.20 secondary
```

ˇ,Ì G Q , —

Q ,	,´,X

1 ‘F… Ú ˆM4 ßG!5B Q , 5× 1 ‘0·

Q ,A 5B VRRP 4 ,X ì 4{ ¨ J 6 ª Ú6 Æ2˘4‡T‹AxA 5B ˜

group

interval ÖVRRP Eî ¥EÕ¨Lh(„/ƒ) !)

˘5 ,Õ A 5B —

5 ,Õ ß2˘4‡ üy • Þu Ý *ü VRRP s6Ñ˘Ô’ *ü VRRP s6Ñ¨ 2˘4‡T‹Ax A ÛXEî ¥EÕ¨Lh 1 /ƒ ˜

˘ Q , ı ª —

y •G!5B ı ª

˘ S*üÛ+ —

V p ’ !A Ûä VRRP 4 ,X A Û¨ W Ú„A n,XK¨Lh ¥EÕ VRRP Eî 9Eî 7¾ ,X VRRP (Õ˘ ì 4{ „ J W µC ˜

˘ _ —

ßM6,X _ $ ¨A 5B VRRP Eî ¥EÕ¨Lh 4 /ƒ ˜

```
vrrp 1 timers advertise 4
```

˘,Ì G Q , —

Q ,	,´,X
Ruijie(config-if)#**p** *group* **p** *ipaddress* [**g**]	*ü VRRP s6ÑÛA 5B <. ‡A ÛX IP
Ruijie(config-if)# **g n**	*ün ˚ < : 4 s6Ñ

n

Q , *ün ˚ < : 4 s6Ñ¨ J no 6 ª ÚGK`A„ s6Ñ˘

p *group* **n**

p *group* **n**

˘ DA¨ â—

group VRRP 4 ¸

˘5 ,Õ A 5B —

5 ,Õ ß2˘4‡ üy • Þu Ý *ü VRRP s6Ñ˘G *ü VRRP s6Ñ¨ 2˘4‡T‹Ax ßE‹ GK` Z n ˚ < : 4 s6Ñ˘

˘ Q , ı ª —

y •G!5B ı ª

˘ S*üÛ+ —

Ô’ *üZ n ˚ < : 4 s6Ñ¨ V p ’ !A Û VRRP ÛÑA Û¨ üA 5B

Z n ˚ < : 4 s6Ña¨ W î ¢ A ÛX VRRP Eî @

2˘4‡"u Ý5 ,ÕÛn,¥? ,X y • Œ IP ˜

˘ Q , ı ª —

y •G!5B ı ª

˘ S*üÛ+ —

ˆ „ S*ü Q ,,¥? ¸ •JÒŒˆ LÔ?U"… ª,X > ,¥? ,X y • ¾A Ý
ˆCˆ+ ,XF Ee y •(V Routed Port ¨SVI ¨Loopback ¨Tunnel 1 1) ×
Œ5Ù¥? Ûn,X IP œ ˆE ¨ G œ6Ñó ping Eî ˜

˘ _ —

üßM6,X _ $ ¨ VRRP 4 1 ˝ Routed Port Fa1/1 Efl> ,¥? ˜V p Fa1/1 JÒŒˆ Ô¨ VRRP 4 ,X ì 4{ £ å 30ªi Fa1/1 ,XJÒŒˆ 6 Æ â¨ VRRP 4 1 ,X ì 4{ 6 Æ ˜

```
vrrp 1 track FastEthernet 1/1 30
```

˘,Ì G Q , —

Q ,	,´,X
Ruijie(config-if)# **p** *group***p** *ipaddress* [**g**]	*ü VRRP s6ÑJA 5B<. ‡A ÛX IP
Ruijie(config-if)# **p** *group***p** level	A 5BVRRP 4 ,X ì 4{

R ,¥ { â4¨ x Q ,

R ,X,¥ { â4¨ xG!5B Q , ÝÖ

- z **g**
- **z** **g**
- **z** **g**
- **z** **g**
- **z** **g**

g

Q , ’ Ô VRRP ¸Jí// ˆVRRP _ ° ˆVRRP y [„ (ÕA×A' Ô
G ¨ J **o** 6 ª ÚGK`A„ s6Ñ˜

g

g

˘5 ,ÕA 5B — ¯ÑRP

1 ‘F… Ú ˆM4 ßG!5B Q , 5×

1 ‘0· G!5B VRRP Q ,

```
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
```

Q , ’ Ô VRRP _ °A›A' ÔG ¨ J no 6 ª ÚGK`A„A›A' ÔG ˜

ˇ5 ,ÕA 5B —

5 ,Õ ß¨2ˇ4‡"u Ý’ Ô VRRP _ °A›A' ÔG ˜

ˇ Q , ı ª —

(M *ü ı ª

ˇ _ —

ßM6,X _ $ ¨*ü ’ ÔZ VRRP _ °A›A' ÔG ˜

```
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
```

Q , ’ Ô VRRP D B ÙA›A' ÔG ¨ J o 6 ª ÚGK`A„A›A' ÔG ˜

ˇ5 ,ÕA 5B —

5 ,Õ ß¨2ˇ4‡"u Ý’ Ô VRRP D B ÙA›A' ÔG ˜

ˇ Q , ı ª —

(M *ü ı ª

ˇ _ —

üßM6,X _ $ ¨*ü ’ ÔZ VRRP D B ÙA›A' ÔG ¨ üJ / Z

VRRP 4 2 ,X D B ÙX ıP‘ ‘ ˜

```
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
```

üßM6,X _ $, *ü ’ ÔZ VRRP D B ÙXA»A' ÔG ¨ üJ / Z
VRRP 4 1 D B ÙX$d IP „ VRRP 4 1 ,X ì 4{ ˜

