RG-S5750

RGOS 10.3(5b1)

RGOS®10.3(5b1)

،

،

،

1.

5

Courier New 5

2.

Arial

[] []

{x|y|…}

[x | y | ...]

//

3.

~

&

&

1)

2)

3)

---

1 CLI

1.1 alias

alias

no

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

mode
al-comTc0.0024 Tw(no a)Tj/TT14 1 Tf-20.0057 -1.44 TD-0.0u-5. Tf-20.0057 -64 TD-0.0002 T

```
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	

1.2 privilege

privilege **no**

privilege *mode* [**all**] {**level** *level* **| reset**level

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

CLI 1 ”test” **reload**

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

1 CLI **reload**

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

reload 1 **all**

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

1 CLI **reload**

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

enable secret	CLI

1.3 show aliases

EXEC

show aliases

show aliases [*mode*]

mode

EXEC

EXEC

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

alias	

&

disable

```
Ruijie# disable 10
```

enable	

2.1.2 enable

enable

2.1.3 enable password

enable password

no

enable password [**level** *level*] {*password* | [**0** | **7**] *encrypted-password*}
no enable password

Password EXEC
Level
0|7 0 7
encrypted-password

password security password
15 security 0 15
password
15 password
security 15 password security
password
security

pw10

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

enable password	

2.1.5 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
```

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

username	

2.1.9 login authentication

AAA AAA

no

login authentication {**default** | *list-name*}

no login authentication {**default** | *list-name*}

default

list-name

line

AAA

VTY radius

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

aaa new-model	AAA
aaa authentication login	

2.1.10 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

privilege-level

~

7

7

7

15

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

login local	

2.1.11 lock

EXEC **lock**

lock

1. **lock**
2. “ Locked ”
3. line

lockable line

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

lockable	

2.1.12 lockable

lock line **lockable**

lock **no**

lockable

no lockable

line

EXEC **lock**

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

lock	

2.1.13 telnet

telnet EXEC

telnet

telnet *host* [*port*] [*keyword*]

Host IP

Port TCP 23

Keyword

/source-interface	telnet
/vrf	VRF

telnet

telnet 192.168.1.11
vlan 1 VRF vpn1

```
Ruijie# telnet 192.168.1.11 /soource-interface vlan 1
/vrf vpn1
```

Show session	TTY
exit	

2.1.14 ip telnet source-interface

IP Telnet
ip telnet source-interface

ip telnet source-interface *interface-name*

interface-name IP Telnet

IP Telnet
telnet Telnet
no ip telnet source-interface

Loopback 1 IP Telnet

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

- **clock set**
- **clock update-calendar**
- **exec-timeout**
- **hostname**
- **session-timeout**
- **show clock**
- **show running-config**
- **show startup-config**
- **reload**
- **show reload**
- **prompt**
- **banner motd**
- **banner login**
- **speed**
- **show line**
- **write**

2.2.1 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		

clock set

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	

2.2.2 clock update-calendar

clock clock privileged EXEC **clock update-calendar** clock clock

clock update-calendar

calendar

clock clock

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

clock read-calendar	

2.2.3 exec-timeout

LINE **exec-timeout** **no exec-timeout** LINE

exec-timeout *minutes* [*seconds*]

no exec-timeout

minutes

seconds

10 min

LINE

LINE

line vty 0 5 30 :

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

2.2.4 hostname

hostname

hostname *name*

name
63

Ruijie

CHAP

BeiJingAgenda

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

```
BeiJingAgenda(config)#
```

2.2.5 session-timeout

LINE

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

session-timeout *minutes* [*seconds*]

no session-timeout

minutes

seconds

0 min

LINE

LINE

LINE

line vty 0 5 30 :

show clock

```
Ruijie# show clock detail
clock: 2003-3-17 10:27:21
Clock read from calendar when system boot.
```

clock set	

2.2.7 show running-config

show

running-config

show running-config

2.2.8 show startup-config

in *mmm* | *hhh:mm*

at *hh:mm month day year* 200

month 1 12

day 1 31

year 1993 2035

cancel

10

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

2.2.10 show reload

show

reload

show reload

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

2.2.11 prompt

prompt

no prompt

prompt *string*

string 32

EXEC

RGOS

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

2.2.12 banner motd

banner motd

no banner motd

banner motd *c message c*

c

message

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

57600 bps

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

2.2.16 write

write

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

memory running-config NVRAM copy running-config startup-config

network TFTP copy running-config tftp

terminal **show running-config**

memory

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

show running-config	
copy	

3 LINE

3.1 LINE

3.1.1 line

LINE

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

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

LINE

LINE VTY 1 3 LINE

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

3.1.2 line vty

VTY **no**
VTY

line vty *line-number*

no line vty *line-number*

VTY 5 0--4

VTY

Line VTY

VTY **show running** Line

~

default transport input **no transport input** LINE **transport input none**

line vty 0 4 telnet

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

show running	

3.1.4 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

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	

4

```
Ruijie# copy flash: config.text xmn
```

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

5

5.1

- **ping**
- **traceroute**
- **line-detect**

5.1.1 ping

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

vrf-name	VRF
ip-address	IPv4
length	
times	
timeout	
data	
source	IPv4

2 5 100Byte

IP

Ping

ping ping

ping

2 5 100Byte

IP ‘ ! ’

‘ . ’ ping

ping

ping

DNS

ping

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

ping

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

5.1.2 traceroute

traceroute

.

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

Ip-address	IPv4
number	
source-address	IPV4
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
1     192.168.12.1    0 msec  0 msec  0 msec
2     192.168.9.2     4 msec  4 msec 4 msec
3     192.168.9.1     8 msec  8 msec  4 msec
4     192.168.0.10    4 msec  28 msec  12 msec
5     202.101.143.130    4 msec  16 msec  8 msec
6     202.101.143.154   12 msec  8 msec  24 msec
7     61.154.22.36    12 msec  8 msec  22 msec
```

IP 61.154.22.36

1 6

2 traceroute

```
Ruijie# traceroute 202.108.37.42
< press Ctrl+C to break >
Tracing the route to 202.108.37.42
1     192.168.12.1    0 msec  0 msec  0 msec
2     192.168.9.2       0 msec  4 msec 4 msec
3     192.168.110.1    16 msec  12 msec  16 msec
4     *  *  *
5     61.154.8.129     12 msec  28 msec  12 msec
```

line-detect

line-detect

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

pairs

State OK Short Open A B OK C D Short A B C D OK

Length state OK

Short Open length

6

aggregate port **show interfaces** **show interfaces aggregateport**

```
Ruijie(config)# interface aggregateport 3
Ruijie(config-if)#
```

show interfaces	

6.1.2 interface giagbitEthernet

interface gigabitEthernet *mod-num/port-num*

mod-num/port-num /

no **show interfaces** **show interfaces gigabitEthernet**

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

show interfaces	

6.1.3 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	

6.1.4 medium-type

no .

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

no medium-type

fiber

copper

Ap SVI

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

shutdown

no shutdown

Ap SVI

show interfaces

Ap 1

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

Ap 1

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

clear interface	
show interfaces	

&

no shutdown

6.1.7 speed

no

10	10Mbps
100	100Mbps
1000	1000Mbps
10G	10Gbps

auto

Ap Ap
Ap

show interfaces

SFP 10M 100M

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

show interfaces	

6.1.8 duplex

no

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

no duplex

auto

full

half

show interfaces

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

show interfaces	

6.1.9 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	

DCD Down Up
DCD

DCD

DCD

5

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

6.1.12 clear counters

clear counters [*interface-id*]

interface-id d ′

Ö*ûÐ

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
```


6.1.16 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

6.1.17 switchport trunk

trunkport native VLAN Trunk VLAN
no trunk

switchport trunk {**allowed vlan** {**all** | [**add** | **remove** | **except**] *vlan-list* }**| native vlan** *vlan-id*}

no switchport trunk {**allowed vlan | native vlan**}

allowed vlan *vlan-list*	Trunk VLAN vlan-list VLAN VLAN VLAN ID VLAN ID - 10-20 , 1-10,20-25,30,33 all VLAN VLAN add VLAN VLAN remove VLAN VLAN except VLAN VLAN VLAN
native vlan *vlan-id*	Native VLAN

```
Switchport is enabled
Mode is trunk port
Acsess vlan is 1,Native vlan is 1
Protected is disabled
Vlan lists is
1,3-4094
```

show interfaces	
switchport access	statics accessport VLAN

6.1.18 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,

Link trap

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

Link trap

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

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

Ruijie(config-if)# **no snmp trap link-status** ۲۷

7 Ş W 2

no aggregateport load-balance

	MAC AP MAC **dst-mac** MAC

8 LACP

8.1

8.1.1 lacp port-priority

LACP no

lacp port-priority *port-priority*

no lacp port-priority

port-priority	0-65535

32768

,

8.1.2 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

-	-

8.1.3 lacp port-priority

LACP no

lacp port-priority *port-priority*

no lacp port-priority

LACP

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

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

-	-

8.2

Â show lacp summary

8.2.1 show lacp summary

LACP

show lacp summary

-	-

```
Ruijie# show LACP summary
Flags:S - Device is sending Slow LACPDUs   F - Device is sending fast
LACPDUs.
A - Device is in active mode.   P - Device is in passive mode.
Aggregate port 3:
```

n

vlan-idn

n*vlan-id*

n

n

n

```
Ruijie(config)#n vlan 1n
Ruijie(config-vlan)#n
```

show vlan	n

n

vlan-name

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	statics accessport VLAN
switchport trunk	trunkport native VLAN Trunk VLAN

9.1.4 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

9.1.5 switchport trunk

trunkport native VLAN Trunk VLAN

no trunk

switchport trunk {**allowed vlan** { **all** | [**add** | **remove** | **except**] *vlan-list* }| **native vlan** *vlan-id*}

no switchport trunk {**allowed vlan** | **native vlan** }

allowed vlan *vlan-list*	Trunk VLAN vlan-list VLAN VLAN VLAN ID VLAN ID - 10-20 , 1-10,20-25,30,33 all VLAN VLAN add VLAN VLAN remove VLAN VLAN except VLAN
native vlan *vlan-id*	Native VLAN

VLAN all Native VLAN VLAN 1

Native VLAN

Trunk native VLAN native VLAN
UNTAG VLAN
VLAN ID IEEE 802.1Q PVID native
VLAN VLAN ID Trunk native VLAN
UNTAG

VLAN 0 Trunk

show vlan [**id** *vlan-id*]

vlan-id	VLAN ID

end **Ctrl+C**

exit

```
Ruijie# show vlan id 1
VLAN[1] "VLAN0001"
GigabitEthernet 3/1
GigabitEthernet 3/2
GigabitEthernet 3/3
GigabitEthernet 3/4
GigabitEthernet 3/5
GigabitEthernet 3/6
GigabitEthernet 3/7
GigabitEthernet 3/8
GigabitEthernet 3/9
GigabitEthernet 3/10
GigabitEthernet 3/11
GigabitEthernet 3/12
```

name	VLAN
switchport access	Vlan

10 Super-vlan

10.1

10.1.1 supervlan

VLAN **supervlan**

supervlan

no supervlan

VLAN

end **Ctrl+C**

exit

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

show supervlan	supervlan

10.1.2 subvlan

super vlan subvlan subvlan ל

subvlan *vlan-id-list*

no subvlan [*vlan-id-list*]

VLAN

no subvlan supevlan subvlan

```
Ruijie(config)# vlan 3
Ruijie(config-vlan)# supervlan
Ruijie(config-vlan)# subvlan 5
Ruijie(config-vlan)# subvlan 7-19
```

show supervlan	supervlan

10.1.3 subvlan-address-range

subvlan ip

subvlan-address-range *start-ip end-ip*

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
```

show supervlan	supervlan

10.1.4 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

10.2

10.2.1 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
```

11 Protocol VLAN

11.1

- **protocol-vlan ipv4** *addr* **mask** *addr* **vlan** *id*
- **protocol-vlan profile** *num* **frame-type** [*type*] **ether-type** [*type*]
- **protocol-vlan profile** *num* **vlan** *id*

11.1.1 protocol-vlan ipv4 addr mask addr vlan id

IP VLAN

addr IP x.x.x.x

id VLAN ID 1- VLAN

```
Ruijie(config)# protocol-vlan ipv4 192.168.100.3 mask
255. 255.255.0 vlan 100
```

show protocol-vlan ipv4

no protocol-vlan ipv4 *addr* **mask** *addr*

no protocol-vlan ipv4

11.1.2 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*

11.1.3 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*

11.2

， **show protocol-vlan**

11.2.1 show protocol-vlan

Protocol VLAN

show vlan protocol-vlan

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

12 PrivateVLAN

12.1

- **private-vlan type**
- **private-vlan association**
- **private-vlan mapping**
- **switchport mode private-vlan**
- **switchport private-vlan host-association**
- **switchport private-vlan mapping**

12.1.1 private-vlan type

VLAN VLAN

private-vlan {community | isolated | primary}
no private-vlan {community | isolated | primary}

community	community VLAN
isolated	isolated VLAN
primary	primary VLAN
no	VLAN

VLAN

```
Ruijie(config)# vlan 22
Ruijie(config-vlan)# private-vlan primary
```

show vlan private-vlan

12.1.2 private-vlan association

secondary VLAN primary VLAN

private-vlan association {*svlist* | **add** *svlist* | **remove** *svlist*}

no private-vlan association

svlist secondary VLAN list

no

show vlan private-vlan

12.1.4 switchport mode private-vlan

private VLAN

switchport mode private-vlan{**host**|**promiscuous**host

no switchport mode

host VLAN

promiscuous

VLAN

```
Ruijie(config)# interface gigabitEthernet 0/1
Ruijie(config-if)# switchport mode private-vlan host
Ruijie(config-if)# switchport private-vlan host-assoc
iation 22 23
```

show vlan private-vlan

12.1.6 switchport private-vlan association trunk

private VLAN trunk primary VLAN secondary VLAN

switchport private-vlan association trunk *p_vid s_vid*

no switchport private-vlan association trunk *p_vid s_vid*

p_vid	primary VID
s_vid	secondary VID
no :	VLAN

```
Ruijie(config)# interface gigabitEthernet 0/1
Ruijie(config-if)# switchport mode trunk
Ruijie(config-if)# switchport private-vlan associatio
n trunk 22 23
```

show vlan private-vlan

RGOS10.3(5)

12.1.7 switchport private-vlan mapping

private VLAN secondary VLAN

switchport private-vlan mapping *p_vid* {*svlist*|**add** *sv* |**remove** *svlist*}

no switchport private-vlan mapping

p_vid primary VID

svlist secondary VLAN list

no secondaryVLAN

VLAN

```
Ruijie(config)# interface gigabitEthernet 0/1
Ruijie(config-if)# switchport mode private-vlan promiscuous
Ruijie(config-if)# switchport private-vlan mapping 22 add 23-25
```

show vlan private-vlan

12.2

- **show vlan private-vlan**

12.2.1 show vlan private-vlan

private VLAN

show vlan private-vlan [**community** | **primary** |

primary primary VLAN

community community VLAN

```
Ruijie# show vlan private-vlan
```

12.3 Hybrid

- **switchport mode hybrid**
-

```
Ruijie(config-if)# switchport hybrid native vlan 3
```

12.3.3 switchport hybrid allowed vlan

switchport hybrid allowed vlan[[**add**][**tagged | untagged**] **| remove**] v*list*

no switchport hybrid allowed vlan

hybrid

no hybrid

```
Ruijie(config-if)# switchport hybrid allowed vlan add
untagged 3-5
```

13 802.1Q Tunneling

13.1

- **switchport mode dot1q-tunnel**
- **switchport mode uplink**
- **switchport dot1q-tunnel allowed vlan**
- **switchport dot1q-tunnel native vlan**
- **dot1q outer-vid**
- **dot1q relay-vid**
- **traffic-redirect access-group** *acl* **outer-vlan**
- **traffic-redirect access-group** *acl* **inner-vlan**
- **traffic-redirect access-group** *acl* **nested-vlan**
- **frame-tag tpid** *tpid*
- **inner-priority-trust enable**
- **l2protocol-tunnel**
- **12protocol-tunnel** *proto-type* **enable**

13.1.1 switchport mode dot1q-tunnel

802.1Q tunneling

switchport mode dot1q-tunnel

no switchport mode

no 802.1Q tunneling

802.1Q tunneling

dot1q-tunnel

```
Ruijie(config)#interface gigabitEthernet 0/1
Ruijie(config-if)#switchport mode dot1q-tunnel
Ruijie(config)#end
```

no

13.1.5 dot1q outer-vid

tunnel vid

dot1q outer-vid *vid* **register inner-vid** *v_list*

no dot1q outer-vid *vid* **register inner-vid** *v_list*

v_list vlan id

vid vlan id

no

tag vid 4-22 tag vid 3

```
Ruijie#configure
Ruijie(config)#interface gigabitEthernet 0/1
Ruijie(config-if)#switchport mode dot1q-tunnel
Ruijie(config-if)#dot1q outer-vid 3 register inner-vid
4-22
Ruijie(config-if)#end
```

show registration-table [**interface** *intf-id*]

13.1.6 dot1q relay-vid

access trunk hybrid vid

dot1q relay-vid *vid* **translate local-vid** *v-list*

no dot1q relay-vid *vid* **translate local-vid** *v-list*

v_list vid

vid tag vid

no

tag vid 10-20 vid 100

```
Ruijie(config)# interface gigabitEthernet 0/1
Ruijie(config-if)# switchport mode access
Ruijie(config-if)# dot1q relay-vid 100 translate
local-vid 10-20
Ruijie(config-if)# end
```

show translation-table [**interface** *intf-id*]

13.1.7 traffic-redirect access-group *acl* outer-vlan

access,trunk,hybrid vid

traffic-redirect access-group *acl* **outer-vlan** *vid* **in**

no traffic-redirect access-group *acl* **outer-vlan**

acl acl

vid vid

no vid

1.1.1.1 vid 3

```
Ruijie#configure
Ruijie(config)#ip access-list standard 2
Ruijie (config-std-nacl)#permit host 1.1.1.1
Ruijie (config-std-nacl)#exit
Ruijie(config)# interface gigabitEthernet 0/1
Ruijie(config-if)# switchport mode trunk
Ruijie(config-if)# traffic-redirect access-group 2
outer-vlan 3 in
```

```
Ruijie(config-if)# end
```

show traffic-redirect

13.1.8 traffic-redirect access-group *acl* inner-vlan

access trunk hybrid vid

traffic-redirect access-group *acl* **inner-vlan** *vid* **out**
no traffic-redirect access-group *acl* **inner-vlan**

acl acl

vid vid

no vid

1.1.1.2 vid 6

```
Ruijie#configure
Ruijie(config)#ip access-list standard to_6
Ruijie(config-acl-std)#permit host 1.1.1.2
Ruijie(config-acl-std)#exit
Ruijie(config)# interface gigabitEthernet 0/1
Ruijie(config-if)# switchport mode trunk
Ruijie(config-if)# traffic-redirect access-group to_6
inner-vlan 6 out
Ruijie(config-if)# end
```

show traffic-redirect

13.1.9 traffic-redirect access-group *acl* nested-vlan

traffic-redirect access-group *acl* **nested-vlan** *vid* **in**

no traffic-redirect access-group *acl* **nested -vlan**

acl acl

vid vid

no vid

1.1.1.3 vid 9

```
Ruijie#configure
Ruijie(config)#ip access-list standard 20
Ruijie(config-acl-std)#permit host 1.1.1.3
Ruijie(config-acl-std)#exit
Ruijie(config)# interface gigabitEthernet 0/1
Ruijie(config-if)# switchport mode dot1q-tunnel
Ruijie(config-if)# traffic-redirect access-group 20
nested-vlan 10 in
Ruijie(config-if)# end
```

show traffic-redirect

13.1.10 frame-tag tpid tpid

tpid

frame-tag tpid <*tpid*>

no frame-tag tpid

no

gvrp gvrp

no

gvrp stp

```
Ruijie#configure
Ruijie(config)# l2protocol-tunnel stp
Ruijie(config)# l2protocol-tunnel gvrp
Ruijie(config)#end
```

show l2protocol-tunnel {**gvrp|stp**}

13.1.13 l2protocol-tunnel

- **show dot1q-tunnel** [**interface** *intf-id*]
- **show interface** [*intf-id*] **dot1q-tunnel**
- **show frame-tag tpid**
- **show inner-priority-trust**
- **show registrationmndlet**
- **show translrationmndles**

```
Ruijie# show interface dot1q-tunnel
Interface: Gi0/3
Native vlan: 10
Allowed vlan list: 4-6  10  30-60
Tagged vlan list: 4  6  30-60
```

13.2.3 show frame-tag tpid

tpid

show frame-tag tpid [**interface** *intf-id*]

intf-id

tpid

```
Ruijie# show frame-tag tpid
Ports  tpid
-----  ---------
Gi0/1   0x9100
```

13.2.4 show inner-priority-trust

show inner-priority-trust

```
Ruijie# show inner-priority-trust
Ports   inner-priority-trust
```

13.2.7 show traffic-redirect

vid

show traffic-redirect [**interface** *intf-id*]

intf-id

```
Ruijie# show traffic-redirect
```

```
L2protocol-tunnel: gvrp Disable
```

14 MAC

14.1

14.1.1 mac-address-table aging-time

no

mac-address-table aging-time *seconds*

no mac-address-table aging-time

seconds

300

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	

14.1.3 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

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

14.1.5 mac-address-table static

no

mac-address-table static *mac-addr* **vlan** *vlan-id* **interface** *interface-id*

no mac-address-table static *mac-addr* **vlan** *vlan-id* **interface** *interface-id*

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

show mac-addre
ss-table static **clear mac-address-ta**
ble static

00d0.f800.073c VLAN 4

gigabitethernet 1/1

```
Ruijie(config)# mac-address-table static
00d0.f800.073c vlan 4 interface gigabitethernet 1/1
```

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

14.1.6 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	

mac-address-table notification [**interval** *value* | **history-size** *value*]

no mac-address-table notification [**interval** | **history-size**]

interval *value*	MAC Trap 1
history-size *value*	MAC 50

1 50

MAC

Trap **snmp-server enable traps mac-notification** MAC Trap

```
Ruijie(config)# mac-address-table notification
Ruijie(config)# mac-address-table notification
interval 40
Ruijie(config)# mac-address-table notification
history-size 100
```

snmp-server enable traps	trap
show mac-address-table notification	MAC
snmp trap mac-notification	MAC

14.1.8 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

14.1.9 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	

14.1.10 address-bind uplink

ip mac .

address-bind uplink *intf-id*

no address-bind uplink *intf-id*

intf-id	

	Ipv4	IPV6
	IPV4+MAC	ipv6

I‘
F
V
4
+
M
A
C

		MAC IPV4+MAC MAC IPV6

IP 192.168.5.2 00d0.f822.33aa
IPV6

```
Ruijie# configure t
Enter configuration commands, one per line.  End with
CNTL/Z.
Ruijie(config)# address-bind 00d0.f822.33aa ip
192.168.5.2
Ruijie(config)# address-bind ipv6-mode compatible
```

14.2

- **show mac-address-table address**

- **show mac-address-table aging-time**
- **show mac-address-table count**
- **show mac-address-table dynamic**
- **show mac-address-table filtering**
- **show mac-address-table interface**
- **show mac-address-table notification**
- **show mac-address-table static**
- **show mac-address-table vlan**
- **show address-bind**
- **show mac-address-table mac-manage-learning**

14.2.1 show mac-address-table address

MAC

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 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	

14.2.2 show mac-address-table aging-time

show mac-address-table aging-time

```
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	
show mac-address-table vlan	VLAN

14.2.4 show mac-address-table dynamic

show mac-address-table dynamic [**address** *mac-addr*] [

```
1    0000.0000.0001     DYNAMIC  gigabitethernet 1/1
1    0001.960c.a740     DYNAMIC  gigabitethernet 1/1
1    0007.95c7.dff9     DYNAMIC  gigabitethernet 1/1
1    0007.95cf.eee0     DYNAMIC  gigabitethernet 1/1
1    0007.95cf.f41f     DYNAMIC  gigabitethernet 1/1
1    0009.b715.d400     DYNAMIC  gigabitethernet 1/1
1    0050.bade.63c40     DYNAMIC  gigabitethernet 1/1
```

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

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

14.2.8 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	

14.2.9 show mac-address-table vlan

VLAN

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

vlan-id	VLAN ID

```
Ruijie# show mac-address-table vlan 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
```

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	
show mac-address-table count	

14.2.10 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	

14.2.11 show mac-address-table mac-manage-learning

MAC

```
Ruijie# show mac-address-table mac-manage-learning
######MAC manage-learning
running mode: uniform
configuration mode: uniform
dynamic address learning-synchronization: off.
```

mac-manage-learing uniform	MAC uniform
mac-manage-learning uniform learning-synchronization	MAC
mac-manage-learning dispersive	MAC dispersive

15 DHCP Snooping

15.1 DHCP snooping

DHCP snooping

- **ip dhcp snooping**
- **ip dhcp snooping vlan**
- **ip dhcp snooping bootp-bind**
- **ip dhcp snooping verify mac-address**
-

```
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)
------------------------  -------    ------------
```

show ip dhcp snooping	DHCP snooping

15.1.2 Ip dhcp snooping vlan

VLAN DHCP Snooping
no VLAN DHCP Snooping

[**no**] **ip dhcp snooping vlan** {*vlan-rng* **|** {*vlan-min* [*vlan-max*]}}

vlan-rng dhcp snooping vlan
vlan-min dhcp snooping vlan
vlan-max dhcp snooping vlan

DHCP Snooping VLAN

VLAN DHCP Snooping
VLAN DHCP Snooping DHCP Snooping

VLAN1000 DHCP Snooping

```
Ruijie# configure terminal
Ruijie(config)# ip dhcp snooping vlan 1000
Ruijie(config)# end
```

ip dhcp snooping	DHCP Snooping

15.1.3 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)
-----------------------  -------    ------------
```

show ip dhcp snooping	DHCP snooping

15.1.4 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

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)
------------------------  -------    ------------
```

show ip dhcp snooping	DHCP snooping

15.1.7 ip dhcp snooping database write-to-flash

DHCP Snooping
FLASH

ip dhcp snooping database write-to-flash

DHCP Snooping
FLASH

DHCP flash

```
Ruijie# configure terminal
```

```
Ruijie(config)# ip dhcp snooping database
write-to-flash
Ruijie(config)# end
```

15.2 DHCP snooping

DHCP snooping

- **ip dhcp snooping suppression**
- **ip dhcp snooping trust**
- **ip dhcp snooping limit rate**

15.2.1 ip dhcp snooping suppression

suppression
no no suppression

[**no**] **ip dhcp snooping suppression**

DHCP
DHCP

fastethernet *0/2* suppression

```
Ruijie# configure terminal
Ruijie(config)# interface fastethernet 0/2
Ruijie(config-if)# ip dhcp snooping suppression
Ruijie(config-if)# end
```

15.2.2 ip dhcp snooping trust

DHCP snooping TRUST
no UNTRUST

[**no**] **ip dhcp snooping trust**

UNTRUST

DHCP TRUST
TRUST DHCP UNTRUST
DHCP

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

15.2.3 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  DHCP snoopis    Trusted    Rate limit (pps)0001 Tcef2T( )
```

DHCP Snooping

DHCP Snooping

```
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)
-----------------------  -------    ------------
```

```
Ruijie# show ip dhcp snooping binding
Total number of bindings: 0
MacAddress IpAddress Lease(sec) Type VLAN Interface
-------  ---  ----------  ---------  ----  ---------
```

show ip dhcp snooping binding	DHCP snooping

15.4.2 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
```

16 IGMP Snooping

16.1

IGMP Snooping profile

Profile

- **range**
- **deny**
- **permit**

- **ip igmp profile**
- **ip igmp snooping ivgl**
- **ip igmp snooping svgl**
- **ip igmp snooping svgl profile**
- **ip igmp snooping ivgl-svgl**
- **ip igmp snooping vlan**
- **ip igmp snooping dyn-mr-aging-time**
- **ip igmp snooping query-max-response-time**
- **ip igmp snooping vlan mrouter learn pim-dvmrp**
- **ip igmp snooping vlan mrouter interface**
- **ip igmp snooping vlan static interface**
- **ip igmp snooping fast-leave enable**
- **ip igmp snooping suppression enable**
- **ip igmp snooping source-check port**
- **ip igmp snooping source-check default-server**
- **ip igmp snooping limit-ipmc vlan server**
- **ip igmp snooping filter**
- **ip igmp snooping max-groups**

16.1.1 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 “ SVGL ” “ ” “ IGMP Filtering ” profile profile

1 profile profile

```
Ruijie(config)# ip igmp profile 1
Ruijie(config-profile)#
```

range	profile

16.1.2 range

profile profile profile range

no

range *low-ip-address* [*high-ip-address*]

no range *low-ip-address* [*high-ip-address*]

low-ip-address 01 173 Tm0.002c580522C

profile

low-ip-address high-ip-address
profile deny

233.3.3.3 234.4.4.4 profile :

```
Ruijie(config)# ip igmp profile 1
Ruijie(config-profile)# range 233.3.3.3 234.4.4.4
```

ip igmp profile	profile
deny	profile deny
permit	profile permit

16.1.3 deny

profile profile
deny

deny

profile deny

profile

profile range

233.3.3.3 profile :

```
Ruijie(config)# ip igmp profile 1
Ruijie(config-profile)# range 233.3.3.3
Ruijie(config-profile)# deny
```

ip igmp profile	profile
range	

16.1.4 permit

profile

16.1.5 ip igmp snooping ivgl

igmp snooping ivgl **ip igmp snooping ivgl** no ip igmp snooping igmp snooping

ip igmp snooping ivgl

no ip igmp snooping

disable

VLAN

VLAN

VLAN VLAN

igmp snooping ivgl

