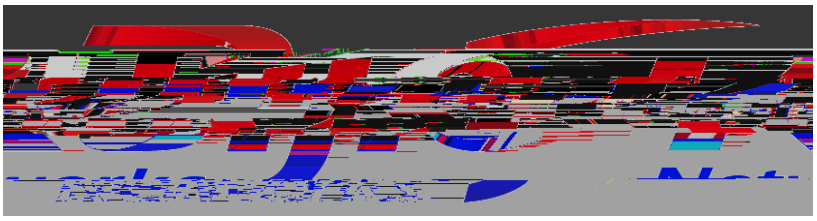
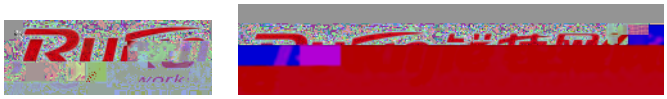


RG-S6000

RGOS 10.4(2T53)p1

©2000-2012



4008-111-000
http://webchat.ruijie.com.cn

- http://www.ruijie.com.cn/

- http://webchat.ruijie.com.cn

4008-111-000
http://webchat.ruijie.com.cn

1 CLI

1.1

1.1.1 alias

alias no

alias *mode command-alias original-command871017*

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

mode	
command-alias	
original-command	

EXEC

EXEC **h p s u un help ping show undebug undebug**

no alias exec

alias ?

```
Ruijie(config)# alias ?
aaa-gs              AAA server group mode
acl                 acl configure mode
bgp                 Configure bgp Protocol
config              globle 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
globle configure mode alias:
def-route          ip route 0.0.0.0 0.0.0.0 192.168.1.1
```

show aliases	

-	-

1.1.2 privilege

privilege

no

privilege *mode* [**all**] *d* 3 Tf0 Tc ( )Tj/TT0 1Td(privilege)Tj/C2_Tll

mode	CLI
[**all**]	
level *level*	0-15
reset	
command-string	

privilege CLI

privilege ?

CLI

enable secret	CLI

-	-

1.2

1.2.1 show aliases

EXEC **show aliases**

show aliases [*mode*]

mode	

EXEC

EXEC

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

alias	

-	-

2

2.1

2.1.1 disable

disable

disable [*privilege-level*]

enable password	

-	-

2.1.5 enable service

SSH Server/Telnet Server/Web Server/Snmp Agent

enable service

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

ssh-sesrver	SSH Server IPv4 IPv6
telnet-server	Telnet Server IPv4 IPv6
web-server	Http Server IPv4 IPv6
snmp-agent	Snmp Agent IPv4 IPv6

no enable service

enable service ssh-sesrver, SSH Server

```
Ruijie(Config  # enable service ssh-sesrver
```


Ω

2.1.6 execute

execute

execute {[**flash:**] *filename*}

flash:	
filename	

PC

TFTP Flash

CLI

line_rcms_script.text

Telnet

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

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


2.1.7 ip http authentication

Http Server Web Web
ip http authentication

ip http authentication { **enable** | **local** }

HTTP **no ip http port**

HTTP 8080

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

[redacted]	
enable service	

-	-

2.1.9 ip telnet source-interface

IP Telnet **ip telnet source-interface**

ip telnet source-interface *interface-name*

2.1.10 lock

EXEC **lock**

lock

-	-

- **lock**
-
“ Locked ”
-
line **lockable**
line

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

lockable	

-	-

2.1.11 lockable

lock line **lockable**
lock **no**

lockable

aaa authentication login	

-	-

2.1.14 login local

AAA **login local**

no

login local

no login local

-	-

line

AAA
username

VTY

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

username	

-	-

2.1.15 privilege mode

CLI

-	-

G –?◄ƒ¥ƒ¶ƒ¶~bT“/X2gx"Xad8AŸRƒ¿HNI5–ƒ¶ƒ¶ƒ¶ƒ¶u&5dd8Å

login	

-	-

2.1.17 service password-encryption

service password-encryption no

service password-encryption

-	-

service password-encryption
password service password-encryption
show running write password
service password-encryption

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

enable password	

-	-

2.1.18 telnet

Telnet EXEC **telnet**

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

Host	Telnet IPV4 IPV6
Port	Telnet TCP 23
/source	Telnet IP
ip *A.B.C.D*	Telnet IPV4
ipv6 *X:X:X:X::X*	Telnet IPV6
interface *interface-name*	Telnet

telnet

1 telnet IPV4 192.168.1.1 vlan 1 VRF vpn1

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

2 telnet IPV6 2AAA:BBBB::CCCC

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

ip telnet source-interface	IP Telnet
show session	TTY
exit	

-	-

2.1.19 username

username

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

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

no username *name*

name	

password	
0|7	0 7

encrypted-password

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

-	-

-	-

2.2.2 banner motd

banner motd

no banner motd

banner motd *c message c*

c	
message	

```
Ruijie(config)# banner motd $ hello,world $
```

-	-

-	-

2.2.3 clock set

clock set

clock set *hh:mm:ss month day year*

hh:mm:ss	24 : :
day	1-31
month	1-12
year	1993-2035

2003 3 17 10 20 30

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

show clock	

-	-

2.2.4 clock update-calendar

clock update-calendar

-	-

calendar

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

-	-

string	32

EXEC

RGOS

```
Ruijie(config)# prompt RGOS
Ruijie(config)# end
RGOS
```

-	-

-	-

2.2.8 reload

reload

reload [*text* | **in** [*hh:*] *mm* [*text*] | **at** *hh:mm* [*month day* | *day month*] [*text*] | **cancel**]

text	1-255
in [*hh:*] *mm*	24
at *hh:mm*	
month	3 Mar
day	1 31
cancel	

10

```
Ruijie# reload in 10
Router will reload in 600 seconds.
```

-	-

-	-

2.2.9 service config

no

service config

no service config

5,Õ!*0Õ@	

boot config	
boot network	

-	-

2.2.10 session-timeout

LINE **session-timeout**
no session-timeout LINE

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

no session-timeout

minutes	
output	

0 min

LINE

LINE
LINE

line vty 0 5 30

```
Ruijie(config-line)# exec-timeout 5 30
```

-	-

-	-

2.2.11 speed

speed *speed*

no speed

speed *speed*

Speed	bps 9600 19200 38400 57600 115200 9600

9600

57600 bps

```
Ruijie(config)# line console 0
Ruijie(config-line)# speed 57600
```

-	-

-	-

2.2.12 write

running-config

write [**memory** | **network** | **terminal**]

memory	NVRAM **copy running-config startup-config**
network	TFTP **copy running-config tftp**
terminal	**show running-config**

boot config **write** [**memory**]

- **boot config** Flash “ /config.text ”
- **boot config**
- **boot config**

■

■

U SD **write** [**memory**] “ /config ”

boot config RSR10 RSR20 RSR50 NPE50

1

-	-

2.3

2.3.1 show clock

show clock

show clock

-	-

detail

show clock

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

clock set	

-	-

2.3.2 show line

show line

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

console	
aux	aux

vty

```
Ruijie# show reload
Reload scheduled in 595 seconds.
At 2003-12-29 11:37:42
Reload reason: test.
```

-	-

-	-

2.3.4 show running-config

show running-config

show running-config

-	-

-	-

-	-

2.3.5 show version

show version

show version [**slots** | **devices**]

slots	
devices	

```
Ruijie# show version
System description : Ruijie Dual Stack Multi-Layer Switch(S3760-24)
By Ruijie Network
System start time: 1970-6-14 11:49:53
System uptime: 3:17:1:17
System hardware version: 2.0
System software version: RGOS 10.3.00(4), Release(34679)
System boot version: 10.2.34077
System CTRL version: 10.2.24136
System serial number: 1234942570001
```

-	-

-	-

3 LINE

3.1 LINE

3.1.1 access-class

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

[**no**] **access-class** *access-list-number* {**in | out**}

access-list-number	access-list
in	
out	

Line

Line

Line **access-class** access list **show running** Line

line vty 0 4 access-list 10

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

show running	

-	-

3.1.2 line

LINE

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

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

10.534 ref61.2 v 5 1 2 0 9 1 6 T f 1 0) T j 4 E r e 4 B T 0 0 9 9 w 1 0 4 8 1 3 7 5 0 5 T 0 / 1 0 5 1 3 6 . 2 8 5 0 3 . 0 6 0 4 4 8 6 ( ) T j / C 2

d**efault transport inpu**t **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
```

4 SSH

4.1 SSH

4.1.1 crypto key generate

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

4.1.2 crypto key zeroize

SSH

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

rsa	RSA
dsa	DSA

SSH Server DISABLE

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**}	m*á @EZÚ Y1

SSH

-	-

4.1.5 ip ssh version

SSH server no

ip ssh version {**1** | **2**}

no ip ssh version

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

session-id	SSH

SSH SSH VTY
SSH SSH

```
Ruijie# disconnect ssh 1

Ruijie# disconnect ssh vty 1
```

show ssh	SSH
Clear line vty *line_number*	VTY

-	-

4.2.2 show crypto key mypubkey

SSH Server

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

rsa	RSA
dsa	DSA

SSH Server

crypto key generate {**rsa	dsa**}	DSA RSA

-	-

4.2.3 show ip ssh

SSH Server

show ip ssh

-	-

SSH Server SSH Server

SSH
SSH

```
Ruijie# show ip ssh
```

	-	-

SSH VTY SSH

```
Ruijie# show ssh
```

5 FTP Server

5.1

5.1.1 debug ftpserver

FTP no

debug ftpserver

no debug ftpserver

-	-

debug ftpserver FTP

1

```
Ruijie# debug ftpserver
FTPSRV_DEBUG:(RECV)   SYST
FTPSRV_DEBUG:(REPLY)  215 RGOS Type: L8
FTPSRV_DEBUG:(RECV)   PORT 192,167,201,82,7,120
FTPSRV_DEBUG:(REPLY)  200 PORT Command okay.
```

2

```
Ruijie# no debug ftpserver
```

-	-

-	-

5.1.2 ftp-server enable

FTP no FTP

ftp-server enable

no ftp-server enable

-	-

FTP FTP

ftp-server topdir FTP

FTP

1 FTP

FTP Server

-	-

-	-

5.1.6 ftp-server username

FTP no

ftp-server username *username*

no ftp-server username

username	

FTP

64

FTP

FTP

1 user

```
Ruijie(config)# ftp-server username user
```

2

```
Ruijie(config)# no ftp-server username
```

-	-

-	-

5.2

5.2.1 show ftp-server

FTP

show ftp-server

-	-

FTP

-
- IP Port
- IP Port
-
-
-
-

FTP

```
Ruijie# show ftp-server
ftp-server information
=======================================
enable : Y
topdir : /
timeout: 20min
username config : Y
password config : Y
type: BINARY
control connect : Y
ftp-server: ip=192.167.201.245  port=21
ftp-client: ip=192.167.201.82  port=4978
port data connect : Y
ftp-server: ip=192.167.201.245  port=22
ftp-client: ip=192.167.201.82  port=4982
passive data connect : N
```

-	-

	-	-

6

6.1

6.1.1 cd

cd [*filesystem:*][*directory*]

filesystem	“ ”
directory	

flash

cd
“ / ”
pwd

```
  1               usb0
Ruijie# cd usb0:/
  2               sd
Ruijie# cd sd0:/
```

pwd	

6.1.2 copy

bþ'HI rÊvJ"F@ÈÈ1µ8>T1/TT0

```
  7         U        sd
Ruijie#copy usb0:/config.text sd0:/config.text
  8         sd        U
Ruijie#copy sd0:/config.text usb0:/config.text
```

del	
rename	
dir	

6.1.3 delete

delete *url*

url	url

url URL flash:/ usb0:/ usb1:/ slave:/ url

.

```
  1               tmpfile
Ruijie# delete tmpfile
  2             rgos.bin.bak
Ruijie# delete slave:/rgos.bin.bak
  3      sd      aaa.bin
Ruijie# delete sd0:/aaa.bin
```


copy	
dir	

6.1.4 dir

dir [*filesystem:*][*directory*]

filesystem	":"
directory	

.

```
  1
Ruijie# dir slave0:/
Directory of slave:/
   Mode Link     Size             MTime Name
-------- ---- --------- ------------------- -----------------
          1  10838016 2008-01-01 00:01:53 rgos.bin
          1      399 2008-01-01 00:01:37 config.text
          1      399 2008-01-01 00:17:58 cfg.txt
------------------------------------------------------------
3 Files (Total size 11210782 Bytes), 0 Directories.
Total 33030144 bytes (31MB) in this device, 20463616 bytes (19MB)
available.
  2
Ruijie# dir
Directory of temp:/
   Mode Link     Size             MTime Name
-------- ---- --------- ------------------- -----------------
```

pwd	

6.1.6 rename

rename *url1 url2*

url1	URL
url2	URL

usb0/1, flash, slave

```
  1    log.txt              ,      config.txt
Ruijie# rename tmp/log.txt ../config.txt

  2         log.txt      usb0
Ruijie# rename slave:/log.txt usb0:/log.txt

  3              log.txt      log.txt.bak
Ruijie# rename log.txt log.txt.bak
  4    sd         rgos.bin      flash
Ruijie# rename sd0:/rgos.bin flash:/rgos_bak.bin
  5    U        test.txt      sd
Ruijie# rename usb0:/test.txt sd0:/test2.txt
```

del	
copy	

6.1.7 rmdir

rmdir *directory*

directory	,

,

tmp

```
Ruijie# rmdir tmp
```

mkdir	

6.2

6.2.1 pwd

pwd

1

```
Ruijie# pwd
flash:/
```

cd	

6.2.2 show file systems

show file systems

7

7.1

7.1.1 clear logging

clear logging

-	-

```
Ruijie# clear logging
```

logging on	
show logging	
logging buffered	

-	-

7.1.2 more flash

FLASH

more flash:filename

show logging

clear logging

FLASH

Syslog Server

8

level	0 7 1

Debugging (7)

show logging

6

```
Ruijie(config)# logging console informational
```

logging on	
show logging	

-	-

7.1.5 logging count

no

logging count

no logging count

-	-

no logging count

```
Ruijie(config)# logging count
```

show logging count	

show logging

max-file-size	128K 6M bytes 128K
level	FLASH 6 1

FLASH

Syslog Server
FLASH
txt

	FLASH FLASH FLASH logging file flash

FLASH trace.txt 64K,
6

```
Ruijie(config)# logging file flash:trace
```

logging on	

show logging

Logging monitor **terminal monitor**

config)# logging monitor informational

logging on	
show logging	

-	

7.1.9 logging on

logging on ing on

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

-	-

7.1.10 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	

-	-

7.1.11 logging server

Syslog Sever **Syslog server**
Syslog Server no

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

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

ip-address	IP
vrf vrf-name	VRF VPN
ipv6 ipv6-address	IPV6

syslog server

Syslog server 5 Syslog Server Syslog Server

1 202.101.11.1 syslog server

```
Ruijie(config)# logging server 202.101.11.1
```

2 IPV6 AAAA:BBBB::FFFF

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

logging on	
show logging	
logging trap	syslog server

-	-

7.1.12 logging source ip| ipv6

IP no

IP

logging source {**ip** *ip-address* | **ipv6** *irTw [(v6)4ds*

no logging source interface

interface-type	
interface-number	

Syslog Server IP IP
IP IP

IP IP IP

Loopback 0 Syslog

```
Ruijie(config)# logging source interface loopback 0
```

logging	Syslog Server

-	-

7.1.14 logging synchronous

no

logging synchronous

no logging synchronous

-	-

```
Ruijie(config)#line console 0
Ruijie(config-line)#logging synchronous
                          UP-DOWN
Ruijie#configue terminal
Oct  9 23:40:55 %LINK-5-CHANGED: Interface GigabitEthernet 0/1,
changed state to down
Oct  9 23:40:55 %LINEPROTO-5-UPDOWN: Line protocol on Interface
GigabitEthernet 0/1, changed state to DOWN
Ruijie# configue terminal        //
```

show running-config	

-	-

7.1.15 logging trap

Syslog Server

no Syslog Server

logging trap *level*

no logging trap

level	1

Informational(6)

Syslog Server logging

Syslog Server logging trap

show logging

6 202.101.11.22 Syslog Server

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

logging on	

logging	Syslog Server
show logging	

-	-

7.1.16 service sequence-numbers

no

service sequence-numbers

no service sequence-numbers

-	-

1

```
Ruijie(config)# service sequence-numbers
```

logging on	
service timestamps	

-	-

7.1.17 service sysname

no

service sysname

no service sysname

-	-

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

show logging	

-	-

7.1.18 service timestamps

no

default

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

no service timestamps *message-type*

default service timestamps *message-type*

message-type	log debug log 0 6 debug 7

uptime	* * * * 07:00:10:41
datetime	Jul 27 16:53:07
msec	: : . Jul 27 16:53:07.299
year	2007 Jul 27 16:53:07

RTC

Uptime
Datetime

Log Debug Datetime

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

logging on	
service sequence-numbers	

-	-

7.1.19 terminal monitor

VTY VTY

no

terminal monitor

terminal no monitor

-	-

VTY

VTY VTY

VTY

```
Ruijie# terminal monitor
```

-	-

-	-

7.2

7.2.1 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
FastEthernet 0/0, changed state to up
00002 2004-11-17 10:20:59  Ruijie: %7:%LINE PROTOCOL CHANGE:
Interface FastEthernet 0/0, changed state to UP
00003 2004-11-17 10:57:18  Ruijie: %7:%LINK CHANGED: Interface
FastEthernet 0/1, changed state to administratively down
00004 2004-11-17 10:57:21  Ruijie: %7:%LINK CHANGED: Interface
FastEthernet 0/1, changed state to down
00005 2004-11-17 10:57:41  Ruijie: %7:%LINK CHANGED: Interface
FastEthernet 0/1, changed state to administratively down
00006 2004-11-17 10:57:43  Ruijie: %7:%LINK CHANGED: Interface
FastEthernet 0/1, changed state to down
```

show logging count

8

8.1

8.1.1 cpu-log

CPU , **cpu-log**

cpu-*log* *log-limit low_num high_num*

log-limit	
low_num	CPU
high_num	CPU

CPU 100% 90% 90%

CPU CPU
CPU , CPU
, , CPU Ō

-	-

8.1.2 memory-lack exit-policy

lower BGP OSPF RIP PIM-SM

memory-lack exit-policy (**bgp**|**ospf**|**pim-sm**|**rip**)

no memory-lack exit-policy

bgp|ospf|pim-sm|rip	BGP OSPF PIM RIP
no	

lower (show memory lower

BGP

bgp

1 BGP

```
Ruijie(config)# memory-lack exit-policy bgp
```

show memory	

-

10.3(4b3)	

8.2

8.2.1 show cpu

CPU **show cpu**

show cpu

-	-

CPU 5 1 5
CPU 5 1 5
CPU

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
  7     0%     0%     0%    kevents
  8     0%     0%     0%    snmpd
  9     0%     0%     0%    snmp_trapd
 10     0%     0%     0%    mtdblock
 11     0%     0%     0%    gc_task
 12     0%     0%     0%    Context
 13     0%     0%     0%    kswapd
 14     0%     0%     0%    bdflush
 15     0%     0%     0%    kupdate
```

```
16    0%    3%    1%    ll_mt
17    0%    0%    0%    ll main process
18    0%    0%    0%    bridge_relay
19    0%    0%    0%    d1x_task
20    0%    0%    0%    secu_policy_task
21    0%    0%    0%    dhcpa_task
22    0%    0%    0%    dhcpsnp_task
23    0%    0%    0%    igmp_snp
24    0%    0%    0%    mstp_event
25    0%    0%    0%    GVRP_EVENT
26    0%    0%    0%    rldp_task
27    0%    2%    1%    rerp_task
28    0%    0%    0%    reup_event_handler
29    0%    0%    0%    tpp_task
30    0%    0%    0%    ip6timer
31    0%    0%    0%    rtadvd
32    0%    0%    0%    tnet6
33    2%    0%    0%    tnet
34    0%    0%    0%    Tarptime
35    0%    0%    0%    gra_arp
36    0%    0%    0%    Ttcptimer
37    8%    1%    0%    ef_res
38    0%    0%    0%    ef_rcv_msg
39    0%    0%    0%    ef_inconsistent_daemon
40    0%    0%    0%    ip6_tunnel_rcv_pkt
41    0%    0%    0%    res6t
42    0%    0%    0%    tunrt6
43    0%    0%    0%    ef6_rcv_msg
44    0%    0%    0%    ef6_inconsistent_daemon
45    0%    0%    0%    imid
46    0%    0%    0%    nsmd
47    0%    0%    0%    ripd
48    0%    0%    0%    ripngd
49    0%    0%    0%    ospfd
50    0%    0%    0%    ospf6d
51    0%    0%    0%    bgpd
52    0%    0%    0%    pimd
53    0%    0%    0%    pim6d
54    0%    0%    0%    pdmd
55    0%    0%    0%    dvmrpd
56    0%    0%    0%    vty_connect
57    0%    0%    0%    aaa_task
58    0%    0%    0%    Tlogtrap
59    0%    0%    0%    dhcp6c
60    0%    0%    0%    sntp_recv_task
61    0%    0%    0%    ntp_task
62    0%    0%    0%    sla_deamon
63    0%    3%    1%    track_daemon
64    0%    0%    0%    pbr_guard
65    0%    0%    0%    vrrpd
66    0%    0%    0%    psnpd
67    0%    0%    0%    igsnpd
```

```
 68     0%     0%     0%    coa_recv
 69     0%     0%     0%    co_oper
 70     0%     0%     0%    co_mac
 71     0%     0%     0%    radius_task
 72     0%     0%     0%    tac+_acct_task
 73     0%     0%     0%    tac+_task
 74     0%     0%     0%    dhcpd_task
 75     0%     0%     0%    dhcps_task
 76     0%     0%     0%    dhcpping_task
 77     0%     0%     0%    dhcpc_task
 78     0%     0%     0%    uart_debug_file_task
 79     0%     0%     0%    ssp_init_task
 80     0%     0%     0%    rl_listen
 81     0%     0%     0%    ikl_msg_operate_thread
 82     0%     0%     0%    bcmDPC
 83     0%     0%     0%    bcmL2X.0
 84     3%     3%     3%    bcmL2X.0
 85     0%     0%     0%    bcmCNTR.0
 86     0%     0%     0%    bcmTX
 87     0%     0%     0%    bcmXGS3AsyncTX
 88     0%     2%     1%    bcmLINK.0
 89     0%     0%     0%    bcmRX
 90     0%     0%     0%    mngpkt_rcv_thread
 91     0%     0%     0%    mngpkt_recycle_thread
 92     0%     0%     0%    stack_task
 93     0%     0%     0%    stack_disc_task
 94     0%     0%     0%    redun_sync_task
 95     0%     0%     0%    conf_dispatch_task
 96     0%     0%     0%    devprob_task
 97     0%     0%     0%    rdp_snd_thread
 98     0%     0%     0%    rdp_rcv_thread
 99     0%     0%     0%    rdp_slot_change_thread
100     4%     2%     1%    datapkt_rcv_thread
101     0%     0%     0%    keepalive_link_notify
102     0%     0%     0%    rerp_msg_recv_thread
103     0%     0%     0%    ip_scan_guard_task
104     0%     0%     0%    ssp_ipmc_hit_task
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         1         5
    CPU                 LISR  HISR                    CPU
```

5Sec	5 CPU
1Min	1 CPU
5Min	5 CPU

2 LISR CPU HISR CPU
3 CPU idle CPU
Windows “ System Idle Process ”
idle 5 CPU 75% CPU 75%

-	-

-	-

8.2.2 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	
lower	**memory-lack exit-policy**
low	OVERFLOW
high	OVERFLOW

3.

9

9.1

9.1.1 ping

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

vrf-name	VRF
ip-address	IPv4
length	
times	
seconds	
data	
source	IPv4 127.0.0.1
df-bit	IP DF DF 1 DF 0
validate	

2 5 100Byte IP

Ping
ping ping ping
2 5
100Byte IP ‘ ! ’
‘ . ’ ping
ping
ping
DNS VRF RSR

1 ping

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

2 ping

```
Ruijie# ping 192.168.5.197 length 1500 ntimes 100 timeout 3 data ffff
source 192.168.4.10
 Sending 100, 1000-byte ICMP Echoes to 192.168.5.197, timeout is 3
seconds:
  < press Ctrl+C to break >
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
Success rate is 100 percent (100/100), round-trip min/avg/max = 2/2/3
ms
```

-	-

-	-

9.1.2 ping ipv6

ping [**ipv6**] [*ip-address* [**length** *length*] [**ntimes** *times*] [**timeout** *seconds*] [**data** *data*] [**source** *source*]]

ip-address	IPv6
length	
times	
seconds	
data	
source	IPv6 ::1

2 5 100Byte IP

Ping ipv6

ping ipv6 ping ipv6

ping ipv6

2 5 100Byte IP

‘!’ ‘.’

‘C’ ping ipv6

ping

ping ipv6

DNS

1 ping ipv6

```
Ruijie# ping ipv6 2000::1
Sending 5, 100-byte ICMP Echoes to 2000::1, timeout is 2 seconds:
  < press Ctrl+C to break >
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/2/10
ms
```

2 ping

```
Ruijie# ping  ipv6 2000::1 length 1500 ntimes 100 timeout 3 data ffff
source 2000::2
 Sending 100, 1000-byte ICMP Echoes to 2000::1, timeout is 3 seconds:
  < press Ctrl+C to break >
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
Success rate is 100 percent (100/100), round-trip min/avg/max = 2/2/3
ms
```

-	-

-	-

9.1.3 traceroute

traceroute .

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

Ip-address	IPv4
number	
source	IPv4 127.0.0.1

seconds	
minimum maximum	TTL

Traceroute

DNS

traceroute

1 traceroute

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

Traceroute ipv6

DNS

traceroute ipv6

1 traceroute ipv6

```
Ruijie# traceroute ipv6 3004::1
 < press Ctrl+C to break >
Tracing the route to 3004::1
1     3000::1         3000::10 msec 3000::4 msec 0 msec
                                                        Tracing the rout
                                                        1     3000::1
```

10

10.1

10.1.1 carrier-delay

carrier-delay **no**

carrier-delay [*seconds*]

no carrier-delay

seconds	1 60

2

DCD Down Up
DCD

DCD
DCD

5

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

-	-

-	-

10.1.2 clear counters

clear counters [*interface-id*]

interface-id	

show interfaces **clear counters**

```
Ruijie# clear counters gigabitethernet 1/1
```

show interfaces	

-	-

10.1.3 clear interface

clear interface *interface-id*

interface-id	

Switch Port,L2 Aggregrate port ,Routed port,L3 Aggregate port **shutdown** **no shutdown**

```
Ruijie# clear interface gigabitethernet 1/1
```


auto	
full	
half	

show interfaces

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

show interfaces	

-	-

10.1.6 flowcontrol

no

flowcontrol {**auto** | **off** | **on**}

no flowcontrol

auto	
off	
on	

show interfaces

1/1

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

show interfaces	

mod-num/port-num	/

no **show interfaces** **show interfaces fastEthernet**

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

	mod-num/port-num9.7

show interfaces

-	-

10.1.10 interface vlan

switch virtual interface SVI

no SVI

interface vlan *vlan-id*

no interface vlan *vlan-id*

vlan-id	VLAN ID

show interfaces **show interfaces vlan**

```
Ruijie(config)# interface vlan 2
Ruijie(config-if)#
```

show interfaces	

-	-

10.1.11 medium-type

no

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

no medium-type

fiber	

copper	

Ap`

Ap SVI

Ap`

```
Ruijie(config)# interface gigabitethernet 1/1
Ruijie(config-if)# medium-type copper
```


show interfaces

-	-

10.1.13 shutdown

no

shutdown

no shutdown

-	-

Ap SVI

show interfaces

	no shutdown

1 Ap 1

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

2 Ap 1

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

clear interface	
show interfaces	

-	-

10.1.14 snmp trap link-status

LinkTrap Link
SNMP LinkTrap, **no** SNMP LinkTrap

snmp trap link-status

no snmp trap link-status

Link SNMP LinkTrap

Ap SVI LinkTrap
Link SNMP LinkTrap,

1 Link trap

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

2 Link trap

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

show interfaces	

-	-

10.1.17 switchport access

access port VLAN
no VLAN

switchport access vlan *vlan-id*

no switchport access vlan

vlan-id	VLAN ID

switch port access VLAN VLAN 1

VLAN ID VLAN ID VLAN
VLAN VLAN ID VLAN
trunkport

```
Ruijie(config)# interface gigabitethernet 1/1
Ruijie(config-if)# switchport access vlan 2
```

switchport mode	switch port
switchport trunk	trunkport native VLAN Trunk VLAN

-	-

10.1.18 switchport mode

Trunk VLAN vlan-list
VLAN

allowed vlan *vlan-list*

-	-

10.2

10.2.1 show interfaces

show interfaces [*interface-id*] [**counters | description | status | switchport | trunk | transceiver [alarm | diagnosis]]**

interface-id	aggregateport SVI loopback
counters	
description	link
status	
switchport	
trunk	trunking port Aggregate port
transceiver	
alarm	“ None ”
diagnosis	

interface gigabitEthernet	
interface aggregateport	
interface vlan	switch virtual interface SVI
shutdown	

speed

11 AP

11.1

11.1.1 aggregateport load-balance

AP no

aggregateport load-balance { **src-dst-mac** | **src-dst-ip** }

no aggregateport load-balance

src-dst-ip	IP IP IP—— IP IP—— IP
src-dst-mac	MAC MAC MAC—— MAC MAC—— MAC

MAC

show aggregateport load-balance

```
Ruijie(config)# aggregateport load-balance src-dst-ip
```

show aggregateport load-balance	aggregateport

-	-

11.1.2 port-group

Aggregate Port no Aggregate Port

port-group *port-group-number*

no port-group

port-group-number	Aggregate Port Aggregate Port

Aggregate Port

AP VLAN trunk port native VLAN AP

1/3 AP 3

```
Ruijie(config)# interface gigabitethernet 1/3
Ruijie(config-if)# port-group 3
```

-	-

-	-

11.1.3 port-group mode

LACP ID no LACP

port-group *key* **mode active** | **passive**

no port-group

Key	ID, key
active	LACP
passive	LACP LACP LACP .

LACP

```
Ruijie(config)# interface gigabitethernet 1/1
Ruijie(config-if)# port-group 1 mode active
```

lacp port-priority	LACP

10.3(5)	

11.1.4 lacp port-priority

LACP no

lacp port-priority *port-priority*

no lacp port-priority

port-priority	0-65535

32768

, ,

,,

```
Ruijie(config)# interface gigabitethernet 1/1
Ruijie(config-if)# lacp port-priority 4096
```

port-group *key* **mode active** | **passive**	LACP ID

10.3(5)	

11.1.5 lacp system-priority

LACP no

lacp system-priority *system-priority*

no lacp system-priority

system-priority	LACP 0-65535

32768

LACP MAC MAC
MAC

```
Ruijie(config)# lacp system-priority 4096
```

port-group *key* **mode active** | **passive**	LACP ID
lacp port-priority	LACP

10.3(5)	

show aggregateport [*aggregate-port-number*] **summary**

10.3(5)	
10.4(2b2)	key

12 SPAN

12.1

12.1.1 monitor session

SPAN . no

monitor session *session_number* {**source interface** *interface-id* [**both** | **rx** | **tx**] | **destination interface** *interface-id* { **encapsulation | switch** } | **mac** {**source** *mac-addr*| **destination** *mac-addr* } [**both** | **rx** | **tx**]} [**acl** *name*]

no monitor session *session_number* [**source interface** *interface-id* [**both** | **rx** | **tx**] | **destination interface** *interface-id* { **encapsulation | switch** }] | **mac** {**source** *mac-addr*| **destination** *mac-addr* } [**both** | **rx** | **tx**] [**acl** *name*]

no monitor session all

session_number	SPAN
source interface *interface-id*	*interface-id* SVI
destination interface *interface-id*	*interface-id* SVI
mac source *mac-addr*	MAC
mac destination *mac-addr*	MAC
both **acl** *name*	**acl** *name/id*
rx	
tx	
all	
encapsulation	, tag
switch	

switch port routed port AP SPAN
SPAN disabled port SPAN

show monitor SPAN

session 1 SPAN
session 1

SPAN 1
1 gigabitEthernet 1/1
gigabitEthernet 1/8

```
Ruijie(config)# no monitor session 1
Ruijie(config)# monitor session 1 source interface gigabitEthernet 1/1 both
Ruijie(config)# monitor session 1 destination interface gigabitEthernet 1/8
```

show monitor	SPAN

-	-

12.2

12.2.1 show monitor

SPAN

show monitor [**session** *session_number*]

session *session_number*	SPAN

SPAN

show monitor SPAN 1

13 NLB GROUP

13.1

13.1.1 nlb-group

VRF IP

no

nlb-group *group-number* [**vrf** *vrf-name*] **ip** *nlb-address* [**reflector-port** *interface-name*]
nlb-group *group-number* **destination-port** *interface-name*
no nlb-group *group-number* [[**vrf** *vrf-name*] **ip** *nlb-address* [**reflector-port** *interface-name*]]
no nlb-group *group-number* [**destination-port** *interface-name*]
no nlb-group all

group-number	
vrf-name	VRF
nlb-address	NLB
reflector-port *interface-name*	interface-name L2AP
destination-port *interface-name*	interface-name L2AP SVI Routed Port

Switch Port L2AP Switch Port
VRF IP
VLAN
VRF IP

show nlb-group

■
■
■
■
■ VRF VRF
■ 5 16

1

```
Ruijie(config)# nlb-group 1 vrf vpn-1 ip 192.168.10.1 reflector-port
gigabitethernet 0/1
Ruijie(config)# nlb-group 1 destination-port gigabitethernet 0/2,
0/3
```

2 1

```
Ruijie(config)# no nlb-group 1 vrf vpn-1 ip 192.168.10.1
reflector-port gigabitethernet 0/1
```

3 1

```
Ruijie(config)# no nlb-group 1 destination-port gigabitethernet
0/2, 0/3
```

show nlb-group	

10.4 2b2	

13.2

13.2.1 show nlb-group

show nlb-group [*group_number*]

group-number	

show nlb-group

```
Ruijie# show nlb-group 1
group-number   1
cluster-vrf: vpn-1
cluster-ip: 192.168.10.1
destination-port: Gi 0/2, Gi 0/3, Gi 0/3
```

group-number	
destination-port	
cluster-vrf	VRF
cluster-ip	IP
reflector-port	

nlb-group	

10.4 2b2	

14 MAC

14.1

14.1.1 address-bind

ip mac

address-bind *ip-address mac-address*

no address-bind *ip-address*

ip-address	IP
mac-address	mac

IP MAC IP IP
MAC IP MAC

ip 3.3.3.3 mac 00d0.f811.1112

```
Ruijie(config)# address-bind 3.3.3.3 00d0.f811.1112
```

show address-bind	

-	-

14.1.2 address-bind install

/

address-bind install

no address-bind install

-	-

fa 0/1

```
Ruijie(config)# address-bind uplink fa0/1
Ruijie(config)# address-bind install
```

show address-bind uplink		

ip 3.3.3.3 mac 00d0.f811.1112

```
Ruijie(config)# address-bind 3.3.3.3 00d0.f811.1112
```

show address-bind	

-	-

14.1.4 address-bind ipv6-mode

ip IP

address-bind ipv6-mode compatible

address-bind ipv6-mode loose

address-bind ipv6-mode strictA'5v8&NT$B…–6DA›ŽYR‡R–avQ dŒ.!Ara"aD‰)–GŒÄ

	MAC	MAC	IPV6

-	-

14.1.6 clear mac-address-table dynamic

clear mac-address-table dynamic[**address** *mac-addr*] [**interface** *interface-id*] [**vlan** *vlan-id*]

dynamic	
address *mac-addr*	
interface *interface-id*	
vlan *vlan-id*	VLAN

show mac-address-table dynamic

```
Ruijie# clear mac-address-table dynamic
```

show mac-address-table dynamic	

-	-

14.1.7 clear mac-address-table filtering

clear mac-address-table filtering [**address** *mac-addr*][**vlan** *vlan-id*]

filtering	
address *mac-addr*	

vlan *vlan-id*	VLAN

show mac-address-table filtering

00d0.f800.0c0c

```
Ruijie# clear mac-address-table filtering address 00d0.f800.0c0c
```

mac-address-table filtering	
show mac-address-table filtering	

mac-address-table static	
show mac-address-table static	

-	-

14.1.9 mac-address-table aging-time

no

mac-address-table aging-time *seconds*

no mac-address-table aging-time

seconds	

300

show mac-address-table aging-time
show mac-address-table dynamic

```
Ruijie(config)# mac-address-table aging-time 150
```

show mac-address-table aging-time	
show mac-address-table dynamic	

-	-

14.1.10 mac-address-table filtering

no

mac-address-table filtering *mac-address* **vlan** *vlan-id*

no mac-address-table filtering *mac-address* **vlan** *vlan-id*

mac-address	
vlan *vlan-id*	VLAN ID

show mac-address-table filtering

```
Ruijie(config)# mac-address-table filtering
00d0f8000000 vlan 1
```

clear mac-address-table filtering	
show mac-address-table filtering	

MAC Trap

show mac-address-table static	
clear mac-address-table static	

-	-

14.1.13 mac-manage-learning uniform

MAC uniform .

-	-

MAC uniform
MAC MAC

show mac-address-table mac-manage-learning	MAC

-	-

14.1.16 snmp trap mac-notification

MAC **no**

snmp trap mac-notification {**added** | **removed**}

no snmp trap mac-notification {**added** | **removed**}

added	
removed	

show mac-address-table notification *interface*

```
Ruijie(config)# interface gigabitethernet 1/1
Ruijie(config-if)# snmp trap mac-notification added
```

mac-address-table notification	MAC
show mac-address-table notification	MAC

-	

-	

14.1.17 mac-address-learning

/

mac-address-learning

MAC

1

```
Ruijie(config-if)# no mac-address-learning
```

14.2

14.2.1 show address-bind

show address-bind


```
Ruijie# show address-bind
IP Address     Binding MAC Addr
-----------    -----------------
3.3.3.3        00d0.f811.1112
3.3.3.4        00d0.f811.1117
```

address-bind	

-	-

14.2.2 show address-bind uplink

show address-bind uplink


```
Ruijie# show address-bind uplink
Ports       State
------------ ------
Fa0/1       Disabled
Fa0/2       Disabled
……
```

address-bind uplink	

-	-

14.2.3 show mac-address-table address

MAC

show mac-address-table [**address** *mac-addr*] [**interface** *interface-id*] [**vlan** *vlan-id*]

address *mac-addr*	MAC
interface *interface-id*	

vlan *vlan-id*	VLAN

```
Ruijie# show mac-address-table address 00d0.f800.1001
Vlan       MAC Address         Type     Interface
-------    ------------      --------   --------
1          00d0.f800.1001      STATIC    Gi1/1
```

show mac-address-table static	
show mac-address-table filtering	
show mac-address-table dynamic	
show mac-address-table interface	
show mac-address-table vlan	VLAN
show mac-address-table count	
show mac-address-table static	
show mac-address-table filtering	

-	-

14.2.4 show mac-address-table aging-time

show mac-address-table aging-time

-	-

```
Ruijie# show mac-address-table aging-time
Aging time    : 300
```

mac-address-table aging-time	

-	-

14.2.5 show mac-address-table count

show mac-address-table count

-	-

```
Ruijie# show mac-address-table count
Dynamic Address Count  : 51
Static  Address Count  : 0
Filter  Address Count  : 0
Total Mac Addresses    : 51
Total Mac Address Space Available: 8139
```

show mac-address-table static	
show mac-address-table filtering	
show mac-address-table dynamic	
show mac-address-table address	
show mac-address-table interface	

14.2.7 show mac-address-table filtering

show mac-address-table static [**addr** *mac-addr*] [**vlan** *vlan-id*]

mac-addr	MAC
vlan-id	VLAN

```
Ruijie# show mac-address-table filtering
Vlan       MAC Address         Type    Interface
------  -------------------- -------- -----------
1     0000.2222.2222     FILTER Not available
```

clear mac-address-table filtering	
mac-address-table filtering	

-	-

14.2.8 show mac-address-table interface

show mac-address-table interface [*interface-id*] [**vlan** *vlan-id*]

interface-id	(AggregatePort)
vlan-id	VLAN

```
Ruijie# show mac-address-table interface gigabitethernet 1/1
Vlan       MAC Address         Type    Interface
------  ---------------       -----   -----------
1    00d0.f800.1001  STATIC   gigabitethernet 1/1
1    00d0.f800.1002  STATIC   gigabitethernet 1/1
1    00d0.f800.1003  STATIC   gigabitethernet 1/1
1    00d0.f800.1004  STATIC   gigabitethernet 1/1
```

show mac-address-table static	
show mac-address-table filtering	
show mac-address-table dynamic	
show mac-address-table address	
show mac-address-table vlan	VLAN
show mac-address-table count	

-	-

14.2.9 show mac-address-table notification

MAC

show mac-address-table notification [**interface**[*interface-id*] **| history**]

interface *interface-id*	MAC
history	MAC

MAC

```
Ruijie# show mac-address-table notification interface
Interface        MAC Added Trap  MAC Removed Trap
```

```
---------        --------------      --------------
GigabitEthernet1/14   Disabled       Disabled
Ruijie# show mac-address-table notification
MAC Notification Feature :  Disabled
Interval between Notification Traps : 1 secs
Maximum Number of entries configured in History Table :1
Current History Table Length : 0
Ruijie# show mac-address-table notification history
History Index : 0
MAC Changed Message :
Operation:ADD Vlan : 1 MAC Addr: 00f8.d012.3456 GigabitEthernet 3/1
```

mac-address-table notification	MAC
snmp trap mac-notification	MAC

-	-

14.2.10 show mac-address-table static

show mac-address-table static [**addr** *mac-addr*] [**interface** *interface-id*] [**vlan** *vlan-id*]

mac-addr	MAC
vlan-id	VLAN
interface-id	(AggregatePort)

```
Ruijie# show mac-address-table static
Vlan    MAC Address     Type        Interface
-----  -----------    --------  ------------------
1    00d0.f800.1001    STATIC   gigabitethernet 1/1
1    00d0.f800.1002    STATIC   gigabitethernet 1/1
```

```
1    00d0.f800.1003    STATIC   gigabitethernet 1/1
```

mac-address-table static	
clear mac-address-table static	

-	-

14.2.12 show mac-address-table mac-manage-learning

MAC

15 VLAN

15.1

15.1.1 name

VLAN **no**

name *vlan-name*

no name

vlan-id	VLAN ID

switch port access VLAN VLAN 1

VLAN ID VLAN ID VLAN
VLAN VLAN ID VLAN

trunk port

```
Ruijie(config)# interface gigabitethernet 1/1
Ruijie(config-if)# switchport access vlan 2
```

switchport mode	switch port
switchport trunk	trunk port native VLAN Trunk VLAN

-	-

15.1.3 switchport mode

switch port access port trunk port hybrid port uplink port 802.1Q no

switchport mode {**access** | **trunk | hybrid | uplink | dot1q-tunnel**}

no switchport mode

access	switch port access port
trunk	switch port trunk port
hybrid	switch port hybrid port
uplink	switch port uplink port
dot1q-tunnel	switch port 802.1Q tunnel port

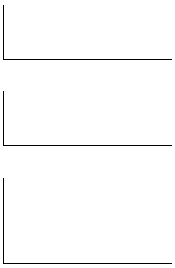
switch port access

switch port access VLAN
switchport access vlan VLAN
switch port trunk VLAN
VLAN VLAN trunk port VLAN
VLAN **switchport trunk** VLAN

```
Ruijie(config-if)# switchport mode trunk
```

switchport access	access port VLAN
switchport trunk	trunk port native VLAN Trunk VLAN

-	-



end **Ctrl+C**

exit

switchport access	Vlan

-	-

16 Super-vlan

16.1

16.1.1 subvlan

super vlan subvlan subvlan

subvlan *vlan-id-list*

no subvlan [*vlan-id-list*]

no subvlan-address-range

start-ip	SubVLAN IP
end-ip	SubVLAN IP

-

VLAN

end **Ctrl+C**
exit

```
Ruijie(config)# vlan 3
Ruijie(config-vlan)# subvlan-address-range 192.168.3.10
192.168.3.100
```

show supervlan	supervlan

-	-

16.1.3 supervlan

VLAN **supervlan**

supervlan

no supervlan

-	-

VLAN

end **Ctrl+C**
exit

```
Ruijie(config)# vlan 3
Ruijie(config-vlan)# supervlan
```

show supervlan	supervlan

-	-

16.1.4 proxy-arp

VLAN ARP

proxy-arp

no proxy-arp

-	-

VLAN

end **Ctrl+C**

exit

```
Ruijie(config)# vlan 3
Ruijie(config-vlan)# proxy-arp
```

show supervlan	supervlan

-	-

16.2

16.2.1 show supervlan

SuperVLAN SubVLAN

show supervlan

show supervlan id *vlan-id*

vlan-id	VLAN ID

```
Ruijie# show supervlan
supervlan id  supervlan arp-proxy  subvlan id  subvlan arp-proxy
subvlan ip range
-----------  -----------  -----------  -----------  ----------
3                ON         4              ON
                                5              ON
```


-	-

-	-

```
Ruijie(config-if)# protocol vlan ipv4
```

no protocol vlan ipv4	-

RGOS10.1

-	-

17.1.3 protocol-vlan profile num frame-type type ether-type type

profile

num	profile
type	

```
Ruijie(config)# protocol-vlan  profile 1 frame-type ETHERII
ether-type aarp
```

show protocol-vlan profile	-
show protocol-vlan profile *num*	-
no protocol-vlan profile	-

no protocol-vlan profile *num*	-

RGOS10.1

-	-

17.1.4 protocol-vlan profile num vlan id

profile

num	profile
id	VLAN ID 1- VLAN