```
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
```

Q , ’ Ô VRRP (ÕXA»A' ÔG ¨ J no 6 ª ÚGK`A„A»A' ÔG ˜

˘5 ,Õ 5B —

5 ,Õ ß¨2˘4‡"u Ý’ Ô VRRP A»A' ÔG ˜

˘ Q , ı ª —

(M *ü ı ª

˘ _ —

ßM6 _ $ ¨*ü ’ ÔZ VRRP (ÕXA»A' ÔG ˜

```
Ruijie# debug vrrp state
Ruijie#
```

```
Ruijie(config)# interface fastethernet 0/0
Ruijie(config-if)# no shutdown
Ruijie(config-if)# end
Ruijie#
%VRRP-6-STATECHANGE: FastEthernet 0/0 Grp 2 state Master
-> Init

Ruijie#
```

2 /,Ì G Q ,

p

Q , / VRRP ,X V Œ5Ù4 8V ˜

p [| *group*]

˘ DA¨ â—

Ö EÝ D ¨ Ûâ / VRRP ,X V

group Ö Y / ,X VRRP 4 ¸

˘ Q , ı ª —

(M *ü ı ª

˘ S*üÛ+ —

V p Æ S*üˆEÝ D ¨ Ú/ ÝX VRRP 4 ,X ˜

˘ _ —

/ ÝX VRRP 4

```
Ruijie# show vrrp
FastEthernet 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
FastEthernet 0/0 - Group 2
State is Master
```


У IPv6 Ъυ ϡ

1.1 ˜ΩЪυ ϡ

IPv6 ˆ ЛυЮ ˜ΩЪυ ϡ'

ping ipv6
ipv6 address
ipv6 enable
ipv6 hop-limit
ipv6 neighbor
ipv6 source-route
ipv6 route
ipv6 ns-linklocal-src
ipv6 nd ns-interval
ipv6 nd reachable-time
ipv6 nd prefix
ipv6 nd ra-lifetime
ipv6 nd ra-interval
ipv6 nd ra-hoplimit
ipv6 nd ra-mtu
ipv6 nd managed-config-flag
ipv6 nd other-config-flag
ipv6 nd dad attempts
ipv6 nd suppress-ra
ipv6 redirects
clear ipv6 neighbors
tunnel mode ipv6ip
tunnel destination
tunnel source
tunnel ttl

1.1.1 ping ipv6

Ъυ ϡ IPV6 Â

ping ipv6 [*ipv6-address*]

ð ٧ Ô

ipv6-address ' ƒσ ѕ

ð Ъυ ʒ Ô

ð ᴳ ´ Ô

ѫ Ъυ ʒ è a ώ ѕ ƒσ ‡ ώ Ӌ ц ˘ ٨ Л υ é ε ٨ ٧ Â ѫ **ping** ы ٨ ٨ ΰ Ѭ Ю'

٨	ΰ Ѭ
!	ə ٨ ĵ ɷ
.	٨ ѫ ą̈ ĵ
U	ĵ ў
R	٧
F	
A	ƒσ ѕ
D	٧ ų Down ٧ IPV6 ╗ (ĵ ѕ ƒσ ă)
?	

ð ѡ ᴿ Ô

```
Ruijie# ping ipv6 fec0::1
```

1.1.2 ipv6 address

й ٧ У ə IPV6 ѕ ƒσ , ᴳ Ъυ ʒ **no** ĵ ѕ ƒσ Â

ipv6 address *ipv6-prefix/prefix-length* [**eui-64**]

no ipv6 address [*ipv6-prefix/prefix-length*] [**eui-64**]

ð ٧ Ô

ipv6-prefix ' IPV6 ѕ ƒσ , RFC2373 Ѭ ѕ ƒσ ˘ ə ѕ ƒσ ѕ ѓ Ѯ ņ ٨ ˘ ə ѕ ´ 16 ˘ ´ Ὼ ⁸

prefix-length ' IPV6 ѧ . IPV6 ѕ ƒσ è ʒ ĵ Â

---

eui-64 ' IPV6 ƒσ ѕ ѕ ƒσ ѧ Ո 64 ٧ ID

ð

ð

G **eui-64** 64 IPV6 ...
Up

G **no ipv6 address** a

G **no ipv6 address** *ipv6-prefix/prefix-length* **eui-64** G **ipv6 address** *ipv6-prefix/prefix-length* **eui-64**

ð

```
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
```

1.1.3 ipv6 enable

IPv6 G **no** IPv6

ipv6 enable

no ipv6 enable

ð

IPv6

ð

ð

2 IPv6 **ipv6 enable**

IPv6

G G **no ipv6 enable** a IPV6

ð

```
Ruijie(config-if)# ipv6 enable
```

ð

NDP Reachable

clear ipv6 neighbors NDP

show ipv6 neighbors

Ruijie(conifg)# ipv6 neighbor *2001::1* vlan *1 00d0.f811.1111*

show ipv6 interface	
clear ipv6 neighbors	NDP

1.1.6 ipv6 source-route

IPv6 **no** IPv6

ipv6 source-route

no ipv6 source-route

IPv6

IPv6

0 0 IPv6

Ruijie(conifg)#no ipv6 source-route

1.1.7 ipv6 route

Ђ ђ IPV6 ˘ G Ђ ђ **no** ‡ Â

ipv6 route *ipv6-prefix/prefix-length* {*ipv6-address* | *interface-id* [*ipv6-address*]} [distance]

no ipv6 route *ipv6-prefix/prefix-length* {*ipv6-address* | *interface-id* [*ipv6-address*]} [distance]

ð ∀ Ô

ipv6-prefix ' IPV6 /∀˘ RFC2373 ѕ ƒ ѕ
prefix-length IPV6 ɱ ˘ ɱ ╗ Э'/'

ipv6-address ' ‡ Ю У ѕ ƒ˘ RFC2373
ѕ ƒ ÂЮ У ѕ ƒ ѕ ⅃ Л Ω Ю У ∀ ⅃ Â
Ю У ѕ ƒ ѕ ѕ ƒ˘ ѫ ∀ Â

interface-id ' ‡ ∀˘
è Θ Θ ѿ ∀ Ю У ѕ ƒ˘ ѫ Ы ѕ ј
∀ Э˘ . ↄ Â
Ю У ѕ ƒ ѕ ѕ ƒ˘ ѫ ∀ Â

ð Ђ ђ Ô

ѽ

ð ᴳ ´ Ô

' ѕ ƒ Ю У ѕ ƒ ѕ ѕ ƒ ѫ
∀ , 3 ѕ ƒ ѕ ѕ ƒ Ю У ≠ ѕ ѕ
ƒ Â ј ѕ ƒ Ω Ю У ѕ ƒ a ї ѕ ƒ˘
Ю У Ω ∀ ѿ˘ ѫ Ю У ⅂ ∀
Ω ∀ У Â

ð ѡ ᴿ Ô

