,XCÃ+ Ô þE²4Á,X 0NKÈ È7¾"• ³E•+ CÃ+ A' Û Ã ¹ ¾Eî Ô þ" 6. CÃ+ È ¢5à û û £ ãCÃ+ ><,X?˜ õ Ä

â area range Q ¸ á à È area range " 6.,X OSPF ³ KÈCÃ+ È 5à summary-address " 6.,X OSPF CÃ+ ³,X êF¼CÃ+ Ä

Í b NSSA È summary-address Q ¸,Â ! ¾ ü NSSA ,X ABR Þ ;> Ý È5à è ¾ ÍG¡ Ú ×CÃ+ E¯> " 6. Ä

Ï _ Ð

¹ ßG!5B Q ¸ È Ú {*ó Ô 5 êF¼" 6.CÃ+ 100.100.0.0/16 Ä

```
redRuijie(config)#          router ospf        20
Ruijie(config-router)#              summary- address    100.100.0.    0
255.255.0.0
Ruijie(config-router)#              redistribute        static      subnets
Ruijie(config-router)#             network   200.2.2.0     0.0.0.255     area
1
Ruijie(config-router)#              network    172.16.24.0 0.0.0.255
area  0
Ruijie(config-router)#              area   1   nssa
```

Ï,Ì G Q ¸ Ð

Q ¸	AÈ â
area range	ü OSPF ³E•+ CÃ+ A' Û Þ .CÃ+ " 6. Ä

Ï G ÄAÈ â Ð

Ï(AÈ â Ð

4.1.47 timers lsa-group-pacing

A¹ Q ¸A'5B LSA >• Ú4˜' â Í H4˜E¯> „ ¹ ž5Õ ê,X,X ÊKÈJÒCÃ(Š Õ È „ ÊKÈ ÈA¹ Q ¸,X no 6 ã 6 á5 ,ÕG!5B Ä

timers lsa-group-pacing seconds

no timers lsa-group-pacing

Ï – DAÈ â Ð

– D	£EÄ
seconds	LSA ,X È „ È õP` `Au1k È5Õ ê1 ,X ÊKÈKÈLh Ä 8× È: 10-1800

Ï5 ,Õ ™ ‰ Ð

5 ,Õ: 240 /¦ Ä

Ï Q ¸ õ ã Ð

CÃ+ E¯/ßG!5B õ ã Ä

Ï S*ü Û + Ð

!9A×A' Û Y,X(Š Õ È „ µ CÄ LSA ÅX È „ ÈõP` `Au1k È5Õ ê1 ,XKÈLh È ¹ È Ý ý*üCÃ+ A' Û Ä 5 ,ÕA'5B 4 ÚJs ÄA¹ – D J áLÔ?U4£ A× H Ä Ô G,X ÊKÈ âCÃ+ A' Û Ý î å LSA LÔ?UAu1k ä ¡!¨,X Ä!¨ V È D B g Ý 10000 5 LSA ÈL! "!9A×KÈLh Ú S 4 ,ž Ä V p ¾ Ý 40~100 5 È íA× H 10~20 ÚJs Ã6Ñ î È Q Ä

Ï _ Ð

¹ ß,XG!5B _ $ È Ú!9A× ÊKÈA'5B 120 /¦ Ä

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

Ï,Ì G Q ¸ Ð

Q ¸	AÈ â
show ip ospf	¹,ß ospf ,X,Ì GG!5B µ C

Ï G ÄAÈ â Ð

Ï(AÈ â Ð

4.1.48 timers spf

?UG!5BOSPF ü y § %,X ¬ ê µ C ÈE¯> SPF Au1k,X Ê Ê ÊKÈ È ¹ ž ø õ SPF Au1k,X ÊKÈKÈLh ÈAË S*üCÃ+ E¯/ßG!5B Qimers spf ÄA¹ Q ¸,X no 6 ã 6 á5 ,ÕG!5B Ä

timers spf spf-delay spf-holdtime

no timers spf

Ï – DAÈ â Ð

– D	£EÄ
spf-delay	n SPF Au1k,X1 Y ÊKÈ È ¹/¦) ! Ä OSPF CÃ+ E¯/ß y § % ¬ ê È ™NO1 Û n,X ÊKÈ â È !E¯> SPF E¤1k Ä
spf-holdtime	n ø õ SPF E¤1k KÈ,X ÊKÈKÈLh¹Ë¦) ! Ä1 Y ÊKÈ Z È ø õE¤1kKÈLh ÊKÈ"u ÈE¬ á6ÑE¯> SPF E¤1k Ä

Ï5 ,Õ ™ ‰ Ð

1 Ãá Õ timers throttle spf Q ¸,X RGOS È2Ï4³5 ,Õ Ö spf-delay Ö

5 /¦ × spf-holdtime Ö10 /¦ Ä

2Ã Õ timers throttle spf Q ¸,X RGOS È5 ,Õ ™ ‰ ß timers spf Q ¸ á*ó È SPF Au1k Ê Ê ¹ timers throttle spf Q ¸,X5 ,ÕG!5B š È –?• timers throttle spf Q ¸AÈ â Ä

Ï Q ¸ õ ã Ð

CÃ+ E¯/ßG!5B õ ã Ä

Ï S*ü Û + Ð

spf-delay ` spf-holdtime ÊKÈA'5B kC^ ã ÈOSPF EÖ h § % ¬ ê,X ÊKÈ 3C^-Á È 3 AÈ5%4° / ÊKÈC^-Á È î 4*üCÃ+ A' Û È î,X CPU ÊKÈ Ä

---

a _ É

timers spf G!5B â timers throttle spf G!5B î f,Ì?Z,ª Ä

Ï _ Ð

¹ ß,XG!5B _ $ È Ú OSPF ,X Ê Ê ` ± Õ ÊKÈ Ú ÿA' 3 ` 9 /¦ Ä

```
Ruijie(config)#          router     ospf    20
Ruijie(config-router)#              timers     spf   3 9
```

Ï,Ì G Q ¸ Ð

Q ¸	AÈ â
show ip ospf	¹,ß ospf ,X,Ì GG!5B µ C
timers throttle spf	G!5B SPF Au1k Û DEÔFS ÊE³ ÊKÈ È s6Ñ!¨ timers spf È t û × |9$ S *ü timers throttle spf ª · timers spf G!5B

Ï G ÄAÈ â Ð

Ï(AÈ â Ð

4.1.49 timers throttle spf

?UG!5BOSPF ü y § %,X ¬ ê µ C ÈE¯> SPF Au1k,X Ê Ê ÊKÈ Ã ø õ SPF Au1k,X Ô ã ÊKÈKÈLh Ã Ô û ÊKÈKÈLh ÈAË S*üCÃ+ E¯/ßG!5B Qmers throttle spf ÄA¹ Q ¸,X no 6 ã 6 á5 ,ÕG!5B Ä

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

no timers throttle spf

Ï – DAÈ â Ð

– D	£EÄ
spf-delay	n SPF Au1k,X1 Y ÊKÈ È ¹!¿/¦) ! È ª 8× È Ö 1-600000 ÄOSPF CÃ+ E¯/ß y § % ¬ ê È?º ¥,X SPF Au1k7Ç å?U ü spf-delay ÊKÈKÈLh â ;> Ä
spf-holdtime	n ø õ SPF E¤1k KÈ,X Ô ã ÊKÈKÈLh¹È !¿/¦) ! È ª 8× È Ö 1-600000 Ä
spf-max-waittime	n ø õ SPF E¤1k KÈ,X Ô û ÊKÈKÈLh¹È !¿/¦) ! È ª 8× È Ö 1-600000 Ä

Ï5 ,Õ ™ ‰ Ð

spf-delay Ö1000 !¿/¦ ×

spf-holdtime Ö5000 !¿/¦ ×

spf-max-waittime Ö10000 !¿/¦ Ä

Ï Q ¸ õ ã Ð

CÃ+ E¯/ßG!5B õ ã Ä

Ï S*ü Û + Ð

spf-delay ></ ¢ § % ¥*ó ¬ ê SPF Ô ŸAu1k È7Ç åLÔ?U ÊE³,X ÊKÈ Ä 1 Ô õ?º ¥ SPF Au1k 1 ` õ?º ¥ SPF Au1k,X Ô ã ÊKÈKÈLh spf-holdtime È !8 â ÈE²4Á?º ¥ SPF Au1k,X ÊKÈKÈLh7Ç å Þ Ô õ ÊKÈ KÈLh,X ø á È' ÊKÈKÈLhE’ spf-max-waittime â È Ú á a r t Ä V p ø õ SPF Au1k,X ÊKÈKÈLh Æ4£CYE› Z?U" ,X Ô ã F₩ SPF Au1k ÊKÈ KÈLh ÚG¡ „ ¢ spf-holdtime Ô ŸAu1k Ä

spf-delay ` spf-holdtime Ã ¹ A ’ 5 B ã o ¹ t ¿ § % , X / × spf-max-waittime Ã ¹A’5B û o ¹ £ å SPF Au1k È Ã ¹ B rL 5%4° § %0 n ûG› ª&I# A’5B Ä

â timers spf Q ¸,Ì!¨ È A¹ Q ¸6Ñ óE¯> È&I# ,XA’5B È ¶ Ã ¹ t ¿ SPF Au1k /Eó z È œ Ã ¹ ü § %E²4Á ¬ ê Ê È Q,X £ å SPF Au1k,X2Ï4³C $d#\5ë È ¹ |9$ S*ü timers throttle spf Q ¸E¯> G!5B Ä

---

a _ É

1 Êspf-holdtime ,X á6Ñ ã b spf-delay È ú í spf-holdtime ,X Ú>•7¾ |A’5B â spf-delay ,Ì1 ×

2 Êspf-max-waittime ,X á6Ñ ã b spf-holdtime È ú í spf-max-waittime ,X Ú>•7¾ |A’5B â spf-holdtime ,Ì1 Ä

3 Êtimers throttle spf G!5B â timers spf G!5B î f,Ì?Z,ª Ä

4 Ê ' timers spf â timers throttle spf FÑ þG!5B Ê È5 ,Õ –?• timers

´5 ,Õ> Ä

Ï Q ¸ õ ã Ð

(M *ü õ ã Ä

Ï S*ü Û + Ð

h*üA¹ Q ¸ Ã ¹ / OSPF CÃ+ E¯/ß,XE¤> µ C V?U Ä

Ï _ Ð

¹ ß show ip ospf Q ¸,XEg Î4§ p Ö

```
Ruijie#      show ip ospf
Routing Process "ospf 1" with ID 1.1.1.1
Process uptime is 4 minutes
Process bound to VRF default
Conforms to RFC2328, and RFC1583Compatibility flag
isenabled
Supports only single TOS(TOS0) routes
Supports opaque LSA
This router is an ASBR (injecting external routing
information)
SPF schedule delay 5 secs, Hold time between two SPFs
10 secs
LsaGroupPacing: 240 secs
Number of incomming current DD exchange neighbors 0/5
Number of outgoing current DD exchange neighbors 0/5
Number of external LSA 4. Checksum 0x0278E0
Number of opaque AS LSA 0. Checksum 0x000000
Number of non-default external LSA 4
External LSA database is unlimited.
Number of LSA originated 6
Number of LSA received 2
Log Neighbor Adjency Changes : Enabled
Graceful-restart disabled
Graceful-restart helper support 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

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

/ 4§ p Ø +!‰,X £EÄ V ß Ä

+!‰	£EÄ
Router ID	CÃ+ A’ Û ÛAš0ú Ä
Process uptime	OSPF E¯/ß*ó ,X ÊKÈ Ärouter-id 0.0.0.0 ÊE¯/ß á*ó ,X Å
Bound to VRF	OSPF E¯/ß 2,X VRF
Conforms to RFC2328	â RFC2328 Ô7È
RFC1583Compatibility flag	üAu1k êF¼CÃ+ ÊG›*ü,X RFC1583 ?˜ íE¬ RFC2328 ,X?˜ í üEÝ ½ Ô G,X ASBR `CÃ+ !¨EW ÊA¹ ?˜ í Ú>•*ü
Support Tos	¾ Õ TOS0
Supports opaque LSA	Õ opaque-LSA
Graceful-restart	RFC3623 Graceful Restart £EÄ,XGR Restart 6Ñ o Ä
Graceful-restart helper	RFC3623 Graceful Restart £EÄ,XGR Help 6Ñ o Ä
Router Type	OSPF CÃ+ A’ Û2O _ ńormal Ã ABR ÃASBR Ä
SPF Delay	§ % ¬ êA×*ü SPF E¤1k ?U ÊE³ ,X ÊKÈ
SPF-holdtime	ø õ SPF Au1k KÈ7Ç å?U4È Õ,X ÊKÈ
LsaGroupPacing	LSA ,X È „ ÈõP` `Au1k È5Õ ê1 ,X Ê KÈKÈLh

Incomming current DD exchange neighbors	!7 ü x f,XF• DG£ È incomming ÛOj õE¯ 9 exstart (Š Õ,XF•
Outgoing current DD exchange neighbors	!7 ü x f,XF• DG£ È outgoing Û ¢ È P¬(Š ÕEÔ ²exstart G¡ „ x f,XF•
Number of external LSA	D B g , |,X êF¼ LSA ,X DG£
External LSA Checksum Sum	D B g , |,X êF¼ LSA ,X ”P` `,X `
Number of opaque LSA	D B g , |,X opaque-LSA ,X DG£
Opaque LSA Checksum Sum	D B g , |,X opaque-LSA ,X ”P` `,X `
Number of non-default external LSA	M25 ,ÕCÃ+ ,Xexternal-LSA ,X DG£
External LSA database limit	external-LSA DG£L$
Exit database overflow state interval	ø •/• Ô overflow (Š Õ,X ÊKÈ

Database overflow state

FastEthernet 0/1	/ E'E•+ CÃ+ A' Û,X y · Ä
ABR, ASBR	/ E•+ CÃ+ A' Û,X2O _ È Ý ABR ` ASBR ø/¡ ÈÃ ¹ à Ê ABR ` ASBR Ä
Area 0.0.0.1	/ : 4 A¹CÃ+ ,X ³ Ä
select	' Ý î 5CÃ X E' ASBR Ê Èselect ></ ' !EÝ ½,X Ô ìCÃ X Ä

Ï G ÄAÈ â Ð

Ï(AÈ â Ð

4.2.3 show ip ospf database

?U / OSPF JÒCÃ(Š Õ D B g µ C ÈAË S*ü(M *ü õ ã Q ¸ show ip ospf database Ä

A¹ Q ¸,X á à ã / á àJÒCÃ(Š Õ £EÄ Ä LSAs Å µ C Ä

show ip ospf [process-id area-id] database [asbr-summary] [link-state-id] [self-originate]

show ip ospf [process-id area-id] database [external] [link-state-id]

show ip ospf [process-id area-id] database [external] [link-state-id] [adv-router ip-address]

show ip ospf [process-id area-id] database [external] [link-state-id] [self-originate]

show ip ospf [process-id area-id] database [nssa-external] [link-state-id]

show ip ospf [process-id area-id] database [nssa-external] [link-state-id] [adv-router ip-address]

show ip ospf [process-id area-id]database [nssa-external] [link-state-id] [self-originate | maxage]

show ip ospf [process-id area-id]database [database-summary]

Ï – DAÈ â Ð

– D	£EÄ
Area-id	Ä ÃEÝ Å / ,X ³ Ë
adv-router	Ä ÃEÝ Å / + Û n @ CÃ+ A’ Û*ó ä,XJÒ CÃ(Š Õ £EÄ µ C
link-state-id	Ä ÃEÝ Å¾ / Û n OSPF JÒCÃ(Š Õ ÛAš,X JÒCÃ(Š Õ £EÄ µ C Ä
self-originate	Ä ÃEÝ Å / + CÃ+ A’ Û7¾ Å*ó ä,XJÒCÃ (Š Õ £EÄ µ C
maxage	Ä ÃEÝ Å / Æ 5Õ ê ÊKÈ,X LSA
router	Ä ÃEÝ Å / OSPF CÃ+ A’ ÛJÒCÃ(Š Õ £EÄ µ C Ä
network	Ä ÃEÝ Å/ OSPF 5%4°JÒCÃ(Š Õ £EÄ µ C Ä
summary	Ä ÃEÝ Å/ OSPF ,?UJÒCÃ(Š Õ £EÄ µ C Ä
asbr-summary	Ä ÃEÝ Å / G b ASBR ,X ,?UJÒCÃ(Š Õ £ EÄ µ C Ä
external	Ä ÃEÝ Å/ OSPF êF¼JÒCÃ(Š Õ £EÄ µ C Ä
nssa-external	Ä ÃEÝ Å / OSPF 1 ×2O êF¼JÒCÃ(Š Õ £ EÄ µ C Ä
opaque-area	Ä ÃEÝ Å / 1 2O LSA
opaque-as	Ä ÃEÝ Å / 1 Ô2O LSA
opaque-link	Ä ÃEÝ Å / 1 12O LSA

100.0.0.0/16
192.88.88.0 1.1.1.1 2 0x80000001 0xbb2d
192.88.88.0/24

NSSA-external Link States (Area 0.0.0.1 [NSSA])

Link ID ADV Router Age Seq# CkSum
Route Tag
20.0.0.0 1.1.1.1 1 0x80000001 0x033c E2
20.0.0.0/24 0
100.0.0.0 1.1.1.1 1 0x80000001 0x9469 E2
100.0.0.0/28 0

AS External Link States

Link ID ADV Router Age Seq# CkSum
Route Tag
20.0.0.0 1.1.1.1 380 0x8000000a 0x7627 E2
20.0.0.0/24 0
100.0.0.0 1.1.1.1 620 0x8000000a 0x0854 E2
100.0.0.0/28 0

show ip ospf database Q ¸ / 4§ p Ø +!‰,X £EÄ V ß Ä

+!‰	£EÄ
OSPF Router with ID	/ OSPF JÒCÃ(Š Õ D B g,XCÃ+ A' Û ÛAš0ú â OSPF Í h,XE¯/ß Ë
Router Link States	></ ¹ ß Y • CÃ+ A' ÛJÒCÃ(Š Õ £EÄ µ C Ä
Net Link States	></ ¹ ß Y • 5%4°JÒCÃ(Š Õ £EÄ µ C Ä
Summary Net Link States	></ ¹ ß Y • ,?U5%4°JÒCÃ(Š Õ £EÄ µ C Ä
NSSA-external Link States	></ ¹ ß Y • 1 ×2O,X7¾"• ³ êF¼JÒCÃ(Š Õ £EÄ µ C
AS External Link States	></ ¹ ß Y • 1 h2O,X7¾"• ³ êF¼JÒCÃ(Š Õ £EÄ µ C Ä
Link ID	JÒCÃ ÛAš Ä
ADV Router	Eî A¹JÒCÃ(Š Õ £EÄ,XCÃ+ A' Û ÛAš Ä
Age	/ A¹JÒCÃ(Š Õ £EÄ,X , ü ÊKÈ Ä
Seq#	/ A¹JÒCÃ(Š Õ £EÄ,X c Ë È*ü b "# 5Õ,X ê G¡ á,X LSA Ä
Cksum	/ A¹JÒCÃ(Š Õ £EÄ,X õP` ` Ä
Link-Count	/ CÃ+ A' ÛJÒCÃ(Š Õ £EÄ µ C ,XJÒCÃ,X D G£
Route	/ !8 LSA Ù ÿ,XCÃ+ µ C

Tag	/ A¹JÒCÃ(Š Õ £EÄ,X ÛA„ Ä

¹ ß show ip ospf database asbr-summary Q ¸,X / 4§ p Ö

Ruijie# show ip ospf database asbr-summary
OSPF Router with ID (1.1.1.35) (Process ID 1)
ASBR-Summary Link States (Area 0.0.0.1)
LS age: 47
Options: 0x2 (*|-|-|-|-|-|E|-)
LS Type: ASBR-summary-LSA
Link State ID: 3.3.3.3 (AS Boundary Router address)
Advertising Router: 1.1.1.1
LS Seq Number: 80000001
Checksum: 0xbe8c
Length: 28
Network Mask: /0
TOS: 0 Metric: 1

show ip ospf database asbr-summary Q ¸ / 4§ p Ø +!‰,X £EÄ V ß Ä

+!‰	£EÄ
OSPF Router with ID	/ ¹ ß µ C Í h,XCÃ+ A' Û ÛAš0ú â OSPF Í h,XE¯/ß Ë
AS Summary Link States	></ ¹ ß / ,X AS ,?UJÒCÃ £EÄ µ C Ä
LS age	/ A¹JÒCÃ(Š Õ £EÄ,X , ü ÊKÈ Ä
Options	EÝNM Ä
LS Type	/ A¹JÒCÃ(Š Õ £EÄ,X2O _ Ä
Link State ID	/ A¹JÒCÃ(Š Õ £EÄ,XJÒCÃ ÛAš Ä
Advertising Router	/ A¹JÒCÃ(Š Õ £EÄ,XEî CÃ+ A' Û Ä
LS Seq Number	/ A¹JÒCÃ(Š Õ £EÄ,X c Ë Ä
Checksum	/ A¹JÒCÃ(Š Õ £EÄ,X õP` ` Ä
Length	/ A¹JÒCÃ(Š Õ £EÄ,XKS z È¹ +8V) ! Ä

þ êF¼CÃ+ FÑ Ý32 þ!¨(M
D• á S*üA¹CÃ+ ÛA„ È
CÃ+ G¡ Ú ×OSPF CÃ+ Ê î

Q ¸,X / 4§ p Ö

1)

Designated

p Ø +!‰,X £EÄ V ß Ä

£EÄ

XCÃ+ A’ Û ÛAšÛA £á- @ Á)}ßÂ ðÂ’pÑÜ

¹ß show ip ospf database router Q ¸,X / 4§ p Ö

Ruijie# show ip ospf database router
OSPF Router with ID (1.1.1.1) (Process ID 1)
Router Link States (Area 0.0.0.0)
LS age: 322
Options: 0x2 (*|-|-|-|-|-|E|-)
Flags: 0x3 : ABR ASBR
LS Type: router-LSA
Link State ID: 1.1.1.1
Advertising Router: 1.1.1.1
LS Seq Number: 80000012
Checksum: 0x6d3a
Length: 48
Number of Links: 2

Link connected to: Stub Network
(Link ID) Network/subnet number: 100.0.1.1
(Link Data) Network Mask: 255.255.255.255
Number of TOS metrics: 0
TOS 0 Metric: 0

show ip ospf database router Q ¸ / 4§ p Ø +!‰,X £EÄ V ß Ä

+!‰	£EÄ
OSPF Router with ID	/ ¹ ß µ C Í h,XCÃ+ A' Û ÛAš0ú â OSPF Í h,XE¯/ß Ë Ä
Router Link States	></ ¹ ß CÃ+ A' ÛJÒCÃ(Š Õ £EÄ µ C Ä
ge kage ãRSK $ðÕ Q ¸	/ A¹JÒC(Ã(ŠÃÐEEÄ,X , ü ÊKÈ Ä
Options	EÝNM

(Link Data)	JÒCÃ D B Ä
Number of TOS metrics	TOS È ¾ Õ

1 hF¼ Ú CÃ+ #A,G!5B Q ¸ –5× 1 ¯0´ G!5BOSPF2 ŒQ ¸ !

Network Mask	/ A¹JÒCÃ(Š Õ £EÄ Í hCÃ+ ,X5%4° }-Õ Ä
Metric Type	></ êF¼JÒCÃ2O _ Ä
TOS	TOS

4.2.4 show ip ospf interface

?U / â OSPF G6(,X y · µ C ÈAË S*ü(M *ü õ ã Q ¸ show ip ospf interface Ä

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

Ï – DAÈ â Ð

– D	£EÄ
interface-type	Ä ÃEÝ Å Û n y ·,X y ·2O _ Ä
interface-number	Ä ÃEÝ Å Û n y ·,X y ·4ê Ë Ä

Ï5 ,Õ ™ ‰ Ð

´5 ,Õ> Ä

Ï Q ¸ õ ã Ð

(M *ü õ ã Ä

Ï S*ü Û + Ð

A¹ / Q ¸ È Ã ¹ / ¾ o y ·E¤> OSPF È ¹ žE- o y ·C³ OSPF ,Ì G,XA'5B µ C Ä

Ï _ Ð

¹ ß show ip ospf interface FastEthernet 1/0 Q ¸,X / 4§ p Ö

Ruijie# show ip ospf interface fa 1/0

FastEthernet 1/0 is up, line protocol is up
Internet Address 192.88.88.27/24, Ifindex 4, Area 0.0.0.0, MTU 1500
Matching network config: 192.88.88.0/24
Process ID 1, Router ID 1.1.1.1, Network Type BROADCAST, Cost: 1
Transmit Delay is 1 sec, State DR, Priority 1
Designated Router (ID) 1.1.1.1, Interface Address 192.88.88.27
Backup Designated Router (ID) 3.3.3.3, Interface Address 192.88.88.72
Timer intervals configured, Hello 10, Dead 40, Wait 40,
Retransmit 5
Hello due in 00:00:03
Neighbor Count is 1, Adjacent neighbor count is 1
Crypt Sequence Number is 70784
Hello received 1786 sent 1787, DD received 13 sent 8

LS-Req received 2 sent 2, LS-Upd received 29 sent 53
LS-Ack received 46 sent 23, Discarded 1

V pA¹ y ·,XF• *ü â BFD G6(ÈFw / Ê r t V ß µ C :

Ruijie# show ip ospf interface fa 1/0

FastEthernet 1/0 is up, line protocol is up

Internet Address 192.88.88.27/24, Ifindex 4, Area 0.0.0.0, MTU 1500

Matching network config: 192.88.88.0/24

Process ID 1, Router ID 1.1.1.1, Network Type BROADCAST, Cost: 1

Transmit Delay is 1 sec, State DR, Priority 1, BFD enabled

Designated Router (ID) 1.1.1.1, Interface Address 192.88.88.27

Backup Designated Router (ID) 3.3.3.3, Interface Address 192.88.88.72

Timer intervals configured, Hello 10, Dead 40, Wait 40, Retransmit 5

Hello due in 00:00:03

Neighbor Count is 1, Adjacent neighbor count is 1

Crypt Sequence Number is 70784

Hello received 1786 sent 1787, DD received 13 sent 8

LS-Req received 2 sent 2, LS-Upd received 29 sent 53

LS-Ack received 46 sent 23, Discarded 1

show ip ospf interface serial 1/0 Q ¸ / 4§ p Ø +!‰,X £EÄ V ß Ä

+!‰	£EÄ
FastEthernet 0/0 State	A¹5%4° y ·,X(Š Õ È UP AÈ â!7 ¹ 0 È Down AÈ â Ý Lp Ä
Internet Address	y · IP Ä
Area	y · 2 OSPF ³ Ä
MTU	Í h,X MTU
Matching network config	Í h OSPF E¯/ß,X network area G!5B
Process ID	Í h,XE¯/ß Ë
Router ID	OSPF CÃ+ A’ Û ÛAš Ä
Network Type	OSPF 5%4°2O _ Ä
Cost	OSPF y ·8…C Ä

Transmit Delay is	OSPF y · ôEg Ê Ê Ä
State	DR/BDR (Š Õ ÛAš Ä
Priority	A¹ y ·,X ì 4{
Designated Router(ID)	A¹ y ·,X DR ,XCÃ+ A’ Û ÛAš
DR's Interface address	A¹ y ·,X DR ,X y ·
Backup designated router(ID)	A¹ y ·,X BDR ,XCÃ+ A’ Û ÛAš
BDR's Interface address	A¹ y ·,X BDR ,X y ·
Time intervals configured	y · Í h , X Hello È Dead È Wait È Retransmit ÊKÈ
Hello due in	Þ õ HELLO ¥EÕ,X ÊKÈ
Neighbor count	F• D
Adjacent neighbor count	Full ,XF• DG£
Crypt Sequence Number	y · Í h,X md5 AxA•,X c Ë
Hello received send	â ¥ Î,X HELLO y [4³Au Ä
DD received send	â ¥ Î,X DD y [4³Au Ä
LS-Req received send	â ¥ Î,X LS AË" y [4³Au Ä
LS-Upd received send	â ¥ Î,X LS È „ y [4³Au Ä
LS-Ack received send	â ¥ Î,X LS ¡ h y [4³Au Ä
Discard	>• ö ×,X OSPF y [4³Au Ä
BFD enabled	></ *ü OSPF â BFD 6(|

Ï G ÄAÈ â Ð

Ï(AÈ â Ð

4.2.5 show ip ospf neighbor

?U / OSPF ,XF• >< ÈAË S*ü(M *ü õ ã Q ¸ show ip ospf neighbor Ä

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

Ï – DAÈ â Ð

– D	£EÄ
detail	Ä ÃEÝ Å / F• Aº4š,X µ C Ä
interface-type interface-number	Ä ÃEÝ Å / Û n y ·,XF• µ C Ä
neighbor-id	Ä ÃEÝ Å / Û nF• µ C Ä

Ï5 ,Õ ™ ‰ Ð

´5 ,Õ> Ä

Ï Q ¸ õ ã Ð

(M *ü õ ã Ä

Ï S*ü Û + Ð

A¹ Q ¸ Ã ¹ / F• ,X µ C È4£ *üA¹ Q ¸ 9.BAx OSPF ú Æ4£!7 E¤> Ä

Ï _ Ð

¹ ß show ip ospf neighbor Q ¸,X / 4§ p Ö

Thread Inactivity Timer	F• ´ n Ê <(Š Õ
Thread Database Description Retransmission	!8 y · DD y [n Ê <(Š Õ
Thread Link State Request Retransmission	!8 y · LS AË" y [n Ê <(Š Õ
Thread Link State Update Retransmission	!8 y · LS È „ y [n Ê <(Š Õ
Thread Poll Timer	M- ÕG!5B,XF• ÈPoll Timer |(Š Õ
Graceful-restart helper	L S Ï G á • Ä @ • ¼ Ò Â a ÿ ‰ ” À a ò C @

Inactive 0
Ruijie#

+!‰	£EÄ
Summary Address	" 6.,X
Summary Mask	" 6.,X8× È Ä
Advertise	ú @ A¹" 6.,XCÃ+
Status	A¹" 6.8× È ú*ó
Aggregated subnets	Ý î å êF¼CÃ+ >•" 6. üA¹8× ÈG M6

Ï G ÄAÈ â Ð

Ï(AÈ â Ð

4.2.8 show ip ospf virtual-link

?U / OSPF <. ³JÒCÃ,X µ C ÈAË S*ü(M *ü õ ã Q ¸ show ip ospf virtual-link Ä

show ip ospf [process-id] virtual-link

Ï – DAÈ â Ð

– D	£EÄ
A¹ Q ¸"u Ý – D	

Ï5 ,Õ ™ ‰ Ð

´5 ,Õ> Ä

Ï Q ¸ õ ã Ð

(M *ü õ ã Ä

Ï S*ü Û + Ð

V p ÝG!5B<. ³JÒCÃ È¾6ÑEîE›A¹ Q ¸ / F• ,X(Š Õ È¹ ž J W,Ì G µ C Äshow ip ospf neighbor Q ¸ á î / <. ³JÒCÃ,XF• Ä

Ï _ Ð

¹ ß show ip ospf virtual-links Q ¸,X / 4§ p Ö

Ruijie# show ip ospf virtual-links
Virtual Link VLINK0 to router 1.1.1.1<0A9 upTransit area0.000001vira iner face FastEthern

1 hF¼ Ú CÃ+ #A,G!5B Q ¸ –5×

1 ¯0´ G!5BOSPF2 Q ¸

1 h0´ G!5BBGP Q ¸

5.1 G!5B,Ì G Q ¸

2_0 /C2_0 1 T

Ï,Ì G Q ¸ Ð

Q ¸	£EÄ
exit-address-family	EÔ Î õ ã

Ï G ÄAÈ â Ð

5.1.2 address-family ipv4 vrf

S*üA¹ Q ¸E¯ 9 address-faimly IPv4 VRF G!5BBGP ,XG!5B õ ã È' Ô ¤ þ vrf CÃ+ µ C x f s6Ñ ÄS*üA¹ Q ¸,X no • ã ÈGKÁ â ¤ þ vrf ,XCÃ + µ C x f s6Ñ Ä S*ü exit-address-family Q ¸EÔ Î BGP ,X G!5B õ ã Ä

address-family ipv4 vrf vrf-name

no address-family ipv4 vrf vrf-name

Ï – DAÈ â Ð

– D	£EÄ
vrf-name	vrf ,X á +

Ï5 ,ÕA'5B Ð

"u Ý n vrf £

Ï Q ¸ õ ã Ð

BGP G!5B õ ã Ä

Ï S*ü Û + Ð

ý*üA¹ Q ¸ Ô ŸG!5B Ä ê5ÙEÔ Î Å PE ` CE KÈ,XCÃ+ µ C x 6 Ä

LÔ?UEÔ ² BGP G!5B õ ã È Ã ¹ S*ü Q ¸ exit-address-family Ä

Ï _ Ð

Ruijie(config)# router bgp 65000
Ruijie(config-router)# address-family ipv4 vrf vpn1

Ï,Ì G Q ¸ Ð

Q ¸	£EÄ
exit-address-family	EÔ Î õ ã

Ï G ÄAÈ â Ð

5.1.3 address-family vpnv4

S*üA¹ Q ¸ AŒPE KÈE¯> VPN CÃ+ µ C,X x f È JE¯ 9 address-family VPN ,X £ õ ã Ä S*ü exit-address-family Q ¸EÔ Î address-family VPN G!5B õ ã Ä

address-family vpnv4 [unicast]

no address-family vpnv4 [unicast]

Ï – DAÈ â Ð

– D	£EÄ
unicast	ÃEÝNM ÈAº4š,XPv4) • !4Ô

Ï5 ,ÕA'5B Ð

5 ,Õ ™ ‰"u Ý n vpn £

Ï Q ¸ õ ã Ð

BGP G!5B õ ã Ä

Ï S*ü Û + Ð

S*üA¹ Q ¸E¯ 9 vpn ,X £G!5B õ ã ß È AŒG!5BPE Í1 ' 9 x f vpn ,X µ C

LÔ?UEÔ ² BGP G!5B õ ã È Ã ¹ S*ü Q ¸ exit-address-family Ä

Ï _ Ð

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

Ï,Ì G Q ¸ Ð

Q ¸	£EÄ
exit-address-family	EÔ Î õ ã

Ï G ÄAÈ â Ð

5.1.4 aggregate-address ÄIPv4 Å

S*üA¹ Q ¸A'5B BGP ,X IPv4 6. ÜCÃ+ ><NM ØS*üA¹ Q ¸,X no EÝNM Ú G KÁA¹ s6Ñ Ä

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

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

A¹ Q ¸"u Ý – D

á ÎA, S*ü!8 Q ¸

Ï _ Ð

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

Ï,Ì G Q ¸ Ð

Q ¸	£EÄ
show ip bgp	/ BGP CÃ+ ><NM
bgp bestpath med confed	EÝ Ô ìCÃ X Ê È AŒ!¨EW 97¾AS 6(,³ YF¼ Í1 ',XCÃ X,X MED
bgp bestpath med missing-as-worst	EÝ Ô ìCÃ X Ê È AŒ Ú þA'5B MED 2 û,XCÃ X,X ì 4{A'5B Ô " Ä
bgp deterministic-med	EÝ Ô ìCÃ X Ê È AŒ 97¾,Ì à AS ,X Í1 ',XCÃ X !¨EW

Ï G ÄAÈ â Ð

5.1.7 bgp bestpath as-path ignore

EÝ Ô ìCÃ X Ê È S*üA¹ Q ¸ Ú á5×<% AS CÃ X,XKS z Ä S*üA¹ Q ¸,X no EÝNM ÚA¹ Ú GKÁA¹ s6Ñ Ä

bgp bestpath as-path ignore

no bgp bestpath as-path ignore

Ï – DAÈ â Ð

A¹ Q ¸"u Ý – D Ä

Ï5 ,ÕA'5B Ð

5 ,Õ ™ ‰ ß È üEÝ ½ Ô ìCÃ X Ê5×<% ŒS CÃ XKS z Ä

Ï Q ¸ õ ã Ð

BGP G!5B õ ã

Ï S*ü Û + Ð

Ý'; Û š (RFC1771) r)„ È BGP E¯> Ô ìCÃ XEÝ Ê J á5×<% AS CÃ X KS z Ä Ô8 ™ ‰ ß È AS CÃ XKS zC^-Á ÈCÃ X ì 4{ hA¹C^P¬ È ¹ å À üE¯> Ô ìCÃ XEÝ Ê5×<% Z AS CÃ X,XKS z Ä¸ Ã ¹ ü B rL ™ ‰ .B n üEÝ Ô ìCÃ X Ê ú5×<% AS CÃ XKS z Ä

Ï _ Ð

Ruijie(config)# router bgp 65000

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

Ï,Ì G Q ¸ Ð

Q ¸	£EÄ
show ip bgp	/ BGP CÃ+ ><NM

Ï G ÄAÈ â Ð

5.1.8 bgp bestpath compare-confed-aspath

EÝ Ô ìCÃ X Ê ÈA¹ Q ¸ AŒ à ,X êF¼CÃ+ !¨EW6(,³,X ASPATH CÃ X KS z È6(,³ Y ASPATH KS zC^ ã ÈCÃ X ì 4{C^P¬ Ä S*üA¹ Q ¸,X no EÝNM Ú GKÁA¹ s6Ñ Ä

bgp bestpath compare-confed-aspath

no bgp bestpath compare-confed-aspath

Ï – DAÈ â Ð

A¹ Q ¸"u Ý – D Ä

Ï5 ,ÕA'5B Ð

5 ,Õ ™ ‰ ß È üEÝ ½ Ô ìCÃ X Ê È á!¨EW 97¾ à Ô þ6(,³ YF¼ebgp peer CÃ+ ,XASPATH È5à B J ª 5 Ê 9E¯> CÃ+ ìEÝ,X Ä

Ï Q ¸ õ ã Ð

BGP G!5B õ ã Ä

Ï S*ü Û + Ð

5 ,Õ ™ ‰ ß è ìEÝ 97¾6(,³ YF¼ EBGP ,X peer E› 9,X,Ì àCÃ+ µ C Ê È Í b6(,³,X ASPATH áE¯> !¨EW ÈíE›A¹ Q ¸ 9G!5BE¯> 6(,³,X ASPATH !¨EW Ä

ü S*üA¹ Q ¸ Ê ÈAË"¼ ã V p Ô 5CÃ+ "u Ý ÿ Ý6(,³,X ASPATH È á 6Ñ ó ÍE- 5CÃ+ E¯> 6(,³,X ASPATH ,X!¨EW,X Ä

Ï _ Ð

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

Ï,Ì G Q ¸ Ð

Q ¸	£EÄ
show ip bgp	/ BGP CÃ+ ><NM

bgp router-id	A’5B BGP ,X Router ID

Ï G ÄAÈ â Ð

5.1.9 bgp bestpath compare-routerid

EÝ Ô ÷E4 b Œ 89.86re 9 12 0 0r53.18 767w 10.137 0.006 Td <419234 rej /TT0 1>

5.1.10 bgp bestpath med confed

EÝ Ô ìCÃ X Ê ÈA¹ Q ¸ AŒ!¨EW 97¾AS 6(,³ YF¼ Í1 ',XCÃ X,X MED Ä S*üA¹ Q ¸,X no EÝNM Ú GKÁA¹ s6Ñ Ä

bgp bestpath med confed [missing-as-worst]

no bgp bestpath med confed [missing-as-worst]

Ï – DAÈ â Ð

– D	£EÄ
missing-as-worst	Ú þA'5B MED 2 û,XCÃ X,X ì 4{A'5B Ô "

Ï5 ,ÕA'5B Ð

5 ,Õ ™ ‰ ß ÈEÝ Ô ìCÃ X Ê á!¨EW AS 6(,³ YF¼ Í1 ',XCÃ X,X MED Ä

Ï Q ¸ õ ã Ð

BGP G!5B õ ã Ä

Ï S*ü Û + Ð

ü6(,³,X ä , AS KÈ ôEæCÃ X,XMED 2 û,X È ü!¨EWCÃ XE›/ß | Ã ¹A'5B !¨EWA¹ Ä

Ï _ Ð

Ruijie(config)# router bgp 65000
Ruijie(config-router)# bgp bestpath med confed

Ï,Ì G Q ¸ Ð

Q ¸	£EÄ
show ip bgp	/ BGP CÃ+ ><NM
bgp bestpath always-compare-med	EÝ Ô ìCÃ X Ê È AŒ!¨EW 97¾ á à AS ,X Í1 ',XCÃ X,X MED
bgp bestpath med missing-as-worst	EÝ Ô ìCÃ X Ê È AŒ Ú þA'5B MED 2 û ,XCÃ X,X ì 4{A'5B Ô " Ä
bgp deterministic-med	EÝ Ô ìCÃ X Ê È AŒ 97¾,Ì à AS ,X Í1 ',XCÃ X !¨EW

Ï G ÄAÈ â Ð

5.1.11 bgp bestpath med missing-as-worst

EÝ Ô ìCÃ X Ê ÈA¹ Q ¸ Ú"u ÝA'5B MED 2 û,XCÃ X,X ì 4{A'5B Ô " Ä S*üA¹ Q ¸,X no EÝNM Ú GKÁA¹ s6Ñ Ä

bgp bestpath med missing-as-worst

no bgp bestpath med missing-as-worst

Ï – DAÈ â Ð

A¹ Q ¸"u Ý – D Ä

Ï5 ,ÕA'5B Ð

5 ,Õ ™ ‰ ß È V p y "u ÝA'5B MED 2 û,XCÃ X ÈA¹CÃ X,X MED >•Ax 0 Ä B MED C^ ã ÈCÃ X ì 4{C^P¬,X s í ÈE-/¡CÃ+ ,X ì 4{ ÔP¬ Ä

Ï Q ¸ õ ã Ð

BGP G!5B õ ã Ä

Ï S*ü Û + Ð

5 ,Õ ™ ‰ ß È V p y þA'5B MED 2 û,XCÃ X ÈA¹CÃ X,X MED >• Ax 0 È B MED C^ ã ÈCÃ X ì 4{C^P¬ È ¹A¹CÃ X,X MED E' Z ÔP¬,X ì 4{ ÄV p | à ï"u ÝA'5B MED 2 û,XCÃ X,X ì 4{ Ô " È S*üA¹ Q ¸ 9 r)„ Ä

Ï _ Ð

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

Ï,Ì G Q ¸ Ð

Q ¸	£EÄ
show ip bgp	/ BGP CÃ+ ><NM

5.1.12 bgp client-to-client reflection

A¹ Q ¸ ' ÔA' Û,X v 0Ã KÈCÃ+ ¡ Ø s6Ñ Ä S*üA¹ Q ¸,X no EÝNM Ú G KÁ v 0Ã KÈCÃ+ ¡ Ø s6Ñ Ä

bgp client-to-client reflection

no bgp client-to-client reflection

Ï – DAÈ â Ð

A¹ Q ¸"u Ý – D Ä

Ï5 ,ÕA'5B Ð

A' Û,XA¹NM s6Ñ ' Ô È "u ÝCÃ+ ¡ Ø,X v 0Ã Ä

Ï Q ¸ õ ã Ð

BGP G!5B õ ã Ä

Ï S*ü Û + Ð

Eî ™ ‰ ß È5x Y,XCÃ+ ¡ Ø <,X v 0Ã KÈ J áLÔ?U Î0ŸE² y G2Ï ÈCÃ + ¡ Ø < Ú ¡ Ø v 0Ã KÈ,XCÃ+ Ä ÈV p Ý v 0Ã KÈFÑ Æ4£ Î 0Ÿ Z <E² y G2Ï È Ã ¹ ª#\CÃ+ ¡ Ø < ¡ Ø v 0ÃCÃ+ ,X s6Ñ Ä

?U ª#\ ¡ Ø v 0ÃCÃ+ ,X s6Ñ È S*ü Q ¸no bgp client-to-client reflection Ä

Ï _ Ð

Ruijie(config)# router bgp 65000
Ruijie(config-router)# no bgp client-to-client reflection

Ï,Ì G Q ¸ Ð

Q ¸	£EÄ
bgp cluster-id	G!5BCÃ+ ¡ Ø <,X5x ÛAš0ú
neighbor route-reflector-client	G!5BCÃ+ ¡ Ø <,X v J Ú7¾D• G!5B CÃ+ ¡ Ø <

Ï G ÄAÈ â Ð

5.1.13 bgp cluster-id

A¹ Q ¸G!5BCÃ+ ¡ Ø <,X5x ÛAš0ú Ä S*üA¹ Q ¸,X no EÝNM Ú J 6 á5 ,Õ A'5B Ä

as-number	AS 6(,³,X ÛAš0ú Ä 8× È Ö1..65535

Ï5 ,ÕA'5B Đ

"u Ý6(,³ ÛAš0ú Ä

Ï Q ¸ õ ã Đ

BGP G!5B õ ã Ä

Ï S*ü Û + Đ

6(,³ º Ô/¡ £ å7¾"•2Ï4³ Y IBGP Í1 'E² y DG£,X •"© Ä

Ú Ô þ7¾"•2Ï4³ æ Ú î þ $7¾"•2Ï4³ È JEîE›A'5B Ô þ4³ Ô,X6(,³ ID(G6(,³ AS Ë) ÚE- o $7¾"•2Ï4³4˜ ä Ô þ6(,³ Ä Í6(,³ êF¼ 9AÈ È H þ6(,³ ¡' Ax Ô þ AS È è ¾ Ý6(,³,X AS Ë Í ê Ã?• Ä ü6(,³ YF¼ È $7¾"•2Ï4³ YF¼,X BGP speakers KÈ ¡' Î0Ÿ ` < IBGP Í1 'E² y È $7¾"•2Ï4³KÈ,X BGP speaker KÈ Î0Ÿ EBGP E² y Ä<Q' ü $7¾"•2Ï4³ ,X BGP speakers KÈ Î0Ÿ,X EBGP E² y È x 6 µ C Ê È Í b ß Ô CÇ ÃMED ¹ ž ì 4{1 µ C ¡' ± Õ á ¬ Ä

Ï _ Đ

Ruijie(config-router)# bgp confederation identifier 65000

Ï,Ì G Q ¸ Đ

Q ¸	

Ï5 ,ÕA'5B Đ

"u Ý6(,³ ä , Ä

Ï Q ¸ õ ã Đ

BGP G!5B õ ã Ä

Ï S*ü Û + Đ

6(,³ Ô/¡ £ å7¾"•2Ï4³ Y IBGP Í1 'E² y DG£,X •"© Ä

Ú Ô þ7¾"•2Ï4³ æ Ú î þ $7¾"•2Ï4³ È JEîE›A'5B Ô þ4³ Ô,X6(,³ ID(G6(,³ AS Ë) ÚE- o $7¾"•2Ï4³4˜ ä Ô þ6(,³ Ä Í6(,³ êF¼ 9AÈ È H þ6(,³ ¡' Ax Ô þ AS È è ¾ Ý6(,³,X AS Ë Í ê Ã?• Äü6(,³ YF¼ È $7¾"•2Ï4³ YF¼,X BGP speakers KÈ ¡' Î0Ÿ ` < IBGP Í1 'E² y È $7¾"•2Ï4³KÈ,X BGP speaker KÈ Î0Ÿ EBGP E² y Ä<Q' ü $7¾"•2Ï4³ ,X BGP speakers KÈ Î0Ÿ,X EBGP E² y È x 6 µ C Ê È Í b ß Ô CÇ ÃMED ¹ ž ì 4{1 µ C ¡' ± Õ á ¬ Ä

EîE› Q ¸ Û n6(,³,X ä , AS Ä

---

a _ É !

Q ¸ Ô õ Ô î Ã ¹G!5B 15 þ6(,³ ä , È V p Ý î b 15 þ,X6(,³ ä , È AË Ú î õEg 9 Ä

Ï _ Đ

Ruijie(config-router)# bgp confederation peers 65000 65100

Ï,Ì G Q ¸ Đ

Q ¸	£EÄ
bgp confederation identifier	G!5B6(,³,X ÛAš0ú

Ï G ÄAÈ â Đ

5.1.16 bgp default ipv4-unicast

A¹ Q ¸*ü 9A'5B address family T¬Ax IPv4 ,X) • Ä S*üA¹ Q ¸,X no 6 ã 9 ôL8G!5B,XT¬Ax £ Ä

bgp default ipv4-unicast

no bgp default ipv4-unicast

Ï – DAÈ â Đ

A¹ Q ¸"u Ý – D Ä

Ï5 ,ÕA'5B Đ

T¬Ax ipv4-unicast £ Ä

Ï Q ¸ õ ã Đ

BGP G!5B õ ã Ä

Ï S*ü Û + Đ

!8 Q ¸*ü 9A'5B BGP T¬Ax S*ü,Xaddress family ipv4) • Ä

Ï _ Đ

Ruijie(config-router)# bgp default ipv4-unicast

Ï,Ì G Q ¸ Đ

Q ¸	£EÄ
address-family ipv4	E¯ 9 IPv4 ,X õ ã

Ï G ÄAÈ â Đ

5.1.17 bgp default local-preference

£' °`YeA™b ' pl `Ôä• 5 Ý (ÑC… ª 6 áóN Đ q P <òÌÁv Nþìâ!Â \ ‰! 3ù! Ã q P ®

BGP speaker Ú y ,X êF¼CÃ+ ¥EÕ4- IBGP peers Ê#Ï t ì 4{ 2 û Ä

Ï _ Đ

Ruijie(config-router)# bgp default local-preference 200

Ï,Ì G Q ¸ Đ

Q ¸	£EÄ
show ip bgp	/ BGP CÃ+ ><NM
bgp bestpath always-compare-med	EÝ Ô ìCÃ X Ê È AŒ!¨EW 97¾ á à AS ,X Í1 ',XCÃ X,X MED
bgp bestpath med confed	EÝ Ô ìCÃ X Ê È AŒ!¨EW 97¾AS 6(,³ YF¼ Í1 ',XCÃ X,X MED
bgp bestpath med missing-as-worst	EÝ Ô ìCÃ X Ê È AŒ Ú þA'5B MED 2 û,XCÃ X,X ì 4{A'5B Ô "

Ï G ÄAÈ â Đ

5.1.18 bgp deterministic-med

A¹ Q ¸A'5B 97¾,Ì à AS ,X Í1 ',XCÃ X ì !¨EW MED È5 ,Õ ™ ‰ ß Ú Ý';CÃ X y NN c!¨EW È Ô „ y ,XCÃ X !¨EW Ä S*ü no Q ¸ 9 Ú J GKÁ Ä

bgp deterministic med

no bgp deterministic med

Ï – DAÈ â Đ

A¹ Q ¸"u Ý – D Ä

Ï5 ,ÕA'5B Đ

5 ,ÕA'5BA¹ s6Ñ GKÁ

Ï Q ¸ õ ã Đ

BGP G!5B õ ã

Ï S*ü Û + Đ

5 ,Õ ™ ‰ ß ÈÝ Ô ìCÃ X Ê È Ú B y ,XCÃ X,XNN cE¯> !¨EW È V p | à ï 97¾,Ì à AS ,X Í1 ',XCÃ X !¨EW È S*üA¹ Q ¸ r)„ Ä

Ï _ Đ

Ruijie(config-router)# bgp deterministic med

Ï,Ì G Q ¸ Đ

1 hF¼ Ú CÃ+ #A,G!5B Q ¸ –5×

1 h0´ G!5BBGP

5.1.20 bgp fast-external-fallover

A¹ Q ¸A'5B ',ÈE²,X EBGP peer Î0ŸE² y S*ü,X5%4° y · Ê È S *üA¹ Q ¸E™Eó GKÁBGP îA±E² y Ä S*üA¹ Q ¸,X no EÝNM GKÁA¹ s6Ñ Ä

bgp fast-external-fallover

no bgp fast-external-fallover

Ï – DAÈ â Ð

A¹ Q ¸"u Ý – D

Ï5 ,ÕA'5B Ð

A¹ s6Ñ ' Ô Ä

Ï Q ¸ õ ã Ð

BGP G!5B õ ã Ä

Ï S*ü Û + Ð

A¹ Q ¸ ¾ Í,ÈE²,X EBGP F• Ý Ä

Ï _ Ð

Ruijie(config-router)# bgp faster-external-fallover

Ï,Ì G Q ¸ Ð

5 ,ÕG!5B	T¬Ax 120 /¦
Q ¸ õ ã	BGP G!5B õ ã
	G¡ ÊKÈ +

S*ü Û Ð

	time	ü 6 á âF• GR A’ Û,XE² y â È ¡' ± Õ stale CÃ+ Ý û,X ÔKS ÊKÈ Ä G!5B8× È 1 3600 /¦

5 ,ÕG!5B T¬Ax 360 /¦

Q ¸ õ ã BGP G!5B õ ã

S*ü Û Ð A¹ Q ¸ J\ Í GR Helper ,X – DG!5B Ästalepath-time GR Helper ü 6 á â GR Restarter Î0ŸE² y â È1 Y y Restarter ,X EOR Û «,X ÔKS ÊKÈ ÄüGR Helper ”# â GR Restarter ,XE² y • Ô Ê î Ú Restarter ,X s ŸCÃ+ ÛA„ Stale È ¡' S *üE- oCÃ+ E¯> CÃ+ Au1k âE@ ¥ØR Helper B y GR Restarter ,XCÃ+ È „ µ C È „CÃ+ J ª#\CÃ+ ,X Stale ÛA„ È8¹ ü stalepath-time ÊKÈ!‰ Y ÈE- o Stale ,X CÃ+ "u Ý>• È „ È í Ú î>• ôL8 ÄA¹ *ü 9L !6 GR Helper KS ÊKÈ"u Ý GR Restarter ,X EOR Û «5à SCÃ+ ´"© / Ä

Ï Q ¸ õ ã Ð

BGP G!5B õ ã

Ï S*ü Û + Ð

3 Ã ¹ S*ü debug Q ¸ 9A„) BGP ,X(Š Õ ¬ ê µ C Ä S*ü BGP ,X debug Q ¸ î#\5ë ûG£,XC $d ÈEg ÎEW î µ C È E ¡*ü ,X S*ü Ä

A¹ s6ÑT¬Ax Ô È ' BGP Í1 '+ M2 Established (Š ÕE¯ 9 Established (Š Õ ê5Ù,Ì ¡ ¢ Established

1 hF¼ Ú

soft	EC á ! È ` Û n Í1 ' ¥,XCÃ+ µ CFÑ ;> EC á ! Ä
soft in	EC á ! È Í y ,XCÃ+ µ C ;> EC á ! Ä
soft out	EC á ! È Í Ú ¥,XCÃ+ µ C ;> EC á ! Ä

Ï5 ,ÕA'5B Ð

"u Ý5 ,ÕA'5B

Ï Q ¸ õ ã Ð

(M õ ã Ä

Ï S*ü Û + Ð

---

a _ É !

S*üA¹ Q ¸?U" ÝE² y,X BGP router FÑ ÕCÃ+ „ s6Ñ Ä { • ÕCÃ+ „ s6Ñ Ä

´AŽ " Ê í È ¾?UCÃ+ 1*+9 ê5Ù BGP ,XG!5B ¥*ó ¬ È ™NO ¤ o Ý ,X •"© S k „,XCÃ+ 1*+9 êG!5B6Ñ ó r ' Ä ô4³,X •"© GKÁ aG¡ „ Î 0ŸBGP E² y ¹E' ,Â,X Ä

{ • ÕEîE›G!5B BGP ,XEC á ! È ü á GKÁ BGP îA±E² y,X ™ ‰ ß È Ý ,X r ' „,XCÃ+ 1*+9 Ä

Í b á ÕCÃ+ „ s6Ñ,Xpeer È | Ã ¹ S*ü Q ¸ neighbor soft-reconfiguration inbound Û n,X!£ þ BGP Í1 ' ü BGP speaker Þ ± , Ô Ñ s Ÿ,XCÃ+ µ C ÄE- î#\5ëF¼ ÚC $d Ä

| Ã ¹EîE› show ip bgp neighbors Q ¸ 9 ø • BGP,X Í1 ' ú ÕCÃ+ „ û6Ñ È V p6Ñ ó Õ È üEg 9CÃ+ 1*+9 ¥*ó ¬ ê Ê ´LÔ ;> neighbor soft-reconfiguration inbound Q ¸ Ä

Ï _ Ð

Ruijie# clear bgp ipv4 unicast *

Ï,Ì G Q ¸ Ð

Q ¸	£EÄ
neighbor soft-reconfiguration inbound	G¡ BGP session È J ±+- BGP Í1 ' (4˜) ¥ 9,X þ4£ È ,XCÃ+ µ C
show ip bgp	/ BGP CÃ+ ><NM

Ï G ÄAÈ â Ð

5.1.27 clear bgp ipv4 unicast dampening

S*üA¹ Q ¸#ÙL8 95 µ C ` S>• e ,XCÃ+ ?·L8 e Ä

clear bgp ipv4 unicast dampening [address [mask]]

Ï – DAÈ â Ð

– D	£EÄ
address	IP Ä
mask	}-Õ Ä

Ï5 ,ÕA'5B Ð

"u Ý5 ,ÕA'5B

Ï Q ¸ õ ã Ð

(M õ ã

Ï S*ü Û + Ð

Q ¸*ü 9#ÙL8 BGP ,XCÃ+ 95 µ C È S>• e ,XCÃ+ ?·L8 e ÄEîE› !8 Q ¸ Ã ¹G¡ „ | BGP ,XCÃ+ 95 Ä

Ï _ Ð

Ruijie# clear bgp ipv4 unicast dampening 192.168.0.0 255.255.0.0

Ï,Ì G Q ¸ Ð

Q ¸	£EÄ
show ip bgp dampening dampened-paths	/ >• e!6,XCÃ+ µ C
bgp dampening	' ÔCÃ+ >D £ s6Ñ JA'5B>D £ – D

Ï G ÄAÈ â Ð

5.1.28 clear bgp ipv4 unicast external

S*üA¹ Q ¸ S Ý,X EBGP E² y á !

clear bgp ipv4 unicast external [[soft] [in | out]]

Ï – DAÈ â Ð

– D	£EÄ

in	á t – D soft È á ! Í1 ' Î0Ÿ |E² y,X îA± Ä
out	á t – D soft Èá ! BGP speaker Î0Ÿ |E² y,X îA± Ä

soft EC á ! È ` Û n Í1 ' ¥,XCÃ+ µ CFÑ ;> EC á ! Ä á á),t9`–$ï dtTP(nò),t9`–$ï" dtT'9 r

Ï Q ¸ õ ã Ð

(M õ ã Ä

Ï S*ü Û + Ð

S*üA¹ Q ¸ ¾6Ñ#ÙL8"u Ý>• e!6,XCÃ+ ,X4³Au µ C È3 á î?·L8>• e!6CÃ + ÄV p | à ï#ÙL8 ÝCÃ+ µ C,X4³Au µ C J?·L8>• e!6,XCÃ+ ÈÃ ¹
S*ü clear ip bgp dampening Q ¸

Ï _ Ð

Ruijie# clear bgp ipv4 unicast flap-statistics

Ï,Ì G Q ¸ Ð

Q ¸	£EÄ
bgp dampening	' ÔCÃ+ >D £ s6Ñ JA'5B>D £ – D
show ip bgp	/ BGP CÃ+ ><NM

Ï G ÄAÈ â Ð

5.1.30 clear bgp ipv4 unicast peer-group

S*üA¹ Q ¸ á ! ` Í1 '4˜ ,X Ý ä ,,X îA± Ä

clear bgp ipv4 unicast peer-group peer-group-name [[soft] [in | out]]

Ï – DAÈ â Ð

– D	£EÄ
peer-group-name	Í1 '4˜,X á +

Ï S*ü Û + Ð

a _ É !

S*üA¹ Q ¸?U" ÝE² y,X BGP router FÑ ÕCÃ+ „ s6Ñ Ä { • ÕCÃ+ „ s6Ñ Ä

´AŽ ” Ê í È ¾?UCÃ+ 1*+9 ê5Ù BGP ,XG!5B ¥*ó ¬ È ™NO ¤ o Ý ,X •"© S k „,XCÃ+ 1*+9 êG!5B6Ñ ó r ‘ Ä ô4³,X •"© GKÁ aG¡ „ Î 0ŸBGP E² y ¹E’ ,Â,X Ä

{ • ÕEîE›G!5B BGP ,XEC á ! È ü á GKÁ BGP îA±E² y,X ™ ‰ ß È Ý ,X r ‘ „,XCÃ+ 1*+9 Ä

Í b á Õ C Ã + „ s 6 Ñ , Xpeer È | Ã ¹ S * ü Q ¸ neighbor soft-reconfiguration inbound Û n,X!£ þ BGP Í1 ' ü BGP speaker Þ ± , Ô Ñ s Ÿ,XCÃ+ µ C ÄE- î#\5ëF¼ ÚC $d Ä

| Ã ¹EîE› show ip bgp neighbors Q ¸ 9 ø • BGP ,X Í1 ' ú Õ CÃ+ „ û6Ñ È V p6Ñ ó Õ È üEg 9CÃ+ 1*+9 ¥*ó ¬ ê Ê ´LÔ ;> neighbor soft-reconfiguration inbound Q ¸ Ä

Ï _ Ð

Ruijie# clear ip bgp *

Ï,Ì G Q ¸ Ð

address	IP Ä
mask	}-Õ Ä

Ï5 ,ÕA'5B Đ

"u Ý5 ,ÕA'5B

Ï Q ¸ õ ã Đ

(M õ ã

Ï S*ü Û + Đ

Q ¸*ü 9#ÙL8 BGP ,XCÃ+ 95 µ C È S>• e ,XCÃ+ ?·L8 e ÄEîE› !8 Q ¸ Ã ¹G¡ „ | BGP ,XCÃ+ 95 Ä

Ï _ Đ

Ruijie# clear ip bgp dampening 192.168.0.0 255.255.0.0

Ï,Ì G Q ¸ Đ

Q ¸	£EÄ
show ip bgp dampening dampened-paths	/ >• e!6,XCÃ+ µ C
bgp dampening	' ÔCÃ+ >D £ s6Ñ JA'5B>D £ – D

Ï G ÄAÈ â Đ

5.1.33 clear ip bgp external

S*üA¹ Q ¸ S Ý,X EBGP E² y á !

clear ip bgp external [ipv4 unicast] [[soft] [in | out]]

Ï – DAÈ â Đ

– D	£EÄ
ipv4 unicast	ipv4 ,X) • îA±
in	á t – D soft È á ! Í1 ' Î0Ÿ |E² y,X îA± Ä
out	á t – D soft È á ! BGP speaker Î0Ÿ |E² y ,X îA± Ä
soft in	EC á ! È Í y ,XCÃ+ µ C ;> EC á ! Ä
soft out	EC á ! È Í Ú ¥,XCÃ+ µ C ;> EC á ! Ä

Ï5 ,ÕA'5B Đ

"u Ý5 ,ÕA’5B

Ï Q ¸ õ ã Ð

(M õ ã Ä

Ï S*ü Û + Ð

S*üA¹ Q ¸ 9 S Ý,X Û n,X êF¼ BGP E² y á ! Ä

ÏS XÐK‡ôKñ%¥deÁÚXa Dt?XT(•õ,[ƒCÀ«RÇœê)‰¼vbE¸y–±9ôœe.ÚØ®Åy¡¥«a ÿ.Qs)À]#"‡•Ý3@¼ØÐ•B., – Ô ôy XrB – a ñS

Ruijie# clear ip bgp flap-statistics

Ï,Ì G Q ¸ Ð

Q ¸	£EÄ
bgp dampening	' ÔCÃ+ >D £ s6Ñ JA'5B>D £ – D
show ip bgp	/ BGP CÃ+ ><NM

Ï G ÄAÈ â Ð

5.1.35 clear ip bgp peer-group

S*üA¹ Q ¸ á ! ` Í1 '4˜ ,X Ý ä ,,X îA± Ä

clear ip bgp peer-group peer-group-name [ipv4 unicast] [[soft] [in | out]]

Ï – DAÈ â Ð

– D	£EÄ
peer-group-name	Í1 '4˜,X á +
ipv4 unicast	ipv4 ,X) • îA±
in	á t – D soft Èá ! Í1 ' Î0Ÿ |E² y,X îA± Ä
out	á t – D soft Èá ! BGP speaker Î0Ÿ |E² y,X îA± Ä
soft	EC á ! È ` Û n Í1 ' ¥,XCÃ+ µ CFÑ ;> EC á ! Ä
soft in	EC á ! È Í y ,XCÃ+ µ C ;> EC á ! Ä
soft out	EC á ! È Í Ú ¥,XCÃ+ µ C ;> EC á ! Ä

Ï5 ,ÕA'5B Ð

"u Ý5 ,ÕA'5B

Ï Q ¸ õ ã Ð

(M õ ã Ä

Ï S*ü Û + Ð

A¹ Q ¸*ü 9 á ! ` Í1 '4˜ Ý ä ,,X BGP îA± Ä

Ï _ Ð

Ruijie# clear ip bgp peer-group my-group in

Ï,Ì G Q ¸ Ð

Q ¸	£EÄ
clear ip bgp	á ! BGP îA±
show ip bgp	/ BGP CÃ+ ><NM

Ï G ÄAÈ â Ð

5.1.36 clear ip bgp vrf

S*üA¹ Q ¸ á ! ü vrf ,X Ý ä ,,X îA± Ä

clear ip bgp vrf vrf-name [* | address] [[soft] [in | out]]

Ï – DAÈ â Ð

– D	£EÄ
vrf-name	vrf ,X á +
*	á ! vrf ß,X Ý BGP îA± Ä
address	á ! vrf ß â Û n peer ,X BGP îA± Ä
ipv4 unicast	ipv4 ,X) • îA±
in	á t – D soft È á ! Í1 ' Î0Ÿ |E² y,X îA± Ä
out	á t – D soft Èá ! BGP speaker Î0Ÿ |E² y,X îA± Ä
soft	EC á ! È ` Û n Í1 ' ¥,XCÃ+ µ CFÑ ;> EC á ! Ä
soft in	EC á ! È Í y ,XCÃ+ µ C ;> EC á ! Ä
soft out	EC á ! È Í Ú ¥,XCÃ+ µ C ;> EC á ! Ä

Ï5 ,ÕA'5B Ð

"u Ý5 ,ÕA'5B

Ï Q ¸ õ ã Ð

(M õ ã Ä

Ï S*ü Û + Ð

A¹ Q ¸*ü 9 á ! ü vrf Ý ä ,,X BGP îA± Ä

Ï _ Ð

Ruijie# clear ip bgp vrf my-vrf in

Ï,Ì G Q ¸ Ð

Q ¸	£EÄ
clear ip bgp	á ! BGP îA±
show ip bgp	/ BGP CÃ+ ><NM

Ï G ÄAÈ â Ð

5.1.37 default-informnation originate

S*üA¹ Q ¸ 9 SG¡ Ú ¥CÃ+ ,X Ê í È6Ñ óE¯> T¬AxCÃ+ ,XG¡ Ú"© ÄS*üA¹ Q ¸,X no • ã È 9/U!6G¡ Ú ¥T¬AxCÃ+ Ä

[no] default-informnation originate

Ï – DAÈ â Ð

A¹ Q ¸"u Ý – D Ä

Ï5 ,ÕA'5B Ð

A¹ Q ¸,X no • ã È áE¯> T¬AxCÃ+ ,XG¡ Ú ¥ Ä

Ï Q ¸ õ ã Ð

BGP G!5B õ ã Ä

Ï S*ü Û + Ð

A¹ Q ¸*ü 9 { G¡ Ú ¥,XT¬AxCÃ+ Ä ¾ Ý üG¡ Ú ¥,XCÃ+ , üT¬AxCÃ+ ,X Ê í È !6Ñ ó,ß A¹ Q ¸,X rL p Ä

A¹ Q ¸ ` network Q ¸ \,Ì Ä á à,X • Ödefault-informnation originate Q ¸ { G¡ Ú ¥,XT¬AxCÃ+ È5à network ,XT¬AxCÃ+ Q ¸ ¾?UIGP , üT¬AxCÃ+ Ã ¹,X Ä

Ï _ Ð

Ruijie(config-router)# default-informnation originate

Ï,Ì G Q ¸ Ð

Q ¸	£EÄ
network	G!5BLÔ?U @ ,XCÃ+ µ C
redistribute	G¡ Ú ¥ J W #A,,XCÃ+

Ï G ÄAÈ â Ð

5.1.38 default-metric

S*üA¹ Q ¸G!5B BGP G¡ Ú ¥CÃ+ Ê í,XT¬Ax metric Ä S*üA¹ Q ¸,X no • ã È 9 ôL8G!5B,X È 6 áT¬Ax,X ¡ 0 Ä

default-metric number

no default-metric

Ï – DAÈ â Ð

– D	£EÄ
number	T¬Ax,Xmetric Ä8× È Ö 1.. 4294967295

Ï5 ,ÕA'5B Ð

A¹ Q ¸,X no • ã È default-metric "u ÝE¯> A'5B Ä

Ï Q ¸ õ ã Ð

BGP G!5B õ ã È Ø þ £G!5B õ ã Ä

Ï S*ü Û + Ð

A¹ Q ¸*ü 9G!5BG¡ Ú ¥,X BGP õ +,XCÃ+ ,X metric Ä 6Ñ ó?· ‡G¡ Ú ¥ Þ 9,X metric á ` H,X ™ ‰ Ä

---

a _ É !

A¹ Q ¸G!5B,X metric È á6Ñ ó?Z,ª S*ü Q ¸ redistribute metric G!5B ,X metric Ä

default-metric h*ü üG¡ Ú ¥,X connected CÃ+ Þ,X Ê í È metric FÑ 0 Ä

Ï _ Ð

Ruijie(config-router)# default-metric 45

Ï,Ì G Q ¸ Ð

Q ¸	£EÄ
redistribute	G¡ Ú ¥ J W #A,,XCÃ+

Ï G ÄAÈ â Ð

5.1.39 distance bgp

S*üA¹ Q ¸ á à2O _,X BGP CÃ+ A’ n á à,X1u)ÚC±/• Ä S*ü no Q ¸ 9 6 á5 ,Õ Ä

distance bgp external-distance internal-distance local-distance

no distance bgp

Ï – DAÈ â Ð

– D	£EÄ
T 4 external-distance uq	¢ EBGP peers ; 4 CÃ+ X1u)ÚC±/• Ä —•4 1 hFsdc Ì Â ñ€Á)}8× Ê Ô 8× Ê Ô

neighbor soft-reconfiguration inbound	G¡ BGP session È J ±+- BGP Í 1 ' (4˜) ¥ 9,X þ4£ È ,XCÃ+ µ C
show ip bgp	/ BGP CÃ+ ><NM

Ï G ÄAÈ â Ð

34n.40 exit-address-family

S*üA¹ Q ¸EÔ Î BGP ,X address-family < G!5B õ ã Ä exit-address-family

Ï – DAÈ â Ð

4˜

path-list-num	Î b!7 í><E’ ã,X AS CÃ X { ë>< á AS CÃ X ë>< ÛAš0ú È8× È Ø---500 Ä
permit	AŒA“KÂ
deny	¦4±A“KÂ
regular-expression	!7 í><E’ ã Ä 8× È Ö1..255 +0ú Ä

Ï5 ,ÕA’5B Ð

"u Ý n ë><

Ï Q ¸ õ ã Ð

G!5B õ ã Ä

Ï S*ü Û + Ð

G b!7 í><E’ ãAº?•G!5B Û + ÉG!5B IP) CÃ+ Ê Ä

Ï _ Ð

Ruijie(config)# ip as-path access-list 105 deny ^123$

Ï,Ì G Q ¸ Ð

Q ¸!òÂ’N(9_DW …n A ’^å&a 6.(U!•ô CF ’%n"%•…!Xä9 ‘ bï Â ò q €‹>4UB õ Q ¸!ñ

5 ,ÕG!5B

á à £ ßCÃ+ µ C g,X !4Ô,X Ô û 5,Â D,XT¬Ax á à Ö
IPv4 VRF ÈVPNv4 £ ß ÈT¬Ax 10000.
IPv4 unicast £ ßT¬Ax 4294967295 Ä

Q ¸ õ ã

BGP G!5B õ ã È BGP ,X IPv4 £G!5B õ ã È BGP ,X IPv4 VRF G!5B õ ã È BGP ,X VPNv4 £G!5B õ ã

S*ü Û Ð

BGP ¤ £ ß,XCÃ+ µ C !4Ô Ý Ã6Ñ EîE› redistribute é 9,X È 3 Ý Ã6Ñ ¢F• : 4 é 9,X È áAŽ ¾/¡ ™ ‰ È Ô ºA¹ £ ß,X BGP CÃ+ µ C !4ÔE' Ô û 5,Â D Ê È!8 £CÃ+ µ C !4Ô Ú á a rKS ,A¹ £E¯ 9 overflow (Š Õ Ä

EîE› show bgp { addressfamily | all } summary Ã ¹,ßCÃ+ µ C g(Š Õ Ä

#ÙL8!8(Š ÕLÔ?UG¡ „G!5Bgp È ê S*ü clear bgp { addressfamily | all } * á ! £ Ä

AÈ â £ Æ4£E¯ 9 overflow (Š Õ È á6ÑEîE›A× Hmaximum-prefix 9 Â!7 Ä

G!5B _

_ 1 Ö ¹ ß _ Z ipv4 multicast L$ BGP CÃ+ µ C g !4Ô Ô û 5,Â Ä