```
Ruijie(config)# ip igmp snooping ivgl
```

ip igmp snooping svgl	igmp snooping svgl
ip igmp snooping ivgl-svgl	igmp snooping

16.1.6 ip igmp snooping svgl

igmp snooping SVGL **ip igmp snooping svgl** no ip igmp snooping igmp snooping

ip igmp snooping svgl

no ip igmp snooping

disable

VLAN VLAN
Shared VLAN VLAN VLAN
Shared VLAN
Shared VLAN SVGL
IGMP Profile SVGL
VLAN
SVGL

&

SVGL profile SVGL
SVGL
“ SVGL ”

SVGL
ip multicast-routing
SVGL

igmp snooping SVGL profile1
SVGL

```
Ruijie(config)# ip igmp snooping svgl
Ruijie(config)# ip igmp snooping svgl profile 1
```

16.1.7 ip igmp snooping svgl profile

SVGL

ip igmp snooping profile *profile-number,* **no ip igmp snooping profile**

ip igmp snooping profile *profile-number*

no ip igmp snooping profile

profile-number s	profile <1-65535>

profile

IGMP Snooping SVGL IVGL-SVGL SVGL profile SVGL VLAN VLAN profile VLAN

SVGL porfile 1

```
Ruijie(config)# ip igmp snooping svgl profile 1
```

ip igmp snooping svgl	igmp snooping svgl
ip igmp snooping ivgl-svgl	igmp snooping

igmp snooping IVGL-SVGL

ip igmp snooping ivgl-svgl no igmp snooping

ip igmp snooping ivgl-svgl

no ip igmp snooping

disable

IVGL SVGL IVGL SVGL

IGMP Profile

SVGL VLAN

VLAN

&

IVGL-SVGL profile

VLAN

VLAN “ SVGL

”

IVGL-SVGL

IVGL-SVGL

igmp snooping ivgl-svgl

profile1 SVGL

```
Ruijie(config)# ip igmp snooping ivgl-svgl
Ruijie(config)# ip igmp snooping svgl profile i
```

ip igmp snooping ivgl	igmp snooping ivgl

16.1.9 ip igmp snooping vlan

VLAN igmp snooping
ip igmp snooping vlan no ip igmp snooping vlan vlan
igmp snooping

ip igmp snooping vlan *num*

no ip igmp snooping vlan *num*

num	VLAN IGMP Snooping VLAN ID

VLAN

VLAN IGMP Snooping

igmp snooping IVGL

ip igmp snooping dyn-mr-aging-time *num*

no ip igmp snooping dyn-mr-aging-time

num	1-3600

300s

IGMP

PIM Hello

Ï Q ¸ ° A Ÿ ð @ Ð Ä 1 ñ — q ! m 0 s Á ! D r T ! = ô Ó j Â ð à Ÿ $ ì / A

VLAN

VLAN no

igmp

snooping

```
Ruijie(config)# ip igmp snooping vlan 1 mrouter learn
pim-dvmrp
```

ip igmp snooping vlan mrouter interface	

16.1.13 ip igmp snooping vlan mrouter interface

ip igmp snooping vlan mrouter interface no

ip igmp snooping vlan *vid* **mrouter interface** *interface-id*

no ip igmp snooping vlan *vid* **mrouter interface** *interface-id*

vid	vlan id
interface-id	

ip igmp snooping vlan mrouter interface	

16.1.15 ip igmp snooping fast-leave enable

igmp snooping fast-leave **ip igmp snooping fast-leave enable** no igmp snooping fast-leave

ip igmp snooping fast-leave enable

no ip igmp snooping fast-leave enable

no ip igmp snooping suppression enable

disable

IGMP
vlan IGMP
Report IGMP Report

suppression IGMPv1/v2 report
IGMPv3 report

igmp snooping suppression

```
Ruijie(config)# ip igmp snooping suppression
```

16.1.17 ip igmp snooping source-check port

igmp
snooping **ip igmp**
snooping source-check port no

ip igmp snooping source-check port

no ip igmp snooping source-check port

IGMP SNOOPING IGMP

IGMP Sooping
IGMP SNOOPING

VLAN

igmp snooping

```
Ruijie(config)# ip igmp snooping source-check port
```

ip igmp snooping source-check default-server	IP

16.1.18 ip igmp snooping source-check default-server

IP IP
igmp snooping IP
ip igmp snooping source-check default-server no
IP

ip igmp snooping source-check default-server *address*

no ip igmp snooping souce-check

address	

```
Ruijie(config)# interface fastEthernet 0/1
Ruijie(config-if)# ip igmp snooping filter 1
```

ip igmp profile	profile

16.1.21 ip igmp snooping max-groups

, **ip igmp snooping max-groups** no

ip igmp snooping max-groups *number*

no ip igmp snooping max-groups

Number: 0 – 1024

IGMP Report

fa0/1 100

```
Ruijie(config)# interface fastEthernet 0/1
Ruijie(config-if)# ip igmp snooping max-group 100
```

ip igmp snooping filter	

16.2

```
1       233.4.4.4           Ag2(S)
```

16.2.2 show ip igmp profile

profile

show ip igmp profile

show ip igmp profile *profile-number*

	profile
profile-number	profile

EXEC

profile

fa0/1 100

```
Ruijie(config-if)#show ip igmp profile
Profile    1
       Permit
       range 224.0.1.0,   239.255.255.255
```

16.2.3 clear ip igmp snooping gda-table

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
packet	IGMP Snooping
msf	IGMP Snooping
warning	IGMP Snooping

EXEC

17 PIM-Snooping

17.1 PIM-Snooping

PIM-Snooping

- **ip pim snooping**
- **ip pim snooping**
- **show ip pim snooping**
- **show ip pim snooping vlan**

17.1.1 ip pim snooping

PIM-Snooping **ip pim snooping**
no PIM-Snooping

ip pim snooping

no ip pim snooping

PIM-Snooping

```
Ruijie# configure terminal
Ruijie(config)# ip pim snooping
```

&

PIM-Snooping VLAN PIM

17.1.2 ip pim snooping

PIM-Snooping **ip pim snooping**
no PIM-Snooping

ip pim snooping

no ip pim snooping

PIM-Snooping

```
Ruijie# configure terminal
Ruijie(config)# interface vlan 199
Ruijie(config-if)# ip pim snooping
```

&

PIM-Snooping VLAN PIM

17.1.3 show ip pim snooping

PIM-Snooping **show ip pim snooping**

show ip pim snooping

PIM-Snooping

```
Ruijie#show ip pim snooping
PIM Snooping table: 2 neighbours, Memory:16
Interface VLAN 7(4103), PC:2
Port GigabitEthernet 0/7(7), NC:1
```

PIM-Snooping VLAN **show ip pim snooping vlan interface-number**

show ip pim snooping vlan *interface-number*

interface-number	VLAN ID

PIM-Snooping VLAN7

```
Ruijie#show ip pim snooping vlan 7
PIM Snooping table:
Interface VLAN 7(4103), PC:2
Port GigabitEthernet 0/7(7), NC:1
Neignbour 4.4.4.1, GenID 0X2f853a91, Holdtime 105s, NLT
75s
Port GigabitEthernet 0/8(8), NC:1
Neignbour 4.4.4.2, GenID 0X38545b24, Holdtime 105s, NLT
77s
```

18 MSTP

18.1

18.1.1 spanning-tree

MSTP MSTP MSTP
no spanning-tree no
spanning tree

spanning-tree [**forward-time** *seconds* | **hello-time** *seconds* | **max-age** *seconds*]

no spanning-tree [**forward-time** | **hello-time** | **max-age**]

forward-time *seconds*

hello-time *seconds* BPDU

max-age *seconds* BPDU

spanning-tree

forward-time hello-time max-age

2*(Hello Time+1.0snd) <= Max-Age Time <= 2*(Forward-Delay

show spanning-tree STP

spanning-tree mst cost STP PathCost

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

no spanning-tree max-hops

hop-count BPDU 1 40

hop-count 20

.

Region Root Bridge BPDU Hot Count Root Bridge Hop Count 1 0 BPDU Hops 0 BPDU

max-hops Instance

MST Instance Max-hops 10

```
Ruijie(config)# spanning-tree max-hops 10
```

show spanning-tree mst

show spanning-tree MSTP

18.1.6 spanning-tree mode

STP no

spanning-tree mode [**stp** | **rstp** | **mstp**]

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

.

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

show spanning-tree mst MST region

instance instance-id vlan vlan-range Vlan MST Instance

name MST

revision MST

show MST MST

18.1.8 spanning-tree mst cost

Instance no

spanning-tree [**mst** *instance-id]* **cost** *cost*

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

instance-id Instance 0 64

cost 1 200 000 000

Instance-ID 0

Interface

• 1000 Mbps—20000

• 100 Mbps—200000

• 10 Mbps—2000000

.

cost

Instance 3 400

```
Ruijie(config)# interface gigabitethernet 1/1
Ruijie(config-if)# spanning-tree mst 3 cost 400
```

show spanning-tree mst interface interface-id

show spanning-tree mst MSTP

spanning-tree mst port-priority

spanning-tree mst priority instance

18.1.9 spanning-tree mst port-priority

Instance

Region

no

spanning-tree [**mst** *instance-id*] **port-priority** *priority*

priority 0, 4096,8192, 12288, 16384, 20480, 24576, 28672, 32768, 36864, 40960, 45056, 49152,53248, 57344 61440 16 4096

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 f10.7.(j/5n2.1tTJ/TT18ac)-4.7(e inter

MSTP

18.1.14 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

18.1.15 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

18.1.16 spanning-tree portfast bpdufilter default

BPDU filter no H@{A1@4

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

show spanning-tree interface STP

18.1.18 spanning-tree tc- protection

tc- protection no tc-protection

spanning-tree tc- protection

no spanning-tree tc- protection

tc- protection

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

18.1.19 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
```

18.1.20 spanning-tree tc-guard

tc- guard no tc- guard tc-guard tc

spanning-tree tc-guard

no spanning-tree tc-guard

EÝNM GKÁ€ h ɐ ή

EÝNM GKÁ€

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

18.1.23 spanning-tree guard loop

loop guard no loop guard
loop guard bpdu

spanning-tree guard loop

no spanning-tree guard loop

loop guard

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

18.1.24 spanning-tree guard none

guard no guard

spanning-tree guard none

no spanning-tree guard none

guard

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

18.1.25 spanning-tree autoedge

Autoedge disabled
Autoedge

spanning-tree autoedge [**disabled**]

disabled Autoedge

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

show spanning-tree interface STP

18.1.26 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
```

18.1.27 clear spanning-tree detected-protocols

RSTP BPDU BPDU

clear spanning-tree detected-protocols [**interface** *interface-id*]

interface-id

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

show spanning-tree interface STP

18.1.28 spanning-tree compatible enable

MSTI

spanning-tree compatible enable

no spanning-tree compatible enable

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

18.1.29 logging event status

LOG

logging event status

no logging event status

```
Ruijie(config-if)#logging event status
```

18.2

18.2.1 show spanning-tree

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

summary MSTP instance
Inconsistentports block
forward-time BridgeForwardDelay
hello-time BridgeHelloTime
max-age BridgeMaxAge
max-hops instance
tx-hold-count TxHoldCount
pathcost method

```
Ruijie# show spanning-tree hello-time
```

spanningtree pathcost method
spanning-tree forward-time BridgeForwardDelay
spanning-tree hello-time BridgeHelloTime
spanning-tree max-age BridgeMaxAge

spanning-tree max-hops instance

spanning-tree tx-hold-count TxHoldCount

18.2.2 show spanning-tree interface

STP

show spanning-tree interface *interface-id* [{**bpdufilter** | **portfast** | **bpduguard** | **link-type** }]

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 “ ”

18.2.3 show spanning-tree mst

MST Instance

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

configuration mst

instance-id *Instance*

interface-id

switch port routed port SPAN
SPAN disabled port
SPAN

show monitor SPAN

SPAN 1.
1 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
```

~ session 1

show monitor	SPAN

19.2 show monitor

SPAN

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

SPAN

session *session_number* SPAN

show monitor SPAN 1

```
Ruijie# show monitor session 1
sess-num: 1
src-intf:
GigabitEthernet 3/1 frame-type Both
dest-intf:
GigabitEthernet 3/8
```

monitor session	SPAN

20 RSPAN

20.1

20.1.1 monitor session

RSPAN

monitor session *session_num* {**remote-destination** | **remote-source**}

monitor session *session-num* **destination remote vlan** *-eÄ*

21 IP

21.1

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

21.1.1 ip address

IP no IP

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

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

ip-address	32 IP 8
network-mask	32 “1” “0” 8
secondary	IP

IP

IP IP
IP IP

32 IP
“ 1 ” IP
“ 0 ” IP A
“ 255.0.0.0 ”

RGOS IP IP
IP IP
IP IP IP
IP IP
IP
C
254 254 C
C
IP
IP
IP
IP

IP 10.10.10.1
255.255.255.0

```
ip address 10.10.10.1 255.255.255.0
```

show interface	

21.1.2 ip unnumbered

IP IP no

ip unnumbered *interface-type interface-number*

no ip unnuG5BÄmb Ï‚Ë•¥ Uð –••

interface-number	

IP IP
IP IP
IP IP
IP

¸
¸ SLIP HDLC PPP LAPB Frame-relay

X.25

¸ ping
IP SNMP

¸

FastEthernet 0/1 ṗ ǿ

- **arp unresolve**
- **arp gratuitous-send interval**
- **arp timeout**
- **ip proxy-arp**
- **service trustedarp**

21.2.1 arp

ARP IP MAC
no MAC

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

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

ip-address	MAC IP
MAC-address	48
type	ARP arpa
alias	RGOS IP arp

ARP

RGOS ARP 32 IP 48 MAC

ARP ARP
clear arp-cache ARP

ARP

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

clear arp-cache	ARP

arp IP

ARP no

5 ARP

arp retry times *number*

no arp retry times

number	ARP <1-100> 1 ARP 1 ARP

ARP ARP 5

ARP

ARP

ARP

```
arp retry times 1
```

ARP 1

```
arp retry times 2
```

arp retry interval *seconds*	arp

21.2.4 arp trusted NUM

ARP no

arp trusted *number*

no arp trusted

number	ARP , <10-7168>

ARP ARP
ARP

1000 ARP

```
arp trusted 1000
```

service trustedarp	ARP

21.2.5 arp trusted aging

ARP no

arp trusted aging

no arp trusted aging

GSN ARP

ARP ARP
arp timeout

service trustedarp	ARP

21.2.6 arp unresolve

ARP no
8192

arp unresolve *number*

no arp unresolve

number	ARP < 1-8192 >
8192

ARP 8192

ARP

500

```
arp unresolved 500
```

21.2.7 arp gratuitous-send interval

arp no

arp gratuitous-send interval *seconds*

no arp gratuitous-send

seconds	ARP <1-3600>

ARP

ARP

SVI 1 ARP

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

SVI 1 ARP

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

21.2.8 arp timeout

ARP ARP

no

arp timeout *seconds*

no arp timeout

seconds	0-2147483

3600

ARP IP MAC
ARP ARP

ARP

FastEthernet 0/1 ARP
120

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

clear arp-cache	ARP
show interface	

21.2.9 ip proxy-arp

ARP **ip proxy-arp**
no ARP

ip proxy-arp

no ip proxy-arp

ARP

ARP
IP MAC ARP ARP

21.2.10 service trustedarp

ARP **service trustedarp**

no ARP

service trustedarp

no service trustedarp

no ip broadcast-addresss *ip-address*

ip-address	IP

IP 255.255.255.255

IP “ 1 ” 255.255.255.255 RGOS IP “ 1 ”

IP 0.0.0.0

```
ip broadcast-address  0.0.0.0
```

21.3.2 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 IP
172.16.16.255

IP

IP “ 1 ”

no ip directed-broadcast RGOS

FastEthernet 0/1

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

21.4 IP

IP

- **clear arp-cache**
- **shoclear arp-cache**

ARP

~

RNFP(Ruijie Network Foundation Protection,)
mac (IP) ARP
clear arp 1s
ARP

ARP

```
clear arp-cache
```

ARP 1.1.1.1

```
clear arp-cache 1.1.1.1
```

SVI1 ARP

```
clear arp-cache interface Vlan 1
```

arp	ARP

21.4.2 show arp

ARP

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

ip	ip ip ARP
ip mask	ip mask ARP
mac-address	mac ARP
static	arp
complete	arp

```
Internet  192.168.195.68    1    0013.20a5.7a5f   arpa
VLAN 1
```

show arp *192.168.195.0 255.255.255.0*

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

show arp *001a.a0b5.378d*

show arp *sh1025 Tw[1 Tf2c03>T7(1-5.70.-5.7(e)5.7(4157.1(-2.26)*

0

show arp detail interface-type *interface-number*

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

show arp detail trusted [**ip** [**mask**]]

192.168.0.1	0012.a990.2241	Local	--	Vl3	--
192.168.0.1	0012.a990.2241	Local	--	Gi2/3/2	--

ARP


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

ARP

21.4.6 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

21.4.7 show ip arp

ARP

show ip arp

show ip arp

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

ARP

Protocol	Internet
Address	IP
Age (min)	ARP “-”
Hardware	IP
Type	ARPA
Interface	IP ÈHU¾1QDQD¾ÕHXP1”Ò@ÃÈÒÑ

Interface-type	
Interface-number	

RGOS

RGOS

RGOS

“ UP ” “ UP ”

show ip interface

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

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	

22 IP

22.1 IP

IP

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

22.1.1 ip mask-reply

RGOS ICMP ICMP
ip mask-reply no ICMP

ip mask-reply

no ip mask-reply

ICMP

ICMP ICMP

FastEthernet 0/1 ICMP

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

22.1.2 ip mtu

IP MTU **ip mtu** no

ip mtu *bytes*

no ip mtu

bytes	IP 68~1500

mtu

IP IP MTU RGOS IP MTU

mtu IP MTU MTU IP MTU MTU

FastEthernet 0/1 IP MTU 512

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

mtu	

22.1.3 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
```

22.1.4 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
```

22.1.5 ip unreachables

RGOS ICMP **ip unreachables** no ICMP

ip unreachables

no ip unreachables

RGOS

ICMP

RGOS

23 DHCP

23.1 DHCP

23.1.1 bootfile

DHCP DHCP
bootfile **no**

bootfile *file-name*

no bootfile

file-name	

DHCP

DHCP DHCP
DHCP
TFTP **next-server**

router.conf

```
bootfile router.conf
```

ip dhcp pool	DHCP DHCP

DHCP

next-server

hardware-address	DHCP
host	IP DHCP
ip dhcp pool	DHCP DHCP

23.1.3 client-name

DHCP DHCP **client-name**
no DHCP

client-name *client-name*

no client-name

client-name	DHCP ASCII river DHCP river.i-net.com.cn

DHCP

DHCP DHCP

river

```
client-name river
```

host	IP DHCP

ip dhcp pool	DHCP DHCP

23.1.4 default-router

DHCP DHCP

default-router **no**

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

no default-router

ip-address	IP
ip-address2…ip-address8	8

DHCP

DHCP DHCP

DHCP IP

192.168.12.1

```
default-router 192.168.12.1
```

ip dhcp pool	DHCP DHCP

23.1.5 dns-server

DHCP DNS DHCP

dns-server **no** DNS

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

no dns-server

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

domain-name *domain-name*

no domain-name

domain-name	DHCP

DHCP

DHCP

DHCP i-net.com.cn

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

dns-server	DHCP DNS
ip dhcp pool	DHCP DHCP

23.1.7 hardware-address

DHCP DHCP **hardware-address** **no**

hardware-address *hardware-address type*

no hardware-address

hardware-address	DHCP MAC

DHCP

type

- ethernet
- ieee802

- 1

ip-address	DHCP IP
netmask	DHCP

IP

DHCP

DHCP IP
A 255.0.0.0 B 255.255.0
C 255.255.255.0

DHCP

IP 192.168.12.91
255.255.255.240
`host 192.168.12.91 255.255.255.240`

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

23.1.9 ip address dhcp

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

ip address dhcp

no ip address dhcp

DHCP IP

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

RGOS PPP FR HDLC dhcp

FastEthernet 0 IP

```
interface fastEthernet 0
ip address dhcp
```

dns-server	DHCP DNS
ip dhcp pool	DHCP DHCP

23.1.10 ip dhcp excluded-address

IP DHCP DHCP
ip dhcp excluded-address **no**

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

low-ip-address	IP IP IP
high-ip-address	IP

DHCP IP

DHCP

IP DHCP DHCP
IP IP
DHCP IP DHCP

DHCP 192.168.12.100~150
IP

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

ip dhcp pool	DHCP DHCP
network DHCP	DHCP

23.1.11 ip dhcp force-send-nak

DHCP NAK
no NAK

ip dhcp force-send-nak

no ip dhcp force-send-nak

DHCP Request

DHCP DHCP IP ping

DHCP Ping
10

ping 3

```
ip dhcp ping packets 3
```

clear ip dhcp conflict	DHCP DHCP ping ping **ip dhcp ping timeout** #

ping

ping 600ms

```
ip dhcp ping timeout 600
```

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

mypool0 DHCP

```
ip dhcp pool mypool0
```

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

23.1.15 lease

DHCP DHCP
lease **no**

lease { *days* [*hours*] [*minutes*] | **infinite** }
no lease

days	
hours	
minutes	
infinite	

DHCP

DHCP DHCP

DHCP 1

DHCP

ip address dhcp	DHCP IP
ip dhcp pool	DHCP DHCP

23.1.17 netbios-node-type

DHCP NetBIOS DHCP
netbios-node-type **no** NetBIOS

netbios-node-type *type*

no netbios-node-type

type	NetBIOS 0~FF Õ 1 b-node Õ 2 p-node Õ 4 m-node Õ 8 h-node Õ b-node Õ p-node Õ m-node Õ h-node

WINS WINS
NetBIOS Hybrid

DHCP NetBIOS

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

ip dhcp pool	DHCP DHCP
netbios-name-server	DHCP NETBIOS WINS

23.1.18 network DHCP

DHCP DHCP

show ip dhcp binding

show ip dhcp conflict

DHCP 192.168.12.0

255.255.255.240

```
network 192.168.12.0 255.255.255.240
```

ip dhcp excluded-address	DHCP IP
ip dhcp pool	DHCP DHCP

23.1.19 next-server

DHCP DHCP

next-server **no**

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

no next-server

ip-address	IP TFTP
ip-address2…ip-address8	8

```
next-server 192.168.12.4
```

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

23.1.20 option

DHCP DHCP **option** **no** option

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

no option

code	DHCP
ascii *string*	ASCII
hex *string*	
ip *ip-address*	IP

19 DHCP
IP 0 IP 1 IP
DHCP IP

```
option 19 hex 1
```

33 DHCP
DHCP 1
172.16.12.0 192.168.12.12 2 172.16.16.0
192.168.12.16

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

ip dhcp pool	DHCP DHCP

23.1.21 service dhcp

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

service dhcp

no service dhcp

DHCP

DHCP IP DNS
DHCP DHCP
DHCP DHCP DHCP

DHCP

DHCP

```
service dhcp
```

show ip dhcp server statistics	DHCP

23.2

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

23.2.1 clear ip dhcp binding

DHCP **clear ip dhcp binding**

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

*	DCHP
ip-address	IP

DHCP DHCP **no ip dhcp pool**

IP 192.168.12.100 DHCP

```
clear ip dhcp binding 192.168.12.100
```

show ip dhcp binding	DHCP

23.2.2 clear ip dhcp conflict

DHCP **clear ip dhcp conflict**

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

*	DCHP
ip-address	IP

DHCP ping DHCP
ARP **clear ip dhcp conflict**

```
clear ip dhcp conflict *
```

ip dhcp ping packets	DHCP ping
show ip dhcp conflict	DHCP

23.2.3 clear ip dhcp server statistics

```
debug ip dhcp client
```

23.2.5 debug ip dhcp server

DHCP Server **debug ip dhcp server**

debug ip dhcp server
no debug ip dhcp server

dhcp server

dhcp

```
debug ip dhcp server
```

23.2.6 show dhcp lease

DHCP EXEC **show dhcp lease**

show dhcp lease

IP IP
IP

show dhcp lease

```
Ruijie# show dhcp lease
```

```
Temp IP addr: 192.168.5.71  for peer on Interface:
FastEthernet0/0
Temp  sub net mask: 255.255.255.0
DHCP Lease server: 192.168.5.70, state: 3 Bound
DHCP transaction id: 168F
Lease: 600 secs,  Renewal: 300 secs,  Rebind: 525 secs
Temp default-gateway addr: 192.168.5.1
Next timer fires after: 00:04:29
Retry      count:      0                  Client-ID:
redgaint-00d0.f8fb.5740-Fa0/0
```

23.2.7 show ip dhcp binding

DHCP EXEC **show ip dhcp binding**

show ip dhcp binding [*ip-address*]

ip-address	IP

IP IP
IP

show ip dhcp binding

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

IP address	DHCP IP

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

clear ip dhcp binding	DHCP

23.2.8 show ip dhcp conflict

DHCP EXEC **show ip dhcp conflict**

show ip dhcp conflict

DHCP

show ip dhcp conflict

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

dhcpd excluded ipaddress
192.168.12.100
```

	۲ ۱

dhcpd excluded ipaddress	

clear ip dhcp confict	DHCP

23.2.9 show ip dhcp server statistics

DHCP EXEC **show ip dhcp server statistics**

show ip dhcp server statistics

DHCP

show ip dhcp server statistics

```
Ruijie# show ip dhcp server statistics
Address pools           4
Automatic bindings       4
Manual bindings          0
Expired bindings         0
Malformed messages 2

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

Message                 Sent
BOOTREPLY                16
DHCPOFFER                9
DHCPACK                  7
```

```
DHCPNAK                    0
```

Address pools	
Automatic bindings	
Manual bindings	
Expired bindings	
Malformed messages	DHCP
Message Received or Sent	DHCP

clear ip dhcp server statistics	DHCP

24 DHCP Relay

24.1 DHCP Relay

DHCP

- **service dhcp**
- **ip helper-address**
-

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

24.1.2 ip helper-address

DHCP no

DHCP

/

DHCP relay 802.1x

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

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

24.1.4 ip dhcp relay information option dot1x access-group

dhcp option dot1x acl no **dhcp option dot1x acl**

,‰

24.1.5 ip dhcp relay information option82

ip dhcp relay information option82

no **ip dhcp relay information option82**

option dot1x

```
Ip dhcp relay information option82
```

service dhcp	DHCP

service dhcp	DHCP

24.1.7 ip dhcp relay suppression

DHCP no
DHCP DHCP relay

DHCP request relay

1 relay

```
Ruijie#
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

25 DNS

25.1

25.1.1 ip domain-lookup

DNS no DNS

ip domain-lookup

no ip domain-lookup

DNS

no ip host host-name ip-address

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

show hosts	DNS

25.1.4 clear host

clear host [*host-name*]

host-name	“*”

1 ip host 2
DNS DNS

-IP

```
clear host *
```

show hosts	

25.1.5 show hosts

DNS

show hosts

DNS

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

ip host	IP
ip name-server	DNS

26 SNTP

26.1

- **sntp enable**
- **sntp server**
- **sntp interval**

26.1.1 sntp enable

SNTP **no**

—Disable

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

SNTP Disable

show sntp SNTP

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

no sntp server

ip-addr NTP/SNTP IP

NTP/SNTP

show sntp SNTP

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

show sntp	SNTP
sntp enable	SNTP

26.1.3 sntp interval

SNTP Client NTP/SNTP Server

sntp interval *seconds*
no sntp interval

seconds “ ” 60 --65535

1800s

show sntp SNTP

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

sntp enable	SNTP
show sntp	SNTP
clock update-calendar	

~

sntp enable

26.2

:

, **show sntp**

26.2.1 show sntp

SNTP

show sntp SNTP

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

sntp enable	SNTP
show sntp	SNTP

27 NTP

27.1 NTP

NTP

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

27.1.1 no ntp

ntp ntp

no ntp

NTP

NTP NTP NTP
NTP

NTP

no ntp

ntp server	NTP

27.1.2 ntp access-group

NTP no

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

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

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

peer	NTP
serve	NTP
serve-only	NTP
query-only	NTP
access-list-number	IP 1 99 1300 1999
access-list-name	IP

NTP

NTP

NTP

NTP

peer

serve serve-only query-only

~

1

2

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

ip access-list	IP

27.1.3 ntp authenticate

NTP NTP

ntp authenticate

no ntp authenticate

NTP

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

27.1.5 ntp disable

NTP

ntp disable

NTP

NTP

NTP

~

IP

NTP

12

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

27.1.7 ntp server

NTP NTP

ntp server

NTP
IP NTP

NTP server

IPv4 `Ruijie(config)# ntp server 192.168.210.222`

no ntp	NTP

27.1.8 ntp trusted-key

ID

ntp trusted-key *key-id*

no ntp trusted-key *key-id*

key-id	ID

NTP ID

```
ntp authentication-key 6 md5 wooooop
ntp trusted-key 6
ntp server 192.168.210.222 key 6
```


ntp authenticate	
ntp authentication-key	NTP
ntp server	NTP

27.1.9 ntp update-calendar

NTP

no

ntp update-calendar
no ntp update-calendar

NTP

NTP NTP

NTP

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

27.2

- **debug ntp**
- **show ntp status**

NTP NTP

NTP

```
show ntp status
```

28 UDP-Helper

28.1

28.1.1 udp-helper enable

udp-helper enable

address	UDP 20

UDP

20

, UDP-Helper

UDP

no ip helper-address

UDP

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

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
```


29 SNMP

29.1

SNMP

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

29.1.1 no snmp-server

SNMP **no snmp-server**

no snmp-server

SNMP

SNMP

SNMP

SNMP

```
Ruijie(config)# no snmp-server
```

29.1.2 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

29.1.3 snmp-server community

SNMP **snmp-server community** no SNMP

snmp-server community *string* [**view** *view-name*] [[**ro** | **rw**] [**host** *ipaddr*] [*number*]

no snmp-server community *string*

string NMS SNMP

view-name

ro NMS MIB

rw NMS MIB

number 0-99
MIB NMS

ipaddr NMS MIB NMS

`

SNMP سخي i-net800@i-net.com.cn

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

show snmp-server	SNMP
no snmp-server	SNMP ⊥

29.1.5 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

SNMP

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

snmp-server host	SNMP

29.1.6 snmp-server host

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*

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	

29.1.7 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

29.1.8 snmp-server packetsize

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

29.1.9 snmp-server queue-length

snmp-server queue-length

snmp-server queue-length *length*

length 1 1000

10

4

4