```
Ruijie(config)# ipv6 route 2001::/64 vlan 1 2005::1
```

ð ‴Ωђ ђ Ô

Ђ ђ	

l’ no ipv6 ns-linklocal-src l’ˇ ৭ ˛ ɢ ѿ ففسم ɔ ѝ
ففسم Â

ð ΏЂ ҳ Ô

Ђ ҳ	
show ipv6 interface	∜ ə

1.1.10 ipv6 nd stale-time

ᴳ Ђ ҳ ɣ STALE ND У Â

ipv6 nd stale-time *seconds*

no ipv6 nd stale-time

ð ∜ Ô

seconds ' У ˘ Л и ́ Æ˘ ت' 0-86400

ð Ô

3600˝ . 1 ə У

ð Ђ ҳ Ô

ѿ

ð ᴳ ´ Ô

У STALE ˘ У Л Ɩ й DELAY
˘ ў ╟ Ɩ ˘ Лѡ a Ɩ ´ Â

ð w ᴿ Ô

```
Ruijie(conifg)# ipv6 nd stale-time 300
```

ð ΏЂ ҳ Ô

Ђ ҳ	

ð Ô

(RA) è 0( ) 30000ms(30)

ð Ô

ð G Ô

a

RFC4861 0.5 1.5

ð R Ô

```
Ruijie(conifg-if)# ipv6 nd reachable-time 1000000
```

ð Ô

show ipv6 interface	

1.1.12 ipv6 nd prefix

(RA) è no

ipv6 nd prefix *ipv6-prefix/prefix-length* | **default** [[*valid-lifetime preferred-lifetime*] | [**at** *valid-date preferred-date*] | **infinite** | **no-advertise**]] [**off-link**] [**no-autoconfig**]

no ipv6 nd prefix *ipv6-prefix/prefix-length* | **default** { [**off-link**] [**no-autoconfig**] | [**no-advertise**] }

ð Ô

ipv6-prefix ' IPV6 RFC2373

prefix-length ' IPV6

valid-lifetime ' ğ

preferred-lifetime ' ğ

at *valid-date preferred-date* '

infinite

default

no-advertise

off-link IPV6 (on-link)

no-autoconfig

ð Ô

IPV6 address

valid-lifetime: 2592000 (30)

preferred-lifetime: 604800 (7),

on-link

ð ipv6 Ô

ð Ô

ipv6 address

ipv6 nd prefix default

ipv6 nd prefix default

ipv6 nd prefix default

at *valid-date preferred-date*

2

ð w R Ô

SVI 1

```
Ruijie(conifg)#interface vlan 1
Ruijie(conifg-if)# ipv6 nd prefix 2001::/64 infinite
2592000
```

SVI 1

```
Ruijie(conifg)# interface vlan 1
Ruijie(conifg-if)# ipv6 nd prefix default no-autoconfig
```

IPv6

ipv6 nd ra-interval	Ы Ъ˜ ч
ipv6 nd ra-hoplimit	Ы Ъ˜ ћ
ipv6 nd ra-mtu	Ы Ъ˜ MTU ћ

1.1.14 ipv6 nd ra-interval

G Ђ ђ ∀ Э ч Ы Ъ˜ (RA) ˘ G Ђ ђ
no ћ Â

ipv6 nd ra-interval {*seconds* | **min-max** *min_value max_value*}
no ipv6 nd ra-interval

ð ∀ Ô

seconds' Ы Ъ˜ (RA) Ъ˜ ч Â Л Ь й ´ Æ Â

min-max: ˜ ч ћ Ո ћ

min_value: ˜ ч ћ

max_value: ˜ ч ћ

ð Ô

200 ˘ ч ж 200 Э Ю ╠ 20 ¸ Â

ð Ђ ђ Ô

∀

ð G ´ Ô

Ї Ы ˘ ѫ ћ a ц Ы
Â ∀ ˘ й ѿ Э è ы ч Ы Ъ˜
´ ˘ Л ч ж ћ Э ╠ ˚ Ѕ γ
˜ Â

Ъ Ω **min-max**˘ ѫ ч ж ћ Ո
ћ Ѕ У э ћ Â

ð w R Ô

```
Ruijie(config)# interface vlan 1
Ruijie(config-if)# ipv6 nd ra-interval 110
Ruijie(config-if)# ipv6 nd ra-interval min-max 110 120
```

ð Ъ Ђ ђ Ô

Ђ ђ	

show ipv6 interface	**ra-info**
ipv6 nd ra-lifetime	
ipv6 nd ra-hoplimit	
ipv6 nd ra-mtu	MTU

1.1.15 ipv6 nd ra-hoplimit

(RA)

ipv6 nd ra-hoplimit *value*

no ipv6 nd ra-hoplimit

Ô

value (RA)

Ô

64

Ô

Ô

Ô

```
Ruijie(config)# interface vlan 1
Ruijie(config -if)# ipv6 nd ra-hoplimit 110
```

Ô

show ipv6 interface	**ra-info**
ipv6 nd ra-lifetime	
ipv6 nd ra-interval	
ipv6 nd ra-mtu	MTU

1.1.16 ipv6 nd ra-mtu

(RA) MTU

no

ipv6 nd ra-mtu *value*

no ipv6 nd ra-mtu

Ô

value (RA) MTU Â

Ô

IPv6 MTU

Ô

Ô

MTU Â

Ô