```
Ruijie(config)# router bgp 65000
Ruijie(config-router)# address-family ipv4 unicast
Ruijie(config-router-af)# maximum-prefix 65535
```

Q ¸	£EÄ

– D	£EÄ
peer-address	Û n Í1 ',X ÈE- þ IPv4 Ä
peer-group-name	Û n Í1 '4˜,X á + Ä Í1 '4˜ á áCYE› 32 +0ú Ä

Ï5 ,ÕA'5B Ð

ü £ ipv4 ß T¬Ax ' Ô

Ï Q ¸ õ ã Ð

BGP G!5B õ ã ÈBGP ,X IPv4 £G!5B õ ã È BGP ,X IPv4 VRF G!5B õ ã È BGP ,X VPNv4 £G!5B õ ã

Ï S*ü Û + Ð

Í b ipv4 ,X £E- þ Q ¸ T¬Ax ' Ô È Í b J ª £2O _ ÈLÔ?UA' 5BA¹ Q ¸E¯> CÃ+ µ C,X x 6 Ä

Ï _ Ð

```
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
```

Ï,Ì G Q ¸ Ð

Q ¸	£EÄ
router bgp	' Ô BGP #A,
neighbor remote-as	G!5BBGP ,X Í1 ' Ä

Ï G ÄAÈ â Ð

5.1.44 neighbor advertisement-interval

A¹ Q ¸A'5B ¥EÕ BGP CÃ+ È „X ÊKÈKÈLh Ä S*üA¹ Q ¸,X no EÝNM Ã ¹ Ú W 6 á ä5 ,Õ Ä

neighbor {peer-address | peer-group-name} advertisement-interval seconds

no neighbor {peer-address | peer-group-name} advertisement-inte rval

Ï – DAÈ â Ð

– D	£EÄ
peer-address	Û n Í1 ',X Ä

peer-group-name	Û n Í1 '4˜,X á + Ä Í1 '4˜ á áCYE› 32 + 0ú Ä
seconds	¥EÕCÃ+ È „X ÊKÈKÈLh Ä8× È1..600 /¦

Ï5 ,ÕA'5B Ð

IBGP E² y : 15seconds

EBGP E² y : 30seconds

Ï Q ¸ õ ã Ð

BGP G!5B õ ã

Ï S*ü Û + Ð

V p | Û n Z BGP Í1 '4˜ ÈFw Í1 '4˜,X Ý ä ,FÑ Ú4» SA¹ Q ¸ ,XA'5B Ä

Ï _ Ð

Ruijie(config)# router bgp 60
Ruijie(config-router)# neighbor 10.0.0.1 remote-as 100
Ruijie(config-router)# neighbor 10.0.0.1 advertisement-interval 10

Ï,Ì G Q ¸ Ð

Q ¸	£EÄ
router bgp	' Ô BGP #A,
neighbor remote-as	G!5BBGP ,X Í1 ' Ä

1 hF¼ Ú CÃ+ #A,G!5B Q ¸ –5×

1 h0´ G!5B BGP

	Í1 '4˜ á áCYE› 32 +0ú Ä

Ï5 ,ÕA'5B Đ

5 ,ÕA'5B"u Ý ' Ô as-override s6Ñ

Ï Q ¸ õ ã Đ

BGP G!5B õ ã ÈBGP IPv4 £G!5B õ ã È BGP ,X IPv4VRF £G!5B õ ã

Ï S*ü Û + Đ

!7 ™ ‰ ß È BGP #A, á î y K Ý ` 7¾"• ³,Ì à AS Ë,XCÃ+ µ C È S*üA¹ Q ¸ Ã ¹?Z,ª] AS Ë È S k BGP #A, Ã ¹ y ¢,Ì à AS Ë ô 9,XCÃ+ µ C Ä

ü vpn È Ô L _,X h*ü ü b ø þ CE 0Ã K Ý,Ì à,X AS Ë ÈFw !7 ™ ‰ ß ÈE- ø þ CE "u Ý r"© y Í •,X µ C È ü PE ÞG!5B ÞEÄ Q ¸ â È Ã ¹A} PE ?Z,ª CE ,X AS Ë ÈS k º ê Ô0Ã,X CE Ã ¹ y A¹CÃ+ µ C Ä

¾ Í EBGP Í1 'A'5BA¹ s6Ñ Ä

Ï _ Đ

```
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
```

Ï,Ì G Q ¸ Đ

Q ¸	£EÄ
router bgp	' Ô BGP #A,
neighbor remote-as	G!5BBGP ,X Í1 ' Ä

Ï G ÄAÈ â Đ

5.1.47 neighbor default-originate

A¹ Q ¸ AŒ BGP speaker å Í1 ' (4˜) @ 5 ,ÕCÃ+ È S*üA¹ Q ¸,X no EÝNM Ã ¹ ª#\ ¥EÕ Ä

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]

Ï – DAÈ â Đ

– D	£EÄ
peer-address	Û n Í1 ',X Ä
peer-group-name	Û n Í1 '4˜,X á + Ä Í1 '4˜ á áCYE› 32 +0ú Ä
map-tag	route map ,X á + Ä route map á áCYE› 32 +0ú Ä

Ï5 ,ÕA'5B Ð

á ¥EÕ5 ,ÕCÃ+ Ä

Ï Q ¸ õ ã Ð

BGP G!5B õ ã Ä

Ï S*ü Û + Ð

A¹ Q ¸?U" EîE›G¡ Ú ¥ , ü5 ,ÕCÃ+ È !6Ñ ó åF• ¥EÕ5 ,ÕCÃ+ Ä

V p | Û n Z BGP Í1 '4˜ ÈFw Í1 '4˜,X Ý ä ,FÑ Ú4» SA¹ Q ¸ ,XA'5B ÄV p | Í1 ',X ¤ þ ä ,A'5BA¹ Q ¸ ÈJ Ú?Z,ª Î b Í1 '4˜ ,XA'5B

Ï _ Ð

```
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
```

peer-address	Û n Í1 ',X Ä
peer-group-name	Û n Í1 '4˜,X á + Ä Í1 '4˜ á áCYE› 32 +0ú Ä
text	*ü 9 £EÄA¹ Í1 ' (4˜),X [Ä 8× È Ö Ô î 80 þ +0ú Ä

Ï5 ,ÕA'5B Ð

"u Ý ' ÔA¹ s6Ñ Ä

Ï Q ¸ õ ã Ð

BGP G!5B õ ã Ä

Ï S*ü Û + Ð

A¹ Q ¸+ 9 Í1 'Ä4˜ Å#Ï t £EÄ û +0ú Ä Ã ¹ \ Q,X } å ÀA„ šA¹ Í1 ' Ä4˜ Å,X(M&• `(M û Ä

Ï _ Ð

```
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
```

Ï,Ì G Q ¸ Ð

Q ¸	£EÄ
router bgp	' Ô BGP #A,
neighbor remote-as	G!5BBGP ,X Í1 ' (4˜) Ä

Ï G ÄAÈ â Ð

5.1.49 neighbor distribute-list

ü à Û n BGP Í1 ' ¥CÃ+ µ C Ê È B ACL r 'CÃ+ 1*+9 ÄS*üA¹ Q ¸,X no EÝNM ª#\A'5B,XACL Ä

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}

Ï – DAÈ â Ð BGP

peer-group-name	Û n Í1 '4˜,X á + Ä Í1 '4˜ á áCYE› 32 +0ú Ä
access-list-number	ACL ,X Ë
in	ACL h*ü b y ,XCÃ+ µ C Ä
out	ACL h*ü b Ú ¥ Î •,XCÃ+ µ C Ä

Ï5 ,ÕA'5B Ð

"u Ý ' ÔA¹ s6Ñ Ä

Ï Q ¸ õ ã Ð

BGP G!5B õ ã È

no neighbor {peer-address | peer-group-name} ebgp-multihop

Ï – DAÈ â Ð

– D	£EÄ
peer-address	Û n Í1 ',X ÈE- þ IPv4 Ä
peer-group-name	Û n Í1 '4˜,X á + Ä Í1 '4˜ á áCYE› 32 +0ú Ä
ttl	AŒ,X Ô ûCÇ D Ä8× È Ö1..255

Ï5 ,ÕA'5B Ð

¾ AŒ â,ÈE²,X EBGP Í1 ' Î0Ÿ BGP E² y Ä

A'5B ebgp-multihop Ê È V p á ú – D ÈFw ttl S*ü 255 Ä

Ï Q ¸ õ ã Ð

BGP G!5B õ ã È BGP ,X IPv4 £G!5B õ ã È BGP ,X IPv4 VRF G!5B õ ã È

Ï S*ü Û + Ð

ZL !6 Î)„CÃ+)ƒCÃ ` 95)„B5 È ÍLÔ?U îCÇ !6Ñ Î0Ÿ BGP E² y,X EBGP peers KÈ ™NO?U" , ü E' Í •,XM25 ,Õ,XCÃ+ Ä

V p | Û n Z BGP Í1 '4˜ ÈFw Í1 '4˜,X Ý ä , Ú4» SA¹ Q ¸,X A'5B È V p | Í1 ',X ¤ þ ä ,A'5BA¹ Q ¸ ÈJ Ú?Z,ª Î b Í1 '4˜ ,XA'5B Ä

Ï _ Ð

```
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
```

Ï,Ì G Q ¸ Ð

Q ¸	£EÄ
router bgp	' Ô BGP #A,
neighbor remote-as	G!5BBGP ,X Í1 ' Ä
ip as-path access-list	ï Î AS_PATH list
match as-path	G! AS_PATH list

Ï G ÄAÈ â Ð

5.1.52 neighbor maximum-prefix

A¹ Q ¸L$ ¢ Û n BGP Í1 ' y 9,X !4Ô,X D,Â Ä S*üA¹ Q ¸,X no EÝNMEÝNM ª#\A'5B,XL$ Ä

neighbor {peer-address | peer-group-name} maximum-prefix maximum [threshold] [warning-only]

no neighbor {peer-address | peer-group-name} maximum-prefix

Ï – DAÈ â Ð

– D	£EÄ
peer-address	Û n Í1 ',X ÈE- þ IPv4 Ä
peer-group-name	Û n Í1 '4˜,X á + Ä Í1 '4˜ á áCYE› 32 +0ú Ä
maximum	AŒ y ,XCÃ+ µ C,X 5,Â,X ÞL$ Ä
threshold	Û n Ô Ÿ {*óA: ` Ô û D,Â,X,R Ú!¨,X
warning-only	CÃ+ µ CE' ÞL$ Ê á4œ!6 BGP E² y È5à *ó ä Ô þ ¹ « µ C Ä

,XA'5B Ä

Ï _ Đ

Ruijie(config)# router bgp 65000
Ruijie(config-router)# neighbor 10.0.0.1 maximum-prefix 1000

Ï,Ì G Q ¸ Đ

Q ¸	£EÄ
router bgp	' Ô BGP #A,
neighbor remote-as	G!5BBGP ,X Í1 ' Ä

Ï G ÄAÈ â Đ

5.1.53 neighbor next-hop-self

ü å Û n BGP Í1 ' Ú ¥CÃ+ Ê È S*üA¹ Q ¸ ÚCÃ+ µ C,X ß ÔCÇA'5B BGP speaker Ä S*üA¹ Q ¸,X no EÝNM ª#\A¹A'5B Ä

neighbor {peer-address | peer-group-name} next-hop-self

no neighbor {peer-address | peer-group-name} next-hop-self

Ï – DAÈ â Đ

– D	£EÄ
peer-address	Û n Í1 ',X ÈE- þ IPv4 Ä
peer-group-name	Û n Í1 '4˜,X á + Ä Í1 '4˜ á áCYE› 32 +0ú Ä

Ï5 ,ÕA'5B Đ

"u Ý ' ÔA¹ s6Ñ Ä

Ï Q ¸ õ ã Đ

BGP G!5B õ ã È BGP ,X IPv4 £G!5B õ ã È BGP ,X IPv4 VRF G!5B õ ã È

Ï S*ü Û + Đ

Q ¸ ?U S*ü üM2 <5%(Š,X5%4° (V Frame Relay ÃX.25) È üE-2O5% 4° È,Ì à $5%,X BGP speakers KÈ á Ô n6Ñ ó ` <,È yA"KÂ Ä

V p | Û n Z BGP Í1 '4˜ ÈFw Í1 '4˜,X Ý ä ,FÑ Ú4» SA¹ Q ¸ ,XA'5B Ä

Ï _ Ð

Ruijie(config)# router bgp 65000
Ruijie(config-router)# neighbor 10.0.0.1 next-hop-self

Ï,Ì G Q ¸ Ð

Q ¸	£EÄ
router bgp	' Ô BGP #A,
neighbor remote-as	G!5BBGP ,X Í1 ' Ä

Ï G ÄAÈ â Ð

5.1.54 neighbor password

ü à Û n BGP Í1 ' Î0Ÿ BGP E² y Ê È S*üA¹ Q ¸ | TCP MD5 Ax A• È JA'5B š-Õ Ä S*üA¹ Q ¸,X no EÝNM ª#\MD5 AxA• Ä

neighbor {peer-address | peer-group-name} password 10[

Ï S*ü Û + Ð

Q ¸ ÚA×*ü TCP ,X MD5 AxA• È Î0Ÿ BGP E² y,X BGP Í1 ' ™NOA' 5B,Ì à,X š-Õ È ú í È ´"© Î0ŸF• ÄA'5B Q ¸ â È BGP speaker Ú à BGP Í1 'G¡ „ Î0Ÿ BGP E² y Ä

V p | Û n Z BGP Í1 '4˜ ÈFw Í1 '4˜,X Ý ä , Ú4» SA¹ Q ¸,X A'5B È V p | Í1 ',X ¤ þ ä ,A'5BA¹ Q ¸ ÈJ Ú?Z,ª Î b Í1 '4˜ ,XA'5B Ä

á1u ü ¾ þ õ ã ßE¯> G!5B È Ô þF• ,X password ¾6Ñ ó Ý Ô þ È á î !£ þ £ Ô þ,X Ä

Ï _ Ð

Ruijie(config)# router bgp 65000
Ruijie(config-router)# neighbor 10.0.0.1 password Red-Giant

Ï,Ì G Q ¸ Ð

Q ¸	£EÄ
router bgp	' Ô BGP #A,
neighbor remote-as	G!5BBGP ,X Í1 ' Ä

Ï G ÄAÈ â Ð

5.1.55 neighbor peer-group (assigning members)

A¹ Q ¸ Ú Û n BGP Í1 'A'5B BGP Í1 '4˜,X ä , Ä S*üA¹ Q ¸,X no EÝNM Ú Û n,XBGP Í1 ' ¢ Í1 '4˜ ôL8 Ä

neighbor peer-address peer-group peer-group-name

no neighbor peer-address peer-group peer-group-name

Ï – DAÈ â Ð

– D	£EÄ

peer-address 1 €

BGP G!5B õ ã

Ï S*ü Û + Ð

Ï – DAÈ â Ð

– D	£EÄ
peer-group-name	Û n Í1 '4˜,X á + Ä Í1 '4˜ á áCYE› 32 +0ú Ä

Ï5 ,ÕA'5B Ð

"u Ý ï Î BGP Í1 '4˜ Ä

Ï Q ¸ õ ã Ð

BGP G!5B õ ã

Ï S*ü Û + Ð

V p î þ BGP Í1 ' Ã ¹E¤*ü,Ì à,X È „1*+9 ÈFw A'5B Ã ¹ E- o Í 1 'A'5B ü Ô þ Í1 '4˜ È ¢5à ¤ o ZG!5B Þ,X1T ê `E¤> Þ,XP¬ Ä

Ï _ Ð

Ruijie(config)# router bgp 65000
Ruijie(config-router)# neighbor Red-Giant peer-group

Ï,Ì G Q ¸ Ð

Q ¸	£EÄ
router bgp	' Ô BGP #A,
neighbor remote-as	G!5BBGP ,X Í1 ' Ä
neighbor peer-group (assigning members)	Ú Û n BGP Í1 'A'5B BGP Í1 '4˜,X ä ,
show ip bgp peer-group	/ BGP Í1 '4˜,X µ C

Ï G ÄAÈ â Ð

5.1.57 neighbor prefix-list

ü à Û n BGP Í1 ' ¥CÃ+ µ C Ê È S*üA¹ Q ¸ B !4Ô ë>< r 'CÃ + 1*+9 Ä S*üA¹ Q ¸,X no EÝNM ª#\A'5B,Xprefix-list Ä

neighbor {peer-address | peer-group-name} prefix-list prefix-list-name {in | out}

no neighbor {peer-address | peer-group-name} prefix-list {in | out}

Ï – DAÈ â Ð

– D	£EÄ
peer-address	Û n Í1 ',X ÈE- þ IPv4

	Ä
peer-group-name	Û n Í1 '4˜,X á + Ä Í1 '4˜ á áCYE› 32 +0ú Ä
prefix-list-name	prefix-list ,X á + Ä !4Ô ë>< á áCYE› 32 +0ú Ä
in	prefix list h*ü b y ,XCÃ+ µ C Ä
out	prefix list h*ü b Ú ¥ Î •,XCÃ+ µ C Ä

Ï5 ,ÕA'5B Ð

"u Ý ' ÔA¹ s6Ñ Ä

Ï Q ¸ õ ã Ð

BGP G!5B õ ã È BGP ,X IPv4 £G!5B õ ã È BGP ,X IPv4 VRF G!5B õ ã È BGP ,X VPNv4 £G!5B õ ã

Ï S*ü Û + Ð

´AŽ ÍEg 9?˜ í (in)E¬ Eg Î?˜ í (out) ÈÏ) Ê í ÈA¹ Q ¸ ` neighbor distribute-list `5Ù á6Ñ E , È G ¾ Ý Ô 5 Q ¸ Ý Ä

V p | Û n Z BGP Í1 '4˜ ÈFw Í1 '4˜,X Ý ä , Ú4» SA¹ Q ¸,X A'5B È V p | Í1 ',X ¤ þ ä ,A'5B neighbor prefix-list in È J Ú?Z ,ª Î b Í1 '4˜,XA'5B Ä

E- þG!5B Î b £,X ÈÃ ¹ ü á à £ ÞG!5B á à,XE›$¸1*+9 È¯ > CÃ+ ,X { Ä

Ï _ Ð