```
Ruijie(config)# snmp-server queue-length 4
```

snmp-server packetsize	SNMP

29.1.10 snmp-server system-shutdown

SNMP **snmp-server system-shutdown** no SNMP

snmp-server system-shutdown

no snmp-server system-shutdown

SNMP

SNMP RGOS reload/reboot NMS

SNMP

```
Ruijie(config)# snmp-server system-shutdown
```

29.1.11 snmp-server trap-source

SNMP **snmp-server trap-source** no

snmp-server trap-source *interface*

no snmp-server trap-source

interface SNMP

SNMP IP

SNMP IP

IP

SNMP

0 IP SNMP

```
Ruijie(config)# snmp-server trap-source fastethernet 0
```

snmp-server enable traps	
snmp-server enable host	NMS

29.1.12 snmp-server trap-timeout

snmp-server

trap-timeout no

snmp-server trap-timeout *seconds*

no snmp-server trap-timeout

seconds

30

60

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


snmp-server queue-length	
snmp-server enable host	NMS

29.1.13 snmp-server user

SNMP **snmp-server user**
no

snmp-server user *username groupname* {**v1** | **v2** | **v3** [**encrypted**] [**auth** {**md5** | **sha**} *auth-password*] [**priv des56** *priv-password*]} [**access** {*num* | *name*}]

no snmp-server user *username groupname* {**v1** | **v2c** | **v3** }

username

groupname

v1 | **v2** | **v3** SNMP v3

encrypted
16
MD5 16 SHA
20

auth **md5** MD5 **sha**
SHA

auth-password: 32

priv **des56** 56 DES
priv-password 32

snmpV3 md5 DES

```
Ruijie(config)# snmp-server user user-2 mib2user v3 auth
md5 authpassstr priv des56 despassstr
```

29.1.15 snmp-server view

SNMP **snmp-server view**
no

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

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

view-name

oid-tree MIB MIB

include MIB

exclude MIB

default MIB

"E t .J MIB

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

show run	

29.2

29.2.1 show snmp

SNMP **show snmp**

show snmp [**mib** | **user** | **view** | **group**]

show snmp SNMP

show snmp mib snmp mib

show snmp user snmp

show snmp view snmp

show snmp group snmp

SNMP

```
Ruijie# show snmp
Chassis: 60FF60
0 SNMP packets input
0 Bad SNMP version errors
0 Unknown community name
0 Illegal operation for community name supplied
0 Encoding errors
```

```
0 Number of requested variables
0 Number of altered variables
0 Get-request PDUs
0 Get-next PDUs
0 Set-request PDUs
0 SNMP packets output
0 Too big errors (Maximum packet size 1500)
0 No such name errors
0 Bad values errors
0 General errors
0 Response PDUs
0 Trap PDUs
SNMP global trap: disabled
SNMP logging: disabled
SNMP agent: enabled
```

snmp-server *chassis-id*	SNMP

30 RMON

30.1

RMON

- **rmon collection stats** *index* [**owner** *owner-string*]
- **rmon collection history** *index* [**owner** *owner-string*] [**buckets** *bucket-number*] [**interval** *seconds*]
- **rmon alarm** *number variable interval* {**absolute** | **delta** } **rising-threshold** *value* [*event-number*] **falling-threshold** *value* [*event-number*] [**owner** *ownername*]
- **rmon event** *number* [**log**] [**trap** *community*] [*description-string*]

30.1.1 rmon collection stats

no

rmon collection stats *index* [**owner** *owner-string*]

no rmon collection stats *index*

1

```
Ruijie(config)# interface fast-Ethernet 0/1
Ruijie(config-if)# rmon collection stats 1 zhansan
```

30.1.2 rmon collection history

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
```


RGOS

rmon alarm *number variable interval* {**absolute** | **delta** } **rising-threshold** *value* [*event-number*] **falling-threshold** *value* [*event-number*] [**owner** *ownername*]	

30.2

30.2.1 show rmon statistics

show rmon statictics

```
Ruijie#  show rmon statistics
Statistics : 1
```

rmon collection stats *index* [**owner** *owner-string*]	

30.2.2 show rmon history

show rmon history

rmon collection history *index* [**owner** *ownername*] [**buckets** *bucket-number*] [**interval** *seconds*]	

30.2.3 show rmon alarm

show rmon alarm

```
Ruijie#  show rmon alarm
Event : 1
Description : firstevent
Event type : log-and-trap
Community : public
Last time sent : 0d:0h:0m:0s
Owner : zhangsan
Log : 1
Log time : 0d:0h:37m:47s
Log description : ipttl
Log : 2
Log time : 0d:0h:38m:56s
Log description : ipttl
```

rmon alarm *number variable interval* {**absolute** | **delta** } **rising-threshold** *value* [*event-number*] **falling-threshold** *value* [*event-number*] [**owner** *ownername*]	

30.2.4 show rmon event

show rmon event

31 VRF

31.1 VRF

VRF

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

31.1.1 show ip route vrf

VRF

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

vrf-name	VRF
network	
mask	

VRF

VRF

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

clear ip route vrf	VRF

RGOS10.1

31.1.2 clear ip route vrf

VRF

31.1.4 rd

rd *rd_value*

vrf rd VRF VRF
rd VRF
VRF

rd_value

1) rd_value as_num nn

an_num nn

2) rd_value ip_addr:nn

ip_addr IP nn

rd vrf rd

vrf

vrf RD RD
RD vrf RD

vrf RD RD

```
Ruijie(config)# ip vrf vrf1
Ruijie (config-vrf)# rd 100:1
```

ip vrf	vrf
show ip vrf	vrf

RGOS10.3(3)

31.1.5 route-target

[**no**] **route-target** {*import*|*export*|*both*} *rt_value*

vrf rt

import vrf import

export vrf export

both vrf imporot export

rt_value

， rt_value as_num nn

as_num ,nn

， rt_value ip_addr:nn

ip_addr IP ,nn

Route-Target

vrf

vrf route-target.import vrf export
vrf

```
Ruijie(config)# ip vrf vrf1
Ruijie(config-vrf)# route-target import 100:1
Ruijie(config-vrf)# route-target export 100:2
Ruijie(config-vrf)# route-target both 100:4
```

ip vrf	vrf

RGOS10.3(3)

31.1.6 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

31.1.7 show ip vrf

VRF

show ip vrf [**brief** | **detail** | **interfaces**] [*vrf-name*]

brief VRF

detail VRF

interfaces VRF

vrf-name ( ) VRF

VRF

VRF

- brief
- detail

VRF interfaces

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

RGOS10.1

32 RIP

32.1

32.1.1 address-family RIP

RIP

address-family

no

address-family ipv4 vrf *vrf-name*

no address-family ipv4 vrf *vrf-name*

vrf *vrf-name*	VRF

RIP

address-family

(config-router-af)# VRF RIP

VRF RIP VRF RIP

exit-address-family **exit**

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

exit-address-family	
ip vrf	VRF

32.1.2 auto-summary (RIP)

RIP **auto-summary**
no

auto-summary

no auto-summary

RIP

RIPv1 RIPv2

RIP

，RIP

，RIP

，

RIPv2

RIPv1

RIPv2

```
Ruijie(config)# router rip
Ruijie(config-router)# version 2
Ruijie(config-router)# no auto-summary
```

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

redistribute	

32.1.4 default-information originate(RIP)

RIP
default-information originate **no**

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

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

always	RIP
metric *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

RIP **route-map**
set metric

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

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
```

32.1.6 distribute-list in RIP

distribute-list in **no**

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	
prefix *prefix-list-name*	
gateway *prefix-list-name*	
interface-type interface-number	( )

protocol	( )
process-id	( ) *protocol* OSPF OSPF id
process-name	( ) *protocol* ISIS ISIS

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	

32.1.8 exit-address-family

exit-address-family

exit-address-family

no

exit

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

RIPv1 RIP RIPv2

Serial 0 RIP ripchain

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

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

32.1.10 ip rip authentication mode

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

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

no ip rip authentication mode

text	RIP
md5	RIP MD5

RIP RIP
RIP RIP

RIPv1 RIP RIPv2

Serial 0 RIP MD5

```
Ruijie(config)# interface serial 0/0
Ruijie(config-if)# ip rip authentication mode md5
```

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

32.1.11 ip rip authentication text-password

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

ip rip authentication text-password *password-string*

no ip rip authentication text-password

password-string	1 16

RIP

RIPv1 RIP RIPv2

Serial 0 RIP ruijie

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

ip rip authentication mode	RIP
ip rip authentication key-chain	RIP RIP RIPv2 RIP

32.1.12 ip rip default-information

RIP **ip rip default-information** **no**

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

no ip rip default-information

only	
originate	

metric

ethernet0/0

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

default-information originate	RIP

32.1.13 ip rip receive enable

RIP RIP **ip rip receive enable** **no** RIP RIP

ip rip receive enable

no ip rip receive enable

RIP

RIP

no

default RIP

Fastethernet 0/0 RIP

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


32.1.14 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

32.1.15 ip rip send enable

RIP RIP **ip rip send enable** **no** RIP RIP

ip rip send enable

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

version	RIP

32.1.18 ip split-horizon (RIP)

RIP **ip split-horizon** Ă 5 " € ə

auto-summary	RIP

32.1.20 network (RIP)

RIP

network **no**

network *network-number* [*wildcard*]

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

network-number	IP RIP
wildcard	IP 0 1

RIP IP **neighbor**
no

neighbor *ip-address*

no neighbor

ip-address IP S • î‚ý-ÓKÂ5% Þ! <F¼-Ñ€’¯!¸&„ Ä< y Ê ‚ýôr µ

interface-number	

offset

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
RIP metric 7

```
Ruijie(config-router)# offset-list 7 in 7
Ruijie(config-router)# offset-list 8 in 7 fastEthernet
1/0
```

32.1.23 output-delay

RIP
output-delay **no**

output-delay *delay*

no output-delay

delay	<8-50>

RIP 512 25
25

output-delay

RIP 30

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

32.1.24 passive-interface

passive-interface **no**

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

passive ethernet0/0

passive

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


ip rip receive enable RIP

RIP

RIP

async default routing

RIP

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

network (RIP)	RIP

32.1.27 timers basic

RIP **timers basic**

no

timers basic *update invalid flush*

no timers basic

flush	RIP *invalid* *flush* *invalid* *Flush* 120

30 180 120

RIP RIP

RIP **show ip rip**

RIP 10 30
invalid
invalid 90

```
Ruijie(config)# router rip
Ruijie(config-router)# timers basic 10 30 90
```

~

2Mbps

32.1.28 validate-update-source

RIP
validate-update-source **no**

validate-update-source

no validate-update-source

RIPv1 RIPv2 RIPv1

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

RIP 2

```
Ruijie(config)# router rip
Ruijie(config-router)# version 2
```

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

32.2

32.2.1 show ip rip

RIP **show ip rip**

show ip rip [**vrf** *vrf-name*]

vrf *vrf-name*	VRF RIP

RIP

rip rip metric distance

VRF VRF VRF-id

RIP

```
Ruijie# show ip rip
Routing Protocol is "rip"
Sending updates every 10 seconds, next due in 4 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)
```

vrf RIP

```
Ruijie(config-router)# sh ip rip vrf 1
VRF 1  VRF-id:1
Routing Protocol is "rip"
Sending updates every 30 seconds, next due in 4 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)
```

32.2.2 show ip rip database

RIP **show ip rip database**

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

vrf *vrf-name*	VRF RIP
network-number	
network-mask	

RIP

RIP

```
Ruijie# show ip rip database
192.168.1.0/24    auto-summary
192.168.1.0/30    directly connected, Loopback 3
192.168.1.8/30    directly connected, FastEthernet 0/0
192.168.121.0/24    auto-summary
192.168.121.0/24    redistributed
[1] via 192.168.2.22, FastEthernet 0/1
```

RIP 192.168.121.0/24

```
Ruijie# show ip rip database 192.168.121.0 255.255.255.0
192.168.121.0/24    redistributed
[1] via 192.168.2.22, FastEthernet 0/1
```


show ip rip	

32.2.3 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	

32.2.4 show ip rip interface

RIP **show ip rip interface**

show ip rip interface [**vrf** *vrf-name*]

vrf *vrf-name*	VRF RIP

RIP

```
Ruijie# show ip rip interface
FastEthernet 1/1 is down, line protocol is down
  RIP is not enabled on this interface
FastEthernet 1/0 is up, line protocol is up
  Routing Protocol: RIP
  Receive RIPv2 packets only
  Send RIPv2 packets only
  Passive interface: Disabled
  Split horizon: Enabled
  V2 Broadcast: Disabled
  Multicast register: Registed
  Interface Summary Rip:
    Not Configured
  Authentication mode: Text
  Authentication key-chain: ripk1
  Authentication text-password: ruijie
  Default-information: only, metric 5
  IP interface address:
    192.168.64.100/24
```

```
       RIP   BFD    ,                    :
Ruijie#show ip rip interface
VLAN 1 is up, line protocol is up
  Routing Protocol: RIP
    Receive RIPv1 and RIPv2 packets
    Send RIPv1 packets only
    Receive RIP packet: Enabled
    Send RIP packet: Enabled
    Send RIP supernet routes: Enabled
    Passive interface: Disabled
    Split horizon: Enabled
    BFD: Enabled
    V2 Broadcast: Disabled
    Multicast registe: Registed
    Interface Summary Rip:
      Not Configured
    IP interface address:
2.2.2.111/24
```

show ip rip	

32.2.5 show ip rip peer

RIP RIP (RIP)
RIP
RIP **show ip rip peer**

show ip rip peer [*ip-address*] [**vrf** *vrf-name*]

ip-address	RIP
vrf *vrf-name*	VRF RIP

RIP

```
Ruijie# show ip rip peer
Peer 192.168.3.2:
  Local address: 192.168.3.1
  Input interface: GigabitEthernet 0/2
  Peer version: RIPv1
  Received bad packets: 3
  Received bad routes: 0
  BFD session state up
```

show ip rip	

33 OSPF

33.1

33.1.1 area

no OSPF

area area-id

no area area-id

OSPF

area-id

network area	OSPF OSPF

33.1.2 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	

33.1.3 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

ABR ABR
STUB NSSA ABR

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

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
```

33.1.5 area nssa

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

area *area-id* **nssa** [**no-redistribution**] [**default-information-originate** [**metric** <*0-16777214*> | **metric-type** <*1-2*>]] [**no-summary**]

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

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

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-ѕummary ABR NSSA summary LSAs Type-3 LSA

area default-cost NSSA ABR NSSA NSSA 1

1

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

```
Ruijie(config-router)# network 172.16.0.0 0.0.255.255
area 0
Ruijie(config-router)# network 192.168.12.0 0.0.0.255
area 1
Ruijie(config-router)# area 1 nssa
```

area default-cost	NSSA OSPF

33.1.6 area range

OSPF **area range** **no** **no** **cost**

area *area-id* **range** *ip-address net-mask* [**advertise** | **not-advertise**] [**cost** *cost*]

no area *area-id* **range** *ip-address net-mask* [**cost**]

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

RFC1583

RFC1583 cost

cost

OSPF

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

area default-cost	STUB OSPF

33.1.8 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*] [**retrans**

mit-interval *seconds*] [**transmit-delay** *seconds*] [[**authentication-ke y** *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*	40
hello-interval *seconds*	OSPF Hello 10
retransmit-interval *seconds*	OSPF LSA 5
transmit-delay *seconds*	OSPF LSA 1 LSA LSA LSA

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**

1 2.2.2.2

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

1 1.1.1.1
10 OSPF
MD5

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


area authentication	OSPF
show ip ospf	OSPF

33.1.9 auto-cost

no

auto-cost [**reference-bandwidth** *ref-bw*]
no auto-cost [**reference-bandwidth**]

ref-bw	Mbps : 1-4294967

100Mbps

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

ip ospf cost cost
cost

10M

```
Ruijie(config)# router  ospf 1
Ruijie(config-router)# network 172.16.10.0 0.0.0.255 area 0
```

```
Ruijie(config-router)# auto-cost reference-bandwidth
10
```

show ip ospf	ospf

33.1.10 clear ip ospf process

OSPF

clear ip ospf (*process-id*) **process**

process-id	OSPF OSPF

RFC2328

OSPF

OSPF 1

```
Ruijie# clear ipip
```

AS

RFC1583 RFC2328

commpatible rfc1583

no commpatible rfc1583

RFC1583

rfc 2328

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

show ip ospf	ospf

33.1.12 default-information originate OSPF

OSPF

default-information originate **no**

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

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

always	OSPF
metric *metric*	1
metric-type *type*	OSPF 1 2 1 2 2
route-map *map-name*	route-map , route-map

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

always OSPF

```
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

33.1.13 default-metric

OSPF

default-metric **no**

default-metric *metric*

no default-metric

metric	OSPF

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
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

33.1.14 distance ospf

OSPF

distance ospf {**intra-area** <*1-255*> | **inter-area** <*1-255*> | **external** <*1-255*>}

no distance ospf

intra-area <*1-255*>	110
inter-area <*1-255*>	110
external <*1-255*>	110

110

OSPF 160

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

33.1.15 distribute-list in

LSA

distribute-list {*listname* | **gateway** *plist-name* | **prefix** *plist-name* } **in** [**interface-type** *num*]

no distribute-list {*listname* | **gateway** *plist-name* | **prefix** *plist-name* } **in** [**interface-type** *num*]

listname	acl
gateway *plist-name*	gateway
prefix *plist-name*	prefix-list
interface-type *num*	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
Ruijie(config-router)# distribute-list 3 in ethernet
1/1
```

33.1.16 distribute-list out

redistribute

distribute-list {l*istname* | **gateway** *plist-name* | **prefix** *plist-name*} **out** [**bgp** | **connected** | **isis** *area-tag* | **ospf** *process-id* | **rip** | **static**]

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

listname	acl
gateway *plist-name*	gateway
prefix *plist-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)# redistribute static subnets
Ruijie(config-router)# distribute-list 22 out static
Ruijie(config-router)#  distribute-list prefix jjj
outstatic
% There already has filter configured. Please
re-configure.
```

33.1.17 enable mib-binding

enable mib-binding MIB OSPFv2

no

enable mib-binding

no enable mib-binding

GR Helper
GR
GR
strict-lsa-checking internal-lsa-checking
LSA(types 1-5,7) AS
LSA(types 1-3)
LSA GR

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

RGOS10.3(5b1),

33.1.19 enable traps

OSPFv2 16 TRAP 4
TRAP **no**
TRAP

enable traps [**error** [**ifauthfailure | ifconfigerror | ifrxbadpacket | virtifauthfailure | virtifconfigerror | virtifrxbadpacket**] | **lsa** [**lsdbapproachoverflow | lsdboverflow | maxagelsa | originatelsa**] | **retransmit** [**iftxretransmit | virtiftxretransmit**] | **state-change** [**ifstatechange | nbrstatechange | virtifstatechange | virtnbrstatechange**]]

no enable traps [**error** [**ifauthfailure | ifconfigerror | ifrxbadpacket | virtifauthfailure | virtifconfigerror | virtifrxbadpacket**] | **lsa** [**lsdbapproachoverflow | lsdboverflow | maxagelsa | originatelsa**] | **retransmit** [**iftxretransmit | virtiftxretransmit**] | **state-change**

[**ifstatechange | nbrstatechange | virtifstatechange | virtnbrstatechange**]]

error traps
error traps

ifauthfailure

ifconfigerror

error

		lsa traps lsa traps **lsdbapproach** **overflow** **lsdboverflow** **maxagelsa** **originatelsa**
	lsa	L

retransmit	retransmit traps retransmit traps **iftxretransmit** **virtiftxretransmit**

state-change	state-change traps state-change traps **ifstatechange** **nbrstatechange** **virtifstatechange** **virtnbrstatechange**

TRAP

snmp-server **snmp-server enable traps ospf**

MIB TRAP

OSPFv2 100 TRAP

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

show ip ospf	OSPF
enable mib-binding	OSPFv2 MIB

33.1.20 ip ospf authentication

no

ip ospf authentication [**message-digest** | **null**]

no ip ospf authentication

message-digest	MD5
null	

,

.

no

null

, ,

FastEthernet 0/0 OSPF MD5

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

OSPF **area authentication**

, **ip ospf authentication** ,

.

FastEthernet 0/0 OSPF ospfauth

```
Ruijie(config)# interface fastethernet 0/0
Ruijie(config-if)# ip address 172.16.10.0 255.255.255.0
Ruijie(config-if)# ip ospf authentication-key ospfauth
```

area authentication	OSPF
Ip ospf authentication	

33.1.22 ip ospf cost

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

ip ospf cost *cost*

no ip ospf cost

cost	OSPF

/Bandwidth 100Mbps

OSPF 100Mbps/Bandwidth Bandwidth
bandwidth

OSPF

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

ip ospf cost OSPF

serial 1/0 OSPF 100

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

bandwidth	
show ip ospf	Ospf

33.1.23 ip ospf database-filter all out

LSA LSA
, **no**

ip ospf database-filter all out

no ip ospf database-filter

, 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
```

33.1.24 ip ospf dead-interval

OSPF **ip ospf dead-interval** **no**

ip ospf dead-interval *seconds*

no ip ospf dead-interval

seconds	

ip ospf hello-interval

OSPF Hello OSPF

Hello

hello 4 hello

OSPF

hello

serial 1/0 OSPF
30

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

ip ospf hello-interval	OSPF Hello

33.1.25 ip ospf disable all

ospf

ip ospf disable all

no ip ospf disable all

network area

network ospf
OSPF OSPF

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

```
Ruijie(config-if)# ip address 172.16.10.1
255.255.255.0
Ruijie(config-if)# ip ospf disable all
```

33.1.26 ip ospf hello-interval

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

ip ospf hello-interval *seconds*

no ip ospf hello-interval

seconds	OSPF hello

、 10
、 PPP HDLC 10
、 10
、 .25 30

hello hello OSPF

hello
hello

serial 1/0 OSPF Hello
15

```
Ruijie(config)# interface serial 1/0
Ruijie(config-if)# ip address 172.16.10.1
255.255.255.0
Ruijie(config-if)# encapsulation ppp
```

```
Ruijie(config-if)# ip ospf hello-interval 15
```

ip ospf dead-interval	OSPF

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
lo10
```

OSPF

ip ospf authentication	

mtu

no

ip ospf mtu-ignore

no ip

mtu

OSPF MTU
MTU , MTU

- 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

,

.

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

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

DR/RDR

DR/BDR

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

	>]ÞR@

ip ospf priority *priority*

LSU

ip ospf retransmit-interval **no**

ip ospf retransmit-interval *seconds*

no ip ospf retransmit-interval

Seconds	LSU 5

5

LSU LSU

ip ospf retransmit-interval

LSA

LSU area

virtual-link retransmit-interval

serial 1/0 LSU 10

```
Ruijie(config)# interface serial 1/0
Ruijie(config-if)# ip ospf retransmit-interval 10
```

ip ospf transmit delay *seconds*

no ip ospf transmit delay

no log-adj-changes [**detail**]

detail	

detail Full

Full

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

show ip ospf	ospf

33.1.34 max-concurrent-dd

DD

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

<*1-65535*>	DD

5

RGOS
IP IP

NBMA
Hello OSPF Hello Hello
OSPF
0 Hello 0
DR/BDR DR/BDR DR/BDR
Hello

,
, ,
cost .

OSPF IP
172.16.24.2 1 150

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

ip ospf priority	OSPF
ip ospf network	OSPF

33.1.36 network area

OSPF OSPF
network area **no** OSPF

network *ip-address wildcard* **area** *area-id*

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

wildcard	IP
area-id	OSPF OSPF OSPF

OSPF

ip-address *wildcard*
OSPF OSPF
IP network area IP **network area** IP IP
OSPF

OSPF **network** IP
OSPF

0 1 172.16.16.0 IP
192.168.12.0/24 1 IP
172.16.16.0/20 172.16.16.0
0

```
Ruijie(config)# router ospf 20
Ruijie(config-router)# network 172.16.16.0
0.0.15.255 area 172.16.16.0
Ruijie(config-router)# network 192.168.12.0
0.0.0.255 area 1
Ruijie(config-router)# network 0.0.0.0 255.255.255.255
area 0
```

router ospf	OSPF

33.1.37 overflow database

OSPF LSA

overflow database <*0-4294967294*> **hard** | **soft**

no overflow database

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

OSPF **hard** OSPF **soft**

LSA 10 OSPF 10

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

33.1.38 overflow database external

external LSA

overflow database external *max-dbsize wait-time*

no overflow database external

H744F8364T/TT2 1 Tf12.4171 1.440 TD-0.0018 Tc0.15730 Tw[(extern)-44.6(al lsa)]TJTT3 1 T

H

OSPF OVERFLOW

OSPF OVERFLOW

OSPF NULL
OVERFLOW

clear ip ospf process OSPF
OSPF OVERFLOW

no OSPF OVERFLOW
OSPF

OSPF OVERFLOW

```
Ruijie# config terminal
Ruijie(config)# router ospf 10
Ruijie(config-router)# no overflow memory-lack
```

clear ip ospf process	OSPF
show ip protocols ospf	OSPF

33.1.40 passive-interface

no

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

type number	
default	

, OSPF

serial 1/0

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

bgp | **isis** *area-tag* | **ospf** *process-id* | **rip** | **connected** | **static**	
metric	OSPF extern2 LSA metric
Level-1/ level-1-2/ level-2	IS-IS level level-2 IS-IS
match	OSPF OSPF
metric-typ	E-1 E-2
route-map	
tag	OSPF tag
subnets	

ASBR OSPF type-5 LSA OSPF

BGP metric 1 LSA metric 20

isis level level-2 level level level 1, level 2 level-1-2

ospf match ospf match match no match

route-map route-map match OSPF ISIS match level route-map

OSPF

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

Show run

```
router ospf 1
redistribute ospf 2 match external 1 internal subnets
redistribute isis isis-001 level-1-2
```

33.1.42 router ospf

OSPF **router ospf** **no** OSPF

router ospf *process-id* [**vrf** *vrf-name*]

no router ospf *process-id*

process-id	ospf
vrf-name	VRF OSPF VRF

OSPF

RGOS10.1 ospf ospf

vrf *vpn_1* OSPF 10

```
Ruijie(config)# router ospf 10 vrf vpn_1
```

show ip protocols	
show ip ospf	ospf

33.1.43 router-id

ID, **no** Router ID Router ID

router-id *router-id*

no router-id

router-id	ID, IP

OSPF ip

ip

,

LSA . OSPF

loopback ospf

```
router-id  0.0.0.36
```

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

show ip protocols	

33.1.44 summary-address

OSPF

summary-address **no**

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

ip-address	IP
net-mask	
not-advertise	

OSPF

OSPF

area rang 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

33.1.45 timers lsa-group-pacing

LSA

no

timers lsa-group-pacing *seconds*

no timers lsa-group-pacing

seconds	LSA : 10-1800

: 240

LSA

4

LSA

10000 LSA 40~100

10~20

120

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

show ip ospf	ospf

33.1.46 timers spf

OSPF SPF
SPF **timers spf**
no

timers spf *spf-delay spf-holdtime*

no timers spf

spf-delay	SPF OSPF SPF
spf-holdtime	SPF SPF

1 timers throttle spf RGOS *spf-delay*
5 *spf-holdtime* 10

2 …

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

33.1.47 timers throttle spf

OSPF SPF
SPF
timers throttle spf no

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

no timers throttle spf

spf-delay	SPF 1-600000 OSPF SPF spf-delay
spf-holdtime	SPF 1-600000
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

~ :

1 spf-holdtime spf-delay spf-holdtime
spf-delay

2 spf-max-waittime spf-holdtime spf-max-waittime
spf-holdtime

3 timers throttle spf timers spf

4 timers spf timers throttle spf timers
throttle spf

OSPF

show ip ospf

```
Ruijie# show ip ospf
Routing Process "ospf 1" with ID 1.1.1.1
Process uptime is 4 minutes
Process bound to VRF default
Conforms to RFC2328, and RFC1583Compatibility flag
isenabled
Supports only single TOS(TOS0) routes
Supports opaque LSA
This router is an ASBR (injecting external routing
information)
SPF schedule delay 5 secs, Hold time between two SPFs
10 secs
LsaGroupPacing: 240 secs
```

OSPF

```
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

Exit database overflow state interval	overflow

33.2.3 show ip ospf database

OSPF **show ip ospf database**

LSAs

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

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

show ip ospf [*process-id area-id*] **database** [**self-originate** | **max-age**]

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

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

show ip ospf [*process-id area-id*] **database** [**router**] [**self-originate**]

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Area-id	
adv-router	
link-state-id	OSPF
self-originate	
maxage	LSA
router	OSPF
network	OSPF
summary	OSPF

asbr-summary

OSPF

OSPF

```
                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


```
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	

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
```

```
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	

```
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

show ip ospf database summary

```
Ruijie# show ip ospf database summary
OSPF Router with ID (1.1.1.1) (Process ID 1)
Summary Link States (Area 0.0.0.0)
LS age: 499
Options: 0x2 (*|-|-|-|-|-|E|-)
```

```
LS Type: 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

show ip ospf database external

```
Ruijie# show ip ospf database external
```

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

OSPF **show ip ospf interface**

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

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
```

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

33.2.5 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
BFD session state up
```

show ip ospf neighbor

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

Thread Database Description Retransmission	DD
Thread Link State Request Retransmission	LS
Thread Link State Update Retransmission	LS
Thread Poll Timer	Poll Timer