```
Ruijie(config)# interface vlan 1
Ruijie(config -if)# ipv6 nd ra-mtu 1400
```

Ô

show ipv6 interface	**ra-info**
ipv6 nd ra-lifetime	
ipv6 nd ra-interval	
ipv6 nd ra-hoplimit	

1.1.17 ipv6 nd managed-config-flag

“managed address configuration” **no** Æ Â

ipv6 nd managed-config-flag

no ipv6 managed-config-flag

Ô

è Æ Â

Ô

Ô

Ipv6

1.1.19 ipv6 nd dad attempts

G Ъυ ʒ ﻫ ٧ Э ѝ IPV6

ð Ô

ћ IPv6 ∀ Э a¸ ∀ Ы Ώ˜ Â

ð Ћ ђ Ô

∀

ð G ´ Ô

ћ У э ∀ Э ⁸ Ы Ώ˜ ∀ ∀ Л G **ipv6 suppress-ra** Ћ ђ Â

ð w R Ô

```
Ruijie(conifgf)# interface vlan 1
Ruijie(config-if)# ipv6 suppress-ra
```

ð ˜ΩЋ ђ Ô

Ћ ђ	
show ipv6 interface	∀ è ˜Ω ¥ ra-info ą

1.1.21 ipv6 redirects

ћ ∀ Э ˆ IPV6 ∀ ÿ ∀ ∀ Ы ∀ Л G Ћ ђ ⁸ Ї ћ ∀ Э ∀ ICMPv6 Л ˇ G Ћ ђ **no** Э a ∀ ICMPv6 Л Â

ipv6 redirects

no ipv6 redirects

ð Ô

ћ IPV6 ∀ Э ї ∀ ICMPv6 Л Â

ð Ћ ђ Ô

∀

ð G ´ Ô

ICMPv6 ↑. ⁸ ˇ
∀ Л ∀ 100 э ICMPv6 (100pps) Â

ð w R Ô

```
Ruijie(conifgf)# interface vlan 1
Ruijie(config-if)# ipv6 redirects
```

ð ˜ΩЋ ђ Ô

Ћ ђ	

show ipv6 interface	

1.1.22 clear ipv6 neighbors

clrear ipv6 neighbors

RDP a

Ruijie# **clear ipv6 neighbors**

ipv6 neighbor	
show ipv6 neighbors	

1.1.23 tunnel mode ipv6ip

IPV6 IPv6 **no**

tunnel mode ipv6ip [**6to4 | isatap**]

no tunnel mode

6to4 6to4

isatap ISATAP

IPv6

RDP **tunnel mode ipv6ip**

Â

ð w R Ô

6to4 R

```
Ruijie(config)# interface tunnel 1
Ruijie(config-if)# tunnel mode ipv6ip 6to4
Ruijie(config-if)# tunnel source vlan 1
```

ð Ô

tunnel source	
tunnel destination	
tunnel ttl	TTL

1.1.24 tunnel destination

G , G **no** Â

tunnel destination *ipv4-address*

no tunnel destination

ð Ô

ipv4-address , IPv4

ð Ô

Â

ð Ô

ð G Ô

a Â

' (6to4 isatap) a Â

ð w R Ô

IPv6 R :

```
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

tunnel source	
tunnel mode	
tunnel ttl	TTL

1.1.25 tunnel source

tunnel source {*ipv4-address* | *interface-type interface-number*}

no tunnel source

ð

ipv4-address

```
Ruijie(config-if)# tunnel mode ipv6ip
Ruijie(config-if)# tunnel source vlan 1
Ruijie(config-if)# tunnel destination 192.168.5.1
```

tunnel mode	
tunnel destination	
tunnel ttl	TTL

1.1.26 tunnel ttl

IPv6 IPv4 TTL , 128

tunnel ttl *value*

no tunnel ttl

1.2.1 show ipv6 route

IPV6 ą Â

show ipv6 route [**static**] [**local**] [**connected**]

ð ϒ Ô

static '

local ' ѫ

connected '

ð Ъυ ϡ Ô

ð G ´ Ô

Ъυ ϡ ϟ Л υ ą Â

ð w R 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
```

ipv6 route	

1.2.2 show ipv6 neighbors

IPV6 Â

show ipv6 neighbors [**verbose**] [

ð G ´ Ô

IPV6 IPv6 ND

ę Â

ð w R Ô

```
Ruijie# show ipv6 interface vlan 1
Interface vlan 1 is Up, ifindex: 2001
address(es):
Mac Address: 00:00:00:00:00:01
INET6: fe80::200:ff:fe00:1 , subnet is fe80::/64
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
```

INET6: 2001::1 , subnet is 2001::/64 [**TENTATIVE**]

INET6 [ ]

Æ	Ő Ⱨ
ANYCAST	
TENTATIVE	(DAD),
DUPLICATED	
DEPRECATED	
NODAD	
AUTOIFID	EUI-64

```
Ruijie# show ipv6 interface vlan 1 ra-info
```

```
vlan 1: DOWN
RA timer is stopped
waits: 0, initcount: 3
statistics: RA(out/in/inconsistent): 4/0/0, RS(input):
0
Link-layer address: 00:00:00:00:00:01
Physical MTU: 1500
ND router advertisements live for 1800 seconds
ND router advertisements are sent every 200
seconds<240--160>
Flags: !M!O, Adv MTU: 1500
ND advertised reachable time is 0 milliseconds
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

RA timer is stopped (on)	
waits	
initcount	RA
RA(out/in/inconsistent)	out: in: inconsistent:
RS(input)	
Link-layer address	
Physical MTU	MTU
!M | M	!M managed-config-flag M:
!O | O	!O

	other-config-flag Æ Э O: б Э ∨

ˆΩ ra-info è (Prefix) л э Ў '

