



RG-NPE

RGOS 10.3(4b7)

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RGOS®10.3(4b7)

1.

5

Courier New

5

[] []

{x|y|...}

[x|y|...]

//

r

1)

2)

1 CLI

1.1 alias

alias

no

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

mode
command-alias
original-command

EXEC

EXEC

h	help
p	ping
s	show
u	undebug
un	undebug

no alias exec

alias ?

Ruijie(config)# **alias ?**

```

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

```

*

**command-alias=original-command*

```

EXEC           "s"    "show"           "s?"
's'

```

```

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

```

```

EXEC           "sv"    "show version"

```

```

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

```

```

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

```

```

"ia"    "ip address"

```

```

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

```

```

"ip address"

```

show aliases

```

"def-route"           "ip"

route 0.0.0.0 0.0.0.0 192.168.1.1"

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

```

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

show aliases	

1.2 privilege

privilege

no

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

mode CLI

[**all**]

level *level* 0-15

reset

command-string

privilege

CLI

privilege ?

CLI

config	

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

CLI 1 "test" reload

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

1 CLI reload

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

reload 1 all

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

1 CLI reload

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

enable secret	CLI

1.3 show aliases

EXEC

show aliases

show aliases [mode]

mode

2

2.1

2.1.1 cd

cd *DIRECTORY*

DIRECTORY

“ ” “ ”

ls

tmp

Ruijie# **cd** tmp

ls	

2.1.2 cp

cp dest {*DESTINE_FILE*

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

DESTINE_FILE

DIRECTORY

SOURCE_FILE ()

a_ÉÉXcpQ5G!0jXÄI_00)
Ruijie# **cp sour** *log.txt* **dest** *../log_1*

2.1.3 ls

ls *PATHNAME*

PATHNAME

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

2.1.4 mkdir

```
mkdir DIRECTORY
```

```
DIRECTORY
```

```
(      )
```

```
test
```

```
Ruijie# mkdir test
```

2.1.5 mv

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

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

SOURCE_FILE

DESTINE_FILE/DIRECTORY

```
a ( type file); b '?'  
'? ' ,
```

```
log.txt , config.txt ,
```

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

```
log.txt tmp
```

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

2.1.6 pwd

```
pwd
```

pwd	

Ruijie# **pwd**

2.1.7 rm

rm *FILE*

FILE ()

log.txt

Ruijie# **rm** *log.txt*

rmdir	, rm

2.1.8 rmdir

rmdir *DIRECTORY*

DIRECTORY ,

, , **rm**

tmp

Ruijie# **rmdir** tmp

Ruijie# **ls**

3

3.1

	CLI	COPY
Xmodem		copy xmodem
Tftp		copy tftp

3.1.1 copy xmodem

xmodem xmodem

copy flash: filename xmodem

copy xmodem flash: filename

r

copy xmodeam flash:"filename" copy flash:"filename" xmodeam

filename

Xmodem

Xmodem

:

xmodem

:

Ruijie# **copy xmodem flash: config.text**

Ruijie# **copy flash: config.text xmodem**

3.1.2 copy tftp

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

r

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

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

filename

vrfname vrf

```
TFTP
TFTP
: ip 192.168.12. 1
config.bak ; switch.bin ip
192.168.12.1 :
Ruijie# copy tftp://192.168.12.1/config.bak flash:
config.text
Ruijie# copy flash: switch.bin tftp://192.168.12.1/ config.bak
```

4 HTTP

4.1.1 http check-version

HTTP
http check-version

-	-

|

|

|

1 HTTP

Ruijie#**http check-version**

files need to be updated: bin, web, config, character-db, normal.

bin:

support identification of 31 kinds of popular games.

--	--

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

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

└──

└──

└──

```

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

-	-

10.3(4b7) NPE50 NPE80 NPE

10.3(4b7)	

4.1.3 http update mode

HTTP

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

HTTP

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

-	-

10.3(4b7) NPE50 NPE80 NPE

10.3(4b7)	

4.1.6 http update time

HTTP

http update time daily *hh:mm*

hh:mm	

	10.3(4b7)	

5

LAN

5.1

5.1.1 bandwidth

bandwidth

no

bandwidth *kilobits*

no bandwidth

kilobits

K

bandwidth

show interface

bandwidth

Serial

Async

Bandwidth

64Kbps

Ruijie(config-if)# **bandwidth 64**

5.1.2 clear counters

clear **counters**

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

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

s10

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

5.1.4 debug vlan

debug vlan VLAN **no**
 VLAN
debug vlan
no debug vlan

VLAN
 Ruijie# **debug vlan**

5.1.5 description

description **no**

description *string*
no description

string

2M

```
Ruijie(config)# interface serial 1/0
```

```
Ruijie(config-if)# description ShanDong-Bandwidth2M
```

5.1.6 duplex

duplex

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

show interface	

5.1.9 ip address

```

                ip address                IP                no
                IP

```

```
ip address ip-address sub-mask [ secondary ]
```

```
no ip address [ ip-address sub-mask ] [ secondary ]
```

```
ip-address      IPV4
```

```
sub-mask       IP
```

```
secondary
```

```
/0/0/Ä
```

```
IP
```

```
IP
```

```
ip address
```

```
IP
```

```
IP
```

secondary IP

IP

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

ip unnumbered	IP

serial	
Bri	ISDN

Loopback 0 IP 192.168.12.1/24 0

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

5.1.11 keepalive

keepalive keepalive no
keepalive

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

no keepalive

keep-period RGOS keepalive 0
 RGOS keepalive 10

dns ip ip dns 3 keepalive

ping ip ip ping
 keepalive ip ping 3

keepalive

keepalive

keepalive

keepalive

keepalive

ping

dns

30

30
GigabitEthernet 0/0 180 **show interface GigabitEthernet 0/0**
3 minutes input rate 15 bits/sec, 0 packets/sec
3 minutes output rate 14 bits/sec, 0 packets/sec

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

show interface	

5.1.13 mac-address

MAC
MAC MAC MAC
MAC

MAC

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

5.1.14 media-type

media-type

no

```
Ruijie(config-if)# interface (pe)TJ/C2_0 1 Tf0.0050 Tc 2 Tc 12821f7283634-207.994<9961E  
media-type {
```

	mtu		MTU	Maxiumum
Transmission Unit		no		

mtu size

no mtu

<i>size</i>	MTU		64-65535		1500
-------------	-----	--	----------	--	------

MTU 1500

MTU MTU

FTP MTU

0 MTU 576

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

Ruijie(config-if)# **mtu 576**

5.1.16 shutdown

shutdown	no
-----------------	-----------

shutdown

no shutdown

RTS	Modem	DTR	RTS	DTR
-----	-------	-----	-----	-----

show interface is administratively down

GigabitEthernet 0/0

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

show interface	

5.1.17 speed

speed **no**

speed {10 | 100 | 1000|auto }

no speed

10 10M

100 100M

1000 1000M

auto

10M 100M 1000M

speed 0

dulpex	speed	
full	10	10M
Full	100	100M
Half	10	10M
Half	100	100M
Auto	auto	

0/0

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

5.2

5.2.1 show interface

show interface

show interface *type interface-number*

type

interface-number

show interface
Bandwidth Loopback

MTU

WFQ

interface FIFO **show**
Queueing strategy: fifo Output queue

```

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

GigabitEthernet 0/0

```

Ruijie# show interface GigabitEthernet 0/0
GigabitEthernet 0/0 is UP , line protocol is UP
Hardware is Nat-Semi DP83815DVNG GigabitEthernet, address is
0a0b.0c0d.0e0f (bia 0a0b.0c0d.0e0f)
Interface address is: no ip address
ARP type: ARPA,ARP Timeout: 3600 seconds
MTU 1500 bytes, BW 100000 Kbit
Encapsulation protocol is Ethernet-II, loopback not set
Keepalive interval is 10 sec , set
Carrier delay is 2 sec
RXload is 1 ,Txload is 1
Queueing strategy: FIFO
Output queue 0/40, 0 drops;
Input queue 0/75, 0 drops
5 minutes input rate 0 bits/sec, 0 packets/sec
5 minutes output rate 0 bits/sec, 0 packets/sec
782 packets input, 88920 bytes, 0 no buffer
Received 782 broadcasts, 0 runts, 0 giants
0 input errors, 0 CRC, 0 frame, 0 overrun, 0 abort
0 packets output, 0 bytes, 0 underruns
0 output errors, 0 collisions, 1 interface resets
  
```

6

6.1

6.1.1 interface giagbitEthernet

interface gigabitEthernet *mod-num/port-num*

mod-num/port-num /

no **show interfaces** **show**
interfaces tenGigabitEthernet

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

show interfaces	

6.1.3 medium-type

no
medium-type { fiber | copper }
no medium-type

fiber
copper

Ap SVI

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

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

show interfaces	

```
24SFP/12GT      12  SFP      12  10/100/1000M BASE-T
                SFP      10/100/1000M BASE-T
```

6.1.4 description

```
no
```

```
description string
```

```
no description
```

```
string
```

```
show interfaces
```

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

show interfaces	

6.1.5 shutdown

no

shutdown

10G
auto

10Gbps

Ap

Ap

Ap

show interfaces
SFP

10M

100M

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

show interfaces	

6.1.7 duplex

no

duplex {auto | full | half}

no duplex

auto

full

half

show interfaces

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

show interfaces	

6.1.8 mtu

mtu

Mtu num

num 64 9216(65536)

1500

mtu

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

Ruijie(config-if)# **mtu 9216**

show interfaces	

6.1.9 carrier-delay

carrier-delay

no

carrier-delay [*seconds*]

no carrier-delay

seconds 1 60

2

DCD DCD Down Up

DCD

DCD

5

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

Ruijie(coinfig)# **carrier-delay 5**

6.1.10 clear counters

clear counters [*interface-id*]

interface-id

LinkTrap
 Link SNMP LinkTrap LinkTrap, **no**
snmp trap link-status
no snmp trap link-status

Link SNMP LinkTrap

LinkTrap Ap SVI Link SNMP LinkTrap,
 LinkTrap

Link trap:

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

Link trap:

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

Ruijie(config-if)# snmp trap link-status	link trap

interface-id

aggregateport

SVI

loopback

counters

description

link

status

Ruijie#

7

7.1

7.1.1 bridge-map

bridge-map *bridge-num*



7.1.2 link-mode

no

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

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

forward

sniffer

bypass

```
GigabitEthernet 0/0
GigabitEthernet 0/1    forward    GigabitEthernet 0/2
GigabitEthernet 0/3    sniffer
```

```
1          GigabitEthernet 0/0    GigabitEthernet 0/1    forward
```

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

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

-	-

10.3(4b7)

NPE50 NPE80 NPE



	10.3(4b7)	
--	-----------	--

7.1.4 specify interface

specify interface *interface-name* { *lan* | *wan*}

no

[no] specify interface *interface-name*

interface-name	
Lan	
Wan	

└──

└──

└──

no

└──

```

1      GigabitEthernet 0/0
Ruijie(config)#specify interface GigabitEthernet 0/0 lan
2      GigabitEthernet 0/0
Ruijie(config)#specify interface GigabitEthernet 0/0 wan
3      GigabitEthernet 0/0
Ruijie(config)#no specify interface GigabitEthernet 0/0

```

-	-

└──

10.3(4b7) NPE50 NPE80 NPE

└──

10.3(4b7)	

7.1.5 sys-mode

no

[no] sys-mode gateway

-	-

no

NAT

IP

NAT

IP

1

Ruijie#**config**

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

-	-

10.3(4b7)

NPE50 NPE80 NPE

10.3(4b7)	

7.1.6 vlan-enable

vlan id 1-4088

vlan-enable

no vlan id 1-4088

[no] vlan-enable



xalui-mode	
slot	slot
slot-num	slot

4

1 XAUI
 Ruijie(config)#xalui-mode slot 0

-	-

10.3(4b7) NPE60 V1.0

10.3(4b7)	

7.2

7.2.1 show bridge-map

show bridge-map [*bridge-num*]

bridge-num	0~2

```

1          0
Ruijie#show bridge-map 0
BRIDGE MAP 0,STATE is DOWN
  Inside interface is GigabitEthernet 0/0,Outside interface is
GigabitEthernet 0/1
  Working mode is forward
  Native vlan is 1

```

-	-

```

10.3(4b7)          NPE50 NPE80 NPE

```

10.3(4b7)	

7.2.2 show sys-mode

```

wan lan
show sys-mode

```

--	--

```

wan lan
sys-mode          LAN

```

```

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

```

-	-

10.3(4b7) NPE50 NPE80 NPE

10.3(4b7)	

8

8.1

mtu flowcontroldescription shutdown

8.1.1 copy

copy *source-url destination-url*

source-url	URL
destination-url	URL

copy url **tftp**
oob_tftp

```
1        TFTP        rgos.bin
Ruijie#copy oob_tftp://192.168.1.1/rgos.bin flash:rgos.bin
Accessing tftp://192.168.1.1/rgos.bin...

Transmission finished, file length 11305856

Download file [rgos.bin] to file system is OK.
```

-	-
---	---

NPE40 NPE60

10.3(4b7)	

8.1.2 gateway

MGMT

gateway ip-address

ip-address	MGMT IPv4

MGMT

MGMT

0

1 MGMT

Ruijie#**config**

Ruijie(config)#**interface mgmt 0**

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

Ruijie(config-if-Mgmt 0)#**end**

Ruijie#

show interface mgmt	MGMT

NPE40 NPE60

8.1.3 ip address

MGMT IP

ip address *ip-address subnet-mask*

ip-address	IP
subnet-mask	

|

|

|

MGMT MGMT 0

1 MGMT IP

	host	IP
		MGMT
		1 192.168.0.1 MGMT
		Ruijie#ping oob 192.168.0.1
		Sending 5, 100-byte ICMP Echoes to 192.168.196.1, timeout is 2 seconds:
		< press Ctrl+C to break >
		!!!!
		Success rate is 100 percent (5/5), round-trip min/avg/max = 10/10/10 ms
		- -
		NPE40 NPE60
		10.3(4b7)

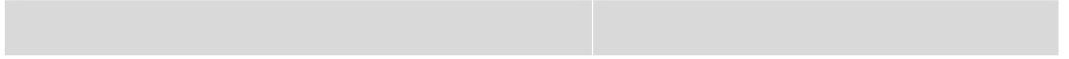
8.1.5 sntp enable oob

	MGMT	SNTP
	sntp enable oob	
		- -

	MGMT	SNTP
	1	SNTP
	Ruijie# config	
	Ruijie(config)# sntp enable oob	
	-	-
	10.3(4b7)	NPE50 NPE80 NPE
	10.3(4b7)	

8.1.6 telnet oob

	MGMT
	telnet oob host
	host
	IP
	MGMT
	1
	192.168.200.1
	Ruijie# telnet oob 192.168.200.1
	User Access Verification
	Password:



NPE40 NPE60



10.3(4b7)

9 LINE

9.1 LINE

9.1.1 line

LINE

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

aux	
console	
tty	
vty	telnet/ssh
<i>First-line</i>	first-line
<i>Last-line</i>	last-line

LINE

LINE VTY 1 3 LINE

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

9.1.2 line vty

VTY

no

VTY

line vty *line-number*

no line vty *line-number*

VTY 5 0--4

VTY

VTY 20 VTY 0--19

Ruijie(config)# **line vty** 19

VTY 10 VTY 0—9

Ruijie(config)# **line vty** 10

9.1.3 transport input

Line **transport input** Line

default transport input LINE

transport input {all | ssh | telnet | none}

default transport input

all	Line
ssh	Line SSH
telnet	Line Telnet

none	Line
------	------

VTY TTY NONE
default
transport input

Line

Line VTY
show running Line VTY

r
default transport input no transport input
LINE transport input none

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

show running	

RGNOS10.1

9.1.4 access-class

Line ACL **access-class** *acl-no*
{ in | out } Line **no access-class**

10 DLDP

10.1.1 DLDP

DLDP

```
lldp ip  
lldp passive
```

10.1.2 dldp ip

```
dldp ip 100  
no
```

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

```
no dldp ip [nexthopip]
```

```
ip ip
```

```
nexthopip: ip
```

```
interval
```

```
retry
```

```
interval 100
```

Interface

MSTP

10.83.132.1

```
Ruijie(config)# interface GigabitEthernet 1/0
```

```
Ruijie(config-if)# dldp 10.83.132.1
```

```
Ruijie(config-if)#  
    dldp  
Ruijie(config-if)# dldp passive  
Ruijie(config-if)#  
            ip 20.1.1.1      ip 10.1.1.1  
Ruijie(config)# dldp 20.1.1.1 10.1.1.1
```

RGNOS10.3

RGNOS10.3

10.1.3 dldp passive

dldp passive	dldp	no
--------------	------	-----------

dldp passive**no dldp passive**

Interface

dldp

dldp

Ruijie(config-if)# **dldp passive**

RGNOS10.3

RGNOS10.3

11

11.1

11.1.1 clear counters

clear counters

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

interface-type Async Dialer GigabitEthernet Group-Async
Loopback Null Serial

interface-number

show interface

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

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

show interface	

11.1.2 clear dialer

DDR

clear dialer

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

interface-type

Async Bri Group-Async Serial

interface-number

DDR

DDR

1

Ruijie# **clear dialer async 1**

11.1.3 clear interface

clear interface

clear interface *interface-type interface-number*

interface-type

Async Dialer GigabitEthernet Group-Async

Loopback Null Serial

interface-number

0

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

11.1.4 clear line

clear line

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

line-type Line **aux console vty** **tty**

line-number

tty aux **vty console**
 line

 VTY 0

Ruijie# **clear line vty 0**

11.1.5 debug dialer

DDR

debug dialer

debug dialer { **pkt** | **mlp**|**callback**|**event**}

pkt

mlp

callback dialer

event

11.1.6 debug ppp

PPP

debug ppp

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

authentication PPP

error PPP

event PPP

negotiation PPP

packet PPP

PPP

PPP

PPP

Ruijie# **debug ppp event**

11.1.7 dialer enable-timeout

dialer enable-timeout

no

dialer enable-timeout *seconds*

no dialer enable-timeout

seconds

15

11.1.9 dialer hold-queue

dialer hold-queue **no**

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

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

packet 0 100

timeout *seconds* 45s

MODEM

50

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

11.1.10 dialer idle-timeout

dialer idle-timeout **no**

dialer idle-timeout *seconds*

no dialer idle-timeout

seconds

120

1 60

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

dialer-group	
dialer fast-idle	

11.1.11 dialer-list

dialer-list no

```
dialer-list dialer-group protocol { ip } { permit | deny | list  
access-list-nr protocol { ip } { permit | deny | list
```

dialer-group

IP

120

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

dialer-group	
access-list	

11.1.12 dialer pool

DDR

dialer pool **no**

dialer pool *number*

no dialer pool *number*

number

1~255

DDR

0 1

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

dialer pool-member	
dialer remote-name	

11.1.13 dialer pool-member

dialer pool-member

no

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

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

number

priority *priority*
255

0 255 0

0

1 1 2 50 100

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

dialer pool	
dialer remote-name	

11.1.14 dialer priority

```
priority no DDR dialer
dialer priority number
no dialer priority

number 0 255 0

0

DDR

DDR

1 50

Ruijie(config)#
```

PPP
no

ip address negotiated

ip address negotiated

no ip address negotiated

IP

1 IP

Ruijie(config)# **interface async 1**

Ruijie(config-if)# **ip address negotiate**

encapsulation ppp	PPP
ip address	IP
ip unnumbered	IP

11.1.16 ip address-pool

IP

ip address-pool

no

ip address-pool [local]

no ip address-pool

local

IP

IP

peer default ip address

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

ip local pool	
peer default ip address	IP

11.1.17 ip route

IP

11.1.18 line

Line

line

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

aux Line

console Line

vty

line-number Line

"

h

```

Line          Line          Line          aux
\ console \ vty          show line

```

```

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

```

```
Tty 0
```

show line

```

aux \ console \ vty          Line
1 Line 1          show line

```

```

0 4          Line          0
4

```

```

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

```

show line	line

11.1.19 peer default ip address

address **no** IP **peer default ip** IP
peer default ip address { *ip-address* | **pool** [*pool-name-list*] }
no peer default ip address

ip-address DDR IP IP

pool *pool-name-list*

pool-name-list

IP

PPP IP IP
IP

Xó~p® R'a* c~s @áXp ® tóp *!\$ 'o7 ð ç @áÔsFp *!\$ ²ò A Đ'M 0eCNí< d® Òÿ

11.1.20 ppp max-bad-auth

```
                PPP                ppp max-bad-auth
no
ppp max-bad-auth number
no ppp max-bad-auth
```

```
number  PPP  0
```

```
2
```

```
3
```

```
1 4:
```

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



1

dial-on-demand

PPPoE

```

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

```

```

default          dialer string          default

```

11.2.2 show ip local pool

show ip local pool

show ip local pool

```

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

```

ip address-pool	
ip local pool	

11.2.3 show pppoe

PPPoE

show pppoe

show pppoe { session | tunnel }

session tunnel

Ruijie# **show pppoe tunnel**

pppoe tunnel state

state is TERMINATED ,my mac is 4E.54.38.00.00.01 , peer mac is
00.D0.F8.38.AA.20

Next timer fires after: 00:00:14

PPPOE

SENT_IDLE

SENT_PADI PADI

RECEIVED_PADO PADO

SENT_PADR PADR

SESSION Session

TERMINATED Session

Next timer fires after

IP

12 IP

12.1

12.1.1 ip address

IP no IP

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

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

<i>ip-address</i>	32	IP	8	
<i>network-mask</i>	32		"1"	"0"
		8		
secondary		IP		

IP

IP IP IP
 IP IP IP
 32 IP IP IP
 1 IP A 0
 IP A
 255.0.0.0

IP

RGOS

IP

IP

IP

IP

IP

IP

IP

IP

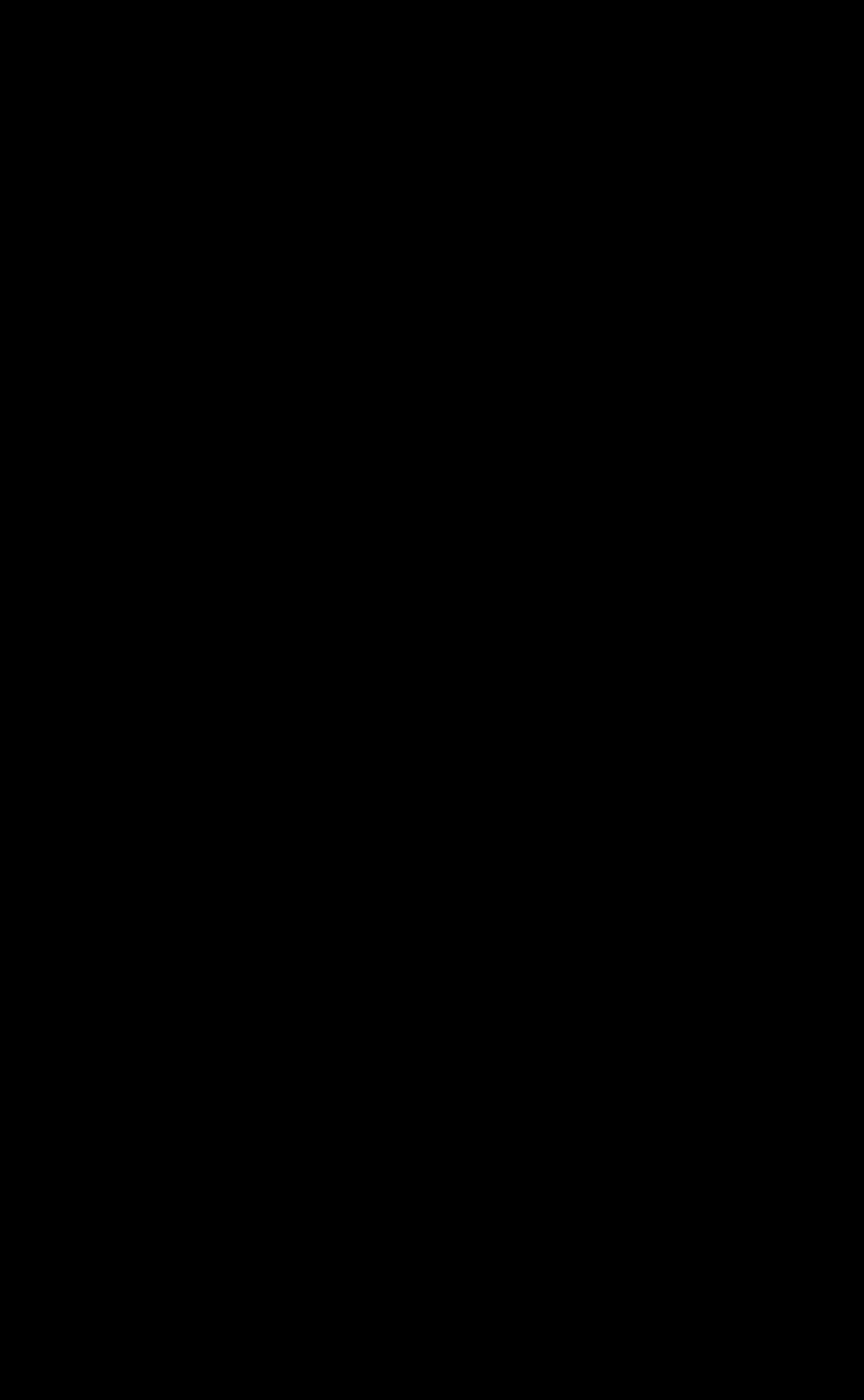
IP

IP

C

IP

IP



<i>interface-number</i>	
-------------------------	--

IP
IP

IP

IP

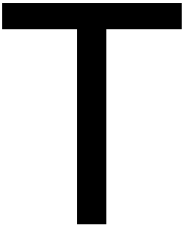


IP

IP



IP



```

no          ARP          IP          MAC
           MAC
arp ip-address MAC-address type [ alias ]
no arp ip-address MAC-address type [ alias ]

```

<i>ip-address</i>	MAC	IP	
<i>MAC-address</i>		48	
<i>type</i>	ARP arpa		
alias	arp	RGOS	IP

ARP

```

RGOS      ARP          32      IP          48      MAC
           ARP
clear arp-cache          ARP          ARP

```

```

           ARP
arp 1.1.1.1 4e54.3800.0002 arpa

```

clear arp-cache	ARP

12.2.2 arp retry interval

<i>number</i>	ARP <1-100> 1 ARP 1 ARP

ARP ARP 5

ARP ARP

ARP
arp retry times 1
ARP 1
arp retry times 2

arp retry interval seconds	arp

12.2.4 arp trusted NUM

ARP no
arp trusted number
no arp trusted

<i>number</i>	ARP , <10-4096>

12-7 104DA%_E_f-}0"3

service trustedarp	ARP

12.2.6 arp unresolve

8192 ARP no

arp unresolve *number*

no arp unresolve

<i>number</i>	ARP	no 7192	8192

arp gratuitous-send interval *seconds*

no arp gratuitous-send



<i>seconds</i>	0-2147483
----------------	-----------

3600

```

ARP                               IP           MAC
  ARP                               ARP
                                     ARP
                                     ARP
                                     GigabitEthernet 0/1
120                                ARP
  
```

```

interface GigabitEthernet 0/1
arp timeout 120
  
```

clear arp-cache	ARP
show interface	

12.2.9 ip proxy-arp

```

                                     ARP           ip proxy-arp           no
                                     ARP
  ARP
  ip proxy-arp
  no ip proxy-arp

10.2(3)                               ARP
  
```

MAC ARP IP
ARP ARP IP
ARP MAC MAC
GigabitEthernet 0 ARP
interface GigabitEthernet 0
ip proxy-arp

12.2.10 service trustedarp

ARP service trustedarp no
ARP
service trustedarp
no service trustedarp

ARP

ARP ARP GSN
GSN
STP MAC
MAC ARP
1) STP
2) root port design , updown
3) tc

service trustedarp

```
config
service trustedarp
```

s32

12.3

12.3.1 ip broadcast-addresss

ip broadcast-addresss

```
no
ip broadcast-addresss ip-address
no ip broadcast-addresss ip-address
```

<i>ip-address</i>	IP

```
IP          255.255.255.255
```

```
IP          1          255.255.255.255  RGOS
           IP          1
```

```
IP          0.0.0.0
```

```
ip broadcast-address 0.0.0.0
```

12.3.2 ip directed-broadcast

IP
no

ip directed-broadcast

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

no ip directed-broadcast

<i>access-list-number</i>	2699 1-199 1300 - IP

IP
172.16.16.255

IP

IP

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

<i>ip</i>	ip ip ARP
<i>ip mask</i>	ip mask ARP
<i>mac-address</i>	mac ARP

Address	IP
Age (min)	ARP “_”
Hardware	IP
Type	ARPA
Interface	IP

show arp 192.168.195.68

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

show arp 192.168.195.0 255.255.255.0

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

show arp 001a.a0b5.378d

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

12.4.3 show arp counter

ARP arp

show arp counter

show arp counter

```
Ruijie# show arp counter
The Arp Entry counter:0
The Unresolve Arp Entry:0
```

ARP

12.4.4 show arp timeout

ARP

show arp timeout**show arp timeout**

```
Ruijie# show arp timeout
Interface          arp timeout(sec)
-----
VLAN 1             3600
```

ARP

12.4.5 clear ip route

IP IP

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

*	
<i>network</i>	
<i>netmask</i>	

192.168.12.0

```
clear ip route 192.168.12.0
```

show ip route	IP

12.4.6 show ip arp

ARP

```
show ip arp
```

```
show ip arp
```

```
Ruijie# show ip arp  
Protocol Address      Age(min)Hardware      Type  
Interface
```

Internet	192.168.7.233	23	0007.e9d9.0488	ARPA
GigabitEthernet	0/0			
Internet	192.168.7.112	10	0050.eb08.6617	ARPA
GigabitEthernet	0/0			
Internet	192.168.7.79	12	00d0.f808.3d5c	ARPA
GigabitEthernet	0/0			
Internet	192.168.7.1	50	00d0.f84e.1c7f	ARPA
GigabitEthernet	0/0			
Internet	192.168.7.215	36	00d0.f80d.1090	ARPA
GigabitEthernet	0/0			
Internet	192.168.7.127	0	0060.97bd.ebee	ARPA
GigabitEthernet	0/0			
Internet	192.168.7.195	57	0060.97bd.ef2d	ARPA
GigabitEthernet	0/0			
Internet	192.168.7.183	--	00d0.f8fb.108b	ARPA
GigabitEthernet	0/0			

ARP

Protocol	Internet

<i>Interface-number</i>	
-------------------------	--

RGOS

RGOS

RGOS

UP

UP

show ip interface

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

IP interface state is:	"UP"
IP interface type is:	

IP interface MTU is:	MTU
IP address is:	IP
IP address negotiate is:	IP
Forward direct-boardcast is:	
ICMP mask reply is:	ICMP
Send ICMP redirect is:	ICMP
Send ICMP unreachable is:	ICMP
DHCP relay is:	DHCP

13 IP

13.1 IP

13.1.1 ip default-gateway

ip default-gateway no

ip default-gateway

no ip default-gateway

show ip redirects

192.168.1.1

ip default-gateway 192.168.1.1



show ip redirects

IPCM

ip mask-reply

no ip mask-reply

```

IP          IP MTU      RGOS
            mtu          IP MTU
MTU                    IP MTU      IP MTU
MTU

```

```

GigabitEthernet 0/1      IP MTU      512
interface GigabitEthernet 0/1
ip mtu 512

```

mtu	

13.1.4 ip redirects

```

RGOS          ICMP          ip redirects
no            ICMP
ip redirects
no ip redirects

```

ICMP

RGOS ICMP

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

13.1.5 ip source-route

```
RGOS          IP          ip
source-route  no
ip source-route
no ip source-route
```

```
RGOS  IP          IP          IP
RFC 791
ICMP
RGOS  IP
IP
no ip source-route
```

13.1.6 ip unreachable

```
RGOS          ICMP          ip
unreachables  no          ICMP
```

no ip unreachablees

RGOS

ICMP

RGOS

ICMP

ICMP

GigabitEthernet 0/1

ICMP

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


	-	-
	NPE	
	-	-

14.1.2 ip ref load-sharing original-only

IPV4 REF IP no IP
 IP/MASK IP
 IP

[no] ip ref load-sharing original-only

	-	-

--

IP

1 IP

Ruijie(config)# ip ref load-sharing original-only

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

	-	-

--

NPE

--	--	--

14.2.1 show ip ref packet-statistic

REF

show ip ref packet-statistic [clear]



IPv4 REF

```

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

id	
state	unresolve resolved
type	local forward drop glean
rfct	

┌

┌

┌

```

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

┌

show ip ref route	REF

┌

NPE

┌

-	-

14.2.4 show ip ref route

REF

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

┌

vrf	
default	
ip	IP
mask	
statistic	

REF

IP/MASK

1 REF

Ruijie#show ip ref route

Codes: * - default route

- zero route

```

ip      mask      adj-id  next-hop      weight  interface
224.0.0.0      224.0.0.0      1      0.0.0.0      1
192.168.52.0   255.255.255.0  11     0.0.0.0      1
FastEthernet 0/0
192.168.52.255 255.255.255.255 1      0.0.0.0      1
 192.168.52.68 255.255.255.255 1      0.0.0.0      1
192.168.52.58  255.255.255.255 12     192.168.52.58 1
FastEthernet 0/0
 20.0.0.0      255.255.255.0  10     0.0.0.0      1
FastEthernet 0/1.1
 20.0.0.255    255.255.255.255 1      0.0.0.0      1
 20.0.0.3      255.255.255.255 1      0.0.0.0      1
    
```

ip	IP
mask	
adj-id	
next-hop	
weight	
interface	

show ip ref exact-route	IP	REF

NPE

-	-

15 IP NAT

15.1

15.1.1 address

	NAT	NAT	address
no			
address	<i>start-ip end-ip</i>	[match interface <i>interface</i>]	
no address	<i>start-ip end-ip</i>	[match interface <i>interface</i>]	
address interface	<i>interface</i>	[match interface <i>interface</i>]	
no address interface	<i>interface</i>	[match interface <i>interface</i>]	

start-ip

```

%                               mulnets
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
    
```

ip nat pool	IP NAT

-	-

15.1.2 clear ip nat translation

```

NAT
clear ip nat translation { *}
    
```

*	NAT

```

NAT                               NAT
                                ftp
    
```

ip nat	NAT
ip nat inside destination	NAT
ip nat inside source	NAT
ip nat outside source	NAT

IP NAT

ip nat pool

IP NAT

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

<i>list-num</i>	,
<i>dest-ip</i>	NAT
tcp <i>dest-ip port-num</i>	tcp NAT
udp <i>dest-ip port-num</i>	udp NAT
dest-change <i>ip-addr port-num</i>	
src-change <i>ip-addr</i>	
vrf <i>vrf_name</i>	vrf vrf

NPE80

NAT

IP

(DNS relay)

```

1          192.168.1.0      DNS      NAT inside
  IP 192.168.1.1          NAT      DNS
  DNS 202.101.98.55      DNS      ip nat
application
192.168.1.1          53  UDP      access-list 1
202.101.98.55      53
!
access-list 1 permit 192.168.1.0 0.0.0.255
!
interface GigabitEthernet 0/0
ip address 192.168.1.1 255.255.255.0
ip nat inside
!
interface GigabitEthernet 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
!