```
Ruijie(config-if)# protocol-vlan profile 1 vlan 101
```

show protocol-vlan profile	-
show protocol-vlan profile *num*	-
no protocol-vlan profile	-
no protocol-vlan profile *num*	-

RGOS10.1

-	-

17.2

17.2.1 show protocol-vlan

Protocol VLAN

show vlan protocol-vlan

-	-

```
Ruijie# show protocol-vlan
```

18 Voice VLAN

18.1

18.1.1 voice vlan

Voice VLAN VLAN Voice VLAN **no** Voice VLAN

voice vlan *vlan-id*

no voice vlan

vlan-id	Voice VLAN ID

Voice VLAN Voice VLAN ID

1 Voice VLAN VLAN

2 VLAN 1 VLAN VLAN 1 Voice VLAN

3 VLAN Voice VLAN Super VLAN

4

10.4	

18.1.2 voice vlan aging

Voice VLAN **no**

voice vlan aging *minutes*

no voice vlan aging

minutes	Voice VLAN

minutes 1440

Voice VLAN

Voice VLAN

1 Voice VLAN 10

```
Ruijie(config)# voice vlan aging 5
```

show voice vlan	Voice VLAN

cos-value 6

Voice VLAN CoS DSCP

1 Voice VLAN CoS 5

```
Ruijie(config)# voice vlan cos 5
```

show voice vlan	Voice VLAN

10.4	

18.1.4 voice vlan dscp

Voice VLAN DSCP **no**

voice vlan dscp *dscp-value*

no voice vlan dscp

dscp-value	Voice VLAN DSCP

dscp-value 46

Voice VLAN CoS DSCP

1 Voice VLAN DSCP 40

```
Ruijie(config)# voice vlan dscp 40
```

show voice vlan	Voice VLAN

10.4	

18.1.5 voice vlan enable

Voice VLAN **no**
Voice VLAN

voice vlan enable

no voice vlan enable

Voice VLAN

Voice VLAN Voice VLAN
Access Port Trunk Port Hybrid Port Private VLAN Private VLAN
Uplink Voice VLAN

Voice VLAN Voice VLAN

1 FastEthernet 0/1 Voice VLAN

```
Ruijie(config)# interface fastEthernet 0/1
Ruijie(config-if)# voice vlan enable
```

show voice vlan	Voice VLAN

10.4	

18.1.6 voice vlan mac-address

Voice VLAN OUI **no**
OUI

Voice VLAN Voice VLAN

Voice VLAN IP
Voice VLAN

1 Voice VLAN
Voice VLAN Voice VLAN
2
native VLAN Voice VLAN
3 Trunk Port/Hybrid Port VLAN
Voice VLAN VLAN Voice
VLAN Voice VLAN
Voice VLAN

1 Voice VLAN
Voice VLAN
2 Voice VLAN
Voice VLAN

1 FastEthernet 0/1 Voice VLAN

```
Ruijie(config)# interface fastEthernet 0/1
Ruijie(config-vlan)# voice vlan mode auto
```

show voice vlan	Voice VLAN Voice VLAN

10.4	

18.1.8 voice vlan security enable

Voice VLAN **no**

voice vlan security enable

no voice vlan security enable

Voice VLAN

Voice VLAN
MAC MAC
Voice VLAN OUI Voice VLAN

Voice VLAN
Voice VLAN

untagged Voice VLAN tag
MAC Voice VLAN tag
VLAN Voice VLAN /

1 Voice VLAN

```
Ruijie(config)# voice vlan security enable
```

show voice vlan	Voice VLAN

10.4	

18.2

18.2.1 show voice vlan

Voice VLAN Voice VLAN

show voice vlan

Voice VLAN Voice VLAN

1 Voice VLAN

```
Ruijie(config)# show voice vlan
Voice VLAN status: ENABLE            //Voice VLAN
Voice VLAN ID: 2                     //Voice VLAN ID
Voice VLAN security mode: Security   //
Voice VLAN aging time: 5 minutes     //
Voice VLAN cos: 6                    //      CoS
Voice VLAN dscp: 46                  //      DSCP
Current voice vlan enabled port mode: //    Voice VLAN
PORT                    MODE
-------------------------------------------------
Fa0/1                   Auto
```

voice vlan *vlan-id*	Voice VLAN VLAN Voice VLAN
voice vlan aging *minutes*	Voice VLAN
voice vlan cos *cos-value*	Voice VLAN CoS
voice vlan dscp *dscp-value*	Voice VLAN DSCP
voice vlan enable	Voice VLAN
voice vlan mode auto	Voice VLAN
voice vlan security enable	Voice VLAN

10.4	

18.2.2 show voice vlan oui

OUI OUI

show voice vlan oui

OUI

1 Voice VLAN OUI

```
Ruijie(config)# show voice vlan oui
OUI             Mask             Description
--------------- ---------------- ---------------
0001.e300.0000  ffff.ff00.0000  Siemens phone
0003.6b00.0000  ffff.ff00.0000  Cisco phone
0004.0d00.0000  ffff.ff00.0000  Avaya phone
0060.b900.0000  ffff.ff00.0000  Philips/NEC phone
00d0.1e00.0000  ffff.ff00.0000  Pingtel phone
00e0.7500.0000  ffff.ff00.0000  Polycom phone
00e0.bb00.0000  ffff.ff00.0000  3com phone
```

OUI	OUI MAC
Mask	OUI OUI
Description	OUI

voice vlan mac-address *mac-addr* **mask** *oui-mask* **[description** *text***]**	Voice VLAN OUI

10.4	

19 GVRP

19.1

19.1.1 gvrp applicant state

GVRP no

gvrp applicant state {**normal** | **non-applicant**}

no gvrp applicant state

-	-

GVRP

show gvrp configuration

```
Ruijie(config-if)# gvrp applicant state normal
```

show gvrp configuration	GVRP

-	-

19.1.2 gvrp dynamic-vlan-creation

vlan no

gvrp dynamic-vlan-creation enable

-	-

19.1.4 gvrp registration mode

VLAN

no

gvrp registration mode {**normal** | **disabled**}

no gvrp registration mode

-	-

VLAN

show gvrp configuration

```
Ruijie(config-if)# gvrp registration mode normal
```

show gvrp configuration	GVRP

-	-

19.1.5 gvrp timer

GVRP no

gvrp timer {**join** | **leave** | **leaveall**} *timer_value*

no gvrp timer

join *timer_value*	0

leave *timer_value*	Leave Message VLAN Join Message VLAN Join Message Empty VLAN

[redacted]

show gvrp configuration	GVRP

⅝ ’ £ § ° N Ò ª “ ´ ’ ⅝

show gvrp statistics

```
Ruijie# clear gvrp statistics all
```

show gvrp statistics	GVRP

-	-

19.2.2 show gvrp configuration

GVRP

show gvrp configuration

-	-

Q¸õã

```
Port:GigabitEthernet 3/8 app mode:normal reg mode:normal
Port:GigabitEthernet 3/9 app mode:normal reg mode:normal
Port:GigabitEthernet 3/10 app mode:normal reg
mode:normal
Port:GigabitEthernet 3/11 app mode:normal reg
mode:normal
Port:GigabitEthernet 3/12 app mode:normal reg
mode:normal
```

-	-

-	-

19.2.3 mode:normal

```
SentLeaveIn    0
SentLeaveAll   0
JoinIndicated  0
LeaveIndicated  0
JoinPropagated  0
LeavePropagated  0
```

clear gvrp statistics	GVRP

-	-

19.2.4 show gvrp status

GVRP VLAN VLAN

show gvrp status

-	-

show gvrp status GVRP

```
Ruijie# show gvrp status
```

-	-

-	-

20 VACL

20.1

Vlan access map *map_name* *map_sn*
map map

1 **vlan access map** map *map_sn*
map map map *map_sn* *10*

2 *map_sn* **vlan access map** *map_name* *Map_name*
map

3 map_sn **vlan access map** map map
map map map

4 map 6553 map

20.1.1 action forward/drop/redirect

map actions vacl no map
actions forward

action forward

no action forward

map actions vacl no map
actions forward

action drop

no action drop

map actions vacl no map
actions forward

action redirect { **GigabitEthernet** | **Aggregateport** | **FastEthernet** } { **port_id** }

no action redirect{**GigabitEthernet** | **Aggregateport** | **FastEthernet** } {***port_id*** }

actions forward	
actions drop	
actions redirect	

map forward map

vacl

```
Ruijie(config-access-map)# action forward
Ruijie(config-access-map)# action drop
Ruijie(config-access-map)# action redirect gigabitEthernet 0/50
```

-	-

■ map ip acl map acl

■ map 8 acl

■ map acl

■ map ace acl acl

■ map ip acl (mac acl)
ip acl (mac acl) ip acl (mac acl)
ip acl (mac acl)

■ map ip acl (mac acl)
mac acl (ip acl) ip acl (mac acl) mac acl (ip acl)

map match

```
Ruijie(config)# vlan access-map dd
Ruijie(config-access-map)# match ip address 10 20 sp1 30 sp2
Ruijie(config-access-map)# exit
Ruijie(config)# vlan access-map dd 20
Ruijie(config-access-map)# match mac address 710 720 m1 760
Ruijie(config-access-map)# exit
Ruijie(config)#
```

-	-

-	-

20.1.3 vlan access map

map map no

Vlan access map *map_name* [*map_sn*]

no Vlan access map *map_name* [*map_sn*]

map_name	map	100
map_sn	map	[0 - 65535]

vlan access map

```
Ruijie(config)# vlan access-map ddd 20
Ruijie(config-access-map)#
```

-	-

-	-

20.1.4 vlan filter

map vlan map vlan no

vlan filter *map_name* **vlan-list** *vlan_id*

no vlan filter *map_name* **vlan-list** *vlan_id*

map_name	map
vlan_id	vlan id

vlan access map vlan vlan vlan
filter aa vlan-list 1-33 map 1-33 vlan

map ff vlan access map vlan 5

```
Ruijie(config)# vlan filter ff vlan-list 5
```

-	-

-	-

20.2

20.2.1 show vlan access map

map

show vlan access map

map

show vlan access map *map_name*

map_name	map

1 **show vlan access map**

```
Ruijie(config)# show vlan access-map
Vlan access-map aa  10
match mac address:   700, 710, m1, 720,
action: forward
Vlan access-map aa  20
match ip address:   10, 20, 30, sp1, sp2, 60, 50, 80,
action: drop
Vlan access-map dd  20
match mac address:   710, 720, m1, 760,
action: forward
Ruijie(config)#
```

2 **show vlan access map** { *map_name* }

```
Ruijie(config)# show vlan access-map dd
Vlan access-map dd  20
match mac address:   710, 720, m1, 760,
action: forward
Ruijie(config)#
```

-	-

-	-

20.2.2 show vlan filter

map vlan

show vlan filter

-	-

Show vlan filter access-map *aa*

```
Ruijie(config)# show vlan filter
VLAN Map aa
Configured on VLANs: 1,  5,  6,
Ruijie(config)#
```

show vlan filter *access-map map_name*	map vlan
show vlan filter vlan *vlan_id*	vlan map

-	-

21 MSTP

21.1

21.1.1 bpdu src-mac-check

bpdu mac no bpdu mac

bpdu src-mac-check *H.H.H*

no bpdu src-mac-check

H.H.H	mac bpdu
no	bpdu

```
Ruijie(config)# interface gigabitethernet 1/1
Ruijie(config-if)# bpdu src-mac-check 00d0.f800.1e2f
```

interface-id	

```
Ruijie# clear spanning-tree detected-protocols
```

show spanning-tree interface	STP

-	-

21.1.3 spanning-tree

MSTP /l MSTP MSTP no
spanning-tree no - 6

1 spanning-tree

```
Ruijie(config)# spanning-tree
```

2 BridgeForwardDelay

```
Ruijie(config)# spanning-tree  forward-time 10
```

show spanning-tree	STP Ö-"v9¢ÇAD}oL2@*"% !/

BPDU filter enabled disabled

BPDU filter

spanning-tree bpdufilter [**enabled** | **disabled**]

enabled	BPDU filter

```
Ruijie(config-if)# spanning-tree bpduguard enable
```

show spanning-tree interface	STP

-	-

spanning-tree guard loop

no spanning-tree guard loop

-	-

loop guard

```
Ruijie(config-if)# spanning-tree guard loop
```

-	-

-	-

21.1.9 spanning-tree guard none

guard no guard

spanning-tree guard none

no spanning-tree guard none

-	-

guard

```
Ruijie(config-if)# spanning-tree guard none
```

-	-

-	-

21.1.10 spanning-tree guard root

root guard no root guard root guard

spanning-tree guard root

no spanning-tree guard root

-	-

root guard

```
Ruijie(config-if)# spanning-tree guard root
```

-	-

-	-

21.1.11 spanning-tree link-type

“ ” no

spanning-tree link-type [**point-to-point** | **shared**]

no spanning-tree link-type

poinit-to-point	point-to-point.

shared	shared

point-to-point
shared.

```
Ruijie(config)# interface gigabitethernet 1/1
Ruijie(config-if)# spanning-tree link-type point-to-point
```

show spanning-tree interface	STP

-	-

21.1.12 spanning-tree loopguard default

loop guard no loop guard loop guard
bpdu

spanning-tree loopguard default

no spanning-tree loopguard default

-	-

loop guard

```
Ruijie(config)# spanning-tree loopguard default
```

-	-

-	-

no spanning-tree mode

stp	Spanning tree protocol(IEEE 802.1d)
rstp	Rapid spanning tree protocol(IEEE 802.1w)
mstp	Multiple spanning tree protocol(IEEE 802.1s)

MSTP

.

```
Ruijie(config)# spanning-tree mode stp
```

show spanning-tree	

-	-

21.1.15 spanning-tree mst configure

MST MSTP Region no
name revision vlan map

spanning-tree mst configuration

no spanning-tree mst configuration

-	-

instance vlan Vlan Instance 0
name
revision 0

.

end Ctrl+C
exit
MST

instance *instance-id* v**lan** *vlan-range* Vlan MST Instance instance-id 0 64 vlan 1 4095 vlan-range vlan VLAN ID VLAN ID ‘ ’ VLAN ID instance 10 vlan 2,3,6-9 VLAN 2 3 6 7 8 9 Instance 10 VLAN Instance 0 VLAN Instance **no** **no instance** *instance-id* [**vlan** *vlan-range*] (no Instance 1 64)

name *name* MST 32 no name

revision *version* MST 0 65535 no revision

show MST region

MST VLAN 3, 5-10 MST Instance 1.

```
Ruijie(config)# spanning-tree mst configuration
Ruijie(config-mst)# instance 1 vlan  3  5-10
Ruijie(config-mst)# name region 1
Ruijie(config-mst)# revision  1
Ruijie(config-mst)# show
MST configuration
Name [region1]
Revision 1
Instance  Vlans Mapped
----------  --------------------
0       1-2,4,11-4094
1       3,5-10
---------------------------------
Ruijie(config-mst)# exit
Ruijie(config)#
```

VLAN 3 Instance 1 MST

```
Ruijie(config-mst)# no instance 1 vlan 3
```

Instance 1

```
Ruijie(config-mst)# no instance 1
```

MST show

21.1.16 spanning-tree mst cost

Instance no

spanning-tree [**mst** *instance-id]* **cost** *cost*
no spanning-tree [**mst** *instance-id*] **cost**

MSTP

instance-id 0

priority 32768

.

Instance 20 8192

```
Ruijie(config-if)# spanning-tree mst 20 priority 8192
```

show spanning-tree mst instance interface interface-id

show spanning-tree mst	MSTP
spanning-tree mst cost	
spanning-tree mst port-priority	Instance

-	-

21.1.19 spanning-tree pathcost method

no

spanning-tree pathcost method [**long** | **short**]

no spanning-tree pathcost method

long	802.1t path-cost
short	802.1d path-cost

802.1T Path-cost

```
Ruijie(config-if)# spanning-tree pathcost method  long
```


show spanning-tree interface	STP

-	-

21.1.20 spanning-tree portfast

Portfast disabled Portfast

spanning-tree portfast [**disabled**]

disabled	Portfast

```
Ruijie(config)# interface gigabitethernet 1/1
Ruijie(config-if)# spanning-tree portfast
```

show spanning-tree interface	STP

-	-

21.1.21 spanning-tree portfast bpdufilter default

BPDU filter no BPDU filter

spanning-tree portfast bpdufilter default

no spanning-tree portfast bpdufilter default

-	-

BPDU filter

BPDU Filter BPDU **show spanning-tree**

```
Ruijie(config)# spanning-tree portfast bpdufilter default
```

show spanning-tree interface	STP

-	-

21.1.22 spanning-tree portfast bpduguard default

BPDU guard no BPDU guard

spanning-tree portfast bpduguard default

no spanning-tree portfast bpduguard default

-	-

BPDU Guard.

BPDU guard BPDU error-disabled

show spanning-tree

```
Ruijie(config)# spanning-tree portfast bpduguard default
```

show spanning-tree interface	STP

	-	-

21.1.23 spanning-tree portfast default

Portfast no Portfast

```
Ruijie(config)# spanning-tree reset
```

show spanning-tree	STP
show spanning-tree interface	STP

spanning-tree tc- protection

no spanning-tree tc- protection

-	-

tc- protection

```
Ruijie(config)# spanning-tree tc- protection
```

-	-

-	-

21.1.27 spanning-tree tc-protection tc-guard

tc- guard no tc- guard tc-guard tc

spanning-tree tc-protection tc-guard

no spanning-tree tc-protection tc-guard

-	-

tc- guard

```
Ruijie(config)# spanning-tree tc-protection tc-guard
```


-	-

-	-

21.1.28 spanning-tree tx-hold-count

STP TxHoldCount BPDU no

spanning-tree tx-hold-count *tx-hold-count*

no spanning-tree tx-hold-count

tx-hold-count	TxHoldCount 1 10

3

```
Ruijie(config)# spanning-tree tx-hold-count 5
```

show spanning-tree	MSTP

-	-

21.2

21.2.1 show spanning-tree

show spanning-tree [**summary** | **forward-time** | **hello-time** | **max-age** | **inconsistentports**| **tx-hold-count** | **pathcost method** | **max_hops**]

interface-id	
bpdufilter	bpdufilter
portfast	portfast
bpduguard	bpduguard
link-type	linktype

```
Ruijie#  show spanning-tree interface gigabitethernet 1/5
```

spanning-tree bpdufilter	BPDU filter
spanning-tree portfast	portfast
spanning-tree bpduguard	BPDU guard
spanning-tree link-type	“ ”

-	-

21.2.3 show spanning-tree mst

MST Instance

show spanning-tree mst { **configuration** | *instance-id* [**interface** *interface-id*] }

configuration	mst
instance-id	*Instance*

```
Ruijie# show spanning-tree mst configuration
```

spanning-tree mst configuration	MST region
spanning-tree mst cost	instance
spanning-tree mst max-hops	instance
spanning-tree mst priority	instance
spanning-tree mst port-priority	instance

-	-

22 LLDP

22.1

22.1.1 lldp mode

LLDP **no** LLDP

lldp mode {**rx** | **tx** | **txrx** }
no lldp mode

rx	LLDPDU
tx	LLDPDU
txrx	LLDPDU

txrx

- LLDP LLDP
- LLDP LLDP LLDP tx rx txrx

LLDP LLDPDU

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

show lldp status	LLDP

-

10.4(2b10)	

22.1.2 lldp enable

LLDP **no** LLDP

lldp enable
no lldp enable

LLDP LLDP

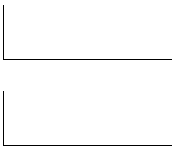
LLDP

```
Ruijie#config
Ruijie(config)#no lldp enable
Ruijie(config)#interface gigabitethernet 0/1
Ruijie(config-if)# no lldp enable
```

show lldp status	LLDP

-

10.4(2b10)	



Ethernet II

LLDP

show interface status	LLDP

-

10.4(2b10)	

22.1.5 lldp fast-count

LLDP Rx TxRx Tx
LLDP
1 LLDP
lldp fast-count *value*
no lldp fast-count

value	LLDP 3 1-10

LLDP 3

LLDP 5

```
Ruijie#config
Ruijie(config)#lldp fast-count 5
```

show interface status	LLDP

-

10.4(2b10)	

22.1.6 lldp hold-multiplier

TTL **no**
lldp hold-multiplier

- IPv4 VLAN IPv6
- IPv6 MAC

LLDP 192.168.1.1

```
Ruijie#config
Ruijie(config)#interface gigabitethernet 0/1
Ruijie(config-if)#lldp management-address-tlv 192.168.1.1
```

show lldp local-information	LLDP

-

10.4(2b10)	

22.1.8 lldp notification remote-change enable

LLDP Trap **no** LLDP Trap

lldp notification remote-change enable
no lldp notification remote-change enable

-	-

Trap

2

show lldp status	LLDP

-

10.4(2b10)	

22.1.12 lldp timer tx-interval

LLDP **no**

lldp timer tx-interval *seconds*
no lldp timer tx-interval

seconds	LLDP 5-32768

30

LLDP 10

```
Ruijie#config
Ruijie(config)#lldp timer tx-interval 10
```

show lldp status	LLDP

-

10.4(2b10)	

22.1.13 lldp tlv-enable

TLV **no** TLV

lldp tlv-enable {

device-type	0-2 ● 0 DHCP Server ● 1 Switch ● 2 LLDP MED
country-code	
ca-type	
ca-value	

22.2.1 show lldp local-information

LLDP TLV

show lldp local-information [**global** | **interface** *interface-name*]

ъ ц

■

```
802.1 organizationally information
Port VLAN ID                    : 1
Port and protocol VLAN ID(PPVID)  : 1
   PPVID Supported              : YES
   PPVID Enabled                : NO
VLAN name of VLAN 1              : VLAN0001
Protocol Identity                :


802.3 organizationally information
Auto-negotiation supported       : YES
Auto-negotiation enabled         : YES
PMD auto-negotiation advertised   : 100BASE-T
```

HardwareRev	

Power-via-MDI power value	
Model name	

-	-

-

10.4(2b10)	

22.2.2665 0/TT0 1 Tf0.T0 8 Tf3523

```
  LLDP-MED capabilities           :
  Device class                   :
  HardwareRev                    :
  FirmwareRev                    :
  SoftwareRev                    :
  SerialNum                      :
  Manufacturer name               :
  Asset tracking identifier        :

  Port ID type                   : Interface name
  Port id                       : GigabitEthernet 0/1
  Port description                :

  802.1 organizationally information
  Port VLAN ID                   : 1
  Port and protocol VLAN ID(PPVID)  : 1
     PPVID Supported             : YES
     PPVID Enabled               : NO
  VLAN name of VLAN 1             : VLAN0001
  Protocol Identity               :


  802.3 organizationally information
  Auto-negotiation supported       : YES
  Auto-negotiation enabled        : YES
  PMD auto-negotiation advertised   : 1000BASE-T full duplex mode,
100BASE-TX full duplex mode, 100BASE-TX half duplex mode, 10BASE-T
full duplex mode, 10BASE-T half duplex mode
  Operational MAU type               : dot3MauType1000BaseTFD:
Four-pair Category 5 UTP, full duplex mode
  PoE support                    : NO
  Link aggregation supported       : YES
  Link aggregation enabled        : NO
  Aggregation port ID             : 0
  Maximum frame Size              : 1500

  LLDP-MED organizationally information
  Power-via-MDI device type        :
  Power-via-MDI power source       :
  Power-via-MDI power priority     :
  Power-via-MDI power value        :
```

show lldp neighbor-information

Neighbor index	
Device type	
Update time	
Chassis ID type	Chassis ID
Chassis ID	MAC
System name	
System description	/

System capabilities enabled	
Management address subtype	
Management address	
Interface numbering subtype	
Interface number	ID
Object identifier	
Device class	Med 2 ● Network connectivity device ● Class I ● Class II Class I

```
------------------------------------------------------------
Lldp statistics information of port [GigabitEthernet 0/1]
------------------------------------------------------------
The number of lldp frames transmitted      : 26
The number of frames discarded            : 0
The number of error frames                : 0
The number of lldp frames received         : 12
The number of TLVs discarded              : 0
The number of TLVs unrecognized           : 0
The number of neighbor information aged out : 0
The number of cdp frames transmitted       : 0
The number of cdp frames received          : 0
The number of cdp frames discarded         : 0
The number of cdp error frames            : 0
```

show lldp statistics

Neighbor information last change time	
The number of neighbor information inserted	
The number of neighbor information deleted	
The number of neighbor information dropped	
The number of neighbor information aged out	
The number of lldp frames transmitted	LLDP
The number of frames discarded	LLDP
The number of error frames	LLDP
The number of lldp frames received	LLDP
The number of TLVs discarded	LLDP TLV
The number of TLVs unrecognized	LLDP TLV
The number of neighbor information aged out	
The number of cdp frames transmitted	CDP
The number of cdp frames received	CDP
The number of cdp frames discarded	CDP

-	-

Global cdp compliance	CDP
Neighbor information last changed time	
Transmit interval	LLDP
Hold multiplier	TTL
Reinit delay	
Transmit delay	LLDP
Notification interval	LLDP Trap
Fast start counts	LLDP
Port status of LLDP	LLDP
Port state	UP DOWN
Port cdp compliance	CDP
Port encapsulation	LLDP
Operational mode	LLDP
Notification enable	LLDP Trap
Number of neighbors	
Number of MED neighbors	MED

-	-
-	

10.4(2b10)	

22.2.5 show lldp tlv-config

TLV

show lldp tlv-config [**interface** *interface-name*]

interface-name	

interface LLDP TLV

1 TLV

```
Ruijie# show lldp tlv-config interface GigabitEthernet 0/1
LLDP tlv-config of port [GigabitEthernet 0/1]
-------------------------------------------------
             NAME             STATUS DEFAULT
-------------------------------- ------ -----------
Basic optional TLV:
Port Description TLV            YES    YES
System Name TLV                YES    YES
System Description TLV          YES    YES
System Capabilities TLV         YES    YES
Management Address TLV          YES    YES

IEEE 802.1 extend TLV:
Port VLAN ID TLV               YES    YES
Port And Protocol VLAN ID TLV    YES    YES
VLAN Name TLV                  YES    YES

IEEE 802.3 extend TLV:
MAC-Physic TLV                 YES    YES
Power via MDI TLV               YES    YES
Link Aggregation TLV            YES    YES
Maximum Frame Size TLV          YES    YES

LLDP-MED extend TLV:
Capabilities TLV               YES    YES
Network Policy TLV              YES    YES
Location Identification TLV      NO     NO
Extended Power via MDI TLV       YES    YES
Inventory TLV                  YES    YES
```

-	-

-

10.4(2b10)	

22.2.6 clear lldp statistics

LLDP

clear lldp statistics [**interface** *interface-name*]

interface-name	

interface LLDP

1 LLDP

```
Ruijie# clear lldp statistics interface GigabitEthernet 0/1
Ruijie# show lldp statistics interface GigabitEthernet 0/1
Lldp statistics information of port [GigabitEthernet 0/1]
-------------------------------------------------------------
The number of lldp frames transmitted      : 0
The number of frames discarded            : 0
The number of error frames                : 0
The number of lldp frames received         : 0
The number of TLVs discarded              : 0
The number of TLVs unrecognized           : 0
The number of neighbor information aged out : 0
The number of cdp frames transmitted       : 0
The number of cdp frames received          : 0
The number of cdp frames discarded         : 0
The number of cdp error frames            : 0
```

-	-

-

10.4(2b10)	

23 IP

23.1

23.1.1 ip address

IP no IP

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

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

IP 10.10.10.1 255.255.255.0

```
ip address 10.10.10.1 255.255.255.0
```

show interface	

D T	? ? ?

show interface	

-	-

23.2

23.2.1 arp

ARP IP MAC no MAC

arp [**vrf** *name*] *ip-address MAC-address type*

no arp [**vrf** *name*] *ip-address*

vrf *name*	VRF name VRF

ip-address

-	-

23.2.2 arp anti-ip-attack

IP ARP
CPU ARP CPU CPU
IP CPU
IP CPU
IP

ARP CPU 3 IP ARP
CPU CPU
ARP IP CPU
arp anti-ip-attack *num*
no 3

10.4(2	10.4(2)

23.2.3 arp gratuitous-send interval

arp no

arp gratuitous-send interval *seconds*

no arp gratuitous-send

seconds	ARP <1-3600>

ARP

ARP

1 SVI 1 ARP

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

2 SVI 1 ARP

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

-	-

-	-

23.2.4 arp retry interval

arp IP 2 ARP
no 1 ARP

arp retry interval *seconds*

no arp retry interval

seconds	<1-3600>,ARP 1 —— 3600 1

ARP 1

ARP ARP
ARP

ARP 30s
`arp retry interval 30`

Arp retry times *number*	ARP

-	-

23.2.5 arp retry times

arp retry interval *seconds*	arp

-	-

23.2.6 arp timeout

ARP ´ Б Ò Ò ŝ ط Ƒ 8

arp trusted 1000

service trustedarp	ARP

-	-

23.2.9 arp unresolve

ARP no
8192

arp unresolve *number*

no arp unresolve

number	ARP < 1-8192 > 8192

ARP 8192

ARP

500

arp unresolved 500

-	-

-	-

23.2.10 ip proxy-arp

ARP **ip proxy-arp** no ARP

ip proxy-arp

no ip proxy-arp

-	-

10.2(3) (10.2(3)) ARP ARP

ARP IP MAC ARP ARP IP IP IP ARP MAC MAC ARP

FastEthernet 0/1 ARP

```
interface fastEthernet 0/1
no switchport
ip proxy-arp
```


-	-

23.3.2 ip directed-broadcast

IP **ip directed-broadcast** no

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

no ip directed-broadcast

access-list-number	1-199 1300 - 2699 IP

IP IP

-	-

23.4 IP

23.4.1 clear arp-cache

ARP ARP clear arp-cache

clear arp-cache [**vrf** *vrf_name* | **trusted**] [*ip* [*mask*]] | **interface** *interface-name*]

trusted	ARP
vrf	9 135.P

-	-

23.4.2 clear ip route

IP IP **clear ip route**

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

*	
network	
netmask	

192.168.12.0

```
clear ip route 192.168.12.0
```

show ip route	IP

-	-

23.4.3 show arp

ARP

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

vrf *vrf_name*	VRF

2 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
```

3 **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
```

4 **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
```

-	-

-	-

23.4.4 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
```

-	-

```
192.168.0.1     0012.a990.2241   Dynamic   30   Vl2       Ag2
192.168.0.39    0012.a990.2241   Local     --   Vl3       --
192.168.0.39    0012.a990.2241   Local     --   Gi2/0/3    --
192.168.0.1     0012.a990.2241   Local     --   Vl3       --
192.168.0.1     0012.a990.2241   Local     --   Gi2/3/2    --
```

ARP

IP Address	IP
MAC Address	IP
Type	ARP
Age	ARP
Interface	IP

Port ARP

```
---------------------  ----------------
VLAN 1                 3600
```

-	-

Hardware	IP
Type	ARPA
Interface	IP

-	-

-	-

23.4.8 show ip interface

IP

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

[redacted] e r f a c

```
Send ICMP redirect is: ON
Send ICMP unreachabled is: ON
DHCP relay is: OFF
Fast switch is: ON
Route horizontal-split is: ON
Help address is: 0.0.0.0
Proxy ARP is: ON
Outgoing access list is not set.
Inbound access list is not set.
```

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 unreachabled is:	ICMP
DHCP relay is:	DHCP
Fast switch is:	IP
Route horizontal-split is:	
Help address is:	helper IP
Proxy ARP is:	ARP
Outgoing access list is	
Inbound access list is	

-	-

ICMP ICMP

-	-

23.5.3 ip redirects

RGOS ICMP **ip redirects** no ICMP

ip redirects

no ip redirects

-	-

ICMP

RGOS ICMP

FastEthernet 0/1 ICMP

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

-	-

-	-

23.5.4 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
```

-	-

-	-

-	-

24.1.2 ipv6 address

IPV6 , no

ipv6 address *ipv6-address*/*prefix-length*

ipv6 address *ipv6-prefix*/*prefix-length* **eui-64**

ipv6 address *prefix-name sub-bits/prefix-length* [**eui-64**]

no ipv6 address

no ipv6 address *ipv6-address*/*prefix-length*

no ipv6 address *ipv6-prefix*/*prefix-length* **eui-64**

no ipv6 address *prefix-name sub-bits/prefix-length* [**eui-64**]

	IPV6 RFC4291
ipv6-address	amgthe /C2_0 1 Tf0 Tc 4.5147

no ipv6 address autoconfig IPv6

```
Ruijie(config-if)# ipv6 address autoconfig default
Ruijie(config-if)# no ipv6 address autoconfig
```

ipv6 address *ipv6-prefix/prefix-length* [**eui-64**]	IPv6

RGOS10.4	RGOS10.4

24.1.4 ipv6 enable

IPv6 no IPv6

ipv6 enable

no ipv6 enable

-	-

IPv6

2 IPv6 **ipv6 enable** ,
IPv6

IPv6 IPv6 **no ipv6 enable** IPV6

```
Ruijie(config-if)# ipv6 enable
```

show ipv6 interface	

24.1.5 ipv6 general-prefix

IPv6 **ipv6 general-prefix**

ipv6 general-prefix *prefix-name ipv6-prefix/prefix-length*

no ipv6 general-prefix *prefix-name ipv6-prefix/prefix-length*

prefix-name	
ipv6-prefix	RFC4291
prefix-length	

IPv6

my-prefix

```
Ruijie(config)# ipv6 general-prefix my-prefix 2001:1111:2222::/48
```

ipv6 address prefix-name sub-bits/prefix-length	
show ipv6 general-prefix	

RGOS10.4	RGOS10.4

24.1.6 ipv6 hop-limit

ipv6 hop-limit value

no ipv6 hop-limit

-	-

64

```
Ruijie(config)# ipv6 hop-limit 100
```

-	-

-	-

24.1.7 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
```

show ipv6 interface	

-	-

24.1.8 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	

-	-

24.1.9 ipv6 nd ns-interval

IPv6

infinite	
default	
no-advertise	
off-link	IPV6 (on-link) on-link
no-autoconfig	

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

1

-	-

24.1.11 ipv6 nd ra-lifetime

(RA) “ ” no

ipv6 nd ra-lifetime *seconds*

no ipv6 nd ra-lifetime

seconds	

1800

“ ” (RA)
0
0 (RA)
(ra-interval)

```
Ruijie(conifgf)# interface vlan 1
Ruijie(conifg-if)# ipv6 nd ra-lifetime 2000
```

show ipv6 interface	ra-info
ipv6 nd ra-interval	
ipv6 nd ra-hoplimit	
ipv6 nd ra-mtu	MTU

-	-

24.1.12 ipv6 nd ra-interval

(RA) no

ipv6 nd ra-interval {*seconds* | *min-max min_value max_value*}

no ipv6 nd ra-interval

IPv6

IPv6

IPv6

IPv6

```
Ruijie(config)# no ipv6 ns-linklocal-src
```

-	-

-	-

24.1.19 ipv6 redirects

IPV6
ICMPv6 no ICMPv6

ipv6 redirects

no ipv6 redirects

-	-

IPV6 ICMPv6

ICMPv6 10
ICMPv6 (10pps)

```
Ruijie(conifgf)# interface vlan 1
Ruijie(config-if)# ipv6 redirects
```

show ipv6 interface	

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*]}

(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

tunnel destination	
tunnel ttl	TTL

-	-

24.1.24 tunnel source

, no

tunnel source {*ipv4-address* | *ipv6-address* |

tunnel destination	
tunnel ttl	TTL

-	-

24.2

24.2.1 clear ipv6 neighbors

clrear ipv6 neighbors

-	-

```
Ruijie# clear ipv6 neighbors
```

ipv6 neighbor	
show ipv6 neighbors	

-	-

24.2.2 show ipv6 general-prefix

show ipv6 general-prefix

show ipv6 general-prefix

IPv6

```
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	

IPv6

State	STATE ACTIVE— INACTIVE— IPV6 mac

ipv6 neighbor	

-	-

24.2.5 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    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	

-	-

24.2.6 show ipv6 router

IPv6

show ipv6 router

show ipv6 router *[interface-type interface-number]*

interface-type interface-number	

show ipv6 router

IPv6

```
Ruijie# show ipv6 router
Router FE80::2D0:F8FF:FEC1:C6E1 on VLAN 2, last update 62 sec
  Hops 64, Lifetime 1800 sec, ManagedFlag=0, OtherFlag=0, MTU=1500
  Preference=MEDIUM
  Reachable time 0 msec, Retransmit time 0 msec
  Prefix 6001:3::/64 onlink autoconfig
    Valid lifetime 2592000 sec, preferred lifetime 604800 sec
  Prefix 6001:2::/64 onlink autoconfig
    Valid lifetime 2592000 sec, preferred lifetime 604800 sec
```

-	-

RGOS10.4	RGOS10.4

25 DHCP

25.1 DHCP

25.1.1 ip address dhcp

PPP HDLC FR DHCP IP

ip address dhcp **no**

ip address dhcp

no ip address dhcp

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

service dhcp

no service dhcp

-	-

dhcp client

dhcp

```
debug ip dhcp client
```

-	-

-	-

25.2.2 show dhcp lease

DHCP EXEC **show dhcp lease**

show dhcp leaseshow

-	-

26 DHCP Relay

26.1

26.1.1 ip dhcp relay check server-id

DHCP Relay check server-id no
DHCP Relay check server-id

[**no**] **ip dhcp relay check server-id**

-	-

[**no**] **ip dhcp relay information option dot1x**

-	-

DHCP 802.1x

DHCP option dot1x

```
Ruijie# configure terminal
Ruijie(config)# ip dhcp relay information option dot1x
```

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

-	-

26.1.3 ip dhcp relay information option dot1x access-group

DHCP Relay option dot1x ACL no
DHCP Relay option dot1x ACL

[**no**] **ip dhcp relay information option dot1x access-group** *acl-name*

-	-

ACL

ACL ACL ACE

dhcp option dot1x acl

```
Ruijie# configure terminal
Ruijie(config)# ip access-list extended
```

```
DenyAccessEachOtherOfUnauthrize
Ruijie(config-ext-nacl)# permit ip any host 192.168.3.1
//
Ruijie(config-ext-nacl)# permit ip any host 192.168.4.1
Ruijie(config-ext-nacl)# permit ip any host 192.168.5.1
Ruijie(config-ext-nacl)# permit ip host 192.168.3.1 any
//      IP
Ruijie(config-ext-nacl)# permit ip host 192.168.4.1 any
Ruijie(config-ext-nacl)# permit ip host 192.168.5.1 any
Ruijie(config-ext-nacl)# deny ip 192.168.3.0 0.0.0.255 192.168.3.0
0.0.0.255
//
Ruijie(config-ext-nacl)# deny ip 192.168.3.0  0.0.0.255
192.168.4.0  0.0.0.255
Ruijie(config-ext-nacl)# deny ip 192.168.3.0  0.0.0.255
192.168.5.0  0.0.0.255
Ruijie(config-ext-nacl)# deny ip 192.168.4.0  0.0.0.255
192.168.4.0  0.0.0.255
Ruijie(config-ext-nacl)# deny ip 192.168.4.0  0.0.0.255
192.168.5.0  0.0.0.255
Ruijie(config-ext-nacl)# deny ip 192.168.5.0  0.0.0.255
192.168.5.0  0.0.0.255
Ruijie(config-ext-nacl)# deny ip 192.168.5.0  0.0.0.255
192.168.3.0  0.0.0.255
Ruijie(config-ext-nacl)# deny ip 192.168.5.0  0.0.0.255
192.168.4.0  0.0.0.255
```

option dot1x

DHCP opion82

```
Ruijie# configure terminal
```

-	-

26.1.6 ip dhcp relay suppression

DHCP Relay no
DHCP relay

[**no**] **ip dhcp relay suppression**

-	-

DHCP

1 DHCP relay

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

service dhcp	DHCP

-	-

26.1.7 ip helper-address

DHCP no
DHCP

-	-

/

20 DHCP
DHCP DHCP Relay DHCP
DHCP DHCP Relay

vrf
vrf vrf vrf
vrf

1 192.168.1.1
2 vrf dep1 192.168.2.1

```
Ruijie# configure terminal
Ruijie(config)# ip helper-address 192.168.1.1
Ruijie(config)# ip helper-address vrf dep1 192.168.2.1
```

service dhcp	DHCP

-	-

26.1.8 service dhcp

DHCP no

[**no**] **service dhcp**

-	-

DHCP DHCP DHCP DHCP
DHCP DHCP

DHCP

```
Ruijie# configure terminal
Ruijie(config)# service dhcp
```

v 03 1(f)F1124>6<02C80A032AF7 0.725 1C4>]TJ] Tf0 Tr34.988 0 Td(6D>Tj[(A.790.B.C.D)F1124>6<02

27 DHCPv6 client

27.1

27.1.1 ipv6 dhcp client pd

DHCPv6 client **ipv6 dhcp client pd**

no

ipv6 dhcp client pd *prefix-name* [**rapid-commit**]

no ipv6 dhcp client pd

-	-

27.2

27.2.1 clear ipv6 dhcp client

DHCPv6 **clear ipv6 dhcp client**

clear ipv6 dhcp client *interface-type interface-number*

interface-type interface-number	

clear ipv6 dhcp client DHCPv6

DHCPv6

```
Ruijie# clear ipv6 dhcp client vlan 1
```

-	-

-	-

28 DHCPv6 Relay Agent

28.1

28.1.1 ipv6 dhcp relay destination

DHCPv6 Relay Agent

no Relay Agent

ipv6 dhcp relay destination *ipv6-address [interface-type interface-number]*

no ipv6 dhcp relay destination *ipv6-address [interface-type interface-number]*

10.4	

28.2

28.2.1 show ipv6 dhcp relay destination

DHCPv6 Relay Agent

show ipv6 dhcp relay destination

all	
interface *interface-type interface-number*	

DHCPv6 Relay

show ipv6 dhcp relay statistics

DHCPv6 Relay

clear ipv6 dhcp relay statistics

-	-

29 DNS

29.1

29.1.1 ip domain-lookup

DNS no DNS

ip domain-lookup

no ip domain-lookup

-	-

DNS

DNS DNS

DNS

```
Ruijie(config)# ip domain-lookup
```

show hosts	DNS

-	-

29.1.2 ip name-server

IP/IPv6

no

ip name-server {*ip-address* | *ipv6-address*}

no ip name-server [*ip-address* | *ipv6-address*]

Ruijie(config)# ip host switch *192.168.5.243*

show hosts	DNS

-	-

29.1.4 ipv6 host

IPV6 no

Ipv6 host *host-name ipv6-address*

no ipv6 host *host-name ipv6-address*

host-name	
Ipv6-address	IPV6

no ipv6 host host-name ipv6-address

Ruijie(config)# ipv6 host ruijie *2001:0DB8:700:20:1::12*

show hosts	DNS

-	-

29.2

29.2.1 clear host

clear host [*host-name*]

host-name	“*”

1 ip host ipv6 host

2 DNS DNS

-IP

```
clear host *
```

show hosts

-	-

29.2.2 show hosts

DNS

show hosts [*hostname*]

-	-

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
Ipv6 host	IPV6
ip name-server	DNS

-	-

30 VRRP

30.1

30.1.1 vrrp authentication

VRRP **no**

vrrp group authentication *string*

no vrrp *group* **authentication**

group	VRRP
string	VRRP (8)

VRRP VRRP

VRRP
/ VRRP

IPv6 VRRP IPv6

VRRP 1

```
vrrp 1 authentication x30dn78k
```

Ruijie(config-if)# **vrrp** *group ip ipaddress* [**secondary**]	VRRP IP

-	-

30.1.2 vrrp description

VRRP **no**

vrrp *group* **description** *text*

no vrrp group description

group	VRRP
text	VRRP

VRRP VRRP
VRRP

VRRP VRRP

E0 VRRP 1 Building A – Marketing and Administration

```
interface FastEthernet 0/0
ip address 10.0.1.1 255.255.255.0
vrrp 1 ip 10.0.1.20
vrrp 1 description “Building A - Marketing and Administration”
```

Ruijie(config-if)# **vrrp** *group* ip *ipaddress* [**secondary**]	VRRP IP

-	-

30.1.3 vrrp ip

VRRP IP **no** VRRP IP

vrrp *group* **ip** *ipaddress* [**secondary**]

no vrrp *group* **ip** *ipaddress* [**secondary**]

group	VRRP
ipaddress	IP
secondary	IP

VRRP

secondary IP IP
VRRP IP no VRRP IP
IP

0 VRRP VRRP 1
IP 10.0.1.20 IP 10.0.2.20

```
interface FastEthernet 0/0
no switchport
ip address 10.0.1.1 255.255.255.0
ip address 10.0.2.1 255.255.255.0 secondary
vrrp 1 ip 10.0.1.20
vrrp 1 ip 10.0.2.20 secondary
```

Ruijie# **show vrrp** [**brief | group**]	VRRP

-	-

30.1.4 vrrp ipv6

IPv6 VRRP IPv6 **no**
VRRP IPv6

vrrp *group* **ipv6** *ipv6-address*

no vrrp *group* **ipv6** *ipv6-address*

ipv6-address	

IPv6

IPv6 VRRP IPv4 VRRP(5)]TLPC2_0 1 TFPv6v4 Tc 2.91v6 ,X4 IPv6 IPv4

FastEthernet 0/0 IPv6 VRRP

```
/RRP      1      IPv6      FE80::1   2001::1
interface FastEthernet 0/0
no switchport
ipv6 enable
ip6 address 2001::2/64
vrrp 1 ipv6 FE80::1
vrrp 1 ipv6 2001::1
```

Ruijie# **show vrrp** [**brief | group**]	VRRP

Ruijie(config-if)# **vrrp** *group* **ip** *ipaddress* [**secondary**]	VRRP IP
Ruijie(config-if)# **vrrp** *group* **priority** *level*	VRRP

-	-

30.1.6 vrrp priority

VRRP **no**

vrrp *group* **priority** *level*

no vrrp *group* **priority**

group	VRRP
level	VRRP

VRRP VRRP VRRP
100

VRRP

VRRP 1 254

```
vrrp 1 priority 254
```

Ruijie(config-if)# **vrrp** *group* **ip** *ipaddress* [**secondary**]	VRRP IP
Ruijie(config-if)# **vrrp** *group* **preempt** [**delay** *seconds*]	VRRP