```
Ruijie(config)#          ip prefix-list bgp-filter deny
10.0.0.1/16
Ruijie(config)#          router bgp       65000
Ruijie(config-router)#                neighbor
```

5.1.58 neighbor remote-as

A¹ Q ¸G!5B BGP Í1 ' (4˜) Ä S*üA¹ Q ¸,X no EÝNM ôL8G!5B,X Í1 ' (4˜) Ä

neighbor {peer-address | peer-group-name} remote-as as-number

no neighbor {peer-address | peer-group-name} remote-as as-number

Ï – DAÈ â Ð

– D	£EÄ
peer-address	Û n Í1 ',X ÈE- þ IPv4 Ä
peer-group-name	Û n Í1 '4˜,X á + Ä Í1 '4˜ á áCYE› 32 +0ú Ä
as-number	BGP Í1 ' (4˜)7¾"•2Ï4³ Ë Ä 8× È Ö1..65535

Ï5 ,ÕA'5B Ð

"u ÝG!5B BGP Í1 ' Ä

Ï Q ¸ õ ã Ð

BGP G!5B õ ã È BGP ,X IPv4 £G!5B õ ã È BGP ,X IPv4 VRF G!5B õ ã È

Ï S*ü Û + Ð

V p | Û n Z BGP Í1 '4˜ ÈFw Í1 '4˜,X Ý ä ,FÑ Ú4» SA¹ Q ¸ ,XA'5B Ä

Ï _ Ð

Ruijie(config)# router bgp 65000
Ruijie(config-router)# neighbor 10.0.0.1 remote-as 80

Ï,Ì G Q ¸ Ð

Q ¸	£EÄ
router bgp	' Ô BGP #A,

Ï G ÄAÈ â Ð

5.1.59 neighbor remove-private-as

A¹ Q ¸ ôL8 ¥ T Û n,X EBGP Í1 ',XCÃ+ ,X AS CÃ X 2 û A„),X/• Ý AS Ë Ä S*üA¹ Q ¸,X no EÝNM ª#\A¹A'5B Ä

no neighbor {peer-address | peer-group-name } route-map map-tag {in | out }

Ï – DAÈ â Ð

– D	£EÄ
peer-address	Í Û n,XF• ÈE- þ IPv4 Ä
peer-group-name	Û n Í1 '4˜,X á + Ä Í1 '4˜ á áCYE› 32 +0ú Ä
map-tag	G!?˜ í,X á +
in	Í bE¯ 9,XCÃ+ S*ü?˜ í
out	Í b Î •,XCÃ+ S*ü?˜ í

Ï5 ,ÕA'5B Ð

"u Ý5 ,ÕA'5B

Ï Q ¸ õ ã Ð

BGP G!5B õ ã È BGP ,X IPv4 £G!5B õ ã È BGP ,X IPv4 VRF G!5B õ ã È BGP ,X VPNv4 £G!5B õ ã Ä

Ï S*ü Û + Ð

neighbor {ip-address | peer-group-name } route-reflector-client

no neighbor {ip-address | peer-group-name } route-reflector-client

Ï – DAÈ â Đ

– D	£EÄ
ip-address	Û n Í1 ',X Ä
peer-group-name	Û n Í1 '4˜,X á + Ä Í1 '4˜ á áCYE› 32 +0ú Ä

Ï5 ,ÕA'5B Đ

"u Ý ' ÔA¹ s6Ñ

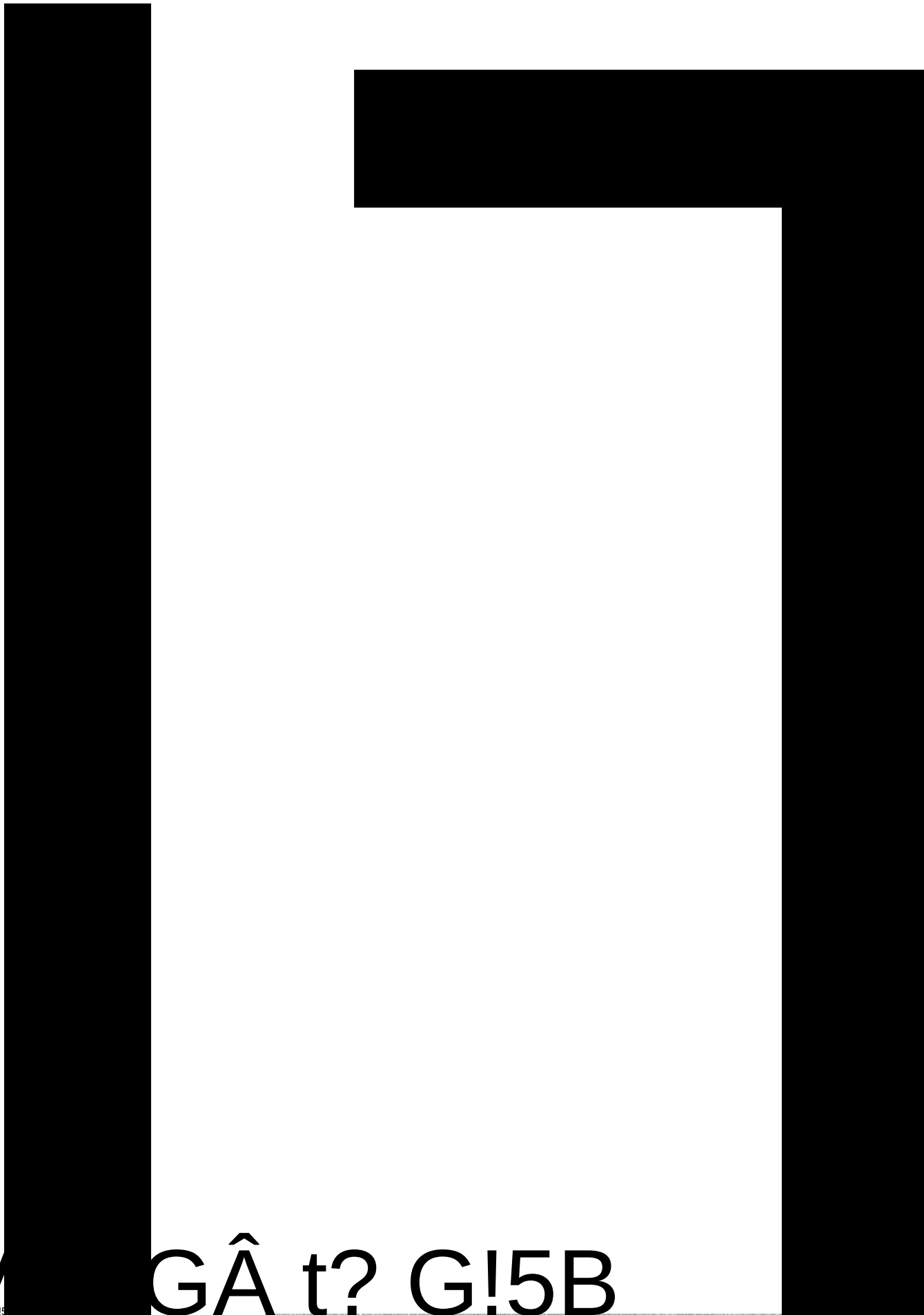
Ï Q ¸ õ ã Đ

BGP G!5B õ ã

Ï S*ü Û + Đ

5 ,Õ ™ ‰ ß È7¾"•2Ï4³ YF¼,X Ý IBGP speakers ™NO Î0Ÿ ` <F• y G

2Ï È BGP speaker J á Ú "B "S"B !ð™Ť DÆ6 ÈÈ ÎC2_[<144A03E1>-6<11DA07C2_83



4 V GÂ t? G!5B

5.1.63 neighbor shutdown

A¹ Q ¸ GKÁ à Û n,X BGP Í1 ' Î0Ÿ,X BGP E² y Ä S*üA¹ Q ¸,X no EÝ NMG¡ „ | BGP Í1 ' (4˜) Ä

neighbor {peer-address | peer-group-name} shutdown

no neighbor {peer-address | peer-group-name} shutdown

Ï – DAÈ â Ð

– D	£EÄ
peer-address	Û n Í1 ',X ÈE- þ IPv4 Ä
peer-group-name	Û n Í1 '4˜,X á + Ä Í1 '4˜ á áCYE› 32 +0ú Ä

Ï5 ,ÕA'5B Ð

"u Ý ' ÔA¹ s6Ñ

Ï Q ¸ õ ã Ð

BGP G!5B õ ã È BGP ,X IPv4 £G!5B õ ã È BGP ,X IPv4 VRF G!5B õ ã È

Ï S*ü Û + Ð

S*ü Q ¸ Ú GKÁ à Û n,X Í1 ' (4˜) Î0Ÿ,X Ý E² y È J ôL8 Ý G6(,XCÃ+ µ C Ä Q ¸ ¡' ±+-A¹ Û n Í1 ' (4˜),XG!5B µ C Ä

V p | Û n Z BGP Í1 '4˜ ÈFw Í1 '4˜,X Ý ä , Ú4» SA¹ Q ¸,X A'5B È V p | Í1 ',X ¤ þ ä ,A'5BA¹ Q ¸ ÈJ Ú?Z,ª Î b Í1 '4˜ ,XA'5B Ä

Ï _ Ð

Ruijie(config)# router bgp 60
Ruijie(config-router)# neighbor 10.0.0.1 shutdown

Ï,Ì G Q ¸ Ð

Q ¸	£EÄ
router bgp	' Ô BGP #A,
neighbor remote-as	G!5BBGP ,X Í1 ' Ä

5.1.64 neighbor soft-reconfiguration inbound

A¹ Q ¸ AŒ ¸ | BGP Í1 ' ¥ 9,XCÃ+ µ C Ä S*üA¹ Q ¸,X no GKÁA¹ NMA'5B Ä

neighbor {peer-address | peer-group-name} soft-reconfiguration inbound

no neighbor
pee(ddress)]TJ /80 1 Tf -0.001 Tc 0.0032 Tw 5.849 0 Td (|)Tj /TT1 1 Tf -0.001 0 Tw 0.81

show ip bgp neighbors	/ BGP Í1 ',X µ C
clear ip bgp	á ! BGP Í1 ' îA±

Ï G ÄAÈ â Ð

5.1.65 neighbor soo

S*üA¹ Q ¸G!5BF• ,X $d0-&• 2 û , S*ü no Q ¸ª#\F• ,X $d0-&• 2 û Ä

neighbor [peer-address | peer-group-name] |

router bgp	' Ô BGP #A,
timers bgp	Î b < A'5B keepalive ` holdtime

Ï G ÄAÈ â Ð

5.1.66 neighbor timers

ü Û n BGP Í1 ' Î0Ÿ BGP E² y Ê È S*üA¹ Q ¸A'5B Î0Ÿ BGP E² y Ê S*ü,X keepalive ` holdtime ÊKÈ ÄS*üA¹ Q ¸,X no EÝNM 6 á5 ,Õ Ä

neighbor [peer-address | peer-group-name] timers keepalive holdtime

no neighbor [peer-address | peer-group-name] timers keepalive holdtime

Ï – DAÈ â Ð

– D	£EÄ
peer-address	Û n Í1 ',X ÈE- þ IPv4 Ä
peer-group-name	Û n Í1 '4˜,X á + Ä Í1 '4˜ á áCYE› 32 +0ú Ä
keepalive	ñ Û n BGP Í 1 ' ¥ E ÕKEEPALIVE message ,X ÊKÈKÈLh Ä8× È Ö0..65535 /¦ Ä
holdtime	Ax BGP Í1 ' ¡' Ý ,X ÊKÈKÈLh Ä 8× È Ö0..65535 /¦ Ä

Ï5 ,ÕA'5B Ð

keepalive: 60 /¦

holdtime: 180 /¦

Ï Q ¸ õ ã Ð

BGP G!5B õ ã

Ï S*ü Û + Ð

Ü)Ú,X keepalive á6Ñ û b holdtime ,X Ý Ú Ô Ä

V p) þ peer ê peer-group G!5B ÊKÈ â ÈFw A¹ peer ê peer É group Ú S*ü7¾ Å,X ÊKÈ 9 · Ó < ,X ÊKÈG!5B È â Í1 'E¯> E² y Ä

V p | Û n Z BGP Í1 '4˜ ÈFw Í1 '4˜,X Ý ä , Ú4» SA¹ Q ¸,X A'5B È V p | Í1 ',X ¤ þ ä ,A'5BA¹ Q ¸ ÈJ Ú?Z,ª Î b Í1 '4˜ ,XA'5B Ä

Ï _ Ð

```
Ruijie(config)#          router bgp        65000
Ruijie(config-router)#              neighbor      10.0.0.1 80 240
```

1 hF¼ Ú CÃ+ #A‚G!5B Q ¸ –5×

Q ¸	£EÄ
router bgp	' Ô BGP #A,
neighbor remote-as	G!5BBGP ,X Í1 ' Ä
aggregate-address	G!5B6. Ü
route-map	G!5Broute-map

Ï G ÄAÈ â Đ

5.1.68 neighbor update-source

ü à Û n IBGP Í1 ' Î0Ÿ BGP E² y Ê È S*üA¹ Q ¸A'5B Î0Ÿ BGP E² y Ê S*ü,X5%4° y · Ä S*üA¹ Q ¸,X no EÝNM Ú7¾ | G! Ô ì,X y · Ä

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

Ï – DAÈ â Đ

– D	£EÄ
peer-address	Û n Í1 ',X ÈE- þ IPv4 Ä
peer-group-name	Û n Í1 '4˜,X á + Ä Í1 '4˜ á áCYE› 32 +0ú Ä
interface-type	y ·2O _
interface-index	y ·,X2ö é Ë

Ï5 ,ÕA'5B Đ

S*ü Ô ì,X y · 0 Eg Î y ·

Ï Q ¸ õ ã Đ

BGP G!5B õ ã È BGP ,X IPv4 BGP4Pvå”Ÿ T041 T3(VRFTf 0.0019 Tc 1.246 0 0.f

Ruijie(config)# router bgp 65000
Ruijie(config-router)# neighbor 10.0.0.1 update-source loopback 1

Ï,Ì G Q ¸ Ð

Q ¸	£EÄ
router bgp	' Ô BGP #A,
neighbor remote-as	G!5BBGP ,X Í1 ' Ä

Ï G ÄAÈ â Ð

5.1.69 neighbor version

A¹ Q ¸AÈ â(M n,X BGP F• S*ü,X BGP #A,,X(Ë Ä S*üA¹ Q ¸,X no EÝNM S*üT¬Ax,X(Ë Ä

neighbor {ip-address|peer-group-name} version number
no neighbor {ip-address|peer-group-name} version number

Ï – DAÈ â Ð

– D	£EÄ
peer-address	Û n Í1 ',X Ä
peer-group-name	Û n Í1 '4˜,X á + Ä Í1 '4˜ á áCYE› 32 +0ú Ä
number	(Ë Ä)„ ü ¾ Õ(4

Ï5 ,ÕA'5B Ð

T¬Ax,X(Ë 4 Ä

Ï Q ¸ õ ã Ð

BGP G!5B õ ã Ä

Ï S*ü Û + Ð

S*üA¹ Q ¸ ¹ â È BGP #A, Ú •(# ,X s6Ñ Ä

Ï _ Ð

Ruijie(config-router)# neighbor 10.1.1.1 version 4

Ï,Ì G Q ¸ Ð

Q ¸	£EÄ

router bgp	' Ô BGP #A,
neighbor remote-as	G!5BBGP ,X Í1 ' Ä

Ï G ÄAÈ â Ð

5.1.70 neighbor weight

A¹ Q ¸AÈ â(M n,X BGP F• S*ü,X G¡ Ä S*üA¹ Q ¸,X no EÝNM 9 ª #\F• ,X G¡ ,XA'5B Ä

neighbor {ip-address|peer-group-name} weight number

no neighbor {ip-address|peer-group-name} weight

Ï – DAÈ â Ð

– D	£EÄ
ip-address	Û n Í1 ',X Ä
peer-group-name	Û n Í1 '4˜,X á + Ä Í1 '4˜ á áCYE› 32 +0ú Ä
number	F• ,X G¡ Ä ª 8× È Ö 0…65535

Ï5 ,ÕA'5B Ð

T¬Ax"u ÝG!5BF• ,X G¡ È!8 Ê ¢F• : ,XCÃ+ G¡ ñ Ÿ 0 È *ó ä,XCÃ+ G¡ ñ Ÿ 32768 Ä

Ï Q ¸ õ ã Ð

BGP G!5B õ ã Ä

Ï S*ü Û + Ð

S*üA¹ Q ¸ ¹ â È ¢E- þF• E› 9,XCÃ+ FÑ ÚE- þ 0 CÃ+ ,X G¡,X ñ Ÿ Ä G¡ C^ û È ì 4{C^P¬ Ä

üF• • å S*ü Z route-map Ý set weight ,X Ê í È Ú?Z,ª Q ¸A'5B ,X G¡ Ä

Ï _ Ð

Ruijie(config-router)# neighbor 10.1.1.1 weight 7 3

Ï,Ì G Q ¸ Ð

Q ¸	£EÄ
router bgp	' Ô BGP #A,

1 hF¼ Ú

Network synchronization	Network G!5B5%!‰,X à!9 Ô G

Ï G ÄAÈ â Ð

5.1.72 network synchronization

A¹ Q ¸G!5B BGP speaker ü ` CÃ+ à!9 â @ network G!5B,X5% 4° µ C Ä S*üA¹ Q ¸,X no EÝNMG!5B,È y Ã ¹ @ network G!5B,X5%4° µ C Ä

network synchronization

no network synchronization

Ï – DAÈ â Ð

´

Ï5 ,ÕA'5B Ð

5%4° µ C à!9 ' Ô

Ï Q ¸ õ ã Ð

BGP G!5B õ ã

Ï S*ü Û + Ð

S*üA¹ Q ¸ 9 Â network üEî E›/ß ,X><)„ È ÎA, á?U GKÁA¹ Ô G È GKÁ â Ã6ÑEô äCÃ+ T¥"ò Ä

Ï _ Ð

Ruijie(config)# router bgp 65000
Ruijie(config-router)# network synchronization

Ï,Ì G Q ¸ Ð

Q ¸	£EÄ
router bgp	' Ô BGP #A,
redistribute	A'5BCÃ+ G¡ Ú ¥
network(BGP)	G!5B?U Ú ¥,XCÃ+

Ï G ÄAÈ â Ð

5.1.73 overflo_hmory-lackn

BGP' ä8q¼S*üA¹ Q µ,] o

overflow memory-lack

no overflow memory-lack

5.1.74 redistribute

CÃ+ G¡ Ú ¥,X Q ¸ È Ã ¹ Ú J WCÃ+ #A„XCÃ+ µ C ` BGP KÈ r)„G¡ „ Ú ¥ ÈA¹ Q ¸,X no EÝNM Ã ¹ ôL8A¹ s6Ñ ž J – DG!5B Ä

redistribute protocol-type [route-map map-tag] [metric

route-map Ý Ø)Ú È S*ü route-map Ø)Ú â,X ×V p route-map "u ÝA'5BE- þ È5à metric EÝNME¯> ZG!5B È S*ümetric G!5B,X ×V p ø5ÙFÑ"u Ý È S*üG¡ Ú ¥ Þ 9,X Ä

Ï _ Ð

```
Ruijie(config-router)#          redistribute static route-map
static-rmap
Ruijie(config-router)#          no redistribute static
route-map static-rmap
Ruijie(config-router)#          no redistribute static
```

Ï,Ì G Q¸ Ð

Q¸	£EÄ
show ip protocols	¹,ßCÃ+ #A,,X < G!5B µ C

Ï G ÄAÈ â Ð

5.1.75 redistribute ÄOSPF Å

CÃ+ G¡ Ú ¥,X Q¸ È Ã ¹ Ú OSPF CÃ+ #A,,XCÃ+ µ C ` BGP KÈ r)„ G¡ „ Ú ¥ ÈA¹ Q¸,X no EÝNM Ã ¹ ôL8A¹ s6Ñ ž J – DG!5B Ä

redistribute ospf process-id [route-map map-tag] [metric metric-value] [match internal external [1|2] nssa-external [1|2]]

no redistribute ospf process-id [route-map map-tag] [metric metric-value] [match {internal |external [1|2]|nssa-external [1|2]}]

Ï – DAÈ â Ð

– D	£EÄ
process-id	>•G¡ Ú ¥,X OSPF #A,,XE¯/ß Ë
route-map map-tag	G6(,X route-map ,X á + Ä 5 ,Õ"u Ý G6(route-map
metric metric-value	G!5B,XG¡ Ú ¥CÃ+ ,XT¬Axmetric Ä T¬Ax áA'5BA¹ Ä
match	*ü 9A'5B G!,X OSPF CÃ+ ,X $2O _
internal	OSPF ,X internal $2O _CÃ+ È G¡ Ú ¥ ospf CÃ+ Êmatch NM,XT¬AxG!5B Ä
external [1|2]	OSPF ,X external 2O _CÃ+ È Ã ¹ K ',X AÈ â 2O _ 1 ê2O _ 2 È V p áAÈ â È Ù À2O _1 `2O _ 2
nssa-external [1|2]	OSPF ,X nssa-external 2O _CÃ+ ÈÃ ¹ K

show ip protocols	¹,ßCÃ+ #A,,X < G!5B µ C

Ï G ÄAÈ â Ð

5.1.76 redistribute ÄISIS Å

CÃ+ G¡ Ú ¥ISIS #A,,X Q ¸ ÈÃ ¹ Ú ISIS CÃ+ #A,,XCÃ+ µ CG¡ Ú ¥ BGP CÃ+ #A, ÈA¹ Q ¸,X no EÝNM Ã ¹ ôL8A¹ s6Ñ ž J – DG!5B Ä

redistribute isis [isis-tag] [route-map map-tag] [metric metric-value] [level-1 | level-1-2 | level-2]

no redistribute isis [isis-tag] [route-map map-tag] [metric metric-value] [level-1 | level-1-2 | level-2]

Ï – DAÈ â Ð

– D	£EÄ
isis-tag	>•G¡ Ú ¥,X ISIS E¯/ß,X á + È ÃEÝNM
route-map map-tag	G6(,X route-map ,X á + Ä 5 ,Õ"u Ý G6(route-map
metric metric-value	G!5B,XG¡ Ú ¥CÃ+ ,XT¬Axmetric Ä T¬Ax áA'5BA¹ Ä
level-1	¾G¡ Ú ¥ isis ,X level-1 ,XCÃ+ µ C
level-1-2	¶G¡ Ú ¥ isis ,X level-1 CÃ+ µ C œG¡ Ú ¥ isis ,X level-2 CÃ+ µ C
level-2	¾G¡ Ú ¥ isis ,X level-2 CÃ+ µ C ÆE- þG! 5BG¡ Ú ¥isis Ê,XT¬AxG!5B Ä

Ï5 ,ÕA'5B Ð

"u Ý ' ÔG¡ Ú ¥ ISIS #A, Ä

Ï Q ¸ õ ã Ð

BGP G!5B õ ã È BGP ,X IPv4 £G!5B õ ã Ä

Ï S*ü Û + Ð

' { • Õ Z î þCÃ+ #A, Ê È Ø þ #A, KÈ,X f,Ì Ü 0 Ô þM2 G¡ ?U,X Y • ÄA' Û ü à Ô ÊKÈ?U6ÑE¤> î þCÃ+ #A, ÈW ™NO6Ñ Ú Ô þ #A, ,X µ CG¡ „ ÚG! º Ô þ #A, ÄE- Í Ý IP CÃ+ #A,FÑ EÖ*ü,X Ä

\ !

'G!5B no Q ¸,X Ê í È V pG!5B Ý – D È5à è Ý,Ì h,X – DG!5B È no],Ì h – D,XG!5B Ä ü"u Ý – D,X Ê í È ! Ú redistribute ,XE- þG!5B no

] ÄCÃ+ $2O _ <F¼ ôL8,X Ê í È T¬Ax,XCÃ+ 2O _ Z Ä

a _ É !

Í b ISIS CÃ+ ,XE›$¸?˜ í ÖOj BG!5B,X level EÝNME¯ÞISIS CÃ+ 2O _,XE›$¸ È â aE¯> route-map ?˜ í,XE›$¸ Ä Í bCÃ+ ,X metric È B s 9,X E¯> route-map Ø)Ú È V p ü route-map Ý Ø)Ú È S *ü route-map Ø)Ú â,X × V p route-map "u Ý Ø)Ú È5à metric EÝNM E¯> ZG!5B È S*ü metric G!5B,X × V p ÿ m 'QÍÐ,,Ì•—•U2¯Äz } šP Þ 9,X Ä

Ï _ Ð

```
Ruijie(config-router)#          redistribute isis route-map
static-rmap
Ruijie(config-router)#          no redistribute isis test
route-map isis-rmap
Ruijie(config-router)#
```

BGP #A,5 ,Õ GKÁ Ä

Ï Q ¸ õ ã Ð

< G!5B õ ã Ä

Ï S*ü Û + Ð

S*üA¹ Q ¸ 9 | BGP #A, Ä

Ï _ Ð

Ruijie(config)# router bgp 65000

Ï,Ì G Q ¸ Ð

Q ¸	£EÄ
Ip routing	' Ô IP CÃ+ Ô G
bgp router-id	A'5BE¤> BGP #A, S*ü,X ÛAš
network	A'5B BGP speaker LÔ?U @ ,X5%4° µ C

Ï G ÄAÈ â Ð

5.1.78 synchronization

A¹ Q ¸ | BGP ` IGP CÃ+ µ C,X à!9 Ä S*üA¹ Q ¸,X no EÝNM ª #\ BGP ` IGP ,X à!9 Ä

synchronization

no synchronization

Ï – DAÈ â Ð

A¹ Q ¸"u Ý – D

Ï5 ,ÕA'5B Ð

5 ,Õ ™ ‰ ß à!9 GKÁ

Ï Q ¸ õ ã Ð

BGP G!5B õ ã

Ï S*ü Û + Ð

BGP ` IGP ,X à!9 ZL !6 Ã6Ñ Î)„,XCÃ+ T¥"ò)„B5 Ä

ü ¹ ß ø/¡ ™ ‰ ß È | Ã ¹ ª#\ à!9 ¹ ±A•CÃ+ µ C,X ¿Eó / Ö

1. á , ü0SC^ AS ,XCÃ+ µ C(Ô8 ™ ‰ ß È AS Ô þ ÿ v AS) ×
2. AS Y Ý,X router FÑE¤>BGP #A, È Ý,X BGP speaker KÈ Î0Ÿ <E² y G2Ï (BGP speaker ø ø Î0ŸF• y G2Ï) Ä

Ï _ Đ

```
Ruijie(config)#          router bgp       65000
Ruijie(config-router)#                    synchronization
```

Ï,Ì G Q ¸ Đ

ï,Ì G Q ¸ Ð

Q ¸	£EÄ
neighbor timers	Î bF• A'5B keepalive ` holdtime

ï G ÄAÈ â Ð

5.2 / ,Ì G Q ¸

5.2.1 show ip bgp

S*üA¹ Q ¸ / BGP CÃ+ µ C Ä

show ip bgp [{network | network-mask}] [longer-prefixes]

ï – DAÈ â Ð

– D	£EÄ
network	/ üCÃ+ >< ,X(M n,XCÃ+ µ C
network-mask	/ Ù ÿ ü Û n5%4° ,XCÃ+ µ C
longer-prefixes	/ CÃ+ µ C È Ù À J Y,X È K ',XCÃ+

ï5 ,ÕA'5B Ð

"u Ý5 ,ÕA'5B

ï Q ¸ õ ã Ð

(M õ ã

ï S*ü Û + Ð

S*üA¹ Q ¸ 9 ¹,ß BGP ,XCÃ+ µ C

ï _ Ð

```
Ruijie# show ip bgp
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

Ï,Ì G Q ¸ Ð

Ï G ÄAÈ â Ð

5.2.2 show ip bgp cidr-only

A¹ Q ¸*ü 9 / ´2O ÿ,XCÃ+ Ä

show ip bgp cidr-only

Ï – DAÈ â Ð

A¹ Q ¸"u Ý – D

Ï5 ,ÕA'5B Ð

"u Ý5 ,ÕA'5B

Ï Q ¸ õ ã Ð

(M õ ã

Ï S*ü Û + Ð

S*üA¹ Q ¸ 9 ¹,ß ´2OCÃ+ µ C Ä

Ï _ Ð

Ruijie# show ip bgp cidr-only

Ï,Ì G Q ¸ Ð

Q ¸	£EÄ
bgp dampening	' ÔCÃ+ >D £ s6Ñ JA'5B>D £ – D
clear ip bgp dampening	#ÙL8>• e ,XCÃ+ Ä

Ï G ÄAÈ â Ð

5.2.3 show ip bgp community

S*üA¹ Q ¸ / Ù ÿ Û n community ,X BGP CÃ+ µ C Ä

show ip bgp community community-number [exact -match]

Ï – DAÈ â Ð

– D	£EÄ
community-number	¶ ' Ë Ä ã AA:NN(7¾"•2Ï4³ Ë /2 +8V D +) È 3 Ã ¹ ¹ ßN X n Ö internet È no-export Èlocal-as È no-advertise
exact -match	/ ` < G! ¶ ' ,XCÃ+ µ C

Ï5 ,ÕA'5B Ð

"u Ý5 ,ÕA'5B

Ï Q ¸ õ ã Ð

(M õ ã

Ï S*ü Û + Ð

S*üA¹ Q ¸ 9 ¹,ß Û n,X community ,XCÃ+ ,X µ C Ä

Ï _ Ð

```
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
```

Ï,Ì G Q ¸ Ð

Ï G ÄAÈ â Ð

5.2.4 show ip bgp community-list

S*üA¹ Q ¸ / G! Û n ¶ ' ë><,X BGP CÃ+ µ C Ä

show ip bgp community-list community-name [exact-match]

Ï – DAÈ â Ð

– D	£EÄ
community-name	¶ ' ë>< á

1 hF¼ Ú CÃ+ #A‚G!5B Q ¸ –5×

"u Ý5 ,ÕA'5B

Ï Q ¸ õ ã Ð

(M õ ã

Ï S*ü Û + Ð

S*üA¹ Q ¸ 9 / >•K _,XCÃ X µ C

Ï _ Ð

```
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 ?
```

Ï,Ì G Q ¸ Ð

Ï G ÄAÈ â Ð

5.2.6 show ip bgp dampening flap-statistics

S*üA¹ Q ¸ / CÃ+ 954³Au µ C Ä

show ip bgp dampening flap-statistics

Ï – DAÈ â Ð

A¹ Q ¸ ´ – D

Ï5 ,ÕA'5B Đ

"u Ý5 ,ÕA'5B

Ï Q ¸ õ ã Đ

(M õ ã

Ï S*ü Û + Đ

A¹ Q ¸+ 9 ¹,ß BGP ,XCÃ+ 95,X4³Au µ C

Ï _ Đ

Ruijie# show ip bgp dampening flap-statistics
Status codes: s suppressed, d damped, h history, * valid, > best, i - internal
Origin codes: i - IGP, e - EGP, ? - incomplete
Status Network From Flaps Duration Reuse Path
------ ------------ ---------- ------ -------- -----
h 192.168.64.0/24 110.110.110.10 2 00:19:17 1000 i
h 201.234.1.0/24 110.110.110.10 2 00:19:17 1000 ?
h 201.234.2.0/23 110.110.110.10 2 00:19:17 1000 ?
h 201.234.2.0/23 110.110.110.10 2 00:19:17 1000 ?
h 201.234.2.0/23 110.110.110.10 2 00:19:17 1000 ?
h 201.234.2.0/23 110.110.110.10 2 00:19:17 1000 ?

Ï,Ì G Q ¸ Đ

Ï G ÄAÈ â Đ

5.2.7 show ip bgp dampening parameters

S*üA¹ Q ¸ / BGP G!5B,XCÃ+ 95,X – D µ C Ä

show ip bgp dampening parameters

Ï – DAÈ â Đ

A¹ Q ¸ ´ – D

Ï5 ,ÕA'5B Đ

"u Ý5 ,ÕA'5B

Ï Q ¸ õ ã Ð

(M õ ã

Ï S*ü Û + Ð

A¹ Q ¸+ 9 ¹,ß BGP G!5B,XCÃ+ 95,X – D µ C

Ï _ Ð

```
Ruijie (config-router)# bgp dampening 25 10000 10000 200
Ruijie# show ip bgp dampening parameters
dampening 25 10000 10000 200
Dampening Control Block(s):
Reachability Half-Life time : 25 min
Reuse penalty : 10000
Suppress penalty : 10000
Max suppress time : 200 min
Max penalty (ceil) : 29800000
Min penalty (floor) : 5000
```

Ï,Ì G Q ¸ Ð

Ï G ÄAÈ â Ð

5.2.8 show ip bgp filter-list

S*üA¹ Q ¸ / 0ú ÜE›$¸ ë><,XCÃ+ µ C Ä

show ip bgp filter-list path-list-number

Ï – DAÈ â Ð

– D	£EÄ
path-list-number	E›$¸ ë>< Û/ Ë-Õ

Ï5 ,ÕA'5B Ð

"u Ý5 ,ÕA'5B

Ï Q ¸ õ ã Ð

(M õ ã

Ï S*ü Û + Ð

S*üA¹ Q ¸ 9 / EîE›E›$¸ ë><,XCÃ+ µ C

Ï _ Ð

```
Ruijie(config)# ip as-path access-list 5 permit . *
Ruijie# show ip bgp filter-list 5
```

BGPtable 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

Ï,Ì G Q ¸ Ð

Ï G ÄAÈ â Ð

5.2.9 show ip bgp inconsistent-as

A¹ Q ¸*ü 9 / Ý-¯,Ò,X$d AS ,XCÃ+ ,X µ C Ä

show ip bgp inconsistent-as

Ï – DAÈ â Ð

A¹ Q ¸"u Ý – D Ä

Ï5 ,ÕA'5B Ð

"u Ý5 ,ÕA'5B

Ï Q ¸ õ ã Ð

(M õ ã

Ï S*ü Û + Ð

S*üA¹ Q ¸ 9 ¹,ß Ý-¯,Ò,X$d AS ,XCÃ+ ,X µ C

Ï _ Ð

Ruijie# show ip bgp inconsistent-as

Ï,Ì G Q ¸ Ð

Ï G ÄAÈ â Ð

5.2.10 show ip bgp neighbors

S*üA¹ Q ¸ / ` BGP F• ,X,Ì G µ C Ä

show ip bgp neighbors [neighbor-address] [received-routes | routes | advertised-routes]

Ï – DAÈ â Ð

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)

Ï,Ì G Q ¸ Ð

Ï G ÄAÈ â Ð

5.2.11 show ip bgp paths

A¹ Q ¸*ü 9 / CÃ+ D B g ,XCÃ X µ C Ä

show ip bgp paths

Ï – DAÈ â Ð

Ï – DAÈ â Ð

DAÈ â Ð

Ï G ÄAÈ â Ð

5.2.12 show ip bgp quote-regexp

S*üA¹ Q ¸ / AS CÃ X 2 û G! ü Û n é Ë Y,X!7 í><E' ã,X BGP CÃ+ µ C Ä

show ip bgp quote-regexp regexp

Ï – DAÈ â Ð

– D	£EÄ
regexp	*ü 9 G! AS CÃ X 2 û,X ÿ ÝEë Ë,X!7 í><E' ã Ä

Ï5 ,ÕA'5B Ð

"u Ý5 ,ÕA'5B

Ï Q ¸ õ ã Ð

(M õ ã

Ï S*ü Û + Ð

S*üA¹ Q ¸ / AS CÃ X 2 û G! ü Û n é Ë Y,X!7 í><E' ã,X BGP CÃ+ µ C Ä

---

a _ É !