33.2.6 show ip ospf route

ospf

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

process-id	ospf 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	

33.2.7 show ip ospf summary-address

OSPF

show ip ospf summary-address

show ip ospf summary-address

NSSA ABR

show ip ospf summary-address

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


Summary Address	
Summary Mask	
Advertise	
Status	
Aggregated subnets	

33.2.8 show ip ospf virtual-link

OSPF **show ip ospf virtual-link**

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

show ip ospf neighbor

show ip ospf virtual-links

```
Ruijie# show ip ospf virtual-links
Virtual Link VLINK0 to router 1.1.1.1 is up
Transit area 0.0.0.1 via interface FastEthernet 0/1
Local address 10.0.0.37/32
Remote address 10.0.0.27/32
Transmit Delay is 1 sec, State Point-To-Point,
```

```
        Timer intervals configured, Hello 10, Dead 40, Wait 40,
        Retransmit 5
        Hello due in 00:00:05
    Adjacency state Full
```

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

34 BGP CLI

34.1

34.1.1 address-family ipv4

address-faimly IPv4 BGP
exit-address-family BGP

address-family ipv4 [**unicast]**

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

unicast	IPv4

BGP

BGP IPv4

BGP **exit-address-family**

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

exit-address-family	

34.1.2 address-family ipv4 vrf

address-faimly IPv4 VRF BGP
vrf **no** vrf

BGP BGP IPv4 BGP IPv4 VRF

BGP

aggregate-address summary-only

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

34.1.6 bgp always-compare-med

BGP Multi Exit Discriminator MED

no

Tw[ntways-compare-med

no Tw[ntways-compare-med

AS MED

BGP

AS MED

AS MED

MED

IGP

```
Ruijie(config)# router W   65000
Ruijie(config-router)# W[ntways-compare-med
```

show ip Tw[	BGP
Tw[bestpath med confed	AS MED
Tw[bestpath med missing-as-worst	MED
Tw[deterministic-med	AS

34.1.7 Tw[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

34.1.8 bgp bestpath compare-confed-aspath

ASPATH

ASPATH **no**

BGP

EBGP peer

ASPATH

ASPATH

ASPATH

ASPATH

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

show ip bgp	BGP
bgp router-id	BGP Router ID

34.1.9 bgp bestpath compare-routerid

router ID

router ID **no**

bgp bestpath compare-routerid

no bgp bestpath compare-routerid

EBGP peers

BGP

EBGP

peers

router ID

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

show ip bgp	BGP
bgp router-id	BGP Router ID

34.1.10 bgp bestpath med confed

AS

MED **no**

bgp bestpath med confed [**missing-as-worst**]

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

missing-as-worst	MED

AS MED

BGP

AS MED

```
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

34.1.11 bgp bestpath med missing-as-worst

MED

no

bgp bestpath med missing-as-worst

no bgp bestpath med missing-as-worst

MED MED

0 MED

BGP

MED MED

0 MED MED

MED

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

show ip bgp	BGP
bgp bestpath	

always-compare-med	AS MED
bgp bestpath med confed	AS MED
bgp deterministic-med	AS

34.1.12 bgp client-to-client reflection

no

bgp client-to-client reflection

no bgp client-to-client reflection

Oõ – N1’5B Đ

34.1.13 bgp cluster-id

no

bgp cluster-id *cluster-id*

no bgp cluster-id [*cluster-id*]

cluster-id	IP 4 (ip)

router-id

BGP

router ID

Ò

no bgp confederation identifier

as-number	AS 1..65535

BGP

IBGP

ID(AS)
AS AS
BGP speakers IBGP
BGP speaker EBGP
BGP speakers EBGP
MED

```
Ruijie(config-router)# bgp confederation identifier
65000
```


as-number	AS 1..65535

BGP

IBGP

ID(AS)

AS

bgp default ipv4-unicast

no bgp default ipv4-unicast

ipv4-unicast

BGP

BGP **address family ipv4**

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

address-family ipv4	IPv4

34.1.17 bgp default local-preference

local-preference

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 med confed	AS MED
bgp bestpath med missing-as-worst	MED

34.1.18 bgp deterministic-med

AS MED
no

bgp deterministic med

no bgp deterministic med

BGP

AS

```
Ruijie(config-router)# bgp deterministic med
```

show ip bgp	BGP
bgp bestpath always-compare-med	AS MED
bgp bestpath med confed	AS MED
bgp bestpath med missing-as-worst	MED

34.1.19 bgp enforce-first-as

AS_PATH AS UPDATE no

bgp enforce-first-as

no bgp enforce-first-as

BGP

UPDATE AS

```
Ruijie(config-router)# bgp enforce-first-as
```

show ip bgp	BGP

34.1.20 bgp fast-external-fallover

EBGP peer

BGP **no**

bgp fast-external-fallover

no bgp fast-external-fallover

BGP

EBGP

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


120

BGP

GR Restarter GR Helper GR Restarter GR Helper
GR Restarter GR Helper
GR Restarter BGP Established BGP
BGP
BGP Open GR GR

~	BGP GR Helper BGP GR clear ip bgp Peer BGP BGP Hold Time Hold Time GR Hold Time

```
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
```

time	GR stale 1 3600

360

BGP

GR Helper stalepath-time GR Helper GR Restarter Restarter EOR GR Helper GR Restarter Restarter “ Stale ” GR Helper GR Restarter “ Stale ” stalepath-time “ Stale ” GR Helper GR Restarter EOR

```
Ruijie(config)# router bgp 500
Ruijie(config-router)# bgp graceful-restart
Ruijie(config-router)# bgp graceful-restart stalepath-time 240
Ruijie(config-router)# no bgp graceful-restart stalepath-time
```

bgp graceful-restart	BGP

Up/Down

BGP

debug BGP BGP **debug**

BGP Established Established Established

```
Ruijie(config-router)#no bgp log-neighbor-changes
```

router bgp	BGP

10.3(5b1)	

34.1.25 bgp router-id

BGP ID——IP

no IP

bgp router-id ip-address

no bgp router-id ip-address

ip-address	IP

route-id

BGP

BGP ID——IP

```
Ruijie(config-router)# bgp router-id 10.0.0.1
```

show ip bgp dampening dampened-paths	
bgp dampening	

34.1.26 bgp update-delay

BGP Speaker **bgp update-delay** no **bgp update-delay**

BGP

bgp update-delay *delay-time*

no bgp update-delay

delay-time	BGP Speaker 0 3600 120 BGP EOR 1 3600

120

BGP

BGP

bgp update-delay

BGP

BGP EOR

100

5000 1 100

200 Update Delay 240

Update Delay

out	
soft	
soft in	
soft out	

~

BGP router

BGP

BGP

BGP BGP

peer **neighbor soft-reconfiguration inbound** BGP BGP speaker

show ip bgp neighbors BGP

neighbor soft-reconfiguration inbound

```
Ruijie# clear bgp ipv4 unicast *
```

neighbor soft-reconfiguration inbound	BGP session BGP ( )
show ip bgp	BGP

34.1.28 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
```

in	soft K

к v Š ¤ ґ

BGP

```
Ruijie# clear bgp ipv4 unicast peer-group my-group in
```

clear ip bgp	BGP
show ip bgp	BGP

34.1.32 clear ip bgp

BGP

clear ip bgp {* | **ipv4 unicast** *address* | *as number* } [**soft** [**in** | **out**]]

*	BGP BGP ipv4 unicast OVERFLOW
ipv4	peer ipv4
address	peer BGP
as number	AS
in	
out	
soft	
soft in	
soft out	

~

BGP router

BGP

BGP

BGP BGP

peer **neighbor soft-reconfiguration inbound** BGP BGP speaker

show ip bgp neighbors BGP

neighbor soft-reconfiguration inbound

```
Ruijie# clear ip bgp *
```

neighbor soft-reconfiguration inbound	BGP session BGP ( )
show ip bgp	BGP

34.1.33 clear ip bgp dampening

clear ip bgp [**ipv4 unicast**] **dampening** [*address mask*]

ipv4 unicast	IPv4
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	

34.1.34 clear ip bgp external

EBGP

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

ipv4 unicast	ipv4
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

34.1.35 clear ip bgp flap-statistics

clear ip bgp flap-statistics [*address*[*mask*]]

address	IP
mask	

clear ip bgp dampening

```
Ruijie# clear ip bgp flap-statistics
```

bgp dampening	

show ip bgp	BGP

34.1.36 clear ip bgp peer-group

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

peer-group-name	
ipv4 unicast	ipv4
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

34.1.37 clear ip bgp vrf

vrf

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

vrf-name	vrf
*	vrf BGP
address	vrf peer BGP
ipv4 unicast	ipv4
in	**soft**
out	**soft** BGP speaker

no

[**no**] **default-informnation originate**

no

BGP

network **default-informnation originate** network IGP

```
Ruijie(config-router)# default-informnation originate
```

network	

redistribute 32 r.39 -0.1143me000c(redistribute)BT

no default-metric

BGP

BGP metric
metric

~

metric **redistribute metric**
metric

default-metric connected metric
0

```
Ruijie(config-router)# default-metric 45
```

redistribute	

34.1.40 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

BGP

BGP

1. external-distance IGP (OSPF RIP)
2. internal-distance local-distance IGP

```
Ruijie(config-router)# distance bgp 20 20 200
```

neighbor soft-reconfiguration inbound	BGP session BGP ( )

neighbor filter-list	as-path
neighbor distribute-list	

34.1.43 maximum-prefix

no

maximum-prefix *maximum*

no maximum-prefix

maximum	<1 - 4294967295>
no	

IPv4 VRF VPNv4 10000.
IPv4 unicast 4294967295

BGP BGP IPv4 BGP IPv4 VRF BGP
VPNv4

BGP redistribute
BGP
, overflow

Ruijie(config-router-af)# **neighbor** *10.0.0.1* **allowas-in**

router bgp	BGP
neighbor remote-as	BGP

```
Ruijie(config-router-af)# neighbor 10.0.0.1
as-override
```

router bgp	BGP
neighbor remote-as	BGP

34.1.48 neighbor default-originate

BGP speaker ( ) **no**

neighbor {*peer-address* | *peer-group-name*} **default-originate**
[**route-map** *map-tag*]
no neighbor {*peer-address* | *peer-group-name*} **default-originate**
[**route-map** *map-tag*]

```
Ruijie(config-router)# neighbor 10.1.1.1
default-originate
```

router bgp	BGP

router bgp	BGP
neighbor remote-as	BGP ( )

34.1.50 neighbor distribute-list

BGP ACL
no ACL

neighbor {*peer-address* | *peer-group-name*} **distribute-list** *access-list-number* {**in** | **out**}

no neighbor {*peer-address* | *peer-group-name*} **distribute-list** *access-list-number* {**in** | **out**}

peer-address	IPv4
peer-group-name	32
access-list-number	ACL
in	ACL
out	ACL

BGP BGP IPv4 BGP IPv4 VRF
BGP VPNv4

```
Ruijie(config-router)# neighbor 10.1.1.1
distribute-list bgp-filter in
```

router bgp	BGP
neighbor remote-as	BGP
ip access-list	IP ACL IP ACL

34.1.51 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
peer-group-name	32
ttl	1..255

EBGP BGP

ebgp-multihop ttl 255

BGP BGP IPv4 BGP IPv4 VRF

BGP

EBGP peers

BGP

```
Ruijie(config)# router bgp 65000
Ruijie(config-router)# neighbor 10.0.0.1 remote-as
65100
Ruijie(config-router)# neighbor 10.0.0.1 ebgp-multihop
```

router bgp	BGP
neighbor remote-as	BGP

34.1.52 neighbor filter-list

BGP

no

neighbor {*peer-address* | *peer-group-name*} **filter-list** *access-list-number* {**in** | **out**}

no neighbor {*peer-address* | *peer-group-name*} **filter-list** *access-list-number* {**in** | **out**}

peer-address	IPv4
peer-group-name	32
access-list-numbe	as-path list
in	as-path list
out	as-path list

BGP

neighbor filter-list

```
Ruijie(config)# ip as-path access-list 1 deny _123_
Ruijie(config)# router bgp 65000
Ruijie(config-router)#  neighbor  10.0.0.1  remote-as
65100
Ruijie(config-router)# neighbor 10.0.0.1 filter-list 1
out
```

router bgp	BGP
neighbor remote-as	BGP
ip as-path access-list	AS_PATH list
match as-path	AS_PATH list

34.1.53 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
peer-group-name	32
maximum	
threshold	
warning-only	BGP

BGP BGP IPv4 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

34.1.54 neighbor next-hop-self

BGP

BGP speaker **no**

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

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

peer-address	IPv4
peer-group-name	32

BGP BGP IPv4 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
```

router bgp	BGP
neiremote-aser bgp	BGP

BGP BGP IPv4 BGP IPv4 VRF

TCP MD5 BGP BGP
BGP speaker
BGP BGP
BGP

password

```
Ruijiesonfig)#  router bgp 65000
Ruijiesonfig-router)#  neighbor 10.0.0.1 password
Red-Giant
```

router bgp	BGP
neighbor remote-as	BGP

34.1.56 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
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

---

~

peer-group IBGP EBGP peer-group

```
Ruijie(config)# router bgp 65000
Ruijie(config-router)# neighbor Red-Giant peer-group
Ruijie(config-router)# neighbor 10.0.0.1 peer-group Red-Giant
```

router bgp	BGP
neighbor remote-as	BGP
neighbor peer-group (creating)	BGP
show ip bgp peer-group	BGP

34.1.57 neighbor peer-group (creating)

BGP **no**

neighbor *peer-group-name* **peer-group**

no neighbor *peer-group-name* **peer-group**

peer-group-name	32

BGP

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

34.1.58 neighbor prefix-list

BGP

no prefix-list

neighbor {*peer-address* | *peer76 308.24 r70i90.88n j-14(1 Tf0.6171 0 mame Tf6.1714 0 TL*

peer-address	IPv4
peer-group-name	32
prefix-list-name	prefix-list 32
in	prefix list
out	prefix list

BGP BGP IPv4 BGP IPv4 VRF
BGP VPNv4

(in) (out) **neighbor distribute-list**

BGP

neighbor prefix-list in

```
Ruijie(config)# ip prefix-list bgp-filter deny
10.0.0.1/16
Ruijie(config)# router bgpro9734989 TjP8(c57 TD-0.0001 1291 -2.0686
```

34.1.59 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
peer-group-name	32
as-number	BGP ( ) 1..65535

BGP

BGP BGP IPv4 BGP IPv4 VRF

BGP

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

router bgp	BGP

34.1.60 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
peer-group-name	32

BGP BGP IPv4 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

34.1.61 neighbor route-map

no

neighbor {*peer-address* | *peer-group-name* } **route-map** *map-tag* {**in** | **out**}

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

peer-address	IPv4

peer-address	IPv4
peer-group-name	32
both	
standard	
extended	

BGP BGP IPv4 BGP IPv4 VRF BGP VPNv4

```
Ruijie(config-router)# neighbor 10.1.1.1
send-community both
```

router bgp	

peer-address	IPv4
peer-group-name	32

BGP BGP IPv4 BGP IPv4 VRF

( )

( )

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

34.1.65 neighbor soft-reconfiguration inbound

BGP **no**

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

no neighbor {*peer-address* | *peer-group-name*} **soft-reconfiguration inbound**

peer-address	IPv4
peer-group-name	32

BGP

BGP BGP ( )

show ip bgp neighbors

BGP

```
Ruijie(config)# router bgp 65000
Ruijie(config-router)# neighbor 10.0.0.1
soft-reconfiguration inbound
```

peer-address	
peer-group-name	32
soo-value	soo soo_value 1 soo_value as_num nn an_num nn 2 soo_value ip_addr:nn ip_addr IP nn

soo

BGP IPv4

CE CE PE CE

```
Ruijie(config)# router bgp 65000
Ruijie(config-router)# neighbor 10.0.0.1 remote-as 100
Ruijie(config-router)# address-family ipv4 vrf vpn1
Ruijie(config-router-af)# neighbor 10.0.0.1 soo 100:100
```

router bgp	BGP

peer-address	IPv4
peer-group-name	32
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*

34.1.68 neighbor unsuppress-map

aggregate-address

no

neighbor {*peer-address* | *peer-group-name*} **unsuppress-map** *map-tag*

no neighbor {*peer-address* | *peer-group-name*} **unsuppress-map**

peer-address	
peer-group-name	32
map-tag	route-map route map 32

BGP

BGP

```
Ruijie(config)# router bgp 65000
Ruijie(config-router)# neighbor 10.0.0.1
unsuppress-map unspress-route
```

router bgp	BGP
neighbor remote-as	BGP
aggregate-address	
route-map	route-map

34.1.69 neighbor update-source

IBGP BGP BGP

no

no neighbor {*peer-address* | *peer-group-name*} **update-source** *interface-type interface-index*

peer-address	IPv4

peer-group-name

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

peer-address	
peer-group-name	32
number	4

4

BGP

BGP

```
Ruijie(config-router)# neighbor 10.1.1.1 version 4
```

router bgp	BGP
neighbor remote-as	BGP

34.1.71 neighbor weight

BGP **no**

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

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

G)(–G–r8TlÈAEEdl'!x•û2COVqwTëmS*ëqN;L@32768

0

32768

BGP

,

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

34.1.73 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)	

34.1.74 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**} *

1 BGP OVERFLOW

```
Ruijie(config)# router bgp 65000
Ruijie(config-router)# no memory-lack overflow
```

OVER67210787.< TD-0.0022 T12055f>]TJ /TT5 1 Tf 0 Tr 4.01225814.14 r54/TT2 1 Tf 1.6re 38 6

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

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	

ISIS ISIS
BGP **no**

redistribute isis [*isis-tag*] [**route-map** *map-tag*] [**metric** *metric-valu*e] [**level-1**| **level-1-2**| **level-2**]

no redistribute isis [*isis-tag*] [**route-map** *map-tag*] [**metric**
el-2]

ISIS ⁒... ⅃

BGP BGP IPv4

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
```

no router bgp *as-number*

as-number	1..65535

BGP

BGP

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

Ip routing	IP
bgp router-id	BGP
network	BGP speaker ,XÛF5¡6WÄAS!¸XÛ¤M

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

```
*>  211.21.23.0/24  110.110.110.10  0      1000   200
300
*>  211.21.25.0/24  110.110.110.10  0     1000   300
*>  211.21.26.0/24  110.110.110.10  0     1000   300
*>  211.21.27.0/24  110.110.110.10  0     1000   200
```

34.2.2 show ip bgp cidr-only

show ip bgp cidr-only

)

```
Ruijie# show ip bgp community-list my_comm
Status codes: s suppressed, d damped, h history, * valid,
> best, i - internal
Origin codes: i - IGP, e - EGP, ? - incomplete
Status Network     Next Hop     Metric  LocPrf  Path
------ ----------------- ---------------   --------
*>  211.21.21.0/24  110.110.110.10  0      1000   200
300
*>  211.21.23.0/24  110.110.110.10  0      1000   200
300
*>  211.21.25.0/24  110.110.110.10  0     1000   300
*>  211.21.26.0/24  110.110.110.10  0     1000   300
*>  211.21.27.0/24  110.110.110.10  0     1000   200
```

ip community-list	

34.2.5 show ip bgp dampening dampened-paths

show ip bgp dampening dampened-paths

```
Ruijie# show ip bgp dampening dampened-paths
Status codes: s suppressed, d damped, h history, * valid,
> best, i - internal
Origin codes: i - IGP, e - EGP, ? - incomplete
status Network          From          Reuse    Path
------ ------------ ------------ -------- -----------
*d    192.168.64.0/24   110.110.110.10  00:21:41 1000
i
*d      202.117.121.0/24    110.110.110.10   00:21:43
1000 ?
*d      202.117.122.0/23    110.110.110.10   00:21:43
1000 ?
*d      202.117.122.0/23    110.110.110.10   00:21:43
1000 ?
*d      202.117.122.0/23    110.110.110.10   00:21:43
1000 ?
*d      202.117.122.0/23    110.110.110.10   00:21:43
1000 ?
*d      202.117.122.0/23    110.110.110.10   00:21:43
1000 ?
*d      202.117.122.0/23    110.110.110.10   00:21:43
1000 ?
*d      202.117.122.0/23    110.110.110.10   00:21:43
1000 ?
```

34.2.6 show ip bgp dampening flap-statistics

show ip bgp dampening flap-statistics

BGP

```
Ruijie# show ip bgp dampening flap-statistics
```

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

34.2.7 show ip bgp dampening parameters

BGP

show ip bgp dampening parameters

BGP

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


```
 Neighbor capabilities:
   Route refresh: advertised and received (old and new)
   Address family IPv4 Unicast: advertised and received
   Graceful restart: advertised and received
     Remote Restart timer is 120 seconds
     Address families preserved by peer:
       none
 Received 14 messages, 0 notifications, 0 in queue
   open message:1 update message:4 keepalive message:9
   refresh message:0 dynamic cap:0 notifications:0
 Sent 12 messages, 0 notifications, 0 in queue
   open message:1 update message:3 keepalive message:8
   refresh message:0 dynamic cap:0 notifications:0
 Route refresh request: received 0, sent 0
 Minimum time between advertisement runs is 0 seconds
For address family: IPv4 Unicast
 BGP table version 2, neighbor version 1
 Index 2, Offset 0, Mask 0x4
 Inbpf notificar]TJfigur
```

```
Ruijie# show ip bgp paths
```

34.2.12 show ip bgp quote-regexp

AS BGP

show ip bgp quote-regexp *regexp*

regexp	AS

AS BGP

~

```
Ruijie# show ip bgp quote-regexp "_300_"
Status codes: s suppressed, d damped, h history, * valid,
> best, i - internal
Origin codes: i - IGP, e - EGP, ? - incomplete
Network     Next Hop     Metric  LocPrf  Path
*>  211.21.21.0/24  110.110.110.10  0      1000   200
300
```

```
*>  211.21.23.0/24  110.110.110.10  0      1000   200
300
*>  211.21.25.0/24  110.110.110.10  0     1000   300
*>  211.21.26.0/24  110.110.110.10  0     1000   300
```

34.2.13 show ip bgp regexp

AS BGP

show ip bgp regexp *regexp*

regexp	AS

AS BGP

```
Ruijie# show ip bgp regexp _300_
Status codes: s suppressed, d damped, h history, * valid,
> best, i - internal
Origin codes: i - IGP, e - EGP, ? - incomplete
Status Network     Next Hop     Metric  LocPrf  Path
------ ----------------- ---------------  --------
*>  211.21.21.0/24  110.110.110.10  0      1000   200
300
*>  211.21.23.0/24  110.110.110.10  0      1000   200
300
*>  211.21.25.0/24  110.110.110.10  0     1000   300
*>  211.21.26.0/24  110.110.110.10  0     1000   300
```

34.2.14 show ip bgp summary

BGP

show ip bgp summary

BGP

```
Ruijie # show ip bgp summary
BGP router identifier 192.168.88.200, local AS number
500
BGP table version is 1
1 BGP AS-PATH entries
0 BGP community entries
Neighbor        V    AS MsgRcvd MsgSent   TblVer  InQ
OutQ Up/Down  State/PfxRcd
1.1.1.1         4   200       0       0        0    0    0
never Active
Total number of neighbors 1
```

router bgp	BGP

34.2.15 show ip bgp vpnv4

vrf rd vpn

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

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

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

network	
neighbor	

summary	
label	
vrf_name	vrf
rd_value	RD 100 1 202.118.239.165:1

vrf rd vpn

```
Ruijie# show ip bgp vpnv4 all
Network          Nexthop      Metric        Localprf
       Weight        Path
Route Distinguisher   100  2
*>i 192.168.0.1/32  192.168.0.2    0         100
0         10 ?
*>i 192.168.1.0/32  192.168.0.2    0     100
0         ?
Route Distinguisher : 100:30
*>i 192.168.0.1/32  192.168.0.2    0      100
0         10 ?
*> 192.168.4.0  192.168.4.1         0
0        20 ?
* 192.168.4.0   0.0.0.0             0

32768       ?

Ruijie# show ip bgp vpnv4 vrf vpn1 summary
BGP router identifier 192.168.0.4 , local AS num 100
BGP  VRF vrf1 Route  Distinguisher   100   30
BGP table version is 1
3 BGP AS  PATH entries
0 BGP community entries
Neibhbor   V   AS   MsgRcvd Msgsend   TblVer  IntQ
OutQ   Up/Down  State/PfxRcd
192.168.4.1 4  20    15      16    1       0    0
00:10:36  3
Total number of neighbors 1
```

MPLS BGP bgp vrf MP-BGP
MP-BGP vpn **show ip bgp vpnv4 vrf** MP-BGP **show ip bgp vpnv4 all**

34.2.16 show ip as-path-access-list

show ip as-path-access-list {*num*}

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

35

35.1

35.1.1 distribute-list in

distribute-list in **no**

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**

RIP Fastethernet 0/0

172.16

```
router rip
network 200.168.23.0
distribute-list 10 in fastethernet 0/0
no auto-summary
!
access-list 10 permit 172.16.0.0 0.0.255.255
```

OSPF
OSPF

RIP 192.168.12.0/24

```
router rip
network 200.4.4.0
network 192.168.12.0
distribute-list 10 out
version 2
access-list 10 permit 192.168.12.0
```

access-list	
prefix-list	
redistribute	

35.1.3 ip community-list

no

ip community-list {[**standard | expanded**] *community-list-name* | *community-number* } {**permit** | **deny**} [*community-number*]

no ip community-list {**standard | expanded**} {*community-list-name* | *community-number*}

community-list-name	32
standard	1..99
expanded	100
permit	
deny	
community-number	AA:NN(/2)

	internet Internet no-export EBGP peers no-advertise BGP peers local-as AS 1..255

BGP

```
Ruijie(config)# ip community-list standard 1 deny 100:20
200:20
Ruijie(config)# ip community-list standard 1 permit
internet
```

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

35.1.4 ip default-network

ip default-network

no

ip default-network *network*

no ip default-network *network*

network	

prefix-lis-name	
seq-number	1 2147483647 5 5
deny	
permit	

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
```

35.1.6 ip prefix-list description

ip prefix-list description

no

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

ip prefix-list description

no

ip prefix-list sequence-number

OSPF RIP
IP IP
(IP 201.1.1.0/24)

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

35.1.8 ip route

ip route no

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

vrf_name	VRF
network	
net-mask	
ip-address	
interface	
distance	
tag	Tag
permanent	
number	

disable/enable	

1

show ip route	IP

35.1.9 ip routing

RGOS IP

no IP

ip routing

no ip routing

IP

VOIP

RGOS IP RGOS IP

RGOS IP

```
no ip routing
```

35.1.10 ip static route-limit

ip static route-limit

no

ip static route-limit *number*

ip static route-limit *number*

number	1-10000

1000

ip static route-limit

show running config

900

```
ip static route-limit 900
```

35.1.11 ipv6 prefix-list

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

Ipv6 prefix-list *prefix-lis-name* [**seq** *seq-number*] { **deny** | **permit** } *ipv6-prefix* [**ge** *minimum-prefix-length*][**le** *maximum-prefix- length*]

no ipv6 prefix-list *prefix-lis-name*[**seq** *seq-number*] { **deny** | **permit**} *ipv6-prefix* [**ge** *minimum-prefix- length*][**le** *maximum-prefix- length*]

prefix-lis-name	
seq-number	1 2147483647 5 5
deny	
permit	
ipv6-prefix	IP 0 32
minimum-prefix-length	( ) **ge**

maximum-prefix- length	( ) **le**

ipv6 prefix-list IPv6 permit deny

ge le

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

RIP OSPF
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)# distribute-list prefix pre out ospf
Ruijie(config-router)# end
```

35.1.12 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

OSPF RIP
IP IP
(IP 201.1.1.0/24)

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

35.1.13 ipv6 prefix-list sequence-number

IPv6 **ipv6 prefix-list description**
no

Ipv6 prefix-list sequence-number

OSPF RIP
IP IP
(IP 201.1.1.0/24)

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

35.1.14 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**

```
route-map ROUTEMAP2IBGP
match as-path 20 30
```

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

35.1.15 match community

COMMUNITY

match community **no**

match community {*standard-list-number* | *expanded-list-number* | *community-list-name*} [**exact-match**] [{*standard-list-number* | *expanded-list-number* | *community-list-name*} [**exact-match**] …]

no match community {*standard-list-number* | *expanded-list-number* | *community-list-name*} [**exact-match**] [{*standard-list-number* | *expanded-list-number* | *community-list-name*} [**exact-match**] …]

standard-list-number	1…99
expanded-list-number r	100…199
communitys-list-name	80
exact-match	

match community

6

exact-match

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

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

match as-path	AS_PATH
match metric	

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

35.1.16 match interface

match

interface **no**

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

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

interface-type	
interface-number	

match interface

OSPF RIP RIP
OSPF

route maps

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

OSPF RIP
fastethernet 0/0 RIP

```
router ospf
redistribute rip subnets route-map redrip
network 192.168.12.0 0.0.0.255 area 0

route-map redrip permit 10
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	

35.1.17 match ip address

match ip address **no**

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

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

access-list-num	

access-list-name() Tj/TT3 1 Tf52.0714 0 TD0 Tc<41934bc207eb3e3c09e1112b8>Tj/TT2 1

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

35.1.18 match ip next-hop

IP

match ip next-hop **no**

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

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

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

match ip next-hop

OSPF
OSPF RIP RIP
OSPF
IP

route maps

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

OSPF RIP RIP
10 20 OSPF

```
router ospf
redistribute rip subnets route-map redrip
network 192.168.12.0 0.0.0.255 area 0
access-l0 Tecutefermit192.168.1200.1
nccess-l0 Tec2tefermit197.168120.1
```

35.1.19 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
OSPF
IP

route maps

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

OSPF RIP RIP
IP 5 OSPF

```
router ospf
redistribute rip subnets route-map redrip
network 192.168.12.0 0.0.0.255 area 0
access-list 5 permit 192.168.100.1
route-map redrip permit 10
match ip route-source 5
```

OSPF RIP RIP
OSPF
IP

route maps

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

OSPF RIP
10 RIP OSPF
type-1 40

```
ipv6 router ospf
redistribute rip subnets route-map redrip
ipv6 access-list v6acl
10 permit ipv6 2620::/64 any
route-map redrip permit 10
match ipv6 address v6acl
set metric 30
```

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

OSPF RIP
10 RIP OSPF
type-1 40