-	-

30.1.7 vrrp timers advertise

VRRP no

vrrp *group* **timers advertise** *interval*

no vrrp *group* **timers advertise**

group	VRRP
interval	VRRP ( )

VRRP VRRP
1

VRRP VRRP
VRRP

VRRP 4

```
vrrp 1 timers advertise 4
```

Ruijie(config-if)# **vrrp** *group* **ip** *ipaddress* [**secondary**]	VRRP IP
Ruijie(config-if)# **vrrp group timers learn**	

-	-

30.1.8 vrrp timers learn

no

vrrp *group* **timers learn**

no vrrp *group* **timers learn**

group	VRRP

VRRP VRRP

VRRP P

ipv6-linklocal-addree	IPv6
interval-value	3
timeout-value	1
priority	VRRP 10

VRRP VRRP
IPv4 IPv6

(Routed Port SVI Loopback Tunnel)
IPv4 IPv4 IPv6
IPv6

1 VRRP 1 Routed Port Fa1/1 Fa1/1
VRRP 30 Fa1/1 VRRP 1

```
vrrp 1 track FastEthernet 1/1 30
```

2 1000::1

```
vrrp 1 track 1000::1
```

3 VLAN 1 FE80::1

```
vrrp 1 track FE80::1 vlan 1
```

```
#       VRRP      BFD             192.168.1.3
Ruijie#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Ruijie(config)#interface FastEthernet 0/1
Ruijie(config-if)#no switchport
Ruijie(config-if)#ip address 192.168.1.1 255.255.255.0
Ruijie(config-if)#bfd interval 50 min_rx 50 multiplier 3
Ruijie(config)#interface FastEthernet 0/2
Ruijie(config-if)#no switchport
Ruijie(config-if)#ip address 192.168.201.17 255.255.255.0
Ruijie(config-if)#vrrp 1 priority 120
Ruijie(config-if)#vrrp 1 ip 192.168.201.1
Ruijie(config-if)#vrrp 1 track bfd FastEthernet 0/1 192.168.1.3 30
Ruijie(config-if)#end
```

Ruijie(config-if)# **vrrp** *group* **ip** *ipaddress* [**secondary**]	VRRP IP
Ruijie(config-if)# **vrrp** *group* **priority** level	VRRP

RGOS 10.4	vrrp track	IPv6	RGOS 10.4

30.2 VRRP

30.2.1 debug vrrp

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: FastEthernet 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: FastEthernet 0/0 Grp 1 state Backup -> Master
Ruijie#
```

Ruijie# **debug vrrp errors**	VRRP
Ruijie# **debug vrrp events**	VRRP
Ruijie# **debug vrrp state**	VRRP

-	-

30.2.2 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
```


-	-

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
```

-	-


```
Ruijie#
VRRP: Grp 2 sending Advertisement checksum DD4D
VRRP: Grp 2 sending Advertisement checksum DD4D
VRRP: Grp 2 sending Advertisement checksum DD4D
  2              ,         VRRP                              VRRP   1
         IP        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
```

-	-

-	-

30.2.5 debug vrrp state

VRRP no

debug vrrp state

no debug vrrp state

-	-

VRRP

VRRP

```
Ruijie# debug vrrp state
Ruijie#
%VRRP-6-STATECHANGE: FastEthernet 0/0 Grp 2 state Master -> Backup
%VRRP-6-STATECHANGE: FastEthernet 0/0 Grp 2 state Backup -> Master
Ruijie# config terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Ruijie(config)# interface fastethernet 0/0
Ruijie(config-if)# no shutdown
Ruijie(config-if)# end
```

```
Ruijie#
%VRRP-6-STATECHANGE: FastEthernet 0/0 Grp 2 state Master -> Init
Ruijie#
```

-	-

-	-

30.3

30.3.1 show vrrp

VRRP

show vrrp [**brief** | *grou*p]

brief	VRRP
group	VRRP

VRRP

1 VRRP

```
Ruijie# show vrrp
FastEthernet 0/0 - Group 1
State is Backup
Virtual IP address is 192.168.201.1 configured
Virtual MAC address is 0000.5e00.0101
Advertisement interval is 3 sec
Preemption is enabled
min delay is 0 sec
Priority is 100
Master Router is 192.168.201.213 , pritority is 120
Master Advertisement interval is 3 sec
Master Down interval is 9 sec
FastEthernet 0/0 - Group 2
```

```
State is Master
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
  2     VRRP
Ruijie# show vrrp brief
Interface   Grp Pri Time  Own Pre State   Master addr     Group addr
FastEthernet 0/0   1   100   -    -   P  Backup  192.168.201.213
192.168.201.1
FastEthernet 0/0   2   120   -    -   P  Master  192.168.201.217
192.168.201.2
```

Ruijie(config-if)# **vrrp** *group ip ipaddress* [**secondary**]	VRRP IP

-	-

30.3.2 show vrrp interface

VRRP

show vrrp interface *type number* [**brief**]

type	
number	
brief	

E1/0 VRRP

```
Ruijie# show vrrp interface fastethernet 0/0
```

```
FastEthernet 0/0 - Group 1
State is Backup
Virtual IP address is 192.168.201.1 configured
Virtual MAC address is 0000.5e00.0101
Advertisement interval is 3 sec
Preemption is enabled
min delay is 0 sec
Priority is 100
Master Router is 192.168.201.213 , pritority is 120
Master Advertisement interval is 3 sec
Master Down interval is 9 sec
FastEthernet 0/0 - Group 2
State is Master
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** *ip address* [**secondary**]	VRRP IP

-	-

31 UDP-Helper

31.1

31.1.1 ip forward-protocol

UDP **no** UDP

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

port	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
```


udp-helper enable	UDP
ip forward-protocol	UDP

-	-

31.1.2 ip helper-address

UDP no UDP

ip helper-address *address*

no ip helper-address *address*

address	UDP 20

UDP

20
, UDP-Helper UDP

no ip helper-address

UDP :

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

ip forward-protocol	UDP

-	-

31.1.3 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

32

32.1

32.1.1 distribute-list in

distribute-list in

no

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

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

access-list-number	1-99 1300-1999 100-199 2000-2699
access-list-name	
prefix *prefix-list-name*	
gateway *prefix-list-name*	
i*nterface-type interface-number*	( )

OSPF OSPF

RIP Fastethernet 0/0
172.16

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

access-list	
prefix-list	

-	-

32.1.2 distribute-list out

distribute-list out

no

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

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

access-list-number	1-99 1300-1999 100-199 2000-2699
access-list-name	
prefix *prefix-list-name*	
Interface	( ) й
protocol	( ) Ś

2

OSPF OSPF

RIP 192.168.12.0/24

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

```
Ruijie(config-router)# network 192.168.12.0
Ruijie(config-router)# distribute-list 10 out
Ruijie(config-router)# version 2
Ruijie(config-router)# exit
Ruijie(config)# access-list 10 permit 192.168.12.0 0.0.0.255
```

access-list	
prefix-list	
redistribute	

-	-

32.1.3 initialization route pbr

initialization route pbr *max_num*

no initialization route pbr

max_num	

64

100

```
Ruijie(config)# initialization route pbr ?
  <64-256>  Max number of policy-based route entry
Ruijie(config)# initialization route pbr 100
```

-	-

-	-

32.1.4 initialization route tunnel-termination

Ipv6

initialization route tunnel-termination *max_num*

no initialization route tunnel-termination

max_num	Ipv6

32 Ipv6

Ipv6 100

```
Ruijie(config)# initialization route tunnel-termination ?
  <32-128>  Max number of tunnel termination entry
Ruijie(config)# initialization route tunnel-termination 100
```

-	-

expanded	
community-list-name	80
community-list-number	1-99 100-199
permit	
deny	
community-number	AA:NN(2) 0-4294967295 internet Internet local-as AS no-advertise BGP peers no-export EBGP peers 1..255 32

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

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

prefix-lis-name	
seq-number	1 2147483647 5 5
deny	
permit	
ip-prefix	IP 0 32
minimum-prefix-length	( ) **ge**
maximum-prefix-length	( ) **le**

ip prefix-list IP permit deny

ge le
ip-prefix
ge le ip-prefix
ge minimum-prefix-length 32 le ip-prefix
maximum-prefix- length
minimum-prefix-length maximum-prefix- length ip-prefix
minimum-prefix-length maximum-prefix-length ip-prefix <
minimum-prefix-length < maximum-prefix-length <= 32

OSPF RIP
IP IP (
IP 201.1.1.0/24)

```
Ruijie# configure terminal
Ruijie(config)# ip prefix-list pre1 permit 201.1.1.0/24
Ruijie(config)# router ospf
Ruijie(config-router)# distribute-list prefix pre1 out rip
Ruijie(config-router)# end
```

--	-

-	-

32.1.8 ip prefix-list description

ip prefix-list description **no**

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

prefix-lis-name	
descripton-text	

IP **Deny routes from Net-A**

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

-	-

-	-

32.1.9 ip prefix-list sequence-number

ip prefix-list description **no**

ip prefix-list sequence-number

1

OSPF
110 125 OSPF

vrf vrf
1 **show ip route weight**
weight WCMP
weight
WCMP 32
WCMP

ip route 0.0.0.0
0.0.0.0 Fastethernet 0/0
Fastethernet 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
fastethernet 0/0
```
Ruijie(config)# ip route 172.16.100.0 255.255.255.0 fastethernet 0/0 192.168.12.1
```

show ip route	IP

-	-

32.1.11 ip routing

RGOS IP no IP

ip routing

no ip routing

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
IP IPv6 (
IP 2222::/64)

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

-	-

-	-

32.1.14 ipv6 prefix-list description

IPv6 **ipv6 prefix-list description** **no**

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

prefix-lis-name	IPv6
descripton-text	IPv6

IPv6 pre **Deny routes from Net-A**

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


-	-

-	-

32.1.15 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
```

-	-

-	-

32.1.16 ipv6 route

ipv6 ipv6 route no

ipv6 route *network* | *prefix-length* { *ipv6-address* | *interface* [*ipv6-address*] } [*distance*] [**weight** *number*]

no ipv6 static route-limit

number	1-10000

1000

RGOS IPv6

```
Ruijie# no ipv6 unicast-routing
```

ipv6 route	ipv6
show ipv6 route	IPv6

10.1	

32.1.19 match as-path

AS_PATH **match as-path**

no

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

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

as-path-acl-list-num	1…500

match as-path

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

match **set**

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

match community	
match metric	
match origin	

set as-path prepend AS_PATH

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

-	-

32.1.21 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*]

interface-type	
interface-number	

match interface

OSPF

RIP RIP

OSPF

route maps

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

match **set**

OSPF RIP fastethernet 0/0 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 fastethernet 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	

-	-

32.1.22 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...*]}

access-list-number	1-99 1300-1999 100-199 2000-2699
access-list-name	
prefix-list *prefix-list-name*	

match ip address

OSPF

RIP RIP

OSPF IP

route maps

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

match **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	

32.1.23 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...*]}

access-list-number	1-99 1300-1999 100-199 2000-2699
access-list-name	
prefix-list *prefix-list-name*	

match ip next-hop

OSPF

OSPF

RIP RIP OSPF

IP

1D1C44CA12B>197Bc 14.1A1 Tf -15.419 -1.491156 76Td [<21A80F5609C304B9>6-156 76T07DA17

match interface	
match ip route-source	
match metric	
match route-type	
match tag	
set metric	
set metric-type	
set tag	

-	-

32.1.24 match ip route-source

IP **match ip route-source** **no**

match ip route-source {*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 route-source {*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...*]}

access-list-number	
access-list-name	
prefix-list *prefix-list-name*	

match ip route-source

OSPF

RIP RIP

match **set**

OSPF RIP RIP IP
5 OSPF

```
Ruijie(config)# router ospf
Ruijie(config-router)# redistribute rip subnets
Ruijie(config-router)# 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 5 permit host 192.168.100.1
Ruijie(config)# route-map redrip permit 10
Ruijie(config-route-map)# match ip route-source 5
```

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

-	-

32.1.25 match ipv6 address

IPv6 PBR IPv6 ACL

IPv6 **match ipv6 address** **no**

match ipv6 address { *access-list-name* | **prefix-list** *prefix-list-name* }

no match ipv6 address

prefix-list *prefix-list-name*	IPv6

- route map sequence IPV6 ACL
- Route map sequence 10
- IPv6 PBR prefix-list
- OSPF RIP RIP

match metric	
match route-type	
match tag	
set metric	
set metric-type	
set tag	
set ipv6 default next-hop	
set ipv6 next-hop	
show ipv6 policy	

-	-

32.1.26 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

access-list-name	
prefix-list *prefix-list-name*	IPv6

OSPF

RIP RIP

OSPF IP

route maps

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

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	

OSPF

RIP RIP

OSPF IP

route maps

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

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 5200::/64 any
Ruijie(config-ipv6-acl)# exit
Ruijie(config)# route-map redrip permit 10
Ruijie(config-route-map)# match ipv6 route-source v6acl
Ruijie(config-route-map)# set metric 50
```

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	

-	-

32.1.28 match length

IP **match length** **no**

match length *min-length max-length*

no match length *min-length max-length*

min-length	IP
max-length	IP

ṡ

set ip precedence	IP

-	-

32.1.29 match metric

match metric **no**

match metric *metric*

no match metric

metric	0-4294967295

OSPF

RIP RIP

OSPF IP

route maps

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

match **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
```

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

```
Ruijie(config-router)# redistribute ospf route-map redrip
Ruijie(config-router)# network 192.168.12.0
Ruijie(config-router)# exit
Ruijie(config)# route-map redrip permit 10
Ruijie(config-route-map)# match route-type internal
```

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

-	-

32.1.32 match tag

match tag **no**

match tag *tag* […*tag*]

no match tag *tag* […*tag*]

tag	

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	
set metric-type	
set tag	

-	-

32.1.33 maximum-paths

maximum-paths no

maximum-paths

show running config

ipv4 ipv6 ipv4

ipv6

ipv6

10

```
Ruijie(config)# maximum-paths 10
Ruijie(config)# no maximum-paths
```

-	-

-	-

32.1.35 set aggregator as

match AS **set aggregator as** **no**

set aggregator as *as-num ip_addr*

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

as-number	AS
ip_addr	

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	

32.1.36 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*]

as-number	AS_PATH AS

AS_PATH as-path

15 as

set comm-list *community-list-number* | *community-list-name* **delete**

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

community-list-number	1-99 100-199
community-list-name	80

```
Ruijie(config)# router bgp 100
Ruijie(config-router)# neighbor 172.16.233.33 remote-as 101
Ruijie(config-router)#
```

-	-

32.1.38 set community

match COMMUNITY **set community** **no**

set community {*community-number*[*community-number …*] **additive** | **none**}

no set community { *community-number*[*community-number …*] **additive** | **none**}

community-number	AA:NN(:2) 0-4294967295 internet Internet local-as AS no-advertise BGP peers no-export EBGP peers
additive	community
none	

```
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	

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

-	-

32.1.39 set dampening

match **set dampening**

no

set dampening *half-life reuse suppress max-suppress-time*

no set dampening

half-life	1..45( ) 15
reuse	1..20000 750
suppress	1..20000 2000
max-suppress-time	1..255( ) 4* half-life

```
Ruijie(config)# route-map tag
```

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 next-hop	IP
set ip precedence	IP

-	-

32.1.42 set ip dscp

match DSCP **set ip dscp** **no**

set ip dscp *dscp_value*

no set ip dscp

dscp_value	IP IP DSCP

route-map	
match ip address	↵

set WCMP WCMP
weight WCMP

set ip next-hop IP 32
ip address weight 4 nexthop

next-hop weight **set**
WCMP WCMP
weight nexthop weight
1

set ip default next-hop	IP
set ip precedence	IP

-	-

32.1.44 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*

ip-address	IP
track-obj-num	

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 permitp
Ruijie(config)#
```

match ip address

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

-	-

32.1.46 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

fastEthernet 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 FastEthernet 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

-	-

32.1.47 set ipv6 default next-hop

match IPv6 IPv6 **set ipv6 default next-hop** no

set ipv6 default next-hop *global-ipv6-address* [*weight*] [*global-ipv6-address* [*weight*]...]

no set ipv6 default next-hop global-ipv6-address [*weight*] [*global-ipv6-address* [*weight*]...]

global-ipv6-address

IPv6

set ipv6 default nexthop

match IPv6

- set ipv6 next-hop
-
- set ipv6 default next-hop
-

64

set ipv6 next-hop verify-availability **set ipv6 next-hop verify-availability**

fastEthernet 0/0

2001:0db8:2001:1760::/64 2002:0db8:2003:1::95

```
Ruijie(config)# ipv6 access-list acl_for_pbr
Ruijie(config -ipv6-acl)#permit ipv6 any 2001:0db8:2001:1760::/64
Ruijie(config)#route-map rm_if_0_0
Ruijie(config-route-map)#match ipv6 address acl_for_pbr
Ruijie(config-route-map)# set ipv6 default next-hop
2002:0db8:2003:1::95
Ruijie(config)#interface FastEthernet 0/0
Ruijie(config-if)#ipv6 policy route-map rm_if_0_0
```

match ipv6 address	
ipv6 policy route-map	
set ipv6 next-hop	

RGOS 10.4	RGOS 10.4

32.1.48 set ipv6 next-hop

match IPv6 IPv6 **set ipv6 next-hop** no

set ipv6 next-hop *global-ipv6-address* [*weight*] [*global-ipv6-address* [*weight*]...]

no set ipv6 next-hop global-ipv6-address [*weight*] [*global-ipv6-address* [*weight*]...]

global-ipv6-address	IPv6

set ipv6 next-hop verify-availability [*global-ipv6-address* [*weight*] **bfd** *interface-type interface-number gateway*]

no set ipv6 next-hop verify-availability [*global-ipv6-address* [*weight*] **bfd** *interface-type interface-number gateway*]

global-ipv6-address	( ) IPv6
bfd	( ) BFD
weight	( )
interface-type interface-number	( )
gateway	( ) BFD IPv6

BFD

set ipv6 nexthop
IPv6 BFD

BFD BFD 2002::2

```
Ruijie#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Ruijie(config)# route-map Example1 permit 10
Ruijie(config-route-map)# match ipv6 address 1
Ruijie(config-route-map)# set ipv6 precedence priority
Ruijie(config-route-map)# set ipv6 next-hop 2002::2
Ruijie(config-route-map)#set ipv6 next-hop verify-availability
2002::2 bfd FastEthernet 0/1 2002::2
Ruijie(config-route-map)#end
```

bfd	BFD

10.4	

32.1.50 set ipv6 precedence

match IPv6 set ipv6 precedence
no

set ipv6 precedence {<*0-7*> | *critical* | *flash* | *flash-override* | *immediate* | *internet* | *network* | *priority* | *routine* }

no set ipv6 precedence {<*0-7*> | *critical* | *flash* | *flash-override*

set interface	
set ipv6 default next-hop	
set ipv6 next-hop	
show ipv6 policy	
show route-map	

10.4	

32.1.51 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)# ek.13.7735_8E51 -27.916 -1.323 (Ruijie((773 0 (re
```

match metric	
match route-type	
match tag	
set metric-type	
set tag	

-	-

32.1.52 set local-preference

match LOCAL_PREFERENCE **set local-preference** **no**

set local-preference *number*

no set local-preference

number	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
```


set metric	
set metric-type	

-	-

32.1.53 set metric

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

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

no set metric

+	metric
-	metric
metric-value	

set metric ‘ + ’ ‘ - ’ metric
RIP metric 1-16
OSPF
RIP RIP
OSPF IP
route maps

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

OSPF RIP
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)# route-map redrip permit 10
Ruijie(config-route-map)# set metric 40
```

```
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 metric-type type-1
```

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

-	-

32.1.55 set next-hop

match

```
Ruijie(config)# route-map SET_ORIGIN
```

```
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
```

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

-	-

32.1.58 set tag

match **set tag** **no**

set tag *tag*

no set tag

tag	

OSPF RIP 100

```
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 tag 100
```

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

-	-

32.1.59 set weight

match BGP **set weightCÃ¶8Ê**

```
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	

-	-

32.2

32.2.1 show initialization route

show initialization route

-	-

```
Ruijie#show initialization route
                          config running default
policy-based route entry:   64    64     64
tunnel termination entry:   32    32     32
```


config	
running	
default	

-	-

32.2.2 show ip community-list

set comm-list delete	BGP

-	-

32.2.3 show ip prefix-list

show ip prefix-list

show ip prefix-list [*prefix-name*]

vrf *vrf_name*	VRF
network	
mask	
count	
protocol	**connected**, **static** **bgp**, **isis**, **ospf**, **rip**
process-id	
weight	

1 **show ip route**

```
Ruijie# show ip route
Codes:  C - connected, S - static, R - RIP, B - BGP
O - OSPF, IA - OSPF inter area
N1-OSPF NSSA external type 1,N2 - OSPF NSSA external type 2
E1 - OSPF external type 1, E2 - OSPF external type 2
i - IS-IS,su - IS-IS summary,L1 - IS-IS level-1,L2 - IS-IS level-2
ia - IS-IS inter area, * - candidate default
Gateway of last resort is no set
S    20.0.0.0/8 is directly connected, VLAN 1
S    22.0.0.0/8 [1/0] via 20.0.0.1
O E2 30.0.0.0/8 [110/20] via 192.1.1.1, 00:00:06, VLAN 1
R    40.0.0.0/8 [120/20] via 192.1.1.2, 00:00:23, VLAN 1
B    50.0.0.0/8 [120/0] via 192.1.1.3, 00:00:41
C    192.1.1.0/24 is directly connected, VLAN 1
C    192.1.1.254/32 is local host.
```

show ip route

O	C S R RIP B BGP O OSPF i IS-IS

E2	E1 OSPF E2 OSPF N1 OSPF NSSA 1 N2 OSPF NSSA 2 IA OSPF su IS-IS L1 IS-IS 1 L2 IS-IS 2 ia IS-IS
20.0.0.0/8	
[1/0]	
Via 20.0.0.1	IP
00:00:06	
VLAN 1	

2 **show ip route** *network*

```
Ruijie# show ip route 30.0.0.0
Routing entry for 30.0.0.0/8
Distance 110, metric 20
Routing Descriptor Blocks:
*192.1.1.1, 00:01:11 ago, via VLAN 1, generated by OSPF, extern 2
```

Routing Descriptor Blocks	IP BGP

3 **show ip route count**

```
Ruijie# show ip route count
--------- route info ----------
the num of active route: 5
```

4 **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
```

-	-

32.2.5 show ipv6 prefix-list

IPv6 **show ipv6 prefix-list**

show ipv6 prefix-list [*prefix-name*]

prefix-name	IPv6

IPv6

```
Ruijie# show ipv6 prefix-list
ipv6 prefix-list p6: 2 entries
permit 13::/20
permit 14::/20
```

-	-

-	-

show ipv6 route

```
Ruijie(config)# show ipv6 route
IPv6 routing table name is Default(0) global scope - 7 entries
Codes: C - Connected, L - Local, S - Static, R - RIP, B - BGP
```

ipv6 route	**ipv6**

10.1

-	-

-	-

33.1.2 auto-summary (RIP)

RIP **auto-summary** **no**

-	-

33.1.3 bfd all-interfaces (RIP)

RIP BFD RIP **bfd all-interfaces** no

bfd all-interfaces

no bfd all-interfaces

RIP BFD RIP (RIP)
BFD BFD RIP

RIP BFD RIP IP
BFD
ip rip bfd [**disable**] BFD
bfd all-interfaces

router rip	RIP
ip rip bfd [**disable**]	RIP BFD

-	-

33.1.4 default-metric (RIP)

RIP **default-metric** **no**

default-metric *metric-value*

no default-metric

metric-value	1 16 *metric-value* 16 RGOS

1

redistribute

RIP

RIP

RIP default-metric

default-metric

default-metric 1

RIP OSPF

RIP 3

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

redistribute	

-	-

33.1.5 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 *metric-value*	*metric-value* 1-15

route-map *map-name*	route-map , route-map

metric 1

RIP

default-information originate

always RIP

show

ip rip database RIP

ip-address	IP
wildcard	IP

120

RIP

RIP

RIP

RIP 160, 192.168.12.1
123

```
Ruijie(config)# router rip
Ruijie(config-router)# distance 160
Ruijie(config-router)# distance 123 192.168.12.1 0.0.0.0
```

-	-

-	-

33.1.7 distribute-list in（RIP）

distribute-list in

no

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

RIP Fastethernet 0/0
172.16

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

access-list	
prefix-list	

-	-

33.1.8 distribute-list out（RIP）

distribute-list out

no

distribute-list {[*access-list-number* | *name*] | **prefix** *prefix-list-name*} **out** [**interface |** [**bgp | connected | isis** [*area-tag*] **| ospf** *process-id* **| rip | static**]]

no distribute-list {[*access-list-number* | *name*] | **prefix** *prefix-list-name*} **out** [**interface |** [**bgp | connected | isis** [*area-tag*] **| ospf** *process-id* **| rip | static**]]

isis [*area-tag*]	( ) isis *area-tag* isis
ospf *process-id*	( ) ospf *process-id* ospf
rip	( ) rip
static	( )

RIP 192.168.12.0/24

```
Ruijie(config)# router rip
Ruijie(config-router)# network 200.4.4.0
Ruijie(config-router)# network 192.168.12.0
Ruijie(config-router)# distribute-list 10 out
Ruijie(config-router)# version 2
Ruijie(config)# access-list 10 permit 192.168.12.0 0.0.0.255
```

access-list	
prefix-list	
redistribute	

-	-

33.1.9 exit-address-family

exit-address-family

exit-address-family

exit

```
Ruijie(config-router)# address-family ipv4 vrf vpn1
Ruijie(config-router-af)# exit-address-family
```

address-family	

ip rip authentication mode	RIP
ip rip authentication text-password	RIP RIP RIPv2 RIP
ip rip receive version	RIP RIP
ip rip send version	RIP RIP
key chain	

-	-

33.1.11 ip rip authentication mode

RIP **ip rip authentication mode** **no**
RIP

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

ip rip authentication key-chain	RIP RIP RIPv2 RIP
ip rip authentication text-password	RIP RIP RIPv2 RIP
key chain	

-	-

33.1.12 ip rip authentication text-password

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

10.4(1)	

33.1.13 ip rip bfd

RIP BFD **ip rip bfd** [**disable**] no **ip rip bfd**

ip rip bfd [**disable**]

no ip rip bfd

disable	RIP BFD

RIP BFD

bfd all-interfaces **ip rip bfd** BFD RIP **bfd all-interfaces** RIP BFD **ip rip bfd disable** BFD

router rip	RIP
bfd all-interfaces	RIP BFD

-	-

33.1.14 ip rip default-information

RIP **default-information** **no**

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

no ip rip default-information

RIP **no**
default RIP

Fastethernet 0/0 RIP

```
Ruijie(config)# interface fastethernet 0/0
Ruijie(config-if)# no ip rip receive enable
```

ip rip send enable	RIP
passive-interface	RIP

-	-

33.1.16 ip rip receive version

RIP RIP **ip rip receive version**
no

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

no ip rip receive version

1	RIPv1
2	RIPv2

version

vesion RIP
RIPv1 RIPv2
version

Fastethernet 0/0 RIPv1 RIPv2

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

version	RIP

no ip rip send supernet-routes

RIP

Q'iÉ°Ð1 ü Û Ð ñgp mÂ 0`˜ Ñ—•›tr Tx 'U'† H DâQgp`! @ '.B°P

vesion RIP

RIPv1 RIPv2

version

Fastethernet 0/0 RIPv1 RIPv2

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

version	RIP

-	-

33.1.20 ip rip split-horizon (RIP)

RIP **ip rip split-horizon** **no** RIP

ip rip split-horizon

no ip rip split-horizon

-	-

IP

`

я

X.25

IP

RIP

ضي show ip rip **neighbor**

RIP

Fastethernet 0/0 RIP

```
Ruijie(config)# interface fastethernet 0/0
```

```
Ruijie(config-if)# no ip rip split-horizon
```

neighbor RIP	RIP IP
Validate-update-source	RIP

-	-

33.1.21 ip rip summary-address

RIP **ip rip summary-address** **no**

ip rip summary-address *ip-address ip-network-mask*

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

ip-address	IP
ip-network-mask	IP

RIP

ip rip summary-address RIP

RIPv2 FastEthernet 1/0 172.16.0.0/16

```
Ruijie(config)# interface FastEthernet 1/0
Ruijie(config-if)# ip rip summary-address 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
```


RIP

network *network-number* [*wildcard*]

no network *network-number* [*wildcard*]

network-number	IP RIP
wildcard	IP 0 1

network-number *wildcard*
RIP
wildcard RGOS
RIP
RIP RIP
RIP

RIP 192.168.12.0/24
172.16.0.0/24 RIP

G!5C ò _

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

RIPv1 IP 255.255.255.255 RIPv2
224.0.0.9
passive-interface
RIP
passive

RIP 192.168.1.2

```
Ruijie(config)# router rip
Ruijie(config-router)# passive-interface default
Ruijie(config-router)# neighbor 192.168.1.2
```

passive-interface	passive

-	-

33.1.25 offset-list(RIP)

RIP metric **offset-list**
no offset

offset-list {*access-list-number* |

RIP offset-list offset-list
RIP offset-list metric

acl 7 RIP metric 7

```
Ruijie(config-router)# offset-list 7 out 7
```

fastEthernet1/0 acl 8

-	-

-	-

33.1.27 passive-interface

passive-interface

no

passive-interface {**default** | *interface-type interface-num*}

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

default	passive
interface-type interface-num	

passive

passive-interface default passive **no passive-interface** *interface-type interface-num* passive passive RIP RIP neighbor ip rip send enable ip rip receive enable

passive ethernet0/0 passive

```
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

-	-

33.1.28 redistribute（RIP）

redistribute

no

redistribute {**bgp** | **connected** | **isis** [*area-tag*] | **ospf** *process-id* | **static**} [{**level-1 | level-1-2 | level-2**} **| match** {**internal | external** [**1|2**]

no match

RIP

RIP **default-information originate**

RIP

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

default-metric *metric*	
default-information originate	RIP

-	-

33.1.29 router rip

RIP E ώ

-	-

33.1.30 timers basic

RIP **timers basic** **no**

-	-

33.1.31 validate-update-source

RIP

validate-update-source **no**

validate-update-source

no validate-update-source

-	-

RIP RIP

IP

RIP

validate-update-source

ip unnumbered RIP

validate-update-source

```
Ruijie(config)# router rip
Ruijie(config-router)# no validate-update-source
```

ip rip split-horizon	RIP
ip unnumbered	IP
neighbor (**RIP**)	RIP IP

-	-

33.1.32 version (RIP)

RIP

RIP rip
rip metric distance
VRF VRF VRF-id

1 RIP

```
Ruijie# show ip rip
Routing Protocol is "rip"
Sending updates every 10 seconds
Invalid after 20 seconds, flushed after 10 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 2
Redistributing: connected
Default version control: send version 2, receive version 2
Interface            Send  Recv
FastEthernet 1/1      2    2
FastEthernet 1/0      2    2
Routing for Networks:
192.168.26.0 255.255.255.0
192.168.64.0 255.255.255.0
Distance: (default is 50)
```

2 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)
```

-	-

RIP

-	-

33.2.3 show ip rip external

RIP **show ip rip external**

show ip rip external [**bgp** | **connected** | **isis** [*process-name*] | **ospf** <*1-65535*>| **static**] [**vrf** *vrf-name*]

bgp | connected | isis | ospf | static	
vrf *vrf-name*	VRF RIP
process-name	ISIS
<1-65535>	OSPF

RIP

```
Ruijie# show ip rip external connected
Protocol connected route:
[connected] 1.0.0.0/8 metric=0
nhop=0.0.0.0, if=2
[connected] 3.0.0.0/8 metric=0
nhop=0.0.0.0, if=16391
[connected] 4.4.0.0/16 metric=0
nhop=0.0.0.0, if=16388
[connected] 5.0.0.0/8 metric=0
nhop=0.0.0.0, if=16386
[connected] 192.168.195.0/24 metric=0
nhop=0.0.0.0, if=1
```

	-	-

show ip rip	

-	-

34 RIPNG

34.1

34.1.1 default-metric (RIPng)

RIPng **default-metric**

no

default-metric *metric*

no default-metric

metric	1 16 metric 16 RGOS

1

redistribute

RIP

RIP

RIPng **default-metric**

default-metric

default-metric 1

OSPF 100 RIP 3

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

redistribute	

-	-

34.1.2 distance（IPv6）

RIPng **distance** **no**

distance *distance*

no distance

distance	RIPng <1-254>

120

RIPng

RIPng 160

```
Ruijie(config)# ipv6 router rip
Ruijie(config-router)# distance 160
```

-	-

-	-

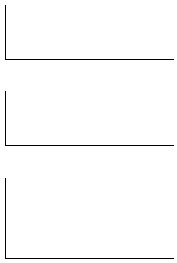
34.1.3 distribute-list

prefix-list / **distribute-list** **no**

distribute-list prefix-list *prefix-list-name* {**in** | **out**} [*interface-type interface-name*]

no distribute-list prefix-list *prefix-list-name* {**in** | **out**} [*interface-type interface-name*]

prefix-list *prefix-list-name*	**prefix-list**
in | **out**	
interface-type interface-name	


eth0

```
Ruijie(config)# interface ethernet 0/0
Ruijie(config-if)# ipv6 rip default-information only
```

34.1.6 ipv6 rip metric-offset

ipv6 rip metric-offset *value* **no**

ipv6 rip metric-offset *value*

no ipv6 rip metric-offset

RIPng

RIPng

```
Ruijie(config)# ipv6 router rip
```

ipv6 rip enable	RIPng

-	-

34.1.8 passive-interface（RIPng）

passive-interface

no

passive-interface {**default** | *interface-type interface-num*}

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

default	passive
interface-type interface-num	

passive

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

passive ethernet0/0 passive

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

-	-

-	-

34.1.9 redistribute

distribute-list	RIPng

-	-

34.1.10 split-horizon (RIPng)

RIPng **split-horizon** **no** RIP **split-horizon** **poisoned-reverse** **no**

split-horizon [**poisoned-reverse**]

no split-horizon [**poisoned-reverse**]

poisoned-reverse	

metric 16 RIPng

RIPng **show ipv6 rip**

RIPng

```
Ruijie(config)# ipv6 router rip
Ruijie(config-router)# no split-horizon
```

-	-

-	-

34.1.11 timers (ipv6)

RIPng **timers** **no**

timers *update invalid flush*

no timers

update	update invalid flush 30
invalid	invalid invalid invalid Invalid 180
flush	RIPng invalid flush invalid flush 120

30 180 120

RIPng RIP

RIPng **show ipv6 rip**

2Mbps

34.2

34.2.1 show ipv6 rip

RIPng **show ipv6 rip**

show ipv6 rip

-	-

```
Ruijie# show ipv6 rip
Routing Protocol is "RIPng"
  Sending updates every 10 seconds with +/-50%, next due in 8 seconds
  Timeout after 30 seconds, garbage collect after 60 seconds
  Outgoing update filter list for all interface is:
    distribute-list prefix aa out
  Incoming update filter list for all interface is: not set
  Default redistribution metric is 1
  Default distance is 120
  Redistribution:
     Redistributing protocol connected route-map rm
     Redistributing protocol static
     Redistributing protocol ospf 1
  Default version control:  send version 1, receive version 1
  Interface              Send   Recv
     VLAN 1              1      1
     Loopback 1           1      1
  Routing Information Sources:
     None
```

show ipv6 rip	RIPng

-	-

34.2.2 show ipv6 rip database

RIPng **show ipv6 rip database**

show ipv6 rip database

-	-

RIPng

```
Ruijie# show ipv6 rip database
Codes: R - RIPng,C - Connected,S - Static,O - OSPF,B - BGP
sub-codes:n - normal,s - static,d - default,r - redistribute,
          i - interface, a/s - aggregated/suppressed
S(r)   2001:db8:1::/64, metric 1, tag 0
          Loopback 0/::
S(r)   2001:db8:2::/64, metric 1, tag 0
          Loopback 0/::
C(r)   2001:db8:3::/64, metric 1, tag 0
          VLAN 1/::
S(r)   2001:db8:4::/64, metric 1, tag 0
          Null 0/::
C(i)   2001:db8:5::/64, metric 1, tag 0
          Loopback 1/::
S(r)   2001:db8:6::/64, metric 1, tag 0
          Null 0/::
```

show ipv6 rip	RIPng

-	-

35 OSPF2

35.1

35.1.1 area

no OSPF

area area-id

no area area-id

35.1.2 area authentication

OSPF **area authentication** **no** OSPF

area *area-id* **authentication** [*message-digest*]

no area *area-id* **authentication**

area-id	OSPF IP
message-digest	MD5 message digest 5

RGOS OSPF OSPF message-digest MD5 message-digest OSPF **ip ospf authentication-key** **ip ospf message-digest-key** MD5

OSPF 0 MD5 backbone

```
Ruijie(config)# interface FastEthernet 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**

area-id	STUB NSSA
cost	STUB NSSA 1-16777214

ABR ABR STUB

NSSA ABR

CÃÊA'Ê9RubTc 2.299 0 Td[<1Ãd<1Td090E0DB3132_0 1 TD4>6<03FE011 Tc 3.24 0 Td(NSSA)Tj2A

area-id	
acl-name	acl
prefix-name	prefix-list
access | **prefix**	prefix list ACL
in | **out**	|

ABR
ABR

area 1 172.22.0.0/8

```
Ruijie# configure terminal
Ruijie(config)# access-list 1 permit 172.22.0.0/8
Ruijie(config)# router ospf 100
Ruijie(config-router)# area 1 filter-list access 1 in
```

-	-

-	-

35.1.5 area nssa

OSPF NSSA **area nssa** **no** NSSA NSSA

area *area-id* **nssa** [**no-redistribution**] [**default-information-originate** [**metric** *value* | **metric-type** <*1-2*>]] [**no-summary**]

no area *area-id* **nssa** [**no-redistribution**] [**default-information-originate**] [**no-summary**]

area-id	NSSA

E 1

no-redistribution

default-information-originate	7 LSA NSSA NSSA ABR ASBR
metric *value*	LSA metric 0-16777214
metric-type <*1-2*>	LSA E-1 E-2
no-summary	nssa (ABR) summary LSAs Type-3 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 1

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 net-mask	
advertise | **not-advertise**	
cost *cost*	0-16777215

RFC1583 RFC1583
cost cost

ABR

advertise not-advertise
cost
OSPF

area range

172.16.16.0/20

```
Ruijie(config)# router ospf 1
Ruijie(config-router)# network 172.16.0.0 0.0.15.255 area 0
Ruijie(config-router)# network 172.16.17.0 0.0.15.255area 1
Ruijie(config-router)# area 1 range 172.16.16.0 255.255.240.0
```

OSPF **area stub** **no**

area *area-id* **stub** [**no-summary**]

no area *area-id* **stub** [**no-summary**]

area-id	STUB
no-summary	ABR ABR

OSPF area stub ABR
(LSA) 1 1 LSA 2 2 LSA 3 3
LSA 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 0.0.255.255area 0
Ruijie(config-router)# network 192.168.12.0 0.0.0.255area 1
Ruijie(config-router)# area 1 stub
```

area default-cost	STUB OSPF

-	-

35.1.8 area virtual-link

OSPF **area virtual-link** **no**

area *area-id* **virtual-link** *router-id* [**authentication** [**message-digest** | **null**]] [**dead-interval** *seconds*] [**hello-interval** *seconds*] [**retransmit-interval** *seconds*] [**transmit-delay** *seconds*] [[**authentication-key** *key*] | [**message-digest-key** *key-id* **md5** *key*]]

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

area-id	OSPF IP
router-id	show ip ospf
dead-interval *seconds*	1-65535
hello-interval *seconds*	OSPF Hello 1-65535
retransmit-interval *seconds*	OSPF LSA 1-65535
transmit-delay *seconds*	OSPF LSA 1-65535 LSA LSA LSA
authentication-key *key*	OSPF service password-encryption
message-digest-key *key-id* **md5** key	OSPF MD5 MD5 service password-encryption
authentication	
message-digest	MD5
null	

dead-interval 40
hello-interval 10
retransmit-interval 5
transmit-delay 1

OSPF

ABR ABR Stub Area
NSSA

router-id OSPF router-id **show ip ospf**
neighbor Loopback
area virtual-link OSPF
area authentication

6009BE>6<116E>6<041D3C2E18B34AD2>6<434343434343434T2 T0 7.94

, ,
. ( )
. **default auto-cost** **no auto-cost**

ip ospf bfd [**disable**]	OSPF BFD

-	-

35.1.11 clear ip ospf process

OSPF

clear ip ospf [*process-id*] **process**

process-id	OSPF OSPF OSPF

RFC2328

OSPF

OSPF 1

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

-	-

-	-

35.1.12 compatible rfc1583

AS RFC1583
RFC2328

commpatible rfc1583

metric 1
metric-type 2

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

always OSPF

show ip ospf database OSPF 0.0.0.0
OSPF **show ip route**

default-information originate
default-metric
OSPF 1 2
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
redistribute	

-	-

35.1.14 default-metric

OSPF **default-metric**

no

default-metric *metric*

no default-metric

metric	OSPF 1-16777214

20

default-metric **redistribute**

default-metric **default-information originate** OSPF

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 1
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

-	-

35.1.15 discard-route

discard no discard

discard-route {**internal**|**external**}

no discard-route {**internal**|**external**}

internal	area range discard
external	summary-address discard

discard

ABR ASBR discard

area range discard

```
Ruijie(config)# router ospf 1
Ruijie(config-router)# no discard-route internal
```

area range	OSPF
summary-address	OSPF

-	-

OSPF 160

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

-	-

-	-

35.1.17 distribute-list in

LSA

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

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

access-list-number | *name*	acl
gateway *prefix-list-name*	gateway
prefix *prefix-list-name*	prefix-list
interface-type interface-number	LSA

LSA SPF

OSPF

ABR ASBR

```
Ruijie(config)# access-list 3 permit 172.16.0.0 0.0.127.255
Ruijie(config)# router ospf 25
Ruijie(config-router)# redistribute rip metric 100
Ruijie(config-router)# distribute-list 3 in ethernet 1/0
```

distribute-list out	

-	-

35.1.18 distribute-list out

redistribute

distribute-list {[*access-list-number* | *name*] | **prefix** *prefix-list-name*} **out** [**bgp** | **connected** | **isis** [*area-tag*] **| ospf** *process-id* **| rip | static**]

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

access-list-number | name	acl
prefix prefix-list-name	prefix-list
bgp | connected | isis [area-tag] | **ospf** process-id | **rip** | **static**	

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

ACL prefix-list

ACL , prefix-list

```
Ruijie(config)# router ospf 1
Ruijie(config-router)# redistribute static subnets
Ruijie(config-router)# distribute-list 22 out static
Ruijie(config-router)# distribute-list prefix jjj out static
% Access-list filter exists, please de-config first
```

distribute-list in	LSA
redistribute	

RestartStatusChange | VirtIfStateChange | VirtNbrRestartHelperStatusChange | VirtNbrStateChange]]

no enable traps [error [IfAuthFailure | IfConfigError | IfRxBadPacket | VirtIfAuthFailure | VirtIfConfigError | VirtIfRxBadPacket] | lsa [LsdbApproachOverflow | LsdbOverflow | MaxAgeLsa | OriginateLsa] | retransmit [IfTxRetransmit | VirtIfTxRetransmit] | state-change [IfStateChange | NbrRestartHelperStatusChange | NbrStateChange | RestartStatusChange | VirtIfStateChange | VirtNbrRestartHelperStatusChange | VirtNbrStateChange]]

error	error traps error traps **IfAuthFailure** **IfConfigError** **IfRxBadPacket** **VirtIfAuthFailure** **VirtIfConfigError** **VirtIfRxBadPacket**
lsa	lsa traps lsa traps **LsdbApproachOverflow** LSA **LsdbOverflow** LSA **MaxAgeLsa** LSA **OriginateLsa** LSA
retransmit	retransmit traps retransmit traps **IfTxRetransmit** **VirtIfTxRetransmit**
state-change	state-change traps state-change traps **IfStateChange** **NbrRestartHelperStatusChange** GR **NbrStateChange** **RestartStatusChange** GR Restarter **VirtIfStateChange** **VirtNbrRestartHelperStatusChange** GR **VirtNbrStateChange**

traps

snmp-server **snmp-server enable**

traps ospf enable traps ospf trap

MIB TRAP

OSPFv2 100 TRAP

```
Ruijie(config)# router ospf 100
Ruijie(config-router)# enable traps
```

show ip ospf	OSPF
enable mib-binding	OSPFv2 MIB
snmp-server enable traps ospf	OSPF TRAP

10.4(1)	

35.1.21 graceful-restart

OSPF (graceful restart GR) **graceful-restart** **graceful-restart grace-period** grace period no

graceful-restart [**grace-period** *grace-period*]

no graceful-restart [**grace-period**]

grace-period	grace-period
grace-period	GR OSPF OSPF 1-1800

GR Restart Grace-period 120s

OSPF OSPF OSPF OSPF OSPF GR OSPF **graceful-restart** GR 120 **graceful-restart grace-period**

OSPF 1 GR GR

```
Ruijie(config)# router ospf 1
Ruijie(config-router)# graceful-restart
```

```
Ruijie(config-router)# graceful-restart grace-period 60
```

OSPF 1 GR

```
Ruijie(config)# router ospf 1
Ruijie(config-router)# graceful-restart helper disable
Ruijie(config-router)# no graceful-restart helper disable
Ruijie(config-router)# graceful-restart helper
strict-lsa-checking
```

graceful-restart	OSPF

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

-	-

35.1.25 ip ospf bfd

OSPF BFD **ip ospf bfd** [**disable**] no **ip ospf bfd**

ip ospf bfd [**disable**]

no ip ospf bfd

disable	OSPF BFD

cost	OSPF

/Bandwidth 100Mbps

OSPF 100Mbps/Bandwidth Bandwidth
bandwidth
OSPF

- 64K cost 1562
- E1 cost 48
- 10M cost 10
- 100M cost 1

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

-	-

35.1.27 ip ospf database-filter all out

LSA LSA , **no**

ip ospf database-filter all out

no ip ospf database-filter

-	-

, LSA

LSA
LSA
LSA

LSA serial 1/0