RGOS™ ƫ ʒ ˜Ą

ƫ ʒ

RGOS™ ÞÚ Ý¼ ÏÄ 1
ÞÚ Ý¼ 1
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ƕ

1.1 GƼBȚGQ

ɅƱOƕ

- busytone
- caller-id all-port-enable
- caller-id enable
- codec
- comfort-noise
- connection
- description
- destination-pattern
- dial-peer vocie
- dialtone
- dtmf-relayˆ dial-peer˜
- dtmf-relayˆ voice-port˜
- echo-cancel converage
- echo-cancel mode
- echo-cancel non-linear
- forward-digits
- group
- h323
- input gain
- ip qos dscp(dial-peer)
- max connection
- num-exp
- output attenuation
- preference
- port
- ring
- session target
- shutdown(dial-peer)
- vad
- voice-port

„ voice service voip

„ voip ip address

1.1.1 busytone

FXO ´ ˘ ˘ Л∪ ˘ no
ѝ

Busytone { **block enable | frequency <***300-500***> | period <***0-5000***>** }

No Bustone { **block enable | frequency | period** }

Block enable	

ƫ	ƫ	
	Voice-port	

ƫ		
	-	-

1.1.2 caller-id all-port-enable

caller-id all-port-enable ƫ Э

˘ ƫ **no** Â

caller-id all-port-enable

no caller-id all-port-enable

	-	-

ƫ	ˆ voice-service˜
	ƫ˘ caller-id enable ƫ Â ˘ ƫ no Э no caller-id enable ƫ Â

>ßAMXÀEK@

ћ ѯ		
	-	-

1.1.3 caller-id

caller-id ћ ѯ Э é ˘ ћ ѯ
no Â

caller-id type[bellore| etsi|dtmf]

no caller-id type

bellore	**bellore**
etsi	**ETSI**
dtmf	**dtmf**

ѝ **bellore** Â

ћ ѯ voice˙ port

1' ЛЬЮ Ґ 0 Ł Â

```
Ruijie(config)# voice-port 0/0
Ruijie(config-voice-service-voip)# caller-id bellore
```

ЪЧ Э **no** ╖ Â

caller-id enable[**first | second | all**]

no caller-id enable

first	γ ˘ ↓ γ ў ↑
second	γ ˘ ↓ ў ↑
All	γ ˘ ↓ ↓ ў ↑

a γ ˘ ‡ЛЭЬ ╖ ↓˘ ѝ ў ↑ Â

╖

caller-id enable˘ first Â

ЪЧ Э ^ dial-peer˜

γ ˘ ‡ ╖ ˘ ‡ a Â

γ ˘ è γ ў ↑ h323-id ˘ з γ ѝ

L ↑˘ ‡ second ў ↑ ' all˘ ↓

γ ў ↑ Â

FXO ´ ╖ ˘ ‡ PBX FXO

˘ FXO ´ ↓ ˘ γ Â FXO

´ ╖ ˘ ‡ Â

1' ЛЬЮ Ї 0 Ł ╖ ˘ '

```
Ruijie(config)# voice-port 0/0
Ruijie(config-voice-service-voip)# caller-id enable
```

2' ЛЬЮ Ї 0 Ł ╖ '

```
Ruijie(config)# voice-port 0/0
Ruijie(config-voice-service-voip)# no caller-id enable
```

ЪЧ Э

ЪЧ Э	
-	-

↓

Â

ЪЧ Э

-	-

1.1.5 codec

Ю **codec** ƕ ƚ
˘ ƕ ƚ **no** Â

codec{**g711alaw|g723r53|g729r8|g711ulaw**|*g723r63*|*g729a*}[**bytes** *payload_size*] }

no codec

g711alaw	G.711 a ˘ ƞ 64kbit/s˘ ƛ Â
g711ulaw	G.711 u ˘ Â
g723r53	G.723.1 Annex Aˆ ƙ ƚ ˆ ACELP˜ ˜ ƞ 5.3kbit/s Â
g723r63	G.723.1 Annex Aˆ ƙ ă ƴ (MP-MLQ)

```
Ruijie(config)# dial-peer voice 500 voip
Ruijie(config-dial-peer)# codec g723r53
```

ƕ

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-	-

ƙ

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-	-

1.1.6 comfort-noise

comfort-noise ƕ **no comfort-noise** ƕ

Ɯ ·

Comfort-noise

No comfort-noise

-	-

ƕ ˆ voice-port˜

ƕ **comfort-noise** Q¸ ˇ Э Ɯ
VAD ƙˇ ƕ ƙ ƛ ƫ ƙˇ ƕ

voip-port

1.1.9 destination-pattern

Ю **destination-pattern** Ъ й
E.164 Ъ **no** Â

destination-pattern *string*

no destination-pattern

string	E.164 0 ~ 9 (.) Â (.) Â

Â

Ъ dial-peer

destination-pattern Ъ й E.164
Ъ Ъ L Â

RGOS a E.164 Â

1 ЛЮ й 10 3703333
```
Ruijie(config)# dial-peer voice 10 pots
Ruijie(config-dial-peer)# destination-pattern 3703333
```
2 ЛЮ й 129 й 823
```
Ruijie(config)# dial-peer voice 129 voip
Ruijie(config-dial-peer)# destination-pattern 823....
```

Ъ

Ъ	
port	POTS б
session target	

Ъ

Ъ

-	-

1.1.10 dial-peer voice

Ю **dial-peer voice** Ъυ ҳ … ˘
ˆ ⊿ б ˜˜ Ъυ ҳ
no Â

dial-peer voice [*tag* **] { voip | pots }**

no dial-peer voice [*tag* **]**

voip-port	^ voip-port˜

ћυ ҳ

-	-

1.1.11 dialtone

´ Л υ ˘ no ѝ

Dialtone {frequency <*0-1000*> | ivr}

No Dialtone {frequency | ivr}

ivr	
frequency <0-1000>	´ ^ -hz˜

Ю ´ a ˘ ѝ 450hz

ћυ ҳ voice-port Â

1¨ ћυ ҳ voip-port, dsp ˘ ѝ voice-port dsp˘ voip-port Ю ћυ ҳ˘ ⅄ dsp voip-port ≠ ˘ ћυ ҳ Л υ ⅄ dsp Ю ß7 ñ -B ðlp€€™aýD· ÒÌÀŸV№pa´Ð ð 0Y½c, ðlp€€™a´K{Àœ ,`6 ô™@