```

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

-	-

15.1.5 ip nat inside destination

NAT
ip nat inside destination
no NAT

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

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

--	--

list access-list-number

IP 100-199

ACL

pool

IP

ip nat inside source	NAT
ip nat outside source	NAT
ip nat pool	IP NAT
show ip nat statistics	IP NAT
show ip nat translations	IP NAT

Overload	pool NAPT cisco
static local-ip global-ip	NAT local-ip global-ip
static protocol	NAT protocol TCP UDP
local-port	TCP UDP
global-port	local-port
permit-inside	ip nat inside source static global-ip local-ip
vrf vrf_name	vrf vrf
match	
netmask <i>mask</i>	



NAT

IP

NAT

```

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

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

-	-

15.1.7 ip nat outside source

```

no NAT ip nat outside source
NAT
    
```

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

list access-list-number	NAT
pool pool-name	NAT
static global-ip local-ip	NAT local-ip global-ip
static protocol	NAT protocol TCP UDP
local-port	TCP UDP global-port
global-port	
vrf vrf_name	vrf vrf

NAT

NPE80

NAT

IP

IP

NAT

NAT

1

NAT

2

NAT

NAT

NAT

IP

DNS

NAT

1

92.168.12.0/24

192.168.12.0/24

92.168.12.0/24

```

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

```

inside outside NAT

clear ip nat translation	NAT
ip nat	NAT
ip nat inside destination	NAT
ip nat inside source	NAT
ip nat pool	IP NAT
show ip nat statistics	IP NAT
show ip nat translations	IP NAT

-	-

15.1.8 ip nat p2p-rate-limit

BT **ip nat p2p-rate-limit**
no BT

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

in	BT

<code>ip nat { inside outside }</code>	NAT
<code>-</code>	<code>-</code>

15.1.9 ip nat pool

NAT
ip nat pool
no

NPE80

ip nat pool *pool-name start-ip end-ip* { **netmask** *netmask* | **prefix-length** *prefix-length* } [**type** *rotary*]

NPE80

ip nat pool *pool-name* { **netmask** *netmask* | **prefix-length** *prefix-length* } [**type** *rotary*]

NPE80

ip nat pool *pool-name* { **netmask** *netmask* | **prefix-length** *prefix-length* } [**type** *rotary*] [hardware]

no ip nat pool *pool-name*

<i>pool-name</i>	NAT
<i>start-ip</i>	NAT IP
<i>end-ip</i>	NAT IP
netmask <i>netmask</i>	NAT
Prefix-length <i>prefix-length</i>	NAT
Type	NAT rotary rotary rotary cisco
Hardware	NPE80 NAT

|
|
|

|
|
|

|
|
|

|
|
|
|

```
1          net192          192.168.12.1
          192.168.12.254          24
ip nat pool net192 192.168.12.1 200.168.12.254 prefix-length 24
```



```

1          ICMP      NAT          30
ip nat translation icmp-timeout 30
          192.168.5.112          600
          500
ip nat translation per-user 0.0.0.0 500
ip nat translation per-user 192.168.5.112 600
    
```

show ip nat translations	IP NAT

-	-

15.2

15.2.1 show ip nat statistics

IP NAT

show ip nat statistics

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

-	-

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

PC

IP

NUM

NUM

NUM

show ip nat statistics *suspicious-pc*

IP

135 445

135

445

10

show ip nat statistics

IP NAT

NAT

outside

inside

┌

└

-	-

15.2.2 show ip nat translations

NAT

show ip nat translations

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

┌

└

┌

└

icmp	icmp nat
tcp	tcp nat
udp	udp nat
acl_num	acl , acl
vrf_name	vrf vrf
verbose	NAT

┌

└

┌

IP NAT

verbose

timeout

1 show ip nat translations verbose

Ruijie# **show ip nat translations verbose**

timeout for NAT TCP flows: 86400

timeout for NAT TCP flows after a FIN or RST: 60

timeout for NAT TCP flows after a SYN : 60

timeout for NAT UDP flows: 300

timeout for NAT DNS flows: 60

timeout for NAT ICMP flows: 60

Pro Inside global Inside local Outside local Outside

global timeout vrf

tcp 192.168.5.103:1987 192.168.211.21:1987 211.67.71.7:80
211.67.71.7:80 timeout=85139 1

udp 192.168.5.103:1041 192.168.211.183:1041 202.101.98.55:53

└

202.101.98.55:53 timeout=38 1

Pro	"tcp" "udp" TCP UDP "icmp" ICMP
Inside global	
Inside local	
Outside local	
Outside global	
timeout	NAT
vrf	vrf

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

-	-

16

16.1

16.1.1 mlb enable

/

mlb enable

no mlb enable

	no	

|

|

|

|

1

Ruijie(config)# **mlb enable**

	-	-	

NPE

no mllb policy

bandwidth	
latency	
load	
intelligent	
no	

bandwidth latency load intelligent
mllb policy no mllb policy
bandwidth

1 **load**
Ruijie(config)# **mllb policy load**
2
Ruijie(config)# **no mllb policy load**

mllb enable	
bandwidth	

NPE

10.3(4b7)	

16.1.3 mllb policy intelligent

/

mllb policy intelligent [bandwidth *base1*] [latency *base2*] [load *base3*]
no mllb policy intelligent

bandwidth <i>base1</i>	1-100
latency <i>base2</i>	1-100
load <i>base3</i>	1-100
no	

1.

percent	
no	

100

1-100

1 95
 Ruijie(config)# **mllb threshold 95**

mllb enable	

NPE

10.3(4b7)	

16.1.5 mllb load-sharing original

IP

mllb load-sharing original

no mllb load-sharing original

	IP
no	

IP

IP

mllb policy bandwidth

1 IP
Ruijie(config)# **mllb load-sharing original**

mllb enable	

NPE

10.3(4b7)	

16.2

16.2.1 show mllb config

show mllb config

show mllb config

-	-

1
Ruijie(config)# show mllb config

muti-link load balance configure:
muti-link load balance state: enabled
muti-link load balance threshold: 95

3 classify enable

no

[no] layer23 classify enable

vlan

1 525.02 q14136 12 7422 5 T-234 6362.14 refB.6 52545.66 Tmh358164526 r135-64 1526-

18

"9B @ #...!•0 ÄF" `B=Ia|B5 T#P


```

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

```

2 vlan1

Ruijie#**show vlan-group vlan1**

```

vlan-group  police_flow  police_url  flow  vlan id
-----
any          9          0          0
vlan1       0          0          0          1

```

show vlan-group

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

vlan-group name vlan vid-list	vlan

10.3(4b7) NPE50 NPE80 NPE

10.3(4b7)	

19

19.1

19.1.1 subscriber export

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



	name	
		avoid-monitor deny
	1	1
		1
		1
	Ruijie#config	
	Ruijie(config)# subscriber set	1 attribute avoid-monitor
	2	1
	Ruijie#config	
	Ruijie(config)#no subscriber set	1 attribute avoid-monitor
	show subscriber [all static dynamic parent [name root]]	
	10.3(4b7)	NPE50 NPE80 NPE
	10.3(4b7)	

19.1.4 subscriber static

no

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

no subscriber static name *name*

name	
parent	

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

```

      ip
      ip mac ip mac ip ip
      mac mac mac ip ip
      ip mac mac ip mac
      / , ip

```

```

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

```

	10.3(4b7)	NPE50	NPE80	NPE
	10.3(4b7)			

19.2

19.2.1 show subscriber

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

Avoid	
Deny	
Ip	ip

subscriber static name name parent <i>parent</i> [ip-host ip-addr] [mac mac-addr] ip-subnet subnet mask ip-range start end	

10.3(4b7)	NPE50	NPE80	NPE
-----------	-------	-------	-----

10.3(4b7)	

20

20.1

20.1.1 network-group

no

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

no network-group *name*

show network-group [name]

```

network2      0      0      0      192.168.197.1
network3      0      0      0      192.168.197.2

```

2 network1

```
Ruijie#show network-group network1
```

```

network-group police_flow police_url flow ip
-----
/ 0 0 0
network1 0 0 0 192.168.197.3

```

```
show network-group
```

Network-group	
Police_flow	
Police_url	url
Flow	
Ip	ip

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

```
10.3(4b7) NPE50 NPE80 NPE
```

10.3(4b7)	

21

21.1

21.1.1 identify-application custom

no

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

|

software-name	
---------------	--

```

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

```

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

```

10.3(4b7)          NPE50 NPE80 NPE

```

10.3(4b7)	

21.1.2 identify-application enable

no

[no] identify-application enable

-	-

1

```

Ruijie#config
Ruijie(config)#identify-application enable

```

--	--

10.3(4b7)	
-----------	--

21.1.4 identify-application key

identify-application key *app-name*

app-name	

```
1 FTP
```

```
Ruijie#config
```

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

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

```
10.3(4b7)
```

```
NPE50 NPE80 NPE
```

10.3(4b7)	

21.1.5 identify-application signature update

identify-application signature update

-	-

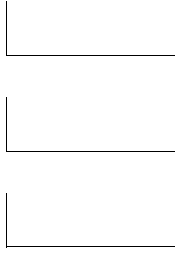
1

Ruijie#**config**

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

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

p0.0j/C2_0 1 T(0f0.0011156 0 7T



1

Ruijie#**show identity-application**

any 255-4095-63-48

LG CÊ


```
14-0-0-0
15-0-0-0
RFC 16-0-0-0
17-0-0-0
248-0-0-0
myp2p 249-0-0-0
```

-	-

```
10.3(4b7) NPE50 NPE80 NPE
```

10.3(4b7)	

21.2.3 show identify-application group-state

show identify-application group-state

-	-

```
1
Ruijie#show identify-application group-state
app group state: on //on
```

	10.3(4b7)	NPE50	NPE80	NPE
	10.3(4b7)			

21.2.4 show identity-application inhibitive

show identity-application inhibitive

-	-

└───

└───

└───

└───
 1
 Ruijie#show identity-application inhibitive

-	-

└───

10.3(4b7) NPE50 NPE80 NPE

10.3(4b7)	

21.2.5 show identify-application key

show identity-application key

-	-

1

Ruijie#**show identity-application key**

IP

QQ

MSN

FTP

-	-

10.3(4b7)

NPE50 NPE80 NPE

10.3(4b7)	

21.2.6 show identify-application userdef-rule

1

Ruijie#**show identity-application userdef-rule**

TYPE	NAME	CLASS	SPL	SPH	DPL	DPH
TCP			1	10	1	100
TCP	myqq		any	any	200	888
UDP	myxunlei	myp2p	18	18	any	any

-	-

10.3(4b7)

NPE50 NPE80 NPE

10.3(4b7)	

21.2.7 show identity-application version

show identify-application version

-	-

1

Ruijie#**show identity-application version**

Version 1.0

Date 2010-1-8

	-	-

10.3(4b7) NPE50 NPE80 NPE

10.3(4b7)	

21.3

21.3.1 identify-application clear key-inhibitive group

identify-application clear key-inhibitive group

-	-

```

1
Ruijie#config
Ruijie(config)#identify-application clear key-inhibitive group

```

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

|

10.3(4b7)

NPE50 NPE80 NPE

|

10.3(4b7)	

22

22.1

- [change-priority](#)
- [channel-default](#)
- [channel-group](#)
- [channel-tree](#)
- [flow-control](#)
- [flow-policy](#)
- [flow-rule](#)

22.1.1 change-priority

no

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

<i>rule1-pri-num</i>	
<i>rule2-pri-num</i>	

session-limit <i>session_limit_num</i>	per-mask 32	IP	Per-net
	65535	IP	1

fifo **pri** 4 **schedule-type**

channel-tree

1. **cir** **pir**
2. **cir** **cir** **cir** **cir**
3. **pir** **pir** **pir**
4. **sfq** **per-net**
5. **per-net** **limit** **per-net**
limit

```

test root
Ruijie(config)#flow-control test
Ruijie(config-flow-control)#channel-tree inbound
Ruijie(config-channel-tree)#channel-group root parent null cir
50000 pir 50000 pri 4 schedule-type fifo

```

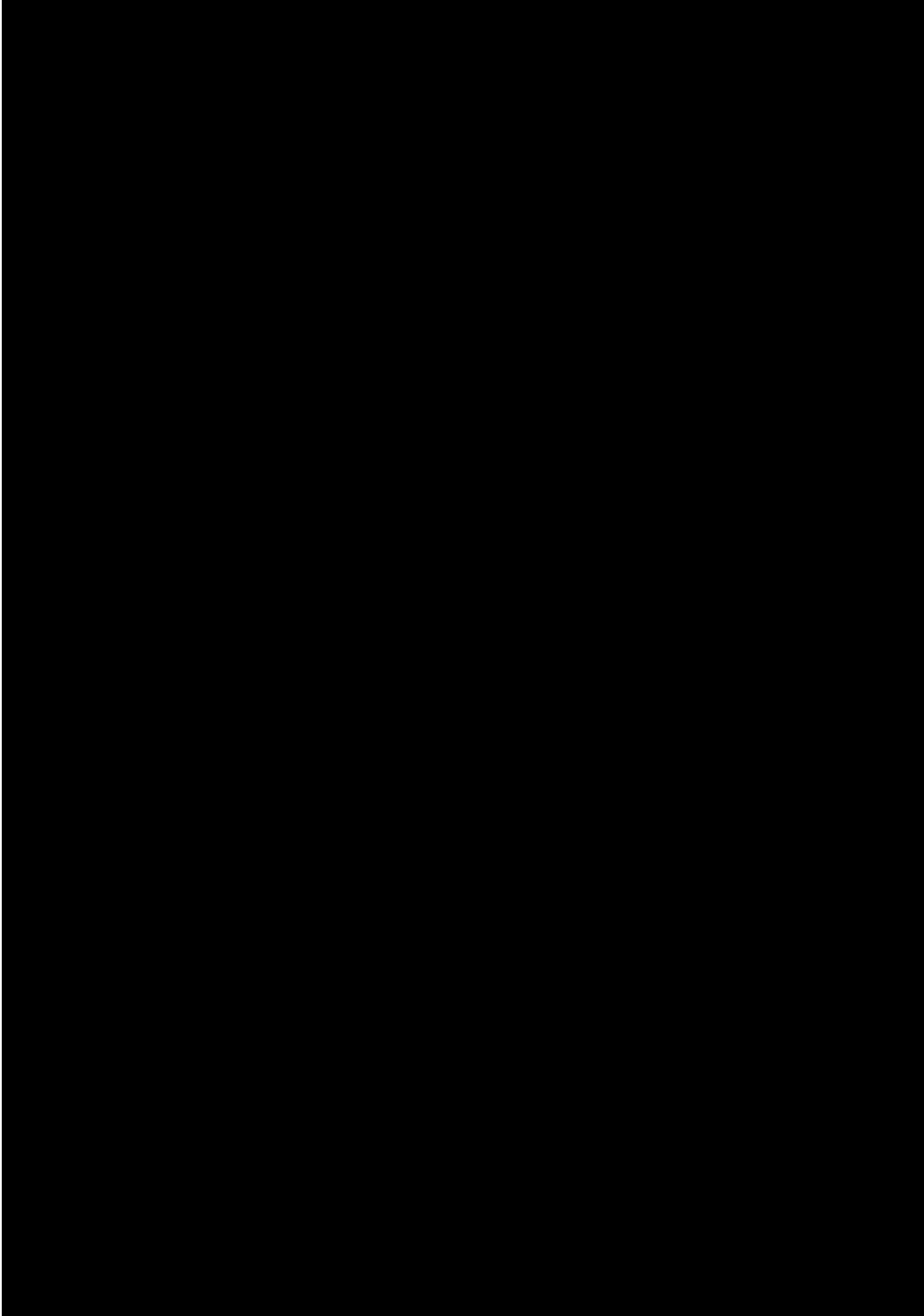
channel-default	
channel-tree	

NPE40 NPE60

--	--

10.3(4b7)

E! H)g#)gdR#044@2!L@B#!X#(EF



	<i>name</i>	

<i>name</i>	

WAN

WAN

WAN

```

1      group1      Gi 0/1
Ruijie#config
Ruijie(config)#interface gi 0/1
Ruijie(config-if-GigabitEthernet 0/1)#flow-policy group1
Ruijie(config-if-GigabitEthernet 0/1)#
2      group2      Gi 0/2
Ruijie#config
Ruijie(config)#interface gi 0/2
Ruijie(config-if-GigabitEthernet 0/2)#flow-policy group2
Ruijie(config-if-GigabitEthernet 0/2)#
3 Gi 0/1          group1
Ruijie#config
Ruijie(config)#interface gi 0/1
Ruijie(config-if-GigabitEthernet 0/1)#no flow-policy
Ruijie(config-if-GigabitEthernet 0/1)#

```

flow-control	

NPE40 NPE60

10.3(4b7)	

22.1.7 flow-rule

no

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

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

no flow-rule *num*

```

pass out-channel          3M
  2          group2
sina
Ruijie#config
Ruijie(config)#flow-control group1
Ruijie(config-flow-control)#flow-rule 1 vlan-group any subscriber
      network-group sina app-group any time-rang work
Ruijie(config-flow-control)#flow-rule 1 session-limit 0 action
drop
  3          group1          1
Ruijie#config
Ruijie(config)#flow-control group1
Ruijie(config-flow-control)#no flow-rule 1

```

time-range <i>name</i>	
vlan-group <i>name</i>	vlan-group
subscriber static <i>name</i>	subscriber
network-group <i>name</i>	network-group
identify-application <i>custom name</i>	app-group



NPE40 NPE60

10.3(4b7)	

22.2.3 show flow-control-policy rule

show flow-control-policy rule [group name]

name	

id

```
Ruijie#show flow-control-policy rule
```

```
Pri_num grp_id rule_num ifx  vlan_id  subs_id  net_wk
```

1 NA 0 2000 0

Pri-num				
grp_id				
rule_num				
ifx			0	
vlan_id		vlan-group	id	0
subs_id		subscriber	id	0
net_wk_id	0	network-group	id	
app_id		app-group	id	0
inchl_id	0	in-channel	id	id
ochl_id	id	0	out-channel	id
ses_num				
ses_lim				
effec	1		0	

-	-

NPE40 NPE60

10.3(4b7)	

23

23.1

23.1.1 flow-audit enable

no

flow-audit enable

no flow-audit enable

|

|

|

|

1

Ruijie#**config**

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

2

Ruijie#**config**

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

-	-

|

NPE

10.3(4b7)-	

23.2

23.2.1 show flowrate application

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

day-interval

by-group by-type

1 gigabitEthernet 0/1

Ruijie#**show flowrate application interface gigabitEthernet 0/1**

path:GigabitEthernet 0/1

Application Subscriber-num

PASS: Upload(bps) Download(bps) Upload(pps)

Download(pps)

DROP: Upload(bps) Download(bps) Upload(pps)

Download(pps)

App1 46

62597 65955 15 17

0 0 0 0

2 bridge 0

Ruijie# **show flowrate application bridge 0 by-group**

path:bridge-map 0

Application_group

PASS: Upload(bps) Download(bps) Upload(pps)

Download(pps)

DROP: Upload(bps) Download(bps) Upload(pps)

Download(pps)

App_group1

211 249 0 0

0 0 0 0

3 bridge 0 2010 1 9 2010 1

9

Ruijie# **show flowrate application bridge 0 by-group day-interval**

2010 1 9 to 2010 1 9

path:bridge-map 0

day-interval: 2010-1-9 ~ 2010-1-9

Application_group

PASS: Upload(KB) Download(KB) Upload(packets)

Download(packets)

DROP: Upload(KB) Download(KB) Upload(packets)

Download(packets)

P2P

0 6 24 24

0 0 0 0

	/HTTP			
5229		116742	59983	89151
0		0	0	0
	/ QQ			
220		135	1349	1290
0		0	0	0
27684236		159994	363431164	226927
0		0	0	0
	/Lotus-Notes			
793		772	5327	4766
0		0	0	0
32		252	567	635
0		0	0	0
	/NETBIOS			
2		98	24	1187
0		0	0	0
0		2	0	4
0		0	0	0

-	-

NPE day-interval

--	--

channel_groupC/	channel_nameC		
down		39632	, 61
0	, 0		
2	NBR		

23.2.4 show flowrate ip

```

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

```

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

IP
day-interval, hour-interval

```
begin-year begin-month begin-day end-year end-month end-day begin-hour
end-hour begin-hour2 end-hour2                2
order-by top n n
```

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

	0	0	0	0
	-		-	
	NPE	day-interval		
	10.3(4b7)			

23.2.5 show flowrate ip-application

```

IP                                     IP
show flowrate ip-application {interface interface-name | bridge bridge-name}
[subscriber-group subscriber-group] [subscriber subscriber-name] [ip
ip-address] [application-group application-group] [application-type
application-type] [application application-name] [day-interval begin-year to end-year]

```

begin-hour2
end-hour2
n

2
2
n

day-interval IP IP

```
1 gigabitEthernet 0/1 IP
Ruijie#show flowrate ip-application interface gigabitEthernet 0/1
path:GigabitEthernet 0/1
Subscriber Application
PASS Upload(bps) Download(bps) Upload(pps) Download(pps)
DROP: Upload(bps) Download(bps) Upload(pps) Download(pps)
/user_groupA/user_nameA applicationA
46003 2093107 93 173
0 0 0 0
/user_groupB/user_nameB applicationB
46001 2093102 193 173
0 0 0 0
/user_groupC/user_nameC applicationC
4003 1093107 63 73
0 0 0 0
2 bridge 0 2010 1 9
```

```
Ruijie# show flowrate ip-application bridge 0 day-interval 2010 1
9 to 2010 1 9
path:bridge-map 0
day-interval: 2010-1-9 ~ 2010-1-9
time-interval(min): 60
count:5
```

```
Subscriber Application
PASS: Upload(KB) Download(KB) Upload(packets)
Download(packets) TD(time-ici(c18iFF5>6<14E300(wnload(KB) )-6(
```

```

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

```

-	-

NPE day-interval

10.3(4b7)	

23.2.6 show online ip

IP

IP

```

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

```

[[

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

3 gigabitEthernet 0/1 2010 1 8 1 3 ip

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

```

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

```

-	-

```

NPE                day-interval

```

10.3(4b7)	

23.2.7 show online ip-application

```

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

```

interface-name	
bridge-name	

subscriber-name
 subscriber-group
 ip-address
 application-name
 application-group
 application-type
 n

IP
n

IP

ip,subscriber,subscriber-group,application,application-group

order-by top n n

1 bridge-map0 IP

Ruijie#**show online ip-application bridge 0**

path:bridge-map 0

Subscriber

IP Application

LoginTime OnlineTime(min)

PASS-Upload(KB) PASS-Download(KB) DROP-Upload(KB)

DROP-Download(KB)

/User_groupA/user_nameA

192.168.196.14 UDP

2010-1-8 19:7 0

24 0 0 0

/user_groupB/user_groupB

192.168.196.15 UDP

2010-1-8 19:7 0

24 0 0 0

/User_groupC/User_nameC

192.168.196.16 UDP

2010-1-8 19:7 0

24 0 0 0

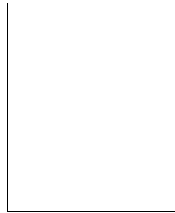
2 gigabitEthernet 0/1 IP 192.168.196.70

IP

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

192.168.196.70

path:GigabitEthernet 0/1
Subscriber



detail IP recent
hour IP time-interval
begin-hour begin-day begin-month begin-year to end-hour end-day end-month
end-year IP

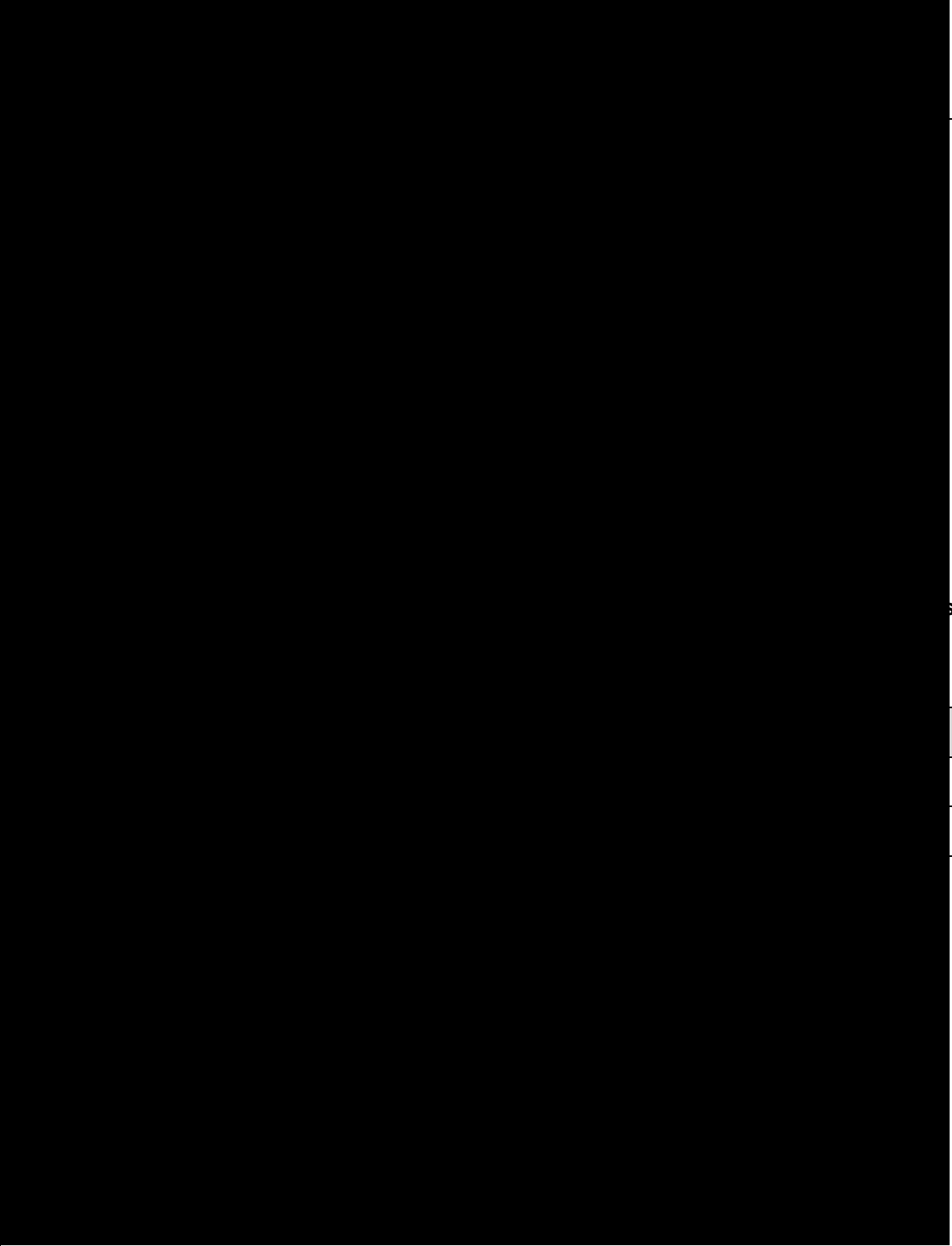
1 bridge-map0 IP
Ruijie#**show**

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

-	-

NPE recent time-interval

10.3(4b7)	



s *times*] [timeout

ping

DNS

VRF

RSR

ping

Ip-address

```

2      192.168.9.2          0 msec  4 msec  4 msec
3      192.168.110.1       16 msec 12 msec 16 msec
4      * * *
5      61.154.8.129       12 msec 28 msec 12 msec
6      61.154.8.17        8 msec 12 msec 16 msec
7      61.154.8.250       12 msec 12 msec 12 msec
8      218.85.157.222     12 msec 12 msec 12 msec
9      218.85.157.130    16 msec 16 msec 16 msec
10     218.85.157.77      16 msec 48 msec 16 msec
11     202.97.40.65       76 msec 24 msec 24 msec
12     202.97.37.65      32 msec 24 msec 24 msec
13     202.97.38.162     52 msec 52 msec 224 msec
14     202.96.12.38      84 msec 52 msec 52 msec
15     202.106.192.226   88 msec 52 msec 52 msec
16     202.106.192.174   52 msec 52 msec 88 msec
17     210.74.176.158   100 msec 52 msec 84 msec
18     202.108.37.42     48 msec 48 msec 52 msec

```

Ruijie#

IP 202.108.37.42

1 17 4

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

Translating " *www.ietf.org* "...[OK]

< press Ctrl+C to break >

Tracing the route to 64.170.98.32

```

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

```

VRF

RSR

24.1.3 Line-detect

line-detect

line-detect

line-detect

```
Ruijie(config)#int gigabitEthernet 3/1
```

```
Ruijie(config-if)#line-detect
```

```
start cable-diagnoses,please wait...
```

```
cable-daignoses end!this is result:
```

```
4 pairs
```

```
pair state      length(meters)
```

```
-----
```

```
A      Ok        2
```

```
B      Ok        1
```

```
C      Short     1
```

```
D      Short     1
```

pairs

State

OK

Short

Open

A B

OK

C D

Short

A B C D

OK

Length:

state OK

Short

Open

length

DHCP

25.1.2 client-identifier

```

DHCP
client-identifier no
DHCP
client-identifier unique-identifier
no client-identifier
    