```
Ruijie(config)# interface serial 1/0
Ruijie(config-if)# ip address 172.16.10.1 255.255.255.0
Ruijie(config-if)# encapsulation ppp
Ruijie(config-if)# ip ospf database-filter all out
```

AÈ V ÿ a%™6 A^45 e b9I•SCQ$‰' B 2$f W‡ Hˆ 2$fÂ ò rrWY 2ÌÃ x¸ Z À– L	
-	-

-	-

35.1.28 ip ospf dead-interval

OSPF **ip ospf dead-interval**
no

```
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

OSPF Hello **ip ospf hello-interval**

no

ip ospf hello-interval *seconds*

no ip ospf hello-interval

seconds	OSPF hello 1-65535

10

PPP HDLC 10

10

X.25 30

hello hello OSPF

hello

hello

serial 1/0 OSPF Hello 15

```
Ruijie(config)# interface serial 1/0
Ruijie(config-if)# ip address
RuS--5d(nfig.198 -0.006 T8Tm[721>encapsulation pppC2168 )7--5547.71]J-25..76 -1
```

key-id	1 255

MD5

ip ospf message-digest-key OSPF
OSPF

OSPF **area authentication**
, **ip ospf authentication**
,
RGOS MD5
OSPF MD5
OSPF

FastEthernet 0/0 OSPF
hello5

```
Ruijie(config)# interface Serial 1/0
Ruijie(config-if)# ip address 172.16.24.2 255.255.255.0
Ruijie(config-if)# ip ospf authentication message-digest
Ruijie(config-if)# ip ospf message-digest-key 10 md5 hello10
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
```

	OSPF

area authentication

no ip ospf mtu-ignore

-	-

mtu

OSPF MTU MTU ,
MTU MTU,
, MTU

serial 1/0 MTU

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

-	-

-	-

35.1.33 ip ospf network

OSPF **ip ospf network** **no**

ip ospf network {*broadcast* *non-broadcast* *point-to-multipoint* [*non-broa05ebCoad*

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
X.25 map

```
Ruijie(config-if)# ip ospf network broadcast
Ruijie(config-if)# ip ospf priority 0
```

dialer map ip	IP
frame-relay map	IP DLCI
neighbor OSPF	IP NBMA
X25 map	IP X.25

-	-

35.1.34 ip ospf priority

OSPF **ip ospf priority** **no**

ip ospf priority *priority*

no ip ospf priority

priority	OSPF 0-255

OSPF hello OSPF DR/BDR
DR BDR
DR BDR
DR/BDR OSPF broadcast non-broadcast

DR BDR DR BDR

fastethernet 0/0 0

```
Ruijie(config)# interface fastethernet 0/0
Ruijie(config-if)# ip ospf priority 0
```


ip ospf network	OSPF

-	-

35.1.35 ip ospf retransmit-interval

LSU **ip ospf retransmit-interval** **no**

ip ospf retransmit-interval *seconds*

no ip ospf retransmit-interval

seconds	LSU 1-65535

5

LSU LSU **ip ospf retransmit-interval** LSU

LSU area virtual-link retransmit-interval

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

show ip ospf	ospf

-	-

35.1.38 max-concurrent-dd

DD

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

no max-concurrent-dd

<*1-65535*>	DD

5

OSPF

DD

DD 4

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

-	-

OSPF2

-	-

35.1.41 overflow database

OSPF LSA

overflow database <*1-4294967294*> **hard** | **soft**

no overflow database

<1-4294967294>	LSA
hard	**soft**	hard LSA OSPF soft LSA

OSPF LSA

OSPF OVERFLOW

OSPF OVERFLOW

OSPF OVERFLOW

OSPF NULL

OVERFLOW

clear ip ospf process OSPF OSPF

OVERFLOW

no OSPF OVERFLOW

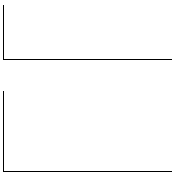
OSPF

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)	



serial 1/0

```
Ruijie(config)# router ospf  30
Ruijie(config-router)# passive-interface
```

metric-type {*1|2*}	E-1 E-2
route-map *route-map-name*	
subnets	
tag *tag-value*	OSPF tag 0-4294967295

OSPF
ISIS level-2

BGP metric level-[illegible]

-	-

show ip ospf 3( )]TJ/C2 0 1 Tf0 Tc06 w 2.9.52 6 Td[61C1 2F0E152726<<820>]TJ/TT0 1 Tf-0.0530 Tc45

no router-id

router-id	ID, IP

OSPF loopback IP
IP loopback OSPF IP

IP

LSA
router-id

router-id 0.0.0.36

```
Ruijie(config)# router ospf 20
Ruijie(config-router)# router-id 0.0.0.36
```

show ip protocols	

-	-

35.1.48 summary-address

OSPF **summary-address**
no

summary-address *ip-address net-mask* {**not-advertise** | **tag** *value*}

no summary-address *ip-address net-mask* {**not-advertise** | **tag** *value*}

ip-address	IP
net-mask	
not-advertise	

OSPF

OSPF

area range area range OSPF
summary-address OSPF
NSSA **summary-address** NSSA ABR

100.100.0.0/16

```
redRuijie(config)# router ospf 20
Ruijie(config-router)# summary-address 100.100.0.0 255.255.0.0
Ruijie(config-router)# redistribute static subnets
Ruijie(config-router)# network 200.2.2.0 0.0.0.255 area 1
Ruijie(config-router)# network 172.16.24.0 0.0.0.255 area 0
Ruijie(config-router)# area 1 nssa
```

area range	OSPF
redistribute	

-	-

35.1.52 timers spf

OSPF SPF SPF
timers spf no

timers spf spf-delay spf-holdtime

no timers spf

spf-delay	SPF 0-214748364 ( ) OSPF SPF
spf-holdtime	SPF 0-214748364 ( ) SPF

1 RGOS 10.4 timers throttle spf
timers spf 5 10
2 RGOS 10.4 timers throttle spf timers spf
SPF **timers throttle spf** timers
throttle spf

spf-delay *spf-holdtime* OSPF
CPU

timers spf timers throttle spf

OSPF 3 9

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

show ip ospf	ospf
timers throttle spf	SPF timers spf timers throttle spf timers spf

10.1	

35.1.53 timers throttle lsa all

LSA **timers throttle lsa all** **no**

timers throttle lsa all *delay-time hold-time max-wait-time*

no timers throttle lsa all

delay-time	LSA 0-600000
hold-time	2 LSA 1-600000
max-wait-time	LSA LSA LSA 1-600000

delay-time 0
hold-time 5000
max-wait-time 5000

delay-time CPU

hold-time delay-time max-wait-time hold-time

10ms hold-time 1s 5s

```
Ruijie(config)# router ospf 1
Ruijie(config-router)# timers throttle lsa all 10 1000 5000
```

show ip ospf	OSPF

10.4(3)	LSA
10.4(2b10)	

35.1.54 timers throttle spf

OSPF

timers spf	SPF RGOS throttle spf 10.4 SPF timers timers spf

10.4(1)	

35.2

35.2.1 show ip ospf

OSPF **show ip ospf**

show ip ospf [*process-id*]

process-id	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
Memory Overflow is enabled.
Router is not in overflow state now.
Conforms to RFC2328, and RFC1583Compatibility flag isenabled
Supports only single TOS(TOS0) routes
Supports opaque LSA
This router is an ASBR (injecting external routing information)
SPF schedule delay 5 secs, Hold time between two SPFs 10 secs
Initial LSA throttle delay 0 msecs
Minimum hold time for LSA throttle 5000 msecs
Maximum wait time for LSA throttle 5000 msecs
Lsa Transmit Pacing timer 40 msecs, 10 LS-Upd
Minimum LSA arrival 1000 msecs
Pacing lsa-group: 240 secs
Number of incomming current DD exchange neighbors 0/5
```

```
Number of outgoing current DD exchange neighbors 0/5
Number of external LSA 4. Checksum 0x0278E0
Number of opaque AS LSA 0. Checksum 0x000000
Number of non-default external LSA 4
External LSA database is unlimited.
Number of LSA originated 6
Number of LSA received 2
Log Neighbor Adjency Changes : Enabled
Graceful-restart disabled
Graceful-restart helper support enabled
Number of areas attached to this router: 1
Area 0 (BACKBONE)
Number of interfaces in this area is 1(1)
Number of fully adjacent neighbors in this area is 1
Area has no authentication
SPF algorithm last executed 00:01:26.640 ago
SPF algorithm executed 4 times
Number of LSA 3. Checksum 0x0204bf
Area 1 (NSSA)
Number of interfaces in this area is 1(1)
Number of fully adjacent neighbors in this area is 0
Number of fully adjacent virtual neighbors through this area is 0
Area has no authentication
SPF algorithm last executed 02:09:23.040 ago
SPF algorithm executed 4 times
Number of LSA 6. Checksum 0x028638
NSSA Translator State iselected
    OSPF   BFD    ,                        ”BFD enabled”,
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
Supports Graceful Restart
This router is an ASBR (injecting external routing information)
SPF schedule delay 5 secs, Hold time between two SPFs 10 secs
Initial LSA throttle delay 0 msecs
Minimum hold time for LSA throttle 5000 msecs
Maximum wait time for LSA throttle 5000 msecs
Lsa Transmit Pacing timer 40 msecs, 10 LS-Upd
Minimum LSA arrival 1000 msecs
Pacing lsa-group: 240 secs
Number of incomming current DD exchange neighbors 0/5
Number of outgoing current DD exchange neighbors 0/5
Number of external LSA 4. Checksum 0x0278E0
Number of opaque AS LSA 0. Checksum 0x000000
Number of non-default external LSA 4
External LSA database is unlimited.
Number of LSA originated 6
Number of LSA received 2
```

```
Log Neighbor Adjency Changes : Enabled
Graceful-restart disabled
Graceful-restart helper support enabled
Number of areas attached to this router: 1
BFD enabled
Area 0 (BACKBONE)
Number of interfaces in this area is 1(1)
Number of fully adjacent neighbors in this area is 1
Area has no authentication
SPF algorithm last executed 00:01:26.640 ago
SPF algorithm executed 4 times
Number of LSA 3. Checksum 0x0204bf
Area 1 (NSSA)
Number of interfaces in this area is 1(1)
Number of fully adjacent neighbors in this area is 0
Number of fully adjacent virtual neighbors through this area is 0
Area has no authentication
SPF algorithm last executed 02:09:23.040 ago
SPF algorithm executed 4 times
Number of LSA 6. Checksum 0x028638
NSSA Translator State iselected
```

Router ID	
Process uptime	OSPF router-id 0.0.0.0
Bound to VRF	OSPF VRF
Conforms to RFC2328	RFC2328
RFC1583Compatibility flag	RFC1583 RFC2328 ASBR
Support Tos	TOS0
Supports opaque LSA	opaque-LSA
Graceful-restart	RFC3623 Graceful Restart GR Restart
Graceful-restart helper	RFC3623 Graceful Restart GR Help
Router Type	OSPF normal ABR ASBR
SPF Delay	SPF
SPF-holdtime	SPF
Pacing lsa-group	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	NSSA LSA External LSA NSSA ABR OSPF
BFD enabled	OSPF BFD

-	-

-	-

35.2.2 show ip ospf border-routers

ABR/ASBR OSPF **show ip ospf border-routers**

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

process-id	ospf

ABR ASBR OSPF OSPF
show ip route OSPF OSPF

show ip ospf border-routers

```
Ruijie# show ip ospf border-routers
OSPF internal Routing Table
Codes: i - Intra-area route, I - Inter-area route
i 1.1.1.1 [2] via 10.0.0.1, FastEthernet 0/1, ABR, ASBR, Area 0.0.0.1
select
```

Codes	i I
I	
1.1.1.1	OSPF
[2]	cost
via 10.0.0.1	
FastEthernet 0/1	
ABR, ASBR	ABR ASBR ABR ASBR
Area 0.0.0.1	

-	-

-	-

35.2.3 show ip ospf database

OSPF **show ip ospf database**

LSAs

show ip ospf [*process-id area-id*] **database** [**adv-router** *ip-address* | {**asbr-summary** | **external** | **network** | **nssa-external | opaque-area | opaque-as | opaque-link | router** | **summary**} [*link-state-id*] [{**adv-router** *ip-address* | **self-originate**}] | **database-summary** | **max-age** | **self-originate**]

area-id	

adv-router Ğ Ψ Ъ

OSPF
OSPF

1 **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 ID         ADV Router      Age  Seq#       CkSum  Link count
1.1.1.1         1.1.1.1         2    0x80000011 0x6f39 2
3.3.3.3         3.3.3.3         120  0x80000002 0x26ac 1
Network Link States (Area 0.0.0.0)
Link ID         ADV Router      Age  Seq#       CkSum
192.88.88.27    1.1.1.1         120  0x80000001 0x5366
Summary Link States (Area 0.0.0.0)
Link ID         ADV Router      Age  Seq#       CkSum  Route
10.0.0.0        1.1.1.1         2    0x80000003 0x350d 10.0.0.0/24
100.0.0.0       1.1.1.1         2    0x8000000c 0x1ecb 100.0.0.0/16
Router Link States (Area 0.0.0.1 [NSSA])
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

OSPF Router with ID	OSPF OSPF
Router Link States	
Net Link States	
Summary Net Link States	
NSSA-external Link States	
AS External Link States	
Link ID	
ADV Router	
Age	

Seq#	LSA
Cksum	
Link-Count	
Route	LSA
Tag	

2 **show ip ospf database asbr-summary**

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

show ip ospf database asbr-summary

OSPF Router with ID	OSPF
AS Summary Link States	AS
LS age	
Options	
LS Type	
Link State ID	
Advertising Router	
LS Seq Number	
Checksum	
Length	
Network Mask	
TOS	TOS 0
Metric	

3 **show ip ospf database external**

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

```
Options: 0x2 (*|-|-|-|-|-|E|-)
LS Type: AS-external-LSA
Link State ID: 20.0.0.0 (External Network Number)
Advertising Router: 1.1.1.1
LS Seq Number: 8000000a
Checksum: 0x7627
Length: 36
Network Mask: /24
Metric Type: 2 (Larger than any link state path)
TOS: 0
Metric: 20
Forward Address: 0.0.0.0
External Route Tag: 0
```

show ip ospf database external

OSPF Router with ID	OSPF
Type-5 AS External Link States	
LS age	
Options	
LS Type	
Link State ID	
Advertising Router	
LS Seq Number	
Checksum	
Length	
Network Mask	
Metric Type	
TOS	TOS 0
Metric	
Forward Address	IP 0.0.0.0
External Route Tag	32 OSPF OSPF

4 **show ip ospf database networ**k

```
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

OSPF Router with ID	OSPF
Network Link States	
LS age	
Options	
LS Type	
Link State ID	
Advertising Router	
LS Seq Number	
Checksum	
Length	
Network Mask	
Attached Router	

5 **show ip ospf database route**r

```
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
TOS 0 Metrics	TOS

6 **show ip ospf database summar**y

```
Ruijie# show ip ospf database summary
OSPF Router with ID (1.1.1.1) (Process ID 1)
   y
```

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

7 **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

OSPF Router with ID	OSPF
NSSA-external Link States	
LS age	
Options	
LS Type	
Link State ID	
Advertising Router	
LS Seq Number	
Checksum	
Length	

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

8 **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	
LS Type	
Link State ID	
Advertising Router	
LS Seq Number	
Checksum	
Length	
Network Mask	

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

9 **show ip ospf database database-summary**

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

show ip ospf database database-summary

interface-type	
interface-number	

OSPF OSPF

show ip ospf interface FastEthernet *1/0*

```
Ruijie# show ip ospf interface fa 1/0
FastEthernet 1/0 is up, line protocol is up
Internet Address 192.88.88.27/24, Ifindex 4, Area 0.0.0.0, MTU 1500
Matching network config: 192.88.88.0/24
Process ID 1, Router ID 1.1.1.1, Network Type BROADCAST, Cost: 1
Transmit Delay is 1 sec, State DR, Priority 1
Designated Router (ID) 1.1.1.1, Interface Address 192.88.88.27
Backup Designated Router (ID) 3.3.3.3, Interface Address
192.88.88.72
Timer intervals configured,Hello 10,Dead 40,Wait 40,Retransmit 5
Hello due in 00:00:03
Neighbor Count is 1, Adjacent neighbor count is 1
Crypt Sequence Number is 70784
Hello received 1786 sent 1787, DD received 13 sent 8
LS-Req received 2 sent 2, LS-Upd received 29 sent 53
LS-Ack received 46 sent 23, Discarded 1
                    BFD                          :
Ruijie# show ip ospf interface fa 1/0
FastEthernet 1/0 is up, line protocol is up
Internet Address 192.88.88.27/24, Ifindex 4, Area 0.0.0.0, MTU 1500
Matching network config: 192.88.88.0/24
Process ID 1, Router ID 1.1.1.1, Network Type BROADCAST, Cost: 1
Transmit Delay is 1 sec, State DR, Priority 1, BFD enabled
Designated Router (ID) 1.1.1.1, Interface Address 192.88.88.27
Backup Designated Router (ID) 3.3.3.3, Interface Address
192.88.88.72
Timer intervals configured,Hello 10,Dead 40,Wait 40,Retransmit 5
Hello due in 00:00:03
Neighbor Count is 1, Adjacent neighbor count is 1
Crypt Sequence Number is 70784
Hello received 1786 sent 1787, DD received 13 sent 8
LS-Req received 2 sent 2, LS-Upd received 29 sent 53
LS-Ack received 46 sent 23, Discarded 1
```

show ip ospf interface serial *1/0*

FastEthernet 0/0 State	UP Down
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
BFD enabled	OSPF BFD

-	-

35.2.5 show ip ospf neighbor

OSPF **show ip ospf neighbor**

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

detail	
interface-type interface-number	
neighbor-id	

OSPF

show ip ospf neighbor

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

BFD ″BFD session state up″

```
Ruijie# show ip ospf neighbor
OSPF process 1, 1 Neighbors, 1 is Full:
Neighbor ID     Pri   State     Dead Time   Address     Interface
```

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 tab1 Tf.16 refBT/TT0 1 Tf0.0006 Tc -0.003 Tw 10.0Tf0.0006 Tc[(Ts8rTf00.48 20.16

OSPF count OSPF

```
Ruijie# show ip ospf route
OSPF process 1:
Codes: C - connected, D - Discard, O - OSPF,
IA - OSPF inter area  N1 - OSPF NSSA external type 1, N2 - OSPF NSSA
external type 2
E1 - OSPF external type 1, E2 - OSPF external type 2
E2 100.0.0.0/24 [1/20] via 192.88.88.126, FastEthernet 1/0
C  192.88.88.0/24 [1] is directly connected,FastEthernet 1/0,Area
0.0.0.1
```

show ip ospf route

codes	
100.0.0.0/24	
[1]	cost
via	

-	-

-	-

35.2.7 show ip ospf summary-address

OSPF **show ip ospf summary-address**

show ip ospf [*process-id*] **summary-address**

process-id	OSPF OSPF

NSSA ABR

```
Remote address 10.0.0.27/32
Transmit Delay is 1 sec, State Point-To-Point,
Timer intervals configured,Hello 10,Dead 40,Wait 40,Retransmit 5
Hello due in 00:00:05
Adjacency state Full
```

Virtual Link VLINK0 to router	
Virtual Link state	.
Transit area	
via interface	
Local address	
Remote Address	
Transmit Delay	
State	
Time intervals configured	Hello Dead Wait Retransmit
Adjacency State	FULL

-	-

-	-

36 OSPFv3

no

area *area-id* **range** *ipv6-prefix*/*prefix-length* [**advertise|not-advertise**]

no area *area-id* **range** *ipv6-prefix*/*prefix-length*

area-id	IPv4
ipv6-prefix/*prefix-length*	
advertise	
not-advertise	

ABR

advertise

not-advertise

cost

OSPF

area *area-id* **stub** [**no-summary**]

no area *area-id* **stub** [**no-summary**]

area-id	stub IPv4
no-summary	stub ABR ABR 3 LSA stub 3 LSA

stub

stub stub
area stub stub AS
(type 5 LSAs)
stub
OSPFv3
stub ABR 3 LSA stub
stub AS
totally stub stub ABR area stub
no-summary

stub 10 ABR stub

```
ipv6 router ospf 1
area 10 stub
area 10 stub no-summary
```


area-id	IPv4
router-id	(router-ID)
hello-interval *seconds*	hello 1-65535
dead-interval *seconds*	1-65535
retransmit-interval *seconds*	LSA 1-65535
transmit-delay *seconds*	LSA 1-65535
instance *instance-id*	instance instance 0-255

hello-interval 10
dead-interval hello-interval
retransmit-interval 5
transmit-delay 1

OSPFv3
OSPFv3

- stub
- **hello-interval** **dead-interval**

instance

```
ipv6 router ospf 1
area 1 virtual-link 192.1.1.1
```

show ipv6 ospf	OSPFv3
show ipv6 ospf neighbor	OSPFv3
show ipv6 ospf virtual-links	OSPFv3

-	-

OSPFv3 Hello OSPFv3 BFD BFD ŏ BFD

OSPFv3

```
enable
clear ipv6 ospf process
```

[redacted]

show ipv6 ospf database OSPFv3 OSPFv3
show ipv6 route

default-information originate

default-metric

OSPFv3 1 2

redistribute	
show ipv6 ospf	OSPFv3

-	-

36.1.10 distance

OSPFv3 **no**

distance {*distance* | **ospf** { **intra-area** *distance* | **inter-area** *distance* | **external** *distance* }}

no distance [**ospf**]

distance	1-255
intra-area *distance*	1-255
inter-area *distance*	1-255
external *distance*	1-255

110

110
110
110

OSPFv3

■ OSPFv3

ipv6 router ospf	OSPFv3

-	-

36.1.11 ipv6 ospf area

OSPFv3 **no**

ipv6 ospf *process-id* **area** *area-id* [**instance** *instance-id*]

no ipv6 ospf *process-id* **area** [**instance** *instance-id*]

process-id	ospf 1-65535
area *area-id*	OSPFv3 IPv4
instance *instance-id*	OSPFv3 0-255

OSPFv3 ‘ Ս ȯ Դ Ե

-	-

36.1.12 ipv6 ospf bfd

OSPFv3 BFD **ipv6 ospf bfd** [**disable**] no **ipv6 ospf bfd**

ipv6 ospf bfd [**disable**] [**instance** *instance-id*]

no ipv6 ospf bfd [**instance** *instance-id*]

disable	OSPF BFD
instance *instance-id*	OSPFv3 0-255

OSPFv3 BFD

bfd all-interfaces

no

ipv6 ospf cost *cost* [**instance** *instance-id*]

no ipv6 ospf cost [**instance** *instance-id*]

cost	1-65535
instance *instance-id*	OSPFv3 0-255

/Bandwidth 100Mbps

Qã **bSÎÂLÎÎ€Ê4ptrT**-210.00070 Td 416r T /TT0213q 5306990385

OSPFv3 100Mbps/Bandwidth Bandwidth

bandwidth

OSPFv3

- 64K cost 1562
- E1 cost 48
- 10M cost 10
- p6T0 1 ospf cos0402.5 0 TwTc 4.024 0 Td4161 6.95 0.742 0 9 Td[<11910.353

ipv6 ospf area	OSPFv3

-	-

36.1.17 ipv6 ospf neighbor

OSPFv3 **no**

ipv6 ospf neighbor *ipv6-address* {[**cost** <1-65535>] | [**poll-interval** <0-2147483647> | **priority** <0-255>]} [**instance** *instance-id*]

no ipv6 ospf neighbor *ipv6-address* {[**cost** <1-65535>] | [**poll-interval** <0-2147483647> | **priority** <0-255>]} [**instance** *instance-id*]

cost *cost*	cost 1-65535 (point-to-multipoint)
poll-interval *seconds*	1-2147483647 (NBMA)
priority *priority*	0-255 (NBMA)
instance *instance-id*	OSPFv3 0-255

120

0

OSPFv3 IPv6 2001:DB8:4::1 1 150

```
Ruijie(config)# interface fastEthernet 0/1
Ruijie(config-if)# ipv6 ospf neighbor 2001:DB8:4::1 priority 1
poll-interval 150
```

Ipv6 ospf priority	
Ipv6 ospf network	

-	-

36.1.18 ipv6 ospf network

no

no ipv6 ospf retransmit-interval [**instance** *instance-id*]

seconds	LSA 1-65535( )
instance *instance-id*	OSPFv3 0-255

5

LSA

LSA

LSA 10s

```
ipv6 ospf retransmit-interval 10
```

show ipv6 ospf interface	OSPFv3
ipv6 ospf area	OSPFv3

-	-

36.1.21 ipv6 ospf transmit-delay

LSA **no**

ipv6 ospf transmit-delay *seconds* [**instance** *instance-id*]

LSA

LSA

```
ipv6 ospf transmit-delay 2
```

show ipv6 ospf interface	OSPFv3

36.1.23 log-adj-changes

no default

log-adj-changes [**detail**]

no log-adj-changes [**detail**]

detail	

FULL

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

show ipv6 ospf	ospf

-	-

36.1.26 redistribute

OSPFv3

no

redistribute {**bgp** | **connected** | **isis** [*area-tag*] | **ospf** *process-id* | **rip** | **static**} [{**level-1** | **level-1-2** | **level-2**} **| match** {**internal | external** [**1|2**]**} | metric** *metric-value* **| metric-type** {*1|2*} | **route-map** *route-map-name* | **tag** *tag-value*]

no redistribute {**bgp** | **connected** | **isis** [*area-tag*] | **ospf** *process-id* | **rip** | **static**} [{**level-1** | **level-1-2** | **level-2**} **| match** {**internal | external** [**1|2**]**} | metric | metric-type** {*1|2*} | **route-map** *route-map-name* | **tag** *tag-value*]

bgp	bgp
connected	
isis [*area-tag*]	isis *area-tag* isis
ospf *process-id*	ospf *process-id* ospf 1-65535
rip	rip
static	
level-1 | **level-1-2** | **level-2**	IS-IS level
match	OSPFv3 internal external [1|2] E1 E2

metric *metric-value* OSPFv3 d<01C3>T30 refB59Tj/5>6<13D702C8453(r)-1(ic)]13

ISIS level-1 level-2 level-1-2
ISIS level level-2 ISIS
OSPFv3 *match* OSPFv3
OSPFv3
ISIS *level* OSPFv3 *match*
route-map
route-map *match*
tag *metric* *metric-type* *route-map* *set*

route-map test

```
ipv6 router ospf 1
redistribute connect metric  10 route-map test

route-map test permit 10
match metric 20
set metric 30
```

metric 20 metric 30
metric 10

default-information originate	

default-metric

router-id	IPv4

OSPFv3 loopback IPv4
IPv4 loopback OSPFv3
IPv4

OSPFv3 Router ID IPv4

OSPFv3

OSPFv3

Router ID OSPFv3

OSPFv3
OSPFv3

area range area range OSPFv3
summary-prefix OSPFv3
summary-prefix (ASBR)

2001:DB8::/64 2001:DB8::/64

```
summary-prefix 2001:DB8::/64
```

area range	OSPFv3
redistribute	

1 RGOS 10.4 timers throttle spf
timers spf 5 10
2 RGOS 10.4 timers throttle spf timers spf
SPF **timers throttle spf** timers
throttle spf

spf-delay *spf-holdtime* *OSPF*
CPU

timers spf timers throttle spf

OSPFv3 3 9

```
Ruijie(config)# ipv6 router ospf 20
Ruijie(config-router)# timers spf 3 9
```

spf-max-waittime	SPF 1-600000

spf-delay 1000
spf-holdtime 5000
spf-max-waittime 10000

spf-delay SPF SPF
SPF *spf-holdtime* SPF
spf-max-waittime
SPF SPF
spf-holdtime
spf-delay *spf-holdtime* *spf-max-waittime*
SPF

timers spf SPF
SPF

timers throttle spf

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

OSPFv3 SPF

36.2.1 show ipv6 ospf

OSPFv3

show ipv6 ospf [*process-id*]

process- id	ospf

OSPFv3

```
Ruijie# show ipv6 ospf
Routing Process "OSPFv3 (1)" with ID 1.1.1.1
Process uptime is 24 minutes
SPF schedule delay 5 secs, Hold time between SPFs 10 secs
Minimum LSA interval 5 secs, Minimum LSA arrival 1 secs
Number of incomming current DD exchange neighbors 0/5
Number of outgoing current DD exchange neighbors 0/5
Number of external LSA 0. Checksum Sum 0x0000
Number of AS-Scoped Unknown LSA 0
Number of LSA originated 11
Number of LSA received 4
Log Neighbor Adjency Changes : Enabled
Number of areas in this router is 2
Area BACKBONE(0)
Number of interfaces in this area is 1(1)
SPF algorithm executed 4 times
Number of LSA 3.  Checksum Sum 0x1DDF1
Number of Unknown LSA 0
    OSPFv3   BFD    ,                        ”BFD is enabled”,

Ruijie# show ipv6 ospf
Routing Process "OSPFv3 (1)" with ID 1.1.1.1
Process uptime is 24 minutes
SPF schedule delay 5 secs, Hold time between SPFs 10 secs
Minimum LSA interval 5 secs, Minimum LSA arrival 1 secs
Number of incomming current DD exchange neighbors 0/5
Number of outgoing current DD exchange neighbors 0/5
Number of external LSA 0. Checksum Sum 0x0000
Number of AS-Scoped Unknown LSA 0
Number of LSA originated 11
Number of LSA received 4
Log Neighbor Adjency Changes : Enabled
Number of areas in this router is 2
```

```
BFD is enabled
Area BACKBONE(0)
Number of interfaces in this area is 1(1)
SPF algorithm executed 4 times
Number of LSA 3.  Checksum Sum 0x1DDF1
Number of Unknown LSA 0
```

ipv6 router ospf	OSPFv3
default-information originate	
default-metric	
router-id	OSPFv3
timers spf	OSPFv3 SPF SPF

-	-

36.2.2 show ipv6 ospf database

OSPFv3

show ipv6 ospf [*process- id*] **database** [*lsa-type* [**adv-router** *router-id*]]

process- id	OSPFv3
lsa-type	LSA AS-external-LSAs Link-LSAs Inter-Area-Prefix-LSAs Inter-Area-Router-LSAs Intra-Area-Prefix-LSAs Network-LSAs Router-LSAs LSA
adv-route*r router-id*	router LSA

OSPFv3

```
Ruijie# show ipv6 ospf database
OSPFv3 Router with ID (1.1.1.1) (Process 1)
Link-LSA (Interface FastEthernet 1/0)
Link State ID   ADV Router     Age  Seq#      CkSum  Prefix
0.0.0.2         1.1.1.1        197 0x80000001 0x7cd8     0
0.0.0.5         2.2.2.2        206 0x80000001 0x8c86     0
Link-LSA (Interface Loopback 1)
Link State ID   ADV Router     Age  Seq#      CkSum  Prefix
0.0.64.1        1.1.1.1         82 0x80000001 0xb760     0
Router-LSA (Area 0.0.0.0)
Link State ID   ADV Router     Age  Seq#      CkSum   Link
0.0.0.0         1.1.1.1      17 0x80000006 0x62a1     1
0.0.0.0         2.2.2.2        156 0x80000003 0x8653     1
Network-LSA (Area 0.0.0.0)
Link State ID   ADV Router     Age  Seq#      CkSum
0.0.0.5         2.2.2.2        157 0x80000001 0xf8f6
Router-LSA (Area 0.0.0.1)
Link State ID   ADV Router     Age  Seq#      CkSum   Link
0.0.0.0         1.1.1.1         17 0x80000002 0x0529     0
Inter-Area-Prefix-LSA (Area 0.0.0.1)
Link State ID   ADV Router     Age  Seq#      CkSum
0.0.0.1         1.1.1.1         77 0x80000002 0x83b4
AS-external-LSA
Link State ID   ADV Router     Age  Seq#      CkSum
0.0.0.1         1.1.1.1         1 0x80000001 0x6035 E2
```

ipv6 router ospf	OSPFv3

-	-

36.2.3 show ipv6 ospf interface

OSPFv3

show ipv6 ospf interface [*interface-type interface-number*]

interface-type interface-number	

OSPFv3

```
Ruijie# show ipv6 ospf interface
FastEthernet 1/0 is up, line protocol is up
Interface ID 2
IPv6 Prefixes
fe80::2d0:22ff:fe22:2223/64 (Link-Local Address)
OSPFv3 Process (1), Area 0.0.0.0, Instance ID 0
Router ID 1.1.1.1, Network Type BROADCAST, Cost: 1
Transmit Delay is 1 sec, State BDR, Priority 1
Designated Router (ID) 2.2.2.2
Interface Address fe80::c800:eff:fe84:1c
Backup Designated Router (ID) 1.1.1.1
Interface Address fe80::2d0:22ff:fe22:2223
Timer interval configured,Hello 10,Dead 40,Wait 40,Retransmit 5
Hello due in 00:00:02
Neighbor Count is 1, Adjacent neighbor count is 1
Hello received 26 sent 26, DD received 5 sent 4
LS-Req received 1 sent 1, LS-Upd received 3 sent 6
LS-Ack received 6 sent 2, Discarded 0
```

BFD , “**BFD enabled**”

```
Ruijie# show ipv6 ospf interface
FastEthernet 1/0 is up, line protocol is up
Interface ID 2
IPv6 Prefixes
fe80::2d0:22ff:fe22:2223/64 (Link-Local Address)
OSPFv3 Process (1), Area 0.0.0.0, Instance ID 0
Router ID 1.1.1.1, Network Type BROADCAST, Cost: 1
Transmit Delay is 1 sec, State BDR, Priority 1  BFD enabled
Designated Router (ID) 2.2.2.2
Interface Address fe80::c800:eff:fe84:1c
Backup Designated Router (ID) 1.1.1.1
Interface Address fe80::2d0:22ff:fe22:2223
Timer interval configured,Hello 10,Dead 40,Wait 40,Retransmit 5
Hello due in 00:00:02
Neighbor Count is 1, Adjacent neighbor count is 1
Hello received 26 sent 26, DD received 5 sent 4
LS-Req received 1 sent 1, LS-Upd received 3 sent 6
LS-Ack received 6 sent 2, Discarded 0
```

ipv6 router ospf	OSPFv3
ipv6 ospf area	OSPFv3

-	-

36.2.4 show ipv6 ospf neighbor

OSPFv3

show ipv6 ospf [*process- id*] **neighbor** [*interface-type interface-number* [**detail**]| *neighbor-id* |**detail**]

process-id	OSPFv3
detail	
interface-type interface-number	
neighbor-id	Router ID

ipv6 router ospf	OSPFv3

-	-

36.2.6 show ipv6 ospf summary-prefix

OSPFv3

show ipv6 ospf [*process-id*] **summary-prefix**

process- id	OSPFv3

OSPFv3

```
Ruijie# show ipv6 ospf summary-prefix
OSPFv3 Process 1, Summary-prefix:
2001:db8::/64,Metric 16777215,Type0,Tag0,Match count0,advertise
```

ipv6 router ospf	OSPFv3
summary-prefix	OSPFv3

-	-

36.2.7 show ipv6 ospf topology

OSPFv3

show ipv6 ospf [*process- id*] **topology** [**area** *area-id*]

process- id	OSPFv3
area-id	

OSPFv3

```
Ruijie# show ipv6 ospf topology
OSPFv3 Process (1)
OSPFv3 paths to Area (0.0.0.0) routers
Router ID       Bits  Metric    Next-Hop
Interface
1.1.1.1          EB  --
2.2.2.2          E   1         2.2.2.2
FastEthernet 1/0
OSPFv3 paths to Area (0.0.0.1) routers
Router ID       Bits  Metric    Next-Hop
Interface
1.1.1.1          B   --
```

ipv6 router ospf	OSPFv3
area range	OSPFv3

-	-

36.2.8 show ipv6 ospf virtual-links

OSPFv3

show ipv6 ospf [*process- id*] **virtual-links**

process- id	OSPFv3

OSPFv3

```
Ruijie# show ipv6 ospf virtual-links
Virtual Link VLINK1 to router 2.2.2.2 is down
Transit area 0.0.0.1 via interface FastEthernet 1/0, instance ID 0
Local address *
Remote address 2001:DB8::1/128
Transmit Delay is 1 sec, State Down,
Timer intervals configured,Hello 10,Dead 40,Wait 40,Retransmit 5
Hello due in inactive
Adjacency state Down
```

ipv6 router ospf	OSPFv3

37 BGP

37.1

37.1.1 address-family ipv4

address-faimly IPv4 VRF BGP vrf
no vrf **exit-address-family**
BGP

address-family ipv4 vrf *vrf-name*

no address-family ipv4 vrf *vrf-name*

vrf-name	vrf

vrf

BGP

PE CE
BGP **exit-address-family**

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

exit-address-family	

-	-

37.1.3 address-family ipv6

BGP **address-faimly IPv6** BGP IPv6
no BGP IPv6 **exit-address-family**
BGP

address-family ipv6 [**unicast**|**multicast**|]

no address-family ipv6 [**unicast**|**multicast**|]

unicast	IPv6
multicast	IPV6

BGP

BGP IPv6 BGP IPv6
IPv6 BGP IPv6 IPv6

multicast BGP IPV6
RPF
BGP **exit-address-family**

```
Ruijie(config)# router bgp 65000
Ruijie(config-router)# address-family ipv6
```

exit-address-family	

-	-

37.1.4 address-family vpnv4

PE VPN **address-family VPN**
exit-address-family **address-family VPN**

address-family vpnv4 [**unicast**]

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

unicast	IPv4

vpn

BGP

vpn PE vpn
BGP **exit-address-family**

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

exit-address-family	

ipv6-network	
length	
as-set	AS
summary-only	

BGP IPv6

```
Ruijie(config)# router bgp 65000
Ruijie(config-router)# address-family ipv6
Ruijie(config-router-af)# aggregate-address5B#ãh)?QÄ
```

IGP

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

show ip bgp	BGP
bgp bestpath med confed	AS MED
bgp bestpath med missing-as-worst	MED
bgp deterministic-med	AS

-	-

37.1.8 bgp bestpath as-path ignore

AS **no**

bgp bestpath as-path ignore

no bgp bestpath as-path ignore

-	-

AS

BGP

(RFC1771) BGP AS
AS
AS AS

```
Ruijie(config)# router bgp 65000
Ruijie(config-router)# bgp bestpath as-path ignore
```

show ip bgp	BGP

bgp bestpath compare-routerid

no bgp bestpath compare-routerid

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

show ip bgp	BGP
bgp bestpath always-compare-med	AS MED
bgp bestpath med missing-as-worst	MED
bgp deterministic-med	AS

bgp bestpath always-compare-med	AS MED
bgp bestpath med confed	AS MED
bgp deterministic-med	AS

-	-

37.1.13 bgp default route-targe filter

route-targe VPNV4 route-targe route-targe no

bgp default route-targe filter

no bgp default route-targe filter

-	-

BGP

BGP VPNV4 route-target vrf no BGP VPNV4 VRF route-targe VPNV4

BGP PE BGP VPNV4 route-targe BGPvrfC2_0 1 Tf 0 Tc 2.359 0 Td [<11DA19791TT0 1B>6<24D

-	-

37.1.14 bgp client-to-client reflection

no

bgp client-to-client reflection

no bgp client-to-client reflection

-	-

BGP

&

cluster-id	IP 4 (ip)

router-id

BGP

router ID

ID

```
Ruijie(config)# router bgp 65000
Ruijie(config-router)# bgp cluster-id 10.0.0.1
```

bgp client-to-client reflection	
neighbor route-reflector-client	

-	-

37.1.16 bgp confederation identifier

AS **no**

bgp confederation identifier *as-number*

no bgp confederation identifier

as-number	AS 1..65535

```
Ruijie(config-router)# bgp confederation identifier 65000
```

bgp confederation peers	AS AS

-	-

37.1.17 bgp confederation peers

AS AS **no** AS

bgp confederation peers as-number [*as-number*,…]

no bgp confederation peers as-number [*as-number*,…]

as-number	AS 1..65535

BGP

IBGP

ID(AS)

AS

AS BGP speakers

IBGP BGP speaker EBGP

BGP speakers EBGP MED

AS

	15	15

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

BGP

BGP Local preference IBGP peers
Local preference
BGP speaker IBGP peers

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

show ip bgp	BGP
bgp bestpath always-compare-med	AS MED
bgp bestpath medconfed	AS MED
bgp bestpath med missing-as-worst	MED

-	-

37.1.20 bgp deterministic-med

AS MED

no

bgp deterministic med

no bgp deterministic med

-	-

BGP

AS

```
Ruijie(config-router)# bgp deterministic med
```


show ip bgp

EBGP peer BGP

no

bgp fast-external-fallover

no bgp fast-external-fallover

-	-

BGP

EBGP

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

router bgp	BGP

-	-

37.1.23 bgp graceful-restart

BGP bgp graceful-restart no BGP

bgp graceful-restart

no bgp graceful-restart

-	-

BGP

BGP

BGP Open

GR

bgp graceful-restart GR Open GR

GR BGP GR GR
BGP BGP GR
BGP Peer GR
BGP BGP
BGP
S6000 GR GR Helper BGP

```
Ruijie(config)# router bgp 500
Ruijie(config-router)# bgp graceful-restart
```

router bgp	BGP
bgp graceful-restart restart-time	BGP

10.4(2)	

37.1.24 bgp graceful-restart restart-time

BGP bgp graceful-restart restart-time no

bgp graceful-restart restart-time *restart-time*

no bgp graceful-restart restart-time

restart-time	GR Restarter GR Helper GR Restarter 1 3600

120

BGP

GR Restarter GR Helper GR Restarter GR Helper
GR Restarter GR Helper
GR Restarter BGP Established BGP
BGP
BGP Open GR GR

```
Ruijie(config)# router bgp 500
Ruijie(config-router)# bgp graceful-restart
```

```
Ruijie(config-router)# bgp graceful-restart restart-time 150
Ruijie(config-router)# no bgp graceful-restart restart-time
```

10.4(2)	

37.1.26 bgp log-neighbor-changes

debug BGP **no**

bgp log-neighbor-changes

no bgp log-neighbor-changes

-	-

BGP

debug BGP BGP **debug**

```
Ruijie(config-router)# bgp log-neighbor-changes
```

router bgp	BGP

-	-

37.1.27 bgp nexthop trigger delay

BGP nexthop **no**

bgp nexthop trigger delay *delay-time*

no bgp nexthop trigger delay

-	-

37.1.29 bgp redistribute-internal

BGP

route-id

BGP

BGP ID——IP

```
Ruijie(config-router)# bgp router-id 10.0.0.1
```

show ip bgp dampening dampened-paths	
bgp dampening	

-	-

37.1.31 bgp scan-rib disable

BGP **no**

bgp scan-rib disable

no bgp scan-rib disable

-	-

BGP BGP IPv4/IPv6/VPNv4 BGP IPv4 VRF

BGP

-	-

37.1.32 bgp scan-time

BGP

bgp scan-time *time*

no bgp scan-time [*time*]

time	5..60

in	**soft**
out	**soft** BGP speaker
soft	
soft in	
soft out	

vrf

clear bgp ipv4 unicast	BGP IPv4

-	-

37.1.35 clear bgp ipv4 unicast

BGP IPv4 **clear ip bgp**

clear ip bgp	**clear ip bgp**

clear ip bgp

clear ip bgp

clear ip bgp	BGP IPv4

-	-

37.1.36 clear bgp ipv4 unicast dampening

clear bgp ipv4 unicast dampening [*address* [*mask*]]

address	IP
mask	

BGP

BGP

```
Ruijie# clear bgp ipv4 unicast dampening 192.168.0.0 255.255.0.0
```

show ip bgp dampening dampened-paths	
bgp dampening	

-	-

37.1.37 clear bgp ipv4 unicast external

EBGP

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

in	soft

out	soft BGP speaker
soft	
soft in	
soft out	

BGP

```
Ruijie# clear bgp ipv4 unicast flap-statistics
```

bgp dampening	
show ip bgp	BGP

-	-

37.1.39 clear bgp ipv4 unicast peer-group

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

peer-group-name	
in	soft
out	soft BGP speaker
soft	
soft in	
soft out	

BGP

```
Ruijie# clear bgp ipv4 unicast peer-group my-group in
```

clear ip bgp	BGP
show ip bgp	BGP

-	-

37.1.40 clear bgp ipv6 unicast

BGP IPv6

clear bgp ipv4 unicast

clear bgp ipv4 unicast	**clear bgp ipv4 unicast**

clear bgp ipv4 unicast

clear bgp ipv4 unicast

clear bgp ipv4 unicast	BGP IPv4

-	-

37.1.41 clear bgp vpnv4 unicast

BGP VPNV4

clear bgp ipv4 unicast

clear bgp ipv4 unicast	**clear bgp ipv4 unicast**

clear bgp ipv4 unicast

clear bgp ipv4 unicast

clear bgp ipv4 unicast	BGP IPv4

-	-

37.1.42 clear ip bgp

BGP IPv4

clear ip bgp {* | *as number* } [**soft** [**in** | **out**]]

*	BGP BGP ipv4 unicast OVERFLOW
address	peer BGP
as number	AS
in	
out	
soft	
soft in	
soft out	

BGP

BGP

BGP BGP

peer **neighbor soft-reconfiguration inbound** BGP BGP speaker

show ip bgp neighbors BGP

neighbor soft-reconfiguration inbound

BGP router