Y

Ruijie(config-voice-port)# **dialtone frequency** *440*

ƕ ƚ	
Voice-port	

2' ЛЬЮ 823 DTMF '

```
Ruijie(config)# dial-peer voice 823 voip
Ruijie(config-dial-peer)# no dtmf-relay h245-alphanumeric
```

ħυ ȝ

ħυ ȝ	
dial-peer voice	… è ˆ ˧ б ˜

˧

ħυ ȝ

-	-

1.1.13 dtmf-relayˆ voice-port˜

Voice-port Ю˜ **dtmf-relay** L ɬ ɬ (DTMF) ˘ ħυ ȝ **no**

ƙ

ƕ

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1.1.14 echo-cancel converage

Э converge

ƚυ ҳ		
	-	-

1.1.16 echo-cancel non-linear

Echo-cancel non-linear {disable|high|low|medium}

No echo-cancel non-linear: й high

disable	a
high	
low	æ
medium	

a ╗ ĥ

ħυ ϡ ^ dial-peer˜

ĥ ^ Ң ‡ ˜ ╗ ⅄ VoIP Э ˘
L ≀ ˘ ˘ ‡ L ≀ ⅄ Ю ˘
ў ˘ ѐ ⅄ Л∪ ў ╗
group ħυ ϡ ⅄ POTS ╗ ĥ ˘ *group_number* ѝ
ĥ ў

ĥ æ POTS

1' Ю POTS 3 ╗ ў ѝ 1/0 ĥ '

```
Ruijie(config)# dial-peer voice 3 pots
Ruijie(config-dial-peer)# group 1/0
```

2' Ю ⅄ POTS 3 ĥ ╗ '

```
Ruijie(config)# dial-peer voice 3 pots
Ruijie(config-dial-peer)# no group
```

ħυ ϡ

ħυ ϡ	
dial-peer voice	… ѐ ^ ⅄ б ˜

⅄

ħυ ϡ

-	-

ħυ ȝ ˆ voice-port˜

ˇ ȷ **input gain** ħυ ȝ Â

1' ЛυЮ ѝ 1/1 2dB '

```
Ruijie(config)# voice-vport 1/1
Ruijie(config- voice-vport)# input gain 2
```

ħυ ȝ

ħυ ȝ	
output attenuation	ѝ ж
voice-port	ˆ voip-port˜

ȷȶ

ħυ ȝ

-	-

1.1.21 ip qos dscp (dial-peer)

Ю ip qos dscp ħυ ȝ IP tos dscp ˇ ħυ ȝ **no** IP dscp ѝ Â

ip qos dscp *dscp-value*

no ip qos dscp

1.1.25 preference

ѝ hunt group( ) dial peer( ) ˘
L ɻ ЮO **preference** Ъу ҳ Â Ъу ҳ no ɻ
Â

preference *value*

no preference

value	*value*' ˘ ѝ 0~9˝ ˘ ˘ 0 DAB15ÑDF4BAñuh1CE

˘ Ђυ ҳ **no** ↓ Â

port *slot-number/port-number*

port *slot-number/port-number′ channel*

no port

!

slot-number E1 ´ ˘ ‡ Ђυ ҳ
╗ Э channel Â

slot-number	´
port-number	
channel	↓ 0 30˜

Ђυ ҳ ^ dial-peer˜

port Ђυ ҳ б ˘
PSTN L ɨ ɅˇĬ ┐ Â ↓ ˘ IP
L ɨ ɅˇĬ ≠ ┐ Â

slot-number E1 ´ ˘ ‡ Ђυ ҳ
╗ Э channel Â

1' ЛЬЮ й POTS 20 5

```
Ruijie(config)# dial-peer voice 20 pots
Ruijie(config-dial-peer)# port 1/0
Ruijie(config-dial-peer)# port 1/0:1
```

Ђυ ҳ

Ђυ ҳ	
ds0-group	E1

↓

Ђυ ҳ

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1.1.27 ring

FXO ´ ˘ no ѝ

ring twitter <*0-15*>

No ring twitter

	ѝ 0 15
	ѝ 7
ћ ў	voice-port Â
Y	ћ ў voip-port, ´ ˘ voip-port ˩ ´ Э Â
	FXO Л ˘ γ L ˧˘ ˘ 25HZ ˘ 4 ˘ a ˘ ´ ˘ ˩Л a

	1' 1/0 Э ѝ 3
	`Ruijie(config)# **voice-port** *1/0*`
	`Ruijie(config-voice-port)# **ring twitter** *10*`

ћ ў	**ћ ў**

	-	-

1.1.29 shutdown(dial-peer)

shutdown

vad

no vad

-	-

a

Ъυ ҳ ^ dial-peer˜

1.VAD^ Voice Activity Detection˜ й ˘
˘ æ ˘ Â
2. ˘ ┘ Â
3. **no vad** Ъυ ҳ ˘ Â

1' ЛъЮ й VoIP 20 ╖

```
Ruijie(config)# dial-peer voice 20 voip
Ruijie(config-dial-peer)# vad
```