E-G ,X!7 í><E' ã?U S*ü é Ë Ä

Ï _ Ð

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
*> 211.21.25.0/24 110.110.110.10 0 1000 300
*> 211.21.26.0/24 110.110.110.10 0 1000 300

Ï,Ì G Q ¸ Ð

Ï G ÄAÈ â Ð

5.2.13 show ip bgp regexp

S*üA¹ Q ¸ / AS CÃ X 2 û G! Û n!7 í><E’ ã,X BGP CÃ+ µ C Ä

A¹ Q ¸"u Ý – D

Ï Q ¸ õ ã Ð

(M õ ã

Ï S*ü Û + Ð

S*üA¹ Q ¸ 9 ¹,ß BGP ,X,Ì G µ C

Ï _ Ð

```
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
```

Ï,Ì G Q ¸ Ð

Q ¸	£EÄ
router bgp	' Ô BGP #A,

Ï G ÄAÈ â Ð

5.2.15 show ip bgp vpnv4

A¹ Q ¸*ü 9 / Ý vrf ê5Ù rd ,X vpn CÃ+ µ C Ä

show ip bgp vpnv4 all [network | neighbor [| address] | summary | label]

show ip bgp vpvn4 vrf vrf_name [network | summary | label]

show ip bgp vpvn4 rd rd_value [network | neighbor [| address] | summary | label]

Ï – DAÈ â Ð

– D	£EÄ
network	¤5%4° Ä
neighbor	/ CÃ+ ,XF• µ C

summary	/ CÃ+ ,X ?U µ C
label	/ CÃ+ ,X Û1R µ C
vrf_name	*ü 9 ÛAš Ô þ vrf ,X á/Ä
rd_value	RD È V 100 Ö1 ê5Ù 202.118.239.165:1

Ï5 ,ÕA'5B Ð

"u Ý5 ,ÕA'5B

Ï Q ¸ õ ã Ð

(M õ ã

Ï S*ü Û + Ð

A¹ Q ¸*ü 9 / Ý vrf ê5Ù rd ,X vpn CÃ+ µ C

Ï _ Ð

```
Ruijie# show ip bgp vpnv4 all
Network Nexthop Metric Localprf
Weight Path
Route Distinguisher Ö100 Ö2
*>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 Ö100 Ö30
BGP table version is 1
3 BGP AS ÉPATH 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
```

– D	£EÄ
community-list-number	?U / µ C,X ¶ ' Ë Ä
community-list-name	?U / µ C,X ¶ ' á +

Ï5 ,ÕA'5B Ð

"u Ý5 ,ÕA'5B

Ï Q ¸ õ ã Ð

(M õ ã

Ï S*ü Û + Ð

S*üA¹ Q ¸ 9 ¹,ß ¶ ' ë><,X µ C

Ï _ Ð

Ruijie# show ip community-list
Community-list standard local
permit local-AS
Community-list standard Red-Giant
permit 0:10
deny 0:20

Ï,Ì G Q ¸ Ð ´ Ä

Ï G ÄAÈ â Ð ´ Ä

RGOS™ Q ¸ –5× `

] <G!5B

,Â)

RGOS™ Q ¸ –5× ` 0
1 Ô0´ G!5BACL Q ¸ 1
1.1 G!5B,Ì G Q ¸ 3
1.1.1 access-list 3
1.1.2 deny 8
1.1.3 ip access-group 10
1.1.4 ip access-list 11
1.1.5 ip access-list resequence 12
1.1.6 list-remark text 13
1.1.7 no sn 14
1.1.8 permit 14
1.1.9 remark 16

2.9 J W 35
2.9.1 ip session filter 35
2.9.2 ip session icmp-reply-check 35
2.9.3 ip session log-on 36
2.9.4 ip session threshold 37
2.9.5 ip session timeout 38
2.9.6 ip session track-state-strictly 40
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1 Ô0´ G!5BACL Q ¸

1 AF¼ Ú] <G!5B Q ¸ –5×

	N	Flags +!‰	32		

Þ>< Ø þ +!‰,X #/ÏG£ W À ü SNAP Çtag ,X 802.3 D B û ,X #/ÏG£ Ä

1.1 G!5B,Ì G Q ¸

< G!5B õ ã Q ¸

z access-list

„ ip access-list

„ ip access-list resequence

ACL G!5B õ ã Q ¸

„ deny

„ permit

„ remark

„ list-remark text

„ no sn

y · õ ã Q ¸

z ip access-group

1.1.1 access-list

A¹ Q ¸ ï Î Ô þA“KÂ ë><?˜ í È*ü bE›$¸ D B y [ÄA¹ Q ¸,X no 6 ã ôL8 Û n,XA“KÂ ë><><NM Ä

1) IP Û šA“KÂ ë>< Ä1 - 99 È1300 - 1999 Å

access-list id {deny | permit } {source source-wildcard | host source | any}

2) IP =)A“KÂ ë>< Ä

1 AF¼ Ú

Q ¸ õ ã < G!5B õ ã

Z S*üA“KÂ ë>< Í D BE¯> E›$¸ ÈOj ™NOEîE› Q ¸ access-list n Ô2Ï ëA“KÂ ë>< ?˜ íAÁ ¹ Ä | Ã ¹ B K '] <LÔ?U S*ü á à/¡2O,XA“KÂ ë>< Ö

Û š IP A“KÂ ë>< Ä1-99 È1300-1999 Å ¾ Í$d E¯> { Ä

=) IP A“KÂ ë>< Ä100-199 È2000-2699 Å È Ã ¹ B$d,Â,X E¯> á ,X { Ä

TCP Flag Ù ÿ ¹ ßF¼ Ú ê <F¼ Ö

„ urg
„ ack
„ psh
„ rst
„ syn
„ fin

y [ì 4{ ÿ á/Ä V ß Ö

„ critical
„ flash
„ flash-override
„ immediate
„ internet
„ network
„ priority
„ routine

S*ü Û Ð á u2O _ á/Ä V ß Ö

„

- 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-pr-big
- net-tos-pora

Ruijie(config)# access-list 1 permit 192.168.1.64 0.0.0.63
_ 2 ÖIP =)A“KÂ ë><⁄ _
ßM6,XIP =)A“KÂ ë>< AŒ DNS y [` ICMP y [EîE› Ö
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

,Ì G Q ¸

Q ¸	£EÄ
show access-lists	¹,ß Ý,XA“KÂ ë><

G ÄAÈ â ´

Q ¸ Z Æ

(Ë	AÈ â
V10.0	EC Ê(V10.0 ¹ Þ

1.1.2 deny

+ â Ô þ ê î þ,X ö × (deny),X 5 Ê ¹*ü b ‡ n y [E@ ¥ êE¬ ö × Ä

1 Å IP Û šA“KÂ ë><

[sn] deny {source source-wildcard | host source | any}

2 Å IP =)A“KÂ ë><

[sn] deny protocol source source-wildcard destiA.36 Pn-4(d]TJ /

[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]

	– D	£EÄ
	Sn	ACL ><NM c p 9” çeg&€$ ŽñQ&g&ƒ”˜ Ž÷ee%€$ ó 6e%€H û ñ
– DAÈ â	dscp	Ý Â á u-Õ&•
	dscp	-Õ&• È 8× È 0-63.
	flow-label	# Û1R
	flow-label	# Û1R È8× È 0-1048575

5 ,ÕG!5B

G ÄAÈ â ´

Q ¸ Z Æ

(Ë	AÈ â
V10.0	EC Ê(V10.0 ¹ Þ

1.1.5 ip access-list resequence

A¹ Q ¸ Í ip 2O _,X ACL ><NMG¡ f È JE¯ 9A¹G!5B õ ã Ä S*üA¹ Q ¸,X no EÝ NM 6 áT¬Ax

ip access-list resequence {id | name} start-sn inc-sn

no ip access-list resequence {id | name}

– DAÈ â

– D	£EÄ
Id	ACL 4ê Ë
name	ACL á +
start-sn	c ËCK Ÿ
inc-sn	c Ë rG£

5 ,ÕG!5B

start-sn Ö10
inc-sn Ö10

Q ¸ õ ã < G!5B õ ã

S*ü Û Ð A¹ Q ¸,XG!5B4§ p Ã ¹EîE› show access-lists Q ¸ ¹,ß Ä

G!5B –

ACL ,X><NMG¡ f Ö
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

,Ì G Q ¸

Q ¸	£EÄ

show access-lists	¹,ßA“KÂ ë><

G ÄAÈ â ´

1.1.7 no sn

ôL8 ACL ,X Ô þ><NM

no sn

– DAÈ â

– D	£EÄ
sn	ACL ,X Ô þ><NM,X c Ë

5 ,ÕG!5B ´

Q ¸ õ ã ACL G!5B õ ã ß

S*ü Û Ð ü ACL G!5B õ ã ß ôL8 ACL ><NM

G!5B _

```
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
```

,Ì G Q ¸

Q ¸	£EÄ
show access-lists	¹,ß Ý,XA“KÂ ë><
ip access-list	ip ACL ,X n
permit	n AŒAÁ ACL ><NM

G ÄAÈ â ´

Q ¸ Z Æ

(Ë	AÈ â
V10.0	EC Ê(V10.0 ¹ Þ

1.1.8 permit

+ â Ô þ ê î þ,X AŒ (permit),X 5 Ê ¹*ü b ‡ n y [E@ ¥ êE¬ ö × Ä

1) IP Û šA“KÂ ë><

[sn] permit {source source-wildcard | host source | any}

2) IP =)A“KÂ ë><

[sn] permit protocol source source-wildcard destination destination-wildcard [precedence precedence] [tos tos] [fragments] [range lower upper] [time-range time-range-name]

Ô oG¡?U #A,,X IP =)A“KÂ { ë>< Ö

„ Internet Control Message Protocol (ICMP)

[sn] permit icmp {source source-wildcard | host source | any} {destination destination-wildcard | host destination | any} [icmp-type] [[icmp-type [icmp-code]] | [icmp-message]] [precedence precedence] [tos tos] [fragments] [time-range time-range-name]

„ Transmission Control Protocol (TCP)

[sn] permit tcp {source source-wildcard | host Source | any} [operator port [port]] {destination destination-wildcard | host destination | any}[operator port [port]] [precedence precedence] [tos tos] [fragments] [range lower upper] [time-range time-range-name] [match-all tcp-flag]

„ User Datagram Protocol (UDP)

[sn] permit udp {source source -wildcard|host source |any} [operator port [port]] {destination destination-wildcard |host destination | any} [operator port [port]] [precedence precedence] [tos tos] [fragments] [range lower upper] [time-range time-range-name]

– DAÈ â	– D	£EÄ
	¹ ß"u Ý ¤ ,XAË –?• deny	-

5 ,ÕG!5B "u Ý Ï)><NM

Q ¸ õ ã ACL G!5B õ ã ß

S*ü Û Ð ü ACL G!5B õ ã ßG!5B ACL ,X AŒ 5 Ê><NM

G!5B –

_ 1 ÖßM6 IP =) ACL S*ü8× _ È‚Â,X šAŒ IP 192.168.4.12 ,X$d ¤ o TCP 0Ã · 100 ,X á u È J h*ü y · 1 ÄG!5B •"©

Ruijie(config)# ip access-list extended 102

Ruijie(config-ext-nacl)# permit tcp host

S*ü Û Đ

Û n,X ACE #Ï t"¼Gž µ C
"¼ ã Ö ¾ AŒ7Ç î100 þ +0ú È á AŒ Ô þ ACL Y Î)„ 2 5,Ì à Y •"¼Gž
ôL8 ace Ê í î ÚA¹ 5 ace â ! Ô 5 ace KÈ,X remark 3 ÔCK ôL8

G!5B _

```
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#
```

,Ì G Q ¸

Q ¸	£EÄ
show access-lists	/ A“KÂ ë><
ip access-list	IP A“KÂ ë>< n

Q õã (M õ

S*ü Ú Ð / ÿ · Þ h*ü,X ACL È à Ú h Þ h*ü,X ACL

Ruijie# show access-group
ip access-list standard ipstd3
Applied On interface GigabitEthernet
ip access-list standard ipstd4
G!5B _ Applied On interface GigabitEthernet 0/2.
ip access-list extended 101
Applied On interface GigabitEthernet
ip access-list extended 102
Applied On interface GigabitEthernet 0/8.

¡¦G Q¸

Q¸	£EÄ
ip access-group	ip A“KÂ ë><KÂ n

G AAÈ à

Q¸Z Æ

Ë	AÈ â
V10	ÈC È(V10.0 ¹ Þ

1.2.2 show access-lists

/ Ý ACL G!5B â Ê á +,X ACL

show access-lists [id | name]

	£EÄ
– DAÈ â id	A ,X4ê Ë

Ruijie# show access-lists
ip access-list standard n_acl
ip access-list extended 101

,Ì G Q ¸

Q ¸	£EÄ
ip access-list	IP ACL n Ä

G ÄAÈ â ´

Q ¸ Z Æ

(Ë	AÈ â
V10.0	EC Ê(V10.0 ¹ Þ

1.2.3 show ip access-group

/ y · G!5B,X IP ACL

show ip access-group [interface <interface>]

– DAÈ â

– D	£EÄ
<interface>	Û n,X y ·

5 ,ÕG!5B ´

Q ¸ õ ã (M õ ã

S*ü Û Ð / y · G!5B,X IP ACL È8¹"u Ý Û n y · È í / Ý y · G6(,X IP ACL

G!5B _

Ruijie# show ip access-group interface gigabitethernet 0/1
ip access-group aaa in
Applied On interface GigabitEthernet 0/1.

,Ì G Q ¸

Q ¸	£EÄ

2.1.2 ip inspect name

G!5B Ô/¡(M!^ #A,,X u ¹?˜ í ÄA¹ Q ¸,X no 6 ã 9 ôL8A¹ 5 u ¹?˜ í Ä

ip inspect name inspection_name protocol

no ip inspect name inspection_name protocol

Ï – DAÈ â Ð

inspection_name: A¹ u ¹?˜ í,X á +

protocol: LÔ?U u ¹,X #A, á/Ä È,Â ! Ã ¹ Û n V ß,X(M!^ #A, Ö ftp Èmms È rtsp Èsip Èh323, tcp

Ï5 ,Õ ™ ‰ Ð

Ï Q ¸ õ ã Ð

< G!5B õ ã Ä

Ï S*ü Û + Ð

S*üA¹ Q ¸G!5B Ô þ u ¹?˜ í

Ô þ u ¹?˜ í Ã ¹ Í î þ(M!^ #A,E¯> u ¹ Ä –?•/ _ Å

Ï _ Ð

ßM6,X/ _G!5B Z ø þ u ¹?˜ í È abc u ¹ ftp ` mms #A, È 123 u ¹ mms ` h.323 #A, Ö

```
Ruijie(config)#        ip inspect name      abc   ftp
Ruijie(config)#        ip inspect name      abc   mms
Ruijie(config)#        ip inspect name       123  mms
Ruijie(config)#        ip inspect name      123   h323
```

ÏAÈ â Ð

C³ cisco 2O È"u ÝA: alert ` uAu audit Ô G ×

2.1.3 show ip inspect

¹,ß G b(M!^ #A,,X u ¹?˜ í,X µ C Ä

show ip inspect parameter

Ï – DAÈ â Ð

parameter: ÃEÝ – D Ý name inspection_name ÖL$ ¾ / Û n,X u ¹?˜ í

interface Ö / üCÃ+ < y · Þ%”# ,X u ¹?˜ í

all Ö / Ý,X µ C

Ï5 ,Õ ™ ‰ Ð

Ï Q ¸ õ ã Ð

< G!5B õ ã Ä

Ï S*ü Û + Ð

S*üA¹ Q ¸ ¹,ß G b Ä(M!^ Å #A„,X u ¹?˜ í,X µ C

Ï _ Ð

ßM6,X/ _*ü 9 ¹,ß u ¹?˜ í abc ,X µ C

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

ÏAÈ â Ð

C³ cisco 2O È µ CG£ å

2.2 IP MAC 4¥ n

2.2.1 clear ipmacbind

#ÙL8IP MAC 4¥ n?˜ í Ä

clear ipmacbind {dynamic | all}

Ï – DAÈ â Ð

dynamic : #ÙL8 Ý ¢ ARP >< Ð 9,X | Õ IP MAC 4¥ n?˜ í ×

all: #ÙL8 Ý,X IP MAC 4¥ n?˜ í

Ï5 ,Õ ™ ‰ Ð

L &? mIP MAC 4¥ n s6Ñ5 ,Õ GKÁ

Ï Q ¸ õ ã Ð

< G!5B õ ã Ä

Ï S*ü Û + Ð

V p IP MAC 4¥ n?˜ í <0N Z ÈL &? m

ßM6,X/ _#ÙL8 Ý,X ¢ ARP >< Ð 9,X | Õ IP MAC 4¥ n?˜ í Ö

Ruijie# clear ipmacbind dynamic

ÏAÈ â Ð

Cisco "u ÝA¹ Q ¸

2.2.2 ipmacbind

G!5B Ô þIP MAC ,X4¥ n?˜ í ÄA¹ Q ¸,X no 6 ã 9 ôL8A¹ 54¥ n?˜ í Ä

ipmacbind A.B.C.D H.H.H log

no ipmacbind A.B.C.D H.H.H log

Ï – DAÈ â Ð

A.B.C.D: ?U4¥ n,XIP

H.H.H: ?U4¥ n,XMAC

log: úA„) ¹ «

Ï5 ,Õ ™ ‰ Ð

L &? mIP MAC 4¥ n s6Ñ5 ,Õ GKÁ

Ï Q ¸ õ ã Ð

< G!5B õ ã Ä

Ï S*ü Û + Ð

S*üA¹ Q ¸G!5B Ô þ4¥ n?˜ í

G!5B Z Ï ã Ô þ4¥ n?˜ í â ÈL &? m IP MAC 4¥ n s6Ñ 7¾ | *ü Z

ôL8 Ý,X4¥ n?˜ í â ÈL &? m IP MAC 4¥ n s6Ñ 7¾ | GKÁ Z

Ô þ MAC Þ Ã ¹4¥ n î þ IP È Ô þ IP ¾ AŒ4¥ n Ô þ MAC Ä

Ï _ Ð

ßM6,X/ _G!5B Z Ô þ4¥ n?˜ í Ö

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

ÏAÈ â Ð

Cisco "u ÝA¹ Q ¸

2.2.3 ipmacbind auto

¢ ARP >< Ð 9 IP MAC 4¥ n?˜ í Ä

ipmacbind auto log

Ï – DAÈ â Ð

log : úA„) ¹ «

Ï5 ,Õ ™ ‰ Ð

L &? mIP MAC 4¥ n s6Ñ5 ,Õ GKÁ

Ï Q ¸ õ ã Ð

< G!5B õ ã Ä

Ï S*ü Û + Ð

S*üA¹ Q ¸ ¢ ARP >< Ð 9 IP MAC 4¥ n?˜ í È‰ &? m IP MAC 4¥ n s6Ñ 7¾ | *ü Z Ä

Ï _ Ð

ßM6,X/ _ ¢ ARP >< Ð 9 IP MAC 4¥ n?˜ í Ö

Ruijie(config)# ipmacbind auto

ÏAÈ â Ð

Cisco "u ÝA¹ Q ¸

2.2.4 show ipmacbind

¹,ß G b IP MAC 4¥ n?˜ í,X µ C Ä

show ipmacbind table | hash | statistic

Ï – DAÈ â Ð

table : ¹,ß IP MAC 4¥ n?˜ í>< haog

Ï _ Ð

ßM6,X/ _ ¹,ß G b IP MAC 4¥ n?˜ í,X µ C Ö

Ruijie# show ipmacbind table
No.

ßM6,X/ zÂc G b

2.3.2 show ip ingress-filter

¹,ß G b5%4° 9 ·E›$¸,X µ C Ä s6Ñ ú Ô ÈL • Z î å 5M2"©,X# Å Ä

show ip ingress-filter

Ï – DAÈ â Ð

Ï5 ,Õ ™ ‰ Ð

5%4° 9 ·E›$¸ s6Ñ5 ,Õ GKÁ

Ï Q ¸ õ ã Ð

< G!5B õ ã Ä

Ï S*ü Û + Ð

Ï _ Ð

ßM6,X/ _ ¹,ß5%4° 9 ·E›$¸ s6Ñ,X µ C Ö

Ruijie# show ip ingress-filter
Firewall Network-ingress-filter is enable, blocked 0 flows
Interface FastEthernet 1/0: log is on, blocked 0 flows

ÏAÈ â Ð

Cisco "u ÝA¹ Q ¸

2.4 TCP SYN ·)Ú

2.4.1 ip tcp-intercept list

ü ¤ þ y ·,X ¤ þ • å Þ Í Û n,X5%4°# G£ *ü TCP SYN ·)Ú s6Ñ ÄA¹ Q ¸,X no 6 ã GKÁA¹ s6Ñ Ä

ip tcp-intercept list extended_ACL_# {in | out} <log>

no ip tcp-intercept list extended_ACL_# {in | out} <log>

Ï – DAÈ â Ð

extended_ACL_#: Û n5%4°# G£

in | out: 0*ü ü y · Þ,X • å

log: úA„) ¹ «

Ï5 ,Õ ™ ‰ Ð

TCP SYN ·)Ú s6Ñ5 ,Õ GKÁ

2.5 TCP NN c Ë ” ¹

2.5.1 ip inspect name tcp

G!5Btcp #A,,X u ¹?˜ í Ä TCP NN c Ë ” ¹ Å ÄA¹ Q ¸,X no 6 ã 9 ôL8A¹ 5 u ¹?˜ í Ä

ip inspect name inspection_name tcp

no ip inspect name inspection_name tcp

Ï – DAÈ â Ð

inspection_name: A¹ u ¹?˜ í,X á + È2O b ACL ,X á/Ä

Ï5 ,Õ ™ ‰ Ð

Ï Q ¸ õ ã Ð

< G!5B õ ã Ä

Ï S*ü Û + Ð

S*üA¹ Q ¸G!5B Ô þ tcp u ¹?˜ í

tcp u ¹?˜ í h*ü y · Þ ÈG›*ü ip inspect Q ¸ Ä

tcp u ¹?˜ í,X ¹,ß ÈG›*ü show ip inspec t Q ¸ Ä

Ï _ Ð

ßM6,X/ _G!5B Z Ô þ tcp u ¹?˜ í tcp_inspec Ö

Ruijie(config)# ip inspect name tcp_inspec tcp

ÏAÈ â Ð

C³ cisco 2O È"u ÝA: alert ` uAu audit Ô G ×

ip inspect name Q ¸,X º ê Ô/¡ ™ ‰ Ä 3LÔ?U S*ü ip inspect Q ¸ 9 h *ü y · Þ È S*ü show ip inspect Ã ¹ ¹,ß u ¹,X,Ì G µ C Ä

2.6 url E›$¸

2.6.1 ip urlfilter category

A’5B url E›$¸?˜ í,X url 2O ÿ È Ú Ô þ ê8¹ F þ url 2O ÿ t 9 Ô þ?˜ í Ä

Q ¸,X no 6 ã ôL8 Ô þ url 2O ÿ Ä

ip urlfiter category url-filter-no url-category

no ip urlfilter category url-filter-no <url-category>

Ï – DAÈ â Ð

url-filter-no url ?˜ í4ê Ë Ä ID Å

url-category url 2O ÿ

Ï5 ,Õ ™ ‰ Ð

´ Ï) url 2O ÿ

Ï Q ¸ õ ã Ð

< G!5B õ ã Ä

Ï S*ü Û + Ð

V p Ç ü Ô 5 url E›$¸?˜ í r t ê URL 2O ÿ ÈAË ü <] <1*+9 õ ã ß S *ü ip urlfilter category Q ¸ È

V p?U ôL8 URL 2O ÿE›$¸?˜ í ÈAË S*ü no ip urlfilter category Q ¸ Ä

Ï _ Ð

ßM6,X Q ¸ ü4ê Ë 10 ,X url E›$¸?˜ í r t Ô þ á porn ,X url 2O ÿ Ö

Ruijie(config)# ip urlfilter category 10 porn

2.6.2 ip urlfilter exclusive-domain

!8 Q ¸*ü b r t ê Â Ô 5 url E›$¸?˜ í y · Þ È

A¹ Q ¸,X no 6 ã*ü b ü ôL8 Ô 5 ê <F¼,X url E›$¸?˜ í Ä

A¹ Q ¸>• h*ü â È V p ' !>• Ø)Ú,X url AË" 6Ñ üE›$¸?˜ í,X2O ÿ R G! NM È í | 0 action È ú í ¹ action ,Ì ¡,X | 0 Ø)Ú Ä

ip urlfilter exclusive-domain url-filter-no acl-no action {in|out} < log >

no ip urlfilter exclusive-domain url-filter-no acl-no action {in|out} < log >

Ï – DAÈ â Ð

url-filter-no Öurl ?˜ í4ê Ë Ä ID Å

acl-no Öacl ?˜ í Ë

action Ö | 0 È block Ö ¦4± È permit Ö y «

{in | out} Ö • å È in Ö 9 · • å È out Ö Î · • å

Log ÖA„) url E›$¸ ¹ «

6Ñ ü +0ú KÈ Î)„ Ä‚OA„‚X url ™NO Ô4{ ³ á È á6Ñ `4{ ³ á

Ï _ Đ

ßM6,X Q ¸‚OA„ Ô þ URL È' â a ôL8 W Ö

Ruijie(config)# ip urlfilter rule porn .sex.com
Ruijie(config)# no ip urlfilter rule porn .sex.com

ßM6,X Q ¸‚OA„ Ô þ ú Ý !5BEîG!0ú‚X URL È' â a ôL8 W Ö

Ruijie(config)# ip urlfilter rule porn .*sex.com
Ruijie(config)# no ip urlfilter rule porn .*sex.com

ßM6,X Q ¸‚OA„ Ô þ ú Ý â5BEîG!0ú URL È' â a ôL8 W Ö

Ruijie(config)# ip urlfilter rule porn .sex*
Ruijie(config)# no ip urlfilter rule porn .sex*

ßM6,X Q ¸‚OA„ Ô þ ! âFÑ ÝEîG!0ú‚X URL È' â a ôL8 W Ö

Ruijie(config)# ip urlfilter rule porn .*sex*
Ruijie(config)# no ip urlfilter rule porn .*sex*

2.6.4 show ip urlfilter

S*üA¹ Q ¸ 9‚¥ { url E›$¸ õ + Ä

Ã ¹ S*ü ßM6 Ý 5 Q ¸ 9‚¥ { Ö

show ip urlfilter config {address|rule|setting } / CÃ+ < Þ url E› $¸ kG!5B Ä

show ip urlfilter statistics / A¹ õ +‚X u ¹4³Au µ C È Ù À ¥EÕ ` ¢ Y • á u < « ‚X AŒ‚X D‚Â Ã ¹ ž>•L 2E² y‚X D‚Â Ä

Ï – DAÈ â Đ

addres s url G!5B µ C

rule url ?˜ íG!5B µ C

setting url E›$¸ y · h*ü µ C

Ï5 ‚Õ ™ ‰ Đ

Ï Q ¸ õ ã Đ

< G!5B õ ã Ä

Ï S*ü Û + Đ

show ip urlfilter config setting Q ¸ S*ü ü y ·G!5B ß / ' ! y ·?˜ í

h*ü ™ ‰ È < õ ã ß / Ô â Ô õE¯ 9 y · õ ã0Ã ·G!5B ™ ‰ Ä

Ï _ Ð

ßM6,ß Ô oE- o Q ¸Eg Î,X _ $ Ä

S*ü show ip urlfilter config address Q ¸

sho ip urlfilter conf address

==========[Url without wildcard]==========
cls_name cls-id url-address aaa 1 .tom.com
==========[Url no-wildcard end]==========
==========[Relative CLI Command]==========
ip urlfilter rule aaa .tom.com
=== [Relative CLI Command To Del the Rules]==========
no ip urlfilter rule aaa .tom.com

S*ü show ip urlfilter config rule Q ¸

Ip UrlFilter Rule configure
Id Attribute Details
---
1 contain-class: aaa
==========[Relative CLI Command]==========
ip urlfilter category 1 aaa
====== [Relative CLI Command To Del the Rules]==========
no ip urlfilter category 1 aaa

S*ü show ip urlfilter config setting Q ¸

===== [Url Filter Rules On gigabitEthernet 0/0]========
Rules On Input
Id Acl Action Class-name Url-address
---
1 1 block aaa .tom.com
Relative CLI Command
ip urlfilter exclusive-domain 1 1 block in log
Relative CLI Command to Del Rules
no ip urlfilter exclusive-domain 1 1 block in log
=====[UrlFilterRulesOngigabitEthernet0/0End]=======

S*ü show ip urlfilter statistic Q ¸

show ip urlfilter statistics
url filter statistics
the rule 1
Total requests allowed: 0
Total requests blocked: 0

2.7 îA±L$

2.7.1 session-limit

G!5B Í Û n*ü 8× È Y Ý*ü E² y DL$ s6Ñ

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 >

Ï – DAÈ â Ð

acl_no ?˜ í Í hA“KÂ ë>< Ë

rate „ ÎE² y D)[

session_no Ô û J ¥E² y D

in|out E² y • å

Ï5 ,Õ ™ ‰ Ð

á .L$

Ï Q ¸ õ ã Ð

y ·G!5B õ ã Ä

Ï S*ü Û + Ð

G£1u)Ú Q ¸G!5B ü Î y ·

Ï _ Ð

G!5BA“KÂ ë>< Y*ü Ô û J ¥E² y D 1000 ÈÈ!£/¦ AŒ „ Î 100 5E² y

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

ÏAÈ â Ð

A¹ Q ¸ ™NOG! Ü ü Î y · È ú í á*ó Ä

A¹ s6Ñ Í H ')[E ¡ á û Ä

2.8 # G£1u)Ú

2.8.1 ip rate-control

G!5B Í Û n*ü 8× È Y!£ þ*ü # G£L$ s6Ñ

ip rate-control acl_no bandwidth {

2.9 J W

2.9.1 ip session filter

E² yE›$¸ È*ü bL$ Ô oM2"©,XE² yEî µ Ä Q ¸ Ô Ê È Í!7 ¡ å# E¯> E› $¸ Ø)Ú ÈE›$¸,X D B y [>• ö × È è# G Ä 3 á î ï Î Í h,X# ><NM ÄT¬Ax ™ ‰ ß á ' Ô Ä

ip session filter acl_id

no ip session filter

Ï – DAÈ â Ð

acl_id A“KÂ { ë><4ê Ë

Ï5 ,Õ ™ ‰ Ð

5 ,Õ GKÁE² yE›$¸ s6Ñ Ä

Ï Q ¸ õ ã Ð

< G!5B õ ã Ä

Ï S*ü Û + Ð

ü n A“KÂ { ë>< â ÈEîE›A¹ Q ¸ ÚA“KÂ { ë>< h*ü bE² yE›$¸ È!8 Ê E² yE›$¸ s6Ñ*ó Ä

Ï _ Ð

_ 1 Ö ßM6,X Q ¸ L !6 IP $d 192.168.1.10 D B# Eî µ,X/ _ Ö

```
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
```

ÏAÈ â Ð

!8 Q ¸G!5B â < *ó È*ü G!5BA¹ Q ¸ â È Ã6Ñ+ b Û n,XE›$¸8× È þ û È Ð7È J ª!7 # ´"©!7 Eî µ È*ü h ã — S*ü!8 Q ¸ Ä

2.9.2 ip session icmp-reply-check

ICMP ¡ å# ” ¹ È GKÁ Ê È ICMP ¾ Ý ¡ å# î „ Í h# ,X*ó , ó È Î)„ ´"© ping Eî,X ™ ‰ ß# î7¾ | ôL8G¡ Î Ä ' Q ¸ Ô Ê È!7 ¡ å# FÑ î „ Í h# ,X*ó , ó ÄT¬Ax ™ ‰ ß á ' Ô ÈT¬Ax á / Ä

ip session icmp-reply-check

no ip session icmp-reply-check

Ï – DAÈ â Ð

´

Ï5 ,Õ ™ ‰ Ð

5 ,Õ GKÁ ICMP ¡ å# ”¹ s6Ñ Ä

Ï Q ¸ õ ã Ð

< G!5B õ ã Ä

Ï S*ü Û + Ð

EîE›A¹ Q ¸ ' Ô ICMP ¡ å# ”¹ s6Ñ Ä

Ï _ Ð

_ 1 Ö ßM6,X Q ¸ Ú ICMP ¡ å# ”¹ s6Ñ/ _ Ö

2.9.4 ip session threshold

EîE›A¹ Q ¸ ¬ Ö îA±(Š Õ ß!7 å y [DG£L$ n Ä

Ï _ Ð

ßM6,X Q ¸ Ú icmp-started (Š Õ!7 å y [DG£L$ n 10 þ Ö

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

ÏAÈ â Ð

V p ´(M ÿLÔ?U ÈAË á?U ¬5 ,ÕG!5B Ä

2.9.5 ip session timeout

G!5B îA±CY Ê ÈA¹ Q ¸,X no 6 ã 6 á5 ,Õ Ä

A¹ Q ¸ Ô4˜ Q ¸ È!£ Ô/¡ îA±(Š Õ Í h Ô þG!5B Q ¸ Ä

ip session timeout icmp-closed timeout_value

ip session timeout icmp-started timeout_value

ip session timeout icmp-connected timeout_value

ip session timeout tcp-established timeout_value

ip session timeout tcp-syn-sent timeout_value

ip session timeout tcp-syn-receive timeout_value

ip session timeout tcp-fin-wait timeout_value

ip session timeout tcp-time-wait timeout_value

ip session timeout tcp-closed timeout_value

ip session timeout tcp-close-wait timeout_value

ip session timeout tcp-last-ack timeout_value

ip session timeout udp-closed timeout_value

ip session timeout udp-started timeout_value

ip session timeout udp-connected timeout_value

ip session timeout udp-established timeout_value

ip session timeout rawip-closed timeout_value

ip session timeout rawip-started timeout_value

ip session timeout rawip-connected timeout_value

ip session timeout rawip-established timeout_value

no ip session timeout icmp-closed

no ip session timeout icmp-started

no ip session timeout icmp-connected

no ip session timeout tcp-established

no ip session timeout tcp-syn-sent

no ip session timeout tcp-syn-receive

no ip session timeout tcp-fin-wait

no ip session timeout tcp-time-wait

no ip session timeout tcp-closed

no ip session timeout tcp-close-wait

no ip session timeout tcp-last-ack

no ip session timeout udp-closed

no ip session timeout udp-started

no ip session timeout udp-connected

no ip session timeout udp-established

no ip session timeout rawip-closed

no ip session timeout rawip-started

no ip session timeout rawip-connected

no ip session timeout rawip-established

Ï – DAÈ â Ð

timeout_value CY Ê ÊKÈ È) ! /¦

Ï5 ,Õ ™ ‰ Ð

Ø îA±(Š Õ5 ,ÕCY Ê V ß Ö

icmp-closed 10

icmp-started 10

icmp-connected 10

tcp-established 1800

tcp-syn-sent 10

tcp-syn-receive 10

tcp-fin-wait 60

tcp-time-wait 10

tcp-closed 10

tcp-close-wait 60

tcp-last-ack 30

udp-closed 10

udp-started 60

ïAÈ â Ð

ù (Š ÕC³Cþ ü Ý,X ™ ‰ ß Ã6ÑEô äAÃ y ÈAË B rL ™ ‰LÔ?U ‡ n ú ' Ô!8 s6Ñ Ä

1 Ý0´ 5%4°] < #A, Ä IPSec Å Q ¸

3.1 G!5B,Ì G Q ¸

5%4°] < #A, Ä IPSec ÅG!5B Ù ÿ ¹ ß Q ¸ Ö

3.1.1 authentication (IKE policy)

?U Û n IKE 1*+9,XAxA• •"© ÈAË ;> IKE 1*+9G!5B Q ¸ authentication Ä A¹ Q ¸,X no 6 ã 6 á5 ,ÕAxA• •"© Ä

authentication {pre-share |rsa-sig|digital-email }

no authentication

– D	£EÄ
pre-share	NX E • šJyP`A•
rsa-sig	D +1R áP`A•
digital-email	D + µ ÕAxA• Ä 97¾ Éipsec vpn T ?˜8× Ê Å

– DAÈ â

5 ,ÕG!5B RGOS 8.31 (¹ â5 ,Õ D +1R áP`A• Ä RGOS8.31 ( !5 ,Õ NX E • šJyP`A• .

Q ¸ õ ã IKE t šG!5B õ ã Ä

S*ü Û Ð ,Â ! IKE # 1*+9 P`A• • ãT¬AxG›*ü D +1R áP`A• ÈE- â Cisco ,Ì à È V p à ïG›*ü NX E • šJy • ãP`A• íLÔ?U r t Ô þ IKE 1*+9 ÄG!5B äNX E • • ã Å Ä

digital-email AxA• õ ã ™*ü b `(M!^ Ü ß `EîE› 6 0 1k"©AxA¥A’ Û fEî Ä ¥CK0ÃLÔ?U NX G!5B Í0ÃA• : Ä

G!5B _ ´ È

Q ¸	£EÄ
crypto isakmp enable	S6ÑIKE Ä
encryption {des | 3des | aes-128 | aes-192 | aes-256 | sm1}	Û n t š1k"©
hash {sha | md5}	Û n HASH 1k"©
group {1 | 2}	Û n Diffie-Hellman 4˜ ÛAš
lifetime	Û n IKE] <6(,³,X*ó Q < ó Ä

,Ì G Q ¸

-

crypto dynamic-map dynamic-map-name dynamic-seq-num

no crypto dynamic-map dynamic-map-name [dynamic-seq-num]

– DAÈ â

– D	£EÄ
dynamic-map-name	Û n t š ô ØLš,X á/Ä
dynamic-seq-num	Û n t š ô Ø,X 5,Â Ë

5 ,ÕG!5B "u Ý | Õ t š ô Ø , ü Ä

Q ¸ õ ã < G!5B õ ã Ä

,Ì G Q ¸

Q ¸	£EÄ
crypto map(interface IPSec)	Ú t š ô Ø h*ü b y ·
match address	t š ô Ø ë>< Û n Ô þA“KÂ ë>< Ä
Set peer	Û nE°/ß Í1 '
Set transform-set	Û n ¬ 6Lš Ü
show crypto map	¹,ß t š ô Ø µ C

G ÄAÈ â ´

Q ¸ Z Æ

(Ë	AÈ â
-	-

3.1.5 crypto ipsec df-bit

ü < õ ã ß Í <F¼ y ·A’5B Õ>™ ,X DF È*ü < Q ¸ crypto ipsec df-bit {clear | set | copy }

– DAÈ â

– D	£EÄ
clear	êF¼IP î ^ DF Bit #ÙL8 ÈA’ Û Ã6Ñ Ú(y [J t Þ IPSEC Õ>™
set	êF¼IP î ^ DF Bit 5B1 È 5à V p s Ÿ,X IP ,X DF Bit #ÙL8,X ÈA’ Û Ã6Ñ î Ú(y [
copy	A’ Û î ^ s Ÿ,X DF Bit 0 êF¼ ,X DF Bit È copy 5 ,Õ,X

5 ,ÕG!5B Q ¸5 ,Õ/U*ü

Q ¸ õ ã < G!5B õ ã Ä

	-	-

3.1.7 crypto ipsec optional

ü < õ ã ßEîE› crypto ipsec optional Q ¸ GKÁ ipsec] < ” ¹ Ä

crypto ipsec optional

no crypto ipsec optional

– DAÈ â	– D	£EÄ

5 ,ÕG!5B	5 ,Õ ™ ‰A¹ Q ¸ GKÁ
Q ¸ õ ã	< G!5B õ ã Ä
S*ü Û Đ	] < ” ¹ D• ÍC $d ÔJÔ!¨EW û È GKÁA¹ s6Ñ Ã ¹8V4z cpu C $d Ä2tp over ipsec ,X õ _ È l2tp Ã ¹ Û n ipsec s6Ñ È3 Ã ¹ r)„ y [™NO4£E› ipsec t š,X y [!6ÑEîE› Ä Ã ¹ B rL LÔ?U4˜ Ü S*ü
G!5B _	_ 1 Ö ª#\ ] < ” ¹ crypto ipsec optional

,Ì G Q ¸	Q ¸	£EÄ
	-	-

G ÄAÈ â	´

Q ¸ Z Æ	(Ë	AÈ â
	-	-

3.1.8 crypto ipsec security-association lifetime

?U Â IPSec] <6(,³ # Ê S*ü,X < *ó Q < ó È Ã ¹ S*ü crypto ipsec security-association lifetime < G!5B Q ¸ ÄA¹ Q ¸,X no 6 ã Ú*ó Q < ó 6 á ä5 ,Õ Ä

crypto ipsec security-association lifetime {seconds seconds | kilobytes kilobytes}

no crypto ipsec security-association lifetime {seconds | kilobytes }

– DAÈ â	– D	£EÄ

seconds seconds	] <6(,³CY Ê ÊKÈ Ä/¦ Å Ä5 ,Õ 3600 /¦ Ä 1 ã Ê Å Ä Ã ¹G!5B 0 È></ á *ü ÊKÈCY Ê s6Ñ Ä
kilobytes kilobytes	] <6(,³,XCY ÊEî µG£ Ä ¹ +8VAu Å Ä5 ,Õ 4,608,000KB Ä ÃG!5B 0 È></ á *ü +8VCY Ê s 6Ñ Ä

5 ,ÕG!5B

3600 /¦ Ä 1 ã Ê Å ` 4,608,000KB Ä ¹!£/¦ 10MB ,XEó)[Eî µ 1 þ ã Ê Å Ä

Q ¸ õ ã

< G!5B õ ã Ä

S*ü Û Ð

1.Sec] <6(,³ t šEî µ Î0Ÿ ü S*ü E • šJy,X Î. Þ Ä Z.B ±] < È] <6(,³ Ú ü 4£E› Ô n ÊKÈ êEî µG£ âCY Ê ÈG¡ „ # È J S*ü „,X E • šJy Ä 'A' Û üE¯>] < 6(,³ # Ê È S*ü Í1 ' ¤A,,X ` A' ÛG!5B,X*ó Q < ó EW ã5Ù 0 „] <6(,³ ,X*ó Q < ó Ä

2. < ó Ý ø/¡ Ö ÊKÈ*ó Q < ó ÃEî µG£*ó Q < ó ÄE- ø þ*ó Q < ó ´AŽ ¾ þ ó È] <6(,³FÑ ÚCY Ê Ä V p ¬ Z < *ó Q < ó È!8 ¬ ¾ 0*ü bLc â # ,X „,X] <6(,³ È á î E ¡)„ ,] <6(,³ Ä V p ÇA} „,XA'5B ¿*ó È Ã ¹ S*ü clear crypto sa Q ¸#Ù L8F¼ Ú ê <F¼] <6(,³ D B g,X Y • Ä

3. < ,X ÊKÈ*ó Q < ó ÈAË S*ü Q ¸ crypto ipsec security-association lifetime seconds Ä ÊKÈ*ó Q < ó Û n Z] <6(,³ ü4£E› Z Ô n,X/¦ D âCY Ê Ä?U Â < ,XEî µG£*ó Q < ó ÈAË S*ü Q ¸,X crypto ipsec security-association lifetime kilobytes Ä Eî µG£*ó Q < ó Û n Z] <6(,³ S*ü] <6(,³ šJy t š,XEî µG£Ä ¹ KB Au ÅE' Z Ô n DG£ ¹ âCY Ê Ä

4. < ó C^-Á Èí. ?· šJy,X ÏC^L' ä s È´ Ï5Ù*ü 9E¯> Ú d,X à Ô šJy t š,X D BC^ å Ä È*ó Q < óC^-Á È*ü b Î0Ÿ „] <6(,³,X CPU Ø)Ú ÊKÈ C^ î Ä ü ¹ Î0Ÿ,X] <6(,³ "u Ý*ó Q < ó Ä

5. < ó,X ¹ 0 s)Ú Ö4£E› Z Ô n,X ÊKÈ Ä+ seconds GK + Û n Å ê ÆEî µ Z Ô n +8V ,X D BEî µG£ Ä+ kilobytes GK + Û n Å ÈE- ø Ê _ ™ ´AŽ ¾ Ê ¥*ó È] <6(,³ Ä ¹ ž,Ì h,X šJy ÅFÑ ÚCY Ê Ä „,X] <6(,³ ü s Ý] <6(,³,X*ó Q < ó UL$ E' ¹ ! Ô ŸE¯> # È ¹.B ± ' s Ý] <6(,³CY Ê,X Ê í È Æ4£ Ý Ô þ „,X] <6(,³ Ã ¹ S*ü Z Ä „] <6(,³ ü seconds *ó Q < óCY Ê ! 30 /¦ È ê4£+ E- 5L{F',X D BEî µG£C± kilobytes *ó Q < óE¬ Ý 256KB Ê Ô ŸE¯> # Ä B ¾ þ ¥*ó Å Ä V p ü Ô þ] < 6(,³,X H þ*ó Q < ó FÑ"u ÝEî µ4£E›E- 5L{F' ÈFw '!8] <6(,³CY Ê,X Ê í á îE¯ > „] <6(,³,X # Ä,Ì h È „,X] <6(,³ ¾ Ý ' IPSec ,ß?• hA¹ « ± x,X Ú4˜ Ê ! Ô ŸE¯> # Ä

6. ÊKÈ*ó Q < ó `Eî µG£*ó Q < ó á6Ñ à Ê LÊ Èú í á6Ñ ä s # Ä G!5B á" ¹ È LÔ?U*ü 7¾ Å ±A• Ä

G!5B _

_ Ö ßM6,X/ _ Ú IPSec] <6(,³,X ÊKÈ < óA' 2500 /¦ ÈEî µG£*ó Q < óA' 2304000KB(¹ 10MB Eó)[Eî µ þ ã Ê) Ö

Ruijie(config)# Cryptoipsecsecurity- associationlifetimeseconds 2500

Ruijie(config)# Crypto ipsec security- association lifetime kilobytes 2304000

,Ì G Q ¸

Q ¸	£EÄ
-	

G ÄAÈ â	´ Ä

Q ¸ Z Æ	(Ë	AÈ â
	-	-

3.1.9 crypto ipsec security-association replay disable

kG¡ • Ô G Q ¸ È Ã ¹ S*ü crypto ipsec security-association replay disable < G!5B Q ¸ ÄA¹ Q ¸,X no 6 ã 6 á ä5 ,Õ Ä

crypto ipsec security-association replay disable

no crypto ipsec security-association replay disable

	– D	£EÄ

no crypto ipsec transform-set transform-set-name

– DAÈ â

– D	£EÄ
transform-set-name	¬ 6Lš,X á/Ä
transform1 Ã transform2 Ã transform3	] <6(,³ S*ü,X] < #A, `1k"© È K ',XAË –5×] < G!5B Û Ð Ä

5 ,ÕG!5B

´ ¬ 6Lš Ü Ä

Q ¸ õ ã

< G!5B õ ã

S*ü Û Ð

1.Lš Ü] < #A, Ã1k"© ¹ ž Ú*ü b « IPSec ± x,XEî µ,X J WA'5B,X4˜ Ü Ä ü IPSec] <6(,³ # E›/ß È Í1 ' ™NO S*ü à Ô þ(M n,X ¬ 6Lš Ü 9 ± x(M n,X D B# Ä

2.G!5B î þ ¬ 6Lš Ü È â ü t š ô Ø 5,Â Û nE- o ¬ 6Lš Ü ,X Ô þ ê î þ Äü t š ô Ø 5,Â n ,X ¬ 6Lš Ü*ü b # IPSec] <6(,³ È ¹ ± x+ t š ô Ø 5,Â Í h,XA“ KÂ ë>< Û n,XFw o D B# Ä ü # E›/ß È • Í1 ' Ï R Ô þ ü • Í1 ' ÞFÑ Ý ,X,Ì à ¬ 6Lš Ü Ä ' R Z Ô þE- ,X ¬ 6Lš Ü Ê È!8Lš Ü Ú>•EÝ È J 0 • Í1 ' IPSec] <6(,³,X ÔF¼ Ú>•E¤*ü « ± x,XEî µ Þ Ä

3. EîE› ¹ 9 Î0Ÿ] <6(,³ È+ b ¹ Î0Ÿ,X] <6(,³ á # – D È´!8 ™NO ø0Ã Í1 ' ™NO Û n Ô þ,Ì à,X ¬ 6Lš Ü Ä

G!5B _

_ Ö ßM6,X/ _ n ¬ 6Lš Ü È ± x • ã ESP-DES-MD5 Ä ¤ o t š `P`A• á u Å Ö

Ruijie(config)# crypto ipsec transform-set myset esp- des esp-md5-hmac

,Ì G Q ¸

Q ¸	£EÄ
show crypto ipsec transform-set	¹,ß ¬ 6Lš Ü

G ÄAÈ â

´ Ä

Q ¸ Z Æ

(Ë	AÈ â
-	-

3.1.11 crypto isakmp enable

?U S*ü IKE E¯> IPSec] <6(,³ # È ™NO S6Ñ IKE Ä?U S6ÑIKE ÈAË ; > < G!5B Q ¸ crypto isakmp enable ÄA¹ Q ¸,X no 6 ã/U!6 IKE Ä

crypto isakmp enable

no crypto isakmp enable

– DAÈ â

– D	£EÄ
-	-

5 ,ÕG!5B	IKE 5 ,Õ ™ ‰ ß ' Ô,X Ä
Q ¸ õ ã	< G!5B õ ã Ä
S*ü Û Ð	5 ,Õ ™ ‰ ß ÈKE ' Ô,X È V p?U S*ü IKE E¯> IPSec] <6(,³ # È"u Ý ™?U S *üA¹ Q ¸ Ä V p á S*ü IKE E¯> IPSec] <6(,³ # È Ã ¹ S*üA¹ Q ¸,X no 6 ã GKÁ IKE Ä
G!5B –	_ 1 Ö ßM6,X/ _ S6Ñ IKE Ö Ruijie(config)# crypto isakmp enable

,Ì G Q ¸

Q ¸	£EÄ
-	-

G ÄAÈ â ´

Q ¸ Z Æ

(Ë	
-	-

3.1.12 crypto isakmp key

?U Û n IKE # S*ü,XNX E • šJy ÈAË ;> < G!5B Q ¸ crypto isakmp key ÄA¹ Q ¸,X no 6 ã ôL8 Û n,XNX E • šJycÄypto isakâ sâ â ž G@ÑSaA 8n O;> G@& IÀõâ