```
ipv6 router ospf
redistribute rip subnets route-map redrip
ipv6 access-list v6acl
10 permit ipv6 2720::/64 any
route-map redrip permit 10
match ipv6 next-hop v6acl
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	

35.1.22 match ipv6 route-source

IPv6

prefix-list *prefix-list-name*	IPv6

OSPF RIP RIP
OSPF
IP

route maps

1 **match** 1
set **match** ų **s**

match ipv6 route-source	IPv6
match metric	
match route-type	
match tag	
set metric	
set metric-type	
set tag	

35.1.23 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

1

OSPF RIP RIP
OSPF
IP

route maps

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

OSPF RIP 10
RIP OSPF

```
router ospf
redistribute rip subnets route-map redist-rip
network 192.168.12.0 0.0.0.255 area 0

route-map redist-rip permit 10
match metric 10
```

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

35.1.25 match origin

35.1.26 match route-type

match route-type

no

match route-type {**local | internal | external** [**type-1 | type-2**] **| level-1 | level-2**}

no match route-type {**local | internal | external** [**type-1 | type-2**] **| level-1 | level-2**}

local	
Internal	OSPF
external	(BGP OSPF)
type-1 | **type-2**	OSPF 1 2
level-1 | **level-2**	ISIS 1 2

OSPF RIP RIP
OSPF
IP

route maps

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

RIP OSPF RIP OSPF

```
router rip
redistribute ospf route-map redrip
```

OSPF RIP 2

maximum-paths *number*

no maximum-paths *number*

number	1-32

32

permit	permit match set set permit match set
deny	deny match deny match set

sequence-number s5 0 0 10.5 180.4r174 Tet

community-list-number	
community-list-name	

```
router bgp 100
neighbor 172.16.233.33 remote-as 120
neighbor 172.16.233.33 route-map ROUTEMAPIN in
neighbor 172.16.233.33 route-map ROUTEMAPOUT out

ip community-list 500 permit 100:10
ip community-list 500 permit 100:20

ip community-list 120 deny 100:50
ip community-list 120 permit 100:.*

route-map ROUTEMAPIN permit 10
set comm-list 500 delete

route-map ROUTEMAPOUT permit 10
set comm-list 120 delete
```

35.1.33 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 internet local-AS no-export no-advertise
additive	community
none	

```
route-map SET_COMMUNITY 10 permit
match as-path 1
set community 109:10

route-map SET_COMMUNITY 20 permit
match as-path 2
set community no-export
```

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

35.1.34 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

```
route-map tag
match as path 10
set dampening 30 1500 10000 120
```

```
router bgp 100
neighbor 172.16.233.52 route-map tag in
```

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

35.1.35 set extcommunity

match

set extcommunity **no**

set extcommunity {**rt** *extend-community-value* | **soo** *extend-community-value*}

no set extcommunity {**rt** | **soo**}

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

match as-path	AS_PATH

set WCMP WCMP weight

WCMP

set ip default next-hop IP 32

ip address weight 4 nexthop

next-hop weight

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

35.1.38 set ip next-hop

match IP
set ip next-hop **no**

set ip next-hop *ip-address* [*weight*] [*…ip-address* [*weight*]]
no set ip next-hop *ip-address* [*weight*] [*…ip-address* [*weight*]]

ip-address	IP
weight	

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

match

1

U ל

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

35.1.39 set ip next-hop verify-availability

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

set ip next-hop verify-availability *ip-address* **track** *track-object-num*
no set ip next-hop *ip-address* [*weight*] [*…ip-address* [*weight*]]

ip-address	IP
track-object-num	

serial 1/0
10.0.0.0/8 192.168.100.1
172.16.0.0/16 172.16.100.1

```
interface serial 1/0
ip policy route-map load-balance

access-list 10 permit 10.0.0.0 0.255.255.255
access-list 20 permit 172.16.0.0 0.0.255.255

route-map load-balance permit 10
match ip address 10
set ip  next-hop 192.168.100.1

route-map load-balance permit 20
```

```
match ip address 20
set ip  next-hop 172.16.100.1

route-map load-balance permit 30
set interface Null0
```

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

35.1.40 set ip precedence

match IP ,
set ip precedence **no**

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

no set ip precedence {*<0-7>* | *critical* | *flash* | *flash-override* | *immediate* Tef174.9 cT14 1 (0 TD0 T TD-0.001 Tc(rorride)Tj/TT2 1 Tf6.2857 0 TD-0.002

set ip precedence

IP

IP TOS IP

IP TOS

fastEthernet 0/0
192.168.217.68 tos 4

```
access-list 1 permit 192.168.217.68 0.0.0.0
route-map name
match ip address 1
set ip tos 4
interface fa 0/0
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

35.1.42 set level

match
set level **no**

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

no set level

OSPF RIP backbone

```
router ospf
redistribute rip subnets route-map redrip
network 192.168.12.0 0.0.0.255 area 0

route-map redrip permit 10
set level backbone
```

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

35.1.43 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

```
route-map SET_PREF permit 10
match as-path 1
set local-preference 6800

route-map SET_PREF permit 20
match as-path 2
set local-preference 50
```

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

35.1.44 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

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

35.1.45 set metric-type

match

set metric-type **no**

set metric-type *type*

no set metric-type

type	

OSPF type-2

OSPF RIP RIP

OSPF

IP

route maps

1 **match** 1

set **match** **set**

OSPF RIP

type-1

```
router ospf
redistribute rip subnets route-map redrip
network 192.168.12.0 0.0.0.255 area 0

route-map redrip permit 10
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	

35.1.46 set next-hop

match IP

set next-hop **no**

set next-hop *ip-address*

no set next-hop *ip-address*

i*p-address*	IP

OSPF RIP RIP
OSPF
IP

route maps

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

192.168.1.2

```
route-map redrip permit 10
match ip address 1
set next-hop 192.168.1.2
```

no set origin

egp	EGP
igp	IGP
Incomplete	

```
route-map SET_ORIGIN 10 permit
match as-path 1
set origin igp
route-map SET_ORIGIN 20 permit
match as-path 2
set origin egp
```

match as-path	AS_PATH
match metric	
match origin	

set as-path prepend

match

set originator-id **no**

set originator-id *ip-addr*

no originator-id [*ip-addr*]

ip-addr	

```
route-map SET_ORIGIN 10 permit
match as-path 1
set originator-id 5.5.5.5
route-map SET_ORIGIN 2 0 TD0 Tc( )Tj/TT4.4.0d2 1  5.5.5.5.5.5
5B,XCÃG20@    9A@@&@
```

set tag *tag*

no set tag

tag	

35.1.50 set weight

match BGP

set community	COMMUNITY
set metric	
set metric-type	

35.1.51 ip ref ecmp load-balance source

ECMP/WCMP

HASH(KEY(SIP,[DIP] [TCP/UDP Port] [UDF]))

Hash

HASH 2 CRC32_Upper CRC32_Lower KEY KEY IP (SIP) TCP/UDP IP(DIP) KEY

ip ref ecmp load-balance
{[**crc32_lower** | **crc32_upper**] [**dip**] [**port**]
[**udf number**]}

no ip ref ecmp load-balance
{[**crc32_lower** | **crc32 upper**] [**dip**] [**port**]
[**udf number**]}

DIP Port UDF Key CRC32_Lower CRC32_Upper Hash **no** **no** Key

SIP + DIP + Port **no ip ref ecmp route dip port** Key SIP **no**

hash

```
Ruijie(config)# ip ref ecmp load-balance crc32_upper
```

ip( ), ip,udp/tc

```
Ruijie(config)# ip ref ecmp load-balance dip port
```

35.2

35.2.1 show route-map

show route-map

show route-map *route-map-name*

route-map-name	

```
Ruijie# show route-map
route-map AAA, permit, sequence 10
Match clauses:
ip address 2
Set clauses:
metric 10
```

route-map	
permit	permit
sequence 10	
Match clauses	permit deny set
Set clauses	match

35.2.2 show ip community-list

show ip community-list [*community-list-number*|*community-list-name*]

community-list-number	
community-list-name	

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

35.2.3 show ip prefix-list

show ip prefix-list

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

prefix-name	

```
Ruijie# show ip prefix-list
ip prefix-list pre: 2 entries
seq 5 permit 192.168.64.0/24
seq 10 permit 192.2.2.0/24
```

35.2.4 show ip route

IP

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 E2	C S R RIP B BGP O OSPF i IS-IS

20.0.0.0/8

prefix-name	IPv6

IPv6

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

35.2.6 show ip ref

REF

REF

```
Ruijie# show ip ref
-----------statistic information-----------:
current    routes: 5
alloc weight_nodes: 5
alloc   bal_tables: 0
alloc    adj_nodes: 5
alloc     res_adj: 0
-------------------------------------------:
```


routes	REF
weight_nodes	
bal_tables	
adj_nodes	
res_adj	

36

36.1

36.1.1 ip policy route-map

ip policy route-map

no

ip policy route-map *route-map*

no ip policy route-map

route-map	

1

ACL ACL

ACL

~

FE0

10.0.0.1 196.168.4.6 20.0.0.1

196.168.5.6

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

access-list	
route-map	
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	

route-map

36.1.2 ip policy

set ip nexthop
ip policy **no**

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

no ip policy

load-balance|redundance	

set ip next-hop

WCMP

4 ECMP 32

ARP

nexthop,

EF0

nexthop

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

```
ip policy route-map lab1
exit
ip policy redundance
```

37 IPv6

37.1

IPv6

- **ping ipv6**
- **ipv6 address**
- **ipv6 enable**
- **ipv6 hop-limit**
- **ipv6 neighbor**
- **ipv6 source-route**
- **ipv6 route**
- **ipv6 ns-linklocal-src**
- **ipv6 nd ns-interval**
- **ipv6 nd reachable-time**
- **ipv6 nd prefix**
- **ipv6 nd ra-lifetime**
- **ipv6 nd ra-interval**
- **ipv6 nd ra-hoplimit**
- **ipv6 nd ra-mtu**
- **ipv6 nd managed-config-flag**
- **ipv6 nd dad attempts**
- **ipv6 nd suppress-ra**
- **ipv6 redirects**
- **clear ipv6 neighbors**
- **tunnel mode ipv6ip**
- **tunnel destination**
- **tunnel source**
- **tunnel ttl**

37.1.1 ping ipv6

IPV6

ping ipv6 [*ipv6-address*]

ipv6-address

ping

!	
.	

~

S57 [0,64]
[128,128] IPv6 [0,64]
[128,128]

---

eui-64 IPV6 64 ID

eui-64 64 IPV6
Up

no ipv6 address

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

```
Ruijie(config-if)# ipv6 address 2001:1::1/64
Ruijie(config-if)# no ipv6 address 2001:1::1/64
Ruijie(config-if)# ipv6 address 2002:1::1/64 eui-64
Ruijie(config-if)# no ipv6 address 2002:1::1/64 eui-64
```

37.1.3 ipv6 enable

IPv6 no IPv6

ipv6 enable

no ipv6 enable

IPv6

2 IPv6 **ipv6 enable**
, IPv6

~

IPv6 þ r

0

IPv6

0 IPv6

```
Ruijie(conifg)# no ipv6 source-route
```

37.1.7 ipv6 route

IPV6 no

ipv6 route *ipv6-prefix*/*prefix-length* {*ipv6-address* | *interface-id* [*ipv6-address*]}

no ipv6 route *ipv6-prefix*/*prefix-length* {*ipv6-address* | *interface-id* [*ipv6-address*]}

ipv6-prefix	IPV6 RFC2373
prefix-length	IPV6 '/'

~

S57			[0,64]
[128,128]		[0,64]	[128,128]

ipv6-address RFC2373

interface-id

,

```
Ruijie(config)# ipv6 route 2001::/64 vlan 1 2005::1
```


show ipv6 interface	

37.1.11 ipv6 nd prefix

(RA)

no

ipv6 nd prefix *ipv6-prefix*/*prefix-length* | **default** [[*valid-lifetime preferred-lifetime*] | [**at** *valid-date preferred-date*] | **infinite** | **no-advertise**]] [**off-link**] [**no-autoconfig**]

no ipv6 nd prefix *ipv6-prefix/prefix-length* | **default** { [**off-link**] [**no-autoconfig**] | [**no-advertise**] }

ipv6-prefix IPV6 RFC2373

prefix-length IPV6 '/'

valid-lifetime

preferred-lifetime

at *valid-date preferred-date*

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

SVI 1

```
Ruijie(conifg)#interface vlan 1
Ruijie(conifg-if)# ipv6 nd prefix 2001::/64 infinite
2592000
```

SVI 1 ( )

```
Ruijie(conifg)# interface vlan 1
Ruijie(conifg-if)# ipv6 nd prefix default no-autoconfig
```

show ipv6 interface	ra-info

37.1.12 ipv6 nd ra-lifetime

(RA) “ ”

no ipv6 nd ra-lifetime

seconds 0-9000s

1800

“ ” (RA)

0 0
(RA)

IPv6

```
Ruijie(config)# interface vlan 1
Ruijie(config-if)# ipv6 nd ra-hoplimit 110
```

show ipv6 interface	**ra-info**

ipv6 nd ra-lifetime	
ipv6 nd ra-interval	
ipv6 nd ra-hoplimit	

37.1.16 ipv6 nd managed-config-flag

“**managed address configuration**” no

ipv6 nd managed-config-flag

no ipv6 managed-config-flag

```
Ruijie(config)# int vlan 1
Ruijie(config)# ipv6 nd managed-config-flag
```

show ipv6 interface	ra-info
ipv6 nd other-config-flag	

37.1.17 ipv6 nd dad attempts

IPV6

(NS) no

ipv6 nd dad attempts *value*

no ipv6 nd dad attempts

value (NS) 0
Ipv6 0-600

1

IPV6
”tentative”( )

EUI-64

(IPV6)
down/up
down up

```
Ruijie(conifgf)# interface vlan 1
Ruijie(conifg-if)# ipv6 nd dad attempts 3
```

show ipv6 interface	

37.1.18 ipv6 nd suppress-ra

(RA) no
(RA)

ipv6 nd suppress-ra

no ipv6 nd suppress-ra

IPv6

ipv6 suppress-ra

```
Ruijie(conifgf)# interface vlan 1
Ruijie(config-if)# ipv6 nd suppress-ra
```

show ipv6 interface	ra-info

37.1.19 ipv6 redirects

IPV6

ICMPv6

no ICMPv6

ipv6 redirects

no ipv6 redirects

IPV6 ICMPv6

ICMPv6

.44 621b5b2c581b40.00180318.24575d40e5>Tj0201 85•y@à

RDP

```
Ruijie# clear ipv6 neighbors
```

ipv6 neighbor	
show ipv6 neighbors	

37.1.21 tunnel mode ipv6ip

IPV6 , no

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

tunnel source	
tunnel mode	
tunnel ttl	TTL

37.1.23 tunnel source

, no

tunnel source {*ipv4-address* | *interface-type interface-number*}

no tunnel source

ipv4-address IPv4 IPv4

interface-type interface-number
IPv4 IPv4

IPv4
IPv4 , (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 mode	
tunnel destination	
tunnel ttl	TTL

37.1.24 tunnel ttl

IPv6 IPv4 TTL , no 128

tunnel ttl *value*

no tunnel ttl

value TTL , 1-255.

128

IPv6 IPv4 TTL

```
Ruijie(config)# interface tunnel 1
Ruijie(config-if)# tunnel ttl 64
```

tunnel mode	
tunnel source	
tunnel destination	

37.2

37.2.1 show ipv6 route

IPV6

show ipv6 route [**static**] [**local**] [**connected**]

static

local

connected

```
Ruijie# show ipv6 route
Codes: C - Connected, L - Local, S - Static, R - RIP,
B - BGP
       I1 - ISIS L1, I2 - ISIS L2, IA - IIS interarea
L    ::1/128
      via ::1, loopback 0
C    fa::/64
      via ::, vlan 1
L    fa::1/128
      via ::, loopback 0
C    2001::/64
      via ::, vlan 2
L    2001::1/128
      via ::, loopback 0
L    fe80::/10
      via ::1, Null0
C    fe80::/64
      via ::, vlan 1
L    fe80::200:ff:fe00:1/128
      via ::, loopback 0
C    fe80::/64
      via ::, vlan 2
```

ipv6 route	

37.2.2 show ipv6 neighbors

IPV6

show ipv6 neighbors [**verbose**] [*interface-id*] [*ipv6-address*]

verbose

interface-id

ipv6-addres

SVI 1

```
Ruijie# show ipv6 neighbors vlan 1
IPv6 Address Linklayer Addr   Interface
 / •"Q@Ø !•Ñ•@ÏÍ CÐ  Î   G‰ƒ˜  rÅ•‡X5‰ˆq  Y  G‰ˆq9•0%•Q‡RFx˜‡ 0  G‰ˆq9•0   h˜-h
```

ra-info RA

IPV6 ND

```
Ruijie# show ipv6 interface vlan 1
Interface vlan 1 is Up, ifindex: 2001
address(es):
Mac Address: 00:00:00:00:00:01
INET6: fe80::200:ff:fe00:1 , subnet is fe80::/64
INET6: 2001::1 , subnet is 2001::/64 [TENTATIVE]
Joined group address(es):
ff01:1::1
ff02:1::1
ff02:1::2
ff02:1::1:ff00:1
MTU is 1500 bytes
ICMP error messages limited to one every 10 milliseconds
ICMP redirects are enabled
ND DAD is enabled, number of DAD attempts: 1
ND reachable time is 30000 milliseconds
ND advertised reachable time is 0 milliseconds
ND retransmit interval is 1000 milliseconds
ND advertised retransmit interval is 0 milliseconds
ND router advertisements are sent every 200
seconds<240--160>
ND router advertisements live for 1800 seconds
```

INET6: 2001::1 , subnet is 2001::/64 [TENTATIVE] INET6 [ ]

ANYCAST	
TENTATIVE	(DAD),
DUPLICATED	
DEPRECATED	
NODAD	

!M

!M | M

38 OSPFv3

38.1

38.1.1 area default-cost

stub NSSA ABR stub NSSA **no**

area *area-id* **default-cost** *cost*

no area *area-id* **default-cost**

area-id	stub NSSA IPv4
cost	stub NSSA 1-16777214

default-cost 1

OSPFv3

Stub NSSA ABR

stub 50 100

```
ipv6 router ospf 1
area 50 stub
area 50 default-cost 100
```

area stub	stub
show ipv6 ospf area	OSPFv3

stub Stub

no Stub

no

area *area-id* **virtual-link** *router-id*

- stub NSSA
-

ipv6 ospf cost

10M

```
ipv6 router ospf 1
auto-cost reference-bandwidth 5
```

ipv6 ospf cost	
show ipv6 ospf	OSPFv3

38.1.6 clear ipv6 ospf process

OSPF

clear ipv6 ospf {**process |** *process-id*}

process-id	ospf <1-65535>

ospf

```
en
clear ipv6 ospf process
```

38.1.7 default-information originate

OSPF

default-information originate **no**

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

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

always	OSPF
metric *metric*	1
metric-type *type*	OSPF 1 2 1 2 2
route-map *map-name*	route-map , route-map

OSPFv3

redistribute **default-information** OSPF
ASBR

redistribute OSPF
ASBR **default-information originate**

always OSPF

show ipv6 ospf database OSPF
0.0.0.0 OSPF
show ipv6 route

default-information originate
default-metric

OSPF 1 2

1 2 show ipv6 route
1

STUB

```
default-information originate always
```

redistribute	
show ipv6 ospf	OSPFv3
show ipv6 ospf database	OSPFv3

38.1.8 default-metric

no

default-metric *metric-value*
no default-metric

metric-value	1-16777214 20

20

OSPFv3

redistribute

1. **default-information originate**
2. 20

metric 10

```
default-metric 10
```

redistribute	
show ipv6 ospf	OSPFv3

38.1.9 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
area *area-id*	OSPFv3 IPv6
instance *instance-id*	OSPFv3

OSPFv3 **ipv6**
router ospf OSPFv3 OSPFv3

no ipv6 ospf area OSPFv3

no ipv6 router ospf OSPFv3

instance-id

OSPFv3

int fastethernet 0/0 OSPFv3

```
int fastethernet 0/0
ipv6 ospf 1 area 2 instance 2
```

ipv6 ospf prefix-filter	
ipv6 router ospf	OSPFv3

38.1.11 ipv6 ospf dead-interval

hello **no**

ipv6 ospf dead-interval *seconds* [**instance** *instance-id*]

no ipv6 ospf dead-interval [**instance** *instance-id*]

Hello **no**

ipv6 ospf hello-interval *seconds* [**instance** *instance-id*]

no ipv6 ospf hello-interval [**instance** *instance-id*]

seconds	Hello 1-65535( )
instance *instance-id*	OSPFv3

10

Hello

hello 20s

```
ipv6 ospf hello-interval 20
```

ipv6 ospf dead-interval	
show ipv6 ospf interface	OSPFv3
instance *instance-id*	OSPFv3

38.1.13 ipv6 ospf neighbor

OSPFv3 **no**

ipv6 ospf neighbor *ipv6-address* [[**cost** <1-65535>] [**poll-interval** <0-4294967295> | **priority** <0-255>]] [**instance** *instance-id*]

no ipv6 ospf neighbor *ipv6-address* [[**cost** <1-65535>] [**poll-interval** <0-4294967295> | **priority** <0-255>]] [**instance** *instance-id*]

cost <*1-65535*>	cost point-to-multipoint
poll-interval <*0-4294967295*>	120 Non-broadcast(NBMA)
priority <*0-255*>	Non-broadcast(NBMA)
instance *instance-id*	OSPFv3

OSPFv3

```
ipv6 ospf network point-to-point
```

ipv6 ospf priority	
show ipv6 ospf interface	OSPFv3

DR/BDR(/)
DR/BDR DR BDR
Router-ID DR BDR

DR/BDR

DR BDR
DR BDR

DR/BDR DR BDR

```
ipv6 ospf priority 0
```

ipv6 ospf network	
router-id	
show ipv6 ospf interface	OSPFv3
instance *instance-id*	OSPFv3

38.1.16 ipv6 ospf retransmit-interval

LSA **no**

ipv6 ospf retransmit-interval *seconds* [**instance** *instance-id*]
no ipv6 ospf retransmit-interval [**instance** *instance-id*]

seconds	LSA 1-65535( )
instance *instance-id*	OSPFv3

5

LSA

LSA

LSA 10s

```
ipv6 ospf retransmit-interval 10
```


show ipv6 ospf interface	OSPFv3

38.1.18 ipv6 router ospf

OSPFv3 **no** OSPFv3

ipv6 router ospf *process-id*

no ipv6 router ospf *process-id*

process-id	OSPF

OSPFv3

OSPFv3 OSPFv3

OSPFv3

```
ipv6 router ospf 1
```

ipv6 ospf area	OSPFv3
show ipv6 ospf	OSPFv3

38.1.19 log-adj-changes

no default

log-adj-changes [**detai**l]

no log-adj-changes [**detail**]

detail	

FULL

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

show ipv6 ospf	ospf

38.1.20 max-concurrent-dd

DD

max-concurrent-dd *number*

no max-concurrent-dd

number	1-65535

OSPFv3

max-concurrent-dd 4 4

DD

```
router ipv6 ospf 1
max-concurrent-dd 4
```

38.1.21 passive-interface

no

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

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

default	
interface-type *interface-number*	

OSPFv3

hello

OSPF

VLAN1 OSPFv3

```
passive-interface default
no passive-interface vlan 1
```

ipv6 ospf area	OSPFv3
show ipv6 ospf	OSPFv3
show ipv6 ospf neighbor	OSPFv3

38.1.22 redistribute

OSPFv3 **no**

redistribute *protocol* [**metric** *metric-value*] [**metric-type** *type-value*][**route-map** *map-tag*] [**match** [**internal** | [**external** | **nssa-external** [1|2]]]]

no redistribute *protocol* [**metric**][**metric-type**][**route-map**] [**match** [**internal** | [**external** | **nssa-external** [1|2]]]]

protocol	static connected rip isis bgp
metric *metric-value*	0-16777214 default-metric
metric-type *type-value*	2 á B> ”Y°U2¯À

route-map *map-tag* route-med

OSPF *match* OSPF
OSPF

ISIS *level* OSPF *match*
route=map

route-map *match*
tag *metric* *metric-type*
route-map

route-map test match
metric 20 s

```
redistribu                    10 route-map test
```

metric 20 metric
30

default-info	
default-met	
summary-p	
show ipv6 c	OSPFv3
show ipv6 ospf database	OSPFv3

no

OSPFv3

OSPFv3 Router ID Router ID IPv4

OSPFv2 OSPFv2 IPv4 Router ID OSPFv3 **Router-id** OSPFv3 Router ID OSPFv3

Router ID

OSPFv3 OSPFv3 Router ID OSPFv3 Router ID Router ID OSPFv3 OSPF

Router ID OSPFv3 Router ID

OSPFv3 1.1.1.1

```
router-id 1.1.1.1
```

Ro2Tj/TT[redacted]mh49522.62 re3000

holdtime	SPF 0-214748364 ( ) 10

spf-delay 5

spf-holdtime 10

OSPFv3

spf-delay *spf-holdtime* OSPF

```
timers spf 2 4
```

clear ipv6 ospf	OSPFv3
show ipv6 ospf	OSPFv3

38.2

38.2.1 show ipv6 ospf

OSPFv3

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
```

ipv6 router ospf	OSPFv3
default-information originate	
default-metric	
router-id	OSPFv3
timers spf	OSPFv3 SPF SPF

38.2.2 show ipv6 ospf database

OSPFv3

show ipv6 ospf [*process- id*] **database** [*lsa-type* [**adv-router** *router-id*]]

process- id	OSPF ,1-65535
lsa-type	lsa external link inter-prefix inter-router intra-prefix network router te 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
```

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 ,


```
DR is 2.2.2.2 BDR is 1.1.1.1
Options is 0x000013 (-|R|-|-|E|V6)
Dead timer due in 00:00:36
Database Summary List 0
Link State Request List 0
Link State Retransmission List 0
          BFD                  ,
“
```

OSPF

```
Ruijie# show ipv6 ospf route
OSPFv3 Process (1)
```

```
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	OSPF

38.2.7 show ipv6 ospf virtual-links

OSPFv3

show ipv6 ospf [*process- id*] **virtual-links**

ipv6 router ospf	OSPFv3
area virtual-link	OSPFv3
show ipv6 ospf neighbor	OSPFv3

39 IGMP

39.1 IGMP

- **clear ip igmp group**
- **clear ip igmp interface**
- **ip igmp access-group**
- **ip igmp join-group**
- **ip igmp static-group**
- **ip igmp immediate-leave group-list**
- **ip igmp last-member-query-count**
- **ip igmp last-member-query-interval**
- **ip igmp limit ( )**
- **ip igmp query-interval**
- **ip igmp query-max-response-time**
- **ip igmp query-timeout**
- **ip igmp robustness-variable**
- **ip igmp version**
- **ip igmp limit ( )**
- **ip igmp proxy-server**
- **ip igmp mroute-proxy**
- **ip igmp ssm-map enable**
- **ip igmp ssm-map static**
- **show ip igmp groups**
- **show ip igmp interface**
- **show ip igmp ssm-mapping**

39.1.1 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

39.1.2 clear ip igmp interface

IGMP

IGMP ifname

```
Ruijie# clear ip igmp interface eth1
```

39.1.3 ip igmp access-group

no

ip igmp access-group *access-list*

no ip igmp access-group

access-list	, <1-199>| <1300-2699> | WORD

ip igmp access-group

Eth0 225.2.2.2.

```
Ruijie# configure terminal
Ruijie(config)# access-list 1 permit 225.2.2.2 0.0.0.0
Ruijie(config)# interface ethernet 0
Ruijie(config-if)# ip igmp access-group 1
```

39.1.4 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
```

39.1.5 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
```

39.1.6 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	

IGMP 2s

IGMP IGMP

```
Ruijie# configure terminal
Ruijie(config)#  access-list  1  permit  225.192.20.0
0.0.0.255
Ruijie(config)# interface ethernet 0/1
Ruijie(config-if)# ip igmp immediate-leave group-list
1
Ruijie(config-if)# exit
```

ip igmp last-member-query-interval

39.1.7 ip igmp last-member-query-count

last-member-query-count leave
last-member-query-count
no

ip igmp last-member-query-count *number*

no ip igmp last-member-query-count

number	, <2-7>

2

IGMPv2 **ip igmp last-member-query-count**

3.