Ъυ ҳ

Ъυ ҳ	
dial-peer voice	… è ^ ┘ б ˜

┘

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ħυ ҳ

1¨ Ю **voice class codec** ħυ ҳ codec

2¨ codec voip Â

1' ЛυЮ Ю codec '

```
Ruijie(config)# voice class codec 1
```

ħυ ҳ

ħυ ҳ	

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ħυ ҳ

1.1.32 voice hunt

hunt group ╖ ˘ Ю voice hunt ħυ ҳ Â ħυ ҳ no hunt group ╖ Â

voice hunt {**user-busy| no-answer**| **no-channel|all**}

no voice hunt

user-busy	Ю hunt groups ╖
no-answer	Ю hunt groups ╖
no-channel	Ю hunt groups ╖
all	L ѵ Ю hunt groups ╖

Â

Ћ ҳ

RGOS Ю hunt groups( )╖ ˘
ЛЬЮЋ ҳ ↓Л hunt groups ╖

1' Ю Ю hunt groups ╖ '

```
Ruijie(config)#voice hunt no-channel
```

Ћ ҳ

Ћ ҳ	

↓

Ћ ҳ

1.1.33 voice-port

Ю **voice-port** Ћ ҳ Â

voice-port *slot-number/port-number*

voice-port *slot-number/port-number' channel*

slot-number	´
port-number	
channel	↓ 0 30˝

Â

Ћ ҳ

Ю **voice-port** Ћ ҳ Â

slot-number	E1 ´ ˘ ‡ Ћ ҳ ╖ Э *channel* Â

1' ЛЬЮ Ю 1 '

ħυ ҳ

ħυ ҳ	
voice class codec	codec

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ħυ ҳ

1.1.35 voice service voip

Ю **voice service voip** Ŀ Â

voice service voip

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ħυ ҳ

voice service voip ħυ ҳ Ŀ ˘ Л∪
˘ **exit** ħυ ҳ ɻ Â

1' ЛυЮ Ŀ '

```
Ruijie(config)# voice service voip
Ruijie(config-voice-service-voip)#
```

ħυ ҳ

ħυ ҳ	

1.1.36 voip ip address

Ю **voip ip address** Ъ IP
Ъ Ъ **no** IP Â

voip ip address *a.b.c.d*

a.b.c.d	IP

IP

Ъ

IP IP **voip ip address** Ъ
Ъ Л ╗ Â

1' ЛЮ 192.168.120.1'

```
Ruijie(config)# voip ip address 192.168.120.1
```

Ъ	
-	-

1.2.1 debug voip all

ƗO **debug voip** ƕ ҳ VoIP ˘
ƕ ҳ **no** VoIP Â

vfdc_error_id_125 1

pstn_error_id_23 3

VOIP L ɻ ˘ VFDC à PSTN ID125 à 23 ǂ 1 3 **Â**

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ƕʒ		

γ GK Client ƕ ʒ

2.1 GK Client ĵGG5BQ

GK Client ЛЬЮƕ ʒ'

- „ gateway
- „ h323-gateway voip h323-id
- „ h323-gateway voip id
- „ h323-gateway voip interface
- „ h323-gateway voip tech-prefix

2.1.1 gateway

ЮO **gateway** ƕ ʒ GK Client ㄴㄱ ض

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2.1.2 h323 gateway voip h323-id

Ю **h323-gateway voip h323-id** ħυ ҳ ﻝ˘ ħυ ҳ **no** ﻝ Â

h323-gateway voip h323-id *name*

no h323-gateway voip h323-id *name*

	name	ﻝ ﻝ ˘ Лυ (-) Ю (‿)˘ й 1~127

ﻝ

ħυ ҳ Â

ﻝ ﻝ˘ ﻝ ﻝ

1' ЛυЮ ﻝ й red-gaint

```
Ruijie(config-if)# h323-gateway voip h323-id red-gaint
```

ħυ ҳ		
ħυ ҳ	**h323-gateway voip id**	GK Server ﻝ IP
	h323-gateway voip interface	й GK Client
	h323-gateway voip tech-prefix	GK Server ЎĄ

ﻝ

ħυ ҳ		
	-	-

ƕ ƙ		
	-	-

2.1.4 h323-gateway voip interface

2.1.5 h323-gateway voip tech prefix

ƗO **h323-gateway voip tech prefix** ƕ ǯ GK Server

	-	-

2.2 GK Client ÌGW

GK Client ЛυЮħυ ҳ'

„ show gateway

2.2.1 show gateway

ЮЎ **show gateway** ħυ ҳ

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show gateway

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ħυ ҳ	Â
	show gateway ħυ ҳ ↲ Â

	1' ЛυЮ RedGiant_GW ˘ ’Ą GK Server RedGiant_GK'
	`Ruijie# show gateway`
	`H323 gateway RedGiant_GW is register to gatekeeper RedGiant_GK.`

ħυ ҳ	**ħυ ҳ**	
	-	-

↲	

ħυ ҳ		
	-	-

Þ Gatekeeper Server Ъυ ҳ

3.1 Gatekeeper Server G5BQ

Gatekeeper Server Ъυ ҳ '

- „ gatekeeper
- „ shutdown(gatekeeper)
- „ zone local
- „ zone remote
- „ zone prefix

3.1.1 gatekeeper

Ю **gatekeeper** Ъυ ҳ Â

gatekeeper

-	-

Â

Ъυ ҳ Â

gatekeeper ↓ ˘ Л∪ GK Server ˘ Ctrl-Z exit Ъυ ҳ ↓ Â

1' ЛυЮ '

```
Ruijie(config)# gatekeeper
Ruijie(config-gk)#
```

Ъυ ҳ

Ъυ ҳ	
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↓

Ћ ѓ		
	-	-

3.1.2 shutdown(gatekeeper)