```
Ruijie# clear bgp ipv4 unicast *
```

neighbor soft-reconfiguration inbound	BGP session BGP ( )
show ip bgp	BGP

-	-

37.1.43 clear ip bgp dampening

IPv4

clear ip bgp dampening [*address mask*]

address	IP
mask	

BGP

BGP

```
Ruijie# clear ip bgp dampening 192.168.0.0 255.255.0.0
```

show ip bgp dampening dampened-paths	
bgp dampening	

-	-

37.1.44 clear ip bgp external

IPv4 EBGP

clear ip bgp external [[**soft**] [**in** | **out**]]

in	soft
out	soft BGP speaker
soft in	
soft out	

BGP

```
Ruijie# clear ip bgp external in
```

clear ip bgp	BGP
show ip bgp neighbors	BGP

-	-

37.1.45 clear ip bgp flap-statistics

IPv4

clear ip bgp flap-statistics

mask	

clear ip bgp

dampening

```
Ruijie# clear ip bgp flap-statistics
```

bgp dampening	
show ip bgp	BGP

-	-

37.1.46 clear ip bgp peer-group

IPv4

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

peer-group-name	
in	**soft**
out	**soft** BGP speaker
soft	
soft in	
soft out	

BGP

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

clear ip bgp	BGP
show ip bgp	BGP

clear ip bgp vrf *vrf-name*

redistribute	

-	-

37.1.51 distance bgp

BGP **no**

distance bgp *external-distance internal-distance local-distance*

no distance bgp [*external-distance internal-distance local-distance*]

external-distance	EBGP peers 1..255
internal-distance	IBGP peers 1..255
local-distance	peers IGP **network** **backdoor** 1..255

external-distance *20*
internal-distance *200*
local-distance *200*

-	-

37.1.52 exit-address-family

BGP address-family

exit-address-family

-	-

BGP address-family

bgp **address-family** bgp

```
Ruijie(config-router-af)# exit-address-family
```

	[redacted]
address-family ipv4	**address-family ipv4**

IP

```
Ruijie(config-router)# ip as-path access-list hsd deny  ^123$
```

neighbor filter-list	as-path
neighbor distribute-list	

-	-

37.1.54 maximum-prefix

no

maximum-prefix *maximum*

no maximum-prefix

Maximum	<1 - 4294967295>
No	

ipv4/ipv6 multicast 10000.
ipv4/ipv6 unicast vpnv4 unicast, ipv4 vrf *memory-limit.*
memory-limit (system-memory/256M)*100000 system-memory
256M memory-limit

show bgp < > summary table

bgp clear bgp < > *

overflow maximum-prefix

1 ipv4 multicast BGP

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

clear bgp <*addressfamily*|**all**> *****	BGP
show bgp < *addressfamily*|**all** > **summary**	BGP

router bgp	BGP
neighbor remote-as	BGP

-	-

37.1.56 neighbor advertisement-interval

BGP **no**

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

no neighbor {*peer-address* | *peer-group-name*} **advertisement-interval**

peer-address	
peer-group-name	32
seconds	: 1..600

IBGP : 15seconds
EBGP : 30seconds

BGP

BGP

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

router bgp	BGP
neighbor remote-as	BGP

-	-

37.1.57 neighbor allowas-in

PE PE PE AS **no**

neighbor {*peer-address* | *peer-group-name*} **allowas-in number**

no neighbor {[*peer-address* | *peer-group-name*} **allowas-in**

peer-address	
peer-group-name	32
number	AS

	peer-group-name	32

BGP

BGP

```
Ruijie(config)# router bgp 60
Ruijie(config-router)# neighbor 10.1.1.1 remote-as 80
Ruijie(config-router)# neighbor 10.1.1.1 default-originate
```

router bgp	BGP
neighbor remote-as	BGP

-	-

37.1.60 neighbor description

( ) **no**

neighbor {*peer-address* | *peer-group-name*} **description** *text*

no neighbor {*peer-address* | *peer-group-name*} **description**

peer-address	
peer-group-name	32
text	( ) 80

BGP

```
Ruijie(config)# router bgp 60
Ruijie(config-router)# neighbor 10.1.1.1 remote-as 80
Ruijie(config-router)# neighbor 10.1.1.1 description xyz.com
```

router bgp	BGP

neighbor remote-as	BGP
ip access-list	IP ACL IP ACL

-	-

37.1.62 neighbor ebgp-multihop

EBGP BGP **no**

neighbor {*peer-address* | *peer-group-name*} **ebgp-multihop** [*ttl*]

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

peer-address	IPv4 IPv6
peer-group-name	32
ttl	1..255

EBGP BGP ebgp-multihop ttl 255

BGP BGP IPv4 BGP IPv6 BGP IPv4 VRF

BGP EBGP peers

BGP

```
Ruijie(config)# router bgp 65293/TT0 1 Tf-0.0013 Tc -0.0011 Tw -37.347 -1.29
```

37.1.63 ne

37.1.64 neighbor local-as

BGP AS AS Remote AS BGP **no** AS

neighbor {*peer-address* | *peer-group-name*} **local-as** *as-number* [**no-prepend** [**replace-as** [**dual-as**]]]

no neighbor {*peer-address* | *peer-group-name*} **local-as**

peer-address	IPv4 IPv6
peer-group-name	32
as-number	AS 1 65535
no-prepend	AS-PATH AS
replace-as	AS-PATH

10.4	

37.1.65 neighbor maximum-prefix

BGP **no**

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

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

peer-address	IPv4 IPv6
peer-group-name	32
maximum	
threshold	
warning-only	BGP

BGP BGP IPv4 BGP IPv6 BGP
IPv4 VRF

BGP
warning-only
BGP

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

router bgp	BGP
neighbor remote-as	BGP

-	-

BGP BGP speaker

no

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

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

peer-address	IPv4 IPv6
peer-group-name	32

BGP BGP IPv4 BGP IPv6 BGP
IPv4 VRF

(Frame Relay X.25)
BGP speakers
BGP

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

next-hop-unchanged	BGP

EBGP

BGP BGP IPV4 BGP VPN

Neighbor next-hop-unchanged EBGP

neighbor next-ho-self
VPN VPN OptionC Multihop MP-EBGP
VPN PE
Multihop MP-EBGP VPN
EBGP
PE VPN VPN
VPN
RR
Multihop MP-EBGP VPNv4 **neighbor**
next-hop-unchanged BGP VPNv4

```
Ruijie(config)# router bgp 60
Ruijie(config-router)# address-family vpnv4
Ruijie(config-router-af)# neighbor 10.1.1.1 next-hop-unchanged
```

router bgp	BGP
neighbor remote-as	BGP ( )

10.4(2)	

37.1.68 neighbor password

BGP BGP TCP MD5
no MD5

neighbor {*peer-address* | *peer-group-name*} **password** [| **0** | **7**] *string*

no neighbor {*peer-address* | *peer-group-name*} **password**

peer-address	IPv4 IPv6

peer-group-name	32
0	
7	
string	TCP MD5 80

BGP BGP IPv4 BGP IPv6 BGP IPv4 VRF

TCP MD5 BGP BGP BGP speaker BGP BGP BGP

password

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

router bgp	BGP
neighbor remote-as	BGP

-	-

37.1.69 neighbor peer-group (assigning members)

BGP BGP **no** BGP

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

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

peer-address	IPv4 IPv6

peer-group-name	32

BGP

remote-as update-source local-as reconnect-interval times advertisemet-interval default-originate next-hop-self remove-private-as send-community distribute-list out filter-list out prefix-list out route-map out unsuppress-map route-reflector-client

,Y „ ,6 !5e$C± ò!•A6hˆ !6rO¡d" !6hf 0

BGP

BGP

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

router bgp	BGP
neighbor remote-as	BGP
neighbor peer-group (**assigning members**)	BGP BGP
show ip bgp peer-group	BGP

-	-

37.1.71 neighbor prefix-list

BGP

no prefix-list

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

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

peer-address	IPv4 IPv6
peer-group-name	32
prefix-list-name	prefix-list 32
in	prefix list
out	prefix list

BGP BGP IPv4

BGP

neighbor prefix-list in

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

router bgp	BGP
neighbor remote-as	BGP
ip prefix-list	ip

-	-

37.1.72 neighbor remote-as

BGP ( ) **no** ( )

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

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

peer-address	IPv4 IPv6
peer-group-name	32
as-number	BGP ( ) 1..65535

BGP

BGP BGP IPv4 BGP IPv6 BGP IPv4 VRF

BGP

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

router bgp	BGP

-	-

37.1.73 neighbor remove-private-as

EBGP AS AS

no

neighbor {*peer-address* | *peer-group-name*} **remove-private-as**

no neighbor {*peer-address* | *peer-group-name*} **remove-private-as**

peer-address	IPv4 IPv6
peer-group-name	32

BGP BGP IPv4 BGP IPv6 BGP IPv4 VRF

EBGP AS AS EBGP AS AS AS 64512 65535

```
Ruijie(config)# router bgp 65000
Ruijie(config-router)# neighbor 10.0.0.1 remove-private-as
```

router bgp	BGP
neighbor remote-as	BGP

-	-

37.1.74 neighbor route-map

no

neighbor {*peer-address* | *peer-group-name* } **route-map** *map-tag* {**in** | **out**}

no neighbor

BGP

IBGP speakers BGP speaker
IBGP peer IBGP peers

Ruijie(config-router)# **neighbor ip-address send-community both**

router bgp	BGP
neighbor remote-as	BGP
ip community-list	

neighbor remote-as	BGP

-	-

37.1.78 neighbor shutdown

BGP BGP **no** BGP

( )

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

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

peer-address	IPv4 IPv6
peer-group-name	32

BGP BGP IPv4 BGP IPv6

( )

( )

BGP

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

router bgp	BGP
neighbor remote-as	BGP
show ip bgp summary	BGP

-	-

37.1.79 neighbor soft-reconfiguration inbound

BGP **no**

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

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

peer-address	IPv4 IPv6
peer-group-name	32

BGP

BGP BGP ( )

show ip bgp neighbors

BGP

keepalive	BGP KEEPALIVE message 0..65535
holdtime	BGP 0..65535

keepalive: 60
holdtime: 180

BGP

keepalive holdtime
peer peer-group peer peer group

BGP

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

router bgp	BGP
timers bgp	keepalive holdtime

-	-

37.1.82 neighbor unsuppress-map

aggregate-address **no**

neighbor {*peer-address* | *peer-group-name*} **unsuppress-map** *map-tag*

no [(peer-) 20.1 reBc 4.56 0 -5.7770 Tc 3.6.56 0 Td({)Tj/TT1 19Tf-0.0006 Tc 0.637 0 T5(-ad T5(d)1)-5 T5

BGP

BGP

-	-

37.1.85 neighbor weight

BGP no

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

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

peer-address	
peer-group-name	32
number	0 - 65535

0

32768

BGP

route-map set weight

```
Ruijie(config-router)# neighbor 10.1.1.1 weight 73
```

router bgp	BGP
neighbor remote-as	BGP

-	-

37.1.86 network(BGP)

BGP speaker **no**

network *network-number* **mask** *mask* [**route-map** *map-tag*] [**backdoor**]

no network *network-number* **mask** *mask* [**route-map**] [**backdoor**]

network-number	
mask	
map-tag	route-map route map 32
backdoor	

BGP

IGP BGP

route-map

```
Ruijie(config)# router bgp 65000
Ruijie(config-router)# network 10.0.0.1 mask 255.255.0.0
```

router bgp	BGP
redistribute	
network synchronization	Network

-	-

37.1.87 network synchronization

BGP speaker network

no network

network synchronization

no network synchronization

-	-

BGP

network

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

router bgp	BGP
redistribute	
network (**BGP**)	

-	-

37.1.88 overflow memory-lack

BGP OVERFLOW no

overflow memory-lack

no overflow memory-lack

no	BGP OVERFLOW

BGP OVERFLOW

BGP

BGP OVERFLOW

BGP OVERFLOW
BGP NULL
OVERFLOW

clear bgp {addressfamily**|all**} * BGP BGP
OVERFLOW
no BGP OVERFLOW
BGP

```
  1                BGP       OVERFLOW
Ruijie(config)# router bgp 65000
Ruijie(config-router)# no memory-lack overflow
```

clear bgp { *addressfamily*|**all** } *	BGP
show bgp { *addressfamily*|**all** } **summary**	BGP

10.3(4b3)	

37.1.89 redistribute

BGP **no**

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

no redistribute *protocol-type* [**route-map** *map-tag*] [**metric** *metric-value*]

protocol-type	, connected static rip
route-map *map-tag*	**route-map** **route-map**
metric *metric-value*	metric

BGP BGP IPv4 BGP IPv6 BGP IPv4 VRF

IP Â€ ξ

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

show ip protocols	

-	-

37.1.90 redistribute（OSPF）

OSPF BGP **no**

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

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

process-id

	no no redistribute no
	OSPF match OSPF route-map metric metric route-map route-map route-map route-map metric metric

```
Ruijie(config-router)# redistribute ospf 2 route-map static-rmap
Ruijie(config-router)# no redistribute ospf 4 match external
route-map ospf-rmap
Ruijie(config-router)# no redistribute ospf 78
```

show ip protocols	

-	-

37.1.91 redistribute（ISIS）

ISIS ISIS BGP

no

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

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

isis-tag	ISIS
route-map *map-tag*	**route-map** **route-map**
metric *metric-value*	metric
level-1	isis level-1
level-1-2	isis level-1 isis level-2
level-2	isis level-2 isis

ISIS

BGP BGP IPv4 BGP IPv6

IP

no no

redistribute

no

ISIS level ISIS

route-map metric

route-map route-map

route-map route-map metric

metric

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

show ip protocols	

BGP

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

Ip routing	IP
bgp router-id	BGP
network	BGP speaker

keepalive: 60
holdtime: 180

BGP

keepalive holdtime
peer peer-group peer peer group

BGP

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

neighbor timers	*keepalive holdtime*

network-mask	
community *community-number*	community *community-number* AA:NN(/2) internet no-export local-as no-advertise
community-list *community-name*	BGP *community-name*
exact -match	
dampening dampened-paths	
dampening flap-statistics	
filter-list *path-list-number*	*path-list-numbe*
inconsistent-as	AS
prefix *ip-prefix-list-name*	prefix-list
quote-regexp *regexp*	AS BGP
regexp *regexp*	AS BGP
route-map *map-tag*	route-map
neighbors *neighbor-address* **received-routes**	peer
neighbors *neighbor-address* **routes**	peer
neighbors *neighbor-address* **advertised-routes**	peer
cidr-only	
label	BGP MPLS

BGP IPv4

```
Ruijie# show bgp ipv4 unicast
BGP table version is 2, local router ID is 192.168.183.1
Status codes: s suppressed, d damped, h history, * valid, > best,
i - internal,
            S Stale
Origin codes: i - IGP, e - EGP, ? - incomplete
   Network         Next Hop           Metric     LocPrf  Path
*>i44.0.0.0        192.168.195.183         0         100     i
*>i64.12.0.0/16    192.168.195.183         0         100     i
```

```
*>i172.16.0.0/24    192.168.195.183         0        100     i
*>i202.201.0.0     192.168.195.183         0        100     i
*>i202.201.1.0     192.168.195.183         0        100     i
*>i202.201.2.0     192.168.195.183         0        100     i
*>i202.201.3.0     192.168.195.183         0        100     i
*>i202.201.18.0    192.168.195.183         0        100     i
Total number of prefixes 8
Ruijie# show bgp ipv4 unicast community 11:2222
111:12345
BGP table version is 2, local router ID is 192.168.183.1
Status codes: s suppressed, d damped, h history, * valid, > best,
i - internal,
            S Stale
Origin codes: i - IGP, e - EGP, ? - incomplete
   Network         Next Hop           Metric     LocPrf  Path
*>i202.201.0.0     192.168.195.183         0        100     i
*>i202.201.1.0     192.168.195.183         0        100     i
*>i202.201.2.0     192.168.195.183         0        100     i
*>i202.201.3.0     192.168.195.183         0        100     i
Total number of prefixes 4
Ruijie(config)# ip as-path access-list 5 permit .*
Ruijie# show bgp ipv4 unicast filter-list 5
BGP table version is 2, local router ID is 192.168.183.1
Status codes: s suppressed, d damped, h history, * valid, > best,
i - internal,
            S Stale
Origin codes: i - IGP, e - EGP, ? - incomplete
   Network         Next Hop           Metric     LocPrf  Path
*>192.168.88.0     0.0.0.0             32768 ?
Total number of prefixes 1
Ruijie# show ip bgp cidr-only
BGP table version is 2, local router ID is 192.168.183.1
Status codes: s suppressed, d damped, h history, * valid, > best,
i - internal,
            S Stale
Origin codes: i - IGP, e - EGP, ? - incomplete
   Network         Next Hop           Metric     LocPrf  Path
*>i64.12.0.0/16    192.168.195.183         0        100     i
*>i172.16.0.0/24   192.168.195.183         0        100     i
Total number of prefixes 2
Ruijie# show bgp ipv4 unicast label
Network         Next Hop        In Label/Out Label
1.1.1.1/32      192.167.1.1     17/18
1.1.1.2/32      192.167.1.1     nolabel/19
```

Network	
Nexthop	

In Label /Out29

show ip bgp	BGP IPv4

-	-

37.2.3 show bgp ipv4 unicast dampening parameters

BGP IPv4

show bgp ipv4 unicast dampening parameters

-	-

ef0 0 10.02 129.72 490.76-6(ef0)Tj/TT1 1 Tf0.0023 1891.06

BGP IPv4

```
Ruijie(config-router)#  bgp dampening 25 10000 10000 200
Ruijie# show bgp ipv4 unicast dampening parameters
dampening 25 10000 10000 200
Dampening Control Block(s):
Reachability Half-Life time    : 25 min
Reuse penalty                : 10000
Suppress penalty             : 10000
Max suppress time            : 200 min
Max penalty (ceil)           : 29800000
Min penalty (floor)          : 5000
```


37.2.4 show bgp ipv4 unicast neighbors

BGPIPv4

show bgp ipv4 unicast neighbors *neighbor-address*

-	-

BGPIPv4

```
Ruijie# show bgp ipv4 unicast neighbors
BGP neighbor is 192.168.195.183, remote AS 23, local AS 23, internal
link
  BGP version 4, remote router ID 44.0.0.1
  BGP state = Established, up for 00:06:37
  Last read 00:06:37, hold time is 180, keepalive interval is 60
seconds
  Neighbor capabilities:
    Route refresh: advertised and received (old and new)
    Address family IPv4 Unicast: advertised and received
    Graceful restart: advertised and received
      Remote Restart timer is 120 seconds
  Received 14 messages, 0 notifications, 0 in queue
    open message:1 update message:4 keepalive message:9
    refresh message:0 dynamic cap:0 notifications:0
  Sent 12 messages, 0 notifications, 0 in queue
    open message:1 update message:3 keepalive message:8
    refresh message:0 dynamic cap:0 notifications:0
  Route refresh request: received 0, sent 0
  Minimum time between advertisement runs is 0 seconds
 For address family: IPv4 Unicast
  BGP table version 2, neighbor version 1
  Index 2, Offset 0, Mask 0x4
  Inbound soft reconfiguration allowed
  8 accepted prefixes
  0 announced prefixes
 Connections established 2; dropped 1
Local host: 192.168.195.239, Local port: 1074
Foreign host: 192.168.195.183, Foreign port: 179
Nexthop: 192.168.195.239
Nexthop global: ::
Nexthop local: ::
BGP connection: non shared network
Last Reset: 00:06:43, due to BGP Notification sent
Notification Error Message: (Cease/Unspecified Error Subcode)
```

Using BFD to detect fast fallover

-	-

-	-

37.2.5 show bgp ipv4 unicast paths

IPv4

show bgp ipv4 unicast paths

-	-

```
Ruijie# show bgp ipv4 unicast paths
Address       Refcnt Path
[0x1d7806a0:0]  (67)
[0x1d7389a0:13]  (20) 10
```

-	-

-	-

37.2.6 show bgp ipv4 unicast summary

BGPIPv4

show bgp ipv4 unicast summary

-	-

BGPIPv4

```
Ruijie # show bgp ipv4 unicast summary
BGP router identifier 192.168.183.1, local AS number 23
BGP table version is 2
2 BGP AS-PATH entries
1 BGP community entries
Neighbor        V    AS MsgRcvd MsgSent   TblVer  InQ OutQ Up/Down
State/PfxRcd
192.168.195.79  4    24      0       0        0    0    0    never
Active
192.168.195.183 4    23     17      15        1    0    0 00:09:04
8
Total number of neighbors 2
```

router bgp	BGP

-	-

37.2.7 show bgp ipv6 unicast

BGP IPv6

show bgp ipv6 unicast [*IPv6-Prefix*]

show bgp ipv6 unicast community *community-number* [**exact-match**]

show bgp ipv6 unicast community-list *community-name* [**exact-match**]

show bgp ipv6 unicast dampening dampened-paths

show bgp ipv6 unicast dampening flap-statistics

show bgp ipv6 unicast filter-list *path-list-number*

show bgp ipv6 unicast inconsistent-as

show bgp ipv6 unicast prefix *ipv6-prefix-list-name*

show bgp ipv6 unicast quote-regexp *regexp*

show bgp ipv6 unicast regexp *regexp*

show bgp ipv6 unicast route-map *map-tag*

BGPIPv6

show bgp ipv6 unicast neighbors *neighbor-address*

-	-

BGPIPv6

show bgp ipv4 unicast neighbors *neighbor-address*

show bgp ipv4 unicast neighbors *neighbor-address*

-	-

show bgp ipv4 unicast neighbors *neighbor-address*	BGPIPv4

-	-

37.2.10 show bgp ipv6 unicast paths

IPv6

show bgp ipv6 unicast paths

-	-

```
Ruijie# show bgp ipv6 unicast paths
```

```
Address       Refcnt Path
[0x1d7806a0:0]  (67)
[0x1d7389a0:13]  (20) 10
```

show bgp ipv6 unicast paths	IPv4

-	-

37.2.11 show bgp ipv6 unicast summary

BGPIPv6

show bgp ipv6 unicast summary

-	-

BGPIPv6

show bgp ipv4 unicast summary **show bgp ipv4 unicast summary**

-	-

router bgp	BGP
show bgp ipv4 unicast summary	BGPIPv4

-	-

37.2.12 show bgp vpnv4 unicast

vrf rd vpn

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

show bgp vpvn4 unicast vrf *vrf_name* [*network* | **summary** | **label**]

show bgp vpvn4 unicast rd *rd_value* [*network* | **summary** | **label**]

network	
neighbor	
summary	
label	
vrf_name	vrf
rd_value	RD 100 1 202.118.239.165:1

vrf rd vpn

MPLS BGP bgp vrf MP-BGP

MP-BGP vpn show bgp vpnv4 unicast vrf

MP-BGP show bgp vpnv4 unicast all

```
Ruijie# show bgp vpnv4 unicast all
BGP table version is 0, local router ID is 192.168.183.1
Status codes: s suppressed, d damped, h history, * valid, > best,
i - internal,
            S Stale
Origin codes: i - IGP, e - EGP, ? - incomplete
Route Distinguisher: 78:90 (Default for VRF this)
   Network         Next Hop          Metric     LocPrf  Path
```

-	-

37.2.14 show ip as-path-access-list

show ip as-path-access-list {*num*}

num	

access-list	
route-map	
set vrf	IP VRF
set ip next-hop	
set ip default next-hop	
set interface	
set default interface	
set ip tos	IP TOS
set ip dscp	IP DSCP
set ip precedence	IP
match ip address	
match length	

-	-

38.1.2 ip policy

set ip [**default**] **nexthop**
ip policy **no**

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

no ip policy

load-balance | redundance	

set ip next-hop

WCMP 8 ECMP 32
ARP ARP MAC
MAC

NPE80

nexthop,

FastEthernet 0/0 nexthop

1 IP ACL

```
Ruijie(config)#access-list 1 permit 10.0.0.1
Ruijie(config)#access-list 2 permit 20.0.0.1
```

2

```
Ruijie(config)#route-map lab1 permit 10
Ruijie(config-route-map)#match ip address 1
Ruijie(config-route-map)#set ip next-hop
196.168.4.6
Ruijie(config-route-map)#set ip next-hop
196.168.4.7
Ruijie(config-route-map)#set ip next-hop
196.168.4.8
Ruijie(config-route-map)#exit
Ruijie(config)#route-map lab1 permit 20
Ruijie(config-route-map)#match ip address 2
Ruijie(config-route-map)#set ip next-hop
196.168.5.6
Ruijie(config-route-map)#set ip next-hop
196.168.5.7
Ruijie(config-route-map)#set ip next-hop
196.168.5.8
Ruijie(config-route-map)#exit

Ruijie(config)#interface FastEthernet 0/0
Ruijie(config-if)#ip policy route-map lab1
Ruijie(config-if)#exit
Ruijie(config)#ip policy redundance
```


route-map	

1

FastEthernet 0/0

10.0.0.1 196.168.4.6 20.0.0.1 196.168.5.6

1 IP ACL

```
Ruijie(config)#access-list 1 permit 10.0.0.1
Ruijie(config)#access-list 2 permit 20.0.0.1
```

2

```
Ruijie(config)#route-map lab1 permit 10
Ruijie (config-route-map)#match ip address 1
Ruijie(config-route-map)#set ip next-hop 196.168.4.6
Ruijie(config-route-map)#exit
Ruijie(config)#route-map lab1 permit 20
Ruijie(config-route-map)#match ip address 2
Ruijie(config-route-map)#set ip next-hop 196.168.5.6
Ruijie(config-route-map)#exit
```

3

```
Ruijie(config)#interface FastEthernet 0/0
Ruijie(config-if)#ip policy route-map lab1
Ruijie(config-if)#exit
```

access-list	
route-map	
set vrf	IP VRF
set ip next-hop	
set ip default next-hop	
set interface	
set default interface	
set ip tos	IP TOS

set ip dscp	IP DSCP
set ip precedence	IP
match ip address	
match length	

-	-

38.1.4 ipv6 local policy route-map

no

ipv6 local policy route-map *route-map-name*

no ipv6 local policy route-map

route-map-name	**route-map**
no	

- IPv6 ping IPv6
- 1

1 2003:1000::10/80 2001:100::/64 aaa ACL6 2003:1001::2

-

●

```
Ruijie(config)#ipv6 local policy route-map pbr-aaa
```

match ipv6 address	IPv6 PBR ACL6
match length	
route-map	
set default interface	
set interface	
set ipv6 default next-hop	
set ipv6 next-hop	
set ipv6 precedence	IPv6
show ipv6 policy	
show route-map	

,

10.4	

38.1.5 ipv6 policy

set next-hop ipv6 policy .

```
Ruijie#show ip policy
Banlance Mode  redundance
Interface           Route map
local               test
FastEthernet 0/0    test
```

Interface	
Route map	

show route-map

39 BFD

39.1

39.1.1 bfd

bfd BFD **no** BFD

bfd interval *milliseconds* **min_rx** *milliseconds* **multiplier** *multiplier-value*

no bfd interval *milliseconds* **min_rx** *milliseconds* **multiplier** *multiplier-value*

Interval *milliseconds*	BFD BFD *milliseconds* 50ms 10000ms echo
min_rx *milliseconds*	BFD BFD *milliseconds* 50ms 10000ms
Multiplier *multiplier-value*	BFD *multiplier-value* 3 50

BFD

L3 AP
BFD

Routed Port FastEthernet 0/2 BFD

```
Ruijie(config)# interface fastEthernet 0/2
Ruijie(config)# no switchport
Ruijie(config-if)# bfd interval 100 min_rx 100 multiplier 3
```

bfd all-interfaces	BFD
clear bfd	BFD
ip ospf bfd	OSPF BFD

ip rip bfd	RIP BFD

10.3(4b3)	
10.3(5)	BFD

39.1.2 bfd all-interfaces

router (RIP,OSPF) **bfd all-interfaces** BFD
no

bfd all-interfaces

no bfd all-interfaces

BFD

BFD
OSPF RIP [**no**] **bfd all-interfaces**
BFD
ip ospf bfd [**disable**] **ip rip bfd** [**disable**]
OSPF RIP BFD
] ծ Ե O48087C>6<02

```
#                              OSPF      BFD
Ruijie(config)# router ospf 123
```

39.1.3 bfd cp

bfd cpp

no bfd c

BFD BFD

BFD

BFD

1000ms

slow-timer 14000
Ruijie(config)# **bfd slow-timer** 14000

bfd echo	BFD Echo

10.3(4b3)	

bfd	BFD
bfd all-interfaces	BFD

10.3(4b3)	

39.1.6 ip rip bfd

ip rip bfd RIP BFD **disable** **no**

ip rip bfd [**disable**]

no ip rip bfd

disable	( ) RIP BFD

disable RIP BFD

RIP BFD

RIP [**no**] **bfd all-interfaces** BFD

ip rip bfd [disable] RIP BFD

Routed Port FastEthernet 0/2 RIP BFD

```
Ruijie(config)# interface FastEthernet 0/2
Ruijie(config-if)# no switchport
Ruijie(config-if)# ip rip bfd disable
```

bfd	BFD
bfd all-interfaces	BFD

10.3(4b3)	

39.1.7 ip route static bfd

ip route static bfd Ipv4 BFD **no**

ip route static bfd [**vrf** vrf-name] interface-type interface-number gateway [**source** ip-address]

no ip route static bfd [**vrf** *vrf-name*] *interface-type interface-number gateway* [**source** *ip-address*]

vrf vrf-name	( ) VRF
interface-type interface-number	
gateway	IP BFD IP BFD
source ip-address	( ) BFD IP , IP

BFD

BFD

```
# BFD BFD 172.16.0.2
Ruijie(config)# interface FastEthernet 0/1
Ruijie(config-if)# no switchport
Ruijie(config-if)# ip address 172.16.0.1 255.255.255.0
Ruijie(config-if)# bfd interval 50 min_rx 50 multiplier 3
Ruijie(config-if)# ip route static bfd FastEthernet 0/1 172.16.0.2
Ruijie(config-if)# ip route 10.0.0.0 255.0.0.0 FastEthernet 0/1
172.16.0.2
```

bfd	BFD

10.3(4b3)	

39.1.8 ipv6 route static bfd

ipv6 route static bfd Ipv6 BFD **no**

Ipv6 route static bfd *interface-type interface-number* **gateway** [**source** *ipv6-address*]

no ipv6 route static bfd *interface-type interface-number gateway* [**source** *ipv6-address*]

interface-type interface-number	
gateway	IP BFD IP BFD
source *ipv6-address*	( ) BFD IP , IP

BFD

router address-family , **neighbor fall-over** BGP BFD
BGP , **no** ip-address **fall-over bfd** ip-address

Û n BGP

"¼ ã G!5B ÊOj .B ±F• ,õ0 Í h,X y ·,X %) ' îA± – D Æ4£G!5B P

4

track

39.2.1 show bfd neighbors

BFD

```
Poll bit: 0              - Final bit: 0
Multiplier: 3            - Length: 24
My Discr.: 2             - Your Discr.: 1
Min tx interval: 50000   - Min rx interval: 50000
Min Echo interval: 0
```

OurAddr	IP
NeighAddr	IP
LD/RD	
RH/RS	
Holdown(mult)	hello
State	
Int	

Session state is UP and using echo function with 50 ms interval

echo echo (

10.3(4b3)	

40 VRF

40.1 VRF 本

40.1.1 clear ip route vrf

VRF

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

vrf-name	VRF
*	VRF
network	
mask	

```
Ruijie# clear ip route vrf redvrf *
```

show ip route vrf	-

RGOS10.1	RGOS10.1

40.1.2 ip vrf

VRF VRF no

ip vrf *vrf-name*

no ip vrf *vrf-name*

vrf-name	VRF

VRF

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

-	-

RGOS10.1	RGOS10.1

40.1.3 ip vrf forwarding

VRF; VRF no

ip vrf forwarding *vrf-name*

no ip vrf forwarding *vrf-name*

vrf-name	VRF

VRF

VRF

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

-	-

RGOS10.1	RGOS10.1

40.2

40.2.1 show ip route vrf

VRF p Ń ɣ p

brief	VRF
detail	VRF
interfaces	VRF
vrf-name	VRF

41 IPv4

41.1 IPv4

41.1.1 clear ip mroute

IP

clear ip mroute {* | *group-address* [*source -address*]}

*	
group-address	
source -address	

Distance *Distance* 0

RFF

ip

rpf bgp

rpf distance distance
rpf distance rpf

172.30.10.13

```
Ruijie(config)# ip mroute 172.16.0.0 255.255.0.0  172.30.10.13
```


```
Ruijie(config-std-nacl)# exit
Ruijie(config)# interface vlan 1
Ruijie(config-if)# ip multicast boundary mul-boun
```

-	-

-	-

41.1.6 ip multicast-routing

no

ip multicast-routing

no ip multicast-routing

-	-

IPv4 IPv4

IPv4 IGMP snooping

IGMP snooping

v4

TTL 5

```
Ruijie(config-if)# ip multicast ttl-threshold 5
```

-	-

-	-

41.1.9 ip multicast rpf longest-match

RPF

no

ip multicast rpf longest-match

no ip multicast rpf longest-match

-	-

RPF

```
Ruijie(config)# ip multicast rpf longest-match
```

-	-

.926

```
Incoming interface: FastEthernet 2/1
Outgoing interface list:
FastEthernet 1/3
  3
Ruijie# show ip mroute count
IP Multicast Statistics
Total 1 routes using 132 bytes memory
Route limit/Route threshold: 2147483647/2147483647
Total NOCACHE/WRONGVIF/WHOLEPKT recv from fwd: 1/0/0
Total NOCACHE/WRONGVIF/WHOLEPKT sent to clients: 1/0/0
Immediate/Timed stat updates sent to clients: 0/0
Reg ACK recv/Reg NACK recv/Reg pkt sent: 0/0/0
Next stats poll: 00:01:10
Forwarding Counts: Pkt count/Byte count, Other Counts: Wrong If pkts
Fwd msg counts: WRONGVIF/WHOLEPKT recv
Client msg counts: WRONGVIF/WHOLEPKT/Imm Stat/Timed Stat sent
Reg pkt counts: Reg ACK recv/Reg NACK recv/Reg pkt sent
(10.10.1.52, 224.0.1.3), Forwarding: 2/19456, Other: 0
Fwd msg: 0/0, Client msg: 0/0/0/0, Reg: 0/0/0
  4
Ruijie# show ip mroute summary
IP Multicast Routing Table
Flags: I - Immediate Stat, T - Timed Stat, F - Forwarder installed
Timers: Uptime/Stat Expiry
Interface State: Interface (TTL)
(10.10.1.52, 224.0.1.3), 00:01:32/00:03:20, PIM-SM, Flags: T
```

Flags	I- T- F-

-	-

41.2.2 show ip mroute static

v4

show ip mroute staitc

-	-

```
Ruijie#show ip mroute static
Mroute: 172.16.0.0, RPF neighbor: 172.30.10.13
  Protocol: , distance: 0
```

-	-

-	-

41.2.3 show ip rpf

RPF

show ip rpf {*source-address*}

192.168.1.54 RPF

```
Ruijie# show ip rpf 192.168.1.54
RPF information for 192.168.1.54
RPF interface: VLAN 1
RPF neighbor: 0.0.0.0
RPF route: 192.168.1.0/24
RPF type: unicast (connected)
RPF recursion count: 0
Doing distance-preferred lookups across tables
Distance: 0
Metric: 0 RPF information for 192.168.1.54
RPF interface: VLAN 1
RPF neighbor: 0.0.0.0
RPF route: 192.168.1.0/24
RPF type: unicast (connected)
RPF recursion count: 0
Doing distance-preferred lookups across tables
Distance: 0
Metric: 0
```

-	-

-	-

41.2.4 show ip mvif

show ip mvif { *interface-type interface-number* }

interface-type interface-number	

svi1

```
Ruijie# show ip mvif vlan 1
Interface        Vif   Owner    TTL  Local          Remote
Uptime
Idx   Module        Address         Address
VLAN 1         1    PIM-DM    2    192.168.1.1     0.0.0.0
00:13:16
```

-	-

41.3.2 debug nsm mcast fib-msg

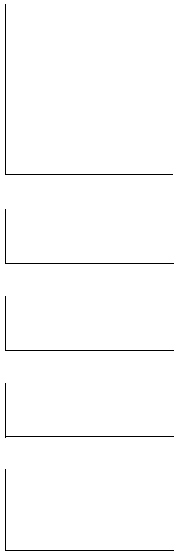
no

debug nsm mcast fib-msg

-	-

Ruijie# **debug nsm mcast fib-msg**

no **debug nsm mcast**



d **e**

42 IPv6 撕

42.1 IPv6 撕 表

42.1.1 clear ipv6 mroute

IPv6

clear ipv6 mroute {***** | *v6group-address* [*v6source -address*]}

*	IPv6
v6group-address	IPv6 IPv6
v6source -address	IPv6 IPv6

IPv6

```
Ruijie# clear ipv6 mroute *
```

show ipv6 mroute	-
clear ipv6 mroute statistics	-

-	-

42.1.2 clear ipv6 mroute statistics

IPv6

clear ipv6 mroute statistics {***** | *v6group-address* [*v6source -address*]}

distance	RPF 0

IPv6

IPv6 IPv6 rpf

ip

rpf bgp

rpf distance distance
rpf distance rpf

2233 /64 3333 3333

```
Ruijie(config)# ipv6 mroute 2233    /64 3333::3333
```

-	-

-	-

42.1.4 ipv6 multicast boundary

IPv6 IPv6 **no** IPv6

ipv6 multicast boundary *access-list-namer*

svi1 IPv6

```
Ruijie(config)# ipv6 access-list mul-boun
Ruijie(config-std-nacl)# permit ipv6 ::/0 ::/0
Ruijie(config-std-nacl)# exit
Ruijie(config)# interface vlan 1
Ruijie(config-if)# ipv6 multicast boundary mul-boun
```

-	-

42.1.6 ipv6 multicast-routing

IPv6 **no** IPv6

ipv6 multicast-routing

no ipv6 multicast-routing

-	-

IPv6

IPv6 IPv6

IPv6 IGMP snooping

IGMP snooping

IPv6

```
Ruijie(config)# ipv6 multicast-rounting
```

-	-

source -address	
group-address	
interface-type interface-number	

PIM-SMV6

(2222::3333 ff66::100) GigabitEthernet 2/6 FastEthernet 3/2

```
Ruijie(config)# ipv6 multicast static 2222::3333 ff66::100 G2/6
Ruijie(config)# ipv6 multicast static 2222::3333 ff66::100 F3/2
```

-	-

-	-

42.1.8 ipv6 multicast rpf longest-match

RPF MBGP RPF MBGP

MBGP

no

MBGP

ipv6 multicast rpf longest-match

no ipv6 multicast rpf longest-match

RPF MBGP RPF
MBGP
MBGP

Ruijie(config)# **ipv6 multicast rpf longest-match**

-	-

-	10.4 2

42.2 IPv6 摒 表

42.2.1 show ipv6 mroute

IPv6

show ipv6 mroute *[v6group-address] [v6source-address]* [**summary**] [**count**]

v6group-address	IPv6
v6source-address	IPv6
summary	IPv6
count	IPv6

IPv6

1

```
Ruijie# show ipv6 mroute
IPv6 Multicast Routing Table
Flags: I - Immediate Stat, T - Timed Stat, F - Forwarder installed
Timers: Uptime/Stat Expiry
Interface State: Interface (TTL)
(2222::1234, ff56::1234), uptime 00:00:31, stat expires 00:02:59
Owner PIM-SMv6, Flags: TF
Incoming interface: FastEthernet 2/1
Outgoing interface list:
FastEthernet 1/3
```

2

```
Ruijie# show ipv6 mroute count
IPv6 Multicast Statistics
Total 1 routes using 168 bytes memory
Route limit/Route threshold: 1024/2147483647
Total NOCACHE/WRONGVIF/WHOLEPKT recv from fwd: 77/147/0
Total NOCACHE/WRONGVIF/WHOLEPKT sent to clients: 77/147/0
Immediate/Timed stat updates sent to clients: 0/29
Reg ACK recv/Reg NACK recv/Reg pkt sent: 0/0/0
Next stats poll: 00:00:09
Forwarding Counts: Pkt count/Byte count, Other Counts: Wrong If pkts
Fwd msg counts: WRONGVIF/WHOLEPKT recv
Client msg counts: WRONGVIF/WHOLEPKT/Imm Stat/Timed Stat sent
Reg pkt counts: Reg ACK recv/Reg NACK recv/Reg pkt sent
(2222::1234, ff56::1234), Forwarding: 1/0, Other: 0
  Fwd msg: 0/0, Client msg: 0/0/0/0,  Reg: 0/0/0
```

3

```
Ruijie# show ipv6 mroute summary
IPv6 Multicast Routing Table
Flags: I - Immediate Stat, T - Timed Stat, F - Forwarder installed
Timers: Uptime/Stat Expiry
Interface State: Interface (TTL)
(2222::1234, ff56::1234), 00:00:28/00:03:25, PIM-SMv6, Flags: TF
```

clear ipv6 mroute	-
clear ipv6 mroute statistics	-

-	-

42.2.2 show ipv6 rpf

IPv6 RPF

show ipv6 rpf *v6source-address*

v6group-address	IPv6 IPv6

IPv6 RPF

2222::3333 RPF

```
Ruijie# show ipv6 rpf 2222::3333
  RPF interface: GigabitEthernet 0/1
  RPF neighbor: ::
  RPF route: 2222::/64
  RPF type: unicast (connected)
  RPF recursion count: 0
  Doing distance-preferred lookups across tables
  Distance: 0
  Metric: 0
```

-	-

-	-

42.2.3 show ipv6 mroute static

IPv6

show ipv6 mroute staitc

-	-

```
Ruijie#show ipv6 mroute static
Mroute: 2233::/64, RPF neighbor: 3333::3333
  Protocol: , distance: 0
```

-	-

-	-

42.2.4 show ipv6 mvif

IPv6

show ipv6 mvif { *interface-type interface-number* }

interface-type interface-number	

svi1

```
Ruijie#show ipv6 mvif
Interface              Mif   Owner           Uptime
                       Idx   Module
Register               0                   03d03h09m
VLAN 1                  1    PIMSMV6          03d03h09m
```

-	-

-	-

42.3 IPv6 撕 表

42.3.1 debug nsm mcast6 all

IPv6 **no** IPv6

debug nsm mcast6 all

-	-

IPv6

```
Ruijie# debug nsm mcast6 all
```

-	-

-	-

42.3.2 debug nsm mcast6 fib-msg

IPv6 **no**

debug nsm mcast6 fib-msg

-	-

IPv6

IPv6

```
Ruijie# debug nsm mcast6 fib-msg
```

-	-

-	-

42.3.3 debug nsm mcast6 register

IPv6 **no**

debug nsm mcast6 register

-	-

IPv6

IPv6

```
Ruijie# debug nsm mcast6 register
```

-	-

IPv6 **no**

debug nsm mcast6 stats

-	-

-	-

43 IGMP

43.1

43.1.1

-	-

-	-

43.1.2 ip igmp join-group

no

ip igmp join-group *group-address*

no ip igmp join-group *group-address*

group-address	

Eth0 233.3.3.3

```
Ruijie# configure terminal
Ruijie(config)# interface ethernet 0
Ruijie(config-if)# ip igmp join-group 233.3.3.3
Ruijie(config-if)# exit
```

-	-

-	-

43.1.3 ip igmp immediate-leave group-list

IGMPversion2 IGMPversion3

no

ip igmp immediate-leave group-list *access-list*

no ip igmp immediate-leave group-list

access-list	

43.1.7 ip igmp limit ( )

igmp no

ip igmp limit *number* [*except access-list*]

no ip igmp limit *number* [*except access-list*]

number	IGMP
except	access-list limit
access-list	

65536

IGMP

IGMP

300

```
Ruijie config # ip igmp limit 300
```

-	-

-	-

43.1.8 ip igmp mroute-proxy

ε . ź ₦

proxy-service

gmp

mroute-proxy

```
Ruijie(config-if)# ip igmp mroute-proxy fa 0/1
```

-	-

-	-

43.1.9 ip igmp proxy-service

mroute-proxy

mroute-proxy

ip igmp proxy-service

no ip igmp proxy-service

-	-

proxy-service

32 IGMP Proxy

proxy-service proxy-service

mroute-proxy

proxy-service .

switchport **ip igmp mroute-proxy**

interface

proxy-service

```
Ruijie(config-if)# ip igmp proxy-service
```

-	-

-	-

43.1.10 ip igmp query-interval

no

ip igmp query-interval *seconds*

no ip igmp query-interval

seconds	s 1 18000

125

1 Ethernet 0 120s

```
Ruijie(config-if)# ip igmp query-interval 120
```

2 Ethernet 0

```
Ruijie(config-if)# no ip igmp query-interval
```

-	-

-	-

43.1.11 ip igmp query-max-response-time

no

ip igmp query-max-response-time *seconds*

no ip igmp query-max-response-time

seconds	s 1 25

10s

IGMPv2

1 Ethernet 0 20s

```
Ruijie(config-if)# ip igmp query-max-response-time 20
```

2 Ethernet 0

```
Ruijie(config-if)# no ip igmp query-max-response-time
```

-	-

-	-

43.1.12 ip igmp query-timeout

no

ip igmp query-timeout *seconds*

no ip igmp query-timeout

seconds	s 60 300

255s

IGMPv2 **ip igmp query-interval** Ruijie 255s

igmp ssm-map

ip igmp ssm-map enable

no ip igmp ssm-map enable

-	-

ip igmp ssm-map static

igmp ssm-map

```
Ruijie(config)# ip igmp ssm-map enable
```

-	-

ACL 11 192.168.2.2

```
Ruijie(config)# ip igmp ssm-map static 11 192.168.2.2.
```

-	-

-	-

43.1.16 ip igmp static-group

no

ip igmp static-group *group-address*

no ip igmp static-group *group-address*

group-address	

Eth0 236.6.6.6