```

<i>unique-identifier</i>	DHCP 0100.d0f8.2233.b467.6967.6162.6974.4574.6865.726e.6574.302f.31

DHCP

```

DHCP DHCP IP MAC
MAC
00d0.f822.33b4 GigabitEthernet 0/1
0100.d0f8.2233.b467.6967.6162.6974.4574.6865.726e.6574.302f.31 01
67.6967.6162.6974.4574.6865.726e.6574.302f.31
GigabitEthernet0/1 RFC1700
Address Resolution Protocol Parameters
    
```

DHCP

```

MAC 00d0.f822.33b4 DHCP
    
```

```

client-identifier
0100.d0f8.2233.b467.6967.6162.6974.4574.6865.726e.6574.302f.31
    
```



host	IP DHCP
ip dhcp pool	DHCP DHCP

25.1.4 default-router

DHCP DHCP **default-router**

no

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

no default-router

	DHCP DHCP
<i>ip-address</i>	IP
<i>ip-address2...ip-address8</i>	8

DHCP

25.1.5 dns-server

DHCP DNS DHCP **dns-server**
no DNS

```

dns-server { ip-address [ ip-address2...ip-address8 ] |
use-dhcp-client interface-type interface-number }
no dns-server
    
```

<i>ip-address</i>	DNS IP
<i>ip-address2</i> ... <i>ip-address8</i>	8 DNS
use-dhcp-client <i>interface-type</i> <i>interface-number</i>	RGOS DHCP DNS DHCP DNS

DNS

DHCP

DNS DHCP
DNS DNS
RGOS DHCP DNS
DHCP

DHCP DNS 192.168.12.3

```
dns-server 192.168.12.3
```

domain-name	DHCP
ip address dhcp	DHCP IP

ip dhcp pool	DHCP	DHCP
---------------------	------	------

25.1.6 domain-name

DHCP DHCP **domain-name**
no
domain-name *domain-name*
no domain-name

<i>domain-name</i>	DHCP

DHCP

DHCP

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

dns-server	DHCP DNS
ip dhcp pool	DHCP DHCP

25.1.7 hardware-address

DHCP
no

DHCP

hardware-address

hardware-address *hardware-address type*
no hardware-address

<i>hardware-address</i>	DHCP	MAC
	DHCP	

type

25.1.8 host

DHCP IP DHCP host
no DHCP IP

host *ip-address* [*netmask*]
no host

<i>ip-address</i>	DHCP IP
<i>netmask</i>	DHCP

IP

DHCP

50 RD (2) 51 262192116578.c... 08 0 Td1CE10875B30

25.1.9 ip address dhcp

```

                PPP HDLC FR          DHCP   IP
                ip address dhcp      no
ip address dhcp
no ip address dhcp
    
```

```

                DHCP   IP
    
```

```

RGOS          DHCP          IP          DHCP
              1 DHCP      1              2 DHCP      3
              3 DHCP      6 DNS          4 DHCP      15
              DHCP      44 WINS
    
```

```

RGOS          PPP FR HDLC          dhcp
    
```

```

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

dns-server	DHCP DNS
ip dhcp pool	DHCP DHCP

25.1.10 ip dhcp excluded-address

```

                IP          DHCP          DHCP
                ip dhcp excluded-address      no
ip dhcp excluded-address low-ip-address [ high-ip-address ]
no ip dhcp excluded-address low-ip-address [ high-ip-address ]
    
```

<i>low-ip-address</i>	IP IP IP
<i>high-ip-address</i>	IP

DHCP

IP

IP

DHCP

DHCP

IP

IP

IP

DHCP

DHCP

DHCP

192.168.12.100~150

IP

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



DHCP

<i>number</i>	0 10 0 ping ping

ping 2

DHCP DHCP IP ping DHCP
Ping 10

ping 3

ip dhcp ping packets 3



<i>milli-seconds</i>	DHCP	ping
	100	10000

500

ping

ping 600ms

ip dhcp ping timeout 600

clear ip dhcp conflict	DHCP
ip dhcp ping packets	DHCP ping
show ip dhcp conflict	DHCP

25.1.13 ip dhcp pool

DHCP DHCP ip
dhcp pool no DHCP
ip dhcp pool *pool-name*
no ip dhcp pool *pool-name*

<i>pool-name</i>	mypool 1

DHCP

DHCP

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

```
IP          DNS
```

```
mypool0    DHCP
```

```
ip dhcp pool mypool0
```

host	IP DHCP
ip dhcp excluded-address	DHCP IP
network DHCP	DHCP

25.1.14 lease

DHCP

DHCP

```
lease      no
```

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

```
no lease
```

<i>days</i>	
<i>hours</i>	

minutes

<i>ip-address2...ip-address8</i>	8 WINS
----------------------------------	--------

WINS

DHCP

WINS WINS DHCP

WINS WINS DHCP

 DHCP WINS 192.168.12.3

`netbios-name-server 192.168.12.3`

ip address dhcp	DHCP	IP
ip dhcp pool	DHCP	DHCP

25.1.16 netbios-node-type

 DHCP NetBIOS DHCP

netbios-node-type **no** NetBIOS

netbios-node-type *type*

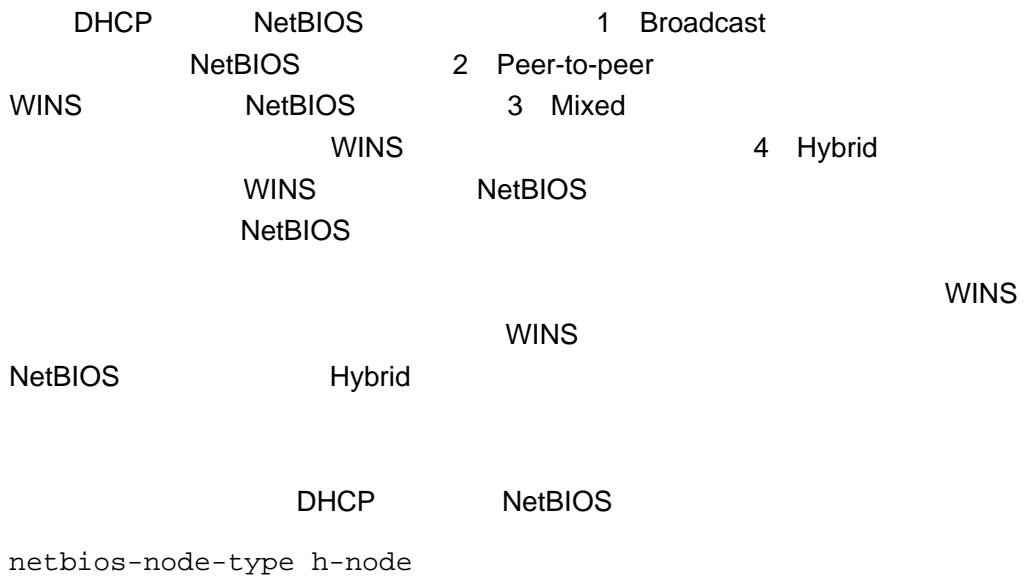
no netbios-node-type

--	--

<i>type</i>	NetBIOS	
	0~FF	
	1	b-node
	2	p-node
	4	m-node
	8	h-node
	b-node	
	p-node	
	m-node	
	h-node	

NetBIOS

DHCP



25.1.17 network DHCP

DHCP
no

DHCP

network

network *net-number net-mask*

no network

<i>net-number</i>	DHCP IP
<i>net-mask</i>	DHCP IP

DHCP

DHCP

DHCP

DHCP

show ip dhcp binding

show ip dhcp conflict

DHCP

192.168.12.0

255.255.255.240

network 192.168.12.0 255.255.255.240

ip dhcp excluded-address	DHCP IP

ip dhcp pool	DHCP DHCP
---------------------	--------------

25.1.18 next-server

DHCP DHCP

next-server **no**

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

no next-server

<i>ip-address</i>	TFTP IP
<i>ip-address2...ip-address8</i>	8

DHCP

DHCP

DHCP

192.168.12.4

next-server 192.168.12.4

bootfile	DHCP
ip dhcp pool	DHCP DHCP
ip help-address	Helper
option	RGOS DHCP

25.1.19 option

DHCP
option

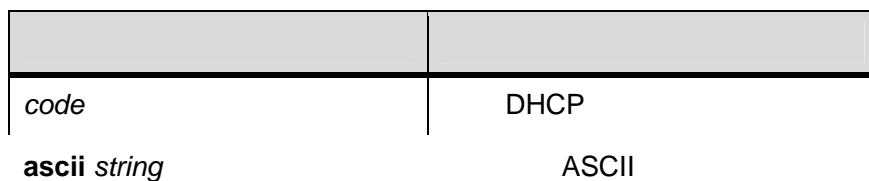
DHCP

option

no

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

no option



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

ip dhcp pool	DHCP DHCP

25.1.20 service dhcp

```

DHCP
no DHCP
service dhcp
no service dhcp

```

DHCP

```

DHCP IP DNS
DHCP DHCP
DHCP DHCP
DHCP

```

DHCP

service dhcp

show ip dhcp server statistics	DHCP

25.2

25.2.1 clear ip dhcp binding

DHCP

*	DCHP
<i>ip-address</i>	IP

DHCP ARP ping DHCP
clear ip dhcp conflict

clear ip dhcp conflict *

ip dhcp ping packets	DHCP ping
show ip dhcp conflict	DHCP

25.2.3 clear ip dhcp server statistics

DHCP statistics clear ip dhcp server
clear ip dhcp server statistics

DHCP Server
debug ip dhcp server
no debug ip dhcp server

debug ip dhcp server

dhcp server

dhcp

debug ip dhcp server

25.2.6 show dhcp lease

DHCP
show dhcp lease

EXEC **show dhcp lease**

IP IP

IP

show dhcp lease

```

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

```

25.2.7 show ip dhcp binding

DHCP EXEC **show ip dhcp binding**

show ip dhcp binding [*ip-address*]

<i>ip-address</i>	IP

IP IP IP

show ip dhcp binding

```

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

```

--	--

IP address	DHCP	IP
Client-Id/ Hardware address	DHCP	client identifier
Lease expiration	IDLE	Infinite
Type	Manual	DHCP Automatic

clear ip dhcp binding	DHCP

25.2.8 show ip dhcp conflict

```

DHCP EXEC show ip dhcp conflict
show ip dhcp conflict

```

DHCP

show ip dhcp conflict

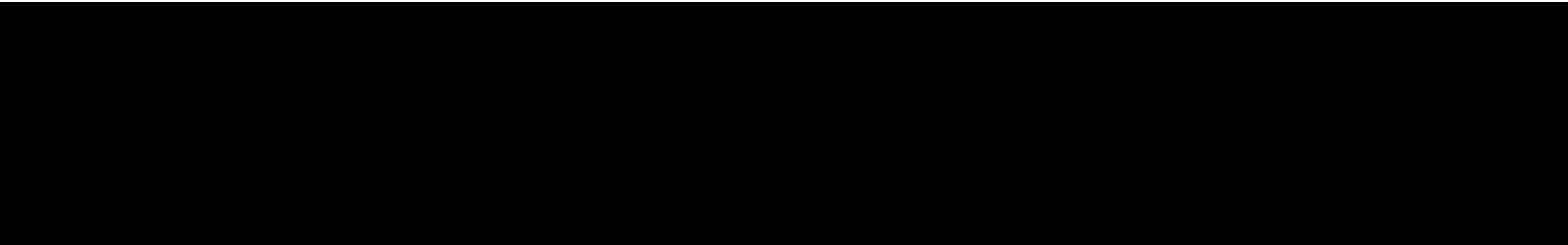
```

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

dhcpd excluded ipaddress
192.168.12.100

```

DHCP



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

Message	Sent
BOOTREPLY	16
DHCPOFFER	9
DHCPACK	7
DHCPNAK	0

Address pools	
Automatic bindings	
Manual bindings	
Expired bindings	

26 DHCP Relay

26.1 DHCP Relay

26.1.1 service dhcp

```
no          DHCP          service dhcp
           DHCP
service dhcp
no service dhcp

DHCP

DHCP          DHCP          DHCP
           DHCP          DHCP

DHCP

service dhcp
```

ip helper-address [vrf] <i>A.B.C.D</i>	DHCP server

26.1.2 ip helper-address

```
DHCP          no
DHCP
```

```

/
      dhcp
vrf          DHCP
vrf          vrf
vrf          vrf          vrf
vrf          vrf          vrf          61.154.26.49
vrf          local          192.168.197.1
ip helper-address 61.154.26.49
ip helper-address vrf local 192.168.197.1
    
```

service dhcp	DHCP

26.1.3 ip dhcp relay information option dot1x

```

      dhcp option dot1x          no          dhcp
option dot1x
    
```

DHCP relay 802.1x

Ip dhcp relay information option dot1x

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

option dot1x

Ip dhcp relay information option82

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

26.1.6 ip dhcp relay check server-id

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

DHCP REQUEST server-id

option server

Ip dhcp relay check server-id

Service dhcp	DHCP

26.1.7 ip dhcp relay suppression

DHCP
DHCP relay

no DHCP

DHCP request relay

1 relay

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

service dhcp	DHCP

<i>ip-address</i>	IP

DNS Server IP
Server

DNS Server
Server DNS

6

DNS Server
DNS

ip-address

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

show hosts	DNS

RGNOS10.1

27.1.3 ip host

IP

no

ip host *host-name ip-address*

no ip host *host-name ip-address*

<i>host-name</i>	
<i>ip-address</i>	IP

no ip host host-name ip-address

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

show hosts	DNS

RGNOS10.1

27.1.4 clear host

clear host [*host-name*]

<i>host-name</i>	“*”

1 ip host 2 DNS
DNS

-IP

clear host *

show hosts	

RGNOS10.1

27.1.5 show hosts

DNS

show hosts

DNS

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

ip host	IP
ip name-server	DNS

RGNOS10.1

28 NTP

28.1 NTP

28.1.1 no ntp

ntp ntp
no ntp

NTP

NTP NTP NTP NTP

NTP

no ntp

ntp server	NTP

28.1.2 ntp access-group

NTP no

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

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

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

peer	NTP
serve	NTP
serve-only	NTP
query-only	NTP
<i>access-list-number</i>	IP 1300 1999 1 99
<i>access-list-name</i>	IP

NTP

NTP

NTP

NTP

peer serve serve-only

query-only



1

2

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

28.1.4 ntp authentication-key

NTP

NTP

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

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

<i>key-id</i>	ID
<i>key-string</i>	
<i>enc-type</i>	7 0

md5
ntp trusted-key *key-id* *key-id*
 1024

ID 6

ntp authentication-key 6 md5 woooooop

ntp authenticate	
ntp trusted-key	
ntp server	NTP

28.1.5 ntp disable

NTP

ntp disable

NTP

NTP

NTP

r

IP

NTP

no ntp

28.1.6 ntp master

NTP

no

NTP

ntp master [stratum]

no ntp master

<i>stratum</i>	15	1 8

NTP

r

12

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

28.1.7 ntp server

NTP

NTP

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

```
no ntp server ip-addr
```



<i>version</i>	NTP	1-3	NTPv3
----------------	-----	-----	-------

if-name

NTP

NTP

8

NTP

Ntp synchronize



ntp server

NTP

Td6939>]TJ/TT0 1 Tf4TT0 1 Tf4.994 C

NTP

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

28.2

28.2.1 debug ntp

NTP

```
debug ntp
```

```
no debug ntp
```

NTP

NTP

```
debug ntp
```

28.2.2 show ntp status

NTP

```
show ntp status
```

NTP

NTP

NTP

```
show ntp status
```

29 SNTP

29.1

29.1.1 sntp enable

```

SNTP                               no
—Disable
[no] sntp enable

```

```

SNTP      Disable

```

```

show sntp      SNTP

```

```

RedGiant(config)# sntp enable

```

show sntp	SNTP
clock update-calendar	
clock set	

RGOS10.0

29.1.2 sntp server

SNTP Server SNTP NTP Server
 internet NTP Server

sntp server ip-addr
no sntp server

ip-addr NTP/SNTP IP

NTP/SNTP

show sntp SNTP

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

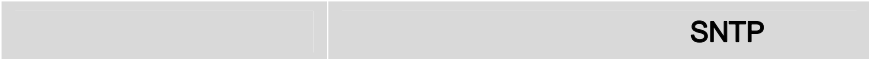
show sntp	SNTP
sntp enable	SNTP

RGOS10.0

29.1.3 sntp interval

show sntp **SNTP**

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



©

show sntp SNTP

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

sntp enable	SNTP
show sntp	SNTP

RGOS10.0

30 SSH

30.1 SSH

30.1.1 crypto key generate

`crypto key generate {rsa | dsa}`

rsa	RSA
dsa	DSA

SSH Server

	SSH Server		SSH		
enable service ssh-server			SSH Server	SSH 1	RSA
SSH 2	RSA	DSA		RSA	SSH1
SSH2		DSA	SSH2		

r

zeroize **no crypto key generate** **crypto key**

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

show ip ssh	SSH Server
crypto key zeroize {rsa dsa}	DSA RSA SSH Server

RGOS10.1

30.1.2 crypto key zeroize

SSH

crypto key zeroize {rsa / dsa}

rsa	RSA
dsa	DSA

DISABLE SSH Server SSH Server
no enable service ssh-server

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

show ip ssh	SSH Server
crypto key generate {rsa dsa}	DSA RSA

30.1.4 ip ssh time-out

SSH Server

no

ip ssh time-out *time*

no ip ssh time-out



time

SSH Server

no

ip ssh authentication-retries *retry times*
no ip ssh authentication-retries

<i>retry times</i>	

3

authentication-retries

no ip ssh

SSH Server

SSH Server
show ip ssh

SSH Server

2

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

show ip ssh	SSH Server

RGOS10.1

30.2 SSH

30.2.1 show ip ssh

SSH Server

show ip ssh

SSH

VTY SSH

Ruijie# **show ssh**

RGOS10.1

30.2.3 show crypto key mypubkey

SSH Server

show crypto key mypubkey {rsa/dsa}

rsa	RSA
dsa	DSA

SSH Server

Ruijie# **show crypto key mypubkey rsa**

RGOS10.1

31 UDP-Helper

31.1

31.1.1 udp-helper enable

```

udp-helper enable          UDP          no udp-helper
enable                    UDP
                           UDP
udp-helper enable
no udp-helper enable

```

UDP

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

UDP :

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

ip forward-protocol	UDP

RGNOS10.1

31.1.2 ip helper-address

UDP

no

UDP

ip helper-address *address*

no ip helper-address *address*

<i>address</i>	UDP &\$

UDP

20
UDP-Helper

UDP

no ip helper-address

UDP :

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

ip forward-protocol	UDP

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

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

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

UDP

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

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

32

32.1

32.1.1 ip policy route-map

	ip policy route-map
no	
ip policy route-map <i>route-map</i>	
no ip policy route-map	

```

                                FE0
10.0.0.1                        196.168.4.6                20.0.0.1
                                196.168.5.6

```

```

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

```

access-list	
route-map	
set ip next-hop	
set ip default next-hop	

set interface

ip local policy route-map *route-map*
no ip local policy route-map



set interface
n r! r nVr2\% #&dr! r2q#i#€rF
, €r2IG , €rP' , €rF

nexthop,

EF0

nexthop

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

33

33.1

33.1.1 route-auto-choose

no

[no

33.1.2 route-auto-choose update

route-auto-choose update

-	-

L

L

L

1
Ruijie#**config**
Ruijie(config)#**route-auto-choose update**

-	-

L

10.3(4b7) NPE50 NPE80 NPE

[Redacted]

34 RIP

34.1

34.1.1 address-family RIP

RIP

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

vrf <i>vrf-name</i>	VRF

RIP

address-family

(config-router-af)#

VRF RIP

VRF

RIP

VRF

RIP

exit-address-family **exit**

vpn1 VRF

vrf

RIP

Ruijie(config)# **ip vrf vpn1**Ruijie(config-vrf)# **exit**Ruijie(config)# **interface GigabitEthernet 1/0**

Ruijie(config-if)#

```

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

```

exit-address-family	
ip vrf	VRF

34.1.2 auto-summary (RIP)

```

RIP
no
auto-summary
no auto-summary

```

auto-summary

```

RIP
RIPv1 RIPv2
RIP

```

```

RIP
RIP

```

RIP

```

default-metric      default-metric
default-metric      1

```

```

RIP      OSPF
RIP      RIP      3

```

```

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

```

redistribute	

34.1.4 default-information originate(RIP)

```

RIP
default-information originate      no

```

```

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

```

```

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

```

always	RIP
metric <i>metric-value</i>	<i>metric-value</i> 1-15
route-map <i>map-name</i>	route-map , route-map

```

metric      1

```

RIP
default-information originate

always RIP

show ip rip database RIP

RIP **route-map**
set metric

metric
route-map **set metric** **metric**
RIP

r

RIP RIP

ip default-network
default-information originate RIP

RIP

```
Ruijie(config-router)# default-information originate  
always
```

ip rip default-information		

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

no distance [*distance ip-address wildcard*]

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

34.1.7 distribute-list out

(o-n)8(um)5(ber _1 1 TTf 1.913 0Tw 2 15

address-family	
-----------------------	--

34.1.9 ip rip authentication key-chain

```

RIP          RIP          ip rip
authentication key-chain      no

```

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

```
no ip rip authentication key-chain
```

<i>name-of-keychain</i>	RIP

```

RIPv1      RIP          key chain
RIPv2          RIP
Serial 0      RIP          ripchain

```

```

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

```

ip rip authentication mode	RIP
ip rip authentication text-password	RIP
key chain	

authentication mode

```
no ip rip authentication mode {text | md5}
ip rip authentication mode
```

text	RIP
md5	RIP MD5

34.1.11 ip rip authentication text-password

```

RIP
text-password          no          ip rip authentication
ip rip authentication text-password password-string
no ip rip authentication text-password

```

<i>password-string</i>	1 16

```

RIP
RIPv1      RIP      RIPv2
Serial 0   RIP
ruijie
Ruijie(config)# interface serial 0/0
Ruijie(config-if)# ip rip authentication text-password
ruijie

```

ip rip authentication mode	RIP

34.1.12 ip rip default-information

```

                                RIP                                ip rip
default-information            no
ip rip default-information only originate [metric metric-value]
no ip rip default-information

```

only	
originate	
metric <i>metric-value</i>	1-15

```
metric 1
```

```

                                ip rip default-information  RIP
default-information originate

```

```

r
1                                ip rip default-information  RIP
2                                ip rip default-information

```

```
ethernet0/0
```

```

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

```

--	--

RIP

default-information originate
--

RIP

34.1.14 ip rip receive version

RIP
ip rip receive version **no** RIP

ip rip receive version [1] [2]
no ip rip receive version

1	RIPv1
2	RIPv2

version

RIP **version** RIPv1 RIPv2
version

GigabitEthernet 0/0 RIPv1 RIPv2

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

version	RIP

34.1.15 ip rip send enable

```
          RIP          RIP          ip rip
send enable      no      RIP      RIP
```

```
ip rip send enable
no ip rip send enable
```

RIP

```
          RIP
no
default      RIP
```

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

--	--

```
ip rip receive enable      RIP
```

no ip rip send version

1	RIPv1
2	RIPv2

version

```

RIP                                     vesion
                                     RIPv1  RIPv2
                                     version
                                     GigabitEthernet 0/0  RIPv1  RIPv2
    
```

```

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



version

vesion

RIP

RIPv1 RIPv2
version

GigabitEthernet 0/0

RIPv2

```
Ruijie(config)# interface GigabitEthernet 0/0
Ruijie(config-if)# ip rip v2-broadcast
```

version	RIP

34.1.18 ip split-horizon (RIP)

RIP

ip split-horizon

no RIP

ip split-horizon

no ip split-horizon

IP

X.25

IP

RIP

neighbor

show ip rip
RIP

GigabitEthernet 0/0

RIP

Ruijie(config)# **interface GigabitEthernet 0/0**Ruijie(config-if)# **no ip split-horizon**

neighbor RIP	RIP IP
validate update source	RIP

34.1.19 ip summary-address rip

RIP

ip

summary-address rip no

ip summary-address rip *ip-address ip-network-mask*no ip summary-address rip *ip-address ip-network-mask*

<i>ip-address</i>	IP
<i>ip-network-mask</i>	IP

RIP

ip summary-address rip
RIP

RIPv2

GigabitEthernet 1/0 172.16.0.0/16

```
Ruijie(config)# interface GigabitEthernet 1/0
Ruijie(config-if)# ip summary-address rip 172.16.0.0
255.255.0.0
Ruijie(config-if)# ip address 172.16.1.1 255.255.255.0
Ruijie(config)# router rip
Ruijie(config-router)# network 172.16.0.0
Ruijie(config-router)# version 2
Ruijie(config-router)# no auto-summary
```

<i>wildcard</i>	IP	0	1
-----------------	----	---	---

```

network-number wildcard
RIP
wildcard RGOS
RIP
RIP RIP
RIP
RIP
RIP
192.168.12.0/24 172.16.0.0/24 RIP
Ruijie(config)# router rip
Ruijie(config-router)# network 192.168.12.0
Ruijie(config-router)# network 172.16.0.0 0.0.0.255

```

34.1.21 neighbor (RIP)

```

RIP IP neighbor
no
neighbor ip-address
no neighbor

```

<i>ip-address</i>	IP

```

RIPv1      IP      255.255.255.255      RIPv2
           224.0.0.9

    passive-interface
    passive
    RIP
  
```

34.1.22 offset-list(RIP)

```

    RIP      metric
offset-list      no      offset

offset-list access-list-number {in | out} offset [interface-type
interface-number]
no offset-list access-list-number {in | out} offset [interface-type
interface-number]
  
```

<i>access-list-number</i>	acl
in	acl metric
out	acl metric
<i>offset</i>	metric
<i>interface-type</i>	acl
<i>interface-number</i>	

offset

```

RIP
offset-list      RIP
offset-list      offset-list  metric
acl 7           RIP      metric  7
Ruijie(config-router)# offset-list 7 out 7
GigabitEthernet1/0  acl 8
RIP      metric  7
Ruijie(config-router)# offset-list 7 in 7
Ruijie(config-router)# offset-list 8 in 7
GigabitEthernet 1/0

```

34.1.23 output-delay

```

RIP
output-delay      no
output-delay delay
no output-delay

```

<i>delay</i>	<8-50>

```

RIP      512      25
25

```

output-delay

RIP 30

```
Ruijie(config)# router rip
Ruijie(config-router)# output-delay 30
```

34.1.24 passive-interface**passive-interface** **no****passive-interface** {**default** | *interface-type interface-num*}**no passive-interface** {**default** | *interface-type interface-num*}

default	passive
<i>interface-type interface-num</i>	

passive

passive-interface default passive**no passive-interface** *intface-type interface-num*

passive

ip rip send enable**ip rip receive enable**

RIP

passive

RIP

RIP

enable **ip rip send enable** **ip rip receive**

passive **passive** **ethernet0/0**

```
Ruijie(config-router)# passive-interface default
Ruijie(config-router)# no passive-interface ethernet
0/0
```

ip rip receive enable	RIP
ip rip send enable	RIP

34.1.25 redistribute RIP

redistribute

no

redistribute {**bgp** | **isis** [*process-name*] | **ospf** <1-65535> | **connected** | **static**}[**metric** *value*] [**route-map** *route-map-name*] [**match internal** | **external** *type* | **nssa-external** *type*]

no redistribute {**bgp** | **isis** [*process-name*] | **ospf** <1-65535> | **connected** | **static**}[**metric** *value*] [**route-map** *route-map-name*] [**match internal** | **external** *type* | **nssa-external** *type*]

bgp isis ospf connected static	
metric	metric
route-map	
match	ospf
<i>process-name</i>	ISIS

<1-65535>	OSPF
-----------	------

```

OSPF
ISIS          level-2
              metric 1
route-map
    
```

RIP

RIP

OSPF

```

isis          level level-2
              level  level
              level 1, level 2
level-1-2
ospf          match
ospf          match match
match        no
    
```

RIP

Ruijie(config-router)# **redistribute static**

default-metric <i>metric</i>	

34.1.26 router rip

```

RIP
router rip          no          RIP
router rip
no router rip

```

RIP

RIP

async default routing

RIP

Ruijie(config)# **router rip**

network (RIP)	RIP

34.1.27 timers basic

```

RIP                                timers basic
no
timers basic update invalid flush
no timers basic

```



34.1.29 version (RIP)

no RIP **version**
version {1 | 2}
no version

1	RIP	1
2	RIP	2

RIPv1 RIPv2 RIPv1

ip rip send version RIP **ip rip receive version** RIP

34.2

34.2.1 show ip rip

RIP

show ip rip

show ip rip [vrf *vrf-name*]

vrf <i>vrf-name</i>	VRF RIP

RIP

rip rip

metric distance

VRF

```

192.168.26.0 255.255.255.0
192.168.64.0 255.255.255.0
Distance: (default is 50)

```

vrf RIP

```

Ruijie(config-router)# sh ip rip vrf 1
VRF 1 VRF-id:1
Routing Protocol is "rip"
Sending updates every 30 seconds
Invalid after 180 seconds, flushed after 120 seconds
Outgoing update filter list for all interface is: not
set
Incoming update filter list for all interface is: not
set
Default redistribution metric is 1
Redistributing:
Default version control: send version 1, receive any
version
Routing for Networks:
Distance: (default is 120)

```

34.2.2 show ip rip database

RIP

show ip rip database

show ip rip database [**vrf** *vrf-name*] [*network-number* {*network-mask*}]

vrf <i>vrf-name</i>	VRF RIP
<i>network-number</i>	
<i>network-mask</i>	

BFD: Enabled

V2 Broadcast: Disabled

Multicast registe: Registered

Interface Summary Rip:

Not Configured

IP interface address:

2.2.2.111/24, next update due in 24 seconds

show ip rip	

35 OSPF2

35.1

35.1.1 area

```
no OSPF
area area-id
no area area-id
```

--	--

```
CGD:
ID 8
```


OSPF 0 MD5
backbone

```
Ruijie(config)# interface GigabitEthernet 0/0
Ruijie(config-if)# ip address 192.168.12.1
255.255.255.0
Ruijie(config-if)# ip ospf message-digest-key 1 md5
backbone
```

```
# OSPF

Ruijie(config)# router ospf 1
Ruijie(config-router)# network 192.168.12.0
0.0.0.255 area 0
Ruijie(config-router)# area 0 authentication
message-digest
```

ip ospf authentication-key	OSPF
ip ospf message-digest-key	OSPF MD5
area virtual-link	

35.1.3 area default-cost

STUB NSSA OSPF
area default-cost **no**

```
area area-id default-cost cost
no area area-id default-cost
```

<i>area-id</i>	STUB NSSA
<i>cost</i>	STUB NSSA

```

                ABR
            STUB
                NSSA
            ABR
                ABR
        OSPF
    stub area nssa
        area stub
        area default-cost
        area nssa
        area default-cost
        NSSA
        ABR
        STUB
        area
        area
    
```

50

```

Ruijie(config)# router ospf 1
Ruijie(config-router)# network 172.16.0.0 0.0.255.255
area 0
Ruijie(config-router)# network 192.168.12.0 0.0.0.255
area 1
Ruijie(config-router)# area 1 stub
Ruijie(config-router)# area 1 default-cost 50
    
```

area stub	OSPF
area nssa	OSPF NSSA

35.1.4 area filter-list

```

ABR
                intra-area
area area-id filter-list [access acl-name | prefix prefix-name] [in | out]
no area area-id filter-list [access acl-name | prefix prefix-name] [in |
out]
    
```


area-id	NSSA
no-redistribution	ABR nssa
default-information-originate	nssa ASBR 7 LSA NSSA ABR
no-summary	(ABR) nssa nssa LSA

NSSA

```

default-information-originate Type-7 LSA
nssa ABR ASBR ABR
Type-7 LSA ASBR (
ABR) Type-7 LSA

no-redistribution ASBR OSPF redistribute
NSSA NSSA
ASBR ABR nssa

NSSA LSA
ABR no-summary ABR NSSA
summary LSAs Type-3 LSA

area default-cost NSSA ABR
NSSA
NSSA
NSSA 1
    
```

1

```

Ruijie(config)# router ospf 1
Ruijie(config-router)# network 172.16.0.0 0.0.255.255
area 0
    