Ю **shutdown** Ћ ѓ GK Serverў Ћ ѓ **no** GK Server Â

shutdown

no shutdown

	-	-

Ю GK Server

Ћ ѓ Â

GK Server Л ў Ў **no shutdown** Ћ ѓ GK Server Â GK Server ш ў ‡ a GK Server Â

1 ЛЊЮ GK Serverґ

```
Ruijie(config)# gatekeeper
Ruijie(config-gk)#shutdown
```

Ћ ѓ		
	-	-

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Ћ ѓ		
	-	-

3.1.3 zone local

Ю **zone local** Ћ ѓ GK Server ш ў Ћ ѓ **no** GK Server ш Â

„ show gatekeeper zone status

3.2.1 show gatekeeper calls

show gatekeeper calls

-	-

```
Ruijie#show gatekeeper gw_type_prefix
GATEWAY TYPE PREFIX TABLE
=========================
Prefix: 15#*
Zone RedGiant_GK02 master gateway list:
172.16.23.1:1720 RedGiant_GW2
Prefix: 22#*
Zone RedGiant_GK02 master gateway list:
172.16.18.1:1720 RedGiant_GW1
```


```
GATEKEEPER SERVERS STATUS
=========================
Gatekeeper Server listening port: 1718
Gatekeeper-ID: RedGiant_GK02
------------------------------
```


	-

3.2.5 show gatekeeper status

show gatekeeper status GK Server

show gatekeeper status

-	-

GateKeeper State й GK Server ˘ (UP) (DOWN)' Zone Name й GK Server ш ɻ Â

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-	-

3.2.6 show gatekeeper zone prefix

Ю **show gatekeeper zone prefix** ћu ҳ ш Â

show gatekeeper zone prefix

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ћu ҳ Â

Ю **show gatekeeper zone prefix** ћu ҳ ш Â

1' ЛuЮ **show gatekeeper zone prefix**

```
Ruijie# show gatekeeper zone prefix
     ZONE PREFIX TABLE
     =================
GK-NAME             E164-PREFIX
-------             -----------
RedGiant_GK01       371....
RedGiant_GK02       378....
RedGiant_GK03       375....
```

GK-NAME й GK Server ɻ ɻ ص

Ъυ ϡ	
-	-

ϥ

Ъυ ϡ	
-	-

3.2.7 show gatekeeper zone status

Ю **show gatekeeper zone status** Ъυ ϡ GK Server ѡ Â

show gatekeeper zone status

-	-

Â

Ъυ ϡ Â

Ю **show gatekeeper zone status** Ъυ ϡ GK Server ѡ Â

1' ЛьЮ й **show gatekeeper zone status** '

```
Ruijie# show gatekeeper zone status
GATEKEEPER ZONES
================
GK Name     Domain Name   RAS Address    PORT  FLAGS
-------     -----------   -----------    ----- -----
RG_GK01     RG_zone1      172.16.2.1     1718  LS
RG_GK02     RG_zone2      172.16.2.2     1718  RS
```

GK name й GK Server ɻ ˇ Domian Name й è ѡ ɻ ˇ RAS Address Port й RAS ˜ IP ˇ FLAGS ˇ L ˇ R ˇ S Â

Ъυ ϡ	Ъυ ϡ	

show gatekeeper calls	GK Server L Â
show gatekeeper endpoints	
show gateway	

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SIP ƕ ǯ

4.1 SIP y95%G5BĖĢQ

SIP ЛьЮ ƕ ǯ'

4.1.4 sip-server

SIP Ł ˘ sip-ua Ю

sip-server Â ħυ ҳ no Ł Â

sip-server ipv4:*ip_addr*:[port *port-num*]

ð Ô

ip-addr ' Ł IPV4 Â

port-num ' Ł UDP Â

ð Ô

ӥ 5060 Â

ð ħυ ҳ Ô

sip-ua Â

ð Ô

a DNS Â

ð Ô

Ю … SIP Ł ˘ ӥ 5060ʻ

```
Ruijie(config-sip-ua)# sip-server ipv4 192.168.52.100
```

RGOS™ ЬU ҙ ٧ ՚Ą

Ŀ ҳ

У ╘ ⌧ Ъ ⅓ 1
1.1 ╘ ⌧ ˇΩ Ъ ⅓ 1
1.1.1 service-module session.....1
1.1.2 service-module session-timeout 1
1.1.3 service-module reset.....2
1.1.4 show service-module.....2

ـ ٩ أ

ḣ' 120s

ð ъ ъ Ô

ŏ

ð G ´ Ô

interface slot/port : Ч ⁄ћ ∙ Â

number: ˘ ت0-1000,´ Æ' Â

ώ Ч ⁄ћ ˘ ⁄ћ ¤ ! ɔ˘ ╠ ÿ Ч ⁄ћ Â

ð w R Ô

```
Ruijie (config)#service-module fastEthernet 2/0 session-timeout 100
```

1.1.3 service-module reset

ŭ Ч ⁄ћ˘ ∟ Л G ъ ъ Â

service-module *interface slot/port* **reset**

ð Ô

ð ъ ъ Ô

ð G ´ Ô

interface slot/port : Ч ⁄ћ ∙ .

ŭ Ч ⁄ћ˘ ∟ Л ƒ Ч ⁄ћ ˘ Â

⁄ћ ŭ Ч ⁄ћ Ѯ ∧˘ ∟ Л ώ Ч ⁄ћ Â

ð Ђ ҙ Ô

ð ᴳ ´ Ô

interface slot/port :Ꮋ ⁂ ᛋ .

Ђ ҙ˘ ᒑ Ո Ꮋ ⁂ У Ҿ ⁎ ą Â

ð w ᴿ Ô

```
Ruijie #show service-module fastEthernet 2/0
Service Module type :Ether Switch .
  Corresponding interface :FastEthernet 2/0
Swport interface(24) :
Fa2/1   Fa2/2   Fa2/3   Fa2/4   Fa2/5   Fa2/6
Fa2/7   Fa2/8   Fa2/9   Fa2/10  Fa2/11  Fa2/12
Fa2/13  Fa2/14  Fa2/15  Fa2/16  Fa2/17  Fa2/18
Fa2/19  Fa2/20  Fa2/21  Fa2/22  Fa2/23  Fa2/24
tty type:5
Commands queue: count 12
Operation mode :NORMAL mode
Snmp mode :UNION
Ruijie #
```