```
Ruijie# configure terminal
Ruijie(config)# interface ethernet 0
Ruijie(config-if)# ip igmp static-group 236.6.6.6
Ruijie(config-if)# exit
```

-	-

-	-

43.1.17 ip igmp version

IGMP no

ip igmp version {*1* | *2* | *3*}

no ip igmp version

{*1*	*2*	*3*}	<1-3>

2

igmp igmp

2

```
Ruijie# configure terminal
Ruijie(config)# interface ethernet 0
Ruijie(config-if)# ip igmp version 2
```

-	-

-	-

43.2

43.2.1 clear ip igmp group

IGMP

clear ip igmp group[*group-address* | *interface-type interface-number*]

group-address	32 IP D 8
interface-type	
interface-number	

IGMP

IGMP

clear ip igmp group

```
Ruijie# clear ip igmp group
```

show ip igmp groups	-
show ip igmp interface	-

-	-

43.2.2 clear ip igmp interface

IGMP

clear ip igmp interface *ifname*

ifname	

IGMP ifname

```
Ruijie# clear ip igmp interface eth1
```

-	-

-	-

43.2.3

```
192.168.55.66 00:00:42 00:03:38 Yes R
```

-	-

-	-

-	-

43.2.5 show ip igmp ssm-mapping

IGMP ssm-map

show ip igmp ssm-mapping (*A.B.C.D*)

A.B.C.D	

44 MLD

44.1

44.1.1 clear ipv6 mld group

MLD

-	-

44.1.2 clear ipv6 mld interface

MLD

clear ipv6 mld interface *interface-type interface-number*

interface-type	
interfaceid	

MLD
report done

```
Ruijie# clear ipv6 mld interface fa 1/1
```

-	-

-	-

44.1.3 ipv6 mld access-group

ACL report

no

ipv6 mld access-group *word*

no ipv6 mld access-group

Word	IPv6 ACL

MLD

2s

```
Ruijie# configure terminal
Ruijie(config)#ipv6 access-list acl
Ruijie(config-ipv6-acl)#permit ipv6 2222::3333/64 ff66::100/64
Ruijie(config)# interface ethernet 0/1
Ruijie(config-if)# ipv6 mld immediate-leave group-list acl
```

ipv6 mld last-member-query-interval	-

-	-

44.1.5 ipv6 mld join-group

no

Ipv6 mld join-group *group-address*

no ipv6 mld join-group *group-address*

group-address	ipv6

MLD

Ruijie#T0 1 configure terminal

no

ipv6 mld last-member-query-interval *interval*

no ipv6 mld last-member-query-interval

interval	<1-255> 0.1s

10 (0.1s)

MLD

MLD **mld last-member-query-count**

2

```
Ruijie# configure terminal
Ruijie(config)# interface fa 0/1
Ruijie(config-if)# ipv6 mld last-member-query-interval 200
```

ipv6 mld immediate-leave	-

-	-

44.1.8 ipv6 mld limit ( )

MLD **no**

ipv6 mld limit *number* [**except** *access-list*]

no ipv6 mld limit

number	MLD 1024
except *access-list*	

1024

MLD

report

300 acl

```
Ruijie(config)# ipv6 mld limit 300 except acl
```

-	-

-	-

44.1.10 ipv6 mld mroute-proxy

Ipv6 mld mroute-proxy *interface-type interface-number*

mroute-proxy

mroute-proxy

ipv6 mld proxy-service

no ipv6 mld proxy-service

-	-

proxy-service

32 MLD Proxy

proxy-service ŕ

Ethernet 0 120s

```
Ruijie(config-if)# ipv6 mld query-interval 120
```

Ethernet 0

```
Ruijie(config-if)# no ipv6 mld query-interval
```

Q,	
-	-

-	-

44.1.13 ipv6 mld query-max-response-time

no

ipv6 mld query-max-response-time *seconds*

no ipv6 mld query-max-response-time

-	-

44.1.14 ipv6 mld querier-timeout

no

.

ipv6 mld querier-timeout *seconds*

no ipv6 mld querier-timeout

seconds	60 300

	number	2-7

-	-

44.1.17 ipv6 mld ssm-map static

ssm-map

ipv6 mld ssm-map static *access-list X:X:X:X::X*

no ipv6 mld ssm-map static *access-list X:X:X:X::X*

access-list	ipv6 ACL
X:X:X:X::X	

ipv6 mld ssm-map enable mldv2

ACL te 4444::1234

```
Ruijie(config)# ipv6 mld ssm-map static te 4444::1234
```

-	-

-	-

44.1.18 ipv6 mld static-group

no

ipv6 mld static-group *group-address*

no ipv6 mld static-group *group-address*

group-address	ipv6

join-group

clear ,
no ipv6 mld static-group

```
Ruijie# configure terminal
Ruijie(config)# interface fast 0/1
Ruijie(config-if)# ipv6 mld static-group ff55::3
```

-	-

-	-

44.1.19 ipv6 mld version

MLD no

ipv6 mld version {**1** | **2** }

no ipv6 mld version

{**1**	**2**}	MLD , <1-2>

2.

MLD

1

```
Ruijie# configure terminal
```

```
Ruijie(config)# interface ethernet 0/1
Ruijie(config-if)# ipv6 mld version 1
```

-	-

```
Group mode:    Exclude (Expires: 00:02:47)
Last reporter:  fe80::2d0:f8ff:fe22:3378
Source list is empty
```

-	-

-	-

44.2.2 show ipv6 mld interface

-	-

-	-

44.2.3 show ipv6 mld ssm-mapping

show ipv6 mld ssm-mapping [*group-address*]

group-address	

```
Ruijie# show ipv6 mld ssm-mapping ff66::1234
Group address: ff66::1234
Database    : Static
```

45 IGMP snooping

45.1

45.1.1 deny

profile profile deny

deny

deny	profile

profile deny

profile

profile range profile
profile

224.2.2.2 profile

```
Ruijie(config)# ip igmp profile 1
Ruijie(config-profile)# range 224.2.2.2
Ruijie(config-profile)# deny
```

ip igmp profile	profile
range	

permit

permit	profile

profile deny

profile

profile range profile
profile

224.2.2.2 profile

```
Ruijie(config)# ip igmp profile 1
Ruijie(config-profile)# range 224.2.2.2
Ruijie(config-profile)# permit
```

ip igmp profile	profile
range	

-	-

45.1.3 range

profile profile range
no

range *low-ip-address* [*high-ip-address*]

no range *low-ip-address* [*high-ip-address*]

low-ip-address	
high-ip-address	

profile

profile deny
profile profile

224.2.2.2~224.2.2.244 profile

```
Ruijie(config)# ip igmp profile 1
Ruijie(config-profile)# range 224.2.2.2 224.2.2.244
```

ip igmp profile	profile
deny	profile deny
permit	profile permit

-	-

45.1.4 ip igmp profile

IGMP profile profile
profile profile-number igmp profile

ip igmp profile *profile-number*

no ip igmp profile *profile-number*

profile-number	profile	1-65535

IGMP Profiles profile
profile

1 profile profile

```
Ruijie(config)# ip igmp profile 1
Ruijie(config-profile)#
```

range	profile
permit	profile permit
deny	profile deny

-	-

45.1.5 ip igmp snooping ivgl

igmp snooping ivgl **ip igmp snooping ivgl**
no igmp snooping

ip igmp snooping ivgl

no ip igmp snooping

-	-

disable

VLAN VLAN
VLAN
VLAN

	pim snooping no ip igmp snooping	igmp snooping igmp snooping pim snooping	IVGL pim snooping

igmp snooping ivgl

```
Ruijie(config)# ip igmp snooping ivgl
```

no ip igmp snooping vlan vid

vid	vlan id

disable

vlan IGMP Snooping

vlan pim snooping igmp snooping no ip igmp snooping vlan vlan igmp snooping pim snooping VLAN pim snooping

vlan 2 igmp snooping

```
Ruijie(config)# ip igmp snooping vlan 2
```

ip igmp snooping ivgl	igmp snooping ivgl

-	-

45.1.7 ip igmp snooping dyn-mr-aging-time

ip igmp snooping dyn-mr-aging-time *time*

no ip igmp snooping dyn-mr-aging-time

time	, <1-3600>

300s

IGMP PIM

Hello

100s

```
Ruijie(config)# ip igmp snooping dyn-mr-aging-time 100
```


45.1.9 ip igmp snooping query-max-response-time

query

ip igmp snooping query-max-response-time *time*

no ip igmp snooping query-max-response-time

time	

10s

IGMP

IP

Server Server IP

IP

IP

ip ip 192.168.4.243

```
Ruijie(config)# ip igmp snooping source-check default-server
192.168.4.243
```

ip igmp snooping limit-ipmc	ip

-	-

45.1.11 ip igmp snooping limit-ipmc

IP **ip igmp snooping limit-ipmc vlan**

no IP

ip igmp snooping limit-ipmc vlan *vid* **address** *gaddress* **server** *saddress*

no ip igmp snooping limit-ipmc vlan *vid* **address** *gaddress* **server** *saddress*

vid	ip vlan id
gaddress	
saddress	( )

IP

Q,

45.1.13 ip igmp snooping mrouter learn pim-dvmrp

IGMP Query/Dvmrp/PIM Hellp

ip igmp snooping mrouter learn no

ip igmp snooping mrouter learn pim-dvmrp

no ip igmp snooping mrouter learn pim-dvmrp

interface-id	id

IP

```
Ruijie(config)# ip igmp snooping vlan 1 mrouter interface
fastEthernet 0/1
```

-	-

-	-

45.1.15 ip igmp snooping vlan mrouter learn pim-dvmrp

IGMP Query/Dvmrp/PIM Hellp

ip igmp snooping vlan mrouter learn no

ip igmp snooping vlan *vid* **mrouter learn pim-dvmrp**

no ip igmp snooping vlan *vid* **mrouter learn pim-dvmrp**

vid	vlan id

VLAN VLAN

no

vlan 1

```
Ruijie(config)# ip igmp snooping vlan 1 mrouter learn pim-dvmrp
```

ip igmp snooping mrouter learn pim-dvmrp	

-	-

45.1.16 ip igmp snooping vlan static interface

igmp snooping
IGMP **ip igmp snooping vlan static interface** no

ip igmp snooping vlan *vid* **static** *ip-addr* **interface** *interface-id*

no ip igmp snooping vlan *vid* **static** *ip-addr* **interface** *interface-id*

profile

no profile

ip igmp snooping filter *profile-number*

no ip igmp snooping filter *profile-number*

profile-number	profile <1-65536>

IGMP Profile IGMP Report
IGMP Profile
profile filter

0/1 profile 1

```
Ruijie(config)# interface fastEthernet 0/1
Ruijie(config-if)# ip igmp snooping filter 1
```

ip igmp profile	profile

IGMP Report

0/1 100

```
Ruijie(config)# interface fastEthernet 0/1
Ruijie(config-if)# ip igmp snooping max-group 100
```

ip igmp snooping filter	

-	-

45.2

45.2.1 show ip igmp snooping

igmp snooping

Show ip igmp snooping [**gda-table** | **interfaces** | **mrouter**| **statistics** [**vlan** *vlan-id*]]

	igmp snooping
gda-table	
interfaces	igmp snooping filtring
mrouter	
statistics [**vlan** *vlan-id*]	snooping
vlan	vlan snooping

EXEC

-	-

-	-

45.2.2 show ip igmp profile [profile-number]

	profile
profile-number	profile

EXEC

profile

-	-

-	-

45.2.3 debug igmp-snp

IGMP Snooping Debug no

debug igmp-snp
debug igmp-snp event
debug igmp-snp packet
debug igmp-snp msf
debug igmp-snp warning
undebug igmp-snp
undebug igmp-snp event
undebug igmp-snp packet
undebug igmp-snp msf

undebug igmp-snp warning

	IGMP Snooping
event	IGMP Snooping

46.1.2 range

profile profile profile range
no

range low-ipv6-address [high-ipv6-address]

no range *low-ipv6-address* [*high-ipv6-address*]

profile deny

profile

profile range

FF77::100 profile :

```
Ruijie(config)# ipv6 mld profile 1
Ruijie(config-profile)# range FF77::100
Ruijie(config-profile)# deny
```

ipv6 mld profile	profile
range	
permit	profile permit

10.4	

46.1.4 permit

profile profile permit

permit

[redacted]		

profile deny

profile

profile range

FF77::1 profile :

```
Ruijie(config)# ipv6 mld profile 1
Ruijie(config-profile)# range FF77::1
Ruijie(config-profile)# permit
```

[redacted]

ipv6 mld profile	profile
range	
deny	profile deny

10.4	

46.1.5 ipv6 mld snooping ivgl

mld snooping ivgl **ipv6 mld snooping ivgl**
no ipv6 mld snooping mld snooping

ipv6 mld snooping ivgl

no ipv6 mld snooping

mld snooping

VLAN VLAN
VLAN
VLAN

mld snooping ivgl
Ruijie(config)# **ipv6 mld snooping ivgl**

10.4	

46.1.6 ipv6 mld snooping dyn-mr-aging-time

ipv6 mld snooping dyn-mr-aging-time *time*
no ipv6 mld snooping dyn-mr-aging-time

ipv6 mld snooping dyn-mr-aging-time *time*
no ipv6 mld snooping dyn-mr-aging-time

time	1-3600

300s

MLD IPv6 PIM
Hello

500s

`Ruijie(config)#` **ipv6 mld snooping d7(n-mr-aging-time)]TJ/TT2 1 Tf-0.0053 Tc 0 Tw 18.138 0**

10.4	

46.1.7

mld snooping

MLD

0

mld snooping

MLD

MLD 15s

```
Ruijie(config)# ipv6 mld snooping query-max-response-time 15
```


10.4	

46.1.8 ipv6 mld snooping vlan

ipv6 mld snooping vlan *vid* vlan mld snooping **no ipv6 mld snooping vlan** *vid* vlan mld snooping

ipv6 mld snooping vlan *vid*

no ipv6 mld snooping vlan *vid*

vid	vlan id 1-4094

mld snooping vlan mld snooping

mld snooping vlan mld snooping

vlan mld snooping

VLAN 1 mld snooping

```
Ruijie(config)# no  ipv6 mld snooping vlan 1
```


10.4	

interface-id	

IPv6

```
Ruijie(config)# ipv6 mld snooping vlan 1 mrouter interface
fastEthernet 0/1
```


10.4	

46.1.11 ipv6 mld snooping vlan static interface

mld snooping

MLD report **ipv6 mld snooping vlan static interface** no

ipv6 mld snooping vlan *vid* **static** *ipv6-multiaddr* **interface** *interface-id*

no ipv6 mld snooping vlan *vid* **static** *ipv6-multiaddr* **interface** *interface-id*

vid	vlan id 1-4094
ipv6-multiaddr	
interface-id	

FF88::1

```
Ruijie(config)# ipv6 mld snooping vlan 1 static FF88::1 interface
fastEthernet 0/1
```

ipv6 mld snooping vlan MLD **mrouter interface**	

IPv6

10.47

46.1.12 ipv6 mld snooping fast-leave enable

mld snooping fast-leave **ipv6 mld snooping fast-leave enable** no7 mld snooping fast-leave

ipv6 mld snooping fast-leave enable

no7ipv6 mld snooping fast-leave enable

7	
7	7
7	7
7	

mld snooping fast-leave

```
Ruijie(config)# ipv6 mld snooping fast-leave
```

7	

ipv6 mld snooping suppression enable

10.4

46.1.13

mld snooping suppression **ipv6 mld snooping suppression enable** no mld snooping suppression

ipv6 mld snooping suppression enable

no ipv6 mld snooping suppression enable

MLD Profile MLD Report
MLD Profile
profile filter

0/1 profile 1

```
Ruijie(config)# interface fastEthernet 0/1
Ruijie(config-if)# ipv6 mld snooping filter 1 1
```

10.4n	

clear ipv6 mld snooping gda-tablen

,n **clear ipv6 mld snooping gda-table** n

clear ipv6 mld snooping gda-table*n*

n	n

n n

n n n

n n n

n n *n*

Ruijie#n**clear ipv6 mld snooping gda-table***n*

n

n n

n	n

n n

n

n n

n **10.4**	n

46.1.17n debug mld-snp

mld , **debug mld-snp**

debug mld-snp

undebug mld-snp*n*

n

n *n*	n

n n

n n n

n

mld

mld

```
Ruijie# debug mld-snp
```


10.4	

46.2

46.2.1 show ipv6 mld snooping

mld snooping

Show ipv6 mld snooping [**gda-table** | **interfaces** | **mrouter**| **statistics** [**vlan** *vlan-id*]]


```
Ruijie# show ipv6 mld snooping statistics
GROUP    Interface    Last report       Last leave     Last
                        time          time         reporter
-------------- ----------- ------------  ------------   -
FF88::1 VL1:Gi4/2   0d:0h:0m:7s     ----    2003::1111
                      Report pkts: 1          Leave pkts: 0
```

3	**show ipv6 mld snooping mrouter**	mld snooping

```
Ruijie# show ipv6 mld snooping mrouter
Vlan   Interface       State     MLD profile number
----     --------        -------     ------------------
1  GigabitEthernet 0/7   static       1
1  GigabitEthernet 0/12  dynamic      0
```

4	**show ipv6 mld snooping gda-table**	GDA

```
Ruijie# show ipv6 mld snooping gda-table
Abbr: M - mrouter
     D - dynamic
     S - static
VLAN  Address            Member ports
-----------------------------------------------------------
1      FF88::1         GigabitEthernet 0/7(S)
```

5	show ipv6 mld snooping interface	mld snooping Filtering

```
Ruijie# show ipv6 mld snooping interface GigabitEthernet 0/7
Interface        Filter Profile number     max-groups
----------      ----------------------    -----------
GigabitEthernet 0/7          1              4294967294
```


10.4	

46.2.2 show ipv6 mld profile

MLD profile

show ipv6 mld profile [*profile-number*]

	profile
profile-number	profile

mld profile

```
1      show ipv6 mld profile
```

47 PIM-DM

47.1 PIM-DM

47.1.1 ip pim dense-mode

PIM-DM **ip pim dense-mode** no PIM-DM

ip pim dense-mode

no ip pim dense-mode

PIM-DM

PIM-DM

PIM-DM

PIM-DM IGMP

“ Failed to enable PIM-DM on <>, resource temporarily unavailable, please try again ”

“ PIM-DM Configure failed! VIF limit exceeded in NSM!!! ”

PIM-DM

PIM-DM PIM-SM DVMRP v4

```
Ruijie# configure terminal
Ruijie(config)# interface fastethernet 0/1
Ruijie(config-if)# ip pim dense-mode
```


47.1.2 ip pim neighbor-filter

ip pim neighbor-filter

PIM-DM Peering

no

ip pim neighbor-filter *access-list*

no ip pim neighbor-filter *access-list*

access-list	access-list acl 1-99 acl

ip pim neighbor-filter

- ACL PIM
  ACL PIM
- peering PIM
  PIM
  PIM

```
Ruijie# configure terminal
Ruijie(config)# interface fastethernet 0/1
Ruijie(config-if)# ip pim neighbor-filter
```

hello override-interval **ip pim override-interval**

no hello override-interval

ip pim override-interval *interval-milliseconds*

no ip pim override-interval

hello interval hello holdtime hello interval 3.5

```
Ruijie# configure terminal
Ruijie(config)# interface fastethernet 0/1
Ruijie(config-if)# ip pim query-interval 123
```


47.1.5 ip pim propagation-delay

hello propagation-delay **ip pim propagation-delay**

no hello propagation-delay

ip pim propagation-delay *interval-milliseconds*

no ip pim propagation-delay

interval-milliseconds	<1-32767>

500

propagation-delay

propagation-delay 600

```
Ruijie# configure terminal
Ruijie(config)# interface fastethernet 0/1
Ruijie(config-if)# ip pim propagation-delay 600
```


47.1.6 ip pim state-refresh disable

PIM-DM **ip pim state-refresh disable**
no PIM-DM

ip pim state-refresh disable

no ip pim state-refresh disable

Hello
Hello SR Cap

ip pim state-refresh disable

PIM-DM

PIM-DM

```
Ruijie# configure terminal
Ruijie(config)# ip pim state-refresh disable
```


47.1.7 ip pim state-refresh origination-interval

PIM-DM **ip pim state-refresh origination-interval** no

ip pim state-refresh origination-interval *interval-seconds*

no ip pim state-refresh origination-interval

interval-seconds	<1-100>

60

```
Ruijie# configure terminal
```

```
Address       Interface        VIFIndex  Ver/   Nbr
                                         Mode   Count
10.10.10.10   FastEthernet 0/45    3     v2/D    1
50.50.50.50   VLAN 4               2     v2/D    1
```

Address	PIM-DM IP
Interface	PIM-DM
VIF Index	VIF ID
Ver/Mode	PIM /
Nbr Count	PIM-DM

show ip pim dense-mode neighbor	PIM-DM

47.2.2 show ip pim dense-mode mroute

PIM-DM show ip pim dense-mode mroute

show ip pim dense-mode mroute [*A.B.C.D A.B.C.D*] [*summary*]

A.B.C.D A.B.C.D	,"ÑÀ

```
Assert State: NoInfo
Downstream IF List:
FastEthernet 0/45:
Downstream State: NoInfo
Assert State: Loser, AT:170
```


47.2.3 show ip pim dense-mode neighbor

PIM-DM **show ip pim dense-mode neighbor**

show ip pim dense-mode neighbor [*interface-type interface-number*]

interface-type interface-number	

/ /

show ip pim dense-mode neighbor

```
Ruijie# show ip pim dense-mode neighbor
Neighbor-Address Interface     Uptime/Expires    Ver
10.10.10.1   FastEthernet 0/45 00:19:29/00:01:21  v2
50.50.50.1   VLAN 4            00:22:09/00:01:39  v2
```

Neighbor-Address	
Interface	
Uptime/Expires	
Ver	PIM

47.2.4 show ip pim dense-mode nexthop

PIM-DM **show ip pim dense-mode nexthop**

47.2.5 show ip pim dense-mode track

PIM-DM show ip pim dense-mode track

show ip pim dense-mode track

47.2.6 clear ip pim dense-mode track

PIM-DM clear ip pim dense-mode track

clear ip pim dense-mode track

PIM

```
Ruijie# clear ip pim dense-mode track
```

show ip pim dense-mode track	PIM

48 PIM-SM

48.1 PIM-SM 表

48.1.1 clear ip mroute

clear ip mroute {* | *group_address* [*source_address*] }

*	pimsm
group_address	pimsm
group_address source_address	pimsm

pimsm

```
Ruijie# clear ip mroute *
Ruijie# clear ip mroute 224.2.2.2
Ruijie# clear ip mroute 224.2.2.2 2.2.2.2
```

-	-

*	pimsm
group_address	pimsm
group_address source_address	pimsm

pimsm

```
Ruijie# clear ip mroute statistics *
Ruijie# clear ip mroute statistics 224.2.2.2
Ruijie# clear ip mroute statistics 224.2.2.2 2.2.2.2
```

-	-

-	-

48.1.4 clear ip pim sparse-mode track

clear ip pim sparse-mode track

-	-

PIM

PIM

```
Ruijie# clear ip pim sparse-mode track
```

show ip pim sparse-mode track	-

-	-

48.1.5 ip multicast-routing

ip multicast-routing

-	-

pimsm

ip pim sparse-mode pimsm

```
Ruijie (config)# ip multicast-routing
```

-	-

-	-

48.1.6 ip pim accept-bsr list

ip pim accept-bsr list { *<1-99>* | *<1300-1999>* | *WORD* }

<1-99>	*<1300-1999>*	IP acl
WORD	IP acl

PIMSM BSM

PIMSM BSR

```
Ruijie# configure terminal
Ruijie(config)# ip pim accept-bsr list 1
```

-	-

-	-

48.1.7 ip pim accept-crp list

ip pim accept-crp list {*<100-199>*|*<2000-2699>*|*WORD*}

<100-199>|<2000-2699>	IP	acl
WORD	IP	acl

BSR RP

BSR BSR BSR C-RP

```
Ruijie# configure terminal
Ruijie(config)# ip pim accept-crp list 100
```

-	-

-	-

48.1.8 ip pim accept-crp-with-null-group

ip pim accept-crp-with-null-group

-	-

BSR prefix-count 0 C-RP-ADV

BSR BSR BSR prefix-count 0 C-RP-ADV C-RP

```
Ruijie# configure terminal
Ruijie(config)# ip pim accept-crp-with-null-group
```

-	-

-	-10.4(1)

48.1.9 ip pim accept-register list

ip pim accept-register list *access-list*

access-list	access-list <100 199> <2000 2699> acl

RP

RP

```
Ruijie (config)# ip pim accept-register list 100
Ruijie (config)# access-list 100 permit ip 192.168.195.0 0.0.0.255
225.1.1.1 0.0.0.255
```

access-list	-

-	-

48.1.10 ip pim bsr-candidate

ip pim bsr-candidate *interface-type interface-number* [*hash-mask-length*] [*priority-value*]

interface-type interface-number	
hash-mask-length	<0-32> RP HASH 10
priority-value	<0-255> BSR 64

BSR

-	-

-	-

48.1.12 ip pim dr-priority

ip pim dr-priority *priority-value*

priority-value	<0-4294967294> 1

DR 1

DR

- hello DR
  DR
  IP DR
- hello
  DR IP DR

```
Ruijie# configure terminal
Ruijie(config)# interface g 0/3
Ruijie(config-if)# ip pim dr-priority 10000
```

-	-

-	-

48.1.13 ip pim ignore-rp-set-priority

ip pim ignore-rp-set-priority

-	-

rp-set rp

rp rp

```
Ruijie# configure terminal
Ruijie(config)# ip pim ignore-rp-set-priority
```

-	-

48.1.15 ip pim mib

ip pim mib dense-mode

-	-

```
Ruijie(config)# interface g 0/3
Ruijie(config-if)# ip pim neighbor-filter 14
Ruijie(config-if)# exit
Ruijie(config)#access-list 14 deny 192.168.1.5 0.0.0.255
```

access-list	-

-	-

48.1.17 ip pim neighbor-tracking

ip pim neighbor-tracking

-	-

join join join

join
join

```
Ruijie# configure terminal
Ruijie(config)# interface g 0/3
Ruijie(config-if)# ip pim neighbor-tracking
```

ip pim propagation-delay	-

-	-

48.1.18 ip pim override-interval

ip pim override-interval *interval-milliseconds*

interval-milliseconds	<1-65535>

Hello Override-Interval 2500

Override-Interval

J/P-override-interval J/P-override-interval
Join-Prune holdtime

Override-Interval 3000

```
Ruijie# configure terminal
Ruijie(config)# interface g0/3
Ruijie(config-if)# ip pim override-interval 3000
```

ip pim propagation-delay-	-

-	-

48.1.19 ip pim propagation-delay

ip pim propagation-delay *interval-milliseconds*

interval-milliseconds

PIM-SM

-	-

48.1.21 ip pim query-interval

ip pim query-interval *interval-seconds*

interval-seconds	<1-65535>

hello 30s

Hello Hello Hello
Hello 3.5 Hello * 3.5 >
65535 Hello 18725

```
Ruijie# configure terminal
Ruijie(config)# interface g 0/3
Ruijie(config-if)# ip pim query-interval 123
```

-	-

-	

RP pimsm

cpu

```
Ruijie# configure terminal
Ruijie(config)# ip pim register-decapsulate-forward
```

-	-

-	-

48.1.23 ip pim register-checksum-wholepkt

ip pim register-checksum-wholepkt [**group-list** *access-list*]

access-list	access-list <1 99> <1300 1999> acl group-list access-list

pim pim

pim

pim

```
Ruijie# configure terminal
Ruijie(config)#ip pim register-checksum-wholepkt
Ruijie(config)#ip pim register-checksum-wholepkt group-list 99
Ruijie(config)# access-list 99 permit 225.1.1.1 0.0.0.255
```

access-list	-

-	-

48.1.24 ip pim register-rate-limit

ip pim register-rate-limit *rate*

rate	register <1-65535>

S G

DR RP

```
Ruijie# configure terminal
Ruijie(config)# ip pim register-rate-limit 3000
```

-	-

-	-

48.1.25 ip pim register-rp-reachability

ip pim register-rp-reachability

-	-

RP

RP

```
Ruijie# configure terminal
Ruijie(config)# ip pim register-rp-reachability
```

-	-

-	-

48.1.26 ip pim register-source

ip pim register-source {*local_address* | *interface-type interface-number*}

local_address	ip
interface-type interface-number	ip ip

IP DR

IP

RP Register-Stop

PIM

```
Ruijie# configure terminal
Ruijie(config)# ip pim register-source 192.168.195.80
Ruijie(config)# ipv6 pim register-source g 0/3
```

-	-

48.1.27 ip pim register-suppression

ip pim register-suppression *seconds*

seconds	<1-65535>

60

DR DR ip pim rp-register-kat

ACL RP

- RP RP
- ACL ACL
  224/4
- RP RP
  RP IP
  RP IP
- RP
  RP

```
Ruijie# configure terminal
Ruijie(config)# ip pim rp-address 210.34.0.55
Ruijie(config)# ip pim rp-address 210.34.0.55 4
Ruijie(config)# access-list 4 permit 225.1.1.1 0.0.0.255
```

access-list	-

-	-

48.1.29 ip pim rp-candidate

ip pim rp-candidate *interface-type interface-number* [**priority** *priority-value*] [***i*nterval** *interval-seconds*][**group-list** *access_list*]

interface-type interface-number	
priority-value	<0-255> priority priority-value 192
Interval-seconds	<1-16383> interval interval-seconds interval-seconds 60s
access_list	acl 1-99 acl group-list access_list

RP

PIM-SM RPT RP
RP RP BSR

permit ace deny ace

```
Ruijie# configure terminal
Ruijie(config)# ip pim rp-candidate g 0/3
Ruijie(config)# ip pim rp-candidate g 0/3 priority 200 group-list
3 interval 70
Ruijie(config)# access-list 3 permit 225.1.1.1 0.0.0.255
```

access-list	-

-	-

48.1.30 ip pim rp-register-kat

ip pim rp-register-kat *seconds*

seconds	KAT <1-65535>

RP KAT 210s

rp kat

```
Ruijie# configure terminal
Ruijie(config)# ip pim rp-register-kat 250
```

-	-

-	-

48.1.31 ip pim sparse-mode

ip pim sparse-mode

rp spt SPT group-list

```
Ruijie# configure terminal
Ruijie(config)# ip pim spt-threshold
eshold group-list 12
```

access-list -	

- -	

48.1.33 ip pim ssm

ip pim ssm { **default** | **range** *access_list*}

default	232/8		
access_list	acl	1-99	acl

SSM

pim ssm pim ssm

1 232/8 Ruijie# **configure terminal** Ruijie(config)#
10 Ruijie(config)# **ip pim SSM range** *10* Ruijie(config)# **access-list** 10 **pe**

access-list -	

-	-

48.1.34 ip pim triggered-hello-delay

ip pim triggered-hello-delay *interval-seconds*

interval-seconds	<1-5>

Triggered-Hello-Delay 5s

Triggered-Hello-Delay
Triggered-Hello-Delay í o ¢

-	-

/ /

```
Ruijie #show debugging
      show debugging
Ruijie #show debugging
ip packet debug:
ip packet debug debugging is on, acl: 0
```

-	-

-	-

48.2.2 show ip pim sparse-mode bsr-router

show ip pim sparse-mode bsr-router

-	-

BSR

/ /

BSR

```
Ruijie# show ip pim sparse-mode bsr-router
    show ip pim sparse-mode bsr-router
Ruijie# show ip pim sparse-mode bsr-router
PIMv2 Bootstrap information
This system is the Bootstrap Router (BSR)
BSR address: 192.168.127.1
Uptime:  01d23h14m, BSR Priority: 64, Hash mask length: 10
Next bootstrap message in 00:00:42
Role: Candidate BSR   Priority: 64, Hash mask length: 10
```

```
State: Elected BSR
Candidate RP: 30.30.100.200(GigabitEthernet 0/3)
Advertisement interval 60 seconds
Next Cand_RP_advertisement in 00:00:32
```

-	-

-	-

48.2.3 show ip pim sparse-mode interface

show ip pim sparse-mode interface [*interface-type interface-number* [**detail**]]

interface-type interface-number	
detail	

/ /

PIM SM

```
Ruijie#show ip pim sparse-mode interface g 0/4 detail
Ruijie#show ip pim sparse-mode interface
Ruijie#show ip pim sparse-mode interface g 0/3
```

show ip pim sparse-mode interface detail

```
Ruijie #show ip pim sparse-mode interface detail
GigabitEthernet 0/3 (vif 3):
  Address 30.30.100.200, DR 30.30.100.200
  Hello period 30 seconds, Next Hello in 11 seconds
  Triggered Hello period 5 seconds
  Neighbors:
   2.2.2.2
```

-	-

-	-

48.2.4 show ip pim sparse-mode local-members

show ip pim sparse-mode local-members [*interface-type interface-number*]

interface-type interface-number	

/

```
Ruijie# show ip pim local-members
Ruijie# show ip pim local-members g 0/3        sh ip pim sparse-m
    PIM SM              IGMP
                                   Ruijie (config-if)#sh ip
                                   PIM Local membership infor
                                   GigabitEthernet 0/3:
                                   (*, 225.1.1.1) : Include
                                   Loopback 1:
                                   GigabitEthernet 0/5:
```

-	-

-	-

48.2.5 show ip pim sparse-mode mroute

{show ip pim sparse-mode mroute|

group_address	A.B.C.D
source_address	A.B.C.D

-	-

/ /

rp

```
Ruijie #show ip pim sparse-mode rp mapping

Ruijie (config)#sh ip pim sparse-mode rp mapping
PIM Group-to-RP Mappings
Group(s): 224.0.0.0/4
RP: 30.30.200.1
Info source: 30.30.200.1, via bootstrap, priority 192
Uptime: 00:00:51, expires: 00:01:39
RP: 30.30.100.1
Info source: 30.30.200.1, via bootstrap, priority 192
Uptime: 00:19:14, expires: 00:01:38
Group(s): 224.0.0.0/4, Static
RP: 100.100.100.100
Uptime: 00:45:35
```

-	-

-	-

48.2.9 show ip pim sparse-mode rp-hash

show ip pim sparse-mode rp-hash *group-address*

group-address	

/ /

RP

```
Ruijie# show ip pim sparse-mode rp-hash 225.1.1.1

Ruijie# show ip pim sparse-mode rp-hash 225.1.1.1
RP: 30.30.100.1
Info source: 30.30.100.1, via bootstrap
```

	-
-	-

400.00 0.006 Tf553Tr 12AFC18DB1r 102 72.72 689.0603 Tm [<1447>-6<09C441C81BE2>]TJ /TT

-	-

48.2.10 show ip pim sparse-mode track

show ip pim sparse-mode track

49 PIM-SMv6

49.1 PIM-SMv6

49.1.1 clear ipv6 mroute

clear ipv6 mroute {* | ipv6_group_address | ipv6_group_address ipv6_source_address }

*	
ipv6_group_address	
ipv6_group_address *ipv6_source_address*	

```
Ruijie# clear ipv6 mroute *
Ruijie# clear ipv6 mroute Ruijie#
```

*	
ipv6_group_address	
ipv6_group_address *ipv6_source_address*	

```
Ruijie# clear ipv6 mroute statistics *
Ruijie# clear ipv6 mroute statistics ff66::6666
Ruijie# clear ipv6 mroute statistics ff66::6666 3333::3333
```

-	-

-	-

49.1.3 clear ipv6 pim sparse-mode bsr rp-set

clear ipv6 pim sparse-mode bsr rp-set *

*	RP-SET

RP

```
Ruijie# clear ipv6 pim sparse-mode bsr rp-set *
```

-	-

-	-

49.1.4 clear ipv6 pim sparse-mode track

clear ipv6 pim sparse-mode track

-	-

```
Ruijie(config)# ipv6 multicast-routing
```

-	-

-	-

49.1.6 ipv6 pim accept-bsr list

ipv6 pim accept-bsr list *WORD*

WORD	v6 acl

PIM-SMv6 BSM

PIM-SMv6 BSR

```
Ruijie# configure terminal
Ruijie(config)# ipv6 pim accept-bsr list bsr-list
```

-	-

BSR RP

BSR BSR BSR C-RP

```
Ruijie# configure terminal
Ruijie(config)# ipv6 pim accept-crp list crp-list
```

-	-

-	-10.4 2

49.1.9 ipv6 pim accept-register

ipv6 pim accept-register {**list** *ipv6_access-list* | **route-map** *map-name*}

ipv6_access-list	ipv6_access-list acl
map-name	

RP

BSM BSR BSM
BSM

g 0/3 BSR

```
Ruijie# configure terminal
Ruijie(config)# interface g 0/3
Ruijie(config-if)# ipv6 pim bsr-border
```

-	-

-	-

49.1.11 ipv6 pim bsr-candidate

-	-

-	-

49.1.12 ipv6 pim dr-priority

ipv6 pim dr-priority *priority-value*

priority-value	<0-4294967294> 1

DR 1

DR

- Hello DR
  DR
  IP DR
- Hello
  DR IP DR

```
Ruijie# configure terminal
Ruijie(config)# interface g 0/3
Ruijie(config-if)# ipv6 pim dr-priority 11234
```

-	-

-	-

49.1.13 ipv6 pim ignore-rp-set-priority

ipv6 pim ignore-rp-set-priority

-	-

RP-SET RP

RP RP

```
Ruijie# configure terminal
Ruijie(config)# ipv6 pim ignore-rp-set-priority
```

-	-

-	-

49.1.14 ipv6 pim jp-timer

ipv6 pim jp-timer *interval-seconds*

Interval-seconds	<1-65535>

Join/Prune 60s

Join/Prune

```
Ruijie# configure terminal  Ëfîê^FRÞBA%"0cNð#7pñFg#X$!uaQ0 dVCn1Dã(Aã(2 0aU
```

-	-

49.1.15 ipv6 pim neighbor-tracking

ipv6 pim neighbor-tracking

-	-

join join join

join
join

```
Ruijie# configure terminal
Ruijie(config)# interface g 0/3
Ruijie(config-if)# ipv6 pim neighbor-tracking
```

ipv6 pim propagation-delay	-

-	-

49.1.16 ipv6 pim neighbor-filter

ipv6 pim neighbor-filter *ipv6_access-list*

ipv6_access-list	ipv6_access-list acl

PIM

PIM-SMV6 peering

```
Ruijie# configure terminal
Ruijie(config)# interface g 0/3
Ruijie(config-if)# ipv6 pim neighbor-filter acl
Ruijie(config-if)# exit
Ruijie(config)# ipv6 access-list acl
                    fe80::2d0:f8ff:fe22:33ad
Ruijie(config-ipv6-acl)#  deny ipv6 fe80::2d0:f8ff:fe22:33ad/128
any
```

ipv6 access-list	-

ipv6 pim propagation-delay	-

ipv6 pim register-rate-limit *rate*

rate	register <1-65535>

S G

DR RP

```
Ruijie# configure terminal
Ruijie(config)# ipv6 pim register-rate-limit 3000
```

-	-

-	-

49.1.23 ipv6 pim register-rp-reachability

ipv6 pim register-rp-reachability

-	-

RP

RP

```
Ruijie# configure terminal
Ruijie(config)# ipv6 pim register-rp-reachability
```

-	-

-	-

49.1.24 ipv6 pim register-source

ipv6 pim register-source {*ipv6_local_address* | *interface-type interface-number*}

ipv6_local_address	IPV6
interface-type interface-number	ipv6

IPV6 DR

IPv6

RP IPv6

60

DR DR ipv6 pim rp-register-kat
RP RP keepalive

RP RP

```
Ruijie# configure terminal
Ruijie(config)# ipv6 pim rp-address 3333::3333 acl
Ruijie(config)# ipv6 access-list acl
```

```
Ruijie(config-ipv6-acl)# permit ipv6  any ff66::6666/64
```

-	-

-	-

49.1.28 ipv6 pim rp embedded

ipv6 pim rp embedded [**group-list** *ipv6_acl_name*]

	ipv6_acl_name RP**24 TcCD Tf0CDD Tc**

ipv6_acl_name

seconds	KAT <1-65535>

RP KAT 210s

RP KAT

```
Ruijie# configure terminal
Ruijie(config)# ipv6 pim rp-register-kat 250
```

-	-

-	-

49.1.30 ipv6 pim sparse-mode

ipv6 pim sparse-mode

-	-

PIM-SMv6

PIM-SMv6
PIM-SMv6
PIM-SMv6 MLD

“ Failed to enable PIM-SMv6 on <
>, resource temporarily unavailable, please try again ”

“ PIM-SMv6 Configure failed! VIF limit exceeded in NSM!!! ”
PIM-SMv6
PIM-SMv6 PIM-DMv6

```
Ruijie# configure terminal
Ruijie(config)# interface g 0/3
Ruijie(config-if)# ipv6 pim sparse-mode
```

-	-

-	-

49.1.31 ipv6 pim spt-threshold

ipv6 pim spt-threshold [**group-list** *ipv6_access-list*]

ipv6_access-list	ipv6_access-list acl group-list ipv6_access-list SPT

SPT

RPT SPT
SPT

/128 ff66::6666/64

ipv6 access-list	-

ipv6 pim static-rp-preferred

-	-

BSR RP RP

RP BSR RP

RP

-	-

-	-

49.2

49.2.1 show debugging

show debugging

-	-

/ /

```
Ruijie# show debugging
PIM-SM6 Debugging status:
  PIM packet debugging is on
```

-	-

-	-

49.2.2 show ipv6 pim sparse-mode bsr-router

show ipv6 pim sparse-mode bsr-router

-	-

/ /

BSR .