```
Ruijie# configure terminal
Ruijie(config)# interface ethernet 0
Ruijie(config-if)# ip igmp last-member-query-count 3
```

39.1.8 ip igmp last-member-query-interval

no

ip igmp last-member-query-interval *interval*

no ip igmp last-member-query-interval

interval	<1-255> 0.1s

1s

IGMPv2 **ip igmp last-member-query-count**

20

```
Ruijie# configure terminal
Ruijie(config)# interface eth 0
Ruijie(config-if)# ip igmp last-member-query-interval
200
```

ip igmp immediate-leave

39.1.9 ip igmp limit ( )

igmp states no

ip igmp limit *number* [**except** *access-list*]

no ip igmp limit

number	IGMP ,1-1024
except	access-list limit
access-list	

1024

IGMP
IGMP

300

```
Ruijie(config-if)# ip igmp limit 300
```

39.1.10 ip igmp query-interval

no

ip igmp query-interval *seconds*

no ip igmp query-interval

seconds	s 1 18000

125

Ethernet 0 120s

```
Ruijie(config-if)# ip igmp query-interval 120
```

Ethernet 0

```
Ruijie(config-if)# no ip igmp query-interval
```

39.1.11 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

IGMP

S!

Ethernet 0

```
Ruijie(config-if)# no ip igmp query-timeout
```

39.1.13 ip igmp robustness-variable

no

ip igmp robustness-variable

{1 | 2 | 3}	<1-3>

2.

igmp igmp

2

```
Ruijie# configure terminal
Ruijie(config)# interface ethernet 0
Ruijie(config-if)# ip igmp version 2
```

39.1.15 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

=

œ

300

```
Ruijie  config  # ip igmp limit 300
```

39.1.16 ip igmp proxy-service

┤ mroute-proxy
mroute-proxy

ip igmp proxy-service

no ip igmp proxy-service

proxy-service t

32
proxy-service 255
proxy-service
proxy-service mroute-proxy
proxy-service
.

switchport **ip igmp**
mroute-proxy interface ┤

proxy-service

```
Ruijie(config-if)# ip igmp proxy-service
```

39.1.17 ip igmp mroute-proxy

IGMP

39.1.19 ip igmp ssm-map static

ssm-map

ip igmp ssm-map static *access-list a.b.c.d*

no ip igmp ssm-map static *access-list a.b.c.d*

access-list	Acl <1-99> |<1300-1999> |WORD
a.b.c.d	

ip igmp ssm-map enable
v3

ACL 11 192.168.2.2,

```
Ruijie(config)# ip igmp ssm-map static 11 192.168.2.2.
```

39.1.20 show ip igmp groups

IGMP

show ip igmp groups [*group-address* | *interface-type interface-number*] **[detail]**

group-address	32 IP D 8
interface-type	

interface-number	
detail	

```
Ruijie# show ip igmp groups
IGMP Connected Group Membership
Group Address Interface Uptime Expires  Last Reporter
224.0.1.1       eth2  00:00:09  00:04:17  10.10.0.82
224.0.1.24      eth2  00:00:06  00:04:14  10.10.0.84
224.0.1.40      eth2  00:00:09  00:04:15  10.10.0.91
224.0.1.60      eth2  00:00:05  00:04:15  10.10.0.7
239.255.255.250 eth2  00:00:12  00:04:15  10.10.0.228
239.255.255.254 eth2  00:00:08  00:04:13  10.10.0.84
```

```
Ruijie# show ip igmp groups 224.1.1.1 detail
Interface: eth1
Group: 224.1.1.1
Uptime: 00:00:42
Group mode: Include
Last reporter: 192.168.50.111
TIB-A Count: 2
TIB-B Count: 0
Group source list: (R - Remote, M - SSM Mapping)
Source Address Uptime v3 Exp Fwd Flags
192.168.55.55 00:00:42 00:03:38 Yes R
192.168.55.66 00:00:42 00:03:38 Yes R
```

39.1.21 show ip igmp interface

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

interface-type	
interface-number	

```
Ruijie# show ip igmp interface
Interface vlan 1(Index 4294967295)
IGMP Active, Non-Querier, Version 3 (default)
IGMP querying router is 0.0.0.0
IGMP query interval is 125 seconds
IGMP querier timeout is 255 seconds
IGMP max query response time is 10 seconds
Last member query response interval is 1000 milliseconds
Group Membership interval is 260 seconds
IGMP Snooping is globally enabled
IGMP Snooping is enabled on this interface
IGMP Snooping fast-leave is not enabled
IGMP Snooping querier is not enabled
IGMP Snooping report suppression is enabled
```

39.1.22 show ip igmp ssm-mapping

IGMP ssm-map

show ip igmp ssm-mapping (*A.B.C.D*)

A.B.C.D	

IGMP ssm-map

ssm-map

```
Ruijie# sh ip igmp ssm-mapping
SSM Mapping : Enabled
Database    : Static mappings configured
```

233.3.3.3

```
Ruijie#show ip igmp ssm-mapping 233.3.3.3
Group address: 233.3.3.3
Database    : Static
Source list  : 192.3.3.3
             : 3.3.3.3
```

40 PIM-DM

40.1 PIM-DM

PIM-DM

- **ip pim dense-mode**
- **ip pim neighbor-filter**
- **ip pim query-interval**
- **ip pim state-refresh disable**
- **ip pim state-refresh origination-interval**
- **show ip pim dense-mode interface**
- **show ip pim dense-mode neighbor**
- **show ip pim dense-mode nexthop**
- **show ip pim dense-mode mroute**

40.1.1 ip pim dense-mode

PIM-DM **ip pim dense-mode**
no PIM-DM

ip pim dense-mode

no ip pim dense-mode

PIM-DM

```
Ruijie# configure terminal
Ruijie(config)# interface fastethernet 0/1
Ruijie(config-if)# ip pim dense-mode
```

&

PIM-DM
PIM-DM

PIM-DM IGMP

“ Failed to enable PIM-DM on < >, resource temporarily unavailable, please try again ”

“ PIM-DM Configure failed! VIF limit exceeded in NSM!!! ”

PIM-DM

PIM-DM PIM-SM DVMRP

v4

40.1.2 ip pim neighbor-filter

ip pim neighbor-filter

1. ACL PIM
   ACL PIM
2. peering PIM
   PIM
   PIM

40.1.3 ip pim query-interval

hello interval **ip pim query-interval**

no hello interval

ip pim query-interval *interval-seconds*

no ip pim query-interval

interval-seconds	<1-65535>

30

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
```

40.1.4 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

PIM-DM

```
Ruijie# configure terminal
Ruijie(config)# ip pim state-refresh disable
```

~

ip pim state-refresh disable

PIM-DM

60

```
Ruijie# configure terminal
Ruijie(config)# interface fastethernet 0/1
Ruijie(config-if)# ip pim state-refresh
origination-interval 65
```

40.1.6 show ip pim dense-mode interface

PIM-DM **show ip pim dense-mode interface**

show ip pim dense-mode interface [*interface-type interface-number*] **[detail]**

interface-type interface-number	
detail	

/ /

show ip pim dense-mode interface

```
Ruijie# show ip pim dense-mode interface
Address       Interface        VIFIndex  Ver/   Nbr
                                         Mode   Count
10.10.10.10   FastEthernet 0/45    3     v2/D    1
50.50.50.50   VLAN 4               2     v2/D    1
```

Address	PIM-DM IP
Interface	PIM-DM
VIF Index	VIF ID

Ver/Mode	PIM /
Nbr Count	PIM-DM

show ip pim dense-mode neighbor	PIM-DM

40.1.7 show ip pim dense-mode neighbor

PIM-DM **show ip pim dense-mode neighbor**

show ip pim dense-mode neighbor [*interface-type interface-number*]

	Ô 0ÕÄhñ!•[Qd2!ñd

PIM-DM

```
Ruijie# show ip pim dense-mode mroute
PIM-DM Multicast Routing Table
(1.1.1.111, 229.1.1.1)
MRT lifetime expires in 205 seconds
RPF Neighbor: 50.50.50.1, Nexthop:50.50.50.1,VLAN 4
Upstream IF: VLAN 4
Upstream State: Pruned, PLT:200
Assert State: NoInfo
Downstream IF List:
FastEthernet 0/45:
Downstream State: NoInfo
Assert State: Loser, AT:170
```

PIM-SM

ip pim sparse-mode PIM-SM

```
Ruijie(config)# ip multicast-routing
```

41.1.5 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 [b
                                                Ruijie(config)#
```

access-list	access-list <1 99> <1300 1999> acl group-list access-list

PIM

PIM cisco

PIM

PIM

```
Ruijie# configure terminal
Ruijie(config)#ip pim cisco-register-checksum
Ruijie(config)#ip pim cisco-register-checksum
group-list 99
Ruijie(config)# access-list 99 permit 225.1.1.1
0.0.0.255
```

access-list

41.1.8 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
```

41.1.9 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
```

41.1.10 ip pim jp-timer

ip pim jp-timer *interval-seconds*

interval-seconds	<1-65535>

Join/Prune 60s

Join/Prune

```
Ruijie# configure terminal
Ruijie(config)# ip pim jp-timer 50
```

41.1.11 ip pim mib

ip pim mib dense-mode

sparse-mode MIB

dense-mode MIB

```
Ruijie# configure terminal
Ruijie(config)# ip pim mib dense-mode
```

41.1.12 ip pim neighbor-filter

ip pim neighbor-filter *access_list*

access_list	access-list acl 1-99 acl

41.1.14 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
```

41.1.15 ip pim register-rp-reachability

ip pim register-rp-reachability

RP

RP

```
Ruijie# configure terminal
```

```
Ruijie(config)# ip pim register-rp-reachability
```

41.1.16 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

IP Register-Stop

~

PIM-SM

```
Ruijie# configure terminal
Ruijie(config)# ip pim register-source 192.168.195.80
Ruijie(config)# ip pim register-source g 0/3
```

41.1.17 ip pim register-suppression

ip pim register-suppression *seconds*

seconds	<11-21843>

60

DR DR ip pim rp-register-kat RP RP keepalive

```
Ruijie# configure terminal
Ruijie(config)# ip pim register-suppression 100
```

41.1.18 ip pim rp-address

ip pim rp-address *rp-address* [*access_list*]

rp-address	RP IP

RP

PIM-SM RPT RP
BSR C-RP BSR C-RP
BSR PIM

RP acl
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

41.1.20 ip pim rp-register-kat

ip pim rp-register-kat *seconds*

seconds	KAT <1-65535>

210s

RP KAT

```
Ruijie# configure terminal
Ruijie(config)# ip pim rp-register-kat 250
```

41.1.21 ip pim sparse-mode

ip pim sparse-mode

PIM-SM

PIM-SM

```
Ruijie# configure terminal
Ruijie(config)# interface g 0/3
Ruijie(config-if)# ip pim sparse-mode
```

&

PIM-SM
PIM-SM

PIM-SM IGMP

“ Failed to enable PIM-SM on <
>, resource temporarily unavailable, please try again ”

“ PIM-SM Configure failed! VIF limit exceeded in NSM!!! ”

PIM-SM

PIM-SM PIM-DM DVMRP

v4

41.1.22 ip pim spt-threshold

ip pim spt-threshold [**group-list** *access-list*]

access-list	access-list acl 1-99 1300-1999 acl group-list access-list SPT

SPT

RPT SPT

SPT group-list

group-list SPT

```
Ruijie# configure terminal
Ruijie(config)# ip pim spt-threshold
Ruijie(config)# ip pim spt-threshold group-list 12
Ruijie(config)# access-list 12 permit 225.1.1.1
0.0.0.255
```

access-list

41.1.23 ip pim ssm

ip pim ssm { **default** | **range** *access_list}*

default	232/8
access_list	acl 1-99 acl

SSM

PIM-SSM PIM-SSM

232/8

```
Ruijie# configure terminal
Ruijie(config)# ip pim ssm default
```

10

```
Ruijie(config)# ip pim ssm range 10
Ruijie(config)# access-list 10 permit 232.0.0.1
0.0.0.255
```

access-list

41.1.24 show debugging

show debugging

/ /

```
Ruijie #show debugging
PIM-SM Debugging status:
  PIM packet debugging is on
```

41.1.25 show ip pim sparse-mode bsr-router

show ip pim sparse-mode bsr-router

/ /

BSR .

```
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
```

41.1.26 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 detail
GigabitEthernet 0/3 (vif 2):
Address 30.30.100.200, DR 30.30.100.200
Hello period 30 seconds, Next Hello in 13 seconds
Triggered Hello period 5 seconds
```

```
Neighbors:
30.30.100.1
```

41.1.27 show ip pim sparse-mode local-members

show ip pim sparse-mode local-members [*interface-type interface-number*]

41.1.29 show ip pim sparse-mode neighbor

show ip pim sparse-mode neighbor [detail]

detail	

/ /

```
Ruijie# show ip pim sparse-mode neighbor detail
Nbr 5.5.5.3 (VLAN 1)
 Expires in 81 seconds
```

41.1.30 show ip pim sparse-mode nexthop

show ip pim sparse-mode nexthop

/ /

metric

41.1.31 show ip pim sparse-mode rp mapping

show ip pim sparse-mode rp mapping

/ /

RP

```
Ruijie# show 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
```

41.1.32 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
   RP: 30.30.100.1
   Info source: 30.30.100.1, via bootstrap
```

42

42.1

- **clear ip mroute**
- **clear ip mroute statistics**
- **ip mroute**
- **ip multicast route-limit**
- **ip multicast ttl-threshold**
- **ip multicast-routing**
- **ip multicast boundary**
- **show ip mroute**
- **show ip rpf**
- **show ip mvif**

42.1.1 clear ip mroute

IP

clear ip mroute {* | *group-address* [*source -address*]}

*	
group-address	
group_address *source_address*	

230.0.0.1

```
Ruijie# clear ip mroute 230.0.0.1
```

show ip mroute	

42.1.2 clear ip mroute statistics

IP

clear ip mroute statistics {***** | *group-address* [*source -address*]}

*	
group_address	
group_address *source_address*	

IP

230.0.0.1

```
Ruijie# clear ip mroute statistics 230.0.0.1
```

show ip mroute

clear ip mroute

42.1.3 ip mroute

no

ip mroute *source-address mask* [*protocol*] {*rpf-addrress* | *interface-type interface-number*} [*distance*]

no ip mroute *source-address mask* [*protocol*] {*rpf-addrress* | *interface-type interface-number*} [*distance*]

source-address	
mask	
protocol	
rpf-address	
interface-type interface-number	
distance	RPF 0 <1-255>

Distance *Distance* 0

RFF

I ø 2ðéAû•¥ KÔÜ>5%´u˜ 1ÁÍÒF îI

limit	1~2147483647 1024
threshold	2147483647.

limit 1024

threshold 2147483647

IPv6

~

500

```
Ruijie(config)#  DG¯ %  Ó‘ˆm—•›• 1õ !¨ <2°Sàž  ò gnñuDr$A pG™Žý á ò athresTc (
```

1

TTL TTL
TTL
TTL 0

TTL 5

```
Ruijie(config-if)# ip multicast ttl-threshold 5
```

42.1.6 ip multicast-routing

no

ip multicast-routing

no ip multicast-routing

IPv4 IPv4

~

S5750 IGMP SNOOPING SVGL
IVGL-SVGL
IGMP SNOOPING SVGL IVGL-SVGL
ip multicast-routing conflicts with SVGL mode of IGMP SNOOPING! IGMP SNOOPING IVGL IGMP SNOOPING IP

```
Ruijie(config)# ip multicast-rounting
```

&

v4

42.1.7 ip multicast boundary

IP IP **no**

ip multicast boundary *access-list*

no ip multicast boundary *access-list*

svi1 IP

```
Ruijie(config)# ip access-list mul-boun
Ruijie(config-std-nacl)# permit ip 233.3.3.0 0.0.0.255
Ruijie(config-std-nacl)# exit
Ruijie(config)# interface vlan 1
Ruijie(config-if)# ip multicast boundary mul-boun
```

42.1.8 show ip mroute

show ip mroute [*group-address*] [*source-address*] [**dense**][**sparse**] [**summary**] [**count**]

group-address	
source-address	
dense	PIMDM
sparse	PIMSM
summary	
count	

```
Ruijie# show ip mroute
IP Multicast Routing Table
Flags: I - Immediate Stat, T - Timed Stat, F - Forwarder
installed
Timers: Uptime/Stat Expiry
Interface State: Interface (TTL)
(10.10.1.52, 224.0.1.3), uptime 00:00:31, stat expires
00:02:59
Owner PIM-SM, Flags: TF
```

Flags	I- T- F-
Timers:Uptime/Stat Expiry	
Interface State	
Owner	
Incoming interface	

Outgoing interface list

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
```

42.1.10 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
```

42.2 IP

IP

- **debug nsm mcast all**
- **debug nsm mcast fib-msg**
- **debug nsm mcast vif**
- **debug nsm mcast register**
- **debug nsm mcast stats**

42.2.1 debug nsm mcast all

no

debug nsm mcast all

```
Ruijie# debug nsm mcast all
```

42.2.2 debug nsm mcast fib-msg

no

debug nsm mcast fib-msg

43

show storm-control

```
Ruijie(config)# interface gigabitethernet 1/1
Ruijie(config-if)# switchport protected
```

show interfaces	

43.1.3 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

43.1.4 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

MAC

IP( ) (

)

1

M

Gigabitethernet 1/1

shutdown

```
Ruijie(config)# interface gigabitethernet 1/1
Ruijie(config-if)# switchport port-security
Ruijie(config-if)# switchport port-security
violation shutdown
```

show port-security	

43.1.5 switchport port-security aging

no

switchport port-security aging {**static** | **time** *time* }

no switchport port-security aging {**static** | **time** }

static	
time	0 1440 0

no switchport port-security aging time

no switchport port-security [**mac-address** *mac-address*] | [**maximum**]

mac-address *mac-address*	
ip-address *ip-address*	IP
ip-address *ipv6-address*	IPV6
maximum *value*	

IP MAC
ACL
ACL 802.1x IP
IP

gigabitethernet 1/1
00d0.f800.073c IP 192.168.12.202

```
Ruijie# configure terminal
Ruijie(config)# interface gigabitethernet 1/1
Ruijie(config-if)# switchport mode access
Ruijie(config-if)# switchport port-security
Ruijie(config-if)# switchport port-security
mac-address 00d0.f800.073c ip-address 192.168.12.202
```

show port-security	

43.1.7 arp-check

ARP **no** default

[**no | default**] **arp-check** [**auto**]

cpu CPU

auto :

Arp-check

Arp arp

```
Ruijie(config-if)# arp-check
```

show port-security	

43.2

- **show storm-control**
- **show port-security**

43.2.1 show storm-control

show storm-control [*interface-id*]


```
Ruijie# show storm-control gigabitethernet 1/1
Interface Broadcast Control Multicast Control Unicast
Control
------------------------------------ --------------
Gi1/1 Disabled Disabled Disabled
```

storm-control	

43.2.2 show port-security

show port-security [**address**] [**interface** *interface-id*]

address	
interface *interface-id*	

```
Ruijie# show port-security
Secure  Port  MaxSecureAddr(count)  CurrentAddr(count)
Security Action
-------- -------------- ----------- -----------
Gi1/1 128 1 Restrict
Gi1/2 128 0 Restrict
```

```
Gi1/3 8 1 Protect
```

switchport port-security	
switchport port-security aging	
switchport port-security mac-address	

44 802.1X

44.1 dot1x

dot1x

- **dot1x auto-req**
- **dot1x auto-req packet-num**

show dot1x auto-req	

44.1.2 dot1x auto-req packet-num

no

dot1x auto-req packet-num *num*

no dot1x auto-req packet-num

num

num = 0;

show dot1x auto-req

802.1x

```
Ruijie# configure terminal
Ruijie(config)# dot1x auto-req packet-num 0
Ruijie(config)# end
Ruijie# show dot1x auto-req
Auto-Req: Enabled
User-Detect : Enabled
Packet-Num  : 0
Req-Interval: 30 Second
```

show dot1x auto-req	

show dot1x auto-req

```
Ruijie# configure terminal
Ruijie(config)# dot1x auto-req user-detect
Ruijie(config)# end
Ruijie# show dot1x auto-req
Auto-Req: Enabled
User-Detect : Enabled
Packet-Num  : 0
Req-Interval: 60 Second
```

show dot1x auto-req	

44.2 dot1x

dot1x

- **dot1x timeout quiet-period**
- **dot1x timeout re-authperiod**
- **dot1x timeout server-timeout**
- **dot1x timeout supp-timeout**
- **dot1x timeout tx-period**

44.2.1 dot1x timeout quiet-period

no

dot1x timeout quiet-period *seconds*

no dot1x timeout quiet-period

seconds

0 65535 s

10

seconds	0	65535	s

3600

show dot1x 802.1x

1000s

```
Ruijie# configure terminal
Ruijie(config)# dot1x timeout re-authperiod 1000
Ruijie(config)# end
Ruijie# show dot1x
802.1X Status:       Enabled
Authentication Mode:  EAP-MD5
Authed User Number:   0
Re-authen Enabled:    Disabled
Re-authen Period:     1000 sec
Quiet Timer Period:   1000 sec
Tx Timer Period:      3 sec
Supplicant Timeout:   3 sec
Server Timeout:       5 sec
Re-authen Max:        3 times
Maximum Request:      3 times
Filter Non-RG Supp:   Disabled
Client Oline Probe:   Disabled
Eapol Tag Enable:     Disabled
Authorization Mode:   Group Server
```

show dot1x	802.1x

dot1x timeout server-timeout *seconds*

no dot1x timeout server-timeout

seconds 0
65535

5

show dot1x 802.1x

10s

```
Ruijie# configure terminal
Ruijie(config)# dot1x timeout server-timeout 10
Ruijie(config)# end
Ruijie# show dot1x

802.1X Status:       Enabled
Authentication Mode:  EAP-MD5
Authed User Number:   0
Re-authen Enabled:    Disabled
Re-authen Period:     1000 sec
Quiet Timer Period:   1000 sec
Tx Timer Period:      3 sec
Supplicant Timeout:   3 sec
Server Timeout:       10 sec
Re-authen Max:        3 times
Maximum Request:      3 times
Filter Non-RG Supp:   Disabled
Client Oline Probe:   Disabled
Eapol Tag Enable:     Disabled
Authorization Mode:   Group Server
```

show dot1x	802.1x

44.2.4 dot1x timeout supp-timeout

no

dot1x timeout supp-timeout *seconds*

no dot1x timeout supp-timeout

seconds 0
65535

3

show dot1x 802.1x

10s

```
Ruijie# configure terminal
Ruijie(config)# dot1x timeout supp-timeout 10
Ruijie(config)# end
Ruijie# show dot1x
802.1X Status:       Enabled
Authentication Mode:  EAP-MD5
Authed User Number:   0
Re-authen Enabled:    Disabled
Re-authen Period:     1000 sec
Quiet Timer Period:   1000 sec
Tx Timer Period:      3 sec
Supplicant Timeout:   10 sec
Server Timeout:       10 sec
Re-authen Max:        3 times
Maximum Request:      3 times
Filter Non-RG Supp:   Disabled
Client Oline Probe:   Disabled
Eapol Tag Enable:     Disabled
Authorization Mode:   Group Server
```

show dot1x	802.1x

44.2.5 dot1x timeout tx-period

no

dot1x timeout tx-period *seconds*

no dot1x timeout tx-period

seconds 0 65535

3

show dot1x 802.1x

10s

```
Ruijie# configure terminal
Ruijie(config)# dot1x timeout tx-period
```

```
Supplicant Timeout:   10 sec
Server Timeout:      10 sec
Re-authen Max:       3 times
Maximum Request:     3 times
Filter Non-RG Supp:   Disabled
Client Oline Probe:   Disabled
Eapol Tag Enable:    Disabled
Authorization Mode:   Group Server
```

show dot1x	802.1x

44.3.2 dot1x reauth-max

no

dot1x reauth-max *count*

no dot1x reauth-max

count

3

show dot1x 802.1x

```
Ruijie# configure terminal
Ruijie(config)# dot1x reauth-max 5
Ruijie(config)# end
Ruijie# show dot1x

802.1X Status:       Enabled
```

```
Re-authen Enabled:    Enabled
Re-authen Period:     1000 sec
Quiet Timer Period:   1000 sec
Tx Timer Period:      10 sec
Supplicant Timeout:   10 sec
Server Timeout:       10 sec
Re-authen Max:        5 times
Maximum Request:      3 times
Filter Non-RG Supp:   Disabled
Client Oline Probe:   Disabled
Eapol Tag Enable:     Disabled
Authorization Mode:   Group Server
```

show dot1x	802.1x

44.4 dot1x

- **dot1x probe-timer**
- **dot1x client-probe enable**

44.4.1 dot1x probe-timer

.

dot1x probe-timer{**interval** | **alive**}*interval*

no dot1x probe-timer

no

interval hello

alive

interval

Hello 20

250

show dot1x 802.1x

hello 30 , 120

```
Ruijie# configure terminal
Ruijie(config)# dot1x probe-timer interval 30
Ruijie(config)# dot1x probe-timer alive 120
Ruijie(config)# end
Ruijie# show dot1x probe-timer
Hello Interval: 30 Seconds
Hello Alive: 120 Seconds
```

Show dot1x probe-timer	

44.4.2 dot1x client-probe enable

[**no**] **dot1x client-probe enable**

```
Ruijie# configure terminal
Ruijie(config)# dot1x client-probe enable
Ruijie(config)# end
Ruijie# show dot1x
802.1X Status:       Enabled
Authentication Mode:  EAP-MD5
```

```
Authed User Number:   0
Re-authen Enabled:    Enabled
Re-authen Period:     1000 sec
Quiet Timer Period:   1000 sec
Tx Timer Period:      10 sec
Supplicant Timeout:   10 sec
Server Timeout:       10 sec
Re-authen Max:        5 times
Maximum Request:      3 times
Filter Non-RG Supp:   Disabled
Client Oline Probe:   Enabled
Eapol Tag Enable:     Disabled
Authorization Mode:   Group Server
```

802.1X **show dot1x auth-address table**

```
Ruijie# configure terminal
Ruijie(config)# dot1x auth-address-table address 00d0f8000000 interface ehternet 1/1
Ruijie(config)# end
Ruijie#
```

show dot1x auth-address-table	802.1X

44.5.3 dot1x auth-fail max-attemp

VLAN

dot1x auth-fail max-attemp *num*

no dot1x auth-fail max-attemp

num	VLAN , 1-3

3

show dot1x

VLAN

```
Ruijie# configure terminal
```

```
Ruijie(config)# dot1x auth-fail max-attemp 5
Ruijie(config)# end
Ruijie#write
```


-	-

44.5.5 dot1x auth-mode

802.1x

dot1x auth-mode {**eap-md5** | **chap** | **pap**}

no dot1x auth-mode

eap-md5 802.1x EAP-MD5

chap 802.1x CHAP

pap 802.1x PAP

EAP-MD5

show dot1x 802.1x

802.1x

```
Ruijie# configure terminal
Ruijie(config)# dot1x auth-mode chap
Ruijie(config)#
```

dot1x default

```
Ruijie(config-if)# dot1x dynamic-vlan enable
Ruijie(config)# end
Ruijie#
```

show dot1x	802.1x

44.5.8 dot1x guest-vlan

guest vlan **no**

dot1x guest-vlan *vid*

no dot1x guest-vlan

vid <1 - 4094>

1. guest vlan **dot1x dynamic-vlan enable**
   guest vlan
2. guest vlan
   vlan
3. **show running-config** 802.1x

802.1x guest vlan

```
Ruijie# configure terminal
Ruijie(config)# interface gigabitEthernet 4/5
Ruijie(config-if)# dot1x guest-vlan 10
Ruijie(config)# end
Ruijie#
```


show running-config	802.1x

44.5.9 dot1x eapol-tag

EAPOL TAG

dot1x eapol-tag

no dot1x eapol-tag

show dot1x 802.1x

802.1X tag

```
Ruijie# configure terminal
Ruijie(config)# dot1x eapol-tag
Ruijie(config)# end
Ruijie#
```

show dot1x	802.1x

44.5.10 dot1x mac-auth-bypass

MAC

dot1x mac-auth-bypass

no dot1x mac-auth-bypass

MAC

show dot1x port-control interface

802.1x MAC

```
Ruijie# configure terminal
Ruijie(config)# interface fa 0/1
Ruijie(config-if)# dot1x mac-auth-bypass
Ruijie(config-if)# end
Ruijie#write
```

show dot1x port-control interface	802.1x

-	-

```
Ruijie(config-if)# dot1x mac-auth-bypass timeout-activity 3600
Ruijie(config-if)# end
Ruijie#write
```

show dot1x port-control interface	802.1x

-	-

44.5.12 dot1x mac-auth-bypass violation

802.1x MAC

dot1x mac-auth-bypass violation

no dot1x mac-auth-bypass violation

v	

show run 802.1x

802.1x MAC

```
Ruijie# configure terminal
Ruijie(config)# interface fa 0/1
Ruijie(config-if)# dot1x mac-auth-bypass violation
Ruijie(config-if)# end
Ruijie#write
```

show dot1x port-control interface	802.1x

-	-

44.5.13 dot1x max-req

DOT1X DOT1X
DOT1X

no

dot1x max-req *count*

no dot1x ma87x-req

count

3

0 Tc(T5 1 Tf-2 -2.25.4971.0009 Tc0.0031 Tw[(dot1257 0 TD0.c[<01cf60715>-5.1db9(f)T

no

dot1x private-supplicant-only

no dot1x private-supplicant-only

show dot1x private-supplicant-only 802.1x

```
Ruijie# configure t
Ruijie(config)# dot1x private-supplicant-only
Ruijie(config)# end
Ruijie#
```

show dot1x private-supplicant-only	

44.5.15 dot1x port-control auto

no

dot1x port-control auto

no dot1x port-control

802.1x

show dot1x 802.1x

802.1x

```
Ruijie# configure terminal
Ruijie(config)# interface g0/1
Ruijie(config-if)# dot1x port-control auto
Ruijie(config-if)# end
Ruijie#
```

show dot1x	802.1x

44.5.16 dot1x port-control-mode

802.1x MAC

dot1x port-control-mode {**mac-based** | {**port-based** [**single-host**]} }

no dot1x port-control-mode

mac-based mac 802.1X

port-based 802.1X

single-host 802.1x

mac-based

show dot1x port-control 802.1x

single-host 802.1x **show dot1x port-control** port-based **show running-config**

dot1x port-control-mode port-based single-host

single-host default-user-limit
single-host single-host
default-user-limit single-host

802.1x

```
Ruijie(config)# interface g 0/1
Ruijie(config-if)# dot1x port-control auto
Ruijie(config-if)# dot1x port-control-mode
port-based
Ruijie(config-if)# end
Ruijie#
```

802.1x

```
Ruijie(config)# interface g 0/1
Ruijie(config-if)# dot1x port-control auto
Ruijie(config-if)# dot1x port-control-mode
port-based single-host
Ruijie(config-if)# end
Ruijie#
```

show dot1x port-control **Show running-config**	802.1x

44.5.17 dot1x stationarity enable

802.1x

802.1X

dot1x stationarity enable

no dot1x stationarity enable

802.1x

```
Ruijie# configure terminal
Ruijie(config)# dot1x stationarity enable
Ruijie(config)# end
Ruijie#
```

44.5.18 dot1x redirect url

802.1x

URL URL http://

http://ruijie.net/web http:// https://

IPخي

-	-

44.5.19 dot1x redirect for special tcp-destination port

ip ip web 80 8080 16 TCP no dot1x redirect for special tcp-destination port port_mum