```

```
Ruijie(config-router)# network 192.168.12.0 0.0.0.255
area 1
Ruijie(config-router)# area 1 nssa
```

area default-cost	OSPF NSSA

35.1.6 area range

```
OSPF
range no no area cost
area area-id range ip-address net-mask [advertise | not-advertise]
[cost cost]
no area area-id range ip-address net-mask [cost]
```

area-id	OSPF IP
ip-address	
advertise not-advertise	
cost cost	

```
RFC1583
RFC1583
cost
cost
```



```

OSPF
(LSA) 1 1 area stub ABR
LSA 3 3 LSA LSA 2 2
OSPF ABR
OSPF
ABR area stub
no-summary
ABR
OSPF area stub area
default-cost area stub
area default-cost ABR area default-cost

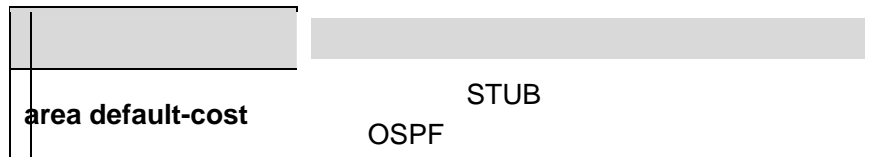
```

1

```

Ruijie(config)# router ospf 1
Ruijie(config-router)# network 172.16.0.0 0.0.255.255
area 0
Ruijie(config-router)# network 192.168.12.0 0.0.0.255
area 1
Ruijie(config-router)# area 1 stub

```



01.1.8 area virtual-link

no area *area-id* **virtual-link** *router-id*

<i>area-id</i>	OSPF IP
<i>router-id</i>	show ip ospf

dead-interval *seconds* 40

;

OSPF

ABR Stub Area NSSA ABR

router-id OSPF *router-id*
show ip ospf neighbor Loopback

area virtual-link OSPF **area authentication**

1 2.2.2.2

```
Ruijie(config)# router ospf 1
Ruijie(config-router)# network 172.16.0.0 0.0.15.255 area
0
Ruijie(config-router)# network 172.16.17.0
0.0.15.255 area 1
Ruijie(config-router)# area 1 virtual-link 2.2.2.2
1 1.1.1.1
10 OSPF
```

MD5

```
Ruijie(config)# router ospf 1
Ruijie(config-router)# network 172.16.17.0
0.0.15.255 area 1
Ruijie(config-router)# network 172.16.252.0
0.0.0.255 area 10
Ruijie(config-router)# area 0 authentication
message-digest
Ruijie(config-router)# area 1 virtual-link 1.1.1.1
message-digest-key 1 md5 hello
```

area authentication	OSPF
show ip ospf	OSPF

35.1.9 auto-cost

no

auto-cost [reference-bandwidth *ref-bw*]

no auto-cost [reference-bandwidth]

<i>ref-bw</i>	Mbps : 1-4294967

100Mbps

```
Ruijie(config-router)# network 172.16.10.0 0.0.0.255 area
0
Ruijie(config-router)# auto-cost reference-bandwidth 10
```

show ip ospf	ospf

35.1.10 clear ip ospf process

OSPF

clear ip ospf (*process-id*) process

<i>process-id</i>	OSPF
	OSPF

RFC2328

OSPF

OSPF 1

```
Ruijie# clear ip ospf 1 process
```

35.1.11 compatible rfc1583

AS
 RFC1583 RFC2328

commpatible rfc1583
no commpatible rfc1583

RFC1583

rfc 2328

```
Ruijie(config)# router ospf 1
Ruijie(config-router)# no commpatible rfc1583
```

show ip ospf	ospf

35.1.12 default-information originate OSPF

OSPF

default-information originate **no**

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

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

--	--

always	OSPF
metric <i>metric</i>	1
metric-type <i>type</i>	OSPF 1 2 1 2
route-map <i>map-name</i>	route-map , route-map

redistribute ASBR OSPF
default-information ASBR
default-information originate ASBR

always OSPF

show ip ospf database OSPF
 0.0.0.0 OSPF

show ip route

default-information originate
default-metric

OSPF 1 2

1 1 2 **show ip route**
 1

STUB

OSPF OSPF
 1 50

Ruijie(config)# **router ospf 1**

```
Ruijie(config-router)# network 172.16.24.0 0.0.0.255
area 0
Ruijie(config-router)# default-information originate
always metric 50 metric-type 1
```

show ip ospf database	OSPF
show ip route	IP

35.1.13 default-metric

```
OSPF
default-metric no
default-metric metric
no default-metric
```

<i>metric</i>	OSPF

20

```
default-metric redistribute
default-metric OSPF default-information originate
OSPF 50
Ruijie(config)# router rip
```

```
Ruijie(config-router)# network 192.168.12.0
Ruijie(config-router)# version 2
Ruijie(config-router)# exit
Ruijie(config)# router ospf
Ruijie(config-router)# network 172.16.10.0 0.0.0.255
area 0
Ruijie(config-router)# default-metric 50
Ruijie(config-router)#redistribute rip subnets
```

redistribute	
show ip ospf	ospf

35.1.14 distance ospf

OSPF

```
Ruijie(config)# router ospf 1  
Ruijie(config-router)# distance ospf external 160
```

35.1.15 distribute-list in

LSA

```
distribute-list {listname | gateway plist-name | prefix plist-name }  
in [in726list-name]
```

```
Ruijie(config-router)# distribute-list 3 in ethernet  
1/0  
Ruijie(config-router)# distribute-list 3 in ethernet  
1/1
```

35.1.16 distribute-list out

redistribute

distribute-list {*listname* | **gateway** *plist-name* | **prefix** *plist-name*} **out**
[**bgp** | **connected** | **isis** *area-tag* | **ospf** *process-id* | **rip** | **static**]
no distribute-list {*listname* | **gateway** *plist-name* | **prefix** *plist-name* }
out [**bgp** | **connected** | **isis** *area-tag* | **ospf** *process-id*] **rip** | **static**]

<i>listname</i>	acl
gateway <i>plist-name</i>	gateway
prefix <i>plist-name</i>	prefix-list
[bgp connected isis <i>area-tag</i> ospf <i>process-id</i> rip static]	

distribute-list out **redistribute route-map**
OSPF



show ip ospf



OSPF



<p>lsa</p>	<p>lsa traps lsa traps lsdbapproachoverflow LSA lsdboverflow LSA maxagelsa LSA originatelsa LSA</p>
<p>retransmit</p>	<p>retransmit traps retransmit traps iftxretransmit virtiftxretransmit</p>
<p>state-change</p>	<p>state-change traps state-change traps ifstatechange nbrstatechange virtifstatechange virtnbrstatechange</p>

TRAP

snmp-server
enable traps ospf

snmp-server

MIB

TRAP

OSPFv2

100

TRAP

35.1.19 ip ospf authentication

no

ip ospf authentication [message-digest | null]

no ip ospf authentication

message-digest	MD5
null	

no

null

GigabitEthernet 0/0 OSPF MD5

```
Ruijie(config)# interface GigabitEthernet 0/0
Ruijie(config-if)# ip address 172.16.10.0
255.255.255.0
Ruijie(config-if)# ip ospf authentication
message-digest
```

area authentication	OSPF
ip ospf authentication-key	OSPF

ip ospf message-digest-key	OSPF MD5
-----------------------------------	----------

35.1.20 ip ospf authentication-key

```

OSPF
authentication-key no ip ospf
ip ospf authentication-key key
no ip ospf authentication-key
    
```

Key	8

```

ip ospf authentication-key OSPF
OSPF
    
```

```

OSPF area
authentication
authentication , ip ospf
    
```

```

ospfauth GigabitEthernet 0/0 OSPF
Ruijie(config)# interface GigabitEthernet 0/0
Ruijie(config-if)# ip address 172.16.10.0
255.255.255.0
    
```

Ruijie(config-if)# ip ospf authentication-key ospfauth

area authentication	OSPF
ip ospf authentication	

35.1.21 ip ospf cost

OSPF
ip ospf cost **no** OSPF
ip ospf cost cost
no ip ospf cost

cost	OSPF

/Bandwidth 100Mbps

OSPF 100Mbps/Bandwidth Bandwidth
 bandwidth
 OSPF
 64K cost 1562
 E1 cost 48
 10M cost 10
 100M cost
ip ospf cost OSPF

serial 1/0 OSPF 100

```
Ruijie(config)# interface serial 1/0
Ruijie(config-if)# ip ospf cost 100
```

bandwidth	
show ip ospf	Ospf

35.1.22 ip ospf database-filter all out

```

, LSA LSA
no
ip ospf database-filter all out
no ip ospf database-filter

```



```
Ruijie(config-if)# ip ospf database-filter all out
```

35.1.23 ip ospf dead-interval

```

OSPF
ospf dead-interval no
ip ospf dead-interval seconds
no ip ospf dead-interval

```

seconds	

ip ospf hello-interval

```

OSPF Hello OSPF
Hello Hello
hello 4 hello
OSPF
hello

```

```

serial 1/0 OSPF
30
Ruijie(config)# interface serial 1/0
Ruijie(config-if)# ip address 172.16.10.1
255.255.255.0
Ruijie(config-if)# encapsulation ppp
Ruijie(config-if)# ip ospf dead-interval 30

```

ip ospf hello-interval	OSPF Hello

35.1.24 ip ospf disable all

```

ospf
ip ospf disable all
no ip ospf disable all

```

```

network area
network ospf
OSPF OSPF

```

```

Ruijie(config)# interface serial 1/0
Ruijie(config-if)# ip address 172.16.10.1
255.255.255.0
Ruijie(config-if)# ip ospf disable all

```

35.1.25 ip ospf hello-interval

```

OSPF Hello ip ospf
hello-interval no
ip ospf hello-interval seconds
no ip ospf hello-interval

```

<i>seconds</i>	OSPF hello

10
PPP HDLC 10
10
.25 30

hello hello OSPF
hello

ip ospf message-digest-key *key-id* **md5** *key*
no ip ospf message-digest-key

<i>Key</i>	16
<i>Key-id</i>	255

MD5

ip ospf message-digest-key

OSPF
OSPF

OSPF

```
Ruijie(config-if)# ip ospf message-digest-key 5 md5
hello5
```

```
Ruijie(config)# interface Serial1/0
Ruijie(config-if)# no ip ospf message-digest-key 10 md5
hello10
```

area authentication	OSPF
ip ospf authentication	

35.1.27 ip ospf mtu-ignore

```
no
mtu
ip ospf mtu-ignore
no ip ospf mtu-ignore
```


mtu

```
OSPF
MTU
MTU,
MTU
MTU
```

serial 1/0 MTU

```
Ruijie(config)# interface serial 1/0
Ruijie(config-if)# ip ospf mtu-ignore
```

35.1.28 ip ospf network

OSPF	ip ospf network
no	
ip ospf network broadcast	non-broadcast point-to-multipoint [non-broadcast] point-to-point
no ip ospf network broadcast	non-broadcast point-to-multipoint [non-broadcast] point-to-point

broadcast	OSPF
non-broadcast	OSPF NBMA
point-to-multipoint [non-broadcast]	OSPF , non-broadcast
point-to-point	OSPF

PPP SLIP X.25

NBMA X.25

OSPF

FDDI

X.25

HDLC PPP SLIP
 OSPF
 (NBMA) NBMA
 SVC
 X.25 PVC
 OSPF NBMA
 Designated Router NBMA

 OSPF
 OSPF

 X.25 OSPF
frame-relay map X.25 **X.25 map**
 OSPF X.25

 OSPF

 X.25 IP
 broadcast

```

Ruijie(config)# interface Serial1/0
Ruijie(config-if)# ip address 172.16.24.4
255.255.255.0
Ruijie(config-if)# encapsulation frame-relay
Ruijie(config-if)# ip ospf network broadcast
  
```

```

Ruijie(config)# interface Serial1/0
Ruijie(config-if)# ip address 172.16.24.4
255.255.255.0
Ruijie(config-if)# encapsulation frame-relay
  
```


OSPF
DR/BDR

hello

OSPF

DR BDR
DR BDR

DR

BDR

OSPF **broadcast** **non-broadcast**

r

DR BDR
DR BDR

.

LSU

LSAs

Age

ip ospf transmit delay

```
Ruijie(config)# router ospf 1
Ruijie(config-router)# log-adj-changes detail
```

show ip ospf	ospf

35.1.33 max-concurrent-dd

DD

```
max-concurrent-dd <1-65535>
```

<1-65535>	DD

5

OSPF

DD

DD

4

```
Ruijie(config)# router ospf 10
Ruijie(config-router)# max-concurrent-dd 4
```

35.1.34 neighbor

OSPF neighbor no

neighbor *ip-address* [**poll-interval** *seconds*] [**priority** *priority*] [**cost** *cost*]

no neighbor *ip-address*

<i>ip-address</i>	IP
poll-interval <i>seconds</i>	Non-broadcast(NBMA) 120
priority <i>priority</i>	Non-broadcast(NBMA)
Cost <i>cost</i>	, cost point-to-multipoint [non-broadcast]

RGOS
 IP IP
 NBMA
 Hello OSPF Hello Hello
 OSPF
 0 Hello 0
 DR/BDR DR/BDR DR/BDR
 Hello
 , ,

```

172.16.24.2          OSPF          IP
                    1              150

Ruijie(config)# router ospf 20
Ruijie(config-router)# network 172.16.24.0 0.0.0.255
area 0
Ruijie(config-router)# neighbor 172.16.24.2 priority 1
poll-interval 150
    
```

ip ospf priority	OSPF
ip ospf network	OSPF

35.1.35 network area

```

                    OSPF          OSPF
network area      no              OSPF

network ip-address wildcard area area-id
no network ip-address wildcard area area-id
    
```

<i>ip-address</i>	IP
<i>wildcard</i>	IP
<i>area-id</i>	OSPF OSPF OSPF

OSPF

OSPF2

OSPF **hard** OSPF
soft

LSA 10 OSPF 10

```

Ruijie# config terminal
Ruijie(config)# router ospf 10
Ruijie(config-router)# overflow database 10 hard
    
```

35.1.37 overflow database external

external LSA

overflow database external *max-dbsize wait-time*

no overflow database external

<i>max-dbsize</i>	external lsa AS 0-2147483647
<i>wait-time</i>	0-65535

external-LSA

external-LSA external-LSA

```

external-LSA          max-dbsize
external-LSA          external-LSA
wait-time             external-LSA

```

```

Ruijie# config terminal
Ruijie(config)# router ospf 10
Ruijie(config-router)# overflow database external 10 3

```

35.1.38 overflow memory-lack

```

no
OSPF OVERFLOW
overflow memory-lack
no overflow memory-lack

```



```

1 OSPF                                OVERFLOW
Ruijie(config)# router ospf 1
Ruijie(config-router)# no overflow memory-lack
    
```

clear ip ospf process	OSPF
show ip protocols ospf	OSPF

10.3(4b3)	

35.1.39 passive-interface

no

passive-interface [default | *type number*]

no passive-interface [default | *type number*]

<i>type number</i>	
default	

, OSPF

OSPF2

route-map	
tag	OSPF tag
subnets	

```

                                ASBR                OSPF
                                OSPF
                                metric 1             LSA
                                BGP
metric 20
                                isis                level-2
                                level                  level
                                level 1, level 2
                                level-1-2
                                ospf                match
                                ospf                    match
                                match                    no
                                match
                                route-map              route-map match
                                match level            OSPF ISIS
                                                        route-map
    
```

OSPF

```

Ruijie(config-router)# redistribute static subnets
Ruijie(config)# router ospf 1
Ruijie(config-router)# redistribute ospf 2 subnets
Ruijie(config-router)# redistribute ospf 2 match
external 1 internal
Ruijie(config-router)# redistribute isis isis-001
Ruijie(config-router)# redistribute isis isis-001
level-1
    
```

Show run

```

router ospf 1
redistribute ospf 2 match external 1 internal subnets
    
```

```
redistribute isis isis-001 level-1-2
```

35.1.41 router ospf

```

          OSPF
no          OSPF
router ospf process-id [vrf vrf-name]
no router ospf process-id
    
```

<i>process-id</i>	ospf
<i>vrf-name</i>	VRF OSPF VRF

OSPF

```

RGOS10.1          ospf
ospf
                vrf vpn_1      OSPF      10
Ruijie(config)# router ospf 10 vrf vpn_1
    
```

show ip protocols	
show ip ospf	ospf

OSPF

area range	OSPF
------------	------

35.1.44 timers lsa-group-pacing

LSA

no

timers lsa-group-pacing *seconds*

no timers lsa-group-pacing

<i>seconds</i>	LSA : 10-1800

: 240

LSA

4

LSA

10000 LSA
10~20

40~100

120

Ruijie(config)#**router ospf 20**

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

show ip ospf	ospf

35.1.45 timers spf

```

OSPF
SPF
no
SPF
timers spf

```

```

timers spf spf-delay spf-holdtime
no timers spf

```

<i>spf-delay</i>	OSPF SPF SPF
<i>spf-holdtime</i>	OSPF SPF SPF

```

spf-delay 5 spf-holdtime 10

```

```

spf-delay spf-holdtime OSPF CPU

```

```

OSPF 3 9

```

```

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

```

show ip ospf	ospf

35.2

35.2.1 show ip ospf

OSPF

show ip ospf

show ip ospf [*process-id*]

<i>process-id</i>	ospf

OSPF

show ip ospf

```
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 SPF's
10 secs
LsaGroupPacing: 240 secs
Number of incoming 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 Adjacency Changes : Enabled
Number of areas attached to this router: 1
Area 0 (BACKBONE)
Number of interfaces in this area is 1(1)
Number of fully adjacent neighbors in this area is 1
Area has no authentication
SPF algorithm last executed 00:01:26.640 ago
SPF algorithm executed 4 times
Number of LSA 3. Checksum 0x0204bf
Area 1 (NSSA)
Number of interfaces in this area is 1(1)
Number of fully adjacent neighbors in this area is 0
Number of fully adjacent virtual neighbors through this
area is 0
Area has no authentication
SPF algorithm last executed 02:09:23.040 ago
SPF algorithm executed 4 times
Number of LSA 6. Checksum 0x028638
NSSA Translator State isselected
    
```

Router ID	
Process uptime	OSPF router-id 0.0.0.0
Bound to VRF	OSPF VRF
Conforms to RFC2328	RFC2328

RFC1583

RFC1583Compatibility flag

LsaGroupPacing	LSA
Incomming current DD exchange neighbors	incomming exstart
Outgoing current DD exchange neighbors	outgoing exstart
Number of external LSA	LSA
External LSA Checksum Sum	LSA
Number of opaque LSA	opaque-LSA
Opaque LSA Checksum Sum	opaque-LSA
Number of non-default external LSA	external-LSA
External LSA database limit	external-LSA
Exit database overflow state interval	overflow
Database overflow state	OSPF overflow
Number of LSA originated	LSA
Number of LSA received	LSA
Log Neighbor Adjency Changes	
Number of areas attached to this router	
Area type	, Default, Stub,NSSA
Number of interfaces in this area	
Number of fully adjacent neighbors in this area	Full
Number of fully adjacent virtual neighbors through this area	Full
Area authentication	
SPF algorithm last executed	SPF
SPF algorithm executed times	SPF

Number of LSA	LSA		
Checksum Sum	LSA		
NSSA Translator State	LSA OSPF	NSSA LSA NSSA	External ABR

35.2.2 show ip ospf border-routers

ABR/ASBR OSPF
show ip ospf border-routers
show ip ospf [*process-id*] border-routers

I	
1.1.1.1	OSPF
[2]	cost
via 10.0.0.1	
GigabitEthernet 0/1	
ABR, ASBR	ASBR ABR ABR ASBR
Area 0.0.0.1	
select	ASBR select

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

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

show ip ospf [*process-id area-id*] **database** [**asbr-summary**]
[*link-state-id*] [**adv-router ip-address**]

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

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

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

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

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

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

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

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

external	OSPF
nssa-external	OSPF
opaque-area	LSA
opaque-as	LSA
opaque-link	LSA
database-summary	OSPF LSA

OSPF

OSPF

show ip ospf database

Ruijie# **show ip ospf database**

OSPF Router with ID (1.1.1.1) (Process ID 1)

Router Link States (Area 0.0.0.0)

Link IDDDDDDDDDADVk(Routeru)-6DDDDDAge Seq#DDDDDDDCkSum

Area 0.0.0.0)

Link(Routerru)-6D847rt7errud8(d8(27)-109(84u)-109(.u)-6D

Link(Routeru)-6DDDDDAge Seq#DDDDDDDCkSum (400-60.860x26

```

Link ID          ADV Router      Age  Seq#          CkSum
Link count
1.1.1.1          1.1.1.1         2   0x80000001 0x91a2 1
  
```

Summary Link States (Area 0.0.0.1 [NSSA])

```

Link ID          ADV Router      Age  Seq#          CkSum
Route
100.0.0.0        1.1.1.1         2   0x80000001 0x52a4
100.0.0.0/16
192.88.88.0      1.1.1.1         2   0x80000001 0xbb2d
192.88.88.0/24
  
```

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

```

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

AS External Link States

```

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

show ip ospf database



Age	
Seq#	

Length	
Network Mask	
Metric Type	
TOS	TOS 0
Metric	
Forward Address	0.0.0.0 IP
External Route Tag	32 OSPF OSPF

show ip ospf database network

```
Ruijie# show ip ospf database network
OSPF Router with ID (1.1.1.1) (Process ID 1)
Network Link States (Area 0.0.0.0)

LS age: 572
Options: 0x2 (*|-|-|-|-|E|-)
LS Type: network-LSA
Link State ID: 192.88.88.27 (address of Designated
Router)
Advertising Router: 1.1.1.1
LS Seq Number: 80000001
Checksum: 0x5366
Length: 32
Network Mask: /24
Attached Router: 1.1.1.1
Attached Router: 3.3.3.3
```

show ip ospf database network

Link State ID	
Advertising Router	
LS Seq Number	
Checksum	
Length	
Network Mask	
Attached Router	

show ip ospf database router

```
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

OSPF Router with ID	OSPF
Router Link States	
LS age	
Options	
Flag	router
LS Type	

Link State ID	
Advertising Router	
LS Seq Number	
Checksum	
Length	
Number of Links	
Link connected to	
(Link ID)	
(Link Data)	

Number of TOS metrics TOS TOS0

Link State ID	
Advertising Router	
LS Seq Number	
Checksum	
Length	
Network Mask	
TOS	TOS 0
Metric	

show ip ospf database nssa-external

```
Ruijie# show ip ospf database nssa-external
OSPF Router with ID (1.1.1.1) (Process ID 1)
  NSSA-external Link States (Area 0.0.0.1 [NSSA])
LS age: 1
Options: 0x0 (*|---|---|---|)
LS Type: AS-NSSA-LSA
Link State ID: 20.0.0.0 (External Network Number For
NSSA)
Advertising Router: 1.1.1.1
LS Seq Number: 80000001
Checksum: 0x033c
Length: 36
Network Mask: /24
Metric Type: 2 (Larger than any link state path)
TOS: 0
Metric: 20
NSSA: Forward Address: 100.0.2.1
External Route Tag: 0
```

show ip ospf database nssa-external

--	--

Options	
LS Type	
Link State ID	
Advertising Router	
LS Seq Number	
Checksum	
Length	
Network Mask	
Metric Type	
TOS	TOS 0
Metric	
NSSA:Forward Address	0.0.0.0 IP
External Route Tag	32 OSPF OSPF

show ip ospf database external

```
Ruijie# show ip ospf database external
OSPF Router with ID (1.1.1.1) (Process ID 1)
AS External Link States
LS age: 1290
Options: 0x2 (*|---|E|)
LS Type: AS-external-LSA
Link State ID: 20.0.0.0 (External Network Number)
Advertising Router: 1.1.1.1
LS Seq Number: 8000000a
Checksum: 0x7627
Length: 36
Network Mask: /24
Metric Type: 2 (Larger than any link state path)
TOS: 0
Metric: 20
Forward Address: 0.0.0.0
External Route Tag: 0
```

show ip ospf database external

OSPF Router with ID	OSPF
Type-7 AS External Link States	
LS age	

Options

checksum2_0 1 Tt 0 Tc 0 Tw 100 Td <1C122F0E41B9

OSPF2

```

Internet Address 192.88.88.27/24, Ifindex 4, Area
0.0.0.0, MTU 1500
Matching network config: 192.88.88.0/24
Process ID 1, Router ID 1.1.1.1, Network Type BROADCAST,
Cost: 1
Transmit Delay is 1 sec, State DR, Priority 1
Designated Router (ID) 1.1.1.1, Interface Address
192.88.88.27
Backup Designated Router (ID) 3.3.3.3, Interface Address
192.88.88.72
Timer intervals configured, Hello 10, Dead 40, Wait 40,
Retransmit 5
Hello due in 00:00:03
Neighbor Count is 1, Adjacent neighbor count is 1
Crypt Sequence Number is 70784
Hello received 1786 sent 1787, DD received 13 sent 8
LS-Req received 2 sent 2, LS-Upd received 29 sent 53
LS-Ack received 46 sent 23, Discarded 1
    
```

show ip ospf interface serial 1/0

GigabitEthernet 0/0 State	Down UP
Internet Address	IP
Area	OSPF
MTU	MTU
Matching network config	OSPF network area
Process ID	
Router ID	OSPF
Network Type	OSPF
Cost	OSPF
Transmit Delay is	OSPF
State	DR/BDR
Priority	
Designated Router(ID)	DR
DR's Interface address	DR
Backup designated router(ID)	BDR

BDR's Interface address	BDR
Time intervals configured	Hello Dead Wait Retransmit
Hello due in	HELLO
Neighbor count	
Adjacent neighbor count	Full
Crypt Sequence Number	md5
Hello received send	HELLO
DD received send	DD
LS-Req received send	LS
LS-Upd received send	LS
LS-Ack received send	LS
Discard	OSPF

35.2.5 show ip ospf neighbor

```

OSPF
neighbor OSPF
show ip ospf

```

OSPF

show ip ospf neighbor

```
Ruijie# show ip ospf neighbor
OSPF process 1, 1 Neighbors, 1 is Full:
Neighbor ID      Pri   State                Dead Time
Address          Interface
3.3.3.3          1     Full/BDR             00:00:32
192.88.88.72    GigabitEthernet 1/0
```

```
Ruijie# show ip ospf neighbor detail
Neighbor 3.3.3.3, interface address 192.88.88.72
In the area 0.0.0.0 via interface GigabitEthernet 1/0
Neighbor priority is 1, State is Full, 11 state changes
DR is 192.88.88.27, BDR is 192.88.88.72
Options is 0x52 (*|O|-|EA|-|-|E|-)
Dead timer due in 00:00:32
Neighbor is up for 05:11:27
Database Summary List 0
Link State Request List 0
Link State Retransmission List 0
Crypt Sequence Number is 0
Thread Inactivity Timer on
Thread Database Description Retransmission off
Thread Link State Request Retransmission off
Thread Link State Update Retransmission off
Thread Poll Timer on
```

show ip ospf neighbor

Neighbor ID	
Pri	DR
State	
Dead Time	Dead
Address	

Interface	
interface address	
In the area	
via interface	
Neighbor priority	OSPF
State	OSPF FULL DR BDR DROTHER DR/BDR DR BDR
State changes times	
Dead Time	
DR	DR (Hello DR)
BDR	BDR (Hello BDR)
Options	Hello E 0 STUB STUB
Dead timer due in	
Neighbor up time	
Database Summary List	DD
Link State Request List	LS
Link State Retransmission List	
Crypt Sequence Number	MD5
Thread Inactivity Timer	
Thread Database Description Retransmission	DD
Thread Link State Request Retransmission	LS
Thread Link State Update Retransmission	LS
Thread Poll Timer	Poll Timer

35.2.7 show ip ospf summary-address

```
OSPF
show ip ospf summary-address
show ip ospf summary-address
```

NSSA ABR

show ip ospf summary-address

```
Ruijie# show ip ospf summary-address
Summary Address Summary Mask Advertise Status
Aggregated subnets
-----
202.101.0.0 255.255.0.0 advertise
Inactive 0
Ruijie#
```

35.2.8 show ip ospf virtual-link

OSPF
virtual-link

show ip ospf

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

via interface	
Local address	
Remote Address	
Transmit Delay	
State	
Time intervals configured	Hello Dead Wait Retransmit
Adjacency State	FULL

36

36.1

36.1.1 distribute-list in

distribute-list in **no**

distribute-list {[*access-list-number* | *access-list-name*] | **prefix**
prefix-list-name [**gateway** *prefix-list-name*]} **in** [*interface-type*
interface-number]

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

		m	b
--	--	----------	----------

1

-

OSPF

OSPF

RIP GigabitEthernet 0/0
 172.16

```
Ruijie(config)# router rip  
Ruijie(config-router)# network 200.168.23.0  
Ruijie(config-router)# distribute-list 10 in  
Td$0C309B71uter rip
```

<i>access-list-number</i>	1300-1999 2000-2699	1-99 100-199
<i>access-list-name</i>		
prefix <i>prefix-list-name</i>		
<i>Interface</i>	()	
<i>protocol</i>	()	

BGP

```
Ruijie(config)# ip community-list standard test deny  
100:20 200:20  
Ruijie(config)# ip community-list standard test2 permit  
internet
```

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

36.1.4 ip default-network

ip default-network

```
no  
ip default-network network  
no ip default-network network
```

<i>network</i>	

0.0.0.0/0

<i>seq-number</i>	1 2147483647 5 5
deny	
permit	

ip-prefix

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

36.1.8 ip route

ip route no

```
ip route [vrf vrf_name] network net-mask {ip-address | interface
[ip-address]} [distance] [tag tag] [permanent] [weight number] [disable |
enable]
```

U?UG5B?BM8

```

1
OSPF 110
125 OSPF
vrf vrf
1 show ip route weight
weight WCMP
WCMP 32
ip
route 0.0.0.0 0.0.0.0 GigabitEthernet 0/0
GigabitEthernet 0/0
ARP CPU
172.16.100.0/24
192.168.12.1 115
ip route 172.16.100.0 255.255.255.0 192.168.12.1 115
172.16.100.0/24 GigabitEthernet 0/0
Ruijie(config)# ip route 172.16.100.0 255.255.255.0
GigabitEthernet 0/0 192.168.12.1

```

show ip route	IP

36.1.9 ip routing

ip static

route-limit

show running-config

900

Ruijie(config)# ip static route-limit 900

Ruijie(config)# no ip static route-limit

36.1.11 ipv6 prefix-list

IPv6

ipv6

prefix-list

no

ipv6 prefix-list *prefix-lis-name* [**seq** *seq-number*] { **deny** | **permit** }

ipv6-prefix [**ge** *minimum-prefix-length*][**le** *maximum-prefix-length*]

no ipv6 prefix-list *prefix-lis-name*[**seq** *seq-number*] { **deny** | **permit** }

ipv6-prefix [**ge** *minimum-prefix-length*][**le** *maximum-prefix-length*]

<i>prefix-lis-name</i>	

1 2147483647

seq-number

<i>maximum-prefix-length</i>) le	(
------------------------------	----------------	---

```

ipv6 prefix-list IPv6 permit
deny
                                ge le

ipv6-prefix                                ge le
  ipv6-prefix                                ge
  minimum-prefix-length 32 le
ipv6-prefix                                maximum-prefix-length
                                minimum-prefix-length maximum-prefix-length
  ipv6-prefix minimum-prefix-length maximum-prefix-length
  ipv6-prefix                                < minimum-prefix-length <
maximum-prefix-length <= 128

```

```

                                RIP OSPF
  1
IPv6 ( IP IP 2222::/64

```

<i>prefix-lis-name</i>	IPv6
<i>descripton-text</i>	IPv6

```

IPv6          pre          Deny routes from
Net-A
Ruijie# configure terminal
Ruijie(config)# ipv6 prefix-list pre description Deny
routes from Net-A

```

36.1.13 ipv6 prefix-list sequence-number

```

IPv6          ipv6 prefix-list description
no
ipv6 prefix-list sequence-number

```

```

IPv6
Ruijie# configure terminal
Ruijie(config)# ipv6 prefix-list sequence-number

```

36.1.14 match as-path

match community { *community-list-number* | *community-list-name*}
[**exact-match**] [{ *community-list-number* | *community-list-name*}
[**exact-match**] ...]

no match community { *community-list-number* | *community-list-name*}
[**exact-match**] [{ *community-list-number* | *community-list-name*}
[**exact-match**] ...]

ip community-list	
match as-path	AS_PATH
match metric	
match origin	
set as-path prepend	AS_PATH
set comm-list delete	
set community	
set metric	

36.1.16 match interface

match

interface **no**

match interface *interface-type interface-number [...interface-type interface-number]*

no match interface *interface-type interface-number [...interface-type interface-number]*

<i>interface-type</i>	
<i>interface-number</i>	

match interface

OSPF

OSPF RIP

RIP

route maps

```

set match 1 match 1
set match 1 match 1

```

```

OSPF
GigabitEthernet 0/0 RIP
RIP

```

```

Ruijie(config)# router ospf
Ruijie(config-router)# redistribute rip subnets
route-map redrip
Ruijie(config-router)# network 192.168.12.0 0.0.0.255
area 0
Ruijie(config-router)# exit
Ruijie(config)# route-map redrip permit 10
Ruijie(config-route-map)# match interface
GigabitEthernet 0/0

```

match ip address	
match ip next-hop	
match ip route-source	
match metric	
match route-type	
match tag	
set metric	
set metric-type	
set tag	

36.1.17 match ip address

match ip address **no**

match ip address {*access-list-number* [*access-list-number...* |
access-list-name...] |*access-list-name* [*access-list-number...* |
access-list-name]} | **prefix-list** *prefix-list-name* [*prefix-list-name...*]

no match ip address {*access-list-number* [*access-list-number...* |
access-list-name...] | *access-list-name* [*access-list-number...* |
access-list-name]} | **prefix-list** *prefix-list-name* [*prefix-list-name...*]

<i>access-list-number</i>	1300-1999 2000-2699 1-99 100-199
<i>access-list-name</i>	
prefix-list <i>prefix-list-name</i>	

match ip address

OSPF OSPF RIP RIP

IP route maps

set 1 **match** 1 **set**

```

                                OSPF                RIP
                                10  RIP            OSPF
                                type-1            40

```

```

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

```

access-list	
match interface	
match ip next-hop	
match ip route-source	
match metric	
match route-type	
match tag	
set metric	
set metric-type	
set tag	

36.1.18 match ip next-hop

IP

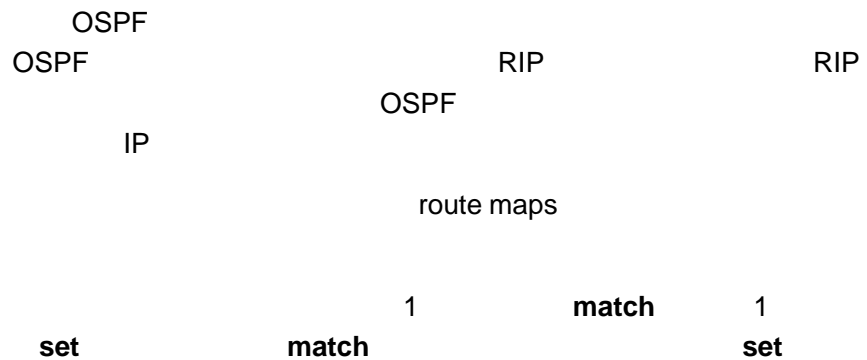
match ip next-hop **no**

match ip next-hop {*access-list-number* [*access-list-number...* |
access-list-name...] |*access-list-name* [*access-list-number...* |
access-list-name] | **prefix-list** *prefix-list-name* [*prefix-list-name...*]}

no match ip next-hop {*access-list-number* [*access-list-number...* |
access-list-name...] | *access-list-name* [*access-list-number...* |
access-list-name] | **prefix-list** *prefix-list-name* [*prefix-list-name...*]}

<i>access-list-number</i>	1300-1999 1-99 2000-2699 100-199
<i>access-list-name</i>	
prefix-list <i>prefix-list-name</i>	

match ip next-hop



no match ip route-source {*access-list-number* [*access-list-number...* |
access-list-name...