```
Ruijie# show ipv6 pim sparse-mode bsr-router
```

```
GigabitEthernet 0/5 (vif 1):
Address fe80::2d0:f8ff:fe22:33ad, DR fe80::2d0:f8ff:fe22:34b3
Hello period 30 seconds, Next Hello in 6 seconds
Triggered Hello period 5 seconds
Secondary addresses:
   3333::8888
   4444::4444
  Neighbors:
   fe80::2d0:f8ff:fe22:34b3
```

	-	-

```
Ruijie# show ipv6 pim sparse-mode neighbor detail
Nbr fe80::2d0:f8ff:fe22:34b3 (GigabitEthernet 0/5)
 Expires in 86 seconds
  Secondary addresses:
   6666::6666
```

-	-

-	-

49.2.7 show ipv6 pim sparse-mode nexthop

show ipv6 pim sparse-mode nexthop

-	-

/ /

metric

-	-

-	-

49.2.8 show ipv6 pim sparse-mode rp mapping

show ipv6 pim sparse-mode rp mapping

-	-

/ /

RP

```
Ruijie# show ipv6 pim sparse-mode rp mapping
PIM Group-to-RP Mappings
This system is the Bootstrap Router (v2)
Group(s): ff00::/8
  RP: 3333::1
    Info source: 3333::1, via bootstrap, priority 192
        Uptime: 00:12:40, expires: 00:01:50
```

-	-

-	-

49.2.9 show ipv6 pim sparse-mode rp-hash

show ipv6 pim sparse-mode rp-hash *ipv6_group-address*

ipv6_group-address	IPv6

/ /

ipv6_group-address RP

```
Ruijie# show ipv6 pim sparse-mode rp-hash ff66::6666
RP: 3333::8888
Info source: 3333::8888, via bootstrap
PIMv2 Hash Value 126
RP 3333::8888, via bootstrap, priority 192, hash value 1468234650
```

-	-

-	-

49.2.10 show ipv6 pim sparse-mode track

show ipv6 pim sparse-mode track

-	-

/ /

PIM

clear ipv6 pim sparse-mode track

PIM

```
Ruijie# show ipv6 pim sparse-mode track
PIMv6 packet counters track
Elapsed time since counters cleared: 00:04:03
                          received      sent
Valid PIMSMv6 packets:      0             8
Hello:                    0             8
Join-Prune:               0             0
Register:                   0             0
Register-Stop:              0             0
Assert:                     0             0
BSM:                      0             0
C-RP-ADV:                 0             0
PIMDMv6-Graft:              0
PIMDMv6-Graft-Ack:          0
PIMDMv6-State-Refresh:      0
Unknown PIMv6 Type:         0
Errors:
Malformed packets:                        0
Bad checksums:                                  0
Send errors:                                    0
Packets received with unknown PIMv6 version:    0
```


50 AAA

50.1

50.1.1 aaa authentication dot1x

AAA 802.1X **aaa authentication dot1x** 802.1X
no 802.1X

aaa authentication dot1x {**default** | *list-name*} *method1* [

enable	
username	

-	-

50.1.3 aaa authentication login

AAA Login **aaa authentication login** Login

no

aaa authentication login {**default** | *list-name*} *method1* [*method2*...]

no aaa authentication login {**default** | *list-name*}

ogin

AAA

aaa new-model	AAA
ppp authentication	PPP
username	

-	-

50.1.5 login authentication

Login **login authentication** Login no

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
```

aaa new-model	AAA
username	
login authentication	Login

-	-

50.2

50.2.1 aaa authorization commands

NAS CLI AAA

aaa authorization commands

no AAA

aaa authorization commands *level* {**default** | *list-name*} *method1* [*method2*...]

no aaa authorization commands *level* {**default** | *list-name*}

level	0~15
default	
list-name	
method	“ none group ” 4
none	
group	TACACS+

AAA

RGOS AAA

14 14

TACACS+ 15

```
Ruijie(config)# aaa authorization commands 15 default group tacacs+
```


aaa new-model	AAA
authorization commands	

AAA **aaa authorization console** no AAA

aaa authorization console

no aaa authorization console

-	-

RGOS

```
Ruijie(config)# aaa authorization console
```

aaa new-model	AAA
aaa authorization commands	AAA
authorization commands	

-	-

50.2.4 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

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

-	-

50.2.7 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

-	-

50.3

50.3.1 aaa accounting commands

NAS

aaa accounting commands no

aaa accounting commands

RGOS

none

TACACS+ 15

```
Ruijie(config)# aaa accounting commands 15 default start-stop group tacacs+
```

aaa new-model	AAA
aaa authentication	AAA
accounting commands	

-	-

50.3.2 aaa accounting exec

NAS **aaa accounting exec** no Exec

aaa accounting exec {**default** | *list-name*} **start-stop** *method1* [*method2*...]

no aaa accounting exec {**default** | *list-name*}

default	Exec
list-name	Exec
method	“ **none group** ” 4
none	

RGOS Exec
none Exec
NAS CLI Start
Stop
Start Stop
Exec

RADIUS NAS

```
Ruijie(config)# aaa accounting exec default start-stop group radius
```

aaa new-model	AAA
aaa authentication	AAA
accounting commands	Exec

-	-

50.3.3 aaa accounting network

aaa

accounting network no

aaa accounting network {**default** | *list-name*} **start-stop** *method1* [*method2*...] [} T4 1 4ault

RGOS **start-stop**

RADIUS

```
Ruijie(config)# aaa accounting network default start-stop group
radius
```

aaa new-model	AAA
aaa accounting network	

-	-

50.3.5 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	

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

AAA

AAA default
domain-name
32

```
Ruijie(config)# aaa domain ruijie.com
Ruijie(config-aaa-domain)#
```

aaa new-model	AAA
aaa domain enable	AAA
show aaa domain	

-	-

50.4.2 aaa domain enable

AAA
AAA no

aaa domain enable

no aaa domain enable

-	-

AAA

AAA

AAA

```
Ruijie(config)# aaa domain enable
```


aaa new-model	AAA
show aaa domain	

-	-

50.4.3 access-limit

IEEE802.1x no

access-limit *num*

no access-limit

num	IEEE802.1x

ruijie.com 20

```
Ruijie(config)# aaa domain ruijie.com
Ruijie(config-aaa-domain)# access-limit 20
```


accounting network {**default |** *list-name*}

no accounting network

default	
list-name	

default

Network

Network

```
Ruijie(config)# aaa domain ruijie.com
Ruijie(config-aaa-domain)# accounting network default
```

aaa new-model	AAA
aaa domain enable	AAA
show aaa domain	

-	-

50.4.5 authentication dot1x

IEEE802.1x no

authentication dot1x {**default** | *list-name*}

no authentication dot1x

default	
list-name	

default

IEEE802.1x

IEEE802.1x

```
Ruijie(config)# aaa domain ruijie.com
Ruijie(config-aaa-domain)# authentication dot1x default
```

aaa new-model	AAA
aaa domain enable	AAA
show aaa domain	

show aaa domain	

-	-

50.4.7 state

no

state {**block** | **active**}

no state

block	
active	

```
Ruijie(config)# aaa domain ruijie.com
Ruijie(config-aaa-domain)# state block
```

aaa new-model	AAA

aaa domain enable

show aaa domain [**default** | *domain-name*]

default	
domain-name	

domain.com

```
Ruijie# show aaa domain domain.com

=============Domain domain.com=============
State: Active
Username format: Without-domain
Access limit: No limit
802.1X Access statistic: 0

Selected method list:
 authentication dot1x default
```

aaa new-model	AAA
aaa domain enable	AAA

-	-

50.4.9 username-format

NAS no

username-format {**without-domain** | **with-domain**}

no username-format

without-domain	
with-domain	

NAS

```
Ruijie(config)# aaa domain ruijie.com
Ruijie(config-aaa-domain)# username-domain without-domain
```

aaa new-model	AAA
aaa domain enable	AAA
show aaa domain	

-	-

50.5 AAA

50.5.1 aaa group server

AAA no

aaa group server {**radius** | **tacacs+**} *name*

no aaa group server {**radius** | **tacacs+**} *name*

name	“ radius ” “ tacacs+ ” RADIUS TACACS+

AAA RADIUS TACACS+

```
Ruijie(config)# aaa group server radius ss
Ruijie(config-gs-radius)# end
Ruijie# show aaa group
Group Name:  ss
Group Type:  radius
Referred:   1
Server List:
```


show aaa group

-	-

50.5.3 server

AAA no

server *ip-addr* [**authen-port** *port1*] [**acct-port** *port2*]

no server *ip-addr* [**authen-port** *port1*] [**acct-port** *port2*]

ip-addr	ip
port1	RADIUS
port2	RADIUS

```
Ruijie(config)# aaa group server radius ss
Ruijie(config-gs-radius)# server 192.168.4.12
acct-port 5 authen-port 6
Ruijie(config-gs-radius)# end
Ruijie# show aaa group
Group Name:  ss
Group Type:  radius
Referred:   2
Server List:
IP Address: 192.168.4.12
Authentication Port: 6
Accounting Port: 5
Referred:  1
```

aaa group server	aaa
show aaa group	aaa

-	-

50.5.4 show aaa group

AAA

show aaa group

-	-

AAA

```
Ruijie# show aaa group
Group Name:  ss
Group Type:  radius
Referred:   2
Server List:
IP Address: 192.168.217.64
Authentication Port: 1812
Accounting Port: 1813
Referred:  1
```

aaa group server	AAA

-	-

50.6 AAA

50.6.1 aaa local authentication attempts

login

aaa local authentication attempts *max-attempts*

max-attempts	1~2147483647

3

Login

```
Ruijie# configure terminal
Ruijie(config)# aaa local authentication attempts 6
```

Show running-config	
Show aaa lockout	login

clear aaa local user lockout {**all** | **user-name** <*word*>}

<*word*>	ID

Ruijie# **clear aaa local user lockout all**

show running-config	
show aaa lockout	login

-	-

50.6.5 debug aaa

AAA **no**

debug aaa event

no debug aaa event

-	-

EXEC

-	-

50.6.7 show aaa user lockout

show aaa user lockout {**all** | **user-name** <*word*>}

<*word*>	ID

Ruijie# **show aaa user lockout all**

show running-config	
show aaa lockout	login

-	-

51 RADIUS

51.1 RADIUS

51.1.1 ip radius source-interface

radius **ip radius source-interface** **no** RADIUS

ip radius source-interface *interface*

no radius source-interface

Interface	radius

radius

radius nas radius ip radius

radius fastEthernet 0/0 ip radius

```
Ruijie(config)# ip radius source-interface
fastEthernet 0/0
```

radius-server host	RADIUS
ip address	ip

radius ttribute{*<id>* | **down-rate-limit** | **dscp** | **mac-limit** | **up-rate-limit**} **vendor-type** <*type*>

no radius attribute {*<id>*|**down-rate-limit** | **dscp** | **mac-limit** | **up-rate-limit**} **vendor-type**

id

2	qos	77
3	user ip	3
4	vlan id	4
5	version to client	5
6	net ip	6
7	user name	7
8	password	8
9	file-diractory	9
10	file-count	10
11	file-name-0	11
12	file-name-1	12
13	file-name-2	13
14	file-name-3	14
15	file-name-4	15
16	max up-rate	75
17	version to server	17
18	flux-max-high32	18
19	flux-max-low32	19
20	proxy-avoid	20
21	dailup-avoid	21
22	ip privilige	22
23	login privilige	42
24	limit to user number	50

max up-rate 211

```
Ruijie(config)# radius attribute 16 vendor-type 211
```

radius set qos cos	radius qos cos

-	-

no radius-server deadtime

minnutes	1-1000

5

D—', ₱

port-number	RADIUS UDP 0

RADIUS

RADIUS AAA RADIUS
radius-server RADIUS

IPv4 RADIUS
```
Ruijie(config)# radius-server host 192.168.12.1
```
IPv6 RADIUS
```
Ruijie(config)# radius-server host 3000::100
```

aaa authentication	AAA
radius-server key	RADIUS
radius-server retransmit	RADIUS
radius-server timeout	RADIUS

-	-

51.1.6 radius-server key

RADIUS
radius-server key no

RADIUS aaa

```
Ruijie(config)# radius-server key aaa
```

radius-server host	RADIUS
radius-server retransmit	RADIUS
radius-server timeout	RADIUS

-	-

51.1.7 radius-server retransmit

RADIUS

radius-server retransmit **no**

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

-	-

51.1.8 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

-	-

51.1.9 radius set qos cos

radius qos cos

radius set qos cos

no radius set qos cos

-	-

qos dscp

qos cos dscp

```
Ruijie(config)# radius set qos cos
```

radius vendor-specific extend	Radius id

h

-	-

51.2 RADIUS

51.2.1 debug radius

RADIUS no RADIUS

debug radius [**event | detail**]

no debug radius [**event | detail**]

-	-

EXEC

-	-

-	-

51.2.2 show radius parameter

RADIUS

show radius parameter

-	-

radius

```
Ruijie# show radius parameter
Server Timout:   5 Seconds
Server Deadtime: 5 Minutes
Server Retries:  3
Server Key:      ******
```

radius-server host	RADIUS
radius-server retransmit	RADIUS
radius-server key	RADIUS
radius-server timeout	RADIUS

-	-

51.2.3 show radius server

RADIUS

show radius server

-	-

radius

```
Ruijie# show radius server
server ip : 192.168.4.12
acct  port: 23
```

```
authen  port: 77
server state: ready
server ip : 192.168.4.13
acct  port: 45
authen  port: 74
server state: ready
```

radius-server host	RADIUS
radius-server retransmit	RADIUS
radius-server key	RADIUS

```
10   file-count            10
11   file-name-0           11
12   file-name-1           12
13   file-name-2           13
14   file-name-3           14
15   file-name-4           15
16   max up-rate           75
17   version to server     17
18   flux-max-high32       18
19   flux-max-low32        19
20   proxy-avoid           20
21   dailup-avoid          21
22   ip privilige          22
23   login privilige       42
24   limit to user number  50
```

radius-server host	RADIUS
radius-server retransmit	RADIUS
radius-server key	RADIUS
radius-server timeout	RADIUS

-	-

52 TACACS+

52.1 TACACS+

52.1.1 aaa group server tacacs+

TACACS+ TACACS+

aaa group server tacacs+ *group-name*

no aaa group server tacacs+ *group-name*

group-name	TACACS+

TACACS+

TACACS+

tac1 TACACS+ 1.1.1.1
TACACS+

```
Ruijie(config)# aaa group server tacacs+ tac1
Ruijie(config-gs-tacacs+)# server 1.1.1.1
```

server	TACACS+ server
ip vrf forwarding	TACACS+ VRF

TACACS+

ip tacacs source-interface *interface*

no ip tacacs source-interface

Interface	TACACS+

TACACS+

TACACS+ nas
TACACS+ ip TACACS+

TACACS+ fastEthernet 0/0 ip
TACACS+

```
Ruijie(config)# ip tacacs source-interface fastEthernet 0/0
```

tacacs-server host	TACACS+
ip address	ip

-	-

52.1.3 ip vrf forwarding(TACACS+)

TACACS+ vrf (VRF)

ip vrf forwarding *vrf-name*

no ip vrf forwarding

vrf-name	vrf

TACACS+

TACACS+

ip vrf forwarding	TACACS+ VRF

-	-

52.1.5 tacacs-server host

TACACS+ IP

tacacs-server host {*ip-address* | *ipv6-address*} [**port** *integer*] [**timout** integer] [**key** *string*]

no tacacs-server host *ip-address*

Ip-address	TACACS+ _

-	-

52.1.6 tacacs-server key

TACACS+

tacacs-server key [*0* | *7*] *string*

no tacacs-server key

string	
0	*7*	0 7

TACACS+ TACACS+
TACACS+
host key
key key

TACACS+ aaa

```
Ruijie(config)#tacacs-server key aaa
```

tacacs-server host	TACACS+
tacacs-server timeout	TACACS+

-	-

52.1.7 tacacs-server timeout

TACACS+

tacacs-server timeout *seconds*

no tacacs-server timeout

seconds	1-1000

5

host timeout
timeout timeout

10
```
Ruijie(config)# tacacs-server timeout 10
```

tacacs-server host	TACACS+
tacacs-server key	TACACS+

-	-

52.2 TACACS+

52.2.1 debug tacacs+

TACACS+ no TACACS+

debug tacacs+

no debug tacacs+

-	-

EXEC

-	-

-	-

52.2.2 show tacacs

TACACS+

show tacacs

-	-

TACACS+

```
Ruijie# show tacacs
Tacacs+ Server : 172.19.192.80/49
Socket Opens: 0
Socket Closes: 0
Total Packets Sent: 0
Total Packets Recv: 0
Reference Count: 0
```

tacacs-server host	TACACS+

-	-

53 GSN

53.1

53.1.1 security address-bind enable

security address-bind enable

no security address-bind enable

-	-

AP AP

GSN

```
Ruijie(config-if)# security address-bind enable
```

security gsn enable	GSN

-	-

53.1.2 security community

smp

security { [**v1 | v2**] **community** *community* | **v3 user** *username* }

no security { [**v1 | v2**] **community** *community* | **v3 user** *username* }

community	*community*
username	v3

v3 **snmp-server** v3
SNMP

```
  1      v1 community
Ruijie(config)# security v1 community public
  2      v3        start
Ruijie(config)# security v3 user start
```

-	-

-	-

53.1.3 security event inteval

security event inteval *interval*

no security event inteval

interval	

5

show security event interval	

ip-address	smp server ip

smp server

-	-

53.2.2 show smp-server

smp server IP

-	-

smp server IP

```
Ruijie# show smp-server
SMP-Server IP  192.168.20.30
```

smp-server host	smp server ip

-	-

54

54.1

54.1.1 protected-ports route-deny

3 3

protected-ports route-deny

no protected-ports route-deny

-	-

3

3 **show running-config**

```
Ruijie(config)# protected-ports route-deny
```

show running-config	3

-	-

54.1.2 strom-control

no

storm-control {**broadcast** | **multicast** | **unicast**} [{**level** *percent* | **pps** *packets* | *rate-bps*}]

no storm-control {**broadcast** | **multicast** | **unicast**} [{**level** *percent* | **pps** *packets* | *rate-bps*}]

broadcast	
multicast	
unicast	
percent	20 20%
packets	pps packets per second
Rate-bps	
64k-2M	64k
2-100M	1M
100M	8M

show storm-control

```
                        GigabitEthernet 1/1
                    4M
Ruijie# configure terminal
Ruijie(config)# interface GigabitEthernet 1/1
Ruijie(config-if)# storm-control multicast 4096
Ruijie(config-if)# end
```

show storm-control	

-	-

54.1.3 switchport protected

no

switchport protected

no switchport protected

-	-

3 **show interfaces**

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

show interfaces	

-	-

54.1.4 switchport port-security

no

switchport port-security [**violation** {**protect** | **restrict** | **shutdown**}]

no switchport port-security [**violation**]

port-security	
violation protect	
violation restrict	trap
violation shutdown	Trap

switchport port-security	
switchport port-security binding interface	
Switchport port-security mac-address	
switchport port-security aging	
show port-security	

-	-

54.1.7 switchport port-security binding interface

IP+ MAC IP

no

[**no**] **switchport port-security binding interface** i*nterface-id mac-address* **vlan** *vlan_id ipv4-address* | *ipv6-address*

[**no**] **switchport port-security binding interface** i*nterface-id ipv4-address* | *ipv6-address*

i*nterface-id*	ID
mac-address	MAC
Vlan_id	MAC VID
Ipv4-address	Ipv4 Ip
Ipv6-address	Ipv6 Ip

```
  1     192.168.1.100      10
Ruijie(config)# switchport port-security binding interface g0/10
192.168.1.100
  2     192.168.1.100 MAC    00d0.f800.5555, VID= 1      10
Ruijie(config)# switchport port-security binding interface g0/10
00d0.f800.5555 vlan 1 192.168.1.100
```

switchport port-security	
switchport port-security binding	
Switchport port-security mac-address	
switchport port-security aging	
show port-security	

-	-

54.1.8 switchport port-security maximum

no

switchport port-security maximum *value*

[**no**] **switchport port-security maximum**

value	1-128

128

128

1 10 2

```
Ruijie(config)#inter g0/10
Ruijie(config-if)# switchport port-security maximum 2
```

switchport port-security	
switchport port-security binding	
Switchport port-security mac-address	
switchport port-security aging	

show port-security	

-	-

54.1.9 switchport port-security mac-address

no

[**no**] **switchport port-security mac-address** ***mac-address*** [*vlan vlan-id*]

mac-address	
vlan-id	MAC VID TRUNK vlan-id

54.1.10 switchport port-security mac-address interface

no

[**no**] **switchport port-security interface** i*nterface-id* **mac-address** *mac-address* [*vlan vlan-id*]

i*nterface-id*	ID
mac-address	
vlan-id	MAC VID TRUNK vlan-id

```
  1      TRUNK     10             00d0.f800.5555 VID=2
Ruijie(config)# switchport port-security interface g0/10
mac-address 00d0.f800.5555 vlan 2
```

switchport port-security	
switchport port-security binding	
Switchport port-security mac-address	
switchport port-security aging	
show port-security	

-	-

54.2

54.2.1 show storm-control

show storm-control [*interface-id*]

interface-id	

```
Ruijie# show storm-control gigabitethernet 1/1
Interface Broadcast Control Multicast Control Unicast Control
---------------------------------- --------------
Gi1/1 Disabled Disabled Disabled
```

storm-control	

-	-

54.2.2 show port-security

show port-security [**address**] [**interface** *interface-id*] [**all**]

address	
interface *interface-id*	
all	

```
Ruijie# show port-security
```

55 URPF

55.1

55.1.1 ip verify unicast source reachable-via ( )

URPF **no** URPF URPF

ip verify unicast source reachable-via {**rx** | **any**} [**allow-default** | *acl_name*]
no ip verify unicast

rx	URPF IP
any	URPF IP
allow-default	URPF
acl_name	ACL 1 to 99 (IP standard access list) 100 to 199 (IP extended access list) 1300 to 1999 (IP standard access list, expanded range) 2000 to 2699 (IP extended access list, expanded range)

URPF

URPF IP

URPF URPF
URPF **allow-default**

URPF ACL (*acl-name*)
ACL ACL deny ACE
permit ACE

1. IPv4/IPv6 URPF
   IPv4 URPF
2. Routed Port L3 AP URPF

- URPF ACL
- URPF 65 127 IPv6 URPF

- URPF
  URPF URPF
  Tunnel
  URPF
  URPF
- URPF
- URPF URPF

3. URPF URPF

1 GigabitEthernet 0/21 URPF

```
Ruijie(config)# interface gigabitEthernet0/21
Ruijie(config-if)# no switchport
Ruijie(config-if)# ip verify unicast source reachable-via rx
```

show ip urpf	URPF

10.4	

55.1.2 ip verify urpf drop-rate compute interval

URPF **no** URPF

ip verify urpf drop-rate compute interval *seconds*

no ip verify urpf drop-rate compute interval

seconds	URPF [30, 300] 30s

30s

URPF URPF

URPF URPF URPF

1 URPF 1

```
Ruijie(config)# ip verify urpf drop-rate compute interval 60
```

ip verify urpf drop-rate notify	URPF
ip verify urpf drop-rate notify hold-down	URPF
ip verify urpf notification threshold	URPF

10.4	

ip verify urpf drop-rate notify hold-down	URPF
ip verify urpf notification threshold	URPF

10.4	

55.1.4 ip verify urpf drop-rate notify hold-down

URPF **no** URPF

ip verify urpf drop-rate notify hold-down *seconds*

no ip verify urpf drop-rate notify hold-down

seconds	URPF [30, 300] 300s

300s

URPF URPF
URPF URPF

1 URPF 1

```
Ruijie(config)# ip verify urpf drop-rate notify hold-down 60
```

ip verify urpf drop-rate compute interval	URPF
ip verify urpf drop-rate notify	URPF
ip verify urpf notification threshold	URPF

10.4	

55.1.5 ip verify urpf notification threshold

Q ¸

snmp-server enable traps NMS URPF

```
  1       SNMP     192.168.12.219      URPF Trap
Ruijie(config)# snmp-server host 192.168.12.219 public urpf
```

snmp-server enable traps	Trap
ip verify urpf drop-rate compute interval	URPF
ip verify urpf drop-rate notify	URPF
ip verify urpf drop-rate notify hold-down	URPF
ip verify urpf notification threshold	URPF

10.4	**urpf**

55.2

55.2.1 show ip urpf

URPF

show ip urpf [**interface** *interface-name*]

interface *interface-name*	

```
  1            GigabitEthernet 0/21    URPF
Ruijie# show ip urpf interface gigabitEthernet0/21
IP verify source reachable-via RX
IP verify URPF drop-rate notify disabled
```

```
IP verify URPF notification threshold is 1000pps
Number of drop packets in this interface is 124
Number of drop-rate notification counts in this interface is 0
```

ip verify unicast source reachable-via	URPF
ip verify urpf drop-rate compute interval	URPF
ip verify urpf drop-rate notify hold-down	URPF
ip verify urpf notification threshold	URPF
clear ip urpf	URPF

10.4	

55.3

55.3.1 clear ip urpf

URPF

clear ip urpf [**interface** *interface-name*]

interface *interface-name*	

```
  1            GigabitEthernet 0/21    URPF
Ruijie# show ip urpf interface gigabitEthernet0/21
IP verify source reachable-via RX
IP verify URPF drop-rate notify disabled
IP verify URPF notification threshold is 1000pps
Number of drop packets in this interface is 124
Number of drop-rate notification counts in this interface is 0
```

```
Ruijie# clear ip urpf interface gigabitEthernet0/21
Ruijie# show ip urpf interface gigabitEthernet0/21
IP verify source reachable-via RX
IP verify URPF drop-rate notify disabled
IP verify URPF notification threshold is 1000pps
Number of drop packets in this interface is 0
Number of drop-rate notification counts in this interface is 0
```

show ip urpf	URPF

10.4

56 DoS 保

56.1

56.1.1 ip deny invalid-l4port

no

ip deny invalid-l4port

no ip deny invalid-l4port

-	-

1

```
Ruijie(config)# ip deny invalid-l4port
```

2

```
Ruijie(config)# no ip deny invalid-l4port
```

show ip deny invalid-l4port	

-	-

56.1.2 ip deny invalid-tcp

TCP **no** TCP

ip deny invalid-tcp

no ip deny invalid-tcp

-	-

TCP

1 TCP
Ruijie(config)# **ip deny invalid-tcp**
2 TCP
Ruijie(config)# **no ip deny invalid-tcp**

show ip deny invalid-tcp	TCP

-	-

56.1.3 ip deny land

Land **no** Land

ip deny land

no ip deny land

Land

1 Land
Ruijie(config)# **ip deny land**
2 Land
Ruijie(config)# **no ip deny land**

TCP

show ip deny invalid-tcp

-	-

```
Ruijie# show ip deny invalid-tcp
DoS Protection Mode                        State
-----------------------------------------  -----
protect against invalid tcp attack         On
```


(**no**)

(**no**) **ip deny land**	Land

-	-

57 DHCP Snooping

57.1 DHCP snooping

57.1.1 ip dhcp snooping

DHCP Snooping no z

-	-

57.1.2 ip dhcp snooping bootp-bind

DHCP Snooping Bootp
no DHCP snooping Bootp

[**no**] **ip dhcp snooping bootp-bind**

-	-

DHCP Snooping Bootp DHCP Snooping Bootp Bootp DHCP Snooping Bootp

DHCP Snooping Bootp

```
Ruijie# configure terminal
Ruijie(config)# ip dhcp snooping bootp-bind
Ruijie(config)# end
Ruijie# show ip dhcp snooping
Switch DHCP snooping status   ENABLE
Verification of hwaddr field status   DISABLE
DHCP snooping database write-delay time: 0 seconds
DHCP snooping option 82 status: ENABLE
DHCP snooping Support Bootp bind status: ENABLE
Interface          Trusted      Rate limit (pps)
```

DHCP Snooping FLASH
no FLASH

ip dhcp snooping database write-delay *time*

[**no**] **ip dhcp snooping database write-delay**

time	DHCP snooping FLASH

FLASH

DHCP Snooping FLASH
IP

flash 3600

```
Ruijie# configure terminal
Ruijie(config)# ip dhcp snooping database write-delay 3600
Ruijie(config)# end
Ruijie# show ip dhcp snooping
Switch DHCP snooping status   ENABLE
Verification of hwaddr field status   DISABLE
DHCP snooping database write-delay time: 3600seconds
DHCP snooping option 82 status: ENABLE
DHCP snooping Support Bootp bind status: ENABLE
Interface              Trusted   Rate limit (pps)
------------------------  -------   ------------
```

```
Verification of hwaddr field status   DISABLE
DHCP snooping database write-delay time: 0 seconds
DHCP snooping option 82 status: ENABLE
DHCP snooping Support Bootp bind status: ENABLE
Interface              Trusted    Rate limit (pps)
```

-	-

57.1.7 ip dhcp snooping verify mac-address

MAC no
MAC

[**no**] **ip dhcp snooping verify mac-address**

-	-

MAC DHCP CLIENT MAC
DHCP CLIENT MAC MAC

DHCP MAC

```
Ruijie# configure terminal
Ruijie(config)# ip dhcp snooping verify mac-address
Ruijie(config)# end
Ruijie# show ip dhcp snooping
Switch DHCP snooping status   ENABLE
Verification of hwaddr field status   ENABLE
DHCP snooping database write-delay time: 0 seconds
DHCP snooping option 82 status: ENABLE
DHCP snooping Support Bootp bind status: ENABLE
Interface              Trusted    Rate limit (pps)
------------------------  -------    ------------
```

show ip dhcp snooping	DHCP snooping

57.2.1 ip dhcp snooping limit rate

DHCP no

[**no**] **ip dhcp snooping limit rate** *rate-value*

rate-value	PPS[Packet Per Second]

DHCP Snooping VLAN

CPP[CPU Protect Protocol] CPP DHCP

CPP DHCP Snooping

CPP

show ip dhcp snooping

1 100pps

```
Ruijie# configure terminal
Ruijie(config)# interface fastEthernet 0/1
Ruijie(config-if)# ip dhcp snooping limit rate 100
Ruijie(config-if)# end
Ruijie# show ip dhcp snooping
Switch DHCP snooping status   ENABLE
Verification of hwaddr field status   DISABLE
DHCP snooping database write-delay time: 0 seconds
DHCP snooping option 82 status: ENABLE
DHCP snooping Support Bootp bind status: ENABLE
Interface              Trusted    Rate limit (pps)
-----------------------  -------    ------------
FastEthernet0/1          NO         100
```

show ip dhcp snooping	DHCP snooping

-	-

57.2.2 ip dhcp snooping suppression

suppression

```
                fastethernet 0/1    TRUST
Ruijie# configure terminal
Ruijie(config)# interface fastEthernet 0/1
Ruijie(config-if)# ip dhcp snooping trust
Ruijie(config-if)# end
Ruijie# show ip dhcp snooping
Switch DHCP snooping status   ENABLE
Verification of hwaddr field status   DISABLE
DHCP snooping database write-delay time: 0 seconds
DHCP snooping option 82 status: ENABLE
DHCP snooping Support Bootp bind status: ENABLE
Interface              Trusted    Rate limit (pps)
-----------------------  -------    ------------
FastEthernet0/1          YES        unlimited
```

show ip dhcp snooping	DHCP snooping

-	-

57.3 DHCP snooping

57.3.1 show ip dhcp snooping

DHCP Snooping

show ip dhcp snooping

```
DHCP snooping database write-delay time: 0 seconds
DHCP snooping option 82 status: ENABLE
DHCP snooping Support Bootp bind status: ENABLE
Interface              Trusted    Rate limit (pps)
-----------------------  -------    ------------
```

ip dhcp snooping	DHCP snooping
ip dhcp snooping verify mac-address	DHCP snooping mac
ip dhcp snooping write-delay	flash
Ip dhcp snooping information option	DHCP option82
ip dhcp snooping bootp-bind	DHCP Snooping Bootp
ip dhcp snooping trust	DHCP snooping trust

-	-

57.3.2 show ip dhcp snooping binding

DHCP Snooping

show ip dhcp snooping binding

-	-

DHCP Snooping

```
Ruijie# show ip dhcp snooping binding
Total number of bindings: 1

MacAddress    IpAddress   Lease(sec)  Type    VLAN  Interface
-----------   --------    --------    -----   ----  ---------
0000.0000.0001 1.1.1.1  78128  dhcp-snooping  1  FastEthernet 0/1
```

57.4.2 debug ip dhcp snooping

DHCP Snooping

debug ip dhcp snooping {**event** | **packet**}

-	-

DHCP snooping

DHCP snooping

```
Ruijie# debug ip dhcp snooping event
Ruijie# debug ip dhcp snooping packet
```

-	-

58 DHCPV6 SNOOPING

58.1

58.1.1 ipv6 dhcp snooping

dhcpv6 snooping **no** dhcpv6 snooping

ipv6 dhcp snooping

no ipv6 dhcp snooping

-	-

dhcpv6 snooping **show ipv6 dhcp snooping** dhcpv6 snooping

1 dhcpv6 snooping

```
Ruijie(config)# ipv6 dhcp snooping
```

show ipv6 dhcp snooping	dhcpv6 snooping

10.4	

58.1.2 ipv6 dhcp snooping binding-delay

no

ipv6 dhcp snooping binding-delay *seconds*

no ipv6 dhcp snooping binding-delay

time	

IPv6

1 10

```
Ruijie(config)# ipv6 dhcp snooping binding-delay 10
```


10.4	

58.1.3 ipv6 dhcp snooping database write-delay

dhcpv6 snooping flash **no**

ipv6 dhcp snooping database write-delay *time*

no ipv6 dhcp snooping database write-delay

time	flash

show ipv6 dhcp snooping	dhcpv6 snooping

10.4	

58.1.4 ipv6 dhcp snooping database write-to-flash

dhcpv6 snooping flash

ipv6 dhcp snooping database write-to-flash

-	

dhcpv6 snooping flash
flash flash

1 dhcpv6 snooping flash

```
Ruijie(config)# ipv6 dhcp snooping database write-to-flash
```


10.4	

58.1.5 ipv6 dhcp snooping filter-dhcp-pkt

dhcpv6 no

ipv6 dhcp snooping filter-dhcp-pkt

58.1.8 ipv6 dhcp snooping trust

dhcpv6 snooping trust no
untrust

ipv6 dhcp snooping trust

no ipv6 dhcp snooping trust

untrust

dhcpv6 trust trust dhcpv6 Server
untrust dhcpv6 Server

```
  1         fastethernet 0/1   trust
Ruijie(config)# interface fastethernet 0/1
Ruijie(config-if)# ipv6 dhcp snooping trust
```

show ipv6 dhcp snooping	dhcpv6 snooping

10.4	

58.1.9 Ipv6 dhcp snooping vlan

vlan dhcpv6 snooping no
vlan dhcpv6 snooping

ipv6 dhcp snooping {*vlan-list* | {*vlan-min* [*vlan-max*]}}

no ipv6 dhcp snooping {*vlan-list* | {*vlan-min* [*vlan-max*]}}

a l *vlan-list* v d vlan	1,3-5,7,9-w -Td<116E>Tj/TT0 1 Tf-0.0015 Tc

dhcpv6 snooping vlan

dhcpv6 snooping vlan dhcpv6 snooping
vlan dhcpv6 snooping vlan dhcpv6 snooping

1 vlan 1 dhcpv6 snooping

```
Ruijie(config)# no ipv6 dhcp snooping vlan 1
```

-	-

10.4	

58.1.10 ipv6 source binding

no

ipv6 source binding *mac-address* **vlan** *vlan-id ipv6-address* **interface** *interface-name*

no ipv6 source binding *mac-address* **vlan** *vlan-id ipv6-address* **interface** *interface-name*

mac-address	MAC
vlan-id	VLAN
ipv6-address	IPV6
interface-name	

IPV6 DHCPV6 IPV6

1

```
Ruijie(config)# ipv6 source binding 00d0.f866.4777 vlan 10
2001:2002::2003 interface fastethernet 0/10
```


58.2.1 show ipv6 dhcp snooping

dhcpv6 snooping

show ipv6 dhcp snooping

-	-

dhcpv6 snooping

1 dhcpv6 snooping

```
Ruijie# show ipv6 dhcp snooping
Switch DHCPv6 snoopingTfs0069s dhcp snooping
```

vlan *vlan_id*	VLAN
interface *interface_name*	

dhcpv6 snooping

```
  1     dhcpv6 snooping
Ruijie# show ipv6 dhcp snooping binding
Total number of bindings: 1
Mac Address     Ipv6 Address  Lease(s)  VLAN  Interface
-------------   ----------   -------   ----  -----------
00d0.f801.0101  2001::10    42368     2      fa 0/1
```


10.4	

58.2.3 show ipv6 dhcp snooping prefix

dhcpv6 snooping

show ipv6 dhcp snooping prefix [*ipv6-prefix*] [*mac-address*] [**vlan** *vlan_id*] [**interface** *interface_name*]

ipv6-prefix	ipv6
mac-address	mac
vlan *vlan_id*	VLAN
interface *interface_name*	

dhcpv6 snooping

```
  1  show ipv6 dhcp snooping prefix
Total number of prefix: 1
Mac Address     IPv6 Prefix  Lease(s)  VLAN  Interface
-------------   ----------   -------   ----  -----------
00d0.f801.0101  2001:2002::/64  42368     2    fa 0/1
```


10.4	

58.2.4 show ipv6 dhcp snooping statistics

dhcpv6 snooping dhcpv6

show ipv6 dhcp snooping statistics

-	-

dhcpv6 snooping dhcpv6

```
  1     dhcpv6 snooping    dhcpv6
Ruijie# show ipv6 dhcp snooping statistics
Packets Processed by DHCPv6 Snooping = 0
Packets Dropped Because
Received on untrusted ports     = 0
Relay forward                  = 0
No binding entry               = 0
Binding fail                   = 0
Unknown packet                 = 0
Unknown output interface       = 0
No enough memory               = 0
Admin filter-dhcpv6-pkt          = 0
```


Received on untrusted ports	untrust
Relay forward	Relay
No binding entry	release/decline
Binding fail	
Unknown packet	DHCP
Unknown output interface	MAC trust
No enough memory	
Admin filter-dhcpv6-pkt	DHCPv6 **ipv6 dhcp snooping filter-dhcp-pkt**

10.4	

58.2.5 show ipv6 source binding

dhcpv6 snooping

show ipv6 source binding [*ipv6-address*] [*mac-address*] [**vlan** *vlan_id*] [**interface** *interface_name*] [**dhcp-snooping | static]**

ipv6-prefix	ipv6
mac-address	mac
vlan *vlan_id*	VLAN
interface *interface_name*	
dhcp-snooping	dhcpv6 snooping
static	

dhcpv6 snooping

```
  1                              dhcpv6 snooping
       type     static                    dynamic
Ruijie# show ipv6 source binding
Total number of bindings: 1
Mac Address    Ipv6 Address    Lease(s)   type    Vlan   Interface
-------------  --------------  --------   ----   -----  ---------
00d0.f866.4777   2001:2002::2003   57      dynamic   10    fa 0/10
```


10.4	

58.3.2 clear ipv6 dhcp snooping prefix

dhcpv6 snooping

clear ipv6 dhcp snooping prefix [*ipv6-prefix*] [*mac-address*] [**vlan** *vlan_id*] [**interface** *interface_name*]

ipv6-prefix	ipv6
mac-address	mac
vlan *vlan_id*	VLAN
interface *interface_name*	

dhcpv6 snooping

```
  1     dhcpv6 snooping
Ruijie# clear ipv6 dhcp snooping prefix
```


10.4	

58.3.3 clear ipv6 dhcp snooping statistics

dhcpv6 snooping

1 dhcpv6 snooping

```
Ruijie# debug ipv6 dhcp snooping event
```


10.4	

59 IP Source Guard

59.1 IP Source Guard

59.1.1 ip source binding

IP **no**

[**no**] **ip source binding** *mac-address* **vlan** *vlan-id ip-address* **interface** *interface-id*

IP

show ip source binding [*ip-address*] [*mac-address*] [**dhcp-snooping**] [**static**] [**vlan** *vlan-id*] [**interface** *interface-id*]

ip-address	ip
mac-address	mac
dhcp-snooping	
static	
vlan-id	vlan
interface-id	

```
Ruijie# show ip source binding static
MacAddress    IpAddress  Lease(sec)   Type    VLAN  Interface
------------- --------- ----------   ----    ----  ------------
0000.0000.0001 1.0.0.1   infinite    static    1  FastEthernet 0/1
Total number of bindings: 1
```

ip source binding	IP

tEthernet 0/10”

address VLAN

1

000.0000.0001 1

ource Guard

60 ND Snooping

60.1

60.1.1 ipv6 nd snooping

IPv6 ND snooping no IPv6 ND Snooping

ipv6 nd snooping
no ipv6 nd snooping

VLAN IPv6 ND snooping no VLAN IPv6 ND Snooping

ipv6 nd snooping vlan {*vlan-rng* | {*vlan-min* [*vlan-max*]}}
no ipv6 nd snooping vlan {*vlan-rng* | {*vlan-min* [*vlan-max*]}}

vlan-rng	vlan
vlan-min	vlan
vlan-max	vlan

untrust

FastEthernet 0/1 Trust

```
Ruijie# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Ruijie(config)# interface fastethernet 0/1
Ruijie(config-if)# ipv6 nd snooping trust
```

show ipv6 nd snooping	ipv6 nd snooping

10.4(2)	

60.1.4 ipv6 nd snooping check address-resolution

ND no ND

ipv6 nd snooping check address-resolution [**key-node-only**]
no ipv6 nd snooping check address-resolution

key-node-only	ND

ND

1 ND

```
Ruijie# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Ruijie(config)#ipv6 nd snooping check address-resolution
```

2 ND

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

```
Ruijie(config)#ipv6 nd snooping check address-resolution
key-node-only
```

show ipv6 nd snooping	ipv6 nd snooping

10.4(2)	

60.1.5 ipv6 nd snooping detect gateway

no

ipv6 nd snooping detect gateway ra
no ipv6 nd snooping detect gateway ra

-	-

VLAN

```
Ruijie# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Ruijie(config)# ipv6 nd snooping auto-gateway ra
```

show ipv6 nd snooping	nd snooping

10.4(2)	

vid	link-local VID
ipv6_address/prefix_len	IPv6

```
Ruijie# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Ruijie(config)#ipv6 nd snooping key-node  2003::1/128
```

show ipv6 nd snooping key-node	nd snooping

10.4(2)	

60.1.8 ipv6 nd snooping monitor stateless-user

no

ipv6 nd snooping monitor stateless-user
no ipv6 nd snooping monitor stateless-user

-	-

ND

```
Ruijie# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Ruijie(config)#no ipv6 nd snooping monitor stateless-user
```

show ipv6 nd snooping stateless-user	

10.4(2)	

60.1.9 ipv6 nd snooping stateless-user combine-security

no

ipv6 nd snooping stateless-user combine-security
no ipv6 nd snooping stateless-user combine-security

-	-

802.1X

```
Ruijie# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Ruijie(config)# ipv6 nd snooping stateless-user combine-security
```

show ipv6 nd snooping	ipv6 nd snooping

10.4(2)	

60.1.10 ipv6 nd snooping stateless-user address-bind

IPv6 no

ipv6 nd snooping stateless-user address-bind [**strict**] [**ip-mac**]
no ipv6 nd snooping stateless-user address-bind

strict	link-local link-local link-local
ip-mac	IP+MAC IP

1
```
Ruijie# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Ruijie(config)# ipv6 nd snooping stateless-user address-bind
```
2 IP+MAC
```
Ruijie# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Ruijie(config)#ipv6 nd snooping stateless-user address-bind strict ip-mac
```

show ipv6 nd snooping	ipv6 nd snooping

10.4(2)	

60.1.11 ipv6 nd snooping stateless-user station-move

ipv6 nd snooping stateless-user station-move
no ipv6 nd snooping stateless-user station-move

-	-

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

show ipv6 nd snooping	ipv6 nd snooping

10.4(2)	

60.1.13 ipv6 nd snooping stateless-user per-vlan prefix-limit

VLAN IPv6

ipv6 nd snooping stateless-user per-vlan prefix-limit *num*
no ipv6 nd snooping stateless-user per-vlan prefix-limit

num	VLAN IPv6

2

VLAN 4 IPv6

```
Ruijie# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Ruijie(config)#ipv6 nd snooping stateless-user per-vlan
prefix-limit 4
```

show ipv6 nd snooping	ipv6 nd snooping

10.4(2)	

60.1.14 clear ipv6 nd snooping key-node

clear ipv6 nd snooping key-node [vlan *vid***]**

vid	VLAN

```
Ruijie# clear ipv6 nd snooping key-node
```

10.4(2)	

60.2.3 show ipv6 nd snooping stateless-user

ipv6

show ipv6 nd snooping stateless-user

-	-

ipv6

```
Ruijie# show ipv6 nd snooping stateless-user
```

-	-

10.4(2)	

60.2.4 show ipv6 nd snooping prefix

show ipv6 nd snooping prefix

ipv6

```
Ruijie# show ipv6 nd snooping prefix
```

-	-

10.4(2)	

61 NFPP

61.1 NFPP

61.1.1 cpu-protect sub-interface {manage|protocol|route} pps

cpu-protect sub-interface {*manage*|*protocol*|*route*} pps *pps_vaule*

pps_vaule	1-8192

(Manage) 3000
(Route) 3000
(Protocol) 3000

```
Ruijie(config)# cpu-protect sub-interface manage pps 200
```

cpu-protect sub-interface { *manage* | *protocol* | *route* } **percent**	

-	-

61.1.2 cpu-protect sub-interface {manage|protocol|route} percent

cpu-protect sub-interface {*manage*|*protocol*|*route*} **percent** *percent_vaule*

percent_vaule	1 100

(Manage) 30
(Route) 25
(Protocol) 45

```
Ruijie(config)# cpu-protect sub-interface manage percent 60
```

cpu-protect sub-interface { *manage* | *protocol* | *route* } **pps**	

```
Ruijie(config)# nfpp
Ruijie(config-nfpp)# arp-guard attack-threshold per-src-ip 2
Ruijie(config-nfpp)# arp-guard attack-threshold per-src-mac 3
Ruijie(config-nfpp)# arp-guard attack-threshold per-port 50
```

nfpp arp-guard policy	
show nfpp arp-guard summary	
show nfpp arp-guard hosts	
clear nfpp arp-guard hosts	

-	-

61.2.3 arp-guard isolate-period

arp-guard isolate-period {*seconds* | **permanent**}

seconds	0 [30, 86400]
permanent	

0

NFPP

```
Ruijie(config)# nfpp
Ruijie(config-nfpp)# arp-guard isolate-period 180
```

nfpp arp-guard isolate-period	
show nfpp arp-guard summary	

-	-

61.2.4 arp-guard monitor-period

arp-guard monitor-period *seconds*

seconds	[180, 86400]

600

NFPP

■ 0

0

■

```
Ruijie(config)# nfpp
Ruijie(config-nfpp)# arp-guard monitor-period 180
```

show nfpp arp-guard summary	
show nfpp arp-guard hosts	
clear nfpp arp-guard hosts	

-	-

61.2.5 arp-guard monitored-host-limit

arp-guard monitored-host-limit *number*

number

show nfpp arp-guard summary	

-	-

61.2.6 arp-guard rate-limit

arp-guard rate-limit {per-src-ip | per-src-mac | per-port} *pps*

per-src-ip	IP
per-src-mac	MAC
per-port	
pps	[1,9999]

IP ă ő

61.2.7 arp-guard scan-threshold

arp-guard scan-threshold *pkt-cnt*

pkt-cnt	[1,9999]

15 10

NFPP

10 15 ARP MAC IP
MAC IP IP

```
Ruijie(config)# nfpp
Ruijie(config-nfpp)# arp-guard scan-threshold 20
```

nfpp arp-guard scan-threshold	
show nfpp arp-guard summary	
show nfpp arp-guard scan	ARP
clear nfpp arp-guard scan	ARP

-	-

61.2.8 clear nfpp arp-guard hosts

clear nfpp arp-guard hosts [**vlan** *vid*] [**interface** *interface-id*] [*ip-address* | *mac-address*]

vid	
interface-id	
ip-address	IP
mac-address	MAC

-	-

61.2.10 nfpp arp-guard enable

ARP

nfpp arp-guard enable

-	-

ARP

ARP ARP

```
Ruijie(config)# interface G0/1
Ruijie(config-if)# nfpp arp-guard enable
```

arp-guard enable	ARP
show nfpp arp-guard summary	

10.4	

61.2.11 nfpp arp-guard isolate-period

nfpp arp-guard isolate-period {*seconds* | **permanent**}

seconds	0 [30, 86400] 0
permanent	

```
Ruijie(config)# interface G 0/1
Ruijie(config-if)# nfpp arp-guard isolate-period 180
```

arp-guard isolate-period	
show nfpp arp-guard summary	

10.4	

61.2.12 nfpp arp-guard policy

nfpp arp-guard policy {**per-src-ip** | **per-src-mac** | **per-port**} *rate-limit-pps attack-threshold-pps*

per-src-ip	IP	
per-src-mac	MAC	
per-port		
rate-limit-pps	1	9999
attack-threshold-pps	1	9999

```
Ruijie(config)# interface G 0/1
Ruijie(config-if)# nfpp arp-guard policy per-src-ip 2 10
Ruijie(config-if)# nfpp arp-guard policy per-src-mac 3 10
Ruijie(config-if)# nfpp arp-guard policy per-port 50 100
```

arp-guard attack-threshold	
arp-guard rate-limit	
show nfpp arp-guard summary	
show nfpp arp-guard hosts	
clear nfpp arp-guard hosts	

10.4	

61.2.13 nfpp arp-guard scan-threshold

nfpp arp-guard scan-threshold *pkt-cnt*

pkt-cnt	[1,9999]

ARP ARP

```
Ruijie(config)# interface G 0/1
Ruijie(config-if)# nfpp arp-guard scan-threshold 20
```