S*ü Û Ð

IKE Ô8 S*üNX E • # È?U S IKE ä s Î0Ÿ IKE] <6(,³ È ™NO S*üA¹ Q ¸ üE¯> Eî Aƒ,X ø þ Í1 ' ÞG!5B,Ì à,XNX E • šJy Ä V p Û n,X Í1 ' Ô þ5%!‰ ÈG›*ü mask 9 ÛAš W,X $5% }-Õ Ä ' peer-address ` Mask FÑ 0.0.0.0 Ê G!5BT¬Ax,XNX E • š Jy Ä

G!5B _

_ 1 Ö ßM6,X/ _ Û n â Í1 ' 172.16.1.1 E¯> IKE # ,XNX E • šJy mysecret Ö

Ruijie(config)# crypto isakmp key 0 mysecret address 172.16.1.1

,Ì G Q ¸

Q ¸	£EÄ
crypto isakmp enable	S6ÑIKE Ä
encryption {des | 3des | aes-128 | aes-192 | aes-256 | sm1}	Û n t š1k"©
hash {sha | md5 }	Û n HASH 1k"©
authentication {pre-share | rsa-sig }	Û nP`A• •"©
group {1 | 2}	Û n Diffie-Hellman 4˜ ÛAš
lifetime	Û n IKE] <6(,³,X*ó Q < ó Ä

G ÄAÈ â

´

Q ¸ Z Æ

(Ë	AÈ â
-	-

3.1.13 crypto isakmp keepalive

ZA}A' Û6Ñ ó ¥EÕ!O Í1 ' "# #\ C4-E°/ß Í1 ' È ü < G!5B G!5B crypto isakmp keepalive Q ¸ Ä Ä »(,X keepalive G!5B –?• 8.2 (Q ¸ –5× Å

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

– DAÈ â

– D	£EÄ
secs	

	retries	G¡ ¥ y [,X ÊKÈKÈLh È8× È 2 /¦ 60 /¦

Ã

5 ,ÕG!5B	á ¥EÕ!O Í1 ' ”# #\ C
Q ¸ õ ã	< G!5B õ ã
S*ü Û Ð	S*ü crypto isakmp keepaliv e SA’ Û n Ê ¥EÕ!O Í1 ' ”# #\ C4-E°/ß Í1 ' È 9 ¥)„ úE°/ß Í1 'E¬# - Ä
G!5B _	_ 1 ÖG!5BL{F'KÆ5B ÊKÈ60 /¦ ÈG¡ ¥ ÊKÈKÈLh 5 /¦ È on-demand • ã Ö crypto isakmp keepalive 60 5 on-demand

,Ì G Q ¸	Q ¸	£EÄ
	-	-

G ÄAÈ â	´

Q ¸ Z Æ	(Ë	AÈ â
	-	-

3.1.14 crypto isakmp mode-detect

*ü b] <5% G*ü õ ã ´"© ` ä Í0Ã ¥CK,X IKE # Ê È7¾ |G›*ü/Ã U õ ãE¯> # Ä

crypto isakmp mode-detect

no crypto isakmp mode-detect

– DAÈ â	– D	£EÄ
	-	-

5 ,ÕG!5B	"u ÝG!5B,X ™ ‰ ß È ¾G›*ü õ ãE¯> #
Q ¸ õ ã	< G!5B õ ã Ä
S*ü Û Ð	,Â ! Ý .] < { •,X V \ î È Ø þ Š ü r)„ Þ J á 4³ Ô,X È IKE ,X # ,X 1 ÔL !‰ ¹ 0 õ ã ¾ Ý ø/¡ È ¹ Z.B ± P • û ÈG›*ü ¹ Þ Q ¸J\ Í ´"© ` ä Í • ¥ CKIKE # E-/¡ ™ ‰ È7¾ |G›*ü/Ã U õ ã ` ä # Ä
G!5B _	_ 1 Ö ßM6,X/ _ ` ä ÍG›*ü/Ã U õ ã ¥CK,X # E¯> 7¾ |Aš ÿ Ö Ruijie(config)# crypto isakmp mode-detect

,Ì G Q ¸	Q ¸	£EÄ
	-	-

G ÄAÈ â ´

Q ¸ Z Æ	(Ë	AÈ â
	-	-

3.1.15 crypto isakmp nat disable

GKÁnat- traversal s6Ñ ÈT¬Ax ™ ‰ ß Ô Ä

crypto isakmp nat disable

no crypto isakmp nat disable

– DAÈ â	– D	£EÄ
	-	-

5 ,ÕG!5B T¬Ax ™ ‰ Ô nat-traversal

Q ¸ õ ã < G!5B õ ã Ä

S*ü Û Ð ¤ o V r)„ #A, È nat-traversal s6Ñ Õ , ü P •KÂNI È(M!^ ™ ‰ ß Ã ¹ GKÁ nat-traversal s6Ñ È r)„ fEî Ä

G!5B – _ 1 Ö ßM6,X/ _ GKÁ nat-traversal s6Ñ Ö
Ruijie(config)# crypto isakmp nat disable

,Ì G Q ¸	Q ¸	£EÄ
	-	-

G ÄAÈ â ´

Q ¸ Z Æ	(Ë	AÈ â
	-	-

3.1.16 crypto isakmp nat keepalive

Õ RFC3947 ÈIPSEC NAT-t È S*ü r t UDP

crypto isakmp nat keepalive secs

no crypto isakmp nat keepalive

– DAÈ â	– D	£EÄ
	secs	L{F' ,# ÊKÈ È8× È 5 /¦ 3600 /¦

Ã

5 ,ÕG!5B 5 ÚJs

Q ¸ õ ã < G!5B õ ã

S*ü Û Ð G!5Bcrypto isakmp nat keepalive Q ¸ Û n*ü G!5B,X keepalive ¥EÕKÈLh È áG!5B,X ™ ‰ ß S*üT¬Ax ÊKȵ ÚJs

G!5B _ _ 1 ÖG!5BL{F' keepalive ¥EÕ y [KÈLh 1 ÚJs

G!5B _

_ 1 Ö ßM6,X/ _ GKÁ next-payload ” ¹ Ö
Ruijie(config)# crypto isakmp next-payload disable

,Ì G Q ¸

Q ¸	£EÄ
-	-

G ÄAÈ â

´

Q ¸ Z Æ

(Ë	AÈ â
-	-

3.1.18 crypto isakmp peer

G!5B î peer ,X ™ ‰ ß ÈOj þ ¥CK # ,X peer EÝ ½ Ã ¹ S*ü ,crypto isakmp peer

crypto isakmp peer {bind|random}

no crypto isakmp peer

– DAÈ â

– D	£EÄ
bind	™3G)ƒ W*ó È 3G 5G!5B î peer ¼ Ë È ` ipsec ¼ Ë Í0Ã 4¥ n È Ý';G!5BNN c È1 Ô4˜ ¼ ËG!5B Í h1 Ô þ peer G!5B
random	Lc EÝ ½Oj õ ñA© # ,X peer

5 ,ÕG!5B

5 ,Õ ™ ‰ ß È Ý';G!5BNN c È ¢1 Ô þ peer Ô Ÿ ñA© Ä

Q ¸ õ ã

< G!5B õ ã Ä

S*ü Û Ð

` 3G JÒCÃ ÔCK S*ü,X Ê í ÈBG ¼ ËG!5B î4˜ ¼ Ë È ` ipsec map peer G!5B Ô Ô Í h È Ã ¹ ' Ô peer 4¥ n s6Ñ È t ¿ ¼ ËEó z Ä
ú íLÔ?UG¡A© î õ !6Ñ R ' ! Í h,X peer È1 Ô õ Î0ŸL{F',X ÊKÈ î!¨EWKS Ä

G!5B _

Ô Lc EÝ ½L{F'E² y
Ruijie(config)# crypto isakmp peer random

,Ì G Q ¸

Q ¸	£EÄ
set peer	?U Û n t š ô Ø 5,Â E°/ß Í1 '

G ÄAÈ â

´

(Ë	AÈ â

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

,Ì G Q ¸

Q ¸	£EÄ
crypto isakmp enable	S6ÑIKE Ä
encryption {des | 3des | aes-128 | aes-192 | aes-256 | sm1}	Û n t š1k"©
hash {sha | md5}	Û n HASH 1k"©
authentication {pre-share | rsa-sig }	Û nP`A• •"©
group {1 | 2}	Û n Diffie-Hellman 4˜ ÛAš
lifetime	Û n IKE] <6(,³,X*ó Q < ó Ä

G ÄAÈ â ´

Q ¸ Z Æ

(Ë	AÈ â
-	-

3.1.20 crypto isakmp rg-sm1

IKE 1*+9 t š1k"©FÑ Ú S*üJä K IKE # • ã Ä

crypto isakmp rg-sm1

no crypto isakmp rg-sm1

– D	£EÄ

,Ì G Q ¸	Q ¸	£EÄ
	-	-

G ÄAÈ â ´

Q ¸ Z Æ	(Ë	AÈ â
	-	-

3.1.21 crypto isakmp vendorid disable

GKÁIKE # E›/ß ,XJä K V µ C Ä

crypto isakmp vendorid disable

no crypto isakmp vendorid disable

– DAÈ â	– D	£EÄ
	-	-

5 ,ÕG!5B T¬Ax ™ ‰ ß ÈKE # E›/ß ú ÝJä K V µ C Ä

Q ¸ õ ã Ä < G!5B õ ã Ä

S*ü Û Ð ü IKE # E›/ß È ¤ o V Î)„ á6ÑAš ÿ/• Ý VID ÈEô ä # áEîE› È Ã ¹ S*ü!8 Q ¸ GKÁJä K V VID µ C,X ¥EÕ Ä

G!5B _ _ 1 Ö ßM6,X/ _ GKÁ vendor vendori

ã ª#\ Ô þ t š ô Ø ê 5,Â Ä

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]

– DAÈ â

– D	£EÄ
map-name	t š ô ØLš Ü,X á/Ä
seq-num	t š ô Ø 5,Â,X c ë Ë
ipsec-manual	Û n ô Ø 5,Â*ü b Î0Ÿ ¹ IPSec] <6(,³ Ä
ipsec-isakmp	Û n ô Ø 5,Â*ü b Î0Ÿ IKE # ,X IPSec] <6(,³ Ä
dynamic-map-name	Û n 0 1*+9 õ S,X | Õ t š ô ØLš,X á/Ä

5 ,ÕG!5B

á , ü t š ô Ø

Q ¸ õ ã

< G!5B õ ã È S*üA¹ Q ¸ ÚE¯ 9 t š ô ØG!5B õ ã Ä

S*ü Û Ð

?U S*ü IPSec Í D BE¯> t š ± x ÈOj ™NO n Ô þ t š ô Ø È' â Ú t š ô Ø h*ü b K ',X y · Ä ü t š ô Ø n t šEî µ,X – D È ?U Ù À ¹ ß – D Ö

1.Eî µ hA¹ « IPSec ± x Ö G6(ÆG!5B Q,X t šA“KÂ ë>< Ä

2. « IPSec ± x,XEî µ Ú>• ¥EÕ ¾G • ÖAÕ E°0Ã IPSec Í1 ' Ä

3.*ü b IPSec Eî µ,X Ö Ú t š ô ØLš Ü h*ü y · Þ È IPSec S*üEî µ y ·,X 0 Í1 ',X Ä

4. ÍE- oEî µ hA¹ h*ü ¾ o IPSec] <1*+9 Ö ¢ Ô þ ê î þ ¬ 6Lš4˜ ä,X ë>< EÝ ½ Ä

5.] <6(,³,X*ó Q ó Ä

6.] <6(,³ >• ¹ Î0ŸE¬ EîE› IKE Î0Ÿ Ä

K Ý,Ì à t š ô Ø á Ä ô Ø c ë Ë á à Å,X t š ô Ø 5,Â4˜ ä Ô þ t š ô ØLš Ü Ä Ú t š ô ØLš Ü h*ü y · Þ ÈE- ÝEîE›E- þ y ·,X IP Eî µFÑ Ú>• h*ü ü y · Þ,X t š ô ØLš ÜE¯> ø • Ä V p Ô þ t š ô Ø 5,Â ¥)„ Z hA¹ « ± x,X Î0- IP Eî µ È J è t š ô Ø Û n Z S*ü IKE ÈÚ BA¹ t š ô Ø 5,Â Ù ÿ,X – D âE°0Ã Í1 'E¯>] < 6(,³ # × V p t š ô Ø 5,Â Û n Z S*ü ¹ Î0Ÿ,X] <6(,³ ÈFw Ô þ] <6(,³ üE¯ > G!5B Ê ™NO Æ4£>• Î0Ÿ Q Z Ä´AŽ ¹ Î0ŸE¬ IKE # È ¾?U] <6(,³ ä s Î0Ÿ È D B Ú>• t š ôEg È V p] <6(,³ # Bù È D B Ú>• ö × Ä

ü t š ô Ø 5,Â £EÄ,X1*+9 Ú ü] <6(,³,X # E›/ß >• S*ü È Z S ø þ IPSec Í 1 ' KÈ,X IPSec 6Ñ óNN ýE¯> È ø þ Í1 ',X t š ô Ø 5,Â ™NO Ù ÿ f,Ì P •,XG!5B AÁ ¹ Ä ' ø þ Í1 'A© Ò Î0Ÿ] <6(,³ Ê È •FÑ ™NO7Ç å Ý Ô 5 t š ô Ø 5,Â ` Í • Í1 ',X Ô 5 t š ô Ø 5,Â,Ì P •7Ç å$µC‡ ¹ ß 5 Ê Ö

1. t š ô Ø 5,Â ™NO Ù ÿ P •,X t šA“KÂ ë>< Ä VK0 £ ô £A“KÂ ë>< Å Ä

2. •,X t š ô Ø 5,ÂÑ ™NO.B n Í • Í1 ' ÄL8M2 Í1 '!7 ü S*ü \| Õ t š ô Ø Å Ä

3. t š ô Ø 5,Â ™NO7Ç å Ý Ô þ,Ì à,X ¬ 6 Ä

4. Í b) þ y · ¾ h*ü Ô þ t š ô ØLš Ü Ät š ô ØLš Ü Ù ÿ Z IPSec/IKEÈê IPSec/ ¹ 5,Â,X4˜ Ü Ä V p 4- n,X y · ï Î î þ t š ô Ø 5,Â ÈFw ?U S*ü ô Ø 5,Â,X seq- num – D ÚE- o ô Ø 5,Â f c × seq-num

V p , ü ßM6 ´/¡ ™ ‰ ,X Ô/¡ È ™NO Ô þ y · ï Î î þ t š ô Ø 5,Â Ö

1. V p!8 y · Þ á à,X D B# Ú+ á à,X IPSec Í1 'E¯> Ø)Ú Ä

2. V p Ç?U Í á à2O _,XEî µ Ä ¥ T,Ì à ê á à,X Í1 ' Å h*ü á à,X IPSec] < û × _ V È ÇA} Ô4˜ $5%KÈ,XEî µ>•AxA• È5à º Ô4˜ $5%KÈ,XEî µ ¶>•AxA• œ>• t š Ä üE-/¡ ™ ‰ ß È á à2O _,XEî µ hA¹ ü ø þ á à,XA“KÂ ë>< >• n È J è ™NO !£ þ t š A“KÂ ë>< ï Î Ô þ)(À,X t š ô Ø 5,Â Ä

| Õ t š ô Ø S*ü –,ß crypto dynamic-map ,X S*ü Û +

_ 1 ÖßM6,X ø þ/ _ ¹ IPSec] <6(,³ ` IKE # ,X IPSec] <6(,³,X Ô ãG!5B Ö

¹ IPSec] <6(,³

Ruijie(config)# crypto map mymap 3 ipsec-manual

Ruijie(config-crypto-map)# set peer 2.2.2.2

Ruijie(config-crypto-map)# set session-key inbound esp 301 cipher abcdef1234567890

Ruijie(config-crypto-map)# set sesession-key

outbound esp 300 cipher abcdef1234567890 Ruijie(config-crypto-map)869sform-mapmymap

G!5B _] <RÕÃ¡X0ñÔ Ayuš Ruijie(config-crypto-match addr)#ey

no crypto map [map-name]

– DAÈ â

– D	£EÄ
map-name	t š ô Ø á/Ä

5 ,ÕG!5B

"u Ý Ï) t š ô Ø h*ü y · Þ

Q ¸ õ ã

y ·G!5B õ ã Ä

S*ü Û Ð

S*ü!8 Q ¸ Ú t š ô ØLš Ü h*ü b y · Ä?U ü y · Þ ¤ o Í D BE¯> IPSec t š ± x È ™NO Ú Ô þ t š ô ØLš Ü h*ü b!8 y · Ä Í b Ô þ y · È ¾6Ñ G6(Ô þ t š ô ØLš Ü Ä V p î þ t š ô Ø 5,Â K Ý,Ì à,X map-name ` á à,X seq-num ÈFw W À ! b à ÔLš Ü È J>• h*ü b à Ô y · Þ ÈFw Seq-num C^ ã,X t š ô Ø 5,Â ì 4{C^P¬ È J è E¯ > ø • Ä

Ô þ t š ô ØLš ¾6ÑG!5B ü Ô þ y · Þ

G!5B _

_ 1 Ö ßM6,X/ _ Ú á/Ä mymap ,X t š ô Ø h*ü b y · s0 Þ Ö

```
Ruijie(config)# interface serial 0
Ruijie(config-if)# crypto map mymap
```

,Ì G Q ¸

Q ¸	£EÄ
crypto map(global IPSec)	n t š ô Ø 5,Â
show crypto map	¹,ß t š ô Ø µ C

G ÄAÈ â

´

Q ¸ Z Æ

(Ë	AÈ â
-	-

3.1.24 crypto map local-address

?U Û nIPSec ,X Î n ÈA Ë ;> < G!5B Q ¸ crypto map local-address ÄA¹ Q ¸,X no 6 ã ª#\ Í IPSec ,X Û n Ä

crypto map map-name local-address interface-type interface-number

no crypto map map-name local-address

– DAÈ â

– D	£EÄ
map-name	IPSec t š ô Ø á/Ä
interface-type interface-number	0 IPSec ,X y ·2O _ `4ê Ë

5 ,ÕG!5B

IPSec D B ¢ ¾ þ y · Î • È ¹ ' ! y ·,X IPSec Ä

Q ¸ õ ã < G!5B õ ã Ä

V p Ô þ t š ô Ø h*ü b î þ y · è"u Ý*üE- þ Q ¸ È Í,Ì à,XE°/ß Í1 ' è,Ì à,X# G£RGOS Ú ü!£ þ y · ï Î Ø7¾,X IPSec] <6(,³ È

S*ü Û Ð

Q ¸ õ ã	< G!5B õ ã Ä
S*ü Û Ð	Ipsec ,X mib 1u)Ú È#] ž Í D B# Ã t?· š D B Ù,X4³Au È Í IPSec D BEî µ,X û6Ñ Ã6Ñ î Ý Ô n,X E ¡ Ä ´!8 È IPsec ,X mib 4³Au s6Ñ üT¬Ax ™ ‰ ß GKÁ ,X Ä8¹LÔA“KÂPSec V&•n,X & —Õ€ õYa (> ÂE›Â övpÝ …€

1 AF¼ Ú] <G!5B Q ¸ –5×

1 Ý0´ 5%4°] < #A, Ä IPSec

1 AF¼ Ú] <G!5B Q ¸ –5×

1 Ý0´ 5%4°] < #A, Ä IPSec

3.1.30 encryption (IKE policy)

?U Û n IKE 1*+9,X t š1k"© ÈAË ;> IKE 1*+9G!5B Q ¸ encryption ÄA¹ Q ¸,X no 6 ã 6 á5 ,Õ Ä

encryption {des|3des|aes-128|aes-192|aes-256|sm1 }

no encryption

– DAÈ â

– D	£EÄ
des	Û n !¨(M,X ' (6 & % & 0 t š1k"© Ä
3des	Û n !¨(M,X ' (6 & % & 0 t š1k"© Ä
aes-128	Û n šJyKS z !¨(M,X $ (6 0 t š1k"© Ä
aes-192	Û n šJyKS z !¨(M,X $ (6 0 t š1k"© Ä
aes-256	Û n šJyKS z 256 !¨(M,X AES 0 t š1k"© Ä
sm1	Û n šJyKS z !¨(M,X 6 0 0 t š1k"© Ä

5 ,ÕG!5B

56 !¨(M,X DES-CBC t š1k"© Ä

Q ¸ õ ã

IKE 1*+9G!5B õ ã Ä

S*ü Û Ð

A¹ Q ¸ Û n,X D B t š1k"© *ü bE¯> IKE] <6(,³ D B t š,X È á à b IPSec] <6(,³,X t š1k"© Ä

G!5B _

_ 1 Ö ßM6,X/ _ Û n IKE 1*+9,X t š1k"© DES Ö

```
Ruijie(config)# crypto isakmp policy 10
Ruijie(isakmp-policy)# encryption des
```

Q ¸	£EÄ
crypto isakmp enable	S6ÑIKE Ä

3.1.31 group (IKE policy)

?U Û nIKE 1*+9 ,X Diffie-Hellman 4˜ ÛAš ÈÆË S*ülKE 1*+9G!5B Q ¸group Ä A¹ Q ¸,X no 6 ã 6 á Diffie-Hellman 4˜ ÛAš 5 ,Õ Ä

group {1|2}

no group

	– D	£EÄ
– DAÈ â	1	Û n 768 !¨(M Diffie-Hellman 4˜ Ä
	2	Û n 1024 !¨(M Diffie-Hellman 4˜ Ä

5 ,ÕG!5B	768 !¨(M Diffie-Hellman 4˜ Ä group 1 Å

'9B—!ðO Yp ã 6 à ïƒ87‘ !¨(@À $ ” 9ò çe#Ÿ80Ð,P

hash {sha | md5

	seconds	IKE *ó Q < ó Ä/¦ Å Ä S*ü 60 86400 /¦ KÈ,X H D Ä

5 ,ÕG!5B 86400 /¦ Ä 1 ý Å

Q ¸ õ ã IKE 1*+9G!5B õ ã Ä

S*ü Û Ð

S*üA¹ Q ¸ Û n IKE] <6(,³,X*ó Q < ó Ä ' IKE Ô Ÿ # Ê È W .,X1 Ô Ê _ ™ J ÍA± ü] < – D ÞE' ä Ô7È ÄE- o Ô7È,X – D ü!£ þ Í1 ' Þ+ IKE] <6(,³ é *ü È ü!£ þ Í1 ' Þ ±+-,È IKE] <6(,³*ó Q óCY Ê Ä

„,X SA ™NO ü ' ! SA ! # Ä

+ b IPSec] <6(,³ # Î0Ÿ ü IKE] <6(,³ Î. Þ,X È ´!8 È?U8V,Õ # IPSec] <6(,³,X ÊKÈ È hG!5BEWKS,X IKE] <6(,³*ó Q ó Ä' 5à È>•. ?·,X Ã6Ñ û `*ó Q < ó ä!7!¨,X È G*ó Q < óC^KS È>•. ?·,X Ã6Ñ û C^ û È*ó Q < óC^-Á È>•. ?·,X Ã 6Ñ û ã È ´!8?U BLÔ?UA'5B Ô þ ÜEÖ,X*ó Q < ó Ä V ý Å Ä

G!5B _

_ 1 Ö ßM6,X/ _A'5B IKE] <6(,³,X*ó Q < ó 1000 /¦ Ö

```
Ruijie(config)# crypto isakmp policy 10
Ruijie(isakmp-policy)# lifetime 1000
```

,Ì G Q ¸

Q ¸	£EÄ
crypto isakmp enable	S6ÑIKE Ä
encryption {des | 3des | aes-128 | aes-192 | aes-256 | sm1}	Û n t š1k"©
hash {sha | md5 }	Û n HASH 1k"©
authentication {pre-share | rsa-sig }	Û nP`A• •"©
group {1 | 2}	Û n Diffie-Hellman 4˜ ÛAš

G ÄAÈ â ´

Q ¸ Z Æ

(Ë	AÈ â
-	-

3.1.34 match address (IPSec)

?U Û n t š ô Ø 5,Â,XA"KÂ ë>< È AË ;> t š ô ØG!5B Q ¸ match address Ä A¹ Q ¸,X no 6 ã ôL8 t š ô Ø 5,Â ,XA"KÂ ë>< Ä

match address access-list-number

no match address

1 AF¼ Ú

Ruijie(config-crypto-map)# reverse-route

,Ì G Q ¸

Q ¸	£EÄ
crypto map(global IPSec)	n t š ô Ø 5,Â
debug crypto ipsec	ipsec sa A×A© µ C

G ÄAÈ â ´

Q ¸ Z Æ

(Ë	AÈ â
-	-

3.1.37 self-identity

*ü b Û n D• ÑG›*ü,X 6 ã Ö

self-identity { address | trustpoint trustpoint| fqdn fqdn | user-fqdn user-fqdn}

no self-identity

– DAÈ â

– D	£EÄ
address	IP
trustpoint	S*üT¬AxA• :JÒ
fqdn	A’5B,X ³ á
user-fqdn	A’5B,X*ü ` ³ á

5 ,ÕG!5B address Ö IP

Q ¸ õ ã < G!5B õ ã Ä

S*ü Û Ð ?U*ü b ` ä/Ã U õ ã ¥CK # D• Ñ ÛAš,XA’ n È Ã ¹EîE› ³ á Û n D• Ñ È 3 Ã ¹EîE› Û n D• Ñ Ä

G!5B _

_ 1 Ö ¹ ß/ _ ` äD• ÑA’ n Ö

```
Ruijie(config)#  self-identity fqdn  www.vpdn.com
Ruijie(config)#  self-identity user-fqdn
zj@www.vpdn.com
Ruijie(config)#  self-identity address
```

,Ì G Q ¸

Q ¸	£EÄ
-	-

G ÄAÈ â	´

Q ¸ Z Æ	(Ë	AÈ â
	-	-
	-	-

3.1.38 set autoup

A’5BL{F'7¾ |E² y Ä Ô8 ™ ‰ ß ipsec L{F' + y [?º ¥ ÈG!5BA¹ Q ¸ âL{ F'+ ipsec õ + YF¼7¾> ?º ¥ ÄT¬Ax ™ ‰ ß á *ü Ä

set autoup

no set autoup

– DAÈ â	– D	£EÄ

5 ,ÕG!5B	á *ü

Q ¸ õ ã	t š ô ØG!5B õ ã

S*ü Û Ð	Ã ¹FS ! ´ # L{F'Eô ä,X ö Ù Ä Í D B ôEg # ó ÈLÔ?UL{F'Lc Ê up ,X C ß S*ü

G!5B _	_ 1 Ö ¹ ß/ _*ü b ` ä ¹ 0 õ ã,XA’5B (/Ã U õ ã) Ö Ruijie(config)# crypto map mymap 10 ipsec-isakmp Ruijie(config-crypto-map)# set autoup

,Ì G Q ¸	Q ¸	£EÄ
	crypto map(interface IPSec)	Ú t š ô Ø h*ü b y ·
	match address	t š ô Ø ë>? ˜ù Ô þA“KÂ ë>? Ä
	Set peer	˜ùE°/ß Í1 '
	Set transform-set	˜ù ¬ 6Lš Ü
	show crypto map	Û’Íð‡A ô Ø µ C

G ÄAÈ â	´

Q ¸ Z Æ	(Ë	AÈ â

-	-

3.1.39 set exchange-mode

*ü bA'5B Í1 'KÈ IKE # 1 ÔL !‰G›*ü,X ¹ 0 õ ã Ä

set exchange-mode {main | aggressive }

no set exchange-mode

– D	£EÄ
main	õ ã
aggressive	/Ã U õ ã

– DAÈ â

5 ,ÕG!5B õ ã

Q ¸ õ ã t š ô ØG!5B õ ã

S*ü Û Ð

IKE # ,XE›/ß Ú ø þL !‰ Ö

1 Ô þL !‰ ü ü r)„ ü ø þ ISAKMP r ' KÈ Î0Ÿ] <,X Ã 4£E›P`A•,XEîF' 9E¯> Eî µ È A¹L !‰G›*ü,X õ ã Ý õ ã `/Ã U õ ã Ä

1 ` þL !‰ ü ü ?U # ·>< á u,X] <6(,³ Ä

	-	-

3.1.40 set local (IPSec)

?U Û n t š ô Ø 5,Â ip ÈAË ;> t š ô ØG!5B Q ¸ set local ÄA¹ Q ¸ ,X no 6 ã ôL8 t š ô Ø 5,Â ,XE°/ß Í1 ' Ä

set local ip-address

no set local ip-address

– DAÈ â	– D	£EÄ
	ip-address	!‰ S*ü,X IP

5 ,ÕG!5B	á Û n Ï)E°/ß Í1 '

Q ¸ õ ã	t š ô ØG!5B õ ã Ä

S*ü Û Ð	*ü bA’5B !‰ # S*ü,X ip È"u ÝG!5B,X ™ ‰ ß S*ü y · # ÄG!5B â S*ü Û n

G!5B _	_ 1 Ö ßM6,X/ _ t š ô Ø mymap Û n Ô þE°/ß Í1 ' Ä 2.2.2.2 Å Ö Ruijie(config)# crypto map mymap 5 ipsec-isakmp Ruijie(config-crypto-map)# set local 2.2.2.2

,Ì G Q ¸	Q ¸	£EÄ
	crypto map(global IPSec)	n t š ô Ø 5,Â
	show crypto map	¹,ß t š ô Ø µ C
	crypto map(interface IPSec)	ü y · Þ G6(t š ô Ø

G ÄAÈ â	´

Q ¸ Z Æ	(Ë	AÈ â
	-	-

3.1.41 set peer (IPSec)

?U Û n t š ô Ø 5,Â E°/ß Í1 ' ÈAË ;> t š ô ØG!5B Q ¸ set peer ÄA¹ Q ¸,X no 6 ã ôL8 t š ô Ø 5,Â ,XE°/ß Í1 ' Ä

set peer

– DAÈ â

– D	£EÄ
ip-address	E°/ß Í1 ',X IP
hostname	E°/ß Í1 ',X á
trustpoint1	Û n Í0ÃA• :JÒ
trustpoint2	Û n !‰A• :JÒ

5 ,ÕG!5B

á Û n Ï)E°/ß Í1 '

Q ¸ õ ã

t š ô ØG!5B õ ã Ä

S*ü Û Ð

Í S*ü,X t š ô ØFÑ ™NO Û n Ô þE°/ß Í1 ' Ä

' , ü î þA• :JÒ,X ™ ‰ È B!£ þ peer Û nA• :JÒ È ü"u Ý Û n A• :JÒ,X ™ ‰ ß S*ü Í0ÃA• :JÒ ca A• :P`A• Ä ü"u Ý Û n Í0ÃA• :JÒ,X ™ ‰ S*üT¬AxA• :JÒ ca A• :P`A• Ä

G!5B _

_ 1 Ö ßM6,X/ _ t š ô Ø mymap Û n Ô þE°/ß Í1 ' Ä 2.2.2.2 Å Ö

Ruijie(config)# crypto map mymap 5 ipsec-isakmp

Ruijie(config-crypto-map)# set peer 2.2.2.2

,Ì G Q ¸

Q ¸	£EÄ
crypto map(global IPSec)	n t š ô Ø 5,Â
show crypto map	¹,ß t š ô Ø µ C
crypto map(interface IPSec)	ü y · Þ G6(t š ô Ø

G ÄAÈ â

´

Q ¸ Z Æ

(Ë	AÈ â
-	-

3.1.42 set pfs (IPSec)

Û n ipsec L{F' Õ>™ S*üDiffie-Hellman 4˜ ÛAš

set pfs {group1 | group2 }

no set pfs

– DAÈ â

– D	£EÄ
group1	768 !
group2	1024 !

1 AF¼ Ú] <G!5B Q ¸ –5×

1 Ý0´ 5%4°] < #A, Ä IPSec Å Q ¸

¤ þ,Â Û G›*ü á à b < *ó Q < ó ,X*ó Q < óE¯> # È Ã ¹ ü âA¹,Â Û E¯ > # ,X t š ô Ø 5,Â S*üA¹ Q ¸ Â *ó Q < ó Ä

a "¼ ã A¹ Q ¸ Â *ó Q < ó ¾ ¬ ¤ þ K ' ô ØE¯> IPSec] <6(,³ # ,X*ó Q < ó È á E ¡ < *ó Q < ó Ä

G!5B _

_ 1 Ö ßM6,X/ _ Â t š ô Ø mymap 5,Â 5 ,X*ó Q < ó 2500 /¦ Ö

```
Ruijie(config)# crypto map mymap 5 ipsec-isakmp
Ruijie(config-crypto-map)# set security-association lifetime seconds 2500
```

,Ì G Q ¸

Q ¸	£EÄ
crypto map(global IPSec)	n t š ô Ø 5,Â
show crypto map	¹,ß t š ô Ø µ C
crypto map(interface IPSec)	ü y · Þ G6(t š ô Ø
crypto ipsec security-association lifetime	G!5B < *ó Q < ó

G ÄAÈ â

´

Q ¸ Z Æ

(Ë	AÈ â
-	-

3.1.44 set session-key

ü W E6!aìÂ K€nd} ah

?U ¹ ï Î] <6(,³ È Ã S*üE- 5 Q ¸ 9 Î0- ` 90-,X « ± xEî µA’5B,Ì G1k"©,X ] < – D2ö é Ä SPIs Å ` š-Õ ÄA¹ Q ¸,X no 6 ã ôL8,Ì G1k"©,X] < – D2ö é Ä SPIs Å ` š-Õ Ä

set session-key { inbound | outbound} ah spi hex-key-data

S*ü Û Ð

¾ ü ipsec-manual S*ü Ä

G!5B _

_ 1 Ö ßM6,X/ _ t š ô Ø mymap Û n esp Õ>™ È?· Õ>™ š-Õ

```
Ruijie(config)# crypto map mymap 5 ipsec-manual
Ruijie(config-crypto-map)# set session-key inbound esp 301 cipher
abcdef1234567890
Ruijie(config-crypto-map)# set session-key outbound esp 300 cipher
abcdef1234567890
```

,Ì G Q ¸

Q ¸	£EÄ
crypto map(global IPSec) ipsec-manual	n t š ô Ø 5,Â
show crypto map	¹,ß t š ô Ø µ C
crypto map(interface IPSec)	ü y · Þ G6(t š ô Ø

G ÄAÈ â

´

Q ¸ Z Æ

(Ë	AÈ â
-	-

3.1.45 set transform-set

?U ¤ þ t š ô Ø 5,Â Û n S*ü ¾ o ¬ 6Lš Ü È AË S*ü t š ô ØG!5B Q ¸ set transform-set ÄA¹ Q ¸,X no 6 ã ôL8 t š ô Ø 5,Â ` ¬ 6Lš Ü,X G6(Ä

Set transform-set transform-set-name1 [transform-set-name2] [transform-set-name3] [transform-set-name4] [transform-set-name5] [transform-set-name6]

no set transform-set

	6Lš Ü Ä
G!5B _	_ 1 Ö ßM6,X/ _ Û n t š ô Ø 5,Â,X ¬ 6Lš Ü myset Ö Ruijie(config)# crypto ipsec transform-set myset esp- des esp-sha-hmac Ruijie(config)# crypto map mymap 5 ipsec-isakmp Ruijie(config-crypto-map)# set transform-set myset

,Ì G Q ¸

Q ¸	£EÄ
crypto map(global IPSec)	n t š ô Ø 5,Â
show crypto map	¹,ß t š ô Ø µ C
crypto map(interface IPSec)	ü y · Þ G6(t š ô Ø

G ÄAÈ â ´

Q ¸ Z Æ

(Ë	AÈ â
-	-

3.1.46 set mtu

A’5B IPSec NX Ú(õ ã ÄL{F' õ ã Ý Å Ä

set mtu length

no set mtu

– DAÈ â

– D	£EÄ
length	Õ>™ ! D B Ù Ú(û ã È8× È 512-1500

5 ,ÕG!5B á S*üNX Ú(õ ã

Q ¸ õ ã t š ô ØG!5B õ ã Ä

S*ü Û Ð Û n ipsec L{F' Õ>™ S*üNX Ú(õ ã

G!5B _ _ 1 Ö ßM6,X/ _ t š ô Ø mymap Û nNX Ú(õ ã
Ruijie(config)# crypto map mymap 5 ipsec-isakmp
Ruijie(config-crypto-map)# set mtu 1000

,Ì G Q ¸ global IPSec)(500)-map

Q ¸	£EÄ

show crypto map	¹,ß t š ô Ø µ C
crypto map(interface IPSec)	ü y · Þ G6(t š ô Ø

G ÄAÈ â ´

Q ¸ Z Æ

(Ë	AÈ â
-	-

3.2 / ,Ì G Q ¸

Ù ÿ ¹ ß / Q ¸ Ö

3.2.1 show crypto dynamic-map (IPSec)

?U ¹,ß | Õ t š ô Ø,X µ C ÈAË ;> (M EXEC G!5B Q ¸ show crypto dynamic-map Ä

show crypto dynamic-map [map-name]

– DAÈ â

– D	£EÄ
map-name	t š ô Ø,X á/Ä Ä

5 ,ÕG!5B V p"u Ý Û n t š ô Ø á/Ä È í / A' Û Þ Ý | Õ t š ô Ø,X µ C Ä

Q ¸ õ ã (M EXEC G!5B õ ã Ä

S*ü Û Ð ´

G!5B _

_ 1 ÖRuijie# 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 = { }

,Ì G Q ¸

Q ¸	£EÄ
-	-

G ÄAÈ â ´

Q ¸ Z Æ

(Ë	AÈ â
-	-

Replay detection support:Y // kG¡ • Ø)Ú

Outbound esp sas: // ê Î Ù Ø)Ú,X] <6(,³ È #A, ESP
spi:0x293b8b55 (691768149) //spi ,X 691768149
transform: esp-3des // ¬ 6Lš Ü esp-3des
in use settings={Tunnel,} //EîF' õ ã
crypto map mymap 7
sa timing: remaining key lifetime (k/sec): (4607024a yC16(Tc -25.5.575 -1.7B<- Tw

Diffie-Hellman group: #1 (768 bit)
lifetime: 86400seconds

,Ì G Q ¸

Q ¸	£EÄ

1 AF¼ Ú] <G!5B Q ¸ –5×

1 ¯0´ G!5B VPDN Q ¸

4.1 G!5B,Ì G Q ¸

VPDN G!5B Ù ÿ ¹ ß Q ¸ Ö

4.1.1 vpdn authorize

Q ¸ *ü VPDN AxA•EÝNM È ¤o 6 ã Ú ª#\ VPDN AxA•EÝNM Ä

vpdn authorize domain [split]

no vpdn authorize domain [split]

– DAÈ â	– D	£EÄ
	domain	³AxA• Ô G
	split	³ 9/• Ô G

5 ,ÕG!5B	5 ,Õ ™ ‰ ß È2Ï4³ á | ³AxA• Ä

Q ¸ õ ã	< G!5B õ ã

S*ü Û Đ	¾ Ý ' vpdn enable G!5B ¹ âA¹ Q ¸ Ã ¹G!5B ³AxA• ç Û ³AxA• G!5B â ³ 9/•EÝNM È ³?· d â î Ú*ü á ³ µ C 9/• È ¾+- ß*ü á ôEæ4-AxA• õ +

G!5B _	_ Ö2Ï4³ *ü VPDN ³ á?· d s6Ñ Ruijie(config)# vpdn authorize domain split Ruijie(config)#

,Ì G Q ¸	Q ¸	£EÄ
	vpdn domain-delimiter	³ á?· dEÝNM
	domain	³ áG!5B

G ÄAÈ â	´ Ä

Q ¸ Z Æ	(Ë	AÈ â
	10.3 Ä5 Å	1 Ô þ ÕA¹ Q ¸,X(

4.1.2 vpdn domain-delimiter

Q ¸G!5B VPDN ³ á?· dEÝNM È J no 6 ã Ú ôL8 VPDN ³ á?· dEÝNM Ä

vpdn domain-delimiter LINE [prefix | suffix]

no vpdn domain-delimiter

– DAÈ â

– D	£EÄ
LINE	³ áAš ÿ Ú F0ú È¾6ÑAš ÿ @, /, %, #, - or \ È\>• S6Ñ â \\ 3 Ã ¹Aš ÿ
prefix	!4Ô Ä ÃEÝ Å
suffix	â4Ô Ä ÃEÝ È5 ,Õ Å

5 ,ÕG!5B

5 ,Õ ™ ‰ ß È2Ï4³ á *ü VPDN ³ á?· d s6Ñ Ä

Q ¸ õ ã

< G!5B õ ã

S*ü Û Ð

BEîG!0úG!5B È ! â4ÔG!5B ¢*ü á ?· d Î ³ á

¾ Ý ' vpdn enable G!5B ¹ âA¹ Q ¸ Ã ¹G!5B

!4Ô â4ÔEÝNM ÃEÝ È áG!5B></ â4Ô

ÚLh0ú ¾6ÑAš ÿ@,/,%,#,-,\\ A þ Ï ã Ô þ ÈG!5B Ã ¹ Ú Ý +0ú Û n !4Ô Ú F0ú ê 5Ù â4Ô ÚLh0ú È !4Ô ` â4Ô ÚLh0ú á6Ñ †0U È G á6Ñ à Ê !4Ô ÚLh0ú ` â4Ô ÚLh 0ú

' ü Ô þ*ü á Î)„,X î þ ÚLh0ú,X Ê í È Ý';G!5B È !4Ô G!1 Ô þ È â4Ô G! Ô â Ô þ È!¨ V Ö

aaa@a@#a%a

' @ !4Ô ÚLh0ú È % â4Ô Ú F0ú ÈFw !4Ô G!,X ³ á aaa È5à â4Ô G!,X ³ á a È ´ â4Ô ì È ¹ Ô4œ k ,X ³ á a

' # !4Ô ÚLh0ú È @ â4Ô ÚLh0ú È !4Ô aaa@a@ È â4Ô #a%a

G!5B _

_ Ö2Ï4³ *ü VPDN ³ á?· d s6Ñ

Ruijie(config)# vpdn domain-delimiter @/%#-\

Ruijie(config)#

,Ì G Q ¸

Q ¸	£EÄ
vpdn authorize	³ á 9/•EÝNM
domain	³ áG!5B

G ÄAÈ â

´ Ä

Q ¸ Z Æ

(Ë	AÈ â
10.3 Ä5 Å	1 Ô þ ÕA¹ Q ¸,X(

1 AF¼ Ú] <G!5B Q ¸ –5× 1 ¯0´ G!5BVPDN Q ¸

,Ì G Q ¸	Q ¸	£EÄ
	-	

G ÄAÈ â ´ Ä

Q ¸ Z Æ	(Ë	AÈ â
	-	-

4.1.6 vpdn session-limit

Q ¸A'5B ' !2Ï4³ ¤ o VPDN s6Ñ Ê AŒ,X Ô û îA± D È J no 6 ã Ú 6 á2Ï4³5 ,ÕA'5B Ä

vpdn session-limit sessions

no vpdn session-limit

– DAÈ â	– D	£EÄ
	sessions	2Ï4³ ¤ o VPDN s6Ñ Ê AŒ,X Ô û îA± D

5 ,Õ G!5B 5 ,Õ ™ ‰ ß ÈA¹ >•A' n 2Ï4³ 6Ñ ó ¤ o,X Ô û îA± D È J 36 2Ï ë 300 Ä

Q ¸ õ ã < G!5B õ ã

S*ü Û Ð ' à Ê Ý þ î VPDN ¼ 9 E ¡ 2Ï4³ H ' û6Ñ Ê È Ã S*ü!8 Q ¸ Í ¼ 9 DE¯> L$ Ä

G!5B _ _ ÖA' n ' ! y «,X Ô û îA± D 100

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

,Ì G Q ¸	Q ¸	£EÄ
	-	

G ÄAÈ â ´ Ä

Q ¸ Z Æ	(Ë	AÈ â
	-	-

4.1.7 vpdn source-ip

Q ¸A’5B ' !2Ï4³ ¤ o VPDN s6Ñ Ê S*ü,X ($d) È J no 6 ã Ú 6 á2Ï4³5 ,ÕA’5B Ä

vpdn source-ip A.B.C.D

no vpdn source-ip

– DAÈ â	– D	£EÄ
	A.B.C.D	2Ï4³ ¤ o VPDN s6Ñ Ê S*ü,X

5 ,ÕG!5B 5 ,Õ ™ ‰ ß È2Ï4³"u Ý ¤ o VPDN s6ÑA’ n S*ü,X ($d) Ä

Q ¸ õ ã < G!5B õ ã

S*ü Û Đ V p2Ï4³ ¤ o LNS(L2TP) ê5Ù HGW(PPTP) s6Ñ È Ã ¹ S*ü Q ¸ 9L$ n ' ! Ý y «,XL{F'E² yAË" ,X,Â,X A’ n,X Ä Q ¸,X Ý A’5B ê5Ù ¬ î0Ÿ G Đ7È Æ 4£ , ü ,Ì GL{F'>• | šL8 Ä

G!5B _ _ ÖA’ n ' ! y «,X ÝL{F'E² yAË" ,X,Â,X ™NO 192.168.12.223
Ruijie(config)# vpdn source-ip 192.168.12.223
Ruijie(config)#

Q ¸	£EÄ Ä ˜lÿvSi$ @`Ö$N†0xaÖ$I$ (äè

%LINK CHANGED: Interface virtual-access 0, changed state to up

VPDN: Pptp tunnel to 192.168.200.114 peer callid 1 recv set-linkinfo

VPDN: Pptp tunnel to 192.168.200.114 peer callid 1 recv set-linkinfo

%LINEPROTOCOLCHANGE: Interfacevirtual- access0,changedstateto UP

_ 2 Ötp

Send ACCM 0xFFFFFFFF

Recv ACCM 0xFFFFFFFF

%UPDOWN: Interface Virtual-Access1, changed state to up

Vi1 VPDN PROCESS Into tunnel: Sending 54 byte pak

Vi1 VPDN PROCESS Into tunnel: Sending 64 byte pak

Vi1 VPDN PROCESS Into tunnel: Sending 50 byte pak

PPTP: I Set-Link-Info len 24 Magic Cookie 0x1A2B3C4D

Peer Call Id 0x1

Send ACCM 0xFFFFFFFF

Recv ACCM 0xFFFFFFFF

Vi1 VPDN PROCESS Into tunnel: Sending 45 byte pak

Vi1 VPDN PROCESS Into tunnel: Sending 46 byte pak

Vi1 VPDN PROCESS Into tunnel: Sending 187 byte pak

Vi1 VPDN PROCESS Into tunnel: Sending 56 byte pak

Vi1 VPDN PROCESS Into tunnel: Sending 64 byte pak

Vi1 VPDN PROCESS Into tunnel: Sending 50 byte pak

Vi1 VPDN PROCESS Into tunnel: Sending 50 byte pak

Vi1 VPDN PROCESS Into tunnel: Sending 52 byte pak

_ 3 Öp L{F',X(=)ÚE² y0U' • Ê,X ' DEg Î _ È debug vpdn error µ C V ß Ö

VPDN: PPTP session Virtual- Access1 wait pak ack timeout(wait seq=37, ack=36), decrease send window to half of current = 33!