OSPF

RIP

RIP

OSPF

IP

route maps

1

match

1

set

set metric-type	
set tag	

36.1.21 match ipv6 next-hop

IPv6

match ipv6 address **no**

match ipv6 next-hop { *access-list-name* | **prefix-list** *prefix-list-name* }

no match ipv6 next-hop

<i>access-list-name</i>	
prefix-list <i>prefix-list-name</i>	IPv6

OSPF

RIP

RIP

OSPF

IP

route maps

set

match

1

match

set

```

                                OSPF                RIP
                                10  RIP            OSPF
                                type-1            40

```

```

Ruijie(config)# ipv6 router ospf
Ruijie(config-router)# redistribute rip subnets
route-map redrip
Ruijie(config-router)# exit
Ruijie(config)# ipv6 access-list v6acl
Ruijie(config-ipv6-acl)# 10 permit ipv6 2720::/64 any
Ruijie(config-ipv6-acl)# exit
Ruijie(config)# route-map redrip permit 10
Ruijie(config-route-map)# match ipv6 next-hop v6acl
Ruijie(config-route-map)# set metric 40

```

ipv6 access-list	IPv6
match interface	
match ipv6 address	IPv6
match ipv6 route-source	IPv6
match metric	
match route-type	
match tag	
set metric	
set metric-type	
set tag	

36.1.22 match ipv6 route-source

```


                                IPv6
                                match ipv6 address    no

```

match ipv6 route-source { *access-list-name* | **prefix-list**
prefix-list-name }

no match ipv6 route-source

```
Ruijie(config)# route-map redrip permit 10
Ruijie(config-route-map)# match ipv6 route-source
v6acl
Ruijie(config-route-map)# set metric 50
```



match metric

no

match metric *metric*

no match metric

<i>metric</i>	0-4294967295

OSPF

RIP

RIP

OSPF

IP

route maps

set

match

1

match

1

set

OSPF

RIP

10

RIP

OSPF

```
Ruijie(config)# router ospf
```

```
Ruijie(config-router)# redistribute rip subnets
```

```
route-map redist-rip
```

```
Ruijie(config-router)# network 192.168.12.0 0.0.0.255
```

```
area 0
```

```
Ruijie(config-router)# exit
```

```
Ruijie(config)# route-map redist-rip permit 10
```

```
Ruijie(config-route-map)# match metric 10
```

--	--

access-list	
match ip address	
match interface	
match ip next-hop	
match ip route-source	
match route-type	
match tag	
set metric	
set metric-type	
set tag	

36.1.25 match origin

match

origin **no**

match origin {egp | igp | incomplete}

no match origin {egp | igp | incomplete}

egp	EGP
igp	IGP
Incomplete	

```
Ruijie(config)# route-map MY_MAP 10 permit
Ruijie(config-route-map)# match origin egp
Ruijie(config-route-map)# set community 109
Ruijie(config-route-map)# exit
Ruijie(config)# route-map MAP20 20 permit
Ruijie(config-route-map)# match origin incomplete
Ruijie(config-route-map)# set community no-export
```



set metric-type	
set tag	

36.1.27 match tag

match tag **no**

match tag *tag* [...*tag*]
no match tag *tag* [...*tag*]

<i>tag</i>	

```

match tag                tag
OSPF                       RIP           RIP
                           OSPF
                           IP
                           route maps
                           1           match       1
                           set         match       set
                           RIP           OSPF       RIP           OSPF
                           50  80
Ruijie(config)# router rip

```

```
Ruijie(config-router)# redistribute ospf 100 route-map
redrip
Ruijie(config-router)# network 192.168.12.0
Ruijie(config-router)# exit
Ruijie(config)# route-map redrip permit 10
Ruijie(config-route-map)# match tag 50 80
```

access-list	
match ip address	
match interface	
match ip route-source	
match metric	
match ip next-hop	
match route-type	
set metric	

permit	match permit set set match set
deny	match deny deny match set
<i>sequence-number</i>	

RGIOS

OSPF

RIP

RIP

OSPF

Ⓜ

match

! V Ä

!! V Ä

```

4   RIP           OSPF           RIP
   40           OSPF           40           type-1

```

```

Ruijie(config)# router ospf
Ruijie(config-router)# redistribute rip subnets
route-map redrip
Ruijie(config-router)# network 192.168.12.0 0.0.0.255
area 0
Ruijie(config-router)# exit
Ruijie(config)# route-map redrip permit 10
Ruijie(config-route-map)# match metric 4
Ruijie(config-route-map)# set metric 40
Ruijie(config-route-map)# set metric-type type-1
Ruijie(config-route-map)# set tag 40

```

Redistribute	

36.1.30 set aggregator as

```

match           AS
set aggregator as no

```

```

set aggregator as as-num ip_addr
no set aggregator as [as-num ip_addr]

```

<i>as-number</i>	AS
<i>ip_addr</i>	

BGP

as,ip-addr

```
Ruijie(config)# route-map set-as-path  
Ruijie(config-route-map)# match as-path 1  
Ruijie(config-route-map)# set aggregator as 3 2.2.2.2
```

match as-path	AS_PATH
match community	
match metric	
match origin	
set community	COMMUNITY
set metric	
set metric-type	

36.1.31 set as-path prepend

match	AS_PATH
set as-path prepend	no

```
set as-path prepend as-number  
no set as-path prepend [as-number]
```

<i>as-number</i>	AS_PATH AS

AS_PATH

as-path 15 as

```
Ruijie(config)# route-map set-as-path
Ruijie(config-route-map)# match as-path 1
Ruijie(config-route-map)# set as-path prepend 100 101
102
```

match as-path	AS_PATH
match community	
match metric	
match origin	
set community	COMMUNITY
set metric	
set metric-type	

36.1.32 set comm-list delete

match COMMUNITY_LIST
community set comm-list delete
no

set comm-list *community-list-number* | *community-list-name* **delete**
no comm-list *community-list-number* | *community-list-name* **delete**

--	--

match origin	
set as-path prepend	AS_PATH
set comm-list delete	
set local-preference	

36.1.33 set community

match

COMMUNITY

```
Ruijie(config)# route-map SET_COMMUNITY 10 permit
Ruijie(config-route-map)# match as-path 1
Ruijie(config-route-map)# set community 109:10
Ruijie(config-route-map)# exit
Ruijie(config)# route-map SET_COMMUNITY 20 permit
Ruijie(config-route-map)# match as-path 2
Ruijie(config-route-map)# set community no-export
```

match as-path	AS_PATH

match community

<i>suppress</i>	1..20000 2000
<i>max-suppress-time</i>	1..255() 4* half-life

```

Ruijie(config)# route-map tag
Ruijie(config-route-map)# match as path 10
Ruijie(config-route-map)# set dampening 30 1500 10000
120
Ruijie(config-route-map)# exit
Ruijie(config)# router bgp 100
Ruijie(config-router)# neighbor 172.16.233.52
route-map tag in

```

match as-path	AS_PATH
match community	
match metric	
match origin	
set as-path prepend	AS_PATH
set metric	
set local-preference	

36.1.35 set default interface

match

set default interface

no

set default interface *interface-type interface-number* [...*interface-type interface-number*]

no set default interface *interface-type interface-number* [...*interface-type interface-number*]

<i>interface-type</i>	
<i>interface-number</i>	

set default interface

1

down
set

set

serial 1/0

500
1/0

GigabitEthernet

```
Ruijie(config)# interface serial 1/0
Ruijie(config-if)# ip policy route-map smallpak
Ruijie(config-if)# exit
Ruijie(config)# route-map smallpak permit 10
```

```
Ruijie(config-route-map)# match length 0 500
Ruijie(config-route-map)# set default interface
GigabitEthernet 1/0
```

route-map	
match ip address	
match length	
set interface	
set ip default next-hop	IP
set ip next-hop	IP
set ip precedence	IP

36.1.36 set extcommunity

```
match
set extcommunity no
```

```
set extcommunity {rt extend-community-value | soo
extend-community-value}
no set extcommunity {rt | soo}
```

rt	RT
soo	SOO
<i>extend-community-value</i>	

```
Ruijie(config)# access-list 2 permit 192.168.78.0  
255.255.255.0  
Ruijie(config)# route-map MAP_NAME permit 10  
Ruijie(config-route-map)# match ip-address 2  
Ruijie(config-route-map)# set extcommunity rt 100:2
```

```
MAP_NAME
```

set interface

1

down set
set

null 0

serial 1/0

500

GigabitEthernet 0/0

Ruijie(config)#**interface serial 1/0**

Ruijie(config-if)#**ip policy route-map smallpak**

Ruijie(config)#**route-map smallpak permit 10**

Ruijie(config-route-map)#**match length 0 500**

Ruijie(config-route-map)#**set interface GigabitEthernet 0/0**

route-map	
match ip address	
match length	
set default interface	
set ip default next-hop	IP
set ip next-hop	IP

set ip precedence	IP
-------------------	----

36.1.38 set ip default next-hop

match IP
set ip next-hop no

set ip default next-hop *ip-address* [*weight*] [...*ip-address* [*weight*]]
no set ip default next-hop *ip-address* [*weight*] [...*ip-address* [*weight*]]

<i>ip-address</i>	IP
<i>weight</i>	

set WCMP WCMP weight
 WCMP
set ip default next-hop IP 32
 ip address weight 4
 nexthop
 next-hop weight set
 WCMP WCMP
 weight nexthop weight
 1
set ip next-hop set ip default next-hop

НА АҢ[0]FZ

(nexthop)

1

set

1 1.1.1.1
 6.6.6.6 2.2.2.2
 7.7.7.7

```
Ruijie(config)#access-list 1 permit ip 1.1.1.1 0.0.0.0  
Ruijie(config)#access-list 2 permit ip 2.2.2.2 0.0.0.0
```

```
Ruijie(config)#interface async 1  
Ruijie(config-if)#ip policy route-map equal-access
```

```
Ruijie(config)#route-map equal-access permit 10  
Ruijie(config- route-map)#match ip address 1  
Ruijie(config-route-map)#set ip default next-hop  
6.6.6.6
```

```
Ruijie(config)#route-map equal-access permit 20  
Ruijie(config-route-map)#match ip address 2  
Ruijie(config-route-map)#set ip default next-hop  
7.7.7.7
```

```
Ruijie(config)#route-map equal-access permit 30  
Ruijie(config- route-map)#set default interface null 0
```

route-map	
match ip address	
set default interface	
set default interface	

set interface	
----------------------	--

set ip default next-hop	IP
set ip precedence	IP

36.1.40 set ip next-hop

match

MIP

set default interface	
set interface	
set ip default next-hop	IP
set ip precedence	IP

36.1.41 set ip next-hop verify-availability

IP set ip
next-hop verify-availability **no**

set ip next-hop verify-availability *ip-address track track-obj-num*
no set ip next-hop verify-availability *ip-address track track-obj-num*

<i>ip-address</i>	IP
<i>track-obj-num</i>	

serial 1/0

10.0.0.0/8	192.168.100.1
172.16.0.0/16	172.16.100.1

```
Ruijie(config)#interface serial 1/0
Ruijie(config-if)#ip policy route-map load-balance

Ruijie(config)#access-list 10 permit 10.0.0.0
0.255.255.255
Ruijie(config)#access-list 20 permit 172.16.0.0
0.0.255.255

Ruijie(config)#route-map load-balance permit 10
Ruijie(config-route-map)#match ip address 10
Ruijie(config-route-map)#set ip next-hop
192.168.100.1

Ruijie(config)#route-map load-balance permit 20
Ruijie(config--route-map)#match ip address 20
Ruijie(config-route-map)#set ip next-hop 172.16.100.1

rmit 30
ull 0
```



[(s.5...).72 4...7003...3)Tute-...a

set ip precedence {<0-7> | *critical* | *flash* | *flash-override* | *immediate* | *internet* | *network* | *priority* | *routine* }

no set ip precedence {<0-7> | *critical* | *flash* | *flash-override* | *immediate* | *internet* | *network* | *priority* | *routine* }

IP

IP

set ip precedence
IP

```

GigabitEthernet 0/0
192.168.217.68      precedence 4

Ruijie(config)#access-list 1 permit 192.168.217.68
0.0.0.0
Ruijie(config)#route-map name
Ruijie(config-route-map)#match ip address 1
Ruijie(config-route-map)#set ip precedence 4
Ruijie(config)#interface GigabitEthernet 0/0
Ruijie(config-if)#ip policy route-map name

```

match interface	
match ip address	
match ip next-hop	
match ip route-source	
match metric	
match route-type	
match tag	
set metric-type	

set tag	
set ip tos	IP tos

36.1.43 set ip tos

 match IP TOS,
set ip tos **no** tos

set ip tos {<0-15> | *max-reliability* | *max-throughput* | *min-delay*
| *min-monetary-cost* | *normal* }

no set ip tos {<0-15> | *max-reliability* | *max-throughput* | *min-delay*
| *min-monetary-cost* | *normal* }

 IP TOS IP
 IP TOS

```

                                          GigabitEthernet 0/0
192.168.217.68            tos    4
Ruijie(config)#access-list 1 permit 192.168.217.68
0.0.0.0
Ruijie(config)#route-map name
Ruijie(config-route-map)#match ip address 1
Ruijie(config-route-map)#set ip tos 4
Ruijie(config)#interface GigabitEthernet 0/0
Ruijie(config-if)#ip policy route-map name

```

match interface	
match ip address	
match ip next-hop	

match ip route-source	
match metric	
match route-type	
match tag	
set metric-type	
set tag	
set ip precedence	IP

36.1.44 set level

match
set level **no**

set level {**level 1** | **level 2** | **level 1-2** | **stub-area** | **backbone**}

no set level

OSPF RIP backbone

```
Ruijie(config)# router ospf
Ruijie(config-router)# redistribute rip subnets
route-map redrip
Ruijie(config-router)# network 192.168.12.0 0.0.0.255
area 0
Ruijie(config-router)# exit
Ruijie(config)# route-map redrip permit 10
Ruijie(config-route-map)# set level backbone
```

match interface	
match ip address	

match ip next-hop	
match ip route-source	
match metric	
match route-type	
match tag	
set metric-type	
set tag	

36.1.45 set local-preference

```

match LOCAL_PREFERENCE
set local-preference no

```

```
set local-preference number
```

```
no set local-preference
```

<i>number</i>	0-4294967295

```
local-preference
```

```
local-preference
```

```

Ruijie(config)# route-map SET_PREF permit 10
Ruijie(config-route-map)# match as-path 1
Ruijie(config-route-map)# set local-preference 6800
Ruijie(config-route-map)# exit
Ruijie(config)# route-map SET_PREF permit 20
Ruijie(config-route-map)# match as-path 2
Ruijie(config-route-map)# set local-preference 50

```

match as-path	AS_PATH
match metric	
match origin	
set as-path prepend	AS_PATH
set metric	
set metric-type	

36.1.46 set metric

metric **match** **no** **set**

set metric [+ *metric-value* | - *metric-value* | *metric-value*]

no set metric



IP OSPF
route maps
set **match** 1 **match** 1

match
set metric-type **no**
set metric-type *type*
no set metric-type



type

match ip address	
match ip next-hop	
match ip route-source	
match metric	
match route-type	
match tag	
set metric	
set tag	

36.1.48 set next-hop

match IP
set next-hop no

set next-hop *ip-address*
no set next-hop *ip-address*

<i>ip-address</i>	IP

OSPF OSPF RIP
IP route maps

```

set match 1 match 1
set match 1 set

```

192.168.1.2

```

Ruijie(config)# route-map redrip permit 10
Ruijie(config-route-map)# match ip address 1
Ruijie(config-route-map)# set next-hop 192.168.1.2

```

match interface	
match ip address	
match ip next-hop	
match ip route-source	
match metric	
match route-type	
match tag	
set metric-type	
set tag	

36.1.49 set origin

```

match
set origin no
set origin {egp | igp | incomplete}
no set origin

```

egp	EGP
igp	IGP
incomplete	

```

Ruijie(config)# route-map SET_ORIGIN 10 permit
Ruijie(config-route-map)# match as-path 1
Ruijie(config-route-map)# set origin igp
Ruijie(config-route-map)# exit
Ruijie(config)# route-map SET_ORIGIN 20 permit
Ruijie(config-route-map)# match as-path 2
Ruijie(config-route-map)# set origin egp

```

match as-path	AS_PATH
match metric	
match origin	
set as-path prepend	AS_PATH
set metric	
set local-preference	

36.1.50 set originator-id

```

match
set originator-id no
set originator-id ip-addr
no originator-id [ip-addr]

```

<i>ip-addr</i>	

```
Ruijie(config)# route-map SET_ORIGIN 10 permit
Ruijie(config-route-map)# match as-path 1
Ruijie(config-route-map)# set originator-id 5.5.5.5
Ruijie(config-route-map)# exit
Ruijie(config)# route-map SET_ORIGIN 20 permit
Ruijie(config-route-map)# match as-path 2
Ruijie(config-route-map)# set originator-id 5.5.5.6
```



”

B

match BGP
set weight no
set weight *number*
no set weight

<i>number</i>	0-65535

BGP

neighbor weight
 32768

BGP

BGP in
 1.1.1.1 100

```

Ruijie(config)# router bgp 1
Ruijie(config-router)# neighbor 1.1.1.1 route-map
nei-rmap-in in
Ruijie(config-router)# exit
Ruijie(config)# route-map nei-rmap-in permit 10
Ruijie(config-route-map)# set weight 100
  
```

match as-path	AS_PATH
match community	
match metric	
match origin	
set community	COMMUNITY

set metric	
set metric-type	

36.2

36.2.1 show ip community-list

show ip community-list [*community-list-number* | *community-list-name*]

<i>community-list-number</i>	1-99 100-199
<i>community-list-name</i>	80

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

--	--

match community

C 192.1.1.254/32 is local host.

show ip route

O	C		
	S		
	R	RIP	
	B	BGP	
	O	OSPF	
	i	IS-IS	
	E1	OSPF	
	E2	OSPF	
	N1	OSPF NSSA	1
E2	N2	OSPF NSSA	2
	IA	OSPF	
	su	IS-IS	
	L1	IS-IS 1	
	L2	IS-IS 2	5l -13.194 -1.44 Td(E2)21009 Tw 6/C2_0

show ip route count

```
Ruijie# show ip route count
----- route info -----
the num of active route: 5
```

show ip route weight

```
Ruijie# show ip route weight
-----[distance/metric/weight]-----
S   23.0.0.0/8 [1/0/2] via 192.1.1.20
S   172.0.0.0/16 [1/0/4] via 192.0.0.1
```

36.2.4 show ipv6 prefix-list

IPv6 show ipv6
prefix-list
show ipv6 prefix-list [*prefix-name*]

<i>prefix-name</i>	IPv6

show route-map

show route-map *route-map-name*

<i>route-map-name</i>	

```
Ruijie# show route-map  
route-map AAA, permit, sequence 10  
Match clauses:  
ip address 2  
Set clauses:  
metric 10
```

route-map	
Permit	permit
sequence 10	
Match clauses	deny permit set
Set clauses	match

37 ACL

id	IP ACL: 1-99,1300-1999 IP ACL: 100-199,2000-2699 MAC ACL: 700-799 ACL: 2700-2899
name	ACL
sn	ACL ()
start-sn	
inc-sn	
deny	
permit	

prot

A	MAC	0	O	TTL	34
B	MAC	6	P		35
C		12	Q	IP	36
D	VLAN tag	14	R	ip	38
E	DSAP()	18	S	ip	42
F	SSAP()	19	T	TCP	46
G	Ctrl	20	U	TCP	48
H	Org Code				

permit
list-remark text
no sn

ip access-group
mac access-group
expert access-group
ipv6 traffic-filter

37.1.1 access-list

no

1) IP 1 - 99 1300 - 1999

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

2) IP 100 - 199 2000 - 2699

access-list id {deny | permit} protocol {source source-wildcard | host source | any} {destination destination-wildcard | host destination | any} [precedence precedence] [tos tos] [fragments] [time-range time-range-name]

3) MAC 700 - 799

access-list id {deny | permit} {any | host source-mac-address} {any | host destination-mac-address} [ethernet-type][cos [out][inner in]]

4) Expert 2700 - 2899

access-list id {deny | permit} [protocol | [ethernet-type][cos [out][inner in]]] [VID [out][inner in]] {source source-wildcard | host source | any} {host source-mac-address | any} {destination destination-wildcard | host destination | any} {host destination-mac-address | any} [[precedence precedence] [tos tos] [fragments] [time-range time-range-name]

Ethernet-type cos

access-list id {deny | permit} {ethernet-type| cos [out][inner in]] [VID [out][inner in]] {source source-wildcard | host source | any} {host source-mac-address | any} {destination destination-wildcard | host destination | any} {host destination-mac-address | any} [time-range time-range-name]

Protocol

access-list *id* {deny | permit}

source-wildcard
protocol IP

EIGRP

0.255.0.32

TCP Flag

urg

ack

psh

rst

syn

fin

critical

flash

flash-override

immediate

internet

network

priority

routine

max-reliability

max-throughput

min-delay

min-monetary-cost

normal

ICMP

administratively-prohibited

dod-host-prohibited

dod-net-prohibited

echo

echo-reply

fragment-time-exceeded

general-parameter-problem

host-isolated

host-precedence-unreachable

host-redirect

host-tos-redirect

host-tos-unreachable
host-unknown
host-unreachable
information-reply
information-request
mask-reply
mask-request
mobile-redirect
net-redirect
net-tos-redirect
net-tos-unreachable
net-unreachable
network-unknown
no-room-for-option
option-missing
packet-too-big
parameter-problem
port-unreachable
precedence-unreachable
protocol-unreachable
redirect
router-advertisement
router-solicitation
source-quench
source-route-failed
time-exceeded
timestamp-reply
timestamp-request
ttl-exceeded
unreachable

TCP **TCP**

bgp
chargen
cmd
daytime
discard

domain
echo
exec
finger
ftp
ftp-data
gopher
hostname
ident
irc
klogin
kshell
ldp
login
nntp
pim-auto-rp
pop2
pop3
smtp
sunrpc
syslog
tacacs
talk
telnet
time
uucp
whois
www

UDP

UDP

isakmp
mobile-ip
nameserver
netbios-dgm
netbios-ns
netbios-ss
ntp
pim-auto-rp
rip
snmp
snmptrap
sunrpc
syslog
tacacs
talk
tftp
time
who
xdmcp

Ethernet-type

aarp
appletalk
decnet-iv
diagnostic
etype-6000
etype-8042
lat
lavc-sca
mop-console
mop-dump
mumps
netbios
vines-echo
xns-idp

1) IP

IP 192.168.1.64 - 192.168.1.127

```
Ruijie(config)# access-list 1 permit 192.168.1.64
0.0.0.63
```

2) IP

IP DNS ICMP

```
Ruijie(config)# access-list 102 permit tcp any any eq domain
Ruijie(config)# access-list 102 permit udp any any eq domain
Ruijie(config)# access-list 102 permit icmp any any echo
Ruijie(config)# access-list 102 permit icmp any any echo-reply
```

3) MAC

MAC 00d0f8000c0c 100
1

```
Ruijie(config)# access-list 702 deny host 00d0f8000c0c any aarp
Ruijie(config)# interface gigabitethernet 1/1
Ruijie(config-if)# mac access-group 702 in
```

4) Expert

192.168.12.3 MAC 00d0.f800.0044 TCP Expert Extended ACL ACL IP

```
Ruijie(config)# access-list 2702 deny tcp host
192.168.12.3 mac 00d0.f800.0044 any any
Ruijie(config)# access-list 2702 permit any any any any
Ruijie(config)# show access-lists
expert access-list extended 2702
10 deny tcp host 192.168.12.3 mac 00d0.f800.0044 any any
10 permit any any any any
```

show access-lists	
mac access-group	MAC

IP ACL IP ACL **no**
 ACL

ip access-list {extended | standard} {id | name}
no ip access-list {extended | standard} {id | name}

id IP 1-99 1300-1999 100-199 2000-2699
name IP

ACL

ACL ACL
deny permit **show access-lists**
 ACL

ACL

```
Ruijie(config)# ip access-list extended 123
Ruijie(config-ext-nacl)# show access-lists
ip access-list extended 123
Ruijie(config-ext-nacl)#
```

ACL

```
Ruijie(config)# ip access-list standard std-acl
Ruijie(config-std-nacl)# show access-lists
ip access-list standard std-acl
Ruijie(config-std-nacl)#
```

show access-lists	IP

RGOS10.0

37.1.3 expert access-list

ACL

no

ACL

expert access-list extended {

ip ACL IPV6 ACL
no

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

no ip access-list resequence {id | name}

Id ACL

Name ACL

start-sn *Id*, 100 *Id* > 17 (enc-snsf-0.0c) 0 *Tw*

37.1.5 deny

(deny)
ACL

ACL

1) IP

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

2) IP

[sn] **deny protocol** source source-wildcard destination
destination-wildcard [**precedence** precedence] [**tos** tos] [**fragments**]
[**time-range** time-range-name]

IP

Internet Control Message Protocol (ICMP)

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

Transmission Control Protocol (TCP)

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

User Datagram Protocol (UDP)

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

3) MAC

[sn] **deny** {**any** | **host** source-mac-address}{**any** | **host**
destination-mac-address} [ethernet-type][**cos** [out] [inner in]]

4) Expert

[sn] **deny**[protocol | [ethernet-type][**cos** [out] [inner in]]] [[**VID** [out][inner in]]]
{source source-wildcard | **host** source | **any**}{**host** source-mac-address | **any** }
{destination destination-wildcard | **host** destination | **any**} {**host**

ACL

source-ipv6-address { *destination-ipv6-prefix / prefix-length* | **any** | *hostdestination-ipv6-address* } [**dscp** *dscp*] [**flow-label** *flow-label*] [**fragments**] [**time-range** *time-range-name*]

IPV6

Internet Control Message Protocol (ICMP)

[*sn*] **deny icmp** { *source-ipv6-prefix / prefix-length* | *any source-ipv6-address* | **host** } { *destination-ipv6-prefix / prefix-length* | **host destination-ipv6-address** | **any** } [*icmp-type*] [[*icmp-type icmp-code*]] | [*icmp-message*] [**dscp** *dscp*] [**flow-label** *flow-label*] [**fragments**] [**time-range** *time-range-name*]

Transmission Control Protocol (TCP)

[*sn*] **deny tcp** { *source-ipv6-prefix / prefix-length* | **host source-ipv6-address** | **any** } [*operator* **port** [*port*]] { *destination-ipv6-prefix / prefix-length* | **host destination-ipv6-address** | **any** } [*operator* **port** [*port*]] [**dscp** *dscp*] [**flow-label** *flow-label*] [**fragments**] [**time-range** *time-range-name*] [**match-all** *tcp-flag*]

User Datagram Protocol (UDP)

[*sn*] **deny udp** { *source-ipv6-prefix/prefix-length* | **host source-ipv6-address** | **any** } [*operator* **port** [*port*]] { *destination-ipv6-prefix / prefix-length* | **host destination-ipv6-address** | **any** } [*operator* **port** [*port*]] [**dscp** *dscp*] [**flow-label** *flow-label*] [**fragments**] [**time-range** *time-range-name*]

access-list

Sn ACL

source-ipv6-prefix IPv6

destination-ipv6-prefix IPv6

prefix-length

source-ipv6-address IPv6

destination-ipv6-address IPv6

dscp

dscp 0-63.

flow-label

flow-label 0-1048575.

protocol IPv6 IPv6 | icmp | tcp | udp <0-255>

ACL

ACL

ACL

		Expert Extended ACL	ACL	IP
192.168.4.12	MAC	001300498272	TCP	

```
Ruijie(config)# expert access-list extended 2702
Ruijie(config-exp-nacl)# deny tcp host
192.168.4.12 host 0013.0049.8272 any any
Ruijie(config-exp-nacl)# permit any any any any
Ruijie(config-exp-nacl)# show access-lists
expert access-list extended 2702
10 deny tcp host 192.168.4.12 host 0013.0049.8272 any any
20 permit any any any any
Ruijie(config-exp-nacl)#
```

IP	ACL	IP	192.168.4.12	TCP
100		1		

```
Ruijie(config)# ip access-list extended ip-ext-acl
Ruijie(config-ext-nacl)# deny tcp host 192.168.4.12 eq 100 any
Ruijie(config-ext-nacl)# show access-lists
ip access-list extended ip-ext-acl
10 deny tcp host 192.168.4.12 eq 100 any
Ruijie(config-ext-nacl)# exit
Ruijie(config)# interface gigabitethernet 1/1
Ruijie(config-if)# ip access-group ip-ext-acl in
Ruijie(config-if)#
```