[**no**] **dot1x redirect for special tcp-destination port** *port num*

port num	TCP

tcp 80 8080 no

TCP 1-65535

1 TCP 8443

```
Ruijie(config)#dot1x redirect for special tcp-destination port 8443
```

dot1x redirect url	
dot1x redirect time-out	
dot1x redirect num for special source-ip	

44.5.20 dot1x redirect time-out

( ), 3 1-10

no

dot1x redirect time-out port *time-out-interval*

no dot1x redirect time-out port

time-out-interval	

3

1 5

```
Ruijie(config)# dot1x redirect time-out 5
```

dot1x redirect url	ip ip web
dot1x redirect for special tcp-destination port	
dot1x redirect num for special source-ip	
show dot1x	dot1x

-	-

44.5.21 dot1x redirect num for special source-ip

1 1-10 no

dot1x redirect num for special source-ip *num*

no dot1x redirect num for special source-ip

num	

1

1 3

```
Ruijie(config)# dot1x redirect num for special source-ip 3
```

dot1x redirect url	
dot1x redirect for special tcp-destination port	ip ip web
dot1x redirect time-out	
show dot1x	dot1x

-	-

44.6 dot1x

- **show dot1x**
- **show dot1x auth-address-table**
- **show dot1x auto-req**
- **show dot1x private-supplicant-only**
- **show dot1x max-req**
- **show dot1x port-control**
- **show dot1x probe-timer**
- **show dot1x re-authentication**

dot1x reauth-max	
dot1x re-authentication	

dot1x timeout quiet-period

dot1x port-control auto	
dot1x reauth-max	
dot1x re-authentication	
dot1x timeout quiet-period	
dot1x timeout re-authperiod	
dot1x timeout server-timeout	
dot1x timeout supp-timeout	
dot1x timeout tx-period	

44.6.4 show dot1x private-supplicant-only

show dot1x private-supplicant-only

```
Ruijie# show dot1x private-supplicant-only
private-supplicant-only:: disabled
```

dot1x auth-mode	802.1x
dot1x max-req	
dot1x port-control auto	
dot1x reauth-max	
dot1x re-authentication	

dot1x timeout quiet-period	
dot1x timeout re-authperiod	
dot1x timeout server-timeout	
dot1x timeout supp-timeout	
dot1x timeout tx-period	

44.6.5 show dot1x max-req

show dot1x max-req

```
Ruijie# show dot1x max-req
max-req: 2 times
Ruijie#
```

dot1x auth-mode	802.1x
dot1x max-req	
dot1x port-control auto	
dot1x reauth-max	
dot1x re-authentication	
dot1x timeout quiet-period	
dot1x timeout re-authperiod	

dot1x timeout server-timeout	
dot1x timeout supp-timeout	
dot1x timeout tx-period	

44.6.6 show dot1x port-control

show dot1x port-control [**interface** *interface*]

interface

```
Ruijie# show dot1x port-control
interface dyn-user static-user max-user qos
ctrl-mode status
--------- -------- ----------- -------- ------- ------
Gi0/1      0          1             6000      dscp: 0
mac-base Authed
Ruijie#
```

dot1x auth-mode	802.1x
dot1x max-req	
dot1x port-control auto	
dot1x reauth-max	
dot1x re-authentication	

dot1x timeout quiet-period	
dot1x timeout re-authperiod	
dot1x timeout server-timeout	
dot1x timeout supp-timeout	
dot1x timeout tx-period	

44.6.7 show dot1x probe-timer

show dot1x probe-timer

```
Ruijie# show dot1x probe-timer
Hello Interval: 20 Seconds
Hello Alive: 250 Seconds
Ruijie#
```

dot1x auth-mode	802.1x
dot1x max-req	
dot1x port-control auto	
dot1x reauth-max	
dot1x re-authentication	

dot1x timeout quiet-period	
dot1x timeout re-authperiod	
dot1x timeout server-timeout	
dot1x timeout supp-timeout	
dot1x timeout tx-period	

44.6.8 show dot1x re-authentication

show dot1x re-authentication

```
Ruijie# show dot1x re-authentication
reauth-enabled: disabled
Ruijie#
```

dot1x auth-mode	802.1x
dot1x max-req	
dot1x port-control auto	
dot1x reauth-max	
dot1x re-authentication	

dot1x timeout quiet-period	
dot1x timeout re-authperiod	
dot1x timeout server-timeout	
dot1x timeout supp-timeout	
dot1x timeout tx-period	

44.6.9 show dot1x reauth-max

show dot1x reauth-max

```
Ruijie# show dot1x reauth-max
reauth-max: 2 times
Ruijie#
```

dot1x auth-mode	802.1x
dot1x max-req	
dot1x port-control auto	
dot1x reauth-max	
dot1x re-authentication	

dot1x timeout quiet-period	
dot1x timeout re-authperiod	
dot1x timeout server-timeout	
dot1x timeout supp-timeout	
dot1x timeout tx-period	

44.6.10 show dot1x summary

802.1X

show dot1x summary

```
Ruijie# show dot1x summary
ID   MAC       Interface VLAN Auth-State
Backend-State Port-Status Type
---------------- -------------- ---------------
1 00d0f8000000 Gi0/1      1  Authenticated Idle
Authed     Static
Ruijie#
```

dot1x auth-mode	802.1x
dot1x max-req	
dot1x port-control auto	

dot1x reauth-max	
dot1x re-authentication	
dot1x timeout quiet-period	
dot1x timeout re-authperiod	
dot1x timeout server-timeout	
dot1x timeout supp-timeout	
dot1x timeout tx-period	

```
Up-bandwidth is 1024 kbps
Down-bandwidth is 1024 kbps
Authorization vlan is dep7
Authorization seesion time is 1000000 seconds
Authorization ip address is 192.168.217.64
Start accounting
Permit proxy user
Permit dial user
IP privilige is 2
```

```
Ruijie# show dot1x timeout quiet-period
quiet-period: 60 sec
```


45 AAA

45.1

- **aaa authentication dot1x**
- **aaa authentication enable**
- **aaa authentication login**
- **aaa authentication ppp**
- **login authentication**

45.1.1 aaa authentication dot1x

AAA 802.1X **aaa authentication dot1x** 802.1X no 802.1X

aaa authentication dot1x {**default** | *list-name*} *method1* [*method2*...]

no aaa authentication dot1x {**default** | *list-name*}

default 802.1X

list-name 802.1X

method 4

local	
none	
group	RADIUS

AAA 802.1X AAA 802.1X

aaa authentication dot1x

802.1X

rds_d1x AAA 802.1X

RADIUS RADIUS

```
Ruijie(config)# aaa authentication dot1x rds_d1x group radius local
```

aaa new-model	AAA
dot1x authentication	802.1X
username	

45.1.2 aaa authentication enable

AAA Enable **aaa authentication enable** Enable no

aaa authentication enable default *method1* [*method2*...]

no aaa authentication enable default

default Enable

Enable

method 4

local	
none	
group	RADIUS TACACS+

AAA Enable AAA Enable

aaa authentication enable

Enable

Enable

local	
none	
group	RADIUS TACACS+

AAA AAA Login

aaa authentication login

Login

Login Login

list-1 AAA Login

RADIUS RADIUS

```
Ruijie(config)# aaa authentication login list-1 group
radius local
```

aaa new-model	AAA
username **login authentication**	Login

45.1.4 aaa authentication ppp

AAA PPP **aaa authentication ppp** PPP no

aaa authentication ppp {**default** | *list-name*} *method1* [*method2*...]

no aaa authentication ppp {**default** | *list-name*}

default PPP

list-name PPP

method 4

local	
none	
group	RADIUS

AAA PPP AAA PPP

aaa authentication ppp

PPP

rds_ppp AAA PPP

RADIUS RADIUS

```
Ruijie(config)# aaa authentication ppp rds_ppp group
radius local
```

45.1.5 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

45.2

- **aaa authorization commands**
- **aaa authorization config-commands**
- **aaa authorization console**
- **aaa authorization exec**
- **aaa authorization network**
- **authorization commands**
- **authorization exec**

45.2.1 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 4

none	
group	TACACS+

AAA

AAA

14 14

no

```
Ruijie(config)# aaa authorization config-commands
```

aaa new-model	AAA
aaa authorization commands	AAA

45.2.3 aaa authorization console

AAA

aaa authorization console no AAA

aaa authorization console

no aaa authorization console

```
Ruijie(config)# aaa authorization console
```


RADIUS

RADIUS RADIUS RADIUS
RADIUS

RADIUS

```
Ruijie(config)# aaa authorization network default group
radius
```

aaa new-model	. . A

cmd 15
TACACS+ none
VTY 0 – 4

```
Ruijie(config)# aaa authorization commands 15 cmd group
tacacs+ none
Ruijie(config)# line vty 0 4
Ruijie(config-line)# authorization commands 15 cmd
```

aaa new-model	AAA
aaa authorization commands	AAA

45.2.7 authorization exec

Exec
authorization exec no Exec

authorization exec {**default** | *list-name*}

no authorization exec

default Exec

list-name Exec

AAA Exec

Exec
Exec

level	0~15	
default		
list-name		
method		4

aaa new-model	AAA
aaa authentication	AAA
accounting commands	Exec

45.3.3 aaa accounting network

aaa accounting network no

aaa accounting network {**default** | *list-name*} **start-stop group radius**

no aaa accounting network {**default** | *list-name*}

network DOT1X PPP

resource

list-name

start-stop

group

radius RADIUS

start-stop

RADIUS

```
Ruijie(config)# aaa accounting network default
start-stop group radius
```

aaa new-model	AAA

45.3.5 aaa accounting update periodic

aaa accounting update periodic no

aaa accounting update periodic *interval*

no aaa accounting update periodic

interval 1

5 minutes

AAA AAA

1

```
Ruijie(config)# aaa new-model
Ruijie(config)# aaa accounting update
Ruijie(config)# aaa accounting update periodic 1
```

level 0~15

default

list-name

[(VTYb07–)D 0(4)/TT3 1 c6116e04169>160<3f55>0<4 Tc (A-1.4457 TD <b8347TD -0.0007 Tc (de

o

list-name Exec

Exec

Exec

Exec

Exec

exec-1 Exec RADIUS

none VTY

0 – 4

```
Ruijie(config)# aaa accounting exec exec-1 group radius
none
Ruijie(config)# line vty 0 4
Ruijie(config-line)# accounting exec exec-1
```

aaa new-model	AAA
aaa accounting commands	AAA Exec

45.4 AAA

- **aaa group server**
- **ip vrf forwarding**
- **server**
- **show aaa group**

45.4.1 aaa group server

AAA no

aaa group server {**radius** | **tacacs+**} *name*

vrf

```
Ruijie(config)# aaa group server radius ss
Ruijie(config-gs-radius)# server 192.168.4.12
Ruijie(config-gs-radius)# server 192.168.4.13
Ruijie(config-gs-radius)# ip vrf forwarding vrf-name
Ruijie(config-gs-radius)# end
```

aaa group server	aaa
show aaa group	aaa

```
Ruijie(config)# aaa group server radius ss
Ruijie(config-gs-radius)#     server     192.168.4.12
acct-port 5 auth-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
```

```
Referred:   2
Server List:
IP Address: 192.168.217.64
Authentication Port: 1812
Accounting Port: 1813
Referred:  1
```

aaa group server	AAA

45.5 AAA

- **aaa local authentication attempts**
- **aaa local authentication lockout-time**
- **aaa new-model**
- **clear aaa local user lockout**
- **debug aaa**
- **show aaa method-list**
- **show aaa user lockout**

45.5.1 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

45.5.2 aaa local authentication lockout-time

login

AAA **aaa new-model**

AAA **no** AAA

```
Ruijie# clear aaa local user lockout all
```

show running-config	
show aaa lockout	login

45.5.5 debug aaa

AAA

AAA

AAA

```
Ruijie# show aaa method-list
Authentication method-list
aaa authentication login default group radius
aaa authentication ppp default group radius
aaa authentication dot1x default group radius
aaa authentication dot1x san-f local  group angel group
rain none
aaa authentication enable default group radius
Accounting method-list
aaa accounting network default start-stop group radius
Authorization method-list
aaa authorizating network default group radius
```

aaa authentication	
aaa authorization	
aaa accounting	

45.5.7 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

radius fastEthernet 0/0 ip radius

```
Ruijie(config)#
```

aaa authentication	AAA
radius-server key	RADIUS
radius-server retransmit	RADIUS
radius-server timeout	RADIUS

46.1.4 radius-server key

RADIUS
radius-server key no

radius-server key [**0 | 7**] *text-string*
no radius-server key

text-string

0 | ***7*** 0 7

RADIUS
RADIUS RADIUS

46.1.5 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

46.1.6 radius-server timeout

RADIUS

radius-server timeout **no**

radius-server timeout *seconds*

no radius-server timeout

seconds 1-1000

5

10

```
Ruijie(config)# radius-server timeout  10
```

radius-server host	RADIUS
radius-server retransmit	RADIUS
radius-server key	RADIUS

46.1.7 radius-server deadtime

t

t deadtime RGOS RADIUS

radius-server deadtime

no

radius-server deadtime *minnutes*

no radius-server deadtime

minnutes 1-1000

5


password
file-diractory
file-dira

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

46.1.9 radius set qos cos

radius qos cos

radius set qos cos

no radius set qos cos

qos dscp

RADIUS

- **show radius server**
- **show radius parameter**
- **show radius vendor-specific**

46.2.1 debug radius

RADIUS no RADIUS

debug radius {**event | detail**}

no debug radius {**event | detail**}

EXEC

46.2.2 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
radius-server timeout	RADIUS

46.2.3 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 y Y. y H ")X*ä-

radius

```
Ruijie# show radius vendor-specific
id    vendor-specific       type-value
----- -------------------- ----------
1     max down-rate         76
2     qos                   77
3     user ip                3
4     vlan id                4
5     version to client      5
6     net ip                 6
7     user name              7
8     password               8
9     file-diractory        9
10    file-count             10
11    file-name-0            11
12    file-name-1            12
13    file-name-2            13
14    file-name-3            14
15    file-name-4            15
16    max up-rate            75
17    version to server      17
18    flux-max-high32        18
19    flux-max-low32         19
20    proxy-avoid            20
21    dailup-avoid           21
22    ip privilige           22
23    login privilige        42
24    limit to user number   50
```

radius-server host	RADIUS
radius-server retransmit	RADIUS
radius-server key	RADIUS
radius-server timeout	RADIUS

47 TACACS+

47.1 TACACS+

TACACS+

- **aaa group server tacacs+**
- **server**(**TACACS+**)
- **ip vrf forwarding**(**TACACS+**)
- **ip tacacs source-interface**
- **tacacs-server host**
- **tacacs-server key**
- **tacacs-server timeout**

47.1.1 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

47.1.2 server(TACACS+)

TACACS+

server *ip-address*

no server *ip-address*

ip-address TACACS+

TACACS+

aaa group server tacacs+ TACACS+

TACACS+
tacacs-server host

TACACS+

tac1 TACACS+
1.1.1.1 TACACS+

```
Ruijie(config)# aaa group server tacacs+ tac1
Ruijie(config-gs-tacacs+)# server 1.1.1.1
```

aaa group server tacacs+	TACACS+
ip vrf forwarding	TACACS+ VRF

47.1.3 ip vrf forwarding(TACACS+)

TACACS+ vrf (VRF)

ip vrf forwarding *vrf-name*

no ip vrf forwarding

vrf-name vrf

TACACS+

TACACS+ vrf

TACACS+ VRF vpn1

```
Ruijie(config)# aaa group server tacacs+ tac1
Ruijie(config-gs-radius)# server 1.1.1.1
Ruijie(config-gs-radius)# ip vrf forwarding vpn1
```

aaa group server tacacs+	TACACS+
server	TACACS+ server

47.1.4 ip tacacs source-interface

TACACS+

ip tacacs source-interface *interface*

no ip tacacs source-interface

Interface TACACS+

tacacs-server host	TACACS+
tacacs-server timeout	TACACS+

47.1.7 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+

47.2 TACACS+

- **debug tacacs+**
- **show tacacs**

47.2.1 debug tacacs+

TACACS+ no TACACS+

debug tacacs+

no debug tacacs+

EXEC

47.2.2 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+

48 SSH

48.1 SSH

SSH

- **crypto key generate**
- **crypto key zeroize**
- **ip ssh version**
- **ip ssh time-out**
- **ip ssh authentication-retries**

48.1.1 crypto key generate

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

rsa	RSA
dsa	DSA

SSH Server

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

~

no crypto key generate **crypto key zeroize**

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

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

48.1.2 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

48.1.4 ip ssh time-out

SSH Server **no**

ip ssh time-out *time*

no ip ssh time-out

time	

120s **no ip ssh time-out**

SSH Server

120s

show ip ssh SSH server

100s

```
Ruijie# configure terminal
Ruijie(config)# ip ssh time-out 100
```

show ip ssh	ssh-server

48.1.5 ip ssh authentication-retries

SSH Server no

ip ssh authentication-retries *retry times*

no ip ssh authentication-retries

retry times	

show ip ssh

SSH Server SSH Server

SSH

SSH

```
Ruijie# show ip ssh
```

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

48.2.2 show ssh

SSH

show ssh

SSH VTY SSH

```
Ruijie# show ssh
```

48.2.3 show crypto key mypubkey

SSH Server

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

rsa	RSA
dsa	DSA

SSH Server

```
Ruijie# show crypto key mypubkey rsa
```

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

48.2.4 disconnect ssh

SSH

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

SSH SSH
VTY SSH SSH

```
Ruijie# disconnect ssh 1
Ruijie# disconnect ssh vty 1
```

show ssh	SSH
clear line vty *line_number*	VTY

49 CPU

49.1

- **cpu-protect type** *packet-tpye* **pps** *pps_value*
- **cpu-protect type** *packet-tpye* **pri** *pri_value*

49.1.1 cpu-protect type packet-type pps pps_value

CPU

cpu-protect type { **arp** | **bpdu** | | **ipv6mc** | **igmp** | **rip** | **ospf** | **vrrp**

pri_num ID 0 7

0

BPDU 7

```
Ruijie(config)# cpu-protect type bpdu pri 7
Set packet type bpdu pri 7.
```

cpu-protect type packet-type pps *pps_value*	

49.2

CPU

- **show cpu-protect mboard**
- **show cpu-protect slot** *slot-id*
- **show cpu-protect type** *packet-type*

49.2.1 show cpu-protect mboard

CPU

show cpu-protect mboard

CPU

show cpu-protect slot *slot-num*	CPU

49.2.2 show cpu-protect slot

CPP

show cpu-protect slot *slot_num*

slot_num 1-16

CPP

50.1.2 system-guard isolate-time *seconds*

no

system-guard isolate-time *seconds*

no system-guard isolate-time

seconds	IP *second* 30 3600 120

120

IP second

IP

100

```
Ruijie(config-if)# system-guard  isolate-time 100
```

system-guard enable	

50.1.3 system-guard sam

number	IP IP 0 2000 20 0

20

100

```
Ruijie(config-if)# system-guard
scan-dest-ip-attack-packets  100
```

system-guard enable	

50.1.5 system-guard detect-maxnum *number*

no

system-guard detect-maxnum *number*

no system-guard detect-maxnum

no(em-gua)-4(rd eTc/TTo)Tj/TT3 103fe18791b5b02c5532af0

number

200

```
Ruijie(config)# system-guard detect-maxnum 200
```

system-guard enable	

50.1.6 system-guard exception-ip *ip mask*

IP **no**

system-guard exception-ip *ip mask*

no system-guard exception-ip *ip mask* [**all-eip**]

ip	ip
mask	
all-eip	ip no

IP

IP

IP 192.168.5.145

255.255.255.0

```
Ruijie(config)# system-guard exception-ip
192.168.5.145/24
```

system-guard enable	

50.1.7 clear system-guard [interface *interface-id* [ip-address *ip-address*]]

IP

clear system-guard [**interface** *interface-id* [*ip-address*]]

interface *interface-id*	
ip-address *ip-address*	IP

Fastethernet 0/1 IP

```
Ruijie(config)# clear system-guard interface
fastethernet 0/1
```

system-guard enable	

50.2

- **show system-guard** [**interface** *interface-id*]
- **show system-guard isolate-ip** [**interface** *interface-id*]
- **show system-guard detect-ip** [**interface** *interface-id*]
- **show system-guard exception-ip** [**interface** *interface-id*]

50.2.1 show system-guard [interface *interface-id*]

show system-guard [**interface** *interface-id*]

interface *interface-id*	

```
Ruijie# show system-guard
detect-maxnum number   : 100     //
isolated host number   : 11        //
inteface state isolate time same-attack-pkts
scan-attack-pkts
---------------------------- ----------------
Fa 0/1  ENABLE   120     20         10
Fa 0/2  DISABLE  110     21         11
……
Ruijie# show system-guard interface Fa 0/1
detect-maxnum number   : 100     //
isolated host number   : 11        //
inteface  state  isolate time  same-attack-pkts
scan-attack-pkts
---------------------------- ----------------
Fa 0/1  ENABLE   120          20           10
```


system-guard enable

interface *interface-id*	

```
Ruijie# show system-guard isolated-ip
interface   ip-address    isolate reason
remain-time(second)
----------  ----------------- ----------------
Fa 0/1    192.168.5.119   scan ip attack     110
Fa 0/1    192.168.5.109   same ip attack     61
```

system-guard enable	

50.2.3 show system-guard detect-ip [interface *interface-id*]

IP

```
interface ip-address same ip attack packets  scan ip
attack packets
-------------------------------------------------
Fa 0/1    192.168.5.118        0             8
Fa 0/1    192.168.5.108       12             2
```

system-guard enable	

50.2.4 show system-guard exception-ip [interface *interface-id*]

IP

show system-guard exception-ip [**interface** *interface-id*]

interface *interface-id*	

```
Ruijie# show system-guard exception-ip
Exception IP Address    Exception Mask
--------------------      ---------------
255.255.255.0
192.168.4.11           255.255.255.0
```

system-guard enable	

GSN

show smp-server	smp server

51.1.4 security event inteval

security event inteval *interval*

no security event inteval

interval

5

show security event interval

```
Ruijie(config)# security event interval 10
```

show security event interval	

51.1.5 security address-bind enable

security address-bind enable

no security address-bind enable

AP AP

GSN

```
Ruijie(config-if)# security address-bind enable
```

```
Ruijie# show security event interval
Event sending interval(Seconds):5
```

security event interval *interval*	

52 DAI

52.1 VLAN DAI

， **ip arp inspection vlan**

52.1.1 ip arp inspection vlan vlan-id

vlan-id VLAN DAI
no *vlan-id* VLAN DAI
vlan-id VLAN DAI

ip arp inspection vlan *vlan-id*

no ip arp inspection vlan [*vlan-id*]

vlan-id	vlan

VLAN DAI

DAI

VLAN 1 ARP

```
Ruijie(config)# ip arp inspection
Ruijie(config)# ip arp inspection vlan 1
```

show ip arp inspection vlan	VLAN DAI

52.2

52.2.1 ip arp inspection trust

ip arp inspection trust **no**

ip arp inspection trust

no ip arp inspection trust

ARP DAI
ARP

gigabitEthernet 0/19

```
Ruijie(config)# interface gigabitEthernet 0/19
Ruijie(config-if)# ip arp inspection trust
```

show ip arp inspection interface	DAI

NFPP( ) NFPP
DAI

52.3 DHCP Snooping

VLAN DAI ARP
ARP
DHCP Snooping .
DHCP Snooping DHCP Snooping

53.1.3 show anti-arp-spoofing

arp

show anti-arp-spoofing

```
Ruijie#show anti-arp-spoofing
port            ip
-------         -----------
Fa0/1           192.168.1.1
```

anti-arp-spoofing ip	arp

54 IP Source Guard

54.1 IP Source Guard

IP Source Guard

¸ **ip source binding**

54.1.1 ip source binding

no

show ip source binding	IP

54.2 IP Source Guard

IP Source Guard

¸ **ip verify source**

```
FastEthernet            0/1  ip        active
192.168.4.243       00d0.f801.0101 1
```

show ip verify source	IP Source Guard

54.3 IP Source Guard

IP Source Guard

- **show ip verify source**
- **show ip source binding**
- **debug ip source bind**

54.3.1 show ip verify source

IP Source Guard

show ip verify source [**interface** *interface-id*]

interface-id

IP Source Guard

“IP source guard is not configured on the interface FastEthernet 0/10”

IP Source Guard

inactive-no-snooping-vlan DHCP Snooping VLAN

inactive-trust-port DHCP Snooping

active DHCP Snooping

```
Ruijie # show ip verify source
Interface          Filter-type       Filter-mode
Ip-address Mac-address    VLAN
-------------------- ----------- -----------
FastEthernet 0/1   ip        active     192.168.4.243
00d0.f801.0101 1
```

ip source binding	

54.3.3 debug ip source bind

IP Source Guard

55 NFPP

55.1

NFPP

- **cpu-protect sub-interface** {**manage|protocol|route**} **pps**
- **cpu-protect sub-interface** {**manage|protocol|route**} **percent**

ARP

- **arp-guard isolate timeout**
- **arp-guard rate-limit**
- **arp-guard attack-threshold**
- **arp-guard scan-threshold**
- **clear arp-guard users**
- **clear arp-guard scan**

55.1.1 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**	

55.1.2 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**	

55.1.3 arp-guard isolate timeout

arp-guard isolate timeout [*seconds* | **permanent**]

seconds 0 [180, 86400] 0

permanent

0

```
Ruijie(config)# arp-guard isolate timeout 180
Ruijie(config)# interface g 0/1
Ruijie(config-if)# arp-guard isolate timeout permanent
```

show arp-guard configuration	

55.1.4 arp-guard rate-limit

arp-guard rate-limit *pps* {**per-src-ip** | **per-src-mac** | **per-port**}

pps

per-src-ip IP نم Ŕ א

```
Ruijie(config)# arp-guard rate-limit 2 per-src-ip
Ruijie(config)# arp-guard rate-limit 3 per-src-mac
Ruijie(config)# arp-guard rate-limit 50 per-port
```

show arp-guard configuration	

55.1.5 arp-guard attack-threshold

arp-guard attack-threshold *pps* {**per-src-ip** | **per-src-mac** | **per-port**}

IP MAC 8
200

TRAP

*Dec 27 15:34:16: %ARPGUARD-4-DOS_DETECTED: ARP DoS attack was detected.

ARP

“ show arp-guard users ”

“ 0

” 0

0

TRAP VLAN=0

ARP DoS attack from
user<IP=N/A,MAC=0000.0000.0004,port=Gi4/1,VLAN=1> detected.

TRAP

User<IP=N/A,MAC=0000.0000.0004,port=Gi4/1,VLAN=1> is isolated.

T

RAP

Failed to isolate user<IP=N/A,MAC=0000.0000.0004,port=Gi4/1,VLAN=1>.

1) 127
ARP

2) 1MB
“ %ARPGUARD-4-MEM_LIMIT:user table's size reached limit 1MB. ”

3)
“ %ARPGUARD-4-ISOLATE_FAILED: failed to isolate ARP DoS attacker. ”

4)
“ %ARPGUARD-4-NO_MEMORY: failed to alloc memory.. ”

5) CPU 30
TRAP

Ruijie(config)# **arp-guard attack-threshold** *2* **per-src-ip**
Ruijie(config)# **arp-guard attack-threshold** *3* **per-src-mac**
Ruijie(config)# **arp-guard attack-threshold** *50* **per-port**

show arp-guard configuration	
clear arp-guard users	
show arp-guard users	

55.1.6 arp-guard scan-threshold

arp-guard scan-threshold pkt-cnt

pkt-cnt

15

ARP MAC IP
MAC IP IP
“ MAC IP ” ARP
10 ARP ARP
MAC ARP

ARP

*Dec 27 15:34:16: %ARPGUARD-4-SCAN: ARP scan was detected.

“ show arp-guard scan ” ARP
256 ARP

*Dec 27 15:34:16: %ARPGUARD-4-SCAN_TABLE_FULL: ARP scan table is full.