-	-

61.2.15 show nfpp arp-guard scan

ARP

show nfpp arp-guard scan [**statistics** | [[**vlan** *vid*] [**interface** *interface-id*] [*ip-address*] [*mac-address*]]]

statistics	ARP
vid	
interface-id	
ip-address	IP
mac-address	MAC

```
Ruijie# show nfpp arp-guard scan statistics
ARP scan table has 4 record(s).
       “ARP           4      ”

Ruijie# show nfpp arp-guard scan
VLAN    interface   IP address   MAC address     timestamp
----    --------    ----------  -----------     ----------
1       Gi0/1       N/A          0000.0000.0001   2008-01-23
16:23:10
2       Gi0/2       1.1.1.1      0000.0000.0002   2008-01-23
16:24:10
3       Gi0/3       N/A          0000.0000.0003   2008-01-23
16:25:10
4       Gi0/4       N/A          0000.0000.0004   2008-01-23
16:26:10
Total  4 record(s)
“timestamp”             ARP             “2008-01-23 16:23:10”
    2008   1   23   16   23   10        ARP

Ruijie# show nfpp arp-guard scan vlan 1 interface G 0/1
0000.0000.0001
VLAN    interface   IP address   MAC address     timestamp
----    --------    ----------    -----------     ----------
1       Gi0/1       N/A           0000.0000.0001   2008-01-23
16:23:10
```

```
Total  1 record(s)
```

arp-guard scan-threshold	
nfpp arp-guard scan-threshold	
clear nfpp arp-guard scan	ARP

-	-

61.2.16 show nfpp arp-guard summary

show nfpp arp-guard summary

-	-

```
Ruijie# show nfpp arp-guard summary
  Format of column Rate-limit and  Attack-threshold is
per-src-ip/per-src-mac/per-port.
Interface  Status  Isolate-period Rate-limit Attack-threshold
Scan-threshold
Global     Enable  300            4/5/60    8/10/100         15
Gi 0/1      Enable  180            5/-/-      8/-/-            -
Gi 0/2      Disable 200            4/5/60    8/10/100         20

Maximum count of monitored hosts: 1000
Monitor period  300s

    Interface   Global
    Status
    Rate-limit            IP            /    MAC            /
                 Attack-threshold              “ - ”
```

arp-guard attack-threshold	
arp-guard enable	ARP
arp-guard isolate-period	
arp-guard monitor-period	
arp-guard monitored-host-limit	
arp-guard rate-limit	
arp-guard scan-threshold	
nfpp arp-guard enable	ARP
nfpp arp-guard isolate-period	
nfpp arp-guard policy	
nfpp arp-guard scan-threshold	

```
Ruijie(config-nfpp)# dhcp-guard attack-threshold per-src-mac 15
Ruijie(config-nfpp)# dhcp-guard attack-threshold per-port 200
```

nfpp dhcp-guard policy	
show nfpp dhcp-guard summary	
show nfpp dhcp-guard hosts	
clear nfpp dhcp-guard hosts	

-	-

61.3.2 dhcp-guard enable

DHCP

dhcp-guard enable

0.10 - uarc 0 Tw 13.447 0 6-D0.02 198.0 Tw 8.92404 Tm[<281C1D00>6<00 10.02 129T4 1 T0.4603 T

61.3.3 dhcp-guard isolate-period

dhcp-guard isolate-period {*seconds* | **permanent**}

seconds	0 [30, 86400] 0
permanent	

0

NFPP

```
Ruijie(config)# nfpp
Ruijie(config-nfpp)# dhcp-guard isolate timeout 180
```

nfpp dhcp-guard isolate-period	
show nfpp dhcp-guard summary	

-	-

61.3.4 dhcp-guard monitor-period

dhcp-guard monitor- period

■ 0

0

■

```
Ruijie(config)# nfpp
Ruijie(config-nfpp)# dhcp-guard monitor-period 180
```

show nfpp dhcp-guard summary	
show nfpp dhcp-guard hosts	
clear nfpp dhcp-guard hosts	

-	-

61.3.5 dhcp-guard monitored-host-limit

dhcp-guard monitored-host-limit *number*

number	1 4294967295

1000

NFPP

1000

1000 “ %ERROR The value that you configured is smaller than current monitored hosts 1000 please clear a part of monitored hosts. ”

“ % NFPP_DHCP_GUARD-4-SESSION_LIMIT: Attempt to exceed limit of 1000 monitored hosts. ”

```
Ruijie(config)# nfpp
Ruijie(config-nfpp)# dhcp-guard monitored-host-limit
```

show nfpp dhcp-guard summary	

-	-

61.3.6 dhcp-guard rate-limit

dhcp-guard rate-limit { **per-src-mac** | **per-port**} *pps*

per-src-mac	MAC
per-port	
pps	[1,9999]

MAC 5 150

NFPP

```
Ruijie(config)# nfpp
Ruijie(config-nfpp)# dhcp-guard rate-limit per-src-mac 8
Ruijie(config-nfpp)# dhcp-guard rate-limit per-port 100
```

nfpp dhcp-guard policy	
show nfpp dhcp-guard summary	

-	-

61.3.7 clear nfpp dhcp-guard hosts

clear nfpp dhcp-guard hosts [*vlan vid*] [**interface** *interface-id*] [*mac-address*]

vid	
interface-id	
mac-address	MAC

VLAN 1 g 0/1

```
Ruijie# clear nfpp dhcp-guard hosts vlan 1 interface g0/1
```

dhcp-guard attack-threshold	
nfpp dhcp-guard policy	
show nfpp dhcp-guard hosts	

```
Ruijie(config-if)# nfpp dhcp-guard enable
```

dhcp-guard enable	DHCP
show nfpp dhcp-guard summary	

10.4	

61.3.9 nfpp dhcp-guard isolate-period

nfpp dhcp-guard isolate-period {*seconds* | **permanent**}

seconds	0 [30, 86400] 0
permanent	

```
Ruijie(config)# interface G 0/1
Ruijie(config-if)# nfpp dhcp-guard isolate-period 180
```

dhcp-guard isolate-period	
show nfpp dhcp-guard summary	

10.4	

61.3.10 nfpp dhcp-guard policy

nfpp dhcp-guard policy { **per-src-mac** | **per-port**} *rate-limit-pps attack-threshold-pps*

per-src-mac	MAC
per-port	
rate-limit-pps	1 9999
attack-threshold-pps	1 9999

```
Ruijie(config)# interface G 0/1
Ruijie(config-if)# nfpp dhcp-guard policy per-src-mac 3 10
Ruijie(config-if)# nfpp dhcp-guard policy per-port 50 100
```

dhcp-guard attack-threshold	
dhcp-guard rate-limit	
show nfpp dhcp-guard summary	
show nfpp dhcp-guard hosts	
clear nfpp dhcp-guard hosts	

10.4	

61.3.11 show nfpp dhcp-guard hosts

show nfpp dhcp-guard hosts [**statistics** | [[**vlan** *vid*] [**interface** *interface-id*] [*mac-addre ss*]]]

statistics	
vid	

interface-id	
mac-address	MAC

Ruijie# **show nfpp dhcp-guard hosts statistics**

success fail total

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

100 20 120

120 100 20

```
Ruijie# show nfpp dhcp-guard summary
  Format of column Rate-limit and  Attack-threshold is per-src-ip
/per-src-mac/per-port.
Interface  Status  Isolate-period Rate-limit Attack-threshold
Global     Enable  300            -/5/150    -/10/300
Gi 0/1      Enable  180            -/6/-      -/8/-
Gi 0/2      Disable 200            -/5/30     -/10/50

Maximum count of monitored hosts: 1000
Monitor period  300s
```

1 Interface Global

2 Status

3 Rate-limit IP / MAC / Attack-threshold “ - ”

dhcp-guard attack-threshold	
dhcp-guard enable	DHCP
dhcp-guard isolate-period	
dhcp-guard monitor-period	
dhcp-guard monitored-host-limit	
dhcp-guard rate-limit	
nfpp dhcp-guard enable	DHCP
nfpp dhcp-guard isolate-period	
nfpp dhcp-guard policy	

10.4	

61.4 DHCPv6

61.4.1 dhcpv6-guard attack-threshold

dhcpv6-guard attack-threshold { **per-src-mac** | **per-port**} *pps*

per-src-mac	MAC
per-port	
pps	[1,9999]

MAC 10 300

NFPP

```
Ruijie(config)# nfpp
Ruijie(config-nfpp)# dhcpv6-guard attack-threshold per-src-mac 15
Ruijie(config-nfpp)# dhcpv6-guard attack-threshold per-port 200
```

nfpp dhcpv6-guard policy	
show nfpp dhcpv6-guard summary	
show nfpp dhcpv6-guard hosts	
clear nfpp dhcpv6-guard hosts	

10.4	

61.4.2 dhcpv6-guard enable

DHCPv6

dhcpv6-guard enable

```
Ruijie(config)# nfpp
Ruijie(config-nfpp)# dhcpv6-guard enable
```

nffp dhcpv6-guard enable	DHCPv6
show nfpp dhcpv6-guard summary	

10.4	

61.4.3 dhcpv6-guard isolate-period

dhcpv6-guard isolate-period {*seconds* | **permanent**}

seconds	0 [30, 86400] 0
permanent	

0

NFPP

```
Ruijie(config)# nfpp
Ruijie(config-nfpp)# dhcpv6-guard isolate timeout 180
```

nfpp dhcpv6-guard isolate-period	
show nfpp dhcpv6-guard summary	

10.4	

61.4.4 dhcpv6-guard monitor-period

dhcpv6-guard monitor- period *seconds*

seconds	[180, 86400]

600

NFPP

■ 0

0

■

```
Ruijie(config)# nfpp
Ruijie(config-nfpp)# dhcpv6-guard monitor-period 180
```

show nfpp dhcpv6-guard summary	
show nfpp dhcpv6-guard hosts	
clear nfpp dhcpv6-guard hosts	

number	1 4294967295

1000

NFPP

1000

1000 Ĩ U ,

```
Ruijie(config-nfpp)# dhcpv6-guard rate-limit per-src-mac 8
Ruijie(config-nfpp)# dhcpv6-guard rate-limit per-port 100
```

nfpp dhcpv6-guard policy	
show nfpp dhcpv6-guard summary	

rVVPHBD_7!ÊfˆÂ•¥wxÝVÝdqe'"D"HH@ÃA(¥g""R'†!A@dßèeC6xEÄ6471.6W.52 70f1961B4f135.96 730.64 394.98

61.4.8 nfpp dhcpv6-guard enable

DHCPv6

nfpp dhcpv6-guard enable

-	-

DHCPv6

DHCPv6 DHCP

```
Ruijie(config)# interface G0/1
Ruijie(config-if)# nfpp dhcpv6-guard enable
```

dhcpv6-guard enable	DHCPv6
show nfpp dhcpv6-guard summary	

10.4	

61.4.9 nfpp dhcpv6-guard isolate-period

nfpp dhcpv6-guard isolate-period {*seconds* | **permanent**}

seconds	0 [30, 86400] 0
permanent	

dhcpv6-guard rate-limit	
nfpp dhcpv6-guard enable	DHCPv6
nfpp dhcpv6-guard isolate-period	
nfpp dhcpv6-guard policy	

10.4	

61.5 ICMP

61.5.1 icmp-guard attack-threshold

icmp-guard attack-threshold { **per-src-ip** | **per-port**} *pps*

-	-

61.5.2 icmp-guard enable

ICMP

icmp-guard enable

-	-

ICMP

NFPP

```
Ruijie(config)# nfpp
Ruijie(config-nfpp)# icmp-guard enable
```

0

NFPP

```
Ruijie(config)# nfpp
Ruijie(config-nfpp)# icmp-guard isolate-period 180
```

nfpp icmp-guard isolate-period	
show nfpp icmp-guard summary	

-	-

61.5.4 icmp-guard monitor-period

icmp-guard monitor-period *seconds*

seconds	[180, 86400]

600

NFPP

- 0

0

-

```
Ruijie(config)# nfpp
Ruijie(config-nfpp)# icmp-guard monitor-period 180
```


show nfpp icmp-guard summary	
show nfpp icmp-guard hosts	
clear nfpp icmp-guard hosts	

-	-

61.5.5 icmp-guard monitored-host-limit

icmp-guard monitored-host-limit *number*

icmp-guard rate-limit { **per-src-ip** | **per-port**} *pps*

per-src-ip	IP

NFPP

CPU ICMP CPU

500

```
Ruijie(config)# nfpp
Ruijie(config-nfpp)# icmp-guard trusted-host 1.1.1.0 255.255.255.0
```

show nfpp icmp-guard trusted-host	

-	-

61.5.8 clear nfpp icmp-guard hosts

clear nfpp icmp-guard hosts [*vlan vid*] [**interface** *interface-id*] [*ip-address*]

vid	
interface-id	
ip-address	IP

VLAN 1 g 0/1

```
Ruijie# clear nfpp icmp-guard hosts vlan 1 interface g 0/1
```

icmp-guard attack-threshold	
nfpp icmp-guard policy	
show nfpp icmp-guard hosts	

-	-

61.5.9 nfpp icmp-guard enable

ICMP

nfpp icmp-guard enable

-	-

ICMP

ICMP ICMP

```
Ruijie(config)# interface G0/1
Ruijie(config-if)# nfpp icmp-guard enable
```

icmp-guard enable	ICMP
show nfpp icmp-guard summary	

10.4	

61.5.10 nfpp icmp-guard isolate-period

nfpp icmp-guard isolate-period {*seconds* | **permanent**}

seconds	0 [30, 86400] 0

permanent

```
Ruijie(config)# interface G 0/1
Ruijie(config-if)# nfpp icmp-guard isolate-period 180
```

icmp-guard isolate-period	
show nfpp icmp-guard summary	

10.4	

61.5.11 nfpp icmp-guard policy

nfpp icmp-guard policy { **per-src-ip** | **per-port**} *rate-limit-pps attack-threshold-pps*

per-src-ip	IP
per-port	

icmp-guard attack-threshold	
icmp-guard rate-limit	
show nfpp icmp-guard summary	
show nfpp icmp-guard hosts	
clear nfpp icmp-guard hosts	

10.4	

61.5.12 show nfpp icmp-guard hosts

show nfpp icmp-guard hosts [**statistics** | [[**vlan** *vid*] [**interface** *interface-id*] [*ip-address*]]]

statistics	
vid	
interface-id	
ip-address	IP

interface-id

interface-id

interface-id

interface-id

clear nfpp icmp-guard hosts	

icmp-guard isolate-period	
icmp-guard monitor-period	
icmp-guard monitored-host-limit	
icmp-guard rate-limit	
nfpp icmp-guard enable	ICMP
nfpp icmp-guard isolate-period	
nfpp icmp-guard policy	

10.4	

61.5.14 show nfpp icmp-guard trusted-host

show nfpp icmp-guard trusted-host

10.4	

61.6.2 ip-guard enable

IP

ip-guard enable

```
Ruijie(config)# nfpp
Ruijie(config-nfpp)# ip-guard isolate-period 180
```


10.4	

61.6.5 ip-guard monitored-host-limit

per-port	
pps	[1,9999]

IP 20 100

NFPP

```
Ruijie(config)# nfpp
Ruijie(config-nfpp)# ip-guard rate-limit per-src-ip 2
Ruijie(config-nfpp)# ip-guard rate-limit per-port 50
```

nfpp ip-guard policy	
show nfpp ip-guard summary	

10.4	

61.6.7 ip-guard scan-threshold

ip-guard scan-threshold *pkt-cnt*

pkt-cnt	[1,9999]

10 100

NFPP

```
Ruijie(config)# nfpp
Ruijie(config-nfpp)# ip-guard scan-threshold 20
```

nfpp ip-guard scan-threshold	

show nfpp ip-guard summary	

10.4	

61.6.8 ip-guard trusted-host

ip-guard trusted-host *ip mask*

no ip-guard trusted-host {**all** | *ip mask*}

ip	IP
mask	IP
all	no

NFPP

CPU IP CPU
500

1.1.1.0/24

```
Ruijie(config)# nfpp
Ruijie(config-nfpp)#ip-guard trusted-host 1.1.1.0 255.255.255.0
```

show nfpp ip-guard trusted-hosts	

10.4	

61.6.9 clear nfpp ip-guard hosts

clear nfpp ip-guard hosts [**vlan** *vid*] [**interface** *interface-id*] [*ip-address*]

vid	
interface-id	
ip-address	IP

VLAN 1 g 0/1

```
Ruijie# clear nfpp ip-guard hosts vlan 1 interface g0/1
```

ip-guard attack-threshold	
nfpp ip-guard policy	
show nfpp ip-guard hosts	

10.4	

61.6.10 nfpp ip-guard enable

IP

nfpp ip-guard enable

-	-

IP

IP

```
Ruijie(config)# interface G0/1
```

```
Ruijie(config-if)# nfpp ip-guard enable
```

ip-guard enable	IP
show nfpp ip-guard summary	

10.4	

61.6.11 nfpp ip-guard isolate-period

nfpp ip-guard isolate-period {*seconds* | **permanent**}

seconds	0 [30, 86400] 0
permanent	

```
Ruijie(config)# interface G 0/1
Ruijie(config-if)# nfpp ip-guard isolate-period 180
```

ip-guard isolate-period	
show nfpp ip-guard summary	

10.4	

61.6.12 nfpp ip-guard policy

nfpp ip-guard policy {**per-src-ip** | **per-port**} *rate-limit-pps attack-threshold-pps*

per-src-ip	IP
per-port	
rate-limit-pps	1 9999
attack-threshold-pps	1 9999

```
Ruijie(config)# interface G 0/1
Ruijie(config-if)# nfpp ip-guard scan-threshold 20
```

ip-guard scan-threshold	
show nfpp ip-guard summary	

10.4	

61.6.14 show nfpp ip-guard hosts

show nfpp ip-guard hosts [**statistics** | [[**vlan** *vid*] [**interface** *interface-id*] [*ip-address*]]]

statistics	
vid	
interface-id	
ip-address	IP

```
Ruijie#show nfpp ip-guard hosts statistics
success    fail    total
-------    ----    -----
100        20       120
      “      120               100             20             ”

Ruijie#show nfpp ip-guard hosts
If column 1 shows '*', it means "hardware do not isolate host" .
```

```
VLAN  interface IP address   Reason     remain-time(s)
----  --------  ---------    -------    -------------
1     Gi0/1     1.1.1.1      ATTACK     110
2     Gi0/2     1.1.2.1      SCAN        61
Total  2 host(s)
```

“Reason” “ATTACK” IP “SCAN”

clear nfpp ip-guard hosts	

10.4	

61.6.15 show nfpp ip-guard summary

show nfpp ip-guard summary

-	-

```
Ruijie# show nfpp ip-guard summary
  Format of column Rate-limit and  Attack-threshold is
per-src-ip/per-src-mac/per-port.
Interface Status Isolate-period Rate-limit Attack-threshold Scan
-threshold
Global     Enable  300           4/-/60    8/-/100         15
Gi 0/1      Enable  180           5/-/-      8/-/-           -
Gi 0/2      Disable 200           4/-/60    8/-/100         20

Maximum count of monitored hosts: 1000
Monitor period  300s
```

1 Interface Global
2 Status
3 Rate-limit IP / MAC /

Attack-threshold “ - ”

ip-guard attack-threshold	
ip-guard enable	IP
ip-guard isolate-period	
ip-guard monitor-period	
ip-guard monitored-host-limit	
ip-guard rate-limit	
nfpp ip-guard enable	IP
nfpp ip-guard isolate-period	
nfpp ip-guard policy	

10.4	

61.6.16 show nfpp ip-guard trusted-host

show nfpp ip-guard trusted-host

-	-

```
Ruijie# show nfpp ip-guard trusted-host
IP address     mask
---------      ------
1.1.1.0        255.255.255.0
1.1.2.0        255.255.255.0
Total  2 record(s)
```

ip-guard trusted-host	

10.4	

61.7 ND

61.7.1 nd-guard attack-threshold

nd-guard attack-threshold per-port {**ns-na** | **rs** | **ra-redirect**} *pps*

ns-na	
rs	
ra-redirect	
pps	[1,9999]

/ 30

30 / 30

NFPP

```
Ruijie(config)# nfpp
Ruijie(config-nfpp)# nd-guard attack-threshold per-port ns-na 20
Ruijie(config-nfpp)# nd-guard attack-threshold per-port rs 10
Ruijie(config-nfpp)# nd-guard attack-threshold per-port ra-redir
ect 10
```

nfpp nd-guard policy	
show nfpp nd-guard summary	

10.4	

61.7.2 nd-guard enable

ND

nd-guard enable

-	-

ND

NFPP

```
Ruijie(config)# nfpp
Ruijie(config-nfpp)# nd-guard enable
```

nffp nd-guard enable	ND
show nfpp nd-guard summary	

10.4	

61.7.3 nd-guard rate-limit

nd-guard rate-limit per-port {**ns-na** | **rs** | **ra-redirect**} *pps*

ns-na	
rs	
ra-redirect	
pps	[1,9999]

/ 15
15 / 15

NFPP

nfpp nd-guard policy	

61.8 NFPP

61.8.1 clear nfpp log

NFPP

clear nfpp log

-	-

```
Ruijie# clear nfpp log
32 log-buffer entries were cleared.
```

show nfpp log	NFPP

NFPP 50

```
Ruijie(config)# nfpp
Ruijie(config-nfpp)# log-buffer entries 50
```

log-buffer logs number_of_message **interval** length_in_seconds	NFPP
show nfpp log	NFPP

10.4	

61.8.3 log-buffer logs

NFPP ગ Õ " Ң Δ Q

10.4	

61.8.4 logging

NFPP VLAN

logging vlan *vlan-range*

logging interface *interface-id*

vlan-range	VLAN “ 1-3,5 ”

NFPP

show nfpp log summary

NFPP

show nfpp log buffer [**statistics**]

statistics	NFPP

”-”

%NFPP_ARP_GUARD-4-DOS_DETECTED: Host<IP=N/A,MAC=0000.0000.0004,port=Gi4/1,VLAN=1> was detected.(2009-07-01 13:00:00)

NFPP

```
Ruijie#show nfpp log summary
Total log buffer size : 10
Syslog rate : 1 entry per 2 seconds
Logging:
VLAN  1-3, 5
interface Gi 0/1
interface Gi 0/2
```

NFPP

```
Ruijie#show nfpp log buffer statistics
There are 6 logs in buffer.
```

NFPP

```
Ruijie#show nfpp log buffer
Protocol VLAN  Interface IP address MAC address    Reason
Timestamp
------- ----  --------  ---------  -----------    ------
---------
ARP    1     Gi0/1      1.1.1.1     -            DoS
2009-05-30 16:23:10
ARP    1     Gi0/1      1.1.1.1     -            ISOLATED
2009-05-30 16:23:10
ARP    1     Gi0/1      1.1.1.2     -            DoS
2009-05-30 16:23:15
ARP    1     Gi0/1      1.1.1.2     -            ISOLATE_FAILED
2009-05-30 16:23:15
ARP    1     Gi0/1      -         0000.0000.0001  SCAN
2009-05-30 16:30:10
ARP    -     Gi0/2      -         -               PORT_ATTACKED
2009-05-30 16:30:10
```

```
Protocol
ARP      ARP
IP      IP
ICMP      ICMP
DHCP      DHCP
DHCPv6      DHCPv6
NS-NA      ND
RS      ND
RA-REDIRECT      ND

Reason           5
DoS
ISOLATED
ISOLATE_FAILED
SCAN
PORT_ATTACKED
```

[redacted]

[redacted]

10.4

62 ACL

[redacted]

CL 1-99 1300-1999

[redacted]

start-sn

deny	
permit	

IPv6 ipv6

prot

VID inner vid	tag vid
ethernet-type	0x
match-all tcpf	tcp flag
text	
in	
out	
{rule mask offset}+	rule mask offset “+”

AA AA AA AA AA AA BB BB BB BB BB BB CC CC DD DD
DD DD EE FF GG HH HH HH II II JJ KK LL LL MM MM
NN NN OO PP QQ QQ RR RR RR RR SS SS SS SS TT TT
UU UU VV VV VV VV WW WW WW WW XY ZZ aa aa bb bb

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	21	V		50
I		24	W		54
J	IP	26	XY	IP	58
K	TOS	27	Z	flags	59
L	IP	28	a	Windows size	60
M	ID	30	b		62
N	Flags	32			

SNAP tag 802.3

62.1

62.1.1 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**] [**range** *lower upper*] [**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**] [**range** *lower upper*] [**time-range** *time-range-name*]

5.

access-list *list-remark text*

id	1-99 100-199 1300-1999 2000-2699 2700 – 2899 700 - 799
Deny	
Permit	
Source	
source-wildcard	0.255.0.32
protocol	IP EIGRP GRE IPINIP IGMP NOS OSPF ICMP UDP TCP IP IP 0-255 ICMP/TCP/UDP
Destination	
destination-wildcard	0.255.0.32
fragments	
precedence	
precedence	0-7
range	
lower	
upper	
time-range	
time-range-name	
tos	
tos	0-15
icmp-type	ICMP 0-255
icmp-code	ICMP 0-255
icmp-message	ICMP
operator	lt- eq- gt- neq- range-
port [*port*]	*range*
host *source-mac-address*	
host *destination-mac-address*	
VID *vid*	vid

ethernet-type	
match-all	*tcp flag*
tcp-flag	tcp flag

ACL

access-list

IP 1-99 1300-1999

IP 100-199 2000-2699

MAC 700-799 MAC

Expert 2700-2899 VLAN ID

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
-

- pim-auto-rp
- pop2
- pop3
- smtp
- sunrpc
- syslog
- tacacs
- talk
- telnet
- time
- uucp
- whois
- www

UDP UDP

- biff
- bootpc
- bootps
- discard
- dnsix
- domain
- echo
- isakmp
- mobile-ip
- nameserver
- netbios-dgm
- netbios-ns
- netbios-ss
- ntp
- pim-auto-rp
- rip
- snmp
- snmptrap
- sunrpc
- syslog
- tacacs
- talk
- tftp
- time
- who
- xdmcp

Ethernet-type

- aarp
- arp
- 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

Expert Extended ACL ACL IP 192.168.12.3 MAC 00d0.f800.0044 TCP

```
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

V10.0	V10.0

62.1.2 deny

(deny)

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**] [**range** *lower upper*] [**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)

2 T [*sn*] **deny tcp** {*source source-wildcard* | **host** *source* | **any**} [**precedence 42.3c 0.**

flow-label	0-1048575
protocol	IPV6 IPV6 | icmp | tcp | udp <0-255>

ACL

ACL ACL

1 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)#
```

2 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 IP 192.168.4.12 1

```
Ruijie(config)# ip access-list standard 34
Ruijie(config-ext-nacl)# deny host 192.168.4.12
Ruijie(config-ext-nacl)# show access-lists
ip access-list standard 34
10 deny host 192.168.4.12
```

```
Ruijie(config-ext-nacl)# exit
Ruijie(config)# interface gigabitethernet 1/1
Ruijie(config-if)# ip access-group 34 in
          IPV6      ACL                    IP    192.168.4.12
       1
Ruijie(config)# ipv6 access-list extended v6-acl
Ruijie(config-ipv6-nacl)# 11 deny ipv6 host 192.168.4.12 any
Ruijie(config-ipv6-nacl)# show access-lists
ipv6 access-list extended v6-acl
11 deny ipv6 host 192.168.4.12 any
Ruijie(config-ipv6-nacl)# exit
Ruijie(config)# interface gigabitethernet 1/1
Ruijie(config-if)# ipv6 traffic-filter v6-acl in
```

show access-lists	
ipv6 traffic-filter	IPV6
ip access-group	IP ACL
mac access-group	MAC ACL
ip access-list	IP ACL
mac access-list	MAC ACL
expert access-list	ACL
ipv6 access-list	IPV6 ACL
permit	

V10.0	V10.0 arp V10.2(3)

62.1.3 expert access-group

EXPERT ACL **no**

expert access-group {*id* | *name*} {**in** | **out**}

no expert access-group {*id* | *name*} {**in** | **out**}

id	Expert 2700-2899
name	Expert
in	

	out	

Expert ACL

```
Ruijie(config)# expert access-list extended 2704
Ruijie(config-exp-nacl)# show expert access-lists
expert access-list extended 2704
Ruijie(config-exp-nacl)#
```

show expert access-lists	

V10.0	V10.0

62.1.5 ip access-group

ip access-group no

ip access-group {*id* | *name*} {**in** | **out**} [**unreflect | reflect**]

no ip access-group { *id* | *name*} {**in** | **out**}

id	IP 1-199 1300-2699
name	IP
in	
out	
unreflect	ACL ACL a. , protocol source-IP , destination-IP source-port,destination-port b.
reflect	ACL

ACL

ip access-group

fastEthernet0/0 120

```
Ruijie(config)# interface fastEthernet 0/0
Ruijie(config-if)#ip access-group 120 in
```

access-list	
show access-lists	
show ip access-list	IP 1-199 1300 – 2699 3000 3199

V10.0	V10.0

62.1.6 ip access-list

IP ACL IP ACL **no** ACL

ip access-list {**extended** | **standard**} {*id* | *name*}

no ip access-list

show ip access-lists	IP

V10.0	V10.0

62.1.7 ip access-list resequence

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	
inc-sn	

start-sn 10
inc-sn 10

show access-lists

ACL

```
Ruijie# show access-lists
ip access-list standard 1
10 permit host 192.168.4.12
20 deny any any
Ruijie# config
Ruijie(config)# ip access-list resequence 1 21 43
Ruijie(config)# exit
Ruijie# show access-lists
ip access-list standard 1
21 permit host 192.168.4.12
64 deny any any
```

ACL

no ipv6 access-list *name*

name	ACL

```
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	
ip access-list	IP

V10.0

sn	ACL

ACL

ACL ACL

```
Ruijie(config)# ipv6 access-list extended v6-acl
Ruijie(config-ipv6-nacl)# permit ipv6 host ::192.168.4.12
```

- Internet Control Message Protocol (ICMP)

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

- Transmission Control Protocol (TCP)

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

- User Datagram Protocol (UDP)

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

3. MAC

[*sn*] **permit** {**any** | **host** *source-mac-address*} {**any** | **host** *destination-mac-addre* [*ethernet-type*][**cos** [*out*] [**inner** *in*]]

4. Expert

[*sn*] **permit** [**protocol** | [*ethernet-type*][**cos** [*out*] [**inner** *in*]]] [**VID** [*out][***inner** *in]*] {**h** *source-wildcard* | **host** *source* | **any**} {**host** *source*-**mac**-*address* | **any** } {*des* *destination-wildcard* | **host** *destination* | **any**} {**host** *destination-mac-address* } [**precedence** *precedence*] [**tos** *tos*][**fragments**] [**range** *lower upper*] [**time** *time-range-name*]

- Ethernet-type cos

[*sn*] **permit** {*ethernet-type*| **cos** [*out*] [**inner** *in*]} [**VID** [*out*][**inne.446 0 T(} {)Tj/TT2 1 Tf{0.1.33**

[

```
  2       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)#
  3       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
  4       ip    ACL                  IP   192.168.4.12
         1
Ruijie(config)# ip access-list standard std-acl
Ruijie(config-std-nacl)# permit host 192.168.4.12
Ruijie(config-std-nacl)# show access-lists
ip access-list standard std-acl
10 permit host 192.168.4.12
Ruijie(config-std-nacl)# exit
Ruijie(config)# interface gigabitethernet 1/1
Ruijie(config-if)# ip access-group std-acl in
  5       IPV6    ACL                  IP   192.168.4.12
          1
Ruijie(config)# ipv6 access-list extended v6-acl
Ruijie(config-ipv6-nacl)# 11 permit ipv6
host ::192.168.4.12 any
Ruijie(config-ipv6-nacl)# show access-lists
ipv6 access-list extended v6-acl
11 permit ipv6 host ::192.168.4.12 any
Ruijie(config-ipv6-nacl)# exit
Ruijie(config)# interface gigabitethernet 1/1
Ruijie(config-if)# ipv6 traffic-filter v6-acl in
```

show access-lists	
ipv6 traffic-filter	IPV6
ip access-group	IP ACL
mac access-group	MAC ACL

ip access-list	IP ACL
mac access-list	MAC ACL
expert access-list	ACL
ipv6 access-list	IPV6 ACL
deny	ACL

V10.0	V10.0 arp V10.2(3)

62.2

62.2.1 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
mac access-group	MAC

expert access-group	Expert
ipv6 traffic-filter	IPV6

V10.0	V10.0

62.2.2 show access-lists

ACL ACL

show access-lists [*id* | *name*]

id	
name	

acl *id* *name* ACL

```
Ruijie# show access-lists n_acl
ip access-list standard n_acl
Ruijie# show access-lists 102
ip access-list extended 102
Ruijie# show access-lists
ip access-list standard n_acl
ip access-list extended 101
mac access-list extended mac-acl
expert access-list extended exp-acl
ipv6 access-list extended v6-acl
```

ip access-list	IP ACL
mac access-list	MAC ACL
expert access-list	Expert ACL
ipv6 access-list	IPv6 ACL

IP ACL IP ACL

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

ip access-list	IP ACL

ACL ACL

```
Ruijie(config-if)#security access-group 1
```


show secu-acl

security uplink enable

no security uplink enable

-	-

Ruijie(config-if)#**security uplink enable**

show secu-acl	

V10.2	V10.2

62.3.4 V10.2TT0 (-0.B39C6}TJTT1 c 2 3f162 0 0 10. Tc 0 Tw 21.952Td[1C10E115D0

security global access-group	
security access-group	
security uplink enable	

V10.2	V10.2

63 QOS

63.1

QoS QoS

- 1 policy-map
- policy-map class-map
- class-map 1 ACL ACL ACE
- ACE “ ACL”

QoS Policy Map
QoS
QoS Policy Map Off
QOS

CoS	0
	8
	WRR
QueueWeight	1:1:1:1:1:1:1:1
WRR Weight Range	1:15
DRR Weight Range	1:15
	No Trust

Cos

Cos

CoS	
0	1
1	2
2	3
3	4
4	5
5	6
6	7
7	8

CoS to DSCP

CoS to DSCP

CoS	DSCP
0	0
1	8
2	16
3	24
4	32
5	40
6	48
7	56

63.2.1 class maps

ACL

ip access-list {**extended** | **standard**} {

show mac access-lists	-
show ip access-lists	-
show class-map	-

-	-

63.2.2 drr-queue bandwidth

DRR

drr-queue bandwidth

no rate-limit

input	
output	
bps	
burst-size	(Kbyte)dscp-list
no	

```
Ruijie(config)# interface fastEthernet 0/1
Ruijie(config-if)# rate-limit input 1000000 4096
```

show mls qos interface	-

-	-

63.2.4 mls qos cos

CoS

mls qos cos *default-cos*

no mls qos cos

default-cos	0 7
no	

CoS 0

```
Ruijie(config)# interface gigabitethernet 1/1
Ruijie(config-if)# mls qos cos 7
```

show mls qos interface *interface-id*	-

-	-

63.2.5 mls qos map cos-dscp

CoS DSCP

mls qos map cos-dscp *dscp1...dscp8*

no mls qos map cos-dscp

dscp	
no	

```
Ruijie(config)# mls qo map cos-dscp 8 10 16 18 24 26 32 34
```

show mls qos maps	dscp-cos maps,dscp-cos maps ip-prec-dscp maps

-	-

63.2.6 mls qos map dscp-cos

QOS

```
Ruijie(config)# mls qo map ip-prec -dscp 8 10 16 18 24 26 32 34
```

show mls qos maps	dscp-cos maps,dscp-cos maps ip-prec-dscp maps

-	-

63.2.8 mls qos scheduler

mls qos scheduler [**sp** | **rr** | **wrr** | **drr**]

no mls qos scheduler

sp	
rr	
wrr	
drr	
no	

wrr

```
Ruijie(config)# mls qos scheduler sp
```

show mls qos scheduler	-

-	-

63.2.9 mls qos trust

Qos

mls qos trust [**cos** | **dscp** | *ip-precedence*]

no mls qos trust

cos	Qos	CoS
dscp	Qos	DSCP
ip-precedence	Qos	IP-PRE
no		

```
Ruijie(config)# interface gigabitethernet 1/1
Ruijie(config-if)# mls qos trust cos
```

show mls qos interface *interface-id*	-

6438TJ/TT1 1 Tf0 Tr 433.12 0.24 refBT841.98 reW n0.852 g135.96 395.96 220.08 20.64 refQQ071 Tf n

[**no**]

show mls qos queueing	-

-	-

63.2.13 service-policy

policy map

service-policy input *policy-map-name*

no service-policy input

policy-map-name	policymap
no	policy map

```
Ruijie(config)# interface fastEthernet 0/1
Ruijie(config-if)# service-policy input po
```

show mls qos interface	-

-	-

63.2.14 wfq-queue bandwidth

wfq

wfq-queue *queue-id* **bandwidth** *min max*

no wfq-queue *queue-id* **bandwidth**

queue-id	
min	
max	

min kbps
max kbps

wfq

wfq

```
Ruijie(config)# mls qos scheduler wfq
Ruijie(config)# show mls qos scheduler

Ruijie(config-if)# wfq-queue 2 bandwidth 10 10240
Ruijie(config-if)# wfq-queue 4 bandwidth 7 10240
Ruijie(config-if)# show running
```

show mls qos scheduler	QOS

-	-

63.2.15 wfq-queue sp

wfq (sp)

wfq-queue *queue-id* **sp**

no wfq-queue

wfq sp+wfq

wfq

```
Ruijie(config)# mls qos scheduler wfq
Ruijie(config)# show mls qos scheduler
       1   3
Ruijie(config)# wfq-queue 1 sp
Ruijie(config)# wfq-queue 3 sp
Ruijie(config)# show running
```

show mls qos scheduler	QOS

-	-

63.2.16 wrr-queue bandwidth

WRR

wrr-queue bandwidth *weight1 ... weightn*

no wrr-queue bandwidth

weight1...weightn	n n
no	

weight1: ...: weightn = 1:...:1

```
Ruijie(config)# wrr-queue bandwidth 1 2 3 4 5 6 7 8
```

show mls qos queueing	-

-	-

63.3

63.3.1 show class-map

class map

show class-map [*class-name*]

class-name	class map

class map

```
Ruijie# show class-map
```

-	-

-	-

63.3.2 show policy-map

policy name

```
Ruijie# show policy-map
```

-	-

-	-

63.3.3 show mls qos interface

QoS

show mls qos interface *interface-id* [**policers**]

interface-id	
policers	police

QOS

```
Ruijie# show mls qos interface fastEthernet 0/1
```

-	-

-	-

63.3.4 show mls qos maps

dscp-cos maps,dscp-cos maps ip-prec-dscp maps

show mls qos maps [**cos-dscp** | **dscp-cos** | **ip-prec-dscp**]

cos-dscp	cos-dscp maps
dscp-cos	dscp-cos maps
ip-prec-dscp	ip-prec-dscp maps

dscp-cos maps dscp-cos maps ip-prec-dscp maps

```
Ruijie# show mls qos maps
```

-	-

-	-

63.3.5 show mls qos queueing

QoS (cos-to-queue map,wrr weight,drr weight)

show mls qos queueing

Ruijie# show mls qos queueing

-	-

-	-

63.3.6 show mls qos rate-limit

ъ ı o ś ª AŠ

-	-

Ruijie# show mls qos scheduler

-	-

-	-

64 SNMP

64.1

64.1.1 no snmp-server

SNMP **no snmp-server**

no snmp-server

-	-

SNMP

SNMP

SNMP

SNMP

```
Ruijie(config)# no snmp-server
```

-	-

-	-

64.1.2 snmp-server chassis-id

SNMP **snmp-server chassis-id** no

snmp-server chassis-id *text*

no snmp-server chassis-id

text	

60FF60

SNMP
show snmp

SNMP 123456:

```
Ruijie(config)# snmp-server chassis-id 123456
```

show snmp	SNMP

-	-

ipaddr	NMS MIB NMS

show snmp-server	SNMP
no snmp-server	SNMP

-	-

64.1.5 snmp-server enable traps

SNMP NMS Trap

snmp-server enable traps no SNMP NMS Trap

snmp-server enable traps [**snmp**]

no snmp-server enable traps

snmp	SNMP

snmp-server host

SNMP

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

snmp-server host	SNMP

-	-

64.1.6 snmp-server group

SNMP **snmp-server group** no

snmp-server group *groupname* {**v1** | **v2c** | **v3** {**auth** | **noauth** | **priv**}} [**read** *readview*][**write** *writeview*] [**access** {[ipv6 ipv6_aclname] [aclnum | aclname]num | name}]

no snmp-server group *groupname* {**v1** | **v2c** | **v3** }

v1	**v2c** |**v3**	SNMP
auth	v3
noauth	v3

SNMP NMS **snmp-server host**
no SNMP

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

port-num][*notification-type*]

no snmp-server host {host-addr | ipv6 ipv6-addr}

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	

-	-

64.1.8 snmp-server location

SNMP **snmp-server location** no
SNMP

snmp-server location *text*

no snmp-server location

text	

Ruijie(config)# **snmp-server location** start-technology-city 4F of A Buliding

snmp-sever contact	SNMP

-	-

64.1.9 snmp-server packetsiz

SNMP **snmp-sever packetsize** no

snmp-server packetsize *byte-count*

no snmp-server packetsize

byte-count	484 17876

1500

SNMP 1492

```
Ruijie(config)# snmp-server packetsize 1492
```

snmp-server queue-length	SNMP

-	-

SNMP **snmp-server system-shutdown**
no SNMP

snmp-server system-shutdown

no snmp-server system-shutdown

-	-

SNMP

SNMP RGOS reload/reboot NMS
ò ∫ ╕ B

0 IP SNMP

```
Ruijie(config)# snmp-server trap-source fastethernet 0
```

snmp-server enable traps	
snmp-server enable host	NMS

-	-

64.1.13 snmp-server trap-timeout

snmp-server trap-timeout

no

snmp-server trap-timeout *seconds*

no snmp-server trap-timeout

seconds	1 – 1000

30

60

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

snmp-server queue-length	
snmp-server enable host	NMS

no

ncrypted] [**auth** {**md5** | **sha**}
aclname] [aclnum | aclname]}]

v3
16 MD5 SHA 20
sha SHA
32
s56 56 DES
32

NGSAV01.30-INTF-CREF.doc

NGSAV01.30-INTF-CREF.doc

NGSAV01.30-INTF-CREF.doc

NGSAV01.30-INTF-CREF.doc

-	-

-	-

64.2

64.2.1 show snmp

SNMP **show snmp**

show snmp [**mib** | **user** | **view** | **group| host**]

-	-

show snmp SNMP
show snmp mib snmp mib
show snmp user snmp
show snmp view snmp
show snmp group snmp
show snmp host

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
```

snmp-server *chassis-id*	SNMP

-	-

65 RMON

65.1

no

rmon collection history *index* [**owner** *ownername*] [**buckets** *bucket-number*] [**interval** *seconds*]

no rmon collection history *index*

-	-

RGOS owner buckets interval

1

```
Ruijie(config)# interface fast-Ethernet 0/1
Ruijie(config-if)# rmon collection history  1 zhansan buckets 10
interval 10
```

rmon collection stats *index*[**owner** *owner-name*]	

-	-

65.1.3 rmon collection stats

no

rmon collection stats *index* [**owner** *owner-string*]

no rmon collection stats *index*

-	-

54f 0.599 0 Td ( )dex
1

```
Ruijie(config)# interface fast-Ethernet 0/1
Ruijie(config-if)# rmon collection stats 1 zhansan
```


rmon collection history *index* [**owner** *owner-name*]**buckets**

-	-

65.2.2 show rmon event

show rmon event

-	-

```
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
```

rmon event *number* [**log**] [**trap** *community*] [*description-string*]	

-	-	-

-	-

```
Ruijie#  show rmon history
Entry : 1
Data source : Gi1/1
Buckets requested : 65535
Buckets granted : 10
Interval : 1
Owner : zhangsan
Sample : 198
Interval start : 0d:0h:15m:0s
DropEvents : 0
Octets : 67988
Pkts : 726
BroadcastPkts : 502
MulticastPkts : 189
CRCAlignErrors : 0
UndersizePkts : 0
OversizePkts : 0
Fragments : 0
Jabbers : 0
Collisions : 0
Utilization : 0
```

rmon collection history *index* [**owner** *ownername*] [**buckets** *bucket-number*] [**interval** *seconds*]	

-	-

65.2.4 show rmon statistics

show rmon statictics

-	-

```
Ruijie#  show rmon statistics
Statistics : 1
Data source : Gi1/1
DropEvents : 0
Octets : 1884085
Pkts : 3096
BroadcastPkts : 161
MulticastPkts : 97
CRCAlignErrors : 0
UndersizePkts : 0
OversizePkts : 1200
Fragments : 0
Jabbers : 0
Collisions : 0
Pkts64Octets : 128
Pkts65to127Octets : 336
Pkts128to255Octets : 229
Pkts256to511Octets : 3
Pkts512to1023Octets : 0
Pkts1024to1518Octets : 1200
Owner : zhangsan
```

rmon collection stats *index* [**owner** *owner-string*]	

-	-

-NTP

peer	NTP
serve	NTP
serve-only	NTP
query-only	NTP
access-list-number	IP 1 99 1300Æc)èÂ@ HDHŸfT4¿@Hi

-	-

NTP

ntp authentication-key ntp trusted-key

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


ntp authentication-key

md5 key-id

ntp trusted-key key-id

1024

ID 6

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

ntp authenticate	
ntp trusted-key	
ntp server	NTP

-	-

66.1.5 ntp disable

NTP

ntp disable

-	-

NTP

NTP

NTP

NTP

IP

NTP

```
no ntp
```

K h	« O Ş

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

no ntp server *ip-addr*

ip-addr	NTP IP IPv4 IPv6
version	NTP 1-3 NTPv3
if-name	NTP
keyid	
prefer	Prefer

NTP

20

prefer

NTP IP

NTP

NTP server

IPv4 Ruijie(config)# **ntp server** *192.168.210.222*

IPv6 Ruijie(config)# **ntp server** *10::2*

no ntp	NTP

-	-

66.1.8 ntp synchronize

NTP

ntp synchronize

no ntp synchronize

-NTP

ntp authenticate	
ntp authentication-key	NTP
ntp server	NTP

-	-

66.1.10 ntp update-calendar

NTP no

ntp update-calendar

no ntp update-calendar

-	-

NTP

NTP NTP

NTP

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

-	-

NTP

show ntp status

-	-

-	-