MAC	ACL	MAC	0013.0049.8272
100		1	

```
Ruijie(config)# mac access-list extended mac1
Ruijie(config-mac-nacl)# deny host 0013.0049.8272 any aarp
Ruijie(config-mac-nacl)# show access-lists
mac access-list extended mac1
10 deny host 0013.0049.8272 any aarp
Ruijie(config-mac-nacl)# exit
Ruijie(config)# interface gigabitethernet 1/1
Ruijie(config-if)# mac access-group mac1 in
```

IP ACL

37.1.6 permit

(**permit**)
ACL

ACL

1) IP

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

2) IP

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

IP

Internet Control Message Protocol (ICMP)

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

Transmission Control Protocol (TCP)

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

User Datagram Protocol (UDP)

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

3) MAC

[*sn*] **permit** {**any** | **host source-mac-address**} {**any** | **host**
destination-mac-address} [*ethernet-type*][**cos** [*out*] [*inner in*]]

4) Expert

[*sn*] **permit** [**protocol** | [*ethernet-type*][**cos** [*out*] [*inner in*]]] [**VID** [*out*]/[*inner in*]]
{*source source-wildcard* | **host source** | **any**} {**host source-mac-address** | **any** }
{*destination destination-wildcard* | **host destination** | **any**} {**host**

destination-mac-address | **any** [**precedence** *precedence*] [**tos** *tos*][**fragments**]
[**time-range** *time-range-name*]

Ethernet-type cos

[*sn*] **permit** {*ethernet-type*| **cos** [*out*] [*inner in*]} [**VID** [*out*][*inner in*]]
{*source source-wildcard* | **host source** | **any**} {**host**
source-mac-address | **any**} {*destination destination-wildcard* | **host**
destination | **any**} {**host destination-mac-address** | **any**} [**time-range**
time-range-name]

Protocol

[*sn*] **permit protocol** [**VID** [*out*][*inner in*]] {*source source-wildcard* |
host Source | **any**} {**host source-mac-address** | **any** } {*destination*
destination-wildcard | **host destination** | **any**} {**host**
destination-mac-address | **any**} [**precedence** *precedence*] [**tos** *tos*]
[**fragments**] [**time-range** *time-range-name*]

Expert

Internet Control Message Protocol (ICMP)

[*sn*] **permit icmp** [**VID** [*out*][*inner in*]] {*source source-wildcard* | **host source** | **any**}
{**host source-mac-address** | **any** } {*destination*
destination-wildcard

| *hostdestination-ipv6-address*} [**dscp** *dscp*] [**flow-label**
flow-label] [**fragments**] [*94efrangfname*]

IPV6

Internet Control Message Protocol (ICMP)

[*sn*] **permit icmp** {*source-ipv6-prefix / prefix-length* | **any**
source-ipv6-address | **host**

```
Ruijie(config-exp-nacl)# permit tcp host 192.168.4.12 host  
0013.0049.8272 any any  
Ruijie(config-exp-nacl)# deny any any any any  
Ruijie(config-exp-nacl)# show access-lists  
expert access-list extended exp-acl  
10 permit tcp host 192.168.4.12 host 0013.0049.8272 any any  
20 deny any any any any  
Ruijie(config-exp-nacl)#
```

IP	ACL	IP	192.168.4.12	TCP
100		1		

```
Ruijie(config)# ip access-list extended 102  
Ruijie(config-ext-nacl)# permit tcp host 192.168.4.12 eq 100  
any  
Ruijie(config-ext-nacl)# show access-lists  
ip access-list extended 102  
10 permit tcp host 192.168.4.12 eq 100 any  
Ruijie(config-ext-nacl)# exit  
Ruijie(config)# interface gigabitethernet 1/1  
Ruijie(config-if)# ip access-group 102 in  
Ruijie(config-if)#
```

MAC	ACL	MAC	0013.0049.8272
100		1	

```
Ruijie(config)# mac access-list extended 702  
Ruijie(config-mac-nacl)# permit host 0013.0049.8272 any aarp  
Ruijie(config-mac-nacl)# show access-lists  
mac access-list extended  
10 permit host 0013.0049.8272 any aarp702  
Ruijie(config-mac-nacl)# exit  
Ruijie(config)# interface gigabitethernet 1/1  
Ruijie(config-if)# mac access-group 702 in
```

ip	ACL	IP	192.168.4.12
----	-----	----	--------------

IPV6

ACL

IP

192.168.4.12

ACL

ACL

```
Ruijie# ip access-list extended 102
Ruijie(config-ext-nacl)# list-remark this acl is to filter the
host 192.168.4.12
Ruijie(config-ext-nacl)# show access-lists
ip access-list extended 102
deny ip host 192.168.4.12 any
1000 hits
this acl is to filter the host 192.168.4.12
Ruijie(config-ext-nacl)#
```



show access-lists

```
Ruijie(config-ipv6-nacl)# 12 deny ipv6 host any any
Ruijie(config-ipv6-nacl)# show access-lists
ipv6 access-list extended v6-acl
10 permit ipv6 host ::192.168.4.12 any
12 deny ipv6 any any
Ruijie(config-ipv6-nacl)# no 12
Ruijie(config-ipv6-nacl)# show access-lists
ipv6 access-list extended v6-acl
10 permit ipv6 host ::192.168.4.12 any
Ruijie(config-ipv6-nacl)#
```

ip access-group

GigabitEthernet0/0 120

```
Ruijie(config)# interface GigabitEthernet 0/0
Ruijie(config-if)#ip access-group 120 in
```

access-list	
show access-lists	

RGOS10.0

37.1.10 expert access-group

EXPERT ACL no

expert access-group {*id* | *name*} {**in** | **out**} [**unreflect**]
no expert access-group {*id* | *name*} {**in** | **out**} [**unreflect**]

id Expert 2700-2899

name Expert

in

out

unreflect ACL

Expert ACL

ACL show
access-group

access-list accept_00d0f8xxxxxx_only Gigabit 1

```
Ruijie(config)# interface GigaEthernet 0/1
Ruijie(config-if)# expert access-group
accept_00d0f8xxxxxx_only in
```

show access-group	ACL

RGOS10.0

37.1.11 ipv6 traffic-filter

IPV6 ACL no

```
ipv6 traffic-filter name {in | out}
no ipv6 traffic-filter name {in | out}
```

name IPV6

in

out

IPV6 ACL

ACL show
ipv6 traffic-filter

```
Ruijie(config)# interface GigaEthernet 0/1
Ruijie(config-if)# ipv6 traffic-filter v6-acl in
```

show access-group	ACL

RGOS10.0

37.2

:

show access-lists

show ip access-group

```
ip access-list extended 102
Ruijie# show access-lists
ip access-list standard n_acl
ip access-list extended 101
mac access-list extended mac-acl
expert access-list extended exp-acl
ipv6 access-list extended v6-acl
```

ip access-list	IP ACL

ip access-list	IP ACL
-----------------------	--------

RGOS10.0

37.2.3 show expert access-group

Expert

show expert access-group [interface <interface>]

<interface>

Expert ACL

Expert ACL

```
Ruijie# show expert access-group interface gigabitethernet 0/2
expert access-group ee in
Applied On interface GigabitEthernet 0/2.
```

expert access-list	Expert ACL

RGOS10.0

37.2.4 show ipv6 traffic-filter

IPV6

show ipv6 traffic-filter [interface <interface>]

<interface>

IPv6 ACL

IPv6 ACL

```
Ruijie# show ipv6 traffic-filter interface gigabitethernet 0/4
ipv6 traffic-filter v6 in
Applied On interface GigabitEthernet 0/4.
```

ipv6 access-list	IPV6 ACL

RGOS10.0

37.2.5 show access-group

ACL

show access-group [interface <interface>]

<interface>

ACL

ACL

```
Ruijie# show access-group
ip access-list standard ipstd3
Applied On interface GigabitEthernet 0/1.
ip access-list standard ipstd4
Applied On interface GigabitEthernet 0/2.
ip access-list extended 101
Applied On interface GigabitEthernet 0/3.
ip access-list extended 102
Applied On interface GigabitEthernet 0/8.
```

ip access-group	ip

macref0 gBE.42>Tj/TT0 1 Tf015007 Tc 0 Tw 17.634 0.023 TMACACL

38 RPL

38.1

38.1.1 reverse-path

reverse-path

no

reverse-path

no reverse-path

	-	-

└───┘

└───┘

└───┘

```

1          RPL .
Ruijie(config)# interface gigabitEthernet 0/0
Ruijie(config-if)# reverse-path

```

	-	-

└───┘

	10.3(3b7)	10.3(4)

39

39.1

39.1.1 acpp

```
AAA                PPP                ppp authentication
no                 no
```

```
ppp authentication {chap | pap | chap pap | pap chap} [callin]
no ppp authentication {chap | pap}
```

```
rate                pps
burst-rate          pps
```

ACPP

```
control-plane
```

```
1                200pps                300pps
Ruijie(config)# control-plane data
Ruijie(config-cp)# acpp bw-rate 200 bw-burst-rate 300
```

```
Ruijie(config)# control-plane control-plane
{protocol | manage | data}
```


protocol	
manage	
data	

└──

└──

└──

```

%                control-plane
Ruijie(config)# control-plane protocol
Ruijie(config-cp)#

```

-	!

└──

-	-

39.1.4 debug ef-rnfp

debug ef-rnfp

no

debug ef-rnfp [acpp | scpp | glean-car | arp-car | port-filter | mpp | all]

no debug ef-rnfp [acpp | scpp | glean-car | arp-car | port-filter | mpp | all]

-	-

└──

└──

|

1 arp-car
Ruijie# debug ef-rnfp arp-car

Ruijie# show ef-rnfp debug-buf [clear echo]	REF show ef-rnfp debug-buf [clear echo]

|

-	-

39.1.5 ef-rnfp

ef-rnfp enable
ef-rnfp disable

ef-rnfp enable
ef-rnfp disable

-	-

|

control-plane

|

1
Ruijie(config)# **control-plane**
Ruijie(config-cp)# **ef-rnfp disable**

--	--

Ruijie(config)# control-plane {protocol manage data}	control-plane
-	-

39.1.6 glean-car

control-plane	IP	Glean-CAR
no	glean-car	
glean-car packet_rate_per_group [log]		
no glean-car		
packet_rate_per_group		pps

Glean-CAR	Glean
5pps	

control-plane

%	Glean
10pps	
Ruijie(config)# control-plane data	
Ruijie(config-cp)# glean-car 10	

Ruijie(config)# control-plane {protocol manage data}	control-plane
---	---------------

--	--

	-	-
--	---	---

39.1.7 management-interface

MPP

MPP

Port-Filter

Port-Filter

control-plane

port-filter

no

Port-Filter

port-filter [log]

no port-filter

-	-

no scpp list acl_no

--	--

acl_no

show ef-rnfp

**show ef-rnfp [acpp | scpp | glean-car | arp-car | port-filter | mpp | all |
debug-buf [clear | echo]]**

-	-

```
TOTALLY dropped 0 packets
Protocol subinterface: disable
ARP CAR information: //ARP-CAR
Manage subinterface: enable
RULE:
    allow packet rate per source: 30(pps)
    log: off
STATISTIC:
    dropped 181 packets
Glean CAR information: //Glean-CAR
Data subinterface: disable
Port Filter information:
Manage subinterface: disable
Management plane protection information: //MPP
Manage subinterface: disable
```

2

```
Ruijie#show ef-rnfp debug-buf echo
```

```
-----
                echo EF-RNFP debug record buffer
total: 65536Byte used: 10560Byte percentage: 16%
-----
FUNC: ef_rnfp_pkt_classify          LINE: 164  INFO: origin reserve
reason EXT: 0xc
FUNC: ef_rnfp_pkt_classify          LINE: 348  INFO: detail
classify ok EXT: 0x1
FUNC: ef_rnfp_pkt_acpp              LINE: 383  INFO: token_num EXT:
0xf41fe
FUNC: ef_rnfp_pkt_acpp              LINE: 393  INFO: acpp permit
FUNC: ef_rnfp_pkt_scpp              LINE: 1008 INFO: flow priv
do_scpp is 0
FUNC: ef_rnfp_pkt_scpp              LINE: 1050 INFO: estab flow, no
flow_event happen
FUNC: ef_rnfp_pkt_scpp              LINE: 1055 INFO: estab flow, no
flow_event
happen, no need scpp handle
FUNC: ef_rnfp_pkt_main_process      LINE: 1460 INFO: ef rnfp pkt
proc ok, permit EXT: 0x1
FUNC: ef_rnfp_pkt_classify          LINE: 164  INFO: origin reserve
reason EXT: 0x18
```

40

40.1

40.1.1 ip inspect name

no

ip inspect name *inspection_name protocol*

no ip inspect name *inspection_name protocol*

inspection_name:

protocol:

sip h323, tcp

ftp mms rtsp

abc ftp mms 123 mms h.323

Ruijie(config)# **ip inspect name abc ftp**

Ruijie(config)# **ip inspect name abc mms**

Ruijie(config)# **ip inspect name 123 mms**

Ruijie(config)# **ip inspect name 123 h323**

40.1.2 show ip inspect

show ip inspect *parameter*

parameter: **name** *inspection_name*

interface

all

abc

Ruijie# **show ip inspect name** abc

Inspection name abc

ftp 1 21 0 [T 1 0 1 0 c t 1 0 c t

1/0 abc

```
Ruijie(conf)# interface ethernet 1/0  
Ruijie(conf-if)# ip inspect abc in
```

40.2 IP MAC

40.2.1 ipmacbind

IP MAC no

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

A.B.C.D: IP

H.H.H: MAC

log:

IP MAC

IP MAC

	IP MAC		
MAC	IP	IP	MAC

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

40.2.2 ipmacbind auto

ARP	IP MAC
-----	--------

```
ipmacbind auto log
```

log:

IP MAC

ARP	IP MAC	IP MAC
-----	--------	--------

ARP	IP MAC
-----	--------

```
Ruijie(config)# ipmacbind auto
```

40.2.3 ipmacbind default action

IP MAC	/
--------	---

```
ipmacbind default action {permit | deny}
```

permit: IP MAC

deny: IP MAC

IP MAC

IP MAC

Ruijie(config)# **ipmacbind** default action permit

40.2.4 clear ipmacbind

IP MAC

clear ipmacbind {dynamic | all}

dynamic: ARP IP MAC

all: IP MAC

IP MAC

IP MAC

IP MAC

ARP

IP MAC

```
Ruijie# clear ipmacbind dynamic
```

40.2.5 show ipmacbind

IP MAC

```
show ipmacbind table | hash | statistic
```

```
table:    IP MAC
```

```
hash:     IP MAC
```

```
statistic: IP MAC
```

IP MAC

IP MAC

```
Ruijie# show ipmacbind table
```

No.	Type	IP address	MAC address	Log
1	static	192.168.52.66	52e1.5d33.aa21	on
2	auto	192.168.52.50	112e.3ca4.3381	off

<-- output omitted -- >

40.3

40.3.1 ip ingress-filter

no

```
ip ingress-filter log
```

no ip ingress-filter

log:

no

Ruijie(config)# **interface ethernet 1/0**

Ruijie(conf-if)# **ip ingress-filter log**

40.3.2 show ip ingress-filter

show ip ingress-filter

show

Ruijie# **show**

Interface GigabitEthernet 1/0: log is on, blocked 0 flows

40.4 TCP SYN

40.4.1 ip tcp-intercept list

TCP SYN no

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

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

extended_ACL_#:

in | out:

log:

TCP SYN

TCP SYN

```
eth 1/0          TCP      TCP SYN
Ruijie(config)# access-list 100 tcp permit any any
Ruijie(config)# interface ethernet 1/0
Ruijie(config-if)# ip tcp-intercept list 100 in log
```

40.4.2 show ip tcp-intercept

TCP SYN

show ip tcp-intercept

TCP SYN

TCP SYN

```
Ruijie# show ip tcp-intercept  
Intercepting new connections using access-list 100 at  
GigabitEthernet 0/1 in  
12 incomplete, 5 established connections (total 17)
```

40.5 TCP

40.5.1 ip inspect name tcp

tcp TCP no

ip inspect name *inspection_name* tcp

no ip inspect name *inspection_name* tcp

inspection_name: ACL

```
tcp
tcp          ip inspect
tcp          show ip inspect

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

```
ip inspect name
```

1000

100

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

40.7

40.7.1 ip rate-control

ip rate-control *acl_no* **bandwidth** {both|up|down} *rate* <session total
session_no> <rate *rate_no*>

no ip rate-control *acl_no* **bandwidth** {both|up|down} *rate* <session total
session_no> <rate *rate_no*>

acl_no

rate kBps

session_no

rate_no

both

200kBps

500

100

ip rate-control 1 bandwidth both 200 session total 500 rate 100

40.8

40.8.1 ip session log-on

no

ip session log-on

no ip session log-on

```
Ruijie(config)#ip session log-on
```

40.8.2 ip session timeout

no

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

timeout_value

icmp-closed 10
icmp-started 10
icmp-connected 10
tcp-established 1800
tcp-syn-sent 10
tcp-syn-receive 10
tcp-fin-wait 60
tcp-time-wait 10
tcp-closed 10
tcp-close-wait 60
tcp-last-ack 30
udp-closed 10
udp-started 60
udp-connected 30
udp-established 600
rawip-closed 10
rawip-started 300
rawip-connected 300
rawip-established 300

icmp-connected 10

Ruijie(config)#**ip session timeout icmp-connected** 10

40.8.3 ip session threshold

no

ip session threshold icmp-closed *threshold_value*
ip session threshold icmp-started *threshold_value*
ip session threshold tcp-syn-sent *threshold_value*
ip session threshold tcp-syn-receive *threshold_value*
ip session threshold tcp-closed *threshold_value*
ip session threshold udp-closed *threshold_value*
ip session threshold rawip-closed *threshold_value*
no ip session threshold icmp-closed
no ip session threshold icmp-started
no ip session threshold tcp-syn-sent
no ip session threshold tcp-syn-receive
no ip session threshold tcp-closed
no ip session threshold udp-closed
no ip session threshold rawip-closed

threshold_value

icmp-closed	10
icmp-started	300
tcp-syn-sent	10
tcp-syn-receive	20
tcp-closed	20
udp-closed	10

rawip-closed 10

icmp-started 10

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

40.8.4 ip session track-state-strictly

	TCP	ICMP
TCP	SYN	ICMP
		no

ip session track-state-strictly

no ip session track-state-strictly

Ruijie(config)#ip session track-state-strictly

X

41 VPDN

41.1 VPDN

VPDN ()

LNS(L2TP) HGW(PPTP)

192.168.12.223

```
Ruijie(config)# vpdn source-ip 192.168.12.223
Ruijie(config)#
```

41.1.3 vpdn session-limit

VPDN no

vpdn session-limit *sessions*

no vpdn session-limit

sessions VPDN

36 300

VPDN

100

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

41.2 VPDN

41.2.1 clear vpdn tunnel

```
clear vpdn tunnel [{l2tp | pptp }[remote-host-name]]
```

l2tp L2TP

pptp PPTP

remote-host-name

(PPTP L2TP)

L2TP

```
Ruijie# show vpdn
```

```
L2TP Tunnel and Session Information Total tunnels 1 sessions  
1
```

```
LocID RemID Remote Name State Remote Address Port Sessions
```

```
L2TP Class/
```

```
VPDN Group
```

```
1 1 BLIZZARD est 192.168.12.213 1701 1 1
```

```
LocID RemID TunID Username, Intf/
```

```
%CHANGED: Interface Virtual-Access1, changed state to
administratively down
```

```
Ruijie# show vpdn
%No active L2TP tunnels
%No active PPTP tunnels
Ruijie#
```

41.2.2 show vpdn

VPDN

show vpdn [session | tunnel]

session

tunnel

VPDN

VPDN

VPDN

```
Ruijie# show vpdn
L2TP Tunnel and Session Information Total tunnels 1 sessions
1
LocID RemID Remote Name State Remote Address Port Sessions
L2TP Class/
VPDN Group
4 77 BLIZZARD est 192.168.12.213 1701 1 1
LocID RemID TunID Username, Intf/ State
Last Chg
Vcid, Circuit
1 1 4 ms,Vil1 est
00:33:58
%No active PPTP tunnels
Ruijie#
```

VPDN

```

                VPDN
                error event packet
    VPDN      L2TP  PPTP      VPDN
                L2TP

```

```

    pptp          debug vpdn event

```

```

VPDN: Pptp rcv start-control-connection-request from host
192.168.200.114
PPTP: New tunnel socket id =9
VPDN: Pptp get tunnel info for 192.168.200.114 ok!
VPDN: Pptp send start-control-connection-reply, ok
VPDN: Pptp tunnel id 0 state change: idle --> estbed
PPTP: Add send-echo-request timer, interval = 60
VPDN: Pptp tunnel id 0 rcv outgoing-call-request!
Pptp: Tunnel to 192.168.200.114 get config para. from vpdn-group
pptp!
VPDN: Must process using ACCEPT_DIALIN parameters
Pptp: Session va0 get config para. from vpdn-group pptp!
VPDN: Pptp session va0 state change: idle --> connected
PPTP: Receive outcall request,process ok!assign local call id
= 1
VPDN: Pptp tunnel id 0 send out-call reply
%LINK CHANGED: Interface virtual-access 0, changed state to up
VPDN: Pptp tunnel to 192.168.200.114 peer callid 1 rcv
set-linkinfo
VPDN: Pptp tunnel to 192.168.200.114 peer callid 1 rcv
set-linkinfo
%LINE PROTOCOL CHANGE: Interface virtual-access 0, changed state
to UP

```

```

    pptp          debug vpdn packet

```

```

PPTP: I Start-Control-Connection-Request len 156 Magic Cookie
0x1A2B3C4D
Protocol Version 0x100
Framing Type 0x1
Bearer Type 0x1
Maximum Channels 0x0
Firmware Revision 0x893
Host Name:
endor String: Microsoft Windows NT
PPTP: O Start-Control-Connection-Reply len 156 Magic Cookie
0x1A2B3C4D

```

Protocol Version 0x100
Framing Type 0x2
Bearer Type 0x3
Maximum Channels 0x0
Firmware Revision 0x100
Host Name: Dingjs
Vendor String: Ret-Giant Network Operating System
PPTP: I Outgoing-Call-Request len 168 Magic Cookie 0x1A2B3C4D
Call Id 0x4000
Call Serial Number 0x96A5
Min BPS 0x12C
Max BPS 0x5F5E100
Bearer Type 0x3
Framing Type 0x3
Rec Window Size 0x40
Proc Delay 0x0
Phone Number Length 0x0
Phone Number:
Subaddress:
PPTP: O Outgoing-Call-Reply len 32 Magic Cookie 0x1A2B3C4D
Call Id 0x1
Peer Call Id 0x4000
Result Code 0x1
Error Code 0x0
Cause Code 0x0
Connect Speed 0xFA00
Rec Window Size 0x10
Physical Channel Id 0x0
PPTP: I Set-Link-Info len 24 Magic Cookie 0x1A2B3C4D
Peer Call Id 0x1
Send ACCM 0xFFFFFFFF
Recv ACCM 0xFFFFFFFF
%UPDOWN: Interface Virtual-Access1, changed state to up
Vil VPDN PROCESS Into tunnel: Sending 54 byte pak
Vil VPDN PROCESS Into tunnel: Sending 64 byte pak
Vil 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
Vil VPDN PROCESS Into tunnel: Sending 45 byte pak
Vil VPDN PROCESS Into tunnel: Sending 46 byte pak
Vil VPDN PROCESS Into tunnel: Sending 187 byte pak
Vil VPDN PROCESS Into tunnel: Sending 56 byte pak

Vil VPDN PROCESS Into tunnel: Sending 64 byte pak
Vil VPDN PROCESS Into tunnel: Sending 50 byte pak
Vil VPDN PROCESS Into tunnel: Sending 50 byte pak
Vil VPDN PROCESS Into tunnel: Sending 52 byte pak

pptp

debug vpdn error

VPDN: PPTP session Virtual-Access1 wait pak ack timeout(wait seq=37, ack=36), decrease send window to half of current = 33!
VPDN: PPTP session Virtual-Access1 adjust ATO to 220 ms!
VPDN: PPTP session Virtual-Access1 wait pak ack timeout(wait seq=38, ack=36), decrease send window to half of current = 16!
VPDN: PPTP session Virtual-Access1 adjust ATO to 280 ms!
VPDN: PPTP session Virtual-Access1 wait pak ack timeout(wait seq=39, ack=36), decrease send window to half of current = 8!
VPDN: PPTP session Virtual-Access1 adjust ATO to 400 ms!
VPDN: Pptp EGRE encap fail, err=-4!
VPDN: PPTP session Virtual-Access1 wait pak ack timeout(wait seq=40, ack=36), decrease send window to half of current = 4!
VPDN: PPTP session Virtual-Access1 adjust ATO to 640 ms!

LNS

()

VPDN

Ruijie# **debug vpdn error**

vpdn protocol errors debugging is on

Ruijie# **debug vpdn event**

vpdn events debugging is on

Ruijie# **debug vpdn packet**

vpdn packet debugging is on

Ruijie# **show debug**

VPDN:

vpdn events debugging is on

vpdn protocol errors debugging is on

vpdn packet debugging is on

Ruijie#

VPDN PROCESS From tunnel: Received 158 byte pak

L2X: UDP socket write 168 bytes, 192.168.12.217(1701) to 192.168.12.242(1701)

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

VPDN PROCESS From tunnel: Pak consumed

VPDN PROCESS From tunnel: Received 70 byte pak

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

VPDN PROCESS From tunnel: Pak consumed

```
VPDN PROCESS From tunnel: Received 76 byte pak
Get virtual-access from free queue: Virtual-Access1
Clone virtual-access from interface Virtual-Templat1
L2X: UDP socket write 56 bytes, 192.168.12.217(1701) to
192.168.12.242(1701)
L2X: UDP socket write 40 bytes, 192.168.12.217(1701) to
192.168.12.242(1701)
VPDN PROCESS From tunnel: Pak consumed
VPDN PROCESS From tunnel: Received 76 byte pak
L2X: UDP socket write 40 bytes, 192.168.12.217(1701) to
192.168.12.242(1701)
Vil Tnl/Sn 3/1 L2TP: Virtual interface created for unknown,
bandwidth 1024 Kbps
Vil Tnl/Sn 3/1 L2TP: VPDN session up
VPDN PROCESS From tunnel: Pak consumed
VPDN PROCESS From tunnel: Received 50 byte pak
Vil VPDN PROCESS From tunnel: Queue 14 byte pak to ppp parse
and iqueue
Vil VPDN PROCESS From tunnel: Pak send successful
%UPDOWN: Interface Virtual-Access1, changed state to up
Vil VPDN PROCESS Into tunnel: Sending 54 byte pak
L2X: UDP socket write 54 bytes, 255.255.255.255(1701) to
4.83.68.68(1701)
VPDN PROCESS From tunnel: Received 50 byte pak
Vil VPDN PROCESS From tunnel: Queue 14 byte pak to ppp parse
and iqueue
Vil VPDN PROCESS From tunnel: Pak send successful
Vil VPDN PROCESS Into tunnel: Sending 50 byte pak
L2X: UDP socket write 50 bytes, 255.255.255.255(1701) to
4.83.68.68(1701)
Vil VPDN PROCESS Into tunnel: Sending 54 byte pak
L2X: UDP socket write 54 bytes, 255.255.255.255(1701) to
4.83.68.68(1701)
VPDN PROCESS From tunnel: Received 50 byte pak
Vil VPDN PROCESS From tunnel: Queue 14 byte pak to ppp parse
and iqueue
Vil VPDN PROCESS From tunnel: Pak send successful
Vil VPDN PROCESS Into tunnel: Sending 50 byte pak
L2X: UDP socket write 50 bytes, 255.255.255.255(1701) to
4.83.68.68(1701)
Vil VPDN PROCESS Into tunnel: Sending 54 byte pak
L2X: UDP socket write 54 bytes, 255.255.255.255(1701) to
4.83.68.68(1701)
VPDN PROCESS From tunnel: Received 50 byte pak
```

Vil VPDN PROCESS From tunnel: Queue 14 byte pak to ppp parse and iqueue
Vil VPDN PROCESS From tunnel: Pak send successful
Vil VPDN PROCESS Into tunnel: Sending 50 byte pak
L2X: UDP socket write 50 bytes, 192.168.12.217(1701) to 192.168.12.242(1701)
Vil VPDN PROCESS Into tunnel: Sending 54 byte pak
L2X: UDP socket write 54 bytes, 192.168.12.217(1701) to 192.168.12.242(1701)
VPDN PROCESS From tunnel: Received 54 byte pak
Vil VPDN PROCESS From tunnel: Queue 18 byte pak to ppp parse and iqueue
Vil VPDN PROCESS From tunnel: Pak send successful
VPDN PROCESS From tunnel: Received 56 byte pak
Vil VPDN PROCESS From tunnel: Queue 20 byte pak to ppp parse and iqueue
Vil VPDN PROCESS From tunnel: Pak send successful
Vil VPDN PROCESS Into tunnel: Sending 45 byte pak
L2X: UDP socket write 45 bytes, 192.168.12.217(1701) to 192.168.12.242(1701)
Vil VPDN PROCESS Into tunnel: Sending 50 byte pak
L2X: UDP socket write 50 bytes, 192.168.12.217(1701) to 192.168.12.242(1701)
VPDN PROCESS From tunnel: Received 50 byte pak
Vil VPDN PROCESS From tunnel: Queue 14 byte pak to ppp parse and iqueue
Vil VPDN PROCESS From tunnel: Pak send successful
Vil VPDN PROCESS Into tunnel: Sending 50 byte pak
L2X: UDP socket write 50 bytes, 192.168.12.217(1701) to 192.168.12.242(1701)
VPDN PROCESS From tunnel: Received 50 byte pak
Vil VPDN PROCESS From tunnel: Queue 14 byte pak to ppp parse and iqueue
Vil VPDN PROCESS From tunnel: Pak send successful
VPDN PROCESS From tunnel: Received 50 byte pak
Vil VPDN PROCESS From tunnel: Queue 14 byte pak to ppp parse and iqueue
Vil VPDN PROCESS From tunnel: Pak send successful
Vil VPDN PROCESS Into tunnel: Sending 50 byte pak
L2X: UDP socket write 50 bytes, 192.168.12.217(1701) to 192.168.12.242(1701)
%UPDOWN: Line protocol on Interface Virtual-Access1, changed state to up

LNS () debug vpdn
I2x-data

L2X: Punting to L2TP control message queue
L2X: Punting to L2TP control message queue
L2X: Punting to L2TP control message queue
L2X: Punting to L2TP control message queue
L2X: Punting to L2TP control message queue
L2X: Punting to L2TP control message queue
%UPDOWN: Interface Virtual-Access1, changed state to up
%UPDOWN: Line protocol on Interface Virtual-Access1, changed state to up

L2TP debug vpdn I2x-error

Tnl 14 L2TP: Tunnel auth failed for BLIZZARD
Tnl 14 L2TP: Expected
9E 8D 7A 8E 78 EA 41 9F A1 74 01 21 DE 4F F3 F0
Tnl 14 L2TP: Got
84 E5 62 69 AE 46 A5 98 4E FE E2 38 EE F2 B7 E2

LNS () debug
vpdn I2x-events

L2TP: I SCCRQ from C3640 tnl 26656
New tunnel created for remote C3640, address 192.168.12.242
Tnl 0 L2TP: Got a challenge in SCCRQ, C3640
Tnl 20 L2TP: O SCCRP to C3640 tnlid 26656
Tnl 20 L2TP: Control channel retransmit delay set to 1 seconds
Tnl 20 L2TP: Tunnel state change from idle to wait-ctl-conn
Tnl 20 L2TP: I SCCCN from C3640 tnl 26656
Tnl 20 L2TP: Got a Challenge Response in SCCCN, C3640
Tnl 20 L2TP: Tunnel Authentication success
Tnl 20 L2TP: Tunnel state change from wait-ctl-conn to established
Tnl 20 L2TP: SM State established
Tnl 20 L2TP: I ICRQ from C3640 tnl 26656
Tnl/Sn 20/1 L2TP: Accepted ICRQ, new session created
Tnl/Sn 20/1 L2TP: O ICRP to C3640 26656/1279
Tnl/Sn 20/1 L2TP: Session state change from idle to wait-connect
Tnl 20 L2TP: Control channel retransmit delay set to 1 seconds
Tnl/Sn 20/1 L2TP: I ICCN from C3640 tnl 26656, cl 1279
Tnl/Sn 20/1 L2TP: Session state change from wait-connect to wait-for-service-selection-iccn