VPDN: PPTP session Virtual-Access1 adjust ATO to 220 ms!

VPDN: PPTP session Virtual-Ac cess1 wait pak ack timeout(wait seq=38, ack=36), decrease send window to half of current = 16!

VPDN: PPTP session Virtual-Access1 adjust ATO to 280 ms!

VPDN: PPTP session Virtual- Access1 wait pak ack timeout(wait seq=39, ack=36), decrease send window to half of current = 8!

VPDN: PPTP session Virtual-Access1 adjust ATO to 400 ms!

VPDN: Pptp EGRE encap fail, err=-4!

VPDN: PPTP session Virtual- Access1 wait pak ack timeout(wait seq=40, ack=36), decrease send window to half of current = 4!

VPDN: PPTP session Virtual-Access1 adjust ATO to 640 ms!

_ 4 Ö« Í0Ã ¼ 9AË" J Ô4œ Î0ŸL{F' (Ù ÀEîF' â îA±),X ` HE›/ß ,X VPDN 'A×A© / _ Ö

Ruijie# debug vpdn error

vpdn protocol errors debugging is on

Ruijie# debug vpdn event

vpdn events debugging is on

Ruijie# debug vpdn packet

vpdn packet debugging is on

Ruijie# show debug

VPDN:

vpdn events debugging is on

vpdn protocol errors debugging is on

vpdn packet debugging is on

Ruijie#

VPDN PROCESS From tunnel: Received 158 byte pak

L2X: UDP socket write 168 bytes, 192.168.12.217(1701) to

192.168.12.242(1701)

L2X: UDP socket write 40 bytes, 192.168.12.217(1701) to 192.168.12.242(1701)

VPDN PROCESS From tunnel: Pak consumed

VPDN PROCESS From tunnel: Received 70 byte pak

L2X: UDP socket write 40 bytes, 192.168.12.217(1701) to 192.168.12.242(1701)

VPDN PROCESS From tunnel: Pak consumed

VPDN PROCESS From tunnel: Received 76 byte pak

Get virtual-access from free queue: Virtual-Access1

Vi1 VPDN PROCESS From tunnel: Queue 14 byte pak to ppp parse and iqueue 1701) 1701)

_ 6 ÖEîF'P`A• Bù Ê debug vpdn l2x-error ,XEg Î/ _ Ö

Tnl 14 L2TP: Tunnel auth failed for BLIZZARD

Tnl 14 L2TP: Expected

9E 8D 7A 8E 78 EA 41 9F A1 74 01 21 DE 4F F3 F0

Tnl 14 L2TP: Got

84 E5 62 69 AE 46 A5 98 4E FE E2 38 EE F2 B7 E2

_ 7 ÖLNS y « Í0Ã ¼ 9AË" J Ô4œ Î0ŸL{F' (Ù ÀEîF' â îA±),X ` HE›/ß debug vpdn l2x-events ,XA×A©/ _ Ö

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: Contro7Bf192Fetransmit delay set 1021 seconds6656

Tnl 20 L2TP: Tunst crtro7BlleCRQ fidle 102wait-ctl-conn.242

Tnl 20 L2TP: ICNCCRQ from C3640 tnl 26656

Tnl 20 L2TP: GoC a challeResponslenge inCNCCRQ, C3640

M)6656 M)6656

L2X: Rx Window Size 800

L2X: Parse AVP 11, len 22, flag 0x8000 (M)

L2X: Chlng

98 20 4E 34 6A 4C E1 E7 FA CF 58 07 FF 4E 56 A3

L2X: Parse AVP 9, len 8, flag 0x8000 (M)

L2X: Assigned Tunnel ID 18889

L2X: Parse AVP 3, len 10, flag 0x8000 (M)

L2X: Framing Cap 0x3

L2X: Parse AVP 4, len 10, flag 0x8000 (M)

L2X: Bearer Cap 0x3

L2X: No missing AVPs in SCCRQ

L2X: I SCCRQ, flg TLS, ver 2, len 130, tnl 0, ns 0, nr 0 contiguous pak, size 130

C8 02 00 82 00 00 00 00 00 00 00 80 08 00 00

00 00 00 01 80 08 00 00 00 02 01 00 00 08 00 00

00 06 11 30 80 0B 00 00 00 07 43 33 36 34 30 00

19 00 00 00 08 43 69 73 63 6F 20 53 79 73 74 65

6D 73 2C 20 49 6E 63 2E ...

Tnl 22 L2TP: O SCCRP to C3640 tnlid 18889

Tnl 22 L2TP: O SCCRP, flg TLS, ver 2, len 140, tnl 18889, ns 0, nr 1

C8 02 00 8C 49 C9 00 00 00 00 00 01 80 08 00 00

00 00 00 02 80 08 00 00 00 02 01 00 80 0A 00 00

00 03 00 00 00 01 80 0A 00 00 00 04 00 00 00 00

00 08 00 00 00 06 11 30 80 0A 00 00 00 07 52 36

32 31 00 0E 00 00 00 08 ...

Tnl 22 L2TP: O ZLB ctrl ack, flg TLS, ver 2, len 12, tnl 18889, ns 1, nr 1

C8 02 00 0C 49 C9 00 00 00 01 00 01

Tnl 22 L2TP: Parse AVP 0, len 8, flag 0x8000 (M)

Tnl 22 L2TP: Parse SCCCN

Tnl 22 L2TP: I SCCCN from C3640 tnl 18889

Tnl 22 L2TP: Parse AVP 13, len 22, flag 0x8000 (M)

Tnl 22 L2TP: Chlng Resp

5C D5 A4 37 36 A6 7D 0F FE EF 22 48 B8 DF F5 12

Tnl 22 L2TP: No missing AVPs in SCCCN

Tnl 22 L2TP: I SCCCN,flg TLS, ver 2, len 42, tnl 22, ns 1, nr 1 contiguous pak, size 42

C8 02 00 2A 00 16 00 00 00 01 00 01 80 08 00 00

00 00 00 03 80 16 00 00 00 0D 5C D5 A4 37 36 A6

7D 0F FE EF 22 48 B8 DF F5 12

Tnl 22 L2TP: O ZLB ctrl ack, flg TLS, ver 2, len 12, tnl 18889, ns 1, nr 2

C8 02 00 0C 49 C9 00 00 00 01 00 02

Tnl 22 L2TP: Parse AVP 0, len 8, flag 0x8000 (M)

Tnl 22 L2TP: Parse ICRQ

Tnl 22 L2TP: I ICRQ from C3640 tnl 18889

Tnl 22 L2TP: Parse AVP 15, len 10, flag 0x8000 (M)

4.2.3 show vpdn

Q ¸ / ' !2Ï4³ Þ Û n,X VPDN L{F' µ C Ä

show vpdn [session | tunnel]

– DAÈ â

– D	£EÄ
session	/ Ý îA± Ä
tunnel	/ ÝEîF'

5 ,ÕG!5B

´ Ä

Q ¸ õ ã

BEî*ü õ ã Ã(M *ü õ ã

S*ü Û Ð

*ü Ã ¹ S Q ¸ 9 r Ê5× ³ ' !2Ï4³ Þ,X VPDN L{F' µ C Ä V p á Û n – D Ú / ' !2Ï4³ Þ Ý,X VPDN EîF' â îA± Ä

"¼ ã Ö+ b*ü á,XKS z Ï ã,X È Z ã ÍU$ È ´!8 show ,X Ê í?˜ n È ™ / ! 12 +8V,X*ü áKS z ÈCYE›!8KS z,X á î / ` H,X Ä

G!5B –

_ 1 Ö5× ³ ' !2Ï4³ Þ Ý,X VPDN L{F' µ C

```
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 LastChg
                   Vcid, Circuit
1        1        4        ms,Vi1            est   00:33:58
%No active PPTP tunnels
Ruijie#
```

/ ' !2Ï4³ Þ Ý VPDN EîF',X µ C

```
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#
```

/ ' !2Ï4³ Þ Ý VPDN îA±,X µ C

```
Ruijie#      show vpdn session
L2TP Session Information Total sessions 1
LocID    RemID    TunID    Username,Intf/    State LastChg
                   Vcid, Circuit
```

1 1 4 ms,Vi1 est 00:37:03
%No active PPTP tunnels
Ruijie#

,Ì G Q ¸

Q ¸	£EÄ
-	-

G ÄAÈ â ´

Q ¸ Z Æ

(Ë	AÈ â
-	-

4.3 VPDN-Group G!5B,Ì G Q ¸

VPDN-Group G!5B Ù ÿ ¹ ß Q ¸ Ö

4.3.1 accept dialin

Q ¸A'5BL{F' ¹ 0 õ ã y « ¼ 9 È J no 6 ã Ú 6 á2Ï4³5 ,ÕA'5B Ä

accept-dialin

no accept-dialin

– DAÈ â

– D	£EÄ
-	-

5 ,ÕG!5B 5 ,Õ ™ ‰ ß È2Ï4³"u ÝA'5BL{F' ¹ 0 õ ã Ä

Q ¸ õ ã VPDN-Group y ·G!5B õ ã

S*ü Û Ð 5 ,Õ ™ ‰ ß È2Ï4³"u Ý VPDN-Group Û n Ï)L{F' ¹ 0 õ ã Ä*ü ™NOOj A'5BL{F' ¹ 0 õ ã !6ÑE¯ Ô!9A'5BL{F' ¹ 0 #A, â4¥ n,X<. õ S y · Ä Q ¸,X Ý A'5B ê5Ù ¬ î0Ÿ G Ð7È Æ4£ , ü ,Ì GL{F'>• | šL8 Ä

G!5B _ _ 1 ÖA'5BL{F' ¹ 0 õ ã y « ¼ 9
Ruijie(config-vpdn)# accept-dialin
Ruijie(config-vpdn)#

,Ì G Q ¸

Q ¸	£EÄ
-	-

G ÄAÈ â	´

Q ¸ Z Æ	(Ë	AÈ â
	-	-

4.3.2 dns

Q ¸A'5BL{F' # E›/ß PPP #A,*ü b # DNS ,X Ä Q ¸,X no 6 ã Ú 6 á2Ï4³5 ,ÕA'5B Ä

dns A.B.C.D A.B.C.D

no dns

– DAÈ â	– D	£EÄ
	A.B.C.D	*ü b PPP # DNS ,X

5 ,ÕG!5B	5 ,Õ ™ ‰ ß È2Ï4³"u Ý L{F' Û n*ü b PPP ,X DNS # ,X Ä

Q ¸ õ ã	vpdn-domain G!5B õ ã

S*ü Û Ð	*ü Ã ¹ B domain ³ á Û n*ü b PPP ,X DNS # ,X È L{F' # ä s â B ³ á ¹ R DNS â È S*ü Û n ` Í • # DNS Ä

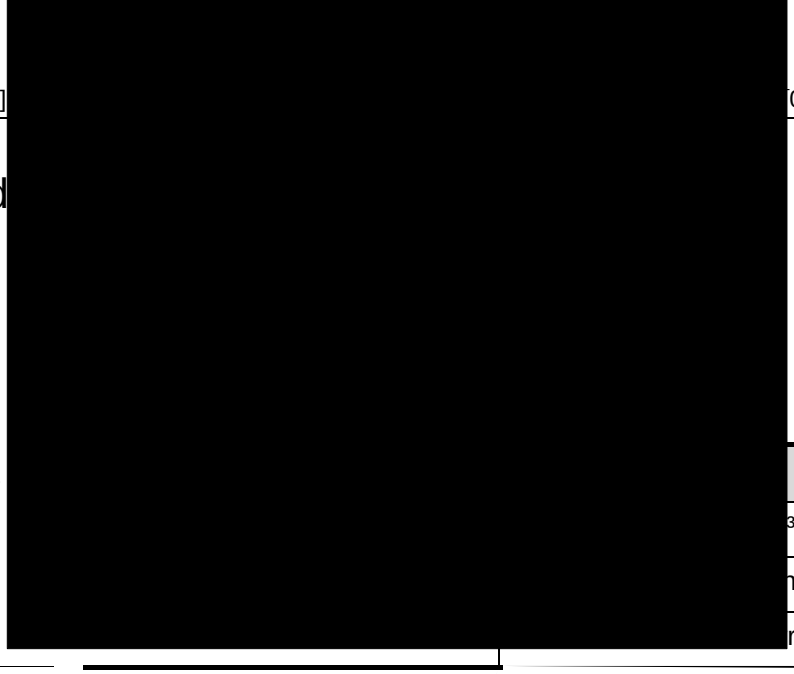
G!5B –	_ 1 ÖA'5B Í h ³ á ruijie ,X*ü # ppp ,X dns *ü Û n Ä Ruijie(config-vpdn)# domain ruijie Ruijie(config-vpdn-domain)# dns 1.1.1.1 2.2.2.2 Ruijie(config-vpdn-domain)#

,Ì G Q ¸	Q ¸	£EÄ
	domain	G!5B*ü ³ á,X Q ¸

G ÄAÈ â	´

Q ¸ Z Æ	(Ë	AÈ â
	-	-

4.3.3 d



– DAÈ	£EÄ
	³ á/Ä
	n2O _ vrf
	rf á/Ä ð

no force-local-chap

– DAÈ â

– D	£EÄ
-	-

5 ,ÕG!5B

5 ,Õ ™ ‰ ß ÈLNS áLÔ?U a Í Clinet E¯> AxA• Ä

Q ¸ õ ã

VPDN-Group y ·G!5B õ ã

S*ü Û Ð

ü Client ?º ¥ LAC Ô Ÿ ¼ Ë Ê ÈLAC î ·)Ú LNS Í Client E¯> AxA• È Q*ü 9 ü L2TP L{F' Î0Ÿ âG¡ „ Í Client E¯> AxA• ÄA¹ Q ¸ ¾ ü LNS Þ Ý Ä

G!5B _

_ 1 ÖA'5BL{F'G¡ „AxA• PPP LCP Ä

```
Ruijie(config-vpdn)# force-local-chap
Ruijie(config-vpdn)#
```

Q ¸	£EÄ

network	ì 4{ ³,X 7
priority	ì 4{ ³,X 1
routine	ì 4{ ³,X 0

Ã

5 ,ÕG!5B 5 ,Õ ™ ‰ ß È2Ï4³A'5BBóEQL{F',XÌP ì 4{ ³ LÊ G routine Ä

Q ¸ õ ã VPDN-Group y ·G!5B õ ã

S*ü Û Ð V p*ü LÔ?UA'5BL{F' D B,X ì 4{ Ã ¹ S*ü Q ¸ r)„ Ä Q ¸,X Ý A'5B î0Ÿ G E ¡L{F' D B ôEg È á î Ð7È,Ì G,XL{F'>• | š!• Ä

A¹ Q ¸ ¾ Í L2TP *ó È Í PPTP á*ó

G!5B _ _ 1 ÖA'5BL{F' D B,X ì 4{ 7 Ä

```
Ruijie(config-vpdn)#          ip precedence      7
Ruijie(config-vpdn)#
```

,Ì G Q ¸

Q ¸	£EÄ
-	-

G ÄAÈ â ´

Q ¸ Z Æ

(Ë	AÈ â
-	-

4.3.6 ip tos

Q ¸A'5BBóEQL{F',X IP TOS(Type of Service) ³ È J no 6 ã Ú 6 á2Ï 4³5 ,ÕA'5B Ä

ip tos { tos-value | max-reliability | max-throughput-reliability

	reflect	S*üL{F'BóEQ,XIP D B Ù,X TOS 0 BóEQL{F',X IP ,X TOS ³

5 ,ÕG!5B 5 ,Õ ™ ‰ ß ÈBóEQL{F',XP ,X TOS ³ LÊ Ä

Q ¸ õ ã VPDN-Group y ·G!5B õ ã

S*ü Û Ð V p*ü LÔ?UA'5BL{F' D B,X TOS Ã ¹ S*ü Q ¸ r)„ Ä Q ¸,X Ý A'5B î0Ÿ G E ¡ L{F' D B ôEg È á î Ð7È,Ì G,XL{F'>• | š!•œ3F'À Ì G,V Q obsçðLÔ?UA'5BL{F'LÔ?U

1 AF¼ Ú

4.3.9 pool

Q ¸A'5BL{F' # ä s â PPP #A, ÚG!4- Í0Ã S*ü,X "4 Ä Q ¸,X no 6 ã Ú 6 á2Ï4³5 ,ÕA'5B Ä

pool pool-name

no pool

– DAÈ â

– D	£EÄ
pool-name	"4 á/Ä

5 ,ÕG!5B

5 ,Õ ™ ‰ ß È2Ï4³"u Ý L{F' Û n ÚG! ,X "4 Ä

Q ¸ õ ã

vpdn-domain G!5B õ ã

S*ü Û Đ

*ü Ã ¹ B domain ³ á Û n4¥ n,X "4 ÈL{F' # ä s â B ³ á ¹ R "4 â È S*ü Û n "4,X ÚG!4- Í0Ã Ä

á Û n pool "4></ T¬Ax S*ü virtual-template y ·,X "4 È pool "4 á/Ä ÔKS Õ 30 !

G!5B _

_ 1 ÖA'5B Í h ³ á ruijie ,X*ü ÚG!*ü "4 vpdn Ä

```
Ruijie(config-vpdn)# domain ruijie
Ruijie(config-vpdn-domain)# pool vpdn
Ruijie(config-vpdn-domain)#
```

,Ì G Q ¸

Q ¸	£EÄ
domain	G!5B*ü ³ á,X Q ¸

G ÄAÈ â

´

Q ¸ Z Æ

(Ë	AÈ â
-	-

4.3.10 protocol

Q ¸A'5BL{F' S*üL{F' #A, Ä Q ¸,X no 6 ã Ú 6 á2Ï4³5 ,ÕA'5B Ä

protocol {any | l2tp | pptp }

no protocol

– DAÈ â

– D	£EÄ
any	G! Ã*ü,X ÝL{F' #A,
l2tp	G!L{F' #A, L2TP
pptp	G!L{F' #A, PPTP

5 ,ÕG!5B 5 ,Õ ™ ‰ ß È2Ï4³"u Ý L{F' Û nG!5B,XL{F' #A, Ä

Q ¸ õ ã VPDN-Group L{F' ¹ 0 õ ã y ·G!5B õ ã

S*ü Û Ð *ü ™NO Û nL{F' S*ü,XL{F' #A, È Ï) ÍL{F' #A,,X Ý A'5B ê5Ù È FÑ î Ð7È Ý Æ4£ , ü,X,Ì GL{F'>• | šL8 Ä

G!5B –

_ 1 ÖA'5BL{F' #A, L2TP Ä
Ruijie(config-vpdn)# accept-dialin
Ruijie(config-vpdn-acc-in)# protocol l2tp
Ruijie(config-vpdn-acc-in)#

,Ì G Q ¸

Q ¸	£EÄ
-	-

G ÄAÈ â ´

Q ¸ Z Æ

(Ë	AÈ â
-	-

4.3.11 source-ip

Q ¸A'5B ' ! VPDN-Group Í hL{F' S*ü ($d) È J no 6 ã Ú 6 á 2Ï4³5 ,ÕA'5B Ä

source-ip A.B.C.D

no source-ip

– DAÈ â

– D	£EÄ
A.B.C.D	' ! VPDN-Group Í hL{F' S*ü,X ($d)

5 ,ÕG!5B 5 ,Õ ™ ‰ ß È2Ï4³"u ÝL$ VPDN-Group Î0ŸL{F' Ê S*ü,X ($d) Ä

Q ¸ õ ã VPDN-Group y ·G!5B õ ã

1 AF¼ Ú] <G!5B Q ¸ –5×

vpdn-group vpdn-group-name

no vpdn-group vpdn-group-name

– D	£EÄ

– DAÈ â

S*ü Û Ð

y ·G!5B Z vrf È áG!5BA¹ Q ¸,X ™ ‰ ß ÈL{F' Õ>™ â îC¼C^ < vrf È V p áLÔ?UC¼ C^ ÈLÔ?UG!5BA¹ Q ¸ È Svpn vrf ` ip vrf forward Ô7È

G!5B _

_ 1 ÖA'5BL{F' ê 2 b vrf 1
Ruijie(config-vpdn)# vpn vrf 1
Ruijie(config-vpdn)#

¸Ì G Q ¸

Q ¸	£EÄ
ip vrf	G!5Bvrf

G ÄAÈ â

´

Q ¸ Z Æ

(Ë	AÈ â
10.3 Ä5 Å	1 Ô þ ÕA¹ Q ¸,X(

4.4 PPTP G!5B¸Ì G Q ¸

PPTP G!5B Ù ÿ ¹ ß Q ¸ Ö

4.4.1 pptp flow-control receive-window 4.4 PPC5<8Tj /TT2 1 Tf 0 932 Tr 4

G!5B _

_ 1 ÖG!5B 0Ã pptp îA±,X Ô û y 0k · 32 Ö
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)#

,Ì G Q ¸

Q ¸	£EÄ
-	-

G ÄAÈ â

´

Q ¸ Z Æ

(Ë	AÈ â
-	-

4.4.2 pptp flow-control static-rtt

Q ¸ n pptp îA± ü ¥EÕ) þ D B y [â1 YA¹ y [ACK h1(,XM- Õ – 5×CY Ê ÊKÈ È Jho 6 ã Ú 6 á2Ï4³5 ,ÕA'5B Ä

pptp flow-control static-rtt timeout-interval

no pptp flow-control static-rtt

– DAÈ â

– D	£EÄ
packets	pptp îA± ü ¥EÕ) þ D B y [â1 YA¹ y [ACK h 1(,XM- Õ –5×CY Ê ÊKÈ È ¹¡¿/¦) ! Ä ª 8× È 100---5000 Ä

5 ,ÕG!5B

5 ,Õ 1500 !¿/¦ Ä

Q ¸ õ ã

vpdn-group G!5B õ ã

S*ü Û Đ

E- PPTP #A, ç*ü,XG!5B Q ¸ È ¹*ü ™NO G!5B protocol pptp ê5Ùprotocol any Q ¸ â È2Ï4³ ! AŒ / `G!5BE- 5 Q ¸ Ä

B PPTP #A, RFC2637 ,X ÎA, È PPTP ¥EÕ D B y [â1 Y ACK CY Ê,X ÊKÈKÈLh ÄATO ÈAcknowledgment Time-Outs Å È S*ü çK¼,X1k"©E¯> Au1k È J S*ü Z | ÕAu 1k,X RTT ÄRound-Trip Time Å ÊKÈ Ä Q ¸G!5B,X static-rtt ÊKÈ 0 RTT Au1k,X –5× ñ

G!5B _

_ 1 ÖG!5B 0Ã pptp îA±,X Ô û y 0k · 32 Ö
Ruijie(config-vpdn)# accept-dialin
Ruijie(config-vpdn-acc-in)# protocol pptp

1 AF¼ Ú] <G!5B Q ¸ –5×

5 ,ÕG!5B 5 ,Õ ™ ‰ ß È‡Hello #\ C ¥EÕKÈLh 60 /¦ Ä

Q ¸ õ ã L2TP-Class y ·G!5B õ ã

S*ü Û Ð *ü Ã ¹ B5%4°)ƒ W 9A'5B Hello #\ C ¥EÕKÈLh ¹ "# L2TP EîF' ú q' Ã*ü ÄV p 5%4°0 n ÃM4 È Ã ¹ Ú Hello #\ C ¥EÕKÈLhA' Ô þEW û Ä Ï) Í Hello ¥EÕKÈLhA' 5B,X Ý ¬FÑ î Ð7È Í h,X Æ4£ , ü,X L2TP L{F'>• | šL8 Ä

G!5B _ _ 1 ÖA'5B Hello #\ C ¥EÕKÈLh 120 /¦
Ruijie(config-l2tp-class)# hello 120
Ruijie(config-l2tp-class)#

,Ì G Q ¸

Q ¸	£EÄ
-	-

G ÄAÈ â ´

Q ¸ Z Æ

(Ë	AÈ â
-	-

4.5.4 hostname (L2TP)

Q ¸A'5B L2TP L{F' 0Ã á/Ä È J no 6 ã Ú 6 á2Ï4³5 ,ÕA'5B Ä

hostname local-hostname-string

no hostname

– DAÈ â

– D	£EÄ
local-hostname-string	L{F' 0Ã á/Ä

5 ,ÕG!5B 5 ,Õ ™ ‰ ß È2Ï4³ S*üCÃ+ <,X á/Ä 0 L{F' 0Ã á/Ä Ä

Q ¸ õ ã L2TP-Class y ·G!5B õ ã

S*ü Û Ð *ü Ã ¹ Ý';LÔ?UA'5BL{F' 0Ã á/Ä*ü ¹E¯> L{F' ÛAš Ä Ï) ÍL{F' 0Ã á/Ä,X Ý ¬FÑ î Ð7È Æ4£ , ü,X Í h L2TP L{F'>• | šL8 Ä

G!5B _ _ 1 Ö ÚA'5BL{F' 0Ã á/Ä "LAC"
Ruijie(config-l2tp-class)# hostname LAC
Ruijie(config-l2tp-class)#

,Ì G Q ¸

Q ¸	£EÄ

	-	-

G ÄAÈ â	´

Q ¸ Z Æ	(Ë	AÈ â
	-	-

4.5.5 ip dfbit set

Q ¸/U!6L{F' D B>• Ú(¥EÕ È J no 6 ã Ú 6 á2Ï4³T¬Ax Ä

ip dfbit set

no ip dfbit set

– DAÈ â	– D	£EÄ
	-	-

ip local interface interface-name

no ip local interface interface-name

– DAÈ â

– D	£EÄ
interface-name	y · á/Ä

5 ,ÕG!5B 5 ,Õ ™ ‰ ß È2Ï4³"u Ý Û nL{F' S*ü,X ($d) y · Ä

Q ¸ õ ã Pseudowire-Class y ·G!5B õ ã

S*ü Û Ð *ü Ã ¹ Û nCÃ+ < Þ,X5%4° y · 0 L{F',X ($d) y · Ä Ï) ÍL{F' ($d) y ·A' 5B,X Ý ¬FÑ î Ð7È Í h,X L2TP L{F'>• | šL8 Ä

G!5B _ _ 1 ÖA'5BL{F',X ($d) y · Serial 0
Ruijie(config-pw-class)# ip local interface serial 0
Ruijie(config-pw-class)#

,Ì G Q ¸

Q ¸	£EÄ
-	-

G ÄAÈ â ´

Q ¸ Z Æ

(Ë	AÈ â
-	-

4.5.7 ip ttl

Q ¸A'5BBóEQL{F' D B,X IP ,X TTL ³ È J no 6 ã Ú 6 á2Ï4³5 ,ÕA'5B Ä

ip ttl ttl-value

no ip ttl

– DAÈ â

– D	£EÄ
ttl-value	TTL ³,X È ª 8× È 1~255

5 ,ÕG!5B 5 ,Õ ™ ‰ ß È2Ï4³A'5BBóEQL{F' D B,XIP ,X TTL ³ 255 Ä

Q ¸ õ ã Pseudowire-Class y ·G!5B õ ã

S*ü Û Ð *ü Ã ¹ Ý';LÔ?UA'5BBóEQL{F' D B,X IP ,X TTL ³ Ä Ï) ÍBóEQL{F' D B,X IP ,X TTL ³,XA'5B,X Ý |FÑ î0Ÿ G ¡ ô L{F' D B ôEg Þ È á î Ð7È Í h,X L2TP

L{F'>• šL8 Ä

_ 1 ÖA’5BBóEQL{F' D B,XlP ,X TTL ³ 253

G!5B _

Ruijie(config-pw-class)# ip ttl 253

Ruijie(config-pw-class)#

Q ¸	

Q ¸ Z Æ	(Ë	AÈ â
	-	-

4.5.9 l2tp ip udp checksum

Q ¸?U" BóEQL{F' D B,X UDP y [Au1k J ? Checksum ³ È J no 6 ã Ú 6 á2Ï4³5 ,ÕA'5B Ä

l2tp ip udp checksum

no l2tp ip udp checksum

– DAÈ â	– D	£EÄ
	-	-

5 ,Õ G!5B	5 ,Õ ™ ‰ ß È2Ï4³?U" BóEQL{F' D B,X UDP y [,X Checksum ³ 0N (G LÊ) Ä
Q ¸ õ ã	VPDN-Group y ·G!5B õ ã
S*ü Û Đ	*ü Ã ¹ q BLÔ?UA'5B ú?U" BóEQL{F' D B,X UDP y [Au1k J ? Checksum ³ Ä Ï) ÍBóEQL{F' D B,X UDP y [,X Checksum ³,XA'5B,X Ý |FÑ î0Ÿ G ¡ ô L{F' D

-	-

5 ,ÕG!5B

5 ,Õ ™ ‰ ß È2Ï4³/U*üEîF'P`A• s6Ñ Ä

Q ¸ õ ã

VPDN-Group y ·G!5B õ ã

S*ü Û Ð

*ü Ã ¹ BLÔ?U *ü ê5Ù/U*üEîF'P`A• s6Ñ Ä Ï ) ÍEîF'P`A• s6ÑA'5B,X Ý |FÑ
î Ð7È,Ì G,X L2TP L{F'>• | šL8 Ä

G!5B _

_ 1 Ö *üEîF'P`A• s6Ñ
Ruijie(config-vpdn)# l2tp tunnel authentication
Ruijie(config-vpdn)#

,Ì G Q ¸

Q ¸	£EÄ
-	-

G ÄAÈ â

´ L2TP

PDN Q ¸

5B Ä

553245E2CCC09E<35423

1 AF¼ Ú] <G!5B Q ¸ –5× 1 ¯0´ G!5BVPDN Q ¸

5 ,ÕG!5B

Ruijie(config-vpdn)# l2tp tunnel timeout no-session 1200
Ruijie(config-vpdn)#

,Ì G Q ¸

Q ¸	£EÄ
-	-

G ÄAÈ â ´

Q ¸ Z Æ

(Ë	AÈ â
-	-

4.5.16 password (L2TP)

Q ¸A'5B*ü bEîF'P`A•,X · ¸ È J no 6 ã Ú 6 á2Ï4³5 ,ÕA'5B Ä

password password-string

no password

– DAÈ â

– D	£EÄ
password-string	*ü bEîF'P`A•,X · ¸

5 ,Õ ™ ‰ ß È2Ï4³/U*üEîF'P`A• s6Ñ7¾' 3"u ÝA'5B*ü bEîF'P`A•,X · ¸ Ä

Q ¸ õ ã L2TP-Class y ·G!5B õ ã

S*ü Û Ð V p*ü ?UE¯> EîF'P`A• ÈFw L{F' ø0ÃFÑ ™NO *üEîF'P`A• s6Ñ J S*ü,Ì à,XP`A• · ¸ Ä ï ) ÍEîF'P`A• · ¸,XA'5B,X Ý ¬FÑ î Ð7È Í h,X L2TP L{F'>• | šL8 Ä

G!5B _ _ 1 ÖA'5BEîF'P`A• · ¸ "share"
Ruijie(config-l2tp-class)# password share
Ruijie(config-l2tp-class)#

,Ì G Q ¸

Q ¸	£EÄ
-	-

G ÄAÈ â ´

Q ¸ Z Æ

(Ë	AÈ â
-	-

4.5.17 protocol (L2TP)

Q ¸A'5B L2TP { E² y – D È J no 6 ã Ú 6 á2Ï4³5 ,ÕA'5B Ä

protocol l2tpv2 [l2tp-class-name]

no protocol

– DAÈ â

– D	£EÄ
l2tpv2	S*ü L2TP 0 L{F' #A,
l2tp-class-name	é*ü,X L2TP-Class y · á/Ä

5 ,ÕG!5B 5 ,Õ ™ ‰ ß È2Ï4³T¬Ax S*üL2TPv2 0 L2TP L{F' #A, Ä

Q ¸ õ ã Pseudowire-Class y ·G!5B õ ã

S*ü Û Ð Ï) Í { E² y – DA' n,X Ý ¬FÑ î Ð7È Í h,X L2TP L{F'>• | šL8 Ä

G!5B _ _ 1 ÖA'5BL{F' #A, l2tpv2 J h*ü L2TP-Class l2x 9A' n { E² y – D

```
Ruijie(config-pw-class)#  protocol l2tpv2 l2x
Ruijie(config-pw-class)#
```

,Ì G Q ¸

Q ¸	£EÄ
-	-

G ÄAÈ â ´

Q ¸ Z Æ

(Ë	AÈ â
-	-

4.5.18 pseudowire

Q ¸A'5B pseudowire ?˜ í È J no 6 ã Ú 6 á2Ï4³5 ,ÕA'5B Ä

pseudowire peer-ip-address vcid {encapsulation l2tpv2 [pw-class pw-class-name] | pw-class pw-class-name }

no pseudowire

***ü** hostname **– DG!5B** pseudowire

pseudowire hostname peer-hostname vcid {encapsulation l2tpv2 [pw-class pw-class-name] | pw-class pw-class-name }

no pseudowire

Q ¸ õ ã L2TP-Class y ·G!5B õ ã

S*ü Û Ð Ï) Í { #\ CG¡ ô – DA' n,X Ý ¬FÑ î Ð7È Í h,X L2TP L{F'>• | šL8 Ä

G!5B _ _ 1 ÖA'5B SCCRQ G¡ ô õ D 3
Ruijie(config-l2tp-class)# retransmit initial retries 3
Ruijie(config-l2tp-class)#

,Ì G Q ¸

Q ¸	£EÄ

G ÄAÈ â	´

Q ¸ Z Æ	(Ë	AÈ â
	-	-

4.5.23 vpdn

Q ¸*ü bA’5B L2tp L{F' ê ü vrf

vpdn vrf vrf-name

no vpdn vrf

– DAÈ â	– D	£EÄ
	vrf	Û n2O _ vrf

5 ,ÕG!5B	5 ,Õ ™ ‰ ß È ê L{F' S*ü < vrf È ´A[redacted]
Q ¸ õ ã	y ·G!5B õ ã
S*ü Û Ð	A¹ Q ¸ ™ Virtual-PPP · Ã ¹?• È ¾ Ý L2tp L{F' Ã [redacted] y ·G!5B Z vrf È ‘ y ·D×!4 •,h %S*‰ ‰U2 Ô¯ÅU[redacted]

1 h0´ G!5B D +A• : Q ¸

5.1 G!5B,Ì G Q ¸

D +A• :G!5B Ù ÿ ¹ ß Q ¸ Ö

5.1.1 certificate

?U ¹#Ï tA• : È AË üA• :JÒG!5B õ ãÄconfig-cert-chain Åß ;> certificate Q ¸ Ä S*ü J no 6 ã ôL8A• : Ä

certificate [ca] certificate-serial-number

no certificate [ca] certificate-serial-number

– D	£EÄ
ca	CA A• :
certificate-serial-number	?U#Ï t ê ôL8,XA• :2Ï ë Ë

– DAÈ â

5 ,ÕG!5B ´ Ä

Q ¸ õ ã A• :JÒG!5B õ ã Ä config-cert-chain Å Ä

S*ü Û Ð | Ã ¹ S*ü!8 Q ¸ ¹ n Ô þA• : Ä È \ å ÝE-/¡ S*ü • ã Ä Ô8 ™*ü!8 Q ¸2l C ê ôL8 Ô þA• : Ä

_ ØM6,X/ _ Ú ôL8CÃ+ <A• : Ä _ S*ü show Q ¸ 9 / ?U ôL8A• :,X2Ï ë Ë Ö

Ruijie# show crypto pki certificate

Ä Ä Ä È Ä Ä Ä

G!5B _

Ruijie(config-cert-chain)# exit
Ruijie(config)#

,Ì G Q ¸

Q ¸	£EÄ
crypto pki certificate chain	A• :JÒG!5B Q ¸

G ÄAÈ â ´ Ä

Q ¸ Z Æ

(Ë	AÈ â
-	-

5.1.2 crypto pki authenticate

ü S*ü SCEP #A,9‹ ªCÃ+ <A• :,X Ê í È?U9‹ ª CA ,X A• : ÈAË ü < G!5B õ ã ß ;> crypto pki authenticate Q ¸ Ä

crypto pki authenticate ca_name

– DAÈ â

– D	£EÄ
ca_name	CA_name A¹ µ Ï&• Í h,X CA ,X @*ü á/Ä

5 ,ÕG!5B ´ Ä

Q ¸ õ ã < G!5B õ ã Ä

S*ü Û Ð

G!5B – 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 //EÝ ½yes y « CA A• :
Trustpoint CA certificate accepted.

,Ì G Q ¸

Q ¸	£EÄ
crypto pki trustpoint	G!5Btrustpoint

G ÄAÈ â ´ Ä

Q ¸ Z Æ

(Ë	AÈ â

	-	-

5.1.3 crypto pki certificate chain

?UE¯ 9A• :JÒG!5B õ ãÄconfig-cert-chain ÅÈÀË ü < G!5B õ ã ß ;> crypto pki certificate chain Q ¸ Ä

5 ,ÕG!5B	´ Ä
Q ¸ õ ã	< G!5B õ ã Ä

S*ü • ã ` Ð 9A• : Ô È,È yT£C A• : pem ã [Ê
crypto pki certificate peer address 192.168.50.203 // Í0Ã IP

S*ü Û Ð % Enter PEM-formatted peer certificate.