```
Vil Tnl/Sn 20/1 L2TP: Session state change from
wait-for-service-selection- iccn to established
%UPDOWN: Interface Virtual-Access1, changed state to up
%UPDOWN: Line protocol on Interface Virtual-Access1, changed
state to up
```

```
LNS ( ) debug
vpdn l2x-packets
```

```
L2TP: I SCCRQ from C3640 tnl 18889
L2X: Parse AVP 0, len 8, flag 0x8000 (M)
L2X: Parse SCCRQ
L2X: Parse AVP 2, len 8, flag 0x8000 (M)
L2X: Protocol Ver 1
L2X: Parse AVP 6, len 8, flag 0x0
L2X: Firmware Ver 0x1130
L2X: Parse AVP 7, len 11, flag 0x8000 (M)
L2X: Hostname C3640
L2X: Parse AVP 8, len 25, flag 0x0
L2X: Vendor Name Cisco Systems, Inc.
L2X: Parse AVP 10, len 8, flag 0x8000 (M)
L2X: Rx Window Size 800
L2X: Parse AVP 11, len 22, flag 0x8000 (M)
L2X: Chlng
          98 20 4E 34 6A 4C E1 E7 FA CF 58 07 FF 4E 56 A3
L2X: Parse AVP 9, len 8, flag 0x8000 (M)
L2X: Assigned Tunnel ID 18889
L2X: Parse AVP 3, len 10, flag 0x8000 (M)
L2X: Framing Cap 0x3
L2X: Parse AVP 4, len 10, flag 0x8000 (M)
L2X: Bearer Cap 0x3
L2X: No missing AVPs in SCCRQ
L2X: I SCCRQ, flg TLS, ver 2, len 130, tnl 0, ns 0, nr 0 contiguous
pak, size 130
C8 02 00 82 00 00 00 00 00 00 00 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)
Tnl 22 L2TP: Serial Number -1714567290
Tnl 22 L2TP: Parse AVP 14, len 8, flag 0x8000 (M)
Tnl 22 L2TP: Assigned Call ID 1280
Tnl 22 L2TP: Parse AVP 18, len 10, flag 0x8000 (M)
Tnl 22 L2TP: Bearer Type 0
Tnl 22 L2TP: No missing AVPs in ICRQ
Tnl 22 L2TP: I ICRQ, flg TLS, ver 2, len 48, tnl 22, ns 2, nr
1 contiguous pak, size 48
C8 02 00 30 00 16 00 00 00 02 00 01 80 08 00 00
00 00 00 0A 80 0A 00 00 00 0F 99 CD C7 86 80 08
00 00 00 0E 05 00 80 0A 00 00 00 12 00 00 00 00
Tnl/Sn 22/1 L2TP: O ICRP to C3640 18889/1280
Tnl/Sn 22/1 L2TP: O ICRP, flg TLS, ver 2, len 28, tnl 18889,
lsid 1, rsid 1280, ns 1, nr 3
C8 02 00 1C 49 C9 05 00 00 01 00 03 80 08 00 00
00 00 00 0B 80 08 00 00 00 0E 00 01
Tnl 22 L2TP: O ZLB ctrl ack, flg TLS, ver 2, len 12, tnl 18889,
ns 2, nr 3
C8 02 00 0C 49 C9 00 00 00 02 00 03
Tnl/Sn 22/1 L2TP: I ICCN from C3640 tnl 18889, cl 1280
```

```
Tnl/Sn 22/1 L2TP: Parse AVP 0, len 8, flag 0x8000 (M)
Tnl/Sn 22/1 L2TP: Parse ICCN
Vil Tnl/Sn 22/1 L2TP: Parse AVP 24, len 10, flag 0x8000 (M)
Vil Tnl/Sn 22/1 L2TP: Connect Speed 0
Vil Tnl/Sn 22/1 L2TP: Parse AVP 19, len 10, flag 0x8000 (M)
Vil Tnl/Sn 22/1 L2TP: Framing Type 1
Tnl/Sn 22/1 L2TP: No missing AVPs in ICCN
Tnl/Sn 22/1 L2TP: I ICCN, flg TLS, ver 2, len 48, tnl 22, lsid
1, rsid 1280, ns 3, nr 2 contiguous pak, size 48
C8 02 00 30 00 16 00 01 00 03 00 02 80 08 00 00
00 00 00 0C 80 0A 00 00 00 18 00 00 00 00 80 0A
00 00 00 13 00 00 00 01 00 08 00 00 00 1D 00 04
Tnl 22 L2TP: O ZLB ctrl ack, flg TLS, ver 2, len 12, tnl 18889,
ns 2, nr 4
C8 02 00 0C 49 C9 00 00 00 02 00 04
%UPDOWN: Interface Virtual-Access1, changed state to up
%UPDOWN: Line protocol on Interface Virtual-Access1, changed
state to up
```

42 VPDN-Group

42.1 VPDN-Group

42.1.1 accept dialin

no

accept-dialin

no accept-dialin

VPDN-Group

VPDN-Group

```
Ruijie(config-vpdn)# accept-dialin
```

```
Ruijie(config-vpdn)#
```

42.1.2 ip precedence

IP

no

ip precedence { *precedence-value* | **critical** | **flash** | **flash-override** | **immediate** | **internet** | **network** | **priority** | **routine** }

no ip precedence

precedence-value

0~7

critical

5

```

flash          3
flash-override 4
immediate      2
internet       6
network        7
priority       1
routine        0

```

IP routine

VPDN-Group

7

```

Ruijie(config-vpdn)# ip precedence 7
Ruijie(config-vpdn)#

```

42.1.3 ip tos

IP TOS(Type of Service) no

```

ip tos { tos-value | max-reliability | max-throughput | min-delay |
min- monetary-cost | normal | reflect }

```

no ip tos

```

tos-value    TOS                      0~15

```

```

max-reliability    TOS                      2

```

```

max-throughput    TOS                      4

```

```

min-delay    TOS                      8

```

```

min-monetary-cost    TOS                      1

```

```

normal    TOS                      0

```

reflect IP TOS IP TOS

IP TOS

VPDN-Group

TOS

TOS **min-delay**

```
Ruijie(config-vpdn)# ip tos min-delay
Ruijie(config-vpdn)#
```

42.1.4 local name

no

local name *local-hostname-string*

no local name

local-hostname-string

VPDN-Group

"LNS"

```
Ruijie(config-vpdn)# local name LNS
Ruijie(config-vpdn)#
```

42.1.5 protocol

no

VPDN-Group

VPDN

()PDN

VPDN-Group

no

virtual-template *number*

no virtual-template

number

VPDN-Group

VPDN-Group

VPDN-Group

VPDN-Group

VPDN- Group

VPDN-Group

0 Td[<19A4056F12050.0057Td<3C2E1FF51D5B70804>Tj(1

LNS

HGW
VPDN-Group

VPDN-Group
VPDN-Group

"1" vpdn-group

Ruijie(config)# **vpdn-group 1**

Ruijie(config-**vpdn**)#

43 PPTP

43.1 PPTP

43.1.1 Pptp flow-control receive-window

pptp

ack

no

Pptp flow-control receive-window *packets*

```

echo-packet-interval ptp echo request
0---1000

```

```

60

```

```

vpdn-group

```

```

PPTP protocol pptp
protocol any
echo-packet-interval 0 echo
echo-packet-interval 0 PPTP echo-packet-interval
echo request echo reply
1
echo request echo reply
5

```

```

pptp echo request 30

```

```

Ruijie(config-vpdn)# accept-dialin
Ruijie(config-vpdn-acc-in)# protocol pptp
Ruijie(config-vpdn-acc-in)# exit
Ruijie(config-vpdn)# pptp tunnel echo 30
Ruijie(config-vpdn)#

```

44 L2TP

44.1 L2TP

44.1.1 authentication (L2TP)

no

authentication

no authentication

L2TP-Class

L2TP-Class

```
Ruijie(config-l2tp-class)# authentication
```

```
Ruijie(config-l2tp-class)#
```



l2tpv2 RFC 2661 L2TP

Pseudowire-Class

pseudowire-class

l2tpv2

Ruijie(config-pw-class)# **encapsulation l2tpv2**

Ruijie(config-pw-class)#

44.1.3 hello

L2TP Keepalive Hello

no

hello interval

no hello

interval Hello

 Hello 60

L2TP-Class

 Hello

 L2TP

 Hello

 Hello

 L2TP

 Hello 120

Ruijie(config-l2tp-class)# **hello 120**

```
Ruijie(config-l2tp-class)#
```

44.1.4 hostname (L2TP)

L2TP

5 ,Ö™ %o ß È2İ4³ S*üCÃ+ <,X á/Ä 0

```
Ruijie(config-pw-class)# ip dfbit set
Ruijie(config-pw-class)#
```

44.1.6 ip local interface

```
( ) no
ip local interface interface-name
no ip local interface interface-name

interface-name

( )

Pseudowire-Class

( ) ( )
L2TP

( ) Serial 0
Ruijie(config-pw-class)# ip local interface serial 0
Ruijie(config-pw-class)#
```

44.1.7 ip ttl

```
IP TTL no
ip ttl ttl-value
no ip ttl
```

tfl-value TTL 1~255

44.1.9 I2tp tunnel authentication

no

I2tp tunnel authentication

no I2tp tunnel authentication

Hello 30

```
Ruijie(config-vpdn)# l2tp tunnel hello 30
```

```
Ruijie(config-vpdn)#
```

44.1.11 I2tp tunnel password

no

I2tp tunnel password *password-string*

no I2tp tunnel password

password-string

VPDN-Group

L2TP

"share"

```
Ruijie(config-vpdn)# l2tp tunnel password share
```

```
Ruijie(config-vpdn)#
```

44.1.12 I2tp tunnel receive-window

no

I2tp tunnel receive-window *size*

no I2tp tunnel receive-window

size

4

VPDN-Group

L2TP

12

```
Ruijie(config-vpdn)# l2tp tunnel receive-window 12
Ruijie(config-vpdn)#
```

44.1.13 l2tp tunnel retransmit

L2TP

no

l2tp tunnel retransmit {retries *number* | timeout {min | max} *seconds*}

no l2tp tunnel retransmit {retries | timeout {min | max}}

number

seconds

5

1

8

VPDN-Group

L2TP

10

```
Ruijie(config-vpdn)# l2tp tunnel retransmit retries 10
Ruijie(config-vpdn)#
```


L2TP-Class

L2TP-Class

L2TP

"l2x" L2TP-Class

Ruijie(config)# **l2tp-class l2x**

Ruijie(config-l2tp-class)#

44.1.16 password (L2TP)**no****password** *password-string***no password***password-string* 9 B 7 > T j / T T 0 1 T f 9

protocol l2tpv2 [*l2tp-class-name*]

no protocol

l2tpv2 L2TP

l2tp-class-name L2TP-Class

L2TPv2 L2TP

Pseudowire-Class

L2TP

l2tpv2 L2TP-Class l2x

Ruijie(config-pw-class)# **protocol l2tpv2 l2x**

Ruijie(config-pw-class)#

44.1.18 pseudowire

pseudowire **no**

pseudowire *peer-ip-address* *vcid* {**encapsulation** **l2tpv2** [**pw-class** *pw-class-name*] | **pw-class** *pw-class-name*}

no pseudowire

hostname **pseudowire**

pseudowire hostname *peer-hostname* *vcid* {**encapsulation** **l2tpv2** [**pw-class** *pw-class-name*] | **pw-class** *pw-class-name*}

no pseudowire

peer-ip-address L2TP Server(LNS)

peer-hostname L2TP Server LNS DNS

hostname

vcid **pseudowire**

l2tpv2 l2tpv2(RFC 2661)

pw-class-name

pseudowire-class

pseudowire

pseudowire

virtual-ppp

virtual-ppp

pseudowire

L2TP

virtual-ppp

pseudowire

LNS

192.168.12.213

pseudowire-class

"pw"

```
Ruijie(config)# interface virtual-ppp 1
```

```
Ruijie(config-if)# pseudowire 192.168.12.213 33 pw-class pw
```

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

hostname

DNS

DNS

ip domain-lookup

l2tp-class 1

pseudowire-class 1

encapsulation l2tpv2

ip name-server 192.168.5.119

ip name-server 61.154.22.41

interface GigabitEthernet 0/0

ip ref

ip address negotiate

ip route 0.0.0.0 0.0.0.0 192.168.52.1

44.1.19 pseudowire-class

pseudowire- class

pseudowire-class

L2TP-Class

L2TP

12

```
Ruijie(config-l2tp-class)# receive-window 12  
Ruijie(config-l2tp-class)#
```

44.1.21 retransmit

no

```
retransmit {initial {retries initial-retries | timeout {max | min} initial-timeout} |  
retries retries | timeout {max | min} timeout}
```

```
no retransmit { ? 1 initial retrie
```

```
Ruijie(config-l2tp-class)# retransmit initial retries 3  
Ruijie(config-l2tp-class)#
```

44.1.22 timeout setup

no

timeout setup *seconds*

no timeout setup

seconds

120

L2TP-Class

L2TP

240

```
Ruijie(config-l2tp-class)# timeout setup 240  
Ruijie(config-l2tp-class)#
```

45

AAA Enable

```

AAA
aaa authentication login
Login

```

```

Login
Login

```

```

list-1 AAA Login
RADIUS RADIUS

```

```

Ruijie(config)# aaa authentication login list-1 group radius
local

```

aaa new-model	AAA
username login authentication	Login

45.1.3 aaa authentication ppp

```

AAA PPP
aaa authentication ppp
PPP no
aaa authentication ppp {default | list-name} method1 [method2...]
no aaa authentication ppp {default | list-name}

```

```

default PPP
list-name PPP
method 4

```

local	
none	

group	RADIUS
--------------	--------

```

AAA PPP
aaa authentication ppp AAA PPP PPP
    
```

```

rds_ppp AAA PPP
RADIUS RADIUS
    
```

```

Ruijie(config)# aaa authentication ppp rds_ppp group radius
local
    
```

aaa new-model	AAA
ppp authentication	PPP
username	

45.1.4 login authentication

```

Login
authentication Login no login
    
```

```

login authentication {default | list-name}
    
```

```

no login authentication
    
```

```

default Login
    
```

list-name

Login

Login

Login

Login

Login

list-1 AAA Login

VTY 0 - 4

```
Ruijie(config)# aaa authentication login list-1 local
```

```
Ruijie(config)# line vty 0 4
```

```
Ruijie(config-line)# login authentication list-1
```



level 0~15

default defau325532A

45.2.2 aaa authorization config-commands

AAA

aaa authorization config-commands

no

AAA

aaa authorization config-commands**no aaa authorization config-commands**

no

Ruijie(config)# **aaa authorization config-commands**

aaa new-model	AAA
aaa authorization commands	AAA

45.2.3 aaa authorization console

AAA

aaa authorization console

no

AAA

aaa authorization console**no aaa authorization console**

```
Ruijie(config)# aaa authorization console
```

aaa new-model	AAA
aaa authorization commands	AAA
authorization commands	

45.2.4 aaa authorization exec

```
AAA          NAS  CLI          Exec
aaa authorization exec          no          AAA Exec
```

```
aaa authorization exec {default | list-name} method1 [method2...]
```

```
no aaa authorization exec {default | list-name}
```

```
default          Exec
```

```
list-name        Exec
```

```
method          4
```

local	
none	
group	TACACS+ RADIUS

AAA Exec

NAS

default Network
method 4

none	
group	RADIUS

AAA Network

PPP SLIP

RADIUS
RADIUS RADIUS RADIUS
RADIUS

RADIUS

(config)# **aaa authorization network default group radius**

authorization**commands** no**authorization commands** *level* {**default** | *list-name*}**no authorization commands** *level**level* 0~15**default***list-name*

AAA

cmd

15

TACACS+

none

VTY 0 – 4

```
Ruijie(config)# aaa authorization commands 15 cmd group tacacs+
none
```

```
Ruijie(config)# line vty 0 4
```

```
Ruijie(config-line)# authorization commands 15 cmd
```

aaa new-model	AAA
aaa authorization commands	AAA

45.2.7 authorization exec

Exec **authorization**
exec no Exec
authorization exec {**default** | *list-name*}
no authorization exec

default Exec
list-name Exec

AAA Exec

Exec
 Exec
 Exec Exec

exec-1 Exec RADIUS
 none VTY 0 – 4

```
Ruijie(config)# aaa authorization exec exec-1 group radius none
Ruijie(config)# line vty 0 4
Ruijie(config-line)# authorization exec exec-1
```

aaa new-model	AAA
aaa authorization commands	AAA Exec

45.3

45.3.1 aaa accounting commands

NAS

aaa accounting commands no

aaa accounting commands *level* {**default** | *list-name*} **start-stop** *method1*
[*method2...*]

no aaa accounting commands *level* {**default** | *list-name*}

level 0~15

default

list-name

method 4

none	
group	TACACS+

none

TACACS+

15

Ruijie(config)# **aaa accounting commands 15 default start-stop
group tacacs+**

--	--

aaa new-model	AAA
aaa authentication	AAA

RADIUS

NAS

```
Ruijie(config)# aaa accounting exec default start-stop group
radius
```

aaa new-model	AAA
aaa authentication	AAA
accounting commands	Exec

45.3.3 aaa accounting network

```
aaa accounting network no
```

```
aaa accounting network {default | list-name} start-stop group radius
```

```
no aaa accounting network {default | list-name}
```

```
network DOT1X PPP
```

```
resource
```

```
list-name
```

```
start-stop
```

```
group
```

```
radius RADIUS
```

```
start-stop
```

RADIUS

aaa new-model	AAA
aaa accounting network	

45.3.5 aaa accounting update periodic

```
aaa accounting update periodic
no
```

```
aaa accounting update periodic interval
```

```
no aaa accounting update periodic
```

```
interval 1
```

```
5 minutes
```

```
AAA
```

```
AAA
```

```
1
```

```
Ruijie(config)# aaa new-model
Ruijie(config)# aaa accounting update
Ruijie(config)# aaa accounting update periodic 1
```

aaa new-model	AAA
aaa accounting network	

45.3.6 accounting commands

accounting

commands no

accounting commands *level* {**default** | *list-name*}

no accounting commands *level*

level 0~15

default

list-name

cmd 15

TACACS+ none

VTY 0 – 4

```
Ruijie(config)# aaa accounting commands 15 cmd group tacacs+
none
Ruijie(config)# line vty 0 4
Ruijie(config-line)# accounting commands 15 cmd
```

aaa new-model	AAA
aaa accounting commands	AAA

45.3.7 accounting exec

	Exec		accounting
exec	no	Exec	
accounting exec {default list-name}			
no accounting exec			
default		Exec	
<i>list-name</i>		Exec	

45.4.1 aaa group server

AAA

no

.


```
Ruijie# configure terminal
Ruijie(config)# aaa local authentication attempts 6
```

show running-config	
show aaa lockout	login

45.5.2 aaa local authentication lockout-time

login

aaa local authentication lockout-time *lockout-time*


lockout-time

1~2147483647

15

login

```
Ruijie# configure terminal
Ruijie(config)# aaa local authentication lockout-time 5
```



45.5.3 aaa new-model

```
AAA                                     aaa new-model   AAA
no AAA
aaa new-model
no aaa new-model

AAA

AAA                                     AAA           AAA           aaa
new-model   AAA
AAA
AAA
Ruijie(config)# aaa new-model
```

```
Ruijie# clear aaa local user logout all
```

show running-config	
show aaa lockout	login

45.5.5 debug aaa

```
AAA no  
debug aaa event  
no debug aaa event
```

```
EXEC
```

45.5.6 show aaa method-list

```
AAA  
show aaa method-list
```

AAA

AAA

```
Ruijie# show aaa method-list
Authentication method-list
aaa authentication login default group radius
aaa authentication ppp default group radius
aaa authentication dotlx default group radius
aaa authentication dotlx san-f local group angel group rain
none
aaa authentication enable default group radius
Accounting method-list
aaa accounting network default start-stop group radius
Authorization method-list
aaa authorizing network default group radius
```

aaa authentication	
aaa authorization	
aaa accounting	

45.5.7 show aaa user logout

```
show aaa user logout {all | user-name <word>}
```

```
<word>      ID
```

```
Ruijie# show aaa user lockout all
```

show running-config	
show aaa lockout	login

46 RADIUS

46.1 RADIUS

46.1.1 ip radius source-interface

radius
no

ip radius source-interface

46.1.2 radius-server host

```

RADIUS
no RADIUS
radius-server host {hostname | ip-address} [auth-port port-number] [acct-port
port-number]
no radius-server host {hostname | ip-address}

```

```

Hostname: RADIUS DNS
ip-address: RADIUS IP
auth-port: RADIUS UDP
port-number: RADIUS UDP 0

acct-port: Radius UDP
port-number: RADIUS UDP 0

```

RADIUS

RADIUS AAA

radius-server timeout	RADIUS
------------------------------	--------

46.1.3 radius-server key

RADIUS

radius-server key no

radius-server key *text-string*

no radius-server key

text-string

RADIUS

RADIUS

RADIUS

RADIUS

aaa

Ruijie(config)# **radius-server key** aaa



radius-server retransmit *retries*

no radius-server retransmit

retries RADIUS

3

AAA

RADIUS

4

Ruijie(config)# **radius-server retransmit 4**

radius-server host	RADIUS
radius-server key	RADIUS
radius-server timeout	RADIUS

46.1.5 radius-server timeout

RADIUS

radius-server timeout no

radius-server timeout *seconds*

no radius-server timeout

seconds

1-1000

5

10

```
Ruijie(config)# radius-server timeout 10
```

radius-server host	RADIUS
radius-server retransmit	RADIUS
radius-server key	RADIUS

46.1.6 radius-server deadtime

```

t
deadtime RGOS RADIUS
radius-server deadtime no

```

```
radius-server deadtime minutes
```

```
no radius-server deadtime
```

```
minutes 1-1000
```

5

10

```
Ruijie(config)# radius-server deadtime 10
```

radius-server host	RADIUS
radius-server retransmit	RADIUS
radius-server key	RADIUS
radius-server timeout	RADIUS

46.1.7 radius attribute

```
radius attribute {<id>} down-rate-limit -3( )TjET.ttate-ctup-limitdeadT/TT5 1 Tf0.0006 Tc 2.00
```

L2TP

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 privilege	22
23	login privilege	42
24	limit to user number	50

max up-rate 211

Ruijie(config)# **radius attribute 16 vendor-type 211**

qos dscp

qos cos dscp

Ruijie(config)# **radius set qos cos**

radius vendor-specific extend	Radius id

46.1.9 radius vendor-specific extend

id

radius vendor-specific extend
no radius vendor-specific extend

id

id

Ruijie(config)# **radius vendor-specific extend**


```
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
```

radius-server host	RADIUS
radius-server retransmit	RADIUS
radius-server key	RADIUS
radius-server timeout	RADIUS

46.2.3 show radius parameter

RADIUS

show radius parameter

radius

```
Ruijie# show radius parameter
Server Timeout: 5 Seconds
Server Deadtime: 5 Minutes
Server Retries: 3
Server Key: *****
```



12	file-name-1	12
13	file-name-2	13
14	file-name-3	14
15	file-name-4	15
16	max up-rate	75
17	version to server	17
18	flux-max-high32	18
19	flux-max-low32	19
20	proxy-avoid	20
21	dailup-avoid	21
22	ip privilige	22
23	login privilige	42
24	limit to user number	50

radius-server host	RADIUS
radius-server retransmit	RADIUS
radius-server key	RADIUS
radius-server timeout	RADIUS

47 VRRP

47.1

47.1.1 vrrp authentication

```

VRRP
no
vrrp group authentication string
no vrrp group authentication

group VRRP
string VRRP ( 8
)

VRRP VRRP

VRRP / VRRP

VRRP 1
vrrp 1 authentication x30dn78k

```

Ruijie(config-if)# vrrp group ip ipaddress [secondary]	VRRP IP

47.1.2 vrrp delay

VRRP

vrrp delay { **minimum** *min-seconds* | **reload** *reload-seconds* }

no vrrp delay

min-seconds

VRRP

min-seconds

reload-seconds

VRRP

min-seconds

reload-seconds

VRRP

min-seconds

VRRP

UP

VRRP

VRRP

0~60

GigabitEthernet 0/1

VRRP

10

UP

VRRP

1

10

interface GigabitEthernet 0/1

shutdown

ip address 10.0.1.1 255.255.255.0

vrrp delay minimum 10

vrrp 1 ip 10.0.1.20

no shutdown

show vrrp 1

Ruijie(config-if)# vrrp group ip <i>ipaddress</i> [secondary]	VRRP IP

RGNOS10.3(4)

47.1.3 vrrp description

VRRP

no

no vrrp group ip ipaddress [secondary]

group VRRP

ipaddress IP

secondary IP IP) <.tjP e977 1 93051Tf Td1

group VRRP

delay *seconds*

Master

100 VRRP VRRP VRRP

VRRP

VRRP 1 254

vrrp 1 priority 254

Ruijie(config-if)# vrrp group ip <i>ipaddress [secondary]</i>	VRRP IP
Ruijie(config-if)# vrrp group preempt <i>[delay seconds]</i>	VRRP

47.1.7 vrrp timers advertise

VRRP no

vrrp group timers advertise *interval*

no vrrp group timers advertise

group VRRP

interval VRRP ()

1 VRRP VRRP

VRRP

VRRP

VRRP

VRRP

4

Ruijie(config-if)# vrrp group ip <i>ipaddress [secondary]</i>	VRRP IP
Ruijie(config-if)# vrrp group timers advertise [msec] interval	VRRP

47.1.9 vrrp track

```

VRRP          vrrp group track interface-type number
VRRP IP       vrrp group track ip-address      vrrp group
track bfd     BFD          IP      no

```

```

vrrp group track [interface-type number] bfd interface-type interface-number
ipv4-address ] [priority ]

```

```

vrrp group track ip-address [[[ interval interval-value ]
      timeout timeout-value ] priority ]

```

```

vrrp group track [interface-type number] bfd interface-type interface-number
ipv4-address | ip-address]

```

```

group      VRRP

```

```

interface-type

```

```

number

```

```

ipv4-address

```

```

IPv4

```

```

bfd

```

```

interval-value

```

```

3

```

```

timeout-value

```

```

1

```

```

priority

```

```

10

```

```

VRRP

```

```

IP

```

```

VRRP

```

```

VRRP

```

(Routed Port SVI Loopback Tunnel) IP
ping

VRRP 1 Routed Port Fa1/1 Fa1/1
VRRP 30 Fa1/1 VRRP 1

vrrp 1 track GigabitEthernet 1/1 30

VRRP BFD 192.168.1.3

Ruijie#**configure terminal**

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

Ruijie(config)#**interface** GigabitEthernet 0/1

Ruijie(config-if)#**no switchport**

Ruijie(config-if)#**ip address** 192.168.1.1 255.255.255.0

Ruijie(config-if)#**bfd interval** 50 **min_rx** 50 **multiplier** min_rx 50 **multipl**

VRRP

VRRP

VRRP

no

debug vrrp

no debug vrrp

VRRP

Ruijie# **debug vrrp**

Ruijie#

VRRP: Grp 1 Advertisement priority 120, ipaddr 192.168.201.213

VRRP: Grp 1 Event - Advert higher or equal priority

%VRRP-6-STATECHANGE: GigabitEthernet 0/0 Grp 1 state Master -> Backup

VRRP: Grp 1 Advertisement from 192.168.201.213 has invalid virtual address 192.168.1.1

%VRRP-6-STATECHANGE: GigabitEthernet 0/0 Grp 1 state Backup -> Master

Ruijie#

Ruijie# debug vrrp errors	VRRP
Ruijie# debug vrrp events	VRRP
Ruijie# debug vrrp state	VRRP

47.2.2 debug vrrp errors

VRRP

no

debug vrrp errors

no debug vrrp errors

VRRP

VRRP

```
Ruijie# debug vrrp errors
Ruijie#
VRRP: Grp 1 Advertisement from 192.168.201.213 has invalid
virtual address 192.168.1.1
VRRP: Grp 1 Advertisement from 192.168.201.213 has invalid
virtual address 192.168.1.1
VRRP: Grp 1 Advertisement from 192.168.201.213 has invalid
virtual address 192.168.1.1
```

47.2.3 debug vrrp events

VRRP no

```
debug vrrp events
no debug vrrp events
```

VRRP

VRRP

```
Ruijie# debug vrrp events
Ruijie#
VRRP: Grp 1 Event - Advert higher or equal priority
VRRP: Grp 1 Event - Advert higher or equal priority
VRRP: Grp 1 Event - Advert higher or equal priority
```

47.2.4 debug vrrp packets

VRRP no

```
debug vrrp packets
no debug vrrp packets
```

VRRP

VRRP

VRRP 1

```
Ruijie# debug vrrp packets
Ruijie#
VRRP: Grp 2 sending Advertisement checksum DD4D
VRRP: Grp 2 sending Advertisement checksum DD4D
VRRP: Grp 2 sending Advertisement checksum DD4D
```

```
,
IP VRRP 1
```

VRRP 1

```
Ruijie# debug vrrp packets
Ruijie#
VRRP: Grp 1 Advertisement priority 120, ipaddr 192.168.201.213
VRRP: Grp 1 Advertisement priority 120, ipaddr 192.168.201.213
VRRP: Grp 1 Advertisement priority 120, ipaddr 192.168.201.213
```

47.2.5 debug vrrp state

VRRP no

```
debug vrrp state
no debug vrrp state
```

VRRP

VRRP

```
Ruijie# debug vrrp state
Ruijie#
%VRRP-6-STATECHANGE: GigabitEthernet 0/0 Grp 2 state Master ->
Backup
```

```
%VRRP-6-STATECHANGE: GigabitEthernet 0/0 Grp 2 state Backup ->
Master
```

```
Ruijie# config terminal
```

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

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

```
Ruijie(config-if)# no shutdown
```

```
Ruijie(config-if)# end
```


brief

E1/0 VRRP

```

Ruijie# show vrrp interface GigabitEthernet 0/0
GigabitEthernet 0/0 - Group 1
State is Backup
Virtual IP address is 192.168.201.1 configured
Virtual MAC address is 0000.5e00.0101
Advertisement interval is 3 sec
Preemption is enabled
min delay is 0 sec
Priority is 100
Master Router is 192.168.201.213 , pritority is 120
Master Advertisement interval is 3 sec
Master Down interval is 9 sec
GigabitEthernet 0/0 - Group 2
State is Master
Virtual IP address is 192.168.201.2 configured
Virtual MAC address is 0000.5e00.0102
Advertisement interval is 3 sec
Preemption is enabled
min delay is 0 sec
Priority is 120
Master Router is 192.168.201.217 (local), priority is 120
Master Advertisement interval is 3 sec
Master Down interval is 9 sec

```

Ruijie(config-if)# vrrp group ip <i>ip address [secondary]</i>	VRRP IP

48 CPU-LOG

48.1

48.1.1 show cpu