,Ì G Q ¸	Q ¸	
	-	-

G ÄAÈ â ´ Ä

Nð…!W ÛEpub! œ°‡ € 0¥ K€

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

Password:F4EEE4FEB3766007 //Eg 9 ¢ CA 9‹ k,X šAÁ
Re-enter password:F4EEE4FEB3766007
%The subject name in the certificate will include: router

,Ì G Q ¸

Q ¸	£EÄ
crypto pki trustpoint	G!5Btrustpoint

G ÄAÈ â ´ Ä

Q ¸ Z Æ

(Ë	AÈ â
-	-

5.1.8 crypto pki import pem

?U ¢PEM ÄPrivacy-enhanced Mail Å ã,X [Ê Ð 9A• : ` RSA šJy È AË ü < G!5B õ ã ß ;> crypto pki import pem Q ¸ Ä!8 Q ¸"u Ý No 6 ã Ä

crypto pki import pem terminal passphrase

– DAÈ â

– D	£EÄ
terminal	A• : ` šJy Ú ¢ { Ä ¹ Ð 9
passsphrase	A• : Ð Î Ê*ü b ± x/•Jy,X š-Õ È ü!8Eg 9*ü b Í/• JyE¯> ?· š

5 ,ÕG!5B ´ Ä

Q ¸ õ ã < G!5B õ ã Ä

S*ü Û Ð !8 Q ¸ á Ã ± , Ä | Ã S*ü!8 Q ¸ ¢ PEM ã,X [Ê Ð 9A• : ` RSA šJy Í ÄE- o [Ê Ã6Ñ 97¾ b J W PKI h*üA' Û È V PC Ä

G!5B _

_ 1 Ö ¹ ß _AÈ â*ü!8 Q ¸ Ð 9A• : `/•Jy,XE›/ß Ö
Ruijie# config t
Ruijie(config)# crypto pki import pem terminal 12345678
% Enter PEM-formatted CA certificate.
// ¤/ Eg 9 PEM ã,X CA A• : [
% End with a blank line or "quit" on a line by itself. // ¤/ Eg 9
0N> ê5Ù quit ¹4§ 3 [Eg 9
// ËBñCA A• : [È ü!82lC È V ß /
-----BEGIN CERTIFICATE-----
MIIDLjCCAtigAwIBAgIQVq4HPBChfoxFro0/FVIzVzANBgkqhkiG9w0BAQUFADCB

End with a blank line or the word "quit" on a line by itself
// ¤/ Eg 90N> ê5Ù quit ¹4§ 3 [Eg 9
// ËBñCÃ+ <A• : [È ü!82lC È V ß /
-----BEGIN CERTIFICATE-----
MIIEsTCCBFugAwIBAgIKEffFFwABAAAAPjANBgkqhkiG9w0BAQUFADCBrDEhMB8G
CSqGSIb3DQEJARYSZGluZ2pzQHN0YXItbmV0LmNuMQswCQYDVQQGEwJDTjEPMA0G
A1UECBMGRnVKaWFuMQ8wDQYDVQQHEwZGdVpob3UxIDAeBgNVBAoTF1JlZ2lhbnQg
TmV0d29yayBDby4gTHRkMR0wGwYDVQQLExRSZXNlYXJjaCBBcGFydG1lbnQgNTEX
MBUGA1UEAxMOQ0EgdGVzdCBzZXJ2ZXIwHhcNMDUwNDEyMDkyOTUzWhcNMDYwNDEy
MDkzOTUzWjCBpDEhMB8GCSqGSIb3DQEJARYSZGluZ2pzQHN0YXItbmV0LmNuMQsw
CQYDVQQGEwJDTjEPMA0GA1UECBMGRnVKaWFuMQ8wDQYDVQQHEwZGdVpob3UxIDAe
BgNVBAoTF1JlZ2lhbnQgTmV0d29yayBDby4gTHRkMR0wGwYDVQQLExRSZXNlYXJj
aCBBcGFydG1lbnQgNTEPMA0GA1UEAxMGZGluZ2pzMFwwDQYJKoZIhvcNAQEBBQAD
SwAwSAJBAM0sOymB/5v35vnf/PlJX+aqZpH9drtevsNaHkj4i3XdaJ55rFo2wLT0
qpWTI0nu638ktUa4dEIfF0AQM67sP0ECAwEAAaOCAmMwggJfMA4GA1UdDwEB/wQE
AwIE8DATBgNVHSUEDDAKBggrBgEFBQgCAjAdBgNVHQ4EFgQUIWVn8+ciY7JJkOFN
7MIkcRWWpx8wgegGA1UdIwSB4DCB3YAUckOEHCsDRS2CWPWEQ3f1IapLLCGhgbKk
ga8wgawxITAfBgkqhkiG9w0BCQEWEmRpbmdqc0BzdGFyLW5ldC5jbjELMAkGA1UE
BhMCQ04xDzANBgNVBAgTBkZ1SmlhbjEPMA0GA1UEBxMGRnVaaG91MSAwHgYDVQQK
ExdSZWdpYW50IE5ldHdvcmsgQ28uIEx0ZDEdMBsGA1UECxMUUmVzZWFyY2ggQXBh
cnRtZW50IDUxFzAVBgNVBAMTDkNBIHRlc3Qgc2VydmVyghBWrgc8EKF+jEWujT8V
UjNXMH8GA1UdHwR4MHYwOKA2oDSGMmh0dHA6Ly96ai1yb3V0ZXIvQ2VydEVucm9s
bC9DQSUyMHRlc3QlMjBzZXJ2ZXIuY3JsMDqgOKA2hjRmaWxlOi8vXFx6ai1yb3V0
ZXJcQ2VydEVucm9sbFxDQSUyMHRlc3QlMjBzZXJ2ZXIuY3JsMIGsBggrBgEFBQcB
AQSBnzCBnDBLBggrBgEFBQcwAoY/aHR0cDovL3pqLXJvdXRlci9DZXJ0RW5yb2xs
L3pqLXJvdXRlcl9DQSUyMHRlc3QlMjBzZXJ2ZXIoMSkuY3J0ME0GCCsGAQUFBzAC
hkFmaWxlOi8vXFx6ai1yb3V0ZXJcQ2VydEVucm9sbFx6ai1yb3V0ZXJfQ0ElMjB0
ZXN0JTIwc2VydmVyKDEpLmNydDANBgkqhkiG9w0BAQUFAANBABSEeYlEi7fm06en
NDdkZMjYV8LZB1JjniePwy1sUEEDa2bH9ZrcpTnJ+CSkCkxXBTc5ZWZnFTiSH/Oc
uVyQ9D8=
-----END CERTIFICATE-----
quit
% Certificate successfully imported
Ruijie(config)#

,Ì G Q ¸

Q ¸	£EÄ
-	-

G ÄAÈ â ´

Q ¸ Z Æ

(Ë	AÈ â
-	-

5.1.9 crypto pki trustpoint

?UE¯ 9trustpoint G!5B õ ãÄca-trustpoint ÅÈAË ü < G!5B õ ã ß ;> crypto pki trustpoint Q ¸ Ä ¹ J NO 6 ã Ã ôL8 trustpoint ž J Ù ÿ,X ÝA• : Ä

crypto pki trustpoint ca_name

no crypto pki trustpoint ca_name

– DAÈ â

– D	£EÄ
ca_name	ca_name µ Ï&•Ä trustpoint ÅÍ h,X CA ,X @*ü á /Ä

5 ,ÕG!5B ´ Ä

Q ¸ õ ã < G!5B õ ã Ä

S*ü Û Ð | Ã ¹ S*ü!8 Q ¸E¯ 9 trustpoint G!5B õ ã È üE- þ õ ã È | Ã ¹G!5BA¹ trustpoint Í h,X Ý – D Ä V p | ;> no crypto pki trustpoint ca_name Q ¸ È | Ú ôL8 µ Ï&• ž J Í h,X ÝA• : Ä

G!5B _

,Ì G Q ¸

Q ¸	£EÄ

G ÄAÈ â ´ Ä

Q ¸ Z Æ

(Ë	AÈ â
-	-

5.1.10 enrollment offline subject

G!5B CÃ+ <,X Ã Ú á + ÈAË ü trustpoint G!5B õ ã ß ;> enrollment offline subject Q ¸ Ä

enrollment offline subject

– DAÈ â

– D	£EÄ
´	´ Ä

5 ,ÕG!5B Ã Ú á 0N Ä

Q ¸ õ ã trustpoint G!5B õ ã Ä

S*ü Û Đ

*ü b+ AËA• : Ê ? m dn µ C È B ¤/ µ CEg 9 Í h µ C
Common Name (eg, YOUR name) []: // |,X á + â §!ã
Organizational Unit Name (eg, section) []: // |,X4˜4›) ! á/Ä
Organization Name (eg, company) []: // |4˜4› á/Ä
Locality Name (eg, city) []: // | ü,X ¢ Ö ê ³ á/Ä

1 AF¼ Ú] <G!5B Q ¸ –5×

1 A0´ G!5B D +A• : Q ¸

enrollment url url_string

no enrollment url

– DAÈ â	– D	£EÄ
	url_string	¹ http:// Ô ,X URL +0ú ÈKS z áCYE› 255

5 ,ÕG!5B ´ Ä

Q ¸ õ ã trustpoint G!5B õ ã Ä

S*ü Û Ð

G!5B _

,Ì G Q ¸	Q ¸	£EÄ
	crypto pki trustpoint	E¯ 9 trustpoint G!5B õ ã

G ÄAÈ â ´ Ä

Q ¸ Z Æ	(Ë	AÈ â
	-	-

5.1.14 enrollment auto-enroll

?U Û n trustpoint Í h,XA• :,X È „ < ó ÈAË ü trustpoint G!5B õ ã ß ;>
enrollment auto-enroll Q ¸ Ä ¹ J NO 6 ã 6 áT¬AxG!5B Ä

enrollment auto-enroll percentage

no enrollment auto-enroll

– DAÈ â	– D	£EÄ
	percentage	percentage Ô þ 1 100 ,X D + È Û nA• :,X Ý *ó Q ó#\5ë ,R Ú î å,X Ê íE¯> A• : È „ Ä

5 ,ÕG!5B ´ Ä

Q ¸ õ ã trustpoint G!5B õ ã Ä

S*ü Û Ð

5.1.16 debug crypto pki

?U ' Ô pki ,Ì G,XA×A© Ô G ÈÆË üEXEC (M G!5B õ ã ß ;> debug crypto pki Q ¸ Ä S*ü J no 6 ã GKÁ,Ì h,XA×A© Ô G Ä

debug crypto pki {event | error }

no debug crypto pki {event | error }

– D	£EÄ

88Tj ET 76.5 659.18 0.28 2

Q ¸ õ ã

trustpoint G!5B õ ã Ä

S*ü Û Ð

CA A• : ™NO 7¾1R áA• : CA AxA• Í CA A• : ” ¹ !‰ Ä V p ¥)„ CA A• : á A• : ÈLÔ?UEæ & ¹ R Þ4{A• : È â*ü a Þ Ô4{A• :P`A• ' ! S*ü CA A• : ÄrL Þ V p,Ì à,X CA 1R ¥ Æ4£ Ã ¹AÈ â «1 Ý • µ Ï È CA A• : á 7¾1R áA• : á E ¡4§ p Ä GKÁ Eæ & ¹ R â È ¾?U à Ô þ CA 1R ¥,XA• : G ÃEîE›P`A• Ä

G!5B _

´ Ä

,Ì G Q ¸

Q ¸	£EÄ
-	-

G ÄAÈ â

´ Ä

Q ¸ Z Æ

(Ë	AÈ â
-	-

5.1.18 revocation-check

? U Â A • : ú x J Ô , X P ` A • 1 * + 9 È ÅuËstpoint õ ã ß ; > revocation-check Q ¸ Ä*ü!8 Q ¸,X No 6 ã 6 á T¬AxG!5B Ä

revocation-check {none}

no revocation-check {none}

– DAÈ â

– D	£EÄ
none	A• :P`A• Ê ÈG›*ü ‘ R1*+9 È G á ” ¹A• : ú Æ>• ÞJÔ

G ÄAÈ â	´ Ä

Q ¸ Z Æ	(Ë	AÈ â
	-	-

5.1.19 time-check

?U GKÁA• : ÊKÈ Ý ó ” ¹ ÈAË ü trustpoint õ ã ß ;> time-check Q ¸ Ä *ü!8 Q ¸,X No 6 ã 6 á T¬AxG!5B Ä

time-check {none}

no time-check {none}

– DAÈ â	– D	£EÄ
	none	GKÁA• : Ý ó ” ¹

5 ,ÕG!5B	5 ,Õ Ô Ý ó ” ¹ È Ý ó8× È ê,X ´ A• : ü S*ü,XE›/ß îP`A• Bù
Q ¸ õ ã	trustpoint G!5B õ ã Ä
S*ü Û Ð	A• : Ý ó Û/ ZA• : ú Ý È üA’ Û Þ S*ü,X Ê í î BA’ Û ÊKÈ 9 ” ¹ È ü ¤ o U0Ã ™ ‰ ß ÈA’ Û ÊKÈ Ö È î Ð7ÈA• : Ý ó ” ¹ Bù È GKÁ â?· ‡ Ô o(M!^ C h *ü Ä ´ A• : ” ¹ •,X È ¾?U º ê ÔE•A’ Û ü ” ¹ Ê í ” ¹ Ý ó È 3 Ã ¹E’ p Ä" 6. {LÔ ã — S*ü Ä
G!5B _	´ Ä

,Ì G Q ¸	Q ¸	£EÄ
	-	-

G ÄAÈ â	´ Ä

Q ¸ Z Æ	(Ë	AÈ â
	-	-

5.2 / ,Ì G Q ¸

Ù ÿ ¹ ß Q ¸ Ö

5.2.1 show crypto pki certificate

?U / 2Ï4³G!5B,XA• : µ C ÈAË ü EXEC (M G!5B õ ã ß ;> show crypto pki certificate Q ¸ Ä

show crypto pki certificate [brief]

Exponent: 65537 (0x10001)

X509v3 extensions: // A• : =)NM µ C

X509v3 Key Usage: // šJy*üEè Û «

Digital Signature, Non Repudiation, Certificate Sign, CRL Sign
// Ù À D +1R á È kG¡ ÈA• :1R á È CRL1R á

X509v3 Basic Constraints: critical

CA:TRUE

X509v3 Subject Key Identifier: // ' š J y Û A š 0 ú
64:46:12:C0:27:A4:9E:01:0C:65:DA:F8:6E:E7:FE:C6:56:EC:AD:D4

X509v3 CRL Distribution Points: //CRL Ú ¥&• µ C

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

// 1R á1k"©

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 // A• :1R á

%Router certificate info: // ¹ ß CÃ+ <A• : µ C

Certificate:

Data:

Version: 3 (0x2) //X.509 v3 (

Serial Number: // A• :2Ï ë Ë

16:2a:7a:1d:00:00:00:00:00:02

Signature Algorithm: sha1WithRSAEncryption

// 1R á1k"©

Issuer: emailAddress=wlcpyjwb@star- net.cn, C=CN, ST=fj, L=fuzhou,
O=Red Giant, OU=Department 5, CN=CA Server

// NU ¥5ÙDN á

Validity // A• : Ý ó µ C

Not Before: Jun 22 05:50:48 2005 GMT // Ô Ÿ*ó ,X UTC ÊKÈ

Not After : Jun 22 06:00:48 2006 GMT // G ÚE› ó,X UTC ÊKÈ

Subject: emailAddress=zhaojun, C=CN, ST=fj, L=fuzhou, O=Red Giant,
OU=De partment 5, CN=zhaojun !ð_Å Ý®Â ð l B t š!ðÁ

// A• : ' DN á

Subject Public Key Info: // ' @Jy µ C Jy k"©

7e:83:ba:76:49:7f:be:f4:1f:4a:a1:0b:98:22:96:
e2:79:54:a0:ed:1c:62:30:b7:ee:6a:6e:cb:72:e9:
9c:d9:e8:b0:dc:f5:c6:19:8f:2b:2a:85:fa:bf:ff:
08:40:7e:f2:a1:df:d1:8b:ef:68:32:1e:1a:45:fa:
16:de:33:b0:62:90:bd:9c:8e:ec:7c:6e:49:48:75:
e6:5c:ce:b1:8e:1c:80:f3:5b:79:6c:a1:31:b2:a9:
48:37:9f:ed:45:95:85:ba:98:0f:42:c5:78:4c:3d:
a2:45:73:90:3d:0b:1a:7c:53:b5:97:1a:a6:43:2f:
44:54:0f:a1:51:3a:0e:9f:8b:2e:d1:70:cb:36:99:
91:57:d2:b7:9d:7c:ee:07:cf:4a:c7:cd:71:dc:ce:
72:dc:75:a0:03:b2:36:be:8e:af:ca:99:46:03:83:
27:d3:ff:24:1e:4c:0c:21:99:b4:fe:5a:4d:61:b5:
e9:b4:38:dc:59:2c:37:f3:93:02:fc:09:88:02:1b:
d0:45
Exponent: 65537 (0x10001)

X509v3 extensions: // A• : =)NM µ C

X509v3 Key Usage: critical // šJy*üEè Û « È GK =)NM

Digital Signature, Non Repudiation // Ù À D +1R á Ã kG¡

X509v3 Extended Key Usage: // =) šJy*üEè

1.3.6.1.5.5.8.2.2

X509v3 Subject Key Identifier: // ' š J y Û A š 0 ú
84:7E:33:A3:91:A5:26:1D:2D:BB:54:65:BF:C7:2A:2A:2E:87:D5:A9

X509v3 Authority Key Identifier: // NU ¥ X šJy ÛAš0ú

keyid:64:46:12:C0:27:A4:9E:01:0C:65:DA:F8:6E:E7:FE:C6:56:EC:AD:D
4
DirName:/emailAddress=wlcpyjwb@star-net.cn/C=CN/ST=fj/L=fuzhou/O
=Red Giant/OU=Department 5/CN=CA Server
serial:7F:FF:BB:39:97:39:B4:81:4B:E1:6B:4F:F9:06:7A:4B

X509v3 CRL Distribution Points: //CRL Ú ¥&• µ C

URI:http://zj-router/CertEnroll/CA%20Server.crl
URI:file://\\zj-router\CertEnroll\CA%20Server.crl

Authority Information Access: // NU ¥ X µ CA“KÂ&•

CA Issuers - URI:http://zj-router/CertEnroll/zj-router_CA%20Serv
er.crt
CA Issuers - URI:file://\\zj-router\CertEnroll\zj-router_CA%20Se
rver.crt

Signature Algorithm: sha1WithRSAEncryption // 1R á1k"©

37:50:0c:d6:6c:23:6d:2d:81:37:02:6c:22:ef:e2:95:98:dc:
91:25:fe:0a:3b:b0:f2:48:69:2c:6b:98:66:be:6b:09:ef:de:
2f:db:ed:71:0e:04:a5:12:38:8b:30:2b:eb:c9:d9:88:1e:a2:
10:2c:86:d2:3d:25:fd:9c:df:b4/ // A• :1R á

Ruijie#

AÈ â	/ ¹ « á u4³Au µ C
G ÄAÈ â	´

Q ¸ Z Æ	(Ë	AÈ â
	-	-

5.2.2 show crypto pki crls

?U / 2Ï4³,X CRL µ C ÈAË üEXEC (M G!5B õ ã ß ;> show crypto pki crl Q ¸ Ä

show crypto pki crls

– DAÈ â	– D	£EÄ
	-	-

Revocation Date: Jun 22 06:19:53 2005 GMT // ÞJÔ ÊKÈ

CRL entry extensions: //CRL 5,Â =)NM

X509v3 CRL Reason Code: //CRL ÞJÔ s ´ ·-Õ

Key Compromise // šJy'˜$ã

Serial Number: 1635E5E3000000000003

Revocation Date: Jun 22 06:19:53 2005 GMT

CRL entry extensions:

X509v3 CRL Reason Code:

Key Compromise // šJy'˜$ã

Signature Algorithm: sha1WithRSAEncryption // 1 R á 1 k " ©
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 // 1R á

Ruijie#

enrollment url http://192.168.50.203/certsrv/mscep/mscep.dll
enrollment retry perriod 1
enrollment retry count 60

Ruijie(config)#

,Ì G Q ¸

Q ¸	£EÄ
-	-

G ÄAÈ â ´ Ä

Q ¸ Z Æ

(Ë	AÈ â
-	-

5.2.4 show crypto pki trustpoints name_string status

?U / 2Ï4³,X trustpoint ,X ' !(Š Õ µ C ÈAË ü EXEC (M G!5B õ ã ß ;>
show crypto pki trustpoints name_string status Q ¸ Ä

show crypto pki trustpoints name_string status

– DAÈ â

– D	£EÄ
name_string	trustpoint ,X á +

5 ,ÕG!5B ´ Ä

Q ¸ õ ã (M

S*ü Û Ð ´ Ä

G!5B _

_ 1 Ö ßM6,X/ _ A¹ Q ¸,X Ô þEg Î Ö
Ruijie(config)#show crypto pki trustpoints CA status
Trustpoint CA Status:
State:
Keys generated ..... Not Generated
Issuing CA authenticated ..... No
Certificate request(s) ..... No

Ruijie(config)#

,Ì G Q ¸

Q ¸	£EÄ
-	-

G ÄAÈ â ´ Ä

Q ¸ Z Æ

(Ë	AÈ â
-	-

1 A0´ IP NAT G!5B Q ¸

6.1 IP NAT G!5B Q ¸

IP NAT G!5B Ù À ¹ ß Q ¸ Ö

- address
- Clear ip nat config-rules
- clear ip nat translation
- ip nat
- ip nat inside destination
- ip nat inside source
- ip nat outside source
- ip nat pool
- ip nat translation
- show ip nat translations
- show ip nat translations
- debug ip nat

6.1.1 address

?UG!5B Ô þNAT 0N "4,X 8× È È*ü NAT "4G!5B Q ¸ address Ä A¹ Q ¸,X no 6 ã Ã ¹ ôL8 Ô þ "4,X 8× È Ä

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]

Ï – DAÈ â Ð

– D	£EÄ
start-ip	Ô þ +,XCK Ÿ IP Ä
end-ip	Ô þ +,X4§ 3 IP Ä

interface interface	*ü b NAT Ý î þ outside ·,X ™ ‰ Ä Pool G n ,X G›*ü y · È Ô8 *ü b y · Ý Y # È î Ô Ÿ þ-¹,X ™ ‰ Ä"¼ ã?U â âM6¸X match interface interface Ü*ü È5à è ø þ interface ?U Ô7È Ä ú í Ã6Ñ éCKNAT áEî Ä
match interface interface	*ü b NAT Ý î þ outside ·,X ™ ‰ Ä '+ CÃ+ ‡ n Z y [,X Î · â È NAT a*üE- þ Î · 9EÝ ª pool â ,Ì G!,X Ä

Ï5 ,Õ ™ ‰ Ð

"u Ý n 8× È Ä

Ï Q ¸ õ ã Ð

NAT "4G!5B õ ã

Ï S*ü Û + Ð

V p Ô þ "4LÔ?U n î þ 8× È È Oj LÔ?UE¯ 9NAT "4G!5B õ ã È ' âE¯> NAT 8× È,X n Ä

"¼ ã ÖNPE80 E-! { • match GK + á ÃEÝ È G Q ¸ ã V ß Ö 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

Ï _ Ð

¹ ßG!5B _ $ È ï Î Z Ô þ mulnets "4 È J n Z ø þ + Ä

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

Ï,Ì G Q ¸ Ð

Q ¸	AÈ â
ip nat pool	n IP NAT "4

6.1.2 clear ip nat config-rules

#ÙL8L8nterface ê,X Ý,X nat G!5B È ü(M *ü õ ã ;> A¹ Q ¸ Ä

clear ip nat config-rules

Ï – DAÈ â Ð

– D	£EÄ
	ôL8 Ý,XL8 interface ê,X NAT G!5B Ä

Ï Q ¸ õ ã Ð

(M *ü õ ã

Ï S*ü Û + Ð

h*üA¹ Q ¸ È Ã ¹ > ôL8L8 Z interface ê,X Ý,X nat G!5B Ä

Ï,Ì G Q ¸ Ð

Q ¸	AÈ â
ip nat	n EîE›A¹ y ·,X# G£LÔ?U NAT E@ 6 Ä
ip nat inside destination	*ü YF¼,Â Û ,X NAT E@ 6 Ä
ip nat inside source	*ü YF¼$d ,X NAT E@ 6 Ä
ip nat outside source	*ü êF¼$d ,X NAT E@ 6 Ä
ip nat pool	n IP NAT "4

6.1.3 ip nat application

?U r)„ NAT ,X(M!^ h*ü È Ã ¹*ü < G!5B Q ¸ ip nat application ÄA¹ Q ¸ ,X no 6 ã Ã ¹ ª#\A¹(M!^ h*ü Ä

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 }

src-change 156 389.9TJ /TT0 1 Tf -0.0026 Tc 0.0048 Tw 7.28 0 Td (} {)Tj /TT2 }0 Td [st-23Ec

dest-ip	G! YF¼ < È G y [,X,Â,X G! 5 Ê È ¾ Ý,Â,X G!A¹ J è$d G! !M6 n ,XA“KÂ ë>< È ! î ï Î NAT E@ 6A„) Ä
tcp dest-ip port-num	G! YF¼ < ¹ ž,Â,X0Ã · È ¾ Ý tcp y [,X,Â,X `,Â,X0Ã · G!E-G n ,X 5 Ê J è$d G! !M6 n ,XA“KÂ ë>< È ! î ï Î NAT E@ 6A„) Ä
udp dest-ip port-num	G! YF¼ < ¹ ž,Â,X0Ã · È ¾ Ý udp y [,X,Â,X `,Â,X0Ã · G! E-G n ,X 5 Ê J è$d G! !M6 n ,XA“KÂ ë>< È ! î ï Î NAT E@ 6A„) Ä
dest-change ip-addr port-num	Â $µC‡ 5 Ê,X y [,X,Â,X ¹ ž ,Â,X0Ã ·
src-change ip-addr	Â $µC‡ 5 Ê,X y [,X$d

Ï5 ,Õ ™ ‰ Ð

"u Ý n A¹?˜ í Ä

Ï Q ¸ õ ã Ð

< G!5B õ ã

Ï S*ü Û + Ð

ü Ô o NAT ,XP¬4{ h*ü Ü ÈLÔ?U Â Ô o(M n,X IP y [$d ê5Ù,Â,X ÄE- Ê Ã ¹*ü E- 5 Q ¸ Ä ßM6,X _ $ *üE- 5 Q ¸ r)„ ³ á?· d 4» á u (DNS relay) Ä"¼ ãA¹ Q ¸ ™ üCÃ+ < ÞEÖ*ü Ä

Ï _ Ð

ü ¹ ßG!5B Ú AŒ Y5% 192.168.1.0 5%!‰,X Ú DNS á u < Û å NAT inside y ·,X IP Ö192.168.1.1 È÷ CÃ+ <,X NAT s6ÑBóB÷ Ú Y5% ,X DNS AË" E@ ¥4-,ó!7,X DNS á u < 202.101.98.55 È J Ú DNS h1(y [E@ ¥4-Y5% Ä S*ü ip nat application Q ¸ 9 r)„A¹ s6Ñ ÈAÁ V p Ý Ö$d $µC‡ access-list 1 Ã,Â,X 192.168.1.1 Ã,Â,X0Ã · 53 ,X UDP y [È í Â E- þ IP y [,X,Â,X 202.101.98.55 Ã,Â,X0Ã · 53 Ä K ' Q ¸6î V ß Ö

```
!
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
!
```

Ï,Ì G Q ¸ Ð

Q ¸	AÈ â
address	n "4,X +8× È
ip nat	n EîE›A¹ y ·,X# G£LÔ?U NAT E@ 6 Ä
ip nat inside destination	*ü YF¼,Â Û ,X NAT E@ 6 Ä
ip nat inside source	*ü YF¼$d ,X NAT E@ 6 Ä
ip nat outside source	*ü êF¼$d ,X NAT E@ 6 Ä
show ip nat translations	/ IP NAT ,XE@ 6A„) Ä

6.1.4 ip nat inside destination

?U *ü NAT YF¼,Â Û E@ 6 È*ü < G!5B Q ¸ ip nat inside destination Ä A¹ Q ¸,X no 6 ã GKÁ NAT YF¼,Â ÛE@ 6 Ä

ip nat inside destination list access-list-number pool pool-name

no ip nat inside destination list access-list-number pool pool-name

Ï – DAÈ â Ð

– D	£EÄ
list access-list-number	A“KÂ ë>< n ,X YF¼ < È V p êF¼ 5%4°A“KÂ ë>< ,X È YF¼ < Ú î E@ 6 äpool n ,X YF¼ Ä"¼ ã E-G hA¹ S*ü G!,Â Û IP <. ³ IP ,X 100-199 E- þ8× È,X =) ACL Ä¼ ãE-G h A¹ S*ü G!,Â Û IP <. ³ IP ,X 100-199 E- þ8× È,X =) ACL Ä
pool pool-name	"4 n Z YF¼ ,X0NKÈ È E¯> ,Â Û E@ 6 Ê È Ú î ¢ ÚG! YF¼ Ä

Ï5 ,Õ ™ ‰ Ð

"u Ý *ü YF¼$d E@ 6 Ä

6.1.5 ip nat inside source

?U *ü YF¼$d NAT È Ã ¹*ü y ·G!5B Q ¸ ip nat inside source ÄA¹ Q ¸,X no 6 ã Ã ¹ ª#\M- Õ ê | Õ,X NAT Ä

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

Ï – DAÈ â Ð

– D	£EÄ
list access-list-number	A“KÂ ë><Ä ¾ Ý$d G!A¹A“KÂ ë><,X# G£ È ! î ï Î NAT E@ 6A„) Ä
interface interface-type interface-number	ý*ü outside y ·,X < . NAPT Ä5% 4° 0Ã ·E@ 6 Å È 3 ¿ =) NAT Ä
pool pool-name	ý*ü "4 ,X < . NAT Ä
Overload	Ä ÃEÝ Åpool ,X!£ þ < FÑ Ã ¹ á *üE@ 6 È . NAPT Ä‚Â !"u ÝG!5BE- þ – D È< 3 á*ü Ä ¹#Ï tE- þ

global-port	< ,X á u0Ã · Ë Ä êF¼5%4°EîE›A¹0Ã ·A“KÂ YF¼5%4° ,X á u Ä A¹0Ã · Ë Ã ¹ â local-port á à Ä
permit-inside	¾ Î)„ ü ip nat inside source static Q ¸ È*ü b AŒ Y5%*ü ¹ global-ip A“KÂ local-ip ,X ÄA¹ GK + ™ üCÃ+ < ÞEÖ *ü Ä

Ï5 ,Õ ™ ‰ Ð

"u Ý YF¼$d NAT ¥*ó Ä

Ï Q ¸ õ ã Ð

< G!5B õ ã

Ï S*ü Û + Ð

' YF¼5%4°,XIP /• Ý È œLÔ?U â êF¼5%4°EîA*ƒ* lÊÔÈ²UG!5BNAT È Ú YF¼/• Ý IP E@ 6 ä < Ô IP Ä

Í b Ô o5% û ê Õ î) ! È V p ™ ™ Z Þ5%A“KÂ êF¼5%4°,XC $d È V##?œ 5%NI Ã ¥F, Ê Ã ßEQ [Ê1 È5à D• á Í êF¼5%4° ¤ o5%4° á u È Ã ¹,È y ý*ü outside y ·,X IP . < È ¹ NAPT • ã r)„ E@ 6 Ä V p á 0 NAT È ÚG!/• Ý ,X YF¼5%4° G S(=)Ú Þ â êF¼5%4° r)„ Z f6(È ,Ì f KÈ H fEî á Z È ´ êF¼5%4°"u Ý/• Ý ,X5%4°CÃ+ Ä

Í b ¤ o á u,X YF¼ ÈLÔ?UG!5BM- Õ NAT ê NAPT Ä5×<% á u ¤ o,X Ã Õ4Á û È G£ á?U ý*ü outside y ·,X .M- Õ NAPT È´ A¹ â ISP f6(È ¬ 6,X Ã6Ñ û \ û ÄEî ™ ‰ ß È Y5%*ü A“KÂE- o YF¼ ¤ o,X á u È ¾?U*ü Y5% IP Ã ¹ Z Ä Ý o(M!^,X h*ü á u È?U" Y5% *ü ¹ < IP A“KÂA¹ á u ÄE- ÊG!5B YF¼$d M- Õ NAT ê YF¼$d M- Õ NAPT Ê ÈLÔ?U t 9 permit-inside GK + Ä!8 Ê Ô Q 3?U ü inside · ÞG! Þ no ip redirects ÈL !6 inside · ¥G¡ n å,X y [Ä

Ï _ Ð

¹ ßG!5B _ $ È Ã ¹ Ú 192.168.12.0/24 YF¼ È | ÕE@ 6 < 200.168.12.0/28 5%!‰ Ä YF¼5%4°,X J W5%!‰ á AŒNAT Ä

```
!
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
```

Ï,Ì G Q ¸ Ð

Q ¸	AÈ â
ip nat	n EîE›A¹ y ·,X# G£LÔ?U NAT E@ 6 Ä
ip nat inside destination	*ü YF¼,Â Û ,X NAT E@ 6 Ä
ip nat outside source	*ü êF¼$d ,X NAT E@ 6 Ä
ip nat pool	n IP NAT "4 Ä
show ip nat translations	/ IP NAT ,XE@ 6A„) Ä

6.1.6 ip nat outside source

?UG!5B êF¼$d NAT È Ã ¹*ü < G!5B Q ¸ ip nat outside source ÄA¹ Q ¸,X no 6 ã Ã ¹ ª#\ êF¼$d NAT Ä

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

Ï – DAÈ â Ð

– D	£EÄ
list access-list-number	< A“KÂ ë>< Ä ¾ Ý$d G!A¹A“KÂ ë><,X# G£ È ! î ï Î NAT E@ 6A„) Ä
pool pool-name	ý*ü "4 ,X . NAT Ä
static global-ip local-ip	n 1T)M- Õ NAT Älocal-ip È global-ip < Ä
static protocol	n =)M- Õ NAT Èprotocol Ã ¹ TCP ê UDP Ä
local-port	,X á u0Ã · Ë Ä TCP ê UDP ,X0Ã · Ë È!£/¡ á uFÑ Ô8 Í h Ô þ á u0Ã · Ä A¹0Ã · Ë Ã ¹ â global-port á Ô Ä
global-port	< ,X á u0Ã · Ë Ä

Ï5 ,Õ ™ ‰ Ð

"u Ý êF¼$d NAT ¥*ó Ä

Ï Q ¸ õ ã Ð

< G!5B õ ã

Ï S*ü Û + Ð

êF¼$d NAT E@ 6 ?U h*ü üG¡ ´ 0NKÈ,X E@ 6 Ä ø þLÔ?U f6(,X /• Ý5%4° ÚG! Z à IP È ê5Ù Ô þ/• Ý5%4° ` @ Ý5%4° ÚG! Z à ,X < IP ÈE-/¡ ™ ‰/Ä G¡ ´ Ä ø þG¡ ´ ,X5%4° KÈ á Ã6Ñ Eî µ,X È´ W À,Ì fAx Í •,X ü 5%4° ÄG¡ ´ NAT çK¼ J\ ÍG¡ ´ 5%4° KÈEî µ,XKÂNl ÈG!5B ZG¡ ´ NAT È êF¼5%4° ü YF¼5%4°><)„ º Ô þ5%4° È ¡ Ô Ä

G¡ ´ NAT G!5B È J r Ú ø þF¼ Ú Y • Ö 1 Å YF¼$d NAT G!5B ×2 Å êF¼$d NAT G!5B È¾ Ý â YF¼5%4° G¡ ´,X êF¼5%4°LÔ?UG!5B êF¼$d E@ 6 È êF¼$d E@ 6 Ã ¹G›*üM- Õ NAT G!5B ê | Õ NAT G!5B Ä

' YF¼5%4° ÎA' Ê ÚG! ZM2"¼ `,X <)× IP È r)„ â f6(5%E² y Ê È ™' î ¥*ó G¡ ´,X ™ ‰ Ä YF¼5%4° Ô8 G›*ü ³ áA“KÂ êF¼5%4° È ´!8CÃ + <E¬ ™NO ÕDNS y [,X NAT Ä

Ï _ Ð

¹ ßG!5B _ $ È YF¼5%4° 92.168.12.0/24 â êF¼5%4°,X G¡ ´ Ä4£E›E@ 6 â È YF¼ Ã ¹EîE› 192.168.12.0/24 5%4° A“KÂ êF¼5%92.168.12.0/24 5%!‰,X Ä

```
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
```

+ b ¢ inside outside • å,X D B Ù È ™NO ø •CÃ+ !6Ñ ‡ n úE¯>

NAT È ´!8 ™NOG!5BM- ÕCÃ+ Ä

Ï,Ì G Q ¸ Ð

Q ¸	AÈ â
ip nat	n EîE›A¹ y ·,X# G£LÔ?U NAT E@ 6 Ä
ip nat inside destination	*ü YF¼,Â Û ,X NAT E@ 6 Ä
ip nat inside source	*ü YF¼$d ,X NAT E@ 6 Ä
ip nat pool	n IP NAT "4
show ip nat translations	/ IP NAT ,XE@ 6A„) Ä

6.1.7 ip nat pool

?U n NAT ,X "4 È Ã ¹*ü < G!5B Q ¸ ip nat pool ÄA¹ Q ¸,X no 6 ã Ã ¹ ôL8 "4 Ä

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

Ï – DAÈ â Ð

– D	£EÄ
pool-name	NAT "4 á + Ä
start-ip	NAT "4,XCK Ÿ IP Ä
end-ip	NAT "4,X4§ 3 IP Ä
netmask netmask	NAT "4,X 5%4° }-Õ Ä
Prefix-length prefix-length	NAT "4,X 5%4° }-ÕKS z Ä
Type	NAT "4,X2O _ Ä rotary EBE@ _ È !£ þ ÚG!,X V)[,Ì1 Ä Ý"u ÝG! rotary FÑ EBE@ _ Ä ¹ é 9 rotary – D â cisco Q ¸ P • Ä

Ï5 ,Õ ™ ‰ Ð

"u Ý "4>• n Ä

Ï Q ¸ õ ã Ð

< G!5B õ ã

Ï S*ü Û + Ð

V p Ô þ "4LÔ?U n î þ + È íLÔ?U ï Î Ô þ0N "4 È â n 8× È Ä

Ï _ Đ

¹ ßG!5B _ $ È ï Î Z á + net192 ,X "4 ÈCK Ÿ 192.168.12.1 È 4§ 3 192.168.12.254 È5%4° }-ÕKS z 24 þ!¨(M ! Ä

ip nat pool net192 192.168.12.1 200.168.12.254 prefix-length 24

Ï,Ì G Q ¸ Đ

Q ¸	AÈ â
address	n "4,X +8× È
ip nat	n EîE›A¹ y ·,X# G£LÔ?U NAT E@ 6 Ä
ip nat inside destination	*ü YF¼,Â Û ,X NAT E@ 6 Ä
ip nat inside source	*ü YF¼$d ,X NAT E@ 6 Ä
ip nat outside source	*ü êF¼$d ,X NAT E@ 6 Ä
show ip nat translations	/ IP NAT ,XE@ 6A„) Ä

6.1.8 ip nat keepalive

!8 Q ¸ Õ nat | ¥EÕ "4 !C arp

Ip nat keepalive time-interval

no Ip nat keepalive

Ï – DAÈ â Đ

– D	£EÄ
time-interval	ÊKÈKÈLh Ä) ! Ö/¦ Å

Ï5 ,Õ ™ ‰ Đ

A¹ s6ÑT¬Ax GKÁ

Ï Q ¸ õ ã Đ

< G!5B õ ã Ä

Ï S*ü Û + Đ

G!5B ÊKÈKÈLh â s6Ñ S6Ñ È "4 Ã6ÑEW î È ÎA,G!5B ÊKÈKÈLh û b 1800 /¦

Ï _ Ð

ip nat keepalive 1800
no ip nat keepalive

Ï,Ì G Q ¸ Ð

Q ¸	AÈ â
ip nat inside source	*ü YF¼$d NAT

6.1.9 ip nat translation

!8 Q ¸ Õ(M!^ #A, S6Ñ Ô G ÈŒ- o #A,T¬Ax Ô ,X È*ü no Q ¸ Ã ¹ G KÁE- o #A, È!8 Q ¸ Ã ¹G¡ „ S6ÑE- o #A, Ä

Ip nat translation {ftp|h323|pptp|rtsp|sip|tftp}

no Ip nat translation {ftp|h323|pptp|rtsp|sip|tftp}

Ï – DAÈ â Ð

– D	£EÄ
ftp	Õ ftp S6Ñ Ô G
h323	Õ h323 S6Ñ Ô G
pptp	Õ pptp S6Ñ Ô G
rtsp	Õ rtsp S6Ñ Ô G
sip	Õ sip S6Ñ Ô G
tftp	Õ tftp S6Ñ Ô G

Ï5 ,Õ ™ ‰ Ð

Ý,X #A,FÑ ' Ô,X Ä

Ï Q ¸ õ ã Ð

< G!5B õ ã

Ï S*ü Û + Ð

A¹ Q ¸T¬Ax (M!^ #A, Ô ,X È Ã*ü no Q ¸ G] ÈŁÔ?UE- o #A, S6Ñ,X Ê í *üA¹ Q ¸ Ô Ä

Ï _ Ð

ip nat translation ftp

/ 4§ p Ø +!‰ ÿ KäEÄ V ß Ö

+!‰	£EÄ
Pro	#A,2O _ Ä “udp”></ A¹E@ 6A„) UDP E@ 6A„) × “tcp”></ A¹E@ 6A„) TCP E@ 6A„) Ä“icmp” ></ A¹E@ 6A„) ICMP E@ 6A„) Ä
Inside global	YF¼ < ž0Ã · Ë Ä
Inside local	YF¼ ž0Ã · Ë Ä
Outside local	êF¼ ž0Ã · Ë Ä
Outside global	êF¼ < ž0Ã · Ë Ä
timeout	></ A¹ NAT E@ 6A„)/•CY ÊE¬ Ý îKS ÊKÈ È) ! /¦ Ä
ESTABLISHED	TCP ,X(Š Õ È Ý ESTABLISHED ÃSYN_SENT Ã SYN_RECV ÃFIN_WAIT ÃTIME_WAIT ÃCLOSE Ã CLOSE_WAIT ÃLAST_ACK ÃLISTEN Ä

Ï,Ì G Q ¸ Ð

Q ¸	AÈ â
ip nat	n EîE›A¹ y ·,X# G£LÔ?U NAT E@ 6 Ä
ip nat inside destination	*ü YF¼,Â Û ,X NAT E@ 6 Ä
ip nat inside source	*ü YF¼$d ,X NAT E@ 6 Ä
ip nat outside source	*ü êF¼$d ,X NAT E@ 6 Ä
ip nat pool	n IP NAT "4

6.1.11 debug ip nat

,¥ { nat _ Ê,X debug Q ¸ Ä

debug ip nat [event]

Ï – DAÈ â Ð

´ – D

Ï Q ¸ õ ã Ð

(M *ü õ ã

Ï S*ü Û + Ð

A¹ Q ¸ Ã ¹,¥ { nat ,XE¤> E›/ß ¥*ó _ Ê Ä

Ï _ Ð

Ruijie#debug ip nat event
Ruijie#debug ip nat

1 ×0´ G!5B AAA Q ¸

7.1 D• ÑAxA•,Ì G Q ¸

z aaa authentication

7.1.1 aaa authentication

?U S*üAAA E¯> *ü AxA• ÈAË ;> < G!5B Q ¸ aaa authentication G!5B *ü AxA•,X •"© ë>< ÄA¹ Q ¸,X no 6 ã ôL8*ü AxA•,X •"© ë>< Ä

aaa authentication {dot1x | enable | ppp | login } {default | list-name} method1 [method2...]

no aaa authentication {dot1x | enable | ppp | login } {default | list-name}

Ï – DAÈ â Ð

default Ö S*üA¹ – D È í âM6 n D• Ñ •"© ë>< 0 *ü AxA•,XT¬Ax •"© Ä

list-name Ö n Ô þ,O)D• ÑAxA•,X •"© ë>< È Ã ¹ Ï) +0ú Ä

dot1x ÖDot1x *ü

enable ÖEnable *ü

ppp ÖPPP *ü

login ÖLogin *ü

method Ö ™NO ><1 ë GK + Ô È Ô þ •"© ë>< Ô î Ý 4 þ •"© Ä

><1 AAA *ü D• ÑAxA• •"©

GK +	£EÄ
local	S*ü *ü á D B gE¯> D• ÑAxA•
none	áE¯> D• ÑAxA•
group	S*ü á u <4˜E¯> D• ÑAxA• È,Â ! Õ RADIUS á u <4˜

Ï5 ,Õ ™ ‰ Ð

V p"u ÝG!5BT¬Ax,Xdefault •"© ë>< È1 à bG!5B •"©

aaa authentication {dot1x | enable | ppp | login } default group radius

Ï Q ¸ õ ã Ð

< G!5B õ ã Ä

Ï S*ü Û + Ð

V pA’ Û *ü AAA] < á u È*ü ™NO S*ü AAA E¯> AxA• # Ä | ™NO S*ü aaa authentication G!5BT¬Ax,X ê ÃEÝ,X •"© ë><*ü b*ü AxA• Ä

¾ Ý !M6,X •"©"u Ý ¡ h È !6Ñ S*ü âM6,X •"©E¯> D• ÑAxA• Ä

Ï _ Ð

ßM6,X/ _ n Ô þ á RDS_D1X ,X AAA D• ÑAxA• •"© ë>< ÄA¹AxA• •"© ë>< S*ü RADIUS] < á u <E¯> D• ÑAxA• È V p RADIUS] < á u <"u Ý ¡ h È í S*ü *ü D B gE¯> D• ÑAxA• Ä

Ruijie(config)# aaa authentication dot1x rds_d1x group radius local

Ï,Ì G Q ¸ Ð

Q ¸	AÈ â
aaa new-model	S*ü AAA] < á u
dot1x authentication	ü DOT1x y · Þ G6((M n •"© ë><
ppp authentication	PPP G6((M n •"© ë><
login authentication	Login G6((M n •"© ë><

Ï – DAÈ â Ð

method1 Ö ™NO ß>< ë GK + Ô Ö

GK +	£EÄ
local	S*ü *ü á D B gE¯> 5%4° \
none	áE¯> 5%4° \
group	S*ü á u <4˜E¯> D• ÑAxA• È,Â ! Õ RADIUS á u <4˜

Ï5 ,Õ ™ ‰ Ð

GKÁAAA \ s6Ñ Ä

Ï Q ¸ õ ã Ð

< G!5B õ ã Ä

Ï S*ü Û + Ð

RGOS Õ Í Ý5%4° Ý G,X á uAË" V PPP ÃSLIP 1 #A,E¯> \ Ä V pG!5B Z \ È í Í Ý,XAxA•*ü ê y ·7¾ |E¯> \ Ä

Ã ¹ Û n Ý/¡ á à,X \ •"© È âD• ÑAxA• Ô È ¾ Ý ' !,X \ •"©"u Ý ¡ h È !6Ñ4»4Á S*ü âM6,X •"©E¯> \ È V p ' ! \ •"© Bù È í á a S*ü J ª â4»,X \ •"© Ä

RADIUS á u < EîE›E¨ ² Ô2Ï ë,X 2 û Í 9 ` ä ÍAxA•*ü ,X \ Ä ¹ RADIUS \ Î0Ÿ ü RADIUS AxA•,X Î. Þ,X È ¾ Ý RADIUS AxA•EîE› Z ! Ý Ã6Ñ9‹ ª RADIUS \ Ä

Ï _ Ð

ßM6,X/ _ S*ü RADIUS á u < Í5%4° á uE¯> \ Ö

Ruijie(config)# aaa authorization network default radius

Ï,Ì G Q ¸ Ð

Q ¸	AÈ â
aaa new-model	S6ÑAAA] < á u
aaa accounting	n AAA A„ ä
aaa authentication	n AAA D• ÑAxA•
username	n *ü D B g

Ê ¥EÕA„ ä y [Ö

Ruijie(config)#	aaa accounting network start-stop group radius

Ï¸Ì G Q ¸ Ð

aaa accounting network	n 5%4°A„ ä,X •"© ë><

7.3.3 aaa accounting update periodic

Æ4£ *üA„ ä È „ s6Ñ ÈAË ;> < G!5B Q ¸ aaa accounting update periodic Q ¸ ÈA¹ Q ¸*ü bA'5BA„ ä È „KÈLh ÄS*üA¹ Q ¸,X no EÝNMG!5BT¬ Ax,XA„ ä È „KÈLh Ä

aaa accounting update periodic interval

no aaa accounting update periodic

Ï – DAÈ â Ð

interval ÖA„ ä È „KÈLh È ¹ ÚJs) ! È Ô ã 1 ÚJs Ä

Ï5 ,Õ ™ ‰ Ð

5 minutes Ä

Ï Q ¸ õ ã Ð

< G!5B õ ã Ä

Ï S*ü Û + Ð

V p"u Ý *ü AAA] < á u È í á6Ñ S*üA„ ä È „ Ä V p Æ4£ *ü AAA] < á u È íA¹ Q ¸*üA'5BA„ äKÈLh Ä

Ï _ Ð

ßM6,X/ _$è/ A'5B!£Lh 1 ÚJsA„ ä È „ Ä

Ruijie(config)# aaa new-model
Ruijie(config)# aaa accounting update
Ruijie(config)# aaa accounting update periodic 1

Ï,Ì G Q ¸ Ð

Q ¸	AÈ â
aaa new-model	' Ô AAA] < á u
aaa accounting network	n 5%4°A„ ä,X •"© ë><

7.3.4 show aaa method-list

?U ¹,ß ' ! Ý*ü •"© ë>< ÈAË ;> (M EXEC Q ¸ show aaa methold-list Ä

show aaa method-list

Ï – DAÈ â Ð

"u Ý GK + ` – D Ä

Ï Q ¸ õ ã Ð

(M EXEC G!5B õ ã Ä

Ï _ Ð

Ruijie# show aaa method-list

7.4 AAA á u <4˜ Q ¸

- z show aaa group
- z aaa group server
- z server ip-addr authen-port port1 acct-port port2
- z ip vrf forwarding

7.4.1 show aaa group

/ AAA G!5B,X Ý á u <4˜ Ä

show aaa group

Ï – DAÈ â Ð

A¹ Q ¸"u Ý – D ê GK + Ä

Ï5 ,Õ ™ ‰ Ð

´

Ï Q ¸ õ ã Ð

(M õ ã Ä

Ï S*ü Û + Ð

A¹ Q ¸ / AAA Ý ÆG!5B,X á u <4˜ Ä

Ï _ Ð

ßM6/ _ Ä

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

Ï,Ì G Q ¸ Ð

Q ¸	AÈ â
aaa group server	G!5BAAA á u <4˜

7.4.3 server ip-addr authen-port port1 acct-port port2

#Ï t AAA á u <4˜,X á u < È no 6 ã ôL8 Ä

server ip-addr [authen-port port1] [acct-port port2]

no server ip-addr [authen-port port1] [acct-port port2]

Ï – DAÈ â Đ

ip-addr Ö á u < ip

port1 Ö á u <AxA•0Ã ·

port2 Ö á u <A„Bú0Ã ·

Ï5 ,Õ ™ ‰ Đ

´ á u <G!5B

Ï Q ¸ õ ã Đ

á u <4˜G!5B õ ã Ä

Ï S*ü Û + Đ

T Û n á u < #Ï t á u < È á Û n0Ã · Ê S*üT¬Ax Ä

Ï _ Đ

ßM6/ _ Ä

```
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
```

Ï,Ì G Q ¸ Đ

Q ¸	AÈ â
aaa group server	G!5Baaa á u <4˜
show aaa group	/ aaa á u <4˜

7.4.4 ip vrf forwarding

AAA á u <4˜EÝ ½ vrf Èno 6 ã ôL8 Ä

ip vrf forwarding vrf_name

no ip vrf forwarding

Ï – DAÈ â Ð

vrf_name Övrf á +

Ï5 ,Õ ™ ‰ Ð

´

Ï Q ¸ õ ã Ð

á u <4˜G!5B õ ã Ä

Ï S*ü Û + Ð

Û n á u <4˜EÝ ½ vrf Ä

Ï _ Ð

ßM6/ _ Ä

```
Ruijie(config)#          aaa group server radius ss
Ruijie(config-gs-radius)#          server     192.168.4.12
Ruijie(config-gs-radius)#          server     192.168.4.13
Ruijie(config-gs-radius)#          ip vrf forwarding          vrf_name
Ruijie(config-gs-radius)#          end
```

Ï,Ì G Q ¸ Ð

- z show aaa user lockout
- z clear aaa local user lockout

7.5.1 aaa new-model

?U S*üRGOS ,X AAA] < á u s6Ñ ÈAË ;> < G!5B Q ¸ aaa new-model S6ÑAAA ÄA¹ Q ¸,X no 6 ã GKÁ AAA] < á u Ä

aaa new-model

no aaa new-model

Ï – DAÈ â Ð

A¹ Q ¸"u Ý – D ê GK + Ä

Ï5 ,Õ ™ ‰ Ð

GKÁAAA] < á u

Ï Q ¸ õ ã Ð

< G!5B õ ã Ä

Ï S*ü Û + Ð

A¹ Q ¸ AAA ,X S6Ñ Q ¸ È V p |?U S*ü AAA] < á u È ™NO S*ü aaa new-model S6ÑAAA] < á u ÄV p"u Ý *ü AAA Èí Ý AAA Q ¸ Ú á ÃG!5B,X Ä

Ï _ Ð

ßM6,X/ _ S6Ñ AAA] < á u Ä

Ruijie(config)# aaa new-model

Ï,Ì G Q ¸ Ð

Q ¸	AÈ â
aaa authentication	n *ü AxA• •"© ë><

7.5.2 debug aaa

' Ô AAA á uA×A© Ô G ÄA¹ Q ¸,X no 6 ã GKÁA×A© Ô G Ä

debug aaa

no debug aaa

Ï – DAÈ â Ð

´ – D ê GK + Ä

Ï Q ¸ õ ã Ð

7.5.4 aaa local authentication attempts

G!5Blogin ,OL *ü ñA©,OL Bù õ D

aaa local authentication attempts <1-2147483647>

Ï – DAÈ â Ð

ª 8× È <1-2147483647>

Ï5 ,Õ ™ ‰ Ð

5 ,Õ 3 õ

Ï Q ¸ õ ã Ð

< G!5B õ ã Ä

Ï S*ü Û + Ð

A¹ Q ¸G!5B login ,OL *ü ñA©,OL Bù õ D

Ï _ Ð

ßM6,X/ _ Ö

ruijie# configure terminal
S3250(config)# aaa local authentication attempts 6

Ï,Ì G Q ¸ Ð

Q ¸	AÈ â
Show running-config	/ A’ Û ' !G!5B
Show aaa lockout	/ ' ! login ,XJÕ nG!5B – D

7.5.5 aaa local authentication lockout-time

G!5Blogin ,OL *ü ñA©CYE›G!5B,OL Bù õ D È>•JÕ n,X ÊKÈKS z

aaa local authentication lockout-time <1-2147483647>

Ï – DAÈ â Ð

ª 8× È Ä) ! Ö ã Ê Å <1-2147483647>

Ï5 ,Õ ™ ‰ Ð

5 ,Õ 15 ã Ê

Ï Q ¸ õ ã Ð

< G!5B õ ã Ä

Ï S*ü Û + Ð

G!5Blogin ,OL *ü ñA©CYE›G!5B,OL Bù õ D È>•JÕ n,X ÊKÈKS z

Ï _ Ð

ßM6,X/ _ Ö

ruijie# configure terminal
S3250(config)# a aa local authentication lockout-time 5

Ï,Ì G Q ¸ Ð

Q ¸	AÈ â
Show running-config	/ A’ Û ' !G!5B
Show aaa lockout	/ ' ! login ,XJÕ nG!5B – D

7.5.6 show aaa user lockout

/ ' !>•JÕ n,X*ü ë>< Ä
show aaa user lockout {all | user-name <word>}

Ï – DAÈ â Ð

*ü ID

Ï5 ,Õ ™ ‰ Ð

Ï Q ¸ õ ã Ð

(M õ ã Ä

Ï S*ü Û + Ð

/ ' !>•JÕ n,X*ü ë>< È ¹ žE¬ Ý î ?U>•?·L8JÕ n Ä

Ï _ Ð

ßM6,X/ _ Ö

ruijie# show aaa user lockout all

Ï,Ì G Q ¸ Ð

Q ¸	AÈ â
Show running-config	/ A’ Û ' !G!5B
Show aaa lockout	/ ' ! login ,XJÕ nG!5B – D

7.5.7 clear aaa local user lockout

#ÙL8>•JÕ n,X*ü ë><

clear aaa local user lockout {all | user-name <word>}

Ï – DAÈ â Đ

*ü ID

Ï5 ,Õ ™ ‰ Đ

Ï Q ¸ õ ã Đ

(M õ ã Ä

Ï S*ü Û + Đ

#ÙL8>•JÕ n,X*ü ë>< È Ã ¹ <F¼#Ù . 3 Ã ¹ Û n*ü #ÙL8

Ï _ Đ

1 ?0´ G!5B TACACS+ Q ¸

8.1 TACACS+ G!5B,Ì G Q ¸

TACACS+G!5B Ù À ¹ ß,Ì G Q ¸ Ö

- 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

8.1.1 aaa group server tacacs+

!8 Q ¸G!5B TACACS+ á u <4˜ È Ú á à,X TACACS+ á u < æ Ú á à,X 4˜ Ä

aaa group server tacacs+ group-name

no aaa group server tacacs+ group-name

Ï – DAÈ â Ð

group-name Ö TACACS+ á u <4˜ á

Ï5 ,Õ ™ ‰ Ð

"u ÝG!5B TACACS+ á u <4˜ Ä

Ï Q ¸ õ ã Ð

< G!5B õ ã Ä

Ï S*ü Û + Ð

EîE› Í TACACS+

E– " ¡%Ì!2Q¬C TACACS+ ÃI€,• 6 $` <RQ s¢ÊÌ Ed@Ø üA¹ Cï ‰" "> ž Å,“Ðþ

Ï¸Ì G Q ¸ Ð

Q ¸	AÈ â
server	G!5BTACACS+ á u <4˜,X server ë><
ip vrf forwarding	G!5BTACACS+ á u <4˜ Õ,X VRF á +

8.1.2 server(TACACS+)

! · d!x pÖˆv Žˆ Žð ð P Ð ð Õ Ï E .³ãÀ

8.1.3 ip vrf forwarding(TACACS+)

!8 Q ¸G!5B TACACS+ á u <4˜ S*ü,X vrf á + (Õ VRF ,XA' Û , ü!8 Q ¸) Ä

ip vrf forwarding vrf-name

no ip vrf forwarding

Ï – DAÈ â Ð

vrf-name Ö vrf á +

Ï5 ,Õ ™ ‰ Ð

´

Ï Q ¸ õ ã Ð

TACACS+ á u <4˜G!5B õ ã Ä

Ï S*ü Û + Ð

Û n,X TACACS+ á u <4˜ Û n vrf á + Ä

Ï _ Ð

ßM6/ _ TACACS+ á u <4˜ Û n VRF á + vpn1 Ö

```
Ruijie(config)#          aaa group server tacacs+          tac1
Ruijie(config-gs-radius)#          server     1.1.1.1
Ruijie(config-gs-radius)#          ip vrf forwarding          vpn1
```

Ï,Ì G Q ¸ Ð

Q ¸	AÈ â
aaa group server tacacs+	G!5BTACACS+ á u <4˜
server	G ! 5 BTACACS+ á u < 4 ˜ , X server ë><

8.1.4 ip tacacs source-interface

!8 Q ¸G!5B TACACS+ y [,X$d Ä

ip tacacs source-interface interface

no ip tacacs source-interface

Ï – DAÈ â Ð

Interface Ö TACACS+ y [,X$d y ·

Ï5 ,Õ ™ ‰ Ð

TACACS+ y [,X$d + 5%4° A'5B Ä

Ï Q ¸ õ ã Ð

< G!5B õ ã Ä

Ï S*ü Û + Ð

Z £ å ü TACACS+ á u < Þ4È x ûG£,X nas µ C,X ¹ 0G£ È Ã ¹EîE›A¹ Q ¸ 9A'5B TACACS+ y [,X$d ÄA¹ Q ¸ Ú ^ Û n y ·,X1 Ô þ ip 0 TACACS+ y [,X$d ÈA¹ Q ¸ ü Ý A' Û S*ü Ä

Ï _ Ð

ßM6,X/ _ Û n Z TACACS+ y [¢ fastEthernet 0/0 y ·9‹ ª ip 9 0 TACACS+ y [,X$d Ö

Ruijie(config)# ip tacacs source-interface fastEthernet 0/0

Ï,Ì G Q ¸ Ð

Q ¸	AÈ â
tacacs-server host	n TACACS+ á u <
ip address	G!5B y ·,X ip

8.1.5 tacacs-server host

!8 Q ¸G!5B TACACS+ á u < IP Ä

tacacs-server host ip-address [port integer] [timout integer] [key string]

no tacacs-server host ip-address

Ï – DAÈ â Ð

Ip-address TACACS+] < á u < ,X IP Ä

port integer TACACS+EîAƒ S*ü,X TCP 0Ã ·

timeout integer TACACS+ ,XCY Ê ÊKÈ Ä

key string TACACS+ client â á u < E •,X šJy Ä

Ï5 ,Õ ™ ‰ Ð

"u Ý Û n,X TACACS+ Ä

Ï Q ¸ õ ã Ð

< G!5B õ ã Ä

Ï S*ü Û + Ð

Z S*ü TACACS+ r)„ AAA] < á u È ™NO n TACACS+] < á u < Ä

| Ã ¹ S*ü tacacs-server host Q ¸ n Ô þ ê î þ TACACS+] < á u < Ä

Ï _ Đ

ßM6,X/ _ n Ô þ TACACS+] < á u < Ö

Ruijie(config)# tacacs-server host 192.168.12.1

Ï,Ì G Q ¸ Đ

Q ¸	AÈ â
aaa authentication n	AAA ,XD• ÑAxA• •"© ë>< TACACS+

Q ¸	AÈ â
tacacs-server host	n TACACS+] < á u <,X
tacacs-server timeout	n TACACS+ y [CY Ê n Ê <

8.1.7 tacacs-server timeout

!8 Q ¸G!5B â TACACS+ á u <EîAƒ Ê È1 Y á u <,X < CY Ê ÊKÈ Ä

tacacs-server timeout seconds

no tacacs-server timeout

Ï – DAÈ â Ð

seconds ÖCY Ê ÊKÈ Ä) ! /¦ Å Ä ÃA'5B,X 8× È 1-1000 /¦ Ä

Ï5 ,Õ ™ ‰ Ð

5 /¦

Ï Q ¸ õ ã Ð

< G!5B õ ã Ä

Ï S*ü Û + Ð

S*üA¹ Q ¸ Í ¡ h y [,XCY Ê ÊKÈE¯> A× H Ä ' å ÀLÔ?U !£ þ á u < Û n á à,XCY Ê ÊKÈ Ê È S*ü tacacs-server host Q ¸ ,X timeout EÝNM r)„ ÈE-G Ã ¹EîE› < G!5B Í Ý þG!5B timeout EÝNM,X á u <G!5B Ô þtimeout Ä

Ï _ Ð

ßM6,X/ _ ÚCY Ê ÊKÈ n 10 /¦ Ö

Ruijie(config)# tacacs-server timeout 10

Ï,Ì G Q ¸ Ð

Q ¸	AÈ â
tacacs-server host	n TACACS+] < á u <,X
tacacs-server key	n TAC6sS+ ,X E • · ¸

8.2 TAC6sS+ (M Q ¸

- z debug tacacs+
- z show tacacs

8.2.1 debug tacacs+

' Ô TACACS+A×A© Ô G ÄA¹ Q ¸,Xno 6 ã GKÁ TACACS+A×A© Ô G Ä

debug tacacs+

no debug tacacs+

Ï – DAÈ â Ð

´ – D ê GK + Ä

Ï Q ¸ õ ã Ð

(M EXEC G!5B õ ã Ä

8.2.2 show tacacs

/ ` Ø TACACS+ á u <,X x fE¤> ™ ‰ Ä

show tacacs

Ï – DAÈ â Ð

´ Ä

Ï5 ,Õ ™ ‰ Ð

´

Ï Q ¸ õ ã Ð

(M õ ã Ä

Ï S*ü Û + Ð

S*üA¹ Q ¸ / ` Ø TACACS+ á u <,X x fE¤> ™ ‰ Ä

Ï _ Ð

```
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
```

Ï,Ì G Q ¸ Ð

tacacs-server host	n / ` Ø TACACS+ á u < ,X x fE¤> ™ ‰] < á u <,X

Ruijie(config)# radius-server attribute 31 mac format ietf

Ï‚Ì G Q ¸ Ð

Q ¸	AÈ â
radius-server host	n RADIUS á u <

9.1.3 radius-server host

?U Û n RADIUS] < á u < ÈAË ;> < G!5B Q ¸ radius-server ÄA¹ Q ¸,X no 6 ã ôL8 Û n,X RADIUS] < á u < Ä

radius-server host {hostname | ip-address} [auth-port port-number] [acct-port port-number]

no radius-server host {hostname | ip-address}

Ï – DAÈ â Ð

Hostname: RADIUS] < á u < ,X DNS á/Ä Ä

ip-address: RADIUS] < á u < ,X IP Ä

auth-port: RADIUS D• ÑAxA•,XUDP 0Ã ·

port-number: RADIUS D• ÑAxA•,XUDP 0Ã · Ë È V pA'5B 0 È íA¹ á E¯> D• ÑAxA• Ä

acct-port: Radius A„ ä,X UDP 0Ã ·

port-number: RADIUS A„ ä,X UDP 0Ã · Ë È V pA'5B 0 È íA¹ áE¯> A„ ä Ä

Ï5 ‚Õ ™ ‰ Ð

"u Ý Û n,X RADIUS Ä

Ï Q ¸ õ ã Ð

< G!5B õ ã Ä

Ï S*ü Û + Ð

Z S*ü RADIUS r)„ AAA] < á u È ™NO n RADIUS] < á u < Ä | Ã ¹ S*ü radius-server Q ¸ n Ô þ ê î þ RADIUS] < á u < Ä

Ï _ Ð

ßM6,X/ _ n Ô þ RADIUS] < á u < Ö

Ruijie(config)# radius-server host 192.168.12.1

Ï‚Ì G Q ¸ Ð

Q ¸	AÈ â
aaa authentication	n AAA ,XD• ÑAxA• •"© ë><
radius-server key	n RADIUS] < á u <,X E • · ¸
radius-server retransmit	n RADIUS y [G¡ ¥ õ D
radius-server timeout	n RADIUS y [CY Ê n Ê <

9.1.4 radius-server key

?U n 5%4°A“KÂ á u < ÄCÃ+ A’ Û Å â RADIUS] < á u <E¯> Eî µ,X E • · ¸ ÈAË ;> < G!5B Q ¸ radius-server key ÄA¹ Q ¸,X no 6 ã ª#\ Û n ,X E • · ¸ Ä

radius-server key text-string

no radius-server key

Ï – DAÈ â Ð

text-string E • · ¸,X [

Ï5 ,Õ ™ ‰ Ð

"u Ý Û n E • · ¸ Ä

Ï Q ¸ õ ã Ð

< G!5B õ ã Ä

Ï S*ü Û + Ð

E • · ¸ A’ Û ` RADIUS ] < á u <E¯> !7.BEî µ,X Î. Ä Z SA’ Û ` RADIUS] < á u <6ÑE¯> Eî µ È ™NO üA’ Û ` RADIUS] < á u < Þ n ,Ì à,X E • · ¸ Ä

Ï _ Ð

ßM6,X/ _ n RADIUS] < á u <,X E • · ¸ aaa Ö

Ruijie(config)# radius-server key aaa

Ï,Ì G Q ¸ Ð

Q ¸	AÈ â
radius-server host	n RADIUS] < á u <,X
radius-server retransmit	n RADIUS y [G¡ ¥ õ D
radius-server timeout	n RADIUS y [CY Ê n Ê <

9.1.5 radius-server retransmit

?UG!5BA' Û üAx RADIUS] < á u <"u Ý ¡ h ¹ !G¡ ¥ y [,X õ D ÈAË ;
> < G!5B Q ¸ radius-server retransmit ÄA¹Q ¸X no 6 ã 6 áT¬AxG¡ ¥ õ D Ä

radius-server retransmit retries

no radius-server retransmit

Ï – DAÈ â Ð

retries ÖRADIUS ñA©G¡ ¥ õ D Ä

Ï5 ,Õ ™ ‰ Ð

T¬AxG¡ ¥ õ D 3 Ä

Ï Q ¸ õ ã Ð

< G!5B õ ã Ä

Ï S*ü Û + Ð

AAA ü S*ü ß Ô þ •"© Í*ü E¯> AxA•,X ! ¤ ' !AxA•,X] < á u <"u Ý ¡ h ÄA' Û ø •] < á u <"u Ý ¡ h,X Û š] < á u < üA' ÛG¡ ¥ Û n õ D RADIUS y [óKÈ "u Ý h1(È!£ õG¡ ¥ KÈ ÝCY ÊKÈLh Ä

Ï _ Ð

ßM6,X/ _ Û nG¡ ¥ õ D 4 Ö

Ruijie(config)# radius-server retransmit 4

Ï,Ì G Q ¸ Ð

Q ¸	AÈ â
radius-server host	n RADIUS] < á u <,X
radius-server key	n RADIUS ,X E • · ¸
radius-server timeout	n RADIUS y [CY Ê n Ê <

1 AF¼ Ú] <G!5B Q ¸ –5×

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	16
17	version to server	17
18	flux-max-high32	18
19	flux-max-low32	19
20	proxy-avoid	20
21	dailup-avoid	21
22	ip privilige	22
23	login privilige	42

=) ™ ‰

id	s6Ñ	type
1	max down-rate	76
2	qos	77
3	user ip	3
4	vlan id	4
5	version to client	5
6	net f 371.52	374D.14041]TJ ET 1280.9

404

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

Ï Q ¸ õ ã Ð

< G!5B õ ã Ä

Ï S*ü Û + Ð

G!5BA¹ Q ¸ È Ã ¹ Ú ô ß,X qos 0 cos ÈT¬Ax Ê 0 dscp

Ï _ Ð

ßM6,X/ _ Ö

Ruijie(config)# radius set qos cos

Ï,Ì G Q ¸ Ð

Q ¸	AÈ â
radius vendor-specific extend	Radius =) á ÿ/• Ý V id

9.1.10 radius vendor-specific extend

=) á ÿ/• Ý V id Ä

radius vendor-specific extend

no radius vendor-specific extend

Ï – DAÈ â Ð

´

Ï5 ,Õ ™ ‰ Ð

¾Aš ÿ å Ì/• Ý V id

Ï Q ¸ õ ã Ð

< G!5B õ ã Ä

Ï S*ü Û + Ð

S*üA¹ Q ¸ Ã Í Ý V id ,X 2 û Ý';G!5B + 2O _Aš ÿ Ä

Ï _ Ð

ßM6,X/ _ Ö

Ruijie(config)# radius vendor-specific extend

Ï,Ì G Q ¸ Ð

Q ¸	AÈ â
radius attribute	G!5B/• Ý2O _ Ë

radius set	G!5Bqos ú S*ü cos

9.2 RADIUS (M Q ¸

- z debug radius [event | detail]
- z show radius server
- z show radius parameter
- z show radius vendor-specific

9.2.1 debug radius

' Ô RADIUS A×A© Ô G ÄA¹ Q ¸,Xno 6 ã GKÁ RADIUS A×A© Ô G Ä

debug radius [event | detail]
no debug radius [event | detail]

Ï – DAÈ â Ð

´ – D ê GK + Ä

Ï Q ¸ õ ã Ð

(M EXEC G!5B õ ã Ä

9.2.2 show radius server

/ RADIUS á u <G!5B ™ ‰ Ä

show radius server

Ï – DAÈ â Ð

´ Ä

Ï5 ,Õ ™ ‰ Ð

´

Ï Q ¸ õ ã Ð

(M õ ã Ä

Ï S*ü Û + Ð

S*üA¹ Q ¸ / radius á u <,XG!5B ™ ‰ Ä

Ï _ Ð

Ruijie# show radius server
server ip : 192.168.4.12

acct port: 23
authen port: 77
server state: ready
server ip : 192.168.4.13
acct port: 45
authen port: 74
server state: ready

Ï,Ì G Q ¸ Ð

radius-server host	n RADIUS] < á u <,X
radius-server retransmit	n RADIUS

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

Ï,Ì G Q ¸ Ð

Q ¸	AÈ â
radius-server host	n RADIUS] < á u <,X
radius-server retransmit	n RADIUS y [G¡ ¥ õ D
radius-server key	n RADIUS ,X E • · ¸
radius-server timeout	n RADIUS CY Ê ÊKÈ

1 0´ G!5B SSH Q ¸

10.1 SSH G!5B,Ì G Q ¸

SSH G!5B Ù À ¹ ß Q ¸ Ö

- crypto key generate
- crypto key zeroize
- ip ssh version
- ip ssh time-out
- ip ssh authentication-retries
- transport input

10.1.1 crypto key generate

Â!÷ä á u <0Ã,X KÀu šJy È ü T •‘Œ õ ã K,È ;> €-`

a _ É !

ôL8 šJy Ê È á , ü Q ¸ no crypto key generate È5à EîE› Q ¸ crypto key zeroize Q ¸ ôL8 šJy Ä

Ï _ Ð

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

Ï,Ì G Q ¸ Ð

Q ¸	AÈ â
show ip ssh	¹,ß SSH Server ,X ' !(Š Õ µ C Ä
crypto key zeroize {rsa | dsa }	ôL8 DSA â RSA šJy È GKÁ SSH Server s6Ñ Ä

Ï(AÈ â Ð

EC Ê(RGOS10.1 ¹ Þ

10.1.2 crypto key zeroize

ôL8 SSH á u <0Ã,X @ E šJy È ü < G!5B õ ã ß È ;> Q ¸ Ö

crypto key zeroize {rsa | dsa}

Ï – DAÈ â Ð

– D	£EÄ
rsa	ôL8 RSA šJy
dsa	ôL8 DSA šJy toj E1

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

Ï,Ì G Q ¸ Ð

Q ¸	AÈ â
show ip ssh	¹,ß SSH Server ,X ' !(Š Õ Ä
crypto key generate {rsa|dsa}	*ó ä DSA â RSA šJy Ä

Ï(AÈ â Ð

EC Ê(RGOS10.1 ¹ Þ

10.1.3 ip ssh version

A'5B SSH server ,X(Ä S*üA¹ Q ¸,X no EÝNM Ú(A'5B 6 á 5 ,ÕA'5B Ä

ip ssh version {1 | 2}

no ip ssh version

Ï – DAÈ â Ð

– D	£EÄ
1	G!5BSSH Server ™ Õ SSH1 ,X v 0ÃE² yAË"
2	G!5BSSH Server ™ Õ SSH2 ,X v 0ÃE² yAË"

Ï 5 ,ÕA'5B Ð

5 ,ÕA'5B ß P • SSH (1 ` 2 Ä'A'5B(â È¾6Ñ y «,Ì h(,X SSH v 0Ã ¥EÕ,XE² y Ä S*ü no ip ssh version Q ¸ 3 Ã ¹ ÚA'5B 6 á T¬AxA' 5B Ä

Ï Q ¸ õ ã Ð

< G!5B õ ã

Ï S*ü Û + Ð

A¹ Q ¸*ü 9G!5B SSH Server Õ,X SSH E² y,X #A,(Ä T¬Ax ™ ‰ ß È SSH Server Õ,X(P • SSH1 â SSH2 È S*ü SSH 1 ê5Ù SSH 2 ,X v 0ÃFÑ Ã ¹E² y ÄV pA'5B Z(1 ê5Ù 2 È¾ AŒ Í h(,X SSH v 0Ã !6Ñ óE² y Ä S*ü show ip ssh Q ¸ ¹,ß SSH Server ,X ' !(Š Õ Ä

Ï _ Ð

A'5B ¾ S*ü(2 Ö

Ruijie# configure terminal
Ruijie(config)# ip ssh version 2

Ï,Ì G Q ¸ Ð

Q ¸	AÈ â
show ip ssh	¹,ß SSH Server ,X ' !(Š Õ Ä

Ï(AÈ â Ð

EC Ê(RGOS10.1 ¹ Þ Ä

10.1.4 ip ssh time-out

A'5B SSH Server ,X*ü AxA•CY Ê ÊKÈ ÄS*üA¹ Q ¸,X no EÝNM Ú*ü AxA•CY ÊKÈA'5B 6 á 5 ,ÕA'5B Ä

ip ssh time-out time

no ip ssh time-out

Ï – DAÈ â Ð

– D	£EÄ
time	G!5B*ü AxA•,XCY Ê ÊKÈ Ä

Ï(AÈ â Ð

EC Ê(RGOS10.1 ¹ Þ Ä

10.1.5 ip ssh authentication-retries

A'5B SSH Server *ü AxA•,XG¡AxA• õ D Ä S*üA¹ Q ¸,X no EÝNM Ú*ü AxA• ,XG¡AxA• õ D 6 á 5 ,ÕA'5B Ä

ip ssh authentication-retries retry times

no ip ssh authentication-retries

Ï – DAÈ â Ð

– D	£EÄ
retry times	G!5B*ü AxA•,XG¡AxA• õ D Ä

Ï5 ,ÕA'5B Ð

5 ,ÕA'5B ßG¡AxA• õ D 3 õ Ä 'A'5BG¡AxA• õ D â È S*ü no ip ssh authentication-retries Q ¸ 3 Ã ¹ SA'5B 6 á T¬Ax Ä

Ï Q ¸ õ ã Ð

< G!5B õ ã

Ï S*ü Û + Ð

A¹ Q ¸G!5B SSH Server E¯> *ü AxA•,XG¡AxA• õ D Ä 'CYE› SSH Server G! 5B,XG¡AxA• õ D È¡"u ÝAxA• ä s ÈíAx *ü AxA• Bù ÄS*ü show ip ssh Q ¸ ¹,ß SSH Server ,XG!5B µ C Ä

Ï _ Ð

A'5B*ü AxA•,XG¡AxA• õ D 2 Ö

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

Ï,Ì G Q ¸ Ð

Q ¸	AÈ â
show ip ssh	¹,ß SSH Server ,X ' !(Š Õ Ä

Ï(AÈ â Ð

EC Ê(RGOS10.1 ¹ Þ

10.2 SSH

EC Ê(RGOS10.1 ¹ Þ

10.2.2 show ssh

/ Æ4£ Î0Ÿ,X SSH E² y,X!£ þE² y µ C Ä

show ssh

Ï – DAÈ â Ð

´

Ï5 ,ÕA'5B Ð

´

Ï Q ¸ õ ã Ð

(M *ü õ ã

Ï S*ü Û + Ð

/ Æ4£ Î0Ÿ,X SSH E² y,XE² y µ C Ä Ù À ÖE² y 4*ü,X VTY Ë ÃSSH (Ã t š1k"© Ã#\ CAxA•1k"© ÃE² y(Š Õ Ã*ü á Ä

Ï _ Ð

Ruijie# show ssh

Ï,Ì G Q ¸ Ð

´

Ï(AÈ â Ð

EC Ê(RGOS10.1 ¹ Þ Ä

10.2.3 show crypto key mypubkey

/ SSH Server @ E šJy,X @ Ô šJyF¼ Ú,X µ C Ä

show crypto key mypubkey {rsa/dsa}

Ï – DAÈ â Ð

– D	£EÄ
rsa	/ RSA šJy,X @JyF¼ Ú
dsa	/ DSA šJy,X @JyF¼ Ú

Ï5 ,ÕA'5B Ð

´

Ï Q ¸ õ ã Ð

(M *ü õ ã

Ï S*ü Û + Ð

/ Æ4£*ó ä,X SSH Server @ E šJy,X @ Ô šJyF¼ Ú,X µ C ÄÙ À ÖšJy*ó ä ÊKÈ Ã šJy á + Ã @ Ô šJyF¼ Ú Y •1 µ C Ä

Ï _ Ð

Ruijie# show crypto key mypubkey rsa

Ï,Ì G Q ¸ Ð

Q ¸	AÈ â
crypto key generate {rsa | dsa }	*ó ä DSA â RSA šJy Ä

Ï(AÈ â Ð

EC Ê(RGOS10.1 ¹ Þ

10.2.4 disconnect ssh

• Ô Æ4£ Î0Ÿ,X SSH E² y îA± Ä

disconnect ssh [vty] session-id

Ï – DAÈ â Ð

– D	£EÄ
session-id	Æ4£ Î0Ÿ,X SSH E² y îA± Ë Ä

Ï5 ,ÕA'5B Ð

´

Ï Q ¸ õ ã Ð

(M *ü õ ã

Ï S*ü Û + Ð

EîE›Eg 9 Û n,X SSH E² y îA± Ë È • Ô Æ4£ Î0Ÿ,X SSH E² y Ä ê5ÙEg 9 Û n,X VTY E² y îA± Ë È • Ô Û n,X SSH E² y Ä ¾6Ñ • Ô SSH 2O _,XE² y Ä

Ï _ Ð

Ruijie# disconnect ssh 1 ê5Ù
Ruijie# disconnect ssh vty 1

Ï,Ì G Q ¸ Ð

Q ¸	AÈ â
show ssh	/ Æ4£ Î0Ÿ,X SSH E² y îA± µ C Ä
Clear line vty line_number	• Ô ' !,X VTY E² y îA± Ä

Ï(AÈ â Ð

EC Ê(RGOS10.1 ¹ Þ Ä

1 Ô0´ IP Accounting G!5B Q ¸

11.1 IP Accounting G!5B Q ¸

Í b Ø þ y4ã

11.1.1 ip accounting

ü y ·G!5B õ ã ß È S*ü!8 Q ¸ S6ÑA¹ y ·,X IP Accounting s6Ñ È S*üA¹ Q ¸,X no EÝNM/U!6 ÍA¹ y ·,X IP Accounting s6Ñ Ä

ip accounting {ingress | egress} list acl_list_number

no ip accounting {ingress | egress} < list acl_list_number >

Ï – DAÈ â Ð

acl_list_number Æ ï Î,X ACL ,X ID Ä

Ï5 ,ÕA'5B Ð

Í b Ø þ y · ÈT¬Ax GKÁ,X

Ï Q ¸ õ ã Ð

y ·G!5B õ ã

Ï S*ü Û + Ð

IP Accounting Is6Ñ Tc!5B 0 0 1 36.6 Tf 1 0 0 1 36.6 [illegible] TJ T* !Ô Tw 2r 9.127IP Ac32.6.9 -0.0019 TcTc 0 Tw

11.1.2 clear ip accounting

ü(M õ ã ß È S*üA¹ Q ¸#ÙL8 Û n y ·,X IP Accounting 4³Au µ C Ä

clear ip accounting interface interface-type interface-number {ingress | egress}

Ï – DAÈ â Ð

interface-type	Û n y ·,X y ·2O _
interface-number	Û n y ·,X y ·4ê Ë

Ï5 ,ÕA'5B Ð

´

Ï Q ¸ õ ã Ð

(M õ ã

Ï S*ü Û + Ð

S*üA¹ Q ¸#ÙL8 Û n y ·,X# 4³Au µ C Ä

Ï _ Ð

ßM6,X _ $ / V)#ÙL8 Û n y · Î • å,X IP Accounting 4³Au µ C

Ruijie# clear ip accounting interface gigabitEthernet 0/1 egress

Ï,Ì G Q ¸ Ð

Q ¸	AÈ â
show ip accounting interface	/ Û n y · IP Accounting 4³Au µ C

11.2 IP accounting / Q ¸

11.2.1 show ip accounting interface

ü y · õ ã ß ÈS*ü!8 Q ¸ Að ä r ü!´? 6 QÃ•K€ 9· 0ð›Ü1*+9ð äg ÿÂ CðÃ` ð á0ð›Ü1*+9—•›p|á¸ĐžR

Ï – DAÈ â Đ

interface-type	Û n y ·,X y ·2O _
interface-number	Û n y ·,X y ·4ê Ë

Ï5 ,ÕA'5B Đ

´

Ï Q ¸ õ ã Đ

y · ;> õ ã

Ï S*ü Û + Đ

```
Ruijie#      show ip accounting config
GigabitEthernet 0/1
    ip accounting ingress list 20
GigabitEthernet 0/1
    ip accounting egress list 10
```

Ï¸Ì G Q ¸ Ð

Q ¸	AÈ âip accounting{ ingress|

Q ¸ õ ã

L{F' y · õ ã Ä

S*ü Û Ð

L{F' y [¥ Î,X(=)Ú y · UP ,X È Ã6Ñ4“CÃ ÎKÂNI È Ð7ÈL{F' y [´"©EÕE’ Í0Ã ÄE-Ê Ã ¹ *üL{F',X ±# s6Ñ È ÍL{F' y ·,X ÃE’ ûE¯> v# Ä

G!5B –

_ 1 Ö ü interface tunnel 1 L{F' y · ÈG!5B ±# s6Ñ È ¥EÕKÈLh 3 /¦ ÈG¡A© õ D 5 õ Ä

Ruijie(config)# interface tunnel 1

Ruijie(config)# keepalive 3 5

¸Ì G Q ¸

Q ¸	£EÄ
show interface tunnel	/ tunnel y ·,XG!5B Ä

G ÄAÈ â

´

Q ¸ Z Æ

(Ë	AÈ â

12.1.2 tunnel checksum

ü y ·G!5B õ ã ß S*ü tunnel checksum Q ¸ ±A• turnnel y · D B ` H ûP`A• È S*ü Q ¸,X no 6 ã ª#\!8NMA’5B Ä

tunnel checksum

no tunnel checksum

– DAÈ â

– D	£EÄ
-	-

5 ¸ÕG!5B

Ruijie(config-if)# tunnel checksum

,Ì G Q ¸

Q ¸	£EÄ
show interface tunnel	/ tunnel y ·,Ì G,X µ C

G ÄAÈ â

CÃ+ < Þ Õ ÄA' Û á Õ Ä

Q ¸ Z Æ

(Ë	AÈ â
-	-

12.1.3 tunnel destination

ü y ·G!5B õ ã ß S*ü tunnel destination Q ¸ (M n,X tunnel y · Û n,Â Û È S*ü Q ¸,X no 6 ã ôL8 tunnel y ·,X,Â Û Ä

tunnel destination ip-address >•m &L{F'` f•ß ñh9q y ô Ã€

12.1.4 tunnel key

ü tunnel y ·G!5B] < šJy È*ü tunnel key Q ¸ 9 Û n Ô þ H D È S*ü Q ¸,X no 6 ã ôL8A¹ šJy Ä

– DAÈ â		
	gre ipv6	Ã ¹ Š X ü IPv6 ,XEî*üCÃ+ Õ>™GRE ÄGeneric Route Encapsulation Å #A, Ä
	ipip	ip over ip ,X Õ>™ õ ã Ä
	ipv6ip	ipv6 over ip ,X Õ>™ õ ã Ä

5 ,ÕG!5B

CÃ+ < Þ5 ,ÕG›*ü gre ip Õ>™ ã Ä

A' Û Þ5 ,ÕG›*ü ipv6ip Õ>™ ã Ä

Q ¸ õ ã

y ·G!5B õ ã Ä

S*ü Û Ð

Tunnel ,X Õ>™ ã Tunnel ,XEQ ' #A, Ä Tunnel y ·,XT¬Ax Õ>™ ã GRE Ä" È *ü 3 Ã ¹ B rL S*ü ™ ‰ 9 ‡ n Tunnel y ·,X Õ>™ ã È ü5 ,Õ,X ™ ‰ ß È Ã ¹ á Í Õ>™ ã . Ï),X n Ã ¹ r)„ IP L{F',X GRE Õ>™ Ä

G!5B _

_ 1 Ö ü tunnel 0 y · Þ Õ>™ GRE IP Ä

```
Ruijie(config)#          interface tunnel          0
Ruijie(config-if)#             tunnel mode gre ip
```

,Ì G Q ¸

Q ¸	£EÄ
show interface tunnel	/ tunnel y ·,Ì G,X µ C

G ÄAÈ â

´

Q ¸ Z Æ

(Ë	AÈ â
-	-

12.1.6 tunnel nested-limit

G!5BL{F' + Õ>™ D,XL$ È S*ü V ß Q ¸ Ö

tunnel nested-limit [num]

no tunnel nested-limit

– DAÈ â

– D	£EÄ
num	L{F' + Õ>™L$,X D Ä 5 ,Õ 4 Äª 8× È 0 Ã 10 Ä

5 ,ÕG!5B

5 ,Õ 4 Ä

Q ¸ õ ã

L{F' y · õ ã Ä

S*ü Û Ð

L{F' + Õ>™ Û y [ü Y4£E› î L{F' Õ>™ ` ! ¥ Î • Ä Þ,XCÃ+ ¬ ê Ã6Ñ Ð7ÈL{F' ´L$,X îG¡ + Õ>™ ÄE› î ,X + Ú Ð7ÈCÃ+ < á •,X Ú(G¡4˜ È ùG¡ E ¡ û6Ñ Ä ZL !6 ÞEÄ)„B5 ¥*ó È RGOS EC Ê Ý7¾ |L !6 ´L$ + Õ>™,X s6Ñ Ä5 ,Õ ™ ‰ ß È ¾ AŒ4 + Ä Ã ¹EîE› tunnel nested-limit Q ¸ 9 Â 5 ,Õ ÄA¹ Q ¸ ü Ô Y ,XL{F' y ·G!5B Ä

_ 1 Ö Ú

G!5B _

S*ü Û Ð

BóEQ #A, y [4£E›L{F' Õ>™ â y [û ã Ã6Ñ îCYE›L{F' y ·,X MTU È Ð7È y [Ú(È G SBóEQ‰P y [A'5B Z DF ÄDon't Fragment Å! Ä RGNOS ü y ·G!5B õ ã ß ¤ o Z tunnel path-mtu-discovery Q ¸ ÈW6Ñ ó7¾ | v# L{F' Í0Ã,X PMTUÈ9A×H tunnel y ·,X mtu û ã È ¢5àFS ! y [Ú(Ä

G!5B _

_ 1 Ö ü tunnel 0 y · Þ%"# PMTUD s6Ñ

```
Ruijie(config)#          interface tunnel          0
Ruijie(config-if)#              tunnel path-mtu-discovery
```

‚Ì G Q ¸

Q ¸	£EÄ
show interface tunnel	/ tunnel y ·‚Ì G,X µ C

G ÄAÈ â

´ Ä

Q ¸ Z Æ

(Ë	AÈ â

12.1.8 tunnel source

ü y ·G!5B õ ã ß S*ü tunnel source Q ¸G!5B tunnel y ·,X$d È S*ü Q ¸,X no 6 ã ôL8 tunnel y ·,X$d Ä

tunnel source { ip-address | interface-type interface-number }

no tunnel source

– DAÈ â

– D	£EÄ
ip-address	*ü 9 Û n tunnel $d ,X IP È üCÃ+ < Þ Æ4£ A'5B Q,X J W y ·,X IP Ä
interface-type	Eî*ü,X y ·2O _ È _ V Ö Ö!9 > y · Async Ã ¼ Ë y · Dialer Ã ¹ þ5% y · Ethernet Ã ¿Eó ¹ þ5% y · FastEthernet ÃLoopback y · Ã Null y · Ã ¹ ž J W Tunnel y · Ä
nterface-number	y ·4ê Ë

5 ‚ÕG!5B

þG!5B$d Ä

Q ¸ õ ã

y ·G!5B õ ã Ä

S*ü Û Ð

S*ü tunnel y · È ™NO Û n$d Ä

1 AF¼ Ú] <G!5B Q ¸ –5×

1 `0´ Tunnel y ·G!5B

G ÄAÈ â ´

1 AF¼ Ú] <G!5B Q ¸ –5×

1 `0´ Tunnel y ·G!5B

5 ,ÕG!5B ´ Ä

Q ¸ õ ã (M õ ã Ä

S*ü Û Đ ' H E¤> G!5B \ î Ê È ¾ ¹,ß EG!5B Z î å GRE L{F' È á*ü ¢ ûG£,X show running Y • • Ú d Ä S*ü Q ¸ G Ã Ä

G!5B _ _ 1 Ö / G!5B Z î å GRE L{F' È ¹ ž Ø7¾,X V?U µ C Ä

```
Ruijie# show tunnel gre
Tunnel1:
Mode:GRE/IP, Destination 192.168.2.2, Source vlan 100
```

,Ì G Q ¸

Q ¸	£EÄ
show interface tunnel	/ tunnel y ·,XG!5B Ä

G ÄAÈ â ´

Q ¸ Z Æ

(Ë	AÈ â