```

CPU
show cpu

CPU
5 CPU
5 CPU
CPU
5 1
5 1
```

show cpu

```
Ruijie# show cpu
=====
CPU Using Rate Information
CPU utilization in five seconds: 25%
CPU utilization in one minute : 20%
CPU utilization in five minutes: 10%
NO   5Sec  1Min  5Min  Process
0    0%   0%   0%   LISR INT
1    7%   2%   1%   HISR INT
2    0%   0%   0%   ktimer
3    0%   0%   0%   atimer
4    0%   0%   0%   printk_task
5    0%   0%   0%   waitqueue_process
6    0%   0%   0%   tasklet_task
```

CPU-LOG

7	0%	0%	0%	kevents
8	0%	0%	0%	snmpd
9	0%	0%	0%	snmp_trapd
10	0%	0%	0%	mtdblock
11	0%	0%	0%	gc_task
12	0%	0%	0%	Context
13	0%	0%	0%	kswapd
14	0%	0%	0%	bdflush
15	0%	0%	0%	kupdate
16	0%	3%	1%	ll_mt
17	0%	0%	0%	ll main process
18	0%	0%	0%	bridge_relay
19	0%	0%	0%	dlx_task
20	0%	0%	0%	secu_policy_task
21	0%	0%	0%	dhcpc_task
22	0%	0%	0%	dhcpsnp_task
23	0%	0%	0%	igmp_snp
24	0%	0%	0%	mstp_event
25	0%	0%	0%	GVRP_EVENT
26	0%	0%	0%	rldp_task
27	0%	2%	1%	rerp_task
28	0%	0%	0%	reup_event_handler
29	0%	0%	0%	tpp_task
30	0%	0%	0%	ip6timer
31	0%	0%	0%	rtadvd
32	0%	0%	0%	tnet6
33	2%	0%	0%	tnet
34	0%	0%	0%	Tarptime
35	0%	0%	0%	gra_arp
36	0%	0%	0%	Ttcptimer
37	8%	1%	0%	ef_res
38	0%	0%	0%	ef_rcv_msg
39	0%	0%	0%	ef_inconsistent_daemon
40	0%	0%	0%	ip6_tunnel_rcv_pkt
41	0%	0%	0%	res6t
42	0%	0%	0%	tunrt6
43	0%	0%	0%	ef6_rcv_msg
44	0%	0%	0%	ef6_inconsistent_daemon
45	0%	0%	0%	imid
46	0%	0%	0%	nsmd
47	0%	0%	0%	ripd
48	0%	0%	0%	ripngd
49	0%	0%	0%	ospfd
50	0%	0%	0%	ospf6d

CPU-LOG

51	0%	0%	0%	bgpd
52	0%	0%	0%	pimd

CPU-LOG

95	0%	0%	0%	conf_dispatch_task
96	0%	0%	0%	devprob_task
97	0%	0%	0%	rdp_snd_thread
98	0%	0%	0%	rdp_rcv_thread
99	0%	0%	0%	rdp_slot_change_thread
100	4%	2%	1%	datapkt_rcv_thread
101	0%	0%	0%	keepalive_link_notify
102	0%	0%	0%	rerp_msg_rcv_thread
103	0%	0%	0%	ip_scan_guard_task
104	0%	0%	0%	ssp_ipmc_hit_task
105	0%	0%	0%	ssp_ipmc_trap_task
106	0%	0%	0%	hw_err_snd_task
107	0%	0%	0%	rerp_packet_send_task
108	0%	0%	0%	idle_vlan_proc_thread
109	0%	0%	0%	cmic_pause_detect
110	1%	1%	1%	stat_get_and_send
111	0%	1%	0%	rl_con
112	75%	80%	90%	idle
			3	5
	CPU		LISR	HISR
				1
				5

high_num CPU

100% 90%

CPU CPU CPU CPU
CPU CPU CPU CPU

CPU 70% CPU
80%

```
ruijie(config)# cpu-log log-limit 70 80
```

CPU 80%

```
Oct 20 15:47:01 %SYSCHECK-5-CPU_USING_RATE: CPU utilization in  
one minute : 95% Using most cpu's task is ktimer : 94%
```

CPU 70%

```
Oct 20 15:47:01 %SYSCHECK-5-CPU_USING_RATE: CPU  
utilization in one minute :68% Using most cpu's task  
is ktimer : 60%
```

```
Oct 20 15:47:01 %SYSCHECK-5-CPU_USING_RATE: The CPU  
using rate has down!
```

48.1.3 show environment

CPU

show environment

show environment

CPU

show environment

```
Ruijie# show environment
---environment information---
CPU Temperature is 30
fan works in high speed mode.
```

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

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

CPU 30

49

49.1

49.1.1 threshold set

MIB CPU CPU 3 CPU
CPU syslog
syslog
no
threshold set {cpu | memory | temperature} [M1 | M2 | slot *n* | member *n*]
warning_value critical_value
no threshold set {cpu | memory | temperature}

cpu memory temperature	cpu
CPU	memory
temperature	

```

1          M1
Ruijie(config)# threshold set memory M1 70 90

```

```

2          CPU
Ruijie(config)# threshold set cpu member 2 70 90

```

show threshold	

10.3(4b3)	

49.2

49.2.1 show threshold

show threshold {cpu | memory | temperature} [M1 | M2 | slot *n* | member *n*]

cpu memory temperature	cpu CPU
	memory
	temperature
M1 M2 slot <i>n</i>	<i>n</i>
member <i>n</i>	<i>n</i>

1 M1 CPU
Ruijie# **show threshold cpu M1**

2
Ruijie# **show threshold memory**



50

50.1

50.1.1 show memory

show memory

show memory

show memory

Ruijie#**show memory**

System Memory Statistic:

Free pages: 1079

watermarks : min 379, lower 758, low 1137, high 1516

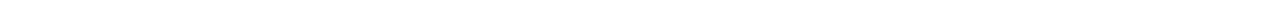
System Total Memory : 128MB, Current Free Memory : 5283KB

Used Rate : 96%

1. 4k

2.

min	



```

1          BGP
Ruijie(config)# memory-lack exit-policy bgp

```

show memory	

-

10.3(4b3)	

50.1.3 show memory protocols

```
show memory protocols
```

BGP,OSPF,RIP,LDP,PIM,ISIS

```

1          show memory protocols
Ruijie(config)# show memory protocols

```

```

=====
protocol      |memory(byte)
BGP           |102000000
OSPF          |24000000
RIP           |10000000
PIM           |50000000

```

LDP	20000000
Total	206000000



51 USB

51.1

	CLI	USB
USB	show usb	
USB	usb remove	

51.1.1 show usb

USB

ID	ID	remove		
Lun			ID	id
Disk Partitions				
/dev/uba/disc0/part1			/mnt/uba	cd /mnt/uba

51.1.2 usb remove

```
usb remove Device_ID
```

```
Device_ID USB
```

```
usb
```

```
USB
```

```
usb
```

```
Ruijie# usb remove 778
```

```
OK, now you can pull out the device 778.
```

52 SD

52.1

52.1.1 sd remove

SD

sd remove

	remove	SD

└───

└───

sd

M

52.2.1 show sd

SD
show sd

sd	sd

sd

Fi] ^]Y#g\ck gX
DfcXi Vh bUaY. G8
DfcXi Vh gYf]U bi aVYf. X+&%)Y'
8]g_ DUf h] h] cbg.
% #XYj #gX\$#X] gV\$#dUf h%!! > #abh#gX\$
g]zY %\$%+*(' \$\$, BfI- +\$NBL"

-	-

10.3(4b7) NPE

10.3(4b7)	

53

53.1

53.1.1 logging on

no

logging on

no logging on

RGOS

Console

VTY

FLASH

Syslog Server

1 Log

Ruijie(config)# **no logging on**

logging buffered	
logging	Syslog Server
logging file flash:	FLASH

logging console	
logging monitor	VTY (telnet)
logging trap	Syslog Server

53.1.2 terminal monitor

```

VTY
no
terminal monitor
terminal no monitor

VTY
VTY

VTY
VTY

RGOS
0 1
no

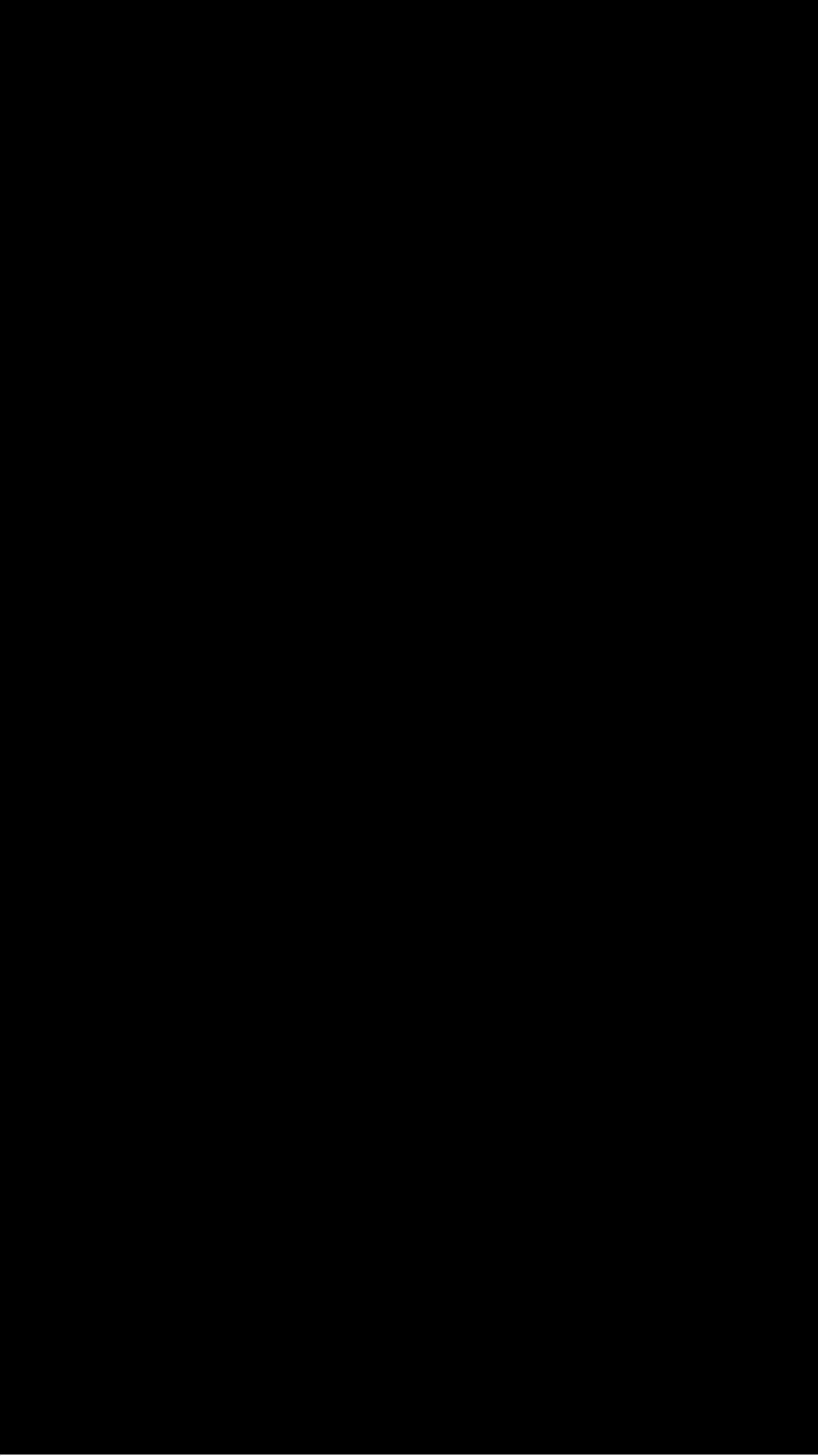
VTY
Ruijie# terminal monitor
Ruijie#

```

53.1.3 logging buffered

```
no
```

logging buffered [*buffer-size*



show logging

6

Ruijie(config)# **logging console informational**

logging on	
show logging	

53.1.7 logging monitor

VTY telnet SSH
no VTY

logging monitor level

no logging monitor

level

1

Debugging (7)

VTY
VTY

terminal monitor
logging monitor

Logging monitor

VTY

VTY

6

logging on	
-------------------	--

logging

no

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

no logging source {**ip** | **ipv6**}

<i>ip-address</i>	IPV4	IPV4
<i>ipv6-address</i>	IPV6	IPV6

Syslog Server

Loopback 0 Syslog

Ruijie(config)# **logging source ip** 192.168.1.1

logging	Syslog server

53.1.11 logging facility

no

(23)

logging facility *facility-type*

no logging facility

facility-type Syslog

Local7(23)

2 Syslog

2

Numerical Code	Facility
0	kernel messages
1	user-level messages
2	mail system
3	system daemons
4	security/authorization messages

5 messages generated ind20 10.5 153.06 473.31.68 r6 0.T147.54 509.9 0.24

22	local use 6 (local6)
23	local use 7 (local7)

RGOS (local7) 23

Syslog kernel

Ruijie(config)# **logging facility kern**



show logging count	
show logging	

53.1.13 logging rate-limit

no

logging rate-limit {*number* | *all number* | *console {number | all number}*} [*except severity*]

no logging rate-limit

number 1—10000

all 0—7

console

except error(3)

error

severity 0—7;

debug 10 warning

Ruijie(config)#**logging rate-limit all 10 except warnings**

--	--

show logging count	
---------------------------	--

show logging	(
---------------------	---

show running-config	
---------------------	--

53.1.15 service sequence-numbers

no

service sequence-numbers
no service sequence-numbers

1

Ruijie(config)# **service sequence-numbers**

logging on	
service timestamps	

53.1.16 service timestamps

no

default

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

no service timestamps *message-type*

default service timestamps *message-type*

<i>message-type</i>		log	debug	log		0
6	debug			7		
<i>uptime</i>		* *	* *		07:00:10:41	
<i>datetime</i>					Jul 27 16:53:07	
<i>msec</i>					: : .	Jul 27
16:53:07.299						
<i>year</i>					: :	2007 Jul 27
16:53:07						

RTC

more flash:filename

Filename

FLASH "/f2/" "/f3/"

FLASH

```
Ruijie# more flash://f2/log.txt
look up file in the extended flash://f2/log.txt
00004 2004-11-17 4:1:32 Ruijie: %5:Reload requested by
Administrator. Reload Reason :Reload command
```

logging file flash:	FLASH

53.1.19 clear logging

clear logging

```
Ruijie# clear logging
```

logging on	
show logging	
logging buffered	

53.2

53.2.1 show logging

show logging

show logging

```
Ruijie# show logging
Syslog logging: enabled
Console logging: level debugging, 4 messages logged
Monitor logging: level informational, 0 messages logged
Buffer logging: level debugging, 6 messages logged
Timestamp debug messages: datetime
Timestamp log messages: disabled
Sequence log messages: enable
Trap logging: level debugging, 2 message lines logged,0
reserved,0 fail
logging to 202.101.11.22
logging to 192.168.200.112
Log Buffer (Total 4096 Bytes) : have written 680
00001 2004-11-17 10:20:59 Ruijie: %7:%LINK CHANGED: Interface
FD2BrTh>Nnet 0/0, changed state to up
00002 2004-11-17 10:20:59 Ruijie: %7:%LINE PROTOCOL CHANGE:
Interface FD2BrTh>Nnet 0/0, changed state to UP
```

```

00003 2004-11-17 10:57:18 Ruijie: %7:%LINK CHANGED: Interface
FastEthernet 0/1, changed state to administratively down
00004 2004-11-17 10:57:21 Ruijie: %7:%LINK CHANGED: Interface
FastEthernet 0/1, changed state to down
00005 2004-11-17 10:57:41 Ruijie: %7:%LINK CHANGED: Interface
FastEthernet 0/1, changed state to administratively down
00006 2004-11-17 10:57:43 Ruijie: %7:%LINK CHANGED: Interface
FastEthernet 0/1, changed state to down

```

Syslog logging	enabled, disabled
Console logging	
Monitor logging	VTY
Buffer logging	
Timestamp debug messages	Debug
Timestamp log messages	Log
Sequence log messages	
Trap logging	Syslog Server
Log Buffer	

logging on	
clear logging	

53.2.2 show logging count

show logging count

logging count

show logging count

show logging

show logging count

```
Ruijie# show logging count
Module Name  Message Name Sev Occur      Last Time
=====SYS
CONFIG_I     5  1      Jul 6 10:29:57
-----SYS
TOTAL                1
```

logging count	
show logging	
clear logging	

54 RLOG

54.1 RLOG

54.1.1 rlog server

VRF

rlog server *server-ip* [**vrf** *vrf-name*]
no rlog server

server-ip

vrf-name VRF

udp

Ruijie(config)# **rlog server** 10.1.1.1

ip session log-on

54.1.2 rlog mtu

no rlog mtu

Number

1500

Ruijie(config)# **rlog mtu 1200**

54.1.3 rlog port

rlog port *number*
no rlog port

Number

10000

Ruijie(config)# **rlog mtu 13000**

54.1.4 rlog export-rate

rlog export-rate *number*
no rlog export-rate

Number

SNMP
show snmp

SNMP 123456:

Ruijie(config)# **snmp-server chassis-id 123456**

show snmp	SNMP

55.1.3 snmp-server community

SNMP **snmp-server community**
no SNMP

snmp-server community *string* [**view** *view-name*] [[**ro** | **rw**] [**host** *ipaddr*]
[*number*]

no snmp-server community *string*

string NMS SNMP

view-name

ro NMS MIB

rw NMS MIB

number 0-99 MIB

NMS

ipaddr NMS MIB NMS

SNMP
MIB NMS

SNMP

no snmp-server

MIB

192.168.12.1 NMS

MIB

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

access-list	

55.1.4 snmp-server contact

SNMP

snmp-server contact

no

SNMP

snmp-server contact *text***no snmp-server contact***text*

SNMP

i-net800@i-net.com.cn

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

show snmp-server	SNMP
no snmp-server	SNMP


```

host-addr      SNMP
ipv6-addr      SNMP          ipv6
vrfname        vrf
version      snmp          V1 V2C V3
auth | noauth | priv      V3
community-string          V3
port-num       snmp
notification-type          snmp
    
```

SNMP

snmp-server enable traps

NMS

SNMP

vrf [vrf]

SNMP

SNMP

Ruijie(config)# **snmp-server host 192.168.12.219 public snmp**

snmp-server enable traps	

55.1.7 snmp-server location

SNMP

no

SNMP

snmp-server location

snmp-server location *text*

no snmp-server location

text

SNMP

1492

```
Ruijie(config)# snmp-server packetsize 1492
```

snmp-server queue-length	SNMP

```

SNMP
system-shutdown no SNMP snmp-server
snmp-server system-shutdown
no snmp-server system-shutdown

```

```
SNMP
```

```

SNMP RGOS reload/reboot
NMS

```

```

SNMP
Ruijie(config)# snmp-server system-shutdown

```

55.1.11 snmp-server trap-source

```

SNMP snmp-server trap-source
no
snmp-server trap-source interface
no snmp-server trap-source

```

```
interface SNMP
```

```
SNMP IP
```

```

SNMP IP IP SNMP

```

SNMP

snmp-server user *username groupname* {**v1** | **v2** | **v3** [**encrypted**]
[**auth** {**md5** | **sha**} *auth-password*] [**priv** **des56** *priv-password*]}
[**access** {*num* | *name*}]

no snmp-server user *username groupname* {**v1** | **v2c** | **v3**}

username

groupname


```

oid-tree          MIB          MIB
include          MIB
exclude          MIB

                default        MIB

```

```

MIB-2          oid  1.3.6.1

```

```

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

```

show snmp view	SNMP

55.1.16 snmp-server if-index persist

```

                snmp-server if-index persist
no
snmp-server if-index persist
no snmp-server if-index persist

```

```

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

```

show run	

55.2

55.2.1 show snmp

SNMP

show snmp**show snmp [mib | user | view | group]**

show snmp	SNMP	
show snmp mib		snmp mib
show snmp user	snmp	
show snmp view	snmp	
show snmp group	snmp	

SNMP

```
Ruijie# show snmp
Chassis: 60FF60
0 SNMP packets input
0 Bad SNMP version errors
0 Unknown community name
0 Illegal operation for community name supplied
0 Encoding errors
0 Number of requested variables
0 Number of altered variables
0 Get-request PDUs
0 Get-next PDUs
0 Set-request PDUs
0 SNMP packets output
0 Too big errors (Maximum packet size 1500)
0 No such name errors
0 Bad values errors
```

0 General errors
0 Response PDUs
0 Trap PDUs
SNMP global trap: disabled
SNMP logging: disabled
SNMP agent: enabled

Ruijie(config-if)# **rmon collection stats 1 zhansan**

rmon collection history <i>index [owner owner-name]</i> buckets <i>bucket-number</i> interval <i>seconds</i>	

56.1.2 rmon collection history

no

rmon collection history *index [owner ownername] [buckets*
bucket-number] [interval seconds]

no rmon collection history *index*

RGOS
 buckets interval ® owner

56.1.3 rmon alarm

MIB no

rmon alarm *number variable interval* {**absolute** | **delta** }
rising-threshold *value [event-number]* **falling-threshold** *value*
[event-number] [**owner** *ownername*]
no rmon alarm *number*

RGOS variable
interval absolute/delta owner interval rising-threadhold/falling-threadhold
event

MIB ifInNUcastPkts.6

```
Ruijie(config)# rmon alarm 10 1.3.6.1.2.1.2.2.1.12.6 30 delta
rising-threshold 56TjB02dj/ Tf1(/C2_0TdTc 2.034 0 Td[<09AC0 Td(0
```



```

DropEvents : 0
Octets : 1884085
Pkts : 3096
BroadcastPkts : 161
MulticastPkts : 97
CRCAlignErrors : 0
UndersizePkts : 0
OversizePkts : 1200
Fragments : 0
Jabbers : 0
Collisions : 0
Pkts64Octets : 128
Pkts65to127Octets : 336
Pkts128to255Octets : 229
Pkts256to511Octets : 3
Pkts512to1023Octets : 0
Pkts1024to1518Octets : 1200
Owner : zhangsan
    
```

rmon collection stats <i>index</i> [owner <i>owner-string</i>]	

56.2.2 show rmon history

show rmon history

```

Ruijie# show rmon history
Entry : 1
Data source : Gil/1
Buckets requested : 65535
Buckets granted : 10
Interval : 1
Owner : zhangsan
Sample : 198
Interval start : 0d:0h:15m:0s
DropEvents : 0
Octets : 67988
Pkts : 726
BroadcastPkts : 502
MulticastPkts : 189
CRCAlignErrors : 0
UndersizePkts : 0
OversizePkts : 0
Fragments : 0
Jabbers : 0
Collisions : 0
Utilization : 0
    
```

--	--

rmon collection history *index*
[owner


```
Ruijie# show rmon event
Alarm : 1
Interval : 1
Variable : 1.3.6.1.2.1.4.2.0
Sample type : absolute
Last value : 64
Startup alarm : 3
Rising threshold : 10
Falling threshold : 22
Rising event : 0
Falling event : 0
Owner : zhangsan
```



IPv6

57 IPv6

57.1

57.1.1 ping ipv6

IPV6

ping ipv6 [*ipv6-address*]

ipv6-address

ping

!	
.	
U	
R	
F	
A	
D	Down IPV6 ()
?	

Ruijie# **ping ipv6 fec0::1**

57.1.2 ipv6 address

```

        IPV6          ,          no
ipv6 address ipv6-prefix/prefix-length [eui-64]
no ipv6 address [ipv6-prefix/prefix-length] [eui-64]

ipv6-prefix  IPV6          ,          RFC2373
                16

prefix-length  IPV6          IPV6

eui-64          IPV6          64          ID

        eui-64          64          IPV6
Up
        no ipv6 address

        no ipv6 address ipv6-prefix/prefix-length eui-64          ipv6
address ipv6-prefix/prefix-length eui-64

Ruijie(config-if)# ipv6 address 2001:1::1/64
Ruijie(config-if)# no ipv6 address 2001:1::1/64
Ruijie(config-if)# ipv6 address 2002:1::1/64 eui-64
Ruijie(config-if)# no ipv6 address 2002:1::1/64 eui-64

```

57.1.303E84A/2 0]nable

```

        IPv6          no          IPv6

        I/mX

```

```

2                               IPv6                               ipv6 enable
                               IPv6
no ipv6 enable                 IPv6                               IPv6
                               IPV6

```

```
Ruijie(config-if)# ipv6 enable
```

show ipv6 interface	

57.1.4 ipv6 hop-limit

```
ipv6 hop-limit value
```

```
no ipv6 hop-limit
```

```
64
```

```
Ruijie(config)# ipv6 hop-limit 100
```

57.1.5 ipv6 neighbor

```
no
```

```
ipv6 neighbor ipv6-address interface-id hardware-address
```

```
no ipv6 neighbor ipv6-address interface-id
```

```
ipv6-address
```

```
IPV6
```

```
RFC2373
```

<i>interface-id</i>	Routed Port,L3 AP	SVI
<i>hardware-address</i>	XXXX.XXXX.XXXX	48
MAC 'X'		

0
0 IPv6 IPv6

```
Ruijie(config)# no ipv6 source-route
```

57.1.7 ipv6 route

```
IPv6 no  
ipv6 route ipv6-prefix/prefix-length {ipv6-address | interface-id  
[ipv6-address]}  
no ipv6 route ipv6-prefix/prefix-length {ipv6-address | interface-id  
[ipv6-address]}  
  
ipv6-prefix IPV6 RFC2373 prefix-length  
IPV6 '  
  
ipv6-address RFC2373  
  
interface-id
```

```
Ruijie(config)# ipv6 route 2001::/64 vlan 1 2005::1
```

show ipv6 route	IPV6

57.1.8 ipv6 ns-linklocal-src

ns-linklocal-src

ipv6 ns-linklocal-src

no ipv6 ns-linklocal-src

no ipv6

```
Ruijie(config)# no ipv6 ns-linklocal-src
```

(RA) 0()
 1000ms(1)

(RA)

Ruijie(conifg-if)# **ipv6 nd ns-interval 2000**

show ipv6 interface	

57.1.10 ipv6 nd reachable-time

NDP

no

ipv6 nd reachable-time *milliseconds*

no ipv6 nd reachable-time

milliseconds

0-3600000

(RA) 0()
 30000ms(30)

(RA)

0

RFC4861

0.5 1.5

Ruijie(config-if)# **ipv6 nd reachable-time 1000000**



```

                                IPV6 address
                                :
    valid-lifetime: 2592000    (30  )
    preferred-lifetime: 604800  (7  ),
                                on-link

```

(RA)

ipv6 address

ipv6 nd prefix default

```

                                ipv6 nd prefix default
                                ipv6 nd
    prefix default
    at valid-date preferred-date
                                2
                                0

```

SVI 1

```

Ruijie(config)#interface vlan 1
Ruijie(config-if)# ipv6 nd prefix 2001::/64 infinite 2592000

```

SVI 1 ()

```

Ruijie(config)# interface vlan 1
Ruijie(config-if)# ipv6 nd default no-autoconfig

```



IPv6

(RA)

no

ipv6 nd ra-interval {seconds | min-max min_value max_value}

no ipv6 nd ra-interval

seconds (RA)

min-max:

min_value:

max_value:

200

200

20

min-max

```
Ruijie(config)# interface vlan 1
Ruijie(config-if)# ipv6 nd ra-interval 110
Ruijie(config-if)# ipv6 nd ra-interval min-max 110 120
```

show ipv6 interface	ra-info
ipv6 nd ra-lifetime	
ipv6 nd ra-hoplimit	
ipv6 nd ra-mtu	MTU

57.1.14 ipv6 nd ra-hoplimit

(RA)

no

ipv6 nd ra-hoplimit

IPv6 MTU

0 MTU

```
Ruijie(config)# interface vlan 1
Ruijie(config-if)# ipv6 nd ra-mtu 1400
```

show ipv6 interface	ra-info
ipv6 nd ra-lifetime	
ipv6 nd ra-interval	
ipv6 nd ra-hoplimit	

57.1.16 ipv6 nd managed-config-flag

“managed address configuration”

no

ipv6 nd managed-config-flag**no ipv6 managed-config-flag**

```
Ruijie(config)# int vlan 1
Ruijie(config)# ipv6 nd managed-config-flag
```

show ipv6 interface	ra-info
ipv6 nd other-config-flag	

57.1.17 ipv6 nd dad attempts

```

                                IPV6
(NS)                               no
ipv6 nd dad attempts value
no ipv6 nd dad attempts

value      (NS)                               0                               ipv6
                                : 0-600

1

```

```

                                IPV6
                                "tentative"( )
                                EUI-64
                                (                               IPV6
                                )                               down/up
                                down                               up

Ruijie(conifgf)# interface vlan 1
Ruijie(conifg-if)# ipv6 nd dad attempts 3

```



```
ICMPv6
100    ICMPv6    (100pps)
```

```
Ruijie(config)# interface vlan 1
Ruijie(config-if)# ipv6 redirects
```

show ipv6 interface	

57.1.20 clear ipv6 neighbors

```
clear ipv6 neighbors
```

RDP

```
Ruijie# clear ipv6 neighbors
```

ipv6 neighbor	
show ipv6 neighbors	

57.1.21 tunnel mode ipv6ip

```
IPv6 IPV6 , no
IPv6
tunnel mode ipv6ip [6to4 | isatap]
no tunnel mode
```

```
6to4 6to4
isatap ISATAP
```

```
IPv6
```

```
218G010 QF47700128...Y90V.8t=610 QF45g#(€
```

```
tunnel mode ipv6ip
```

```
ú ì ÿ ! ó
```

```
6to4
```

ipv4-address , IPv4

r
(6to4 isatap)

IPv6 :

```
Ruijie(config)# interface tunnel 1
Ruijie(config-if)# tunnel mode ipv6ip
Ruijie(config-if)# tunnel source vlan 1
Ruijie(config-if)# tunnel destination 192.168.5.1
```

tunnel source	
tunnel mode	
tunnel ttl	TTL

57.1.23 tunnel source

, no

tunnel source {*ipv4-address* | *interface-type interface-number*}

no tunnel source

ipv4-address IPv4 IPv4

interface-type interface-number

IPv4

IPv4

IPv4
(6to4 isatap)

IPv4 ,

r

IPv6

```
Ruijie(config)# interface tunnel 1
Ruijie(config-if)# tunnel mode ipv6ip
Ruijie(config-if)# tunnel source vlan 1
Ruijie(config-if)# tunnel destination 192.168.5.1
```

tunnel mode	
tunnel destination	
tunnel ttl	TTL

57.1.24 tunnel ttl

IPv6

IPv4

TTL ,

no

128

tunnel ttl *value*

no tunnel ttl

value TTL

128

IPv6 IPv4 TTL

```
Ruijie(config)# interface tunnel 1  
Ruijie(config-if)# tunnel ttl 64
```

tunnel mode	
tunnel source	
tunnel destination	

57.2

57.2.1 show ipv6 route

IPV6

show ipv6 route [static] [local] [connected]

static

local

connected

```
Ruijie# show ipv6 route
Codes: C - Connected, L - Local, S - Static, R - RIP, B - BGP
       I1 - ISIS L1, I2 - ISIS L2, IA - IIS interarea
L   ::1/128
    via ::1, loopback 0
C   fa::/64
    via ::, vlan 1
L   fa::1/128
    via ::, loopback 0
C   2001::/64
    via ::, vlan 2
L   2001::1/128
    via ::, loopback 0
L   fe80::/10
    via ::1, Null0
C   fe80::/64
    via ::, vlan 1
L   fe80::200:ff:fe00:1/128
    via ::, loopback 0
C   fe80::/64
    via ::, vlan 2
```

ipv6 route	

57.2.2 show ipv6 neighbors

IPV6

```
show ipv6 neighbors [verbose] [interface-id] [ipv6-address]
```

verbose

interface-id

ipv6-address


```
INET6: 2001::1 , subnet is 2001::/64 [TENTATIVE]
Joined group address(es):
ff01:1::1
ff02:1::1
ff02:1::2
ff02:1::1:ff00:1
MTU is 1500 bytes
ICMP error messages limited to one every 10 milliseconds
ICMP redirects are enabled
ND DAD is enabled, number of DAD attempts: 1
ND reachable time is 30000 milliseconds
ND advertised reachable time is 0 milliseconds
ND retransmit interval is 1000 milliseconds
ND advertised retransmit interval is 0 milliseconds
ND router advertisements are sent every 200 seconds<240--160>
ND router advertisements live for 1800 seconds
```

```
INET6: 2001::1 , subnet is 2001::/64
```

```
[TENTATIVE] INET6 []
```



```
ANYCAST
```

```

ND advertised retransmit time is 0 milliseconds
ND advertised CurHopLimit is 64
Prefixes: (total: 1)
fec0:1:1:1::/64(Def,Auto,vltime: 2592000, pltime: 604800,
flags: LA)

```

ra-info

RA timer is stopped (on)	
waits	
initcount	RA
RA(out/in/inconsistent)	out: in: inconsistent:
RS(input)	
Link-layer address	
Physical MTU	MTU
!M M	!M managed-config-flag M:
!O O	!O other-config-flag O:

ra-info (Prefix)

total	
fec0:1:1:1::/64	

Def	
Auto CFG	Auto IPV6 , CFG
!Adv	
vlttime	()
pltime	()
L !L	L !L on-link
A !A	A auto-config , !A