TRAP

ARP scan from user< MAC=0000.0000.0004,port=Gi4/1,VLAN=1> detected.

clear arp-guard users [**vlan** *vid*] [**interface** *interface-id*] [*ip-address* | *mac-address*]

vid

interface-id

ip-address IP

mac-address MAC

VLAN 1 g 0/1

```
Ruijie# clear arp-guard users vlan 1 interface g 0/1
```

arp-guard attack-threshold	
show arp-guard users	

55.1.8 clear arp-guard scan

ARP

clear arp-guard scan

```
Ruijie# clear arp-guard scan
```

55.2.2 show arp-guard users

show arp-guard users [**statistics** | [[**vlan** *vid*] [**interface** *interface-id*] [*ip-address* | *mac-address*]]]

statistics

vid

interface-id

ip-address IP

mac-address MAC

```
Ruijie# show arp-guard users statistics
Success:  100
Fail:    1
----------------
Total:   101
```

101 100 1

“ remain-time(seconds) ”

```
Ruijie# show arp-guard users
If column 1 shows '*', it means "hardware failed to
isolate user".
VLAN     interface     Ip address     MAC address
 remain-time(seconds)
1       Gi0/1        1.1.1.1         -       110
2       Gi0/1        1.1.2.1         -        61
*3      Gi0/1          -      0000.0000.1111   110
4       Gi0/1          -      0000.0000.2222   61
Total  4 users
```

arp-guard attack-threshold	
clear arp-guard users	

55.2.3 show arp-guard scan

ARP

show arp-guard scan [**statistics** | [[**vlan** *vid*] [**interface** *interface-id*] [*mac-address*]]]

statistics ARP

vid

interface-id

mac-address

56 ACL

id	IP ACL: 1-99,1300-1999 IP ACL: 100-199,2000-2699 MAC ACL: 700–799 ACL: 2700–2899
name	ACL
sn	ACL ( )
start-sn	
inc-sn	
deny	
permit	
prot	IPv6 ipv6, icmp, tcp,udp 0-255 IPv4 eigrp, gre, ipinip, igmp, nos, ospf, icmp, udp, tcp, ip IP 0-255 icmp/tcp/udp
interface idx	
src	
src-wildcard	0.255.0.32
src-ipv6-pfix	IPv6
dst-ipv6-pfix	IPv6
pfix-len	
src-ipv6-addr	IPv6
dst-ipv6-addr	IPv6
dscp dscp	, 0-63
flow-label flow-label	0-1048575
dst	
dst-wildcard	0.255.0.32
fragment	

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

5%)TjET174.96 534008 326.52 0.4

- **ip access-group**
- **mac access-group**
- **expert access-group**
- **ipv6 traffic-filter**

56.1.1 access-list

no

1) IP 1 - 99 1300 - 1999

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

2) IP 100 - 199 2000 - 2699

access-list *id* {**deny** | **permit**} **protocol** {*source source-wildcard* | **host** *source* | **any**} {*destination destination-wildcard* | **host** *destination* | **any**} [**precedence** *precedence*] [**tos** *tos*] [**fragments**] [**time-range** *time-range-name*]

3) MAC 700 - 799

access-list *id* {**deny** | **permit**} {**any** | **host** *source-mac-address*} [*mask*] [**time-range** *time-range-name*]

destination-mac-address | **any**} [**precedence** *precedence*] [**tos** *tos*] [**fragments**] [**time-range** *time-range-name*]

Expert

- **urg**
- **ack**
- **psh**
- **rst**
- **syn**
- **fin**

- **critical**
- **flash**
- **flash-override**
-

- **information-request**
- **mask-reply**
- **mask-request**
- **mobile-redirect**
- **net-redirect**
- **net-tos-redirect**
- **net-tos-unreachable**
- **net-unreachable**
- **network-unknown**
- **no-room-for-option**
- **option-missing**
- **packet-too-big**
- **parameter-problem**
- **port-unreachable**
- **precedence-unreachable**
- **protocol-unreachable**
- **redirect**
- **router-advertisement**
- **router-solicitation**
- **source-quench**
- **source-route-failed**
- **time-exceeded**
- **timestamp-reply**
- **timestamp-request**
- **ttl-exceeded**
- **unreachable**

TCP TCP

- **bgp**
- **chargen**
- **cmd**
- **daytime**
- **discard**
- **domain**
- **echo**
- **exec**
- **finger**
- **ftp**

- **ftp-data**
- **gopher**
- **hostname**
- **ident**
- **irc**
- **klogin**
- **kshell**
- **login**
- **nntp**
- **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**
- **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

56.1.2 ip access-list

IP ACL IP ACL
no ACL

ip access-list {**extended** | **standard**} {*id* | *name*}

no ip access-list {**extended** | **standard**} {*id* | *name*}

id IP 1-99 1300-1999 100-199 2000-2699

name IP

ACL ACL **deny** **permit** **show ip access-lists** ACL

ACL

```
Ruijie(config)# ip access-list extended 123
Ruijie(config-ext-nacl)# show ip access-lists
ip access-list extended 123
Ruijie(config-ext-nacl)#
```

ACL

```
Ruijie(config)# ip access-list standard std-acl
Ruijie(config-std-nacl)# show ip access-lists
ip access-list standard std-acl
Ruijie(config-std-nacl)#
```

show ip access-lists	IP

56.1.3 MAC access-list

MAC ACL **no** ACL

mac access-list extended {*id* | *name*}

no mac access-list extended {*id* | *name*}

id MAC 700-799

Name MAC

show mac access-lists ACL

MAC ACL

```
Ruijie(config)# mac access-list extended mac-acl
Ruijie(config-mac-nacl)# show mac access-lists
mac access-list extended mac-acl
Ruijie(config-mac-nacl)#
```

MAC ACL

```
Ruijie(config)# mac access-list extended 704
Ruijie(config-mac-nacl)# show mac access-lists
mac access-list extended 704
Ruijie(config-mac-nacl)#
```

show mac access-lists	mac

56.1.4 expert access-list

ACL **no** ACL

expert access-list extended {*id* | *name*}

no expert access-list extended {*id* | *name*}

id Expert 2700-2899

name ACL

ACL

show access-lists	IPV6

56.1.6 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

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
Ruijie#
```

show access-lists	

56.1.7 deny

(deny)

ACL ACL

1) IP

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

2) IP

[*sn*] **deny protocol** *source source-wildcard destination destination-wildcard* [**precedence** *precedence*] [**tos** *tos*] [**fragments**] [**time-range** *time-range-name*]

IP

Internet Control Message Protocol (ICMP)

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

Transmission Control Protocol (TCP)

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

User Datagram Protocol (UDP)

[*sn*] deny udp {*source source –wildcard* | **host** *source* | **any**} [*operator* **port** [*port*]] {*destination destination-wildcard* | **host** *destination* | **any**} [*operator* **port** [*port*]] [**precedence** *precedence*] [**tos** *tos*] [**fragments**] [**time-range** *time-range-name*]

3) MAC

[*sn*] **deny** {**any** | **host** *source-mac-address*}{**any** | **host** *destination-mac-address*} [*ethernet-type*][**cos** [*out*] [**inner** *in*]]

4) Expert

[*sn*] **deny**[**protocol** | [*ethernet-type*][**cos** [*out*] [**inner** *in*]]] [[**VID** [*out*][**inner** *in*]]] {*source source-wildcard* | **host** *source* | **any**}{**host**

source-mac-address | **any** } {*destination destination-wildcard* | **host** *destination* | **any**} {**host** *destination-mac-address* | **any**} [**precedence** *precedence*] [**tos** *tos*][**fragments**] [**time-range** *time-range-name*]

ethernet-type cos

[*sn*] **deny** {[*ethernet-type*}[**cos** [*out*] [**inner** *in*]]} [[**VID** [*out*][**inner** *in*]]] {*source source-wildcard* | **host** *source* | **any**} {**host** *source-mac-address* | **any** } {*destination destination-wildcard* | **host** *destination* | **any**} {**host** *destination-mac-address* | **any**} [**time-range** *time-range-name*]

protocol

[*sn*] **deny protocol** [[**VID** [*out*][**inner** *in*]]] {*source source-wildcard*sourcehostsource | any

| *hostdestination-ipv6-address*} [**dscp** *dscp*] [**flow-label** *flow-label*] [**fragments**] [**time-range** *time-range-name*]

IPV6

Internet Control Message Protocol (ICMP)

[*sn*]**deny icmp** {*source-ipv6-prefix / prefix-length* | *any* *source-ipv6-address* | **host**} {*destination-ipv6-prefix* / *prefix-length* | **host** *destination-ipv6-address* | **any**} [*icmp-type*] [[*icmp-type* [*icmp-code*]] | [*icmp-message*]] [**dscp** *dscp*] [**flow-label** *flow-label*] [**fragments**] [**time-range** *time-range-name*]

Transmission Control Protocol (TCP)

[*sn*] **deny tcp** {*source-ipv6-prefix / prefix-length* | **host** *source-ipv6-address* | **any**}[*operator* **port**[*port*]] {*destination-ipv6-prefix /prefix-length* | **host** *destination-ipv6-address* | **any**} [*operator* **port** [*port*]] [**dscp** *dscp*] [**flow-label** *flow-label*] [**fragments**] [**time-range** *time-range-name*] [**match-all** *tcp-flag*]

User Datagram Protocol (UDP)

[sn] **deny udp** {*source-ipv6-prefix/prefix-length* | **host** *source-ipv6-address* | **any**} [*operator* **port** [*port*]] {*destination-ipv6-prefix /prefix-length* | **host** *destination-ipv6-address* | **any**}[*operator* **port** [*port*]] [**dscp** *dscp*] [**flow-label** *flow-label*] [**fragments**] [**time-range** *time-range-name*]

access-list

Sn ACL

source-ipv6-prefix IPv6 .

destination-ipv6-prefix IPv6

prefix-length

source-ipv6-address IPv6

destination-ipv6-address IPv6

dscp

dscp 0-63.

flow-label

flow-label 0-1048575.

protocol IPV6 IPV6 | icmp | tcp | udp <0-255>

ACL

ACL ACL

Expert Extended ACL ACL
IP 192.168.4.12 MAC 001300498272
TCP

```
Ruijie(config)# expert access-list extended 2702
Ruijie(config-exp-nacl)# deny tcp  host
192.168.4.12 host 0013.0049.8272 any any
Ruijie(config-exp-nacl)# permit any any any any
Ruijie(config-exp-nacl)# show access-lists
expert access-list extended 2702
10 deny tcp  host  192.168.4.12 host 0013.0049.8272 any
any
20 permit any any any any
Ruijie(config-exp-nacl)#
```

IP ACL IP 192.168.4.12
TCP 100 1

```
Ruijie(config)# ip access-list extended ip-ext-acl
Ruijie(config-ext-nacl)# deny tcp host 192.168.4.12 eq
100 any
Ruijie(config-ext-nacl)# show access-lists
ip access-list extended ip-ext-acl
10 deny tcp host 192.168.4.12 eq 100 any
Ruijie(config-ext-nacl)# exit
Ruijie(config)# interface gigabitethernet 1/1
Ruijie(config-if)# ip access-group ip-ext-acl in
Ruijie(config-if)#
```

MAC ACL MAC 0013.0049.8272
100 1

```
Ruijie(config)# mac access-list extended mac1
Ruijie(config-mac-nacl)# deny host 0013.0049.8272 any
aarp
Ruijie(config-mac-nacl)# show access-lists
mac access-list extended mac1
10 deny host 0013.0049.8272 any aarp
Ruijie(config-mac-nacl)# exit
Ruijie(config)# interface gigabitethernet 1/1
Ruijie(config-if)# mac access-group mac1 in
```

IP ACL 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	

56.1.8 permit

(

source-mac-address | **any** } {*destination destination-wildcard* | **host** *destination* | **any**} {**host** *destination-mac-address* | **any**} [**time-range** *time-range-name*]

Protocol

[*sn*] **permit protocol** [**VID** [*out]*[**inner** *in*]] {*source source-wildcard* | **host** *Source* | **any**} {**host** *source-mac-address* | **any** } {*destination destination-wildcard* | **host** *destination* | **any**} {**host** *destination-mac-address* | **any**} [**precedence** *precedence*] [**tos** *tos*] [**fragments**] [**time-range** *time-range-name*]

Expert

Internet Control Message Protocol (ICMP)

[*sn*] **permit icmp** [**VID** [*out*][**inner** *in*]] {*source source-wildcard* | **host** *source* | **any**} {**host** *source-mac-address* | **any** } {*destination destination-wildcard* | **host** *destination* | **any**} {**host** *destination-mac-address* | **any**}[*icmp-type*] [[*icmp-type* [*icmp-code*]] | [*icmp-message*]] [**precedence** *precedence*] [**tos** *tos*] [**fragments**] [**time-range** *time-range-name*]

Transmission Control Protocol (TCP)

[*sn*] **permit tcp** [**VID** [*out*][**inner** *in*]]{*source source-wildcard* | **host** *Source* | **any**} {**host** *source-mac-address* | **any** } [*operator* **port** [*port*]] {*destination destination-wildcard* | **host** *destination* | **any**} {**host** *destination-mac-address* | **any**} [*operator* **port** [*port*]] [**precedence** *precedence*] [**tos** *tos*] [**fragments**] [**time-range** *time-range-name*] [**match-all** *tcp-flag*]

User Datagram Protocol (UDP)

[*sn*] **permit udp** [**VID** [*out*][**inner** *in*]]{*source source –wildcard* | **host** *source* | **any**} {**host** *source-mac-address* | **any** } [*operator* **port** [*port*]] {*destination destination-wildcard* | **host** *destination* | **any**} {**host** *destination-mac-address* | **any**} [*operator* **port** [*port*]] [**precedence precedence**] [**tos** *tos*] [**fragments**] [**time-range** *time-range-name*]

5) IPV6

[*sn*] **permit protocol** {*source-ipv6-prefix* / *prefix-length* | **any** | **host** *source-ipv6-address*} {*destination-ipv6-prefix* / *prefix-length* | **any** | *hostdestination-ipv6-address*} [**dscp** *dscp*] [**flow-label** *flow-label*|

ACL

IP ACL IP 192.168.4.12
TCP 100 1

```
Ruijie(config)# ip access-list extended 102
Ruijie(config-ext-nacl)# permit tcp host 192.168.4.12
eq 100 any
Ruijie(config-ext-nacl)# show access-lists
ip access-list extended 102
10 permit tcp host 192.168.4.12 eq 100 any
Ruijie(config-ext-nacl)# exit
Ruijie(config)# interface gigabitethernet 1/1
Ruijie(config-if)# ip access-group 102 in
Ruijie(config-if)#
```

MAC ACL MAC 0013.0049.8272
100 1

```
Ruijie(config)#                Ruijie(config-ext-nacl)
```

```
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

56.1.9 list-remark

ACL **no**

list-remark *text*

text

ACL

ACL

```
Ruijie# ip access-list extended 102
Ruijie(config-ext-nacl)# list-remark this acl is to
filter the host 192.168.4.12
Ruijie(config-ext-nacl)# show access-lists
ip access-list extended 102
deny ip host 192.168.4.12 any
1000 hits
this acl is to filter the host 192.168.4.12
Ruijie(config-ext-nacl)#
```

```
Ruijie# configure terminal
Ruijie(config)# access-list 88 list-remark
last_comment
```

show access-lists	
ip access-list	IP

56.1.10 remark

ACL ACE no

remark *text*

Text

ACL

ACL

```
Ruijie# ip access-list extended 102
Ruijie(config-ext-nacl)# remark first_remark
Ruijie(config-ext-nacl)#  permit  tcp  1.1.1.1  0.0.0.0
2.2.2.2 0.0.0.0
Ruijie(config-ext-nacl)# remark second_remark
Ruijie(config-ext-nacl)#  permit  tcp  3.3.3.3  0.0.0.0
4.4.4.4 0.0.0.0
Ruijie(config-ext-nacl)# end

Ruijie# configure terminal
Ruijie(config)# access-list 80 remark  test_remark
```


show access-lists	
ip access-list IP	

RGOS10.3(5)

56.1.11 no sn

ACL **no** *sn*

sn ACL ACL

ACL ACL Ruijie(config)# **ipv6 access-li**

host *::192.168.4.12* **any** Ruijie(config-ipv6-nacl)# *12* **deny ipv6 host any any**

```
cl)# show access-lists ipv6 access-list extended v6-acl
:192.168.4.12 any 12 deny ipv6 any any
cl)# no 12 Ruijie(config-ipv6-nacl)# show access-lists ipv6 access-list extended v6-acl
:192.168.4.12 any
cl)#
```

access-lost (ACL)Tj /TT3 1 Tf32.2514 0 T*40 Tc 0 Tw d2c5816ef044d>Tj /TT2 1 Tf32 0

show access-lists

MAC ACL **no**

mac access-group {*id* | *name*}{**in** | **out**}
no mac access-group {*id* | *name*} {**in** | **out**}

id MAC 700-799
name MAC
in
out

ACL

ACL **show running-config**

access-list accept_00d0f8xxxxxx_only Gigabit 1

```
Ruijie(config)# interface GigaEthernet 1/1
Ruijie(config-if)# mac access-group
accept_00d0f8xxxxxx_only in
```

show access-group	ACL

56.1.14 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

ACL

ACL
show ipv6 traffic-filter

access-list v6-acl Gigabit 1

```
Ruijie(config)# interface GigaEthernet 0/1
Ruijie(config-if)# ipv6 traffic-filter v6-acl in
```

show access-group	ACL

56.2

:

- **show access-lists**
- **show ip access-group**
- **show expert access-group**
- **show mac access-group**
- **show ipv6 traffic-filter**
- **show access-group**

56.2.1 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

56.2.2 show ip access-group

IP ACL

show ip access-group[**interface** <*interface*>]

<*interface*>

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

56.2.3 show expert access-group

Expert

show expert access-group [**interface** <*interface*>]

<*interface*>

Expert ACL

Expert ACL

```
Ruijie# show expert access-group interface
gigabitethernet 0/2
expert access-group ee in
Applied On interface GigabitEthernet 0/2.
```

expert access-list	Expert ACL

56.2.4 show mac access-group

MAC

```
Ruijie# show mac access-group interface gigabitethernet
0/3
mac access-group mm in
Applied On interface GigabitEthernet 0/3.
```

mac access-list	MAC ACL

56.2.5 show ipv6 traffic-filter

IPV6

show ipv6 traffic-filter [

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 K

id ACL id

name ACL

:

56.3.3 security uplink enable

security uplink enable

no security uplink enable

```
Ruijie(config-if)#security uplink enable
```

show secu-acl	

57 QOS

57.1

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
ЇµN0	No Trust

Cos

CoS 0 1 2 3 4 5 6 7

IP-Precedence	0	1	2	3	4	5	6	7
			16	24	32	40	48	56

MAC ACL, me

```
Ruijie(config)# mac access-list extended me
```

ACL

```
Ruijie(config-ext-macl)# permit host 1111.2222.3333 any
```

ACL

```
Ruijie(config-ext-macl)# exit
```

class-map, cm

```
Ruijie(config)# class-map cm
```

ACL

```
Ruijie(config-cmap)# match access-group me
```

class-map

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

show mac access-lists

show ip access-lists

show class-map

57.2.4 Policy Maps

policy map policymap

[**no**] **policy-map** *policy-map-name*

policy map class-map ,

[**no**] **class** *class-map-name*

IP ipdscp IP

set ip dscp *new-dscp*

no set ip dscp

police *rate-bps burst-byte*[**exceed-action** {**drop** | **dscp** *dscp-value*}]

no police

policy-map-name policymap

no policy-map *policy-map-name* policy map

class-map-name class map

no class *class-map-name*

new-dscp DSCP

rate-bps kbps

burst-byte kbyte

drop

dscp-value DSCP

policy map, po

```
Ruijie(config)# policy-map po
```

class-map cm

```
Ruijie(config-pmap)# class cm
```

dscp 10

```
Ruijie(config-pmap-c)# set ip dscp 10
```

1M, 4096k, dscp 16

```
Ruijie(config-pmap-c)# police 1000000 4096
exceed-action dscp 16
```

show policy-map

57.2.5 service-policy

policy map

service-policy {**input** | **output**} *policy-map-name*

no service-policy {**input** | **output**}

policy-map-name policymap

no policy map

```
Ruijie(config)# interface fastEthernet 0/1
Ruijie(config-if)# service-policy input po

Ruijie(config)# virtual-group 3
Ruijie(config-if)# service-policy input po
```

show mls qos interface

virtual-group output

57.2.6 priority-queue

[**no**] **priority-queue**

priority-queue SP

no priority-queue WRR

WRR

```
Ruijie(config)# no priority-queue
```

show mls qos queueing

57.2.7 priority-queue cos-map

CoS

priority-queue cos-map *qid cos0* [*cos1* [*cos2* [*cos3* [*cos4* [*cos5* [*cos6* [*cos7*]]]]]]]

no priority-queue cos-map

qid id

cos0 ... cos7 CoS

no

```
Ruijie(config)# priority-queue cos-map 1 0 1
```

show mls qos queueing

57.2.8 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

57.2.9 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

57.2.10 mls qos map dscp-cos

DSCP CoS

mls qos map dscp-cos *dscp-list* to *cos*

no mls qos map dscp-cos

dscp-list

cos 0 7

no

```
Ruijie(config)# mls qos map dscp-cos 8 10 16 18 to 0
```

show mls qos maps	dscp-cos maps,dscp-cos maps ip-prec-dscp maps

57.2.11 interface rate-limit

rate-limit {**input** | **output**} *bps burst-size*

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

57.2.12 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

57.2.13 drr-queue bandwidth

DRR

drr-queue bandwidth *weight1...weight8*

no drr-queue bandwidth

weight1...weight8

no

```
Ruijie(config)# drr-queue bandwidth 1 2 3 4 5 6 7 8
```

show mls qos queueing

57.2.14 mls qos map ip-prec-dscp

ippre DSCP

mls qos map ip-prec-dscp dscp1...dscp8

no mls qos map ip-prec-dscp

dscp

no

```
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

virtual-group

Aggregate Port

no

virtual-group *virtual-group-number*

no virtual-group *virtual-group-number*

virtual-group-number	128

Aggregate Port

( ) ( )

48 24

24

1/3 3

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

show virtual-group	

57.3

57.3.1 show class-map

class map

show class-map [*class-name*]

class-name class map

class map

policy-name policy name

class-name class map

policy name

```
Ruijie# show policy-map
```

57.3.3 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
```

57.3.4 show mls qos virtual-group

police

show mls qos virtual-group [*virtual-group-number* | **policers**]

virtual-group-number

policers police

police

```
Ruijie# show mls qos virtual-group 1
Ruijie# show mls qos virtual-group policers
```

57.3.5 show mls qos queueing

QoS (cos-to-queue map,wrr weight,drr weight)

show mls qos queueing

```
Ruijie# show mls qos queueing
```

57.3.6 show mls qos scheduler

show mls qos scheduler

```
Ruijie# show mls qos scheduler
```

57.3.7 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
```

57.3.8 show mls qos rate-limit

show mls qos rate-limit [**interface** *interface-id*]

interface interface-id rate-limit

```
Ruijie# show mls qos rate-limit
```

57.3.9 show virtual-group

show virtual-group [*virtual-group-number* | **summary**]

virtual-group-number
128

summary

```
Ruijie# show virtual-group 1
Ruijie# show virtual-group summary
```

58 WRED

58.1 WRED

	Threshold1	CoS	0 1 2 3 4 5 6 7
		WRED-drop	100%low 100%high
		random-detectprobability	100%
		CoS	NONE

WRED-drop

Â wrr-queue cos-map

58.2.1 wrr-queue random-detect max-threshold

no

wrr-queue random-detect max-threshold *queue_id thr1* [*thr2 thr3*]

no wrr-queue random-detect max-threshold *queue_id*

queue_id	
thr1	
thr2	
thr3	

WRED WRED
WRED WRED

S5750 100%

1

```
Ruijie(config-if)# wrr-queuerandom-detect max-threshold 1 88 89 90
```

no

wrr-queue random-detect min-threshold *queue_id thr1 [thr2 thr3]*

no wrr-queue random-detect min-threshold *queue_id*

queue_id	
thr1	
thr2	
thr3	

WRED WRED
WRED WRED

S5750
S5750 2

1

```
Ruijie(config-if)# wrr-queue random-detect min-threshold 1 68 69 70
```

-	-

-	-

58.2.3 wrr-queue random-detect probability

no

wrr-queue random-detect min-threshold *queue_id prob1 [prob2 prob3]*

no wrr-queue random-detect min-threshold *queue_id*

queue_id	

queue_id				
cos_value	cos	1	8	0~7

cos

DSCP-CoS CoS-threshold DSCP threshold

CoS threshold WRED
RED

cos 1 6 cos
priority-queue cos-map

```
Ruijie(config-if)#wrr-queue cos-map 2 1 6
```

-	-

-	-

58.3

Â show queueing wred interface

58.3.1 show queueing wred interface

wred

show queueing wred interface<*interface*>

Interface	

2 1 ÏG)0Ã_ÈÐ

59 VRRP

59.1

VRRP

- **vrrp authentication**
- **vrrp delay**
- **vrrp description**
- **vrrp ip**
- **vrrp preempt**
- **vrrp priority**
- **vrrp timers advertise**
- **vrrp timers learn**
- **vrrp track**

59.1.1 vrrp authentication

VRRP **no**

vrrp group authentication *string*
no vrrp *group* **authentication**

group VRRP

string VRRP (8)

VRRP VRRP

VRRP

/ VRRP

VRRP 1

```
vrrp 1 authentication x30dn78k
```

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

59.1.2 vrrp delay

VRRP

vrrp delay { **minimum** *min-seconds* | **reload** *reload-seconds* }

no vrrp delay

min-seconds VRRP *min-seconds*

reload-seconds VRRP
min-seconds *reload-seconds* VRRP
min-seconds

VRRP

X V

VRRP 0~60

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

59.1.3 vrrp description

VRRP **no**

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

no vrrp group description

group VRRP

text VRRP

VRRP VRRP VRRP

VRRP VRRP

VRRP IP **no**
VRRP IP

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

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

group VRRP

ipaddress IP

secondary IP ی ɔ

group VRRP

delay *seconds* Master
0

VRRP VRRP
VRRP

VRRP
Master VRRP VRRP
Master
VRRP VRRP IP
VRRP
VRRP

VRRP (200)
15

```
vrrp 1 preempt delay 15
vrrp 1 priority 200
```

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

59.1.6 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**	

VRRP 4

```
vrrp 1 timers advertise 4
```

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

59.1.8 vrrp timers learn

no

vrrp *group* **timers learn**

no vrrp *group* **timers learn**

group VRRP

VRRP VRRP

VRRP

VRRP VRRP

Master

VRRP Master VRRP

VRRP 1

```
vrrp 1 timers learn
```

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

Ruijie(config-if)# **vrrp** *group* **timers advertise** [**msec**] *interval*	VRRP

59.2.1 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

59.2.2 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
```

59.2.3 debug vrrp events

```
%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
```

59.3

59.3.1 show vrrp

VRRP

show vrrp [**brief** | *group*]

brief VRRP

group VRRP

VRRP

VRRP

```
Ruijie# show vrrp
FastEthernet 0/0 - pTi6 Tc( )TjEc( )TjEc( )TjEc( )TjEc( )TjEc( )TjE
```

```
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#
```

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#
```

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

60 BFD

60.1

60.1.1 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 1000ms echo
min_rx *milliseconds*	BFD BFD *milliseconds* 50ms 1000ms
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

60.1.2 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

```
#                                OSPF        BFD
Ruijie(config)# router ospf 123
Ruijie(config-router)# bfd all-interface
```

bfd	BFD
ip ospf bfd	OSPF BFD

```
#          BFD
Ruijie(config)# bfd cpp
```

-	-

60.1.4 bfd echo

bfd echo echo **no** echo

bfd echo

no bfd echo

-	-

BFD echo

BFD echo echo
Interval milliseconds **min_rx** *milliseconds*

L3 AP
BFD ECHO , BFD **no ip**
~ **redirects** ICMP **no ip deny land**
DDOS (Land-based)
Echo BFD W Ɔ

```
Ruijie(config)# no switchport
Ruijie(config-if)# bfd echo
```

bfd	BFD
ip redirects	ICMP
ip deny land	Land-based
bfd slow-timer	

60.1.5 bfd slow-timer

bfd slow-timer BFD ECHO
BFD

```
Ruijie(config)# bfd slow-timer 14000
```

bfd echo	BFD Echo

60.1.6 bfd up-dampening

, UP UP

no

bfd up-dampening [milliseconds]

no bfd up-dampening

	( ) UP UP

milliseconds

10.3(5)	

60.1.7 ip ospf bfd

ip ospf bfd OSPF BFD
disable **no**

ip ospf bfd [**disable**]

bfd	BFD
bfd all-interfaces	BFD

60.1.8 ip rip bfd

ip rip bfd RIP BFD
disable **no**

ip rip bfd [**disable**]

no ip rip bfd

disable	( ) RIP BFD

disable RIP BFD

RIP BFD
RIP [**no**] **bfd all-interfaces**
BFD
ip rip bfd [disable]
RIP BFD

Routed Port FastEthernet 0/2 RIP BFD

```
Ruijie(config)# interface FastEthernet 0/2
Ruijie(config-if)# no switchport
Ruijie(config-if)# ip rip bfd disable
```


bfd	BFD
bfd all-interfaces	BFD

60.1.9 ip route static bfd

ip route static bfd BFD **no**

ip route static bfd [**vrf** *vrf-name*] *interface-type interface-number gateway* [**source** *ip-address*]

no ip route static bfd [**vrf** *vrf-name*] *interface-type interface-number gateway* [**source** *ip-address*]

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

60.1.10 neighbor fall-over bfd

router address-family , **neighbor fall-over** BGP

60.1.10 neigh5-9]6uijie8087c441c8>d391e94231f284d116e468f12192c5809ac08ea>d390879

```
Ruijie(config-router)# neighbor 172.16.0.2 fall-over bfd
Ruijie(config-router)# end
```


IP BFD ~ VRRP , IP

VRRP BFD BFD

```
Ruijie#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Ruijie(config)#interface FastEthernet 0/1
Ruijie(config-if)#no switchport
Ruijie(config-if)#ip address 192.168.201.11 255.255.255.0
Ruijie(config-if)#bfd interval 50 min_rx 50 multiplier 3
Ruijie(config-if)#vrrp 1 priority 120
Ruijie(config-if)#vrrp 1 ip 192.168.201.1
Ruijie(config-if)#vrrp 1 bfd 192.168.201.12
Ruijie(config-if)#end
```

bfd	BFD

60.2

BFD

Â [show bfd neighbors](#)

60.2.1 show bfd neighbors

BFD

show bfd neighbors [**vrf** *vrf-name*] [**ipv4** *ip-addess* [**details**]| **ipv6** *ip-addess* [**details**] | **client** {**bgp|ospf|rip|vrrp|static-route|**} [**ipv4** *ip-addess* [**details**] | **ipv6** *ip-addess* [**details**]| **details**]]

Tx Interval	
Registered	
Uptime	UP
Last packet	BFD

-	-

61 RERP

61.1

RERP RERP

- **rerp enable**
- **rerp hello-interval**
- **rerp fail-interval**
- **rerp region**

RERP

- **ring**
- **edge-ring**
- **major-ring**

61.1.1 rerp enable

RERP

rerp enable

no rerp enable

	h r e e l r l

3

6 :

```
Ruijie(config)# rerp fail-interval 6
```


rerp hello- interval

rerp enable	RERP

61.1.5 ring

RERP vlan

ring *num* **role** [**master** | **backup** | **transit**] **ctrl-vlan** *vid* **primary-port interface** *interface-id* **secondary-port interface** *interface-id*
no ring *num*

num id

master | backup | transit

vid vlan

interface-id

RERP

RERP , RERP
Master Backup RERP trunk
native vlan vlan

```
Ruijie(config)# rerp region 1
Ruijie(config-rerp)# ring 1 role master ctrl-vlan 100
primary-port interface GigabitEthernet 0/1
secondary-port interface GigabitEthernet 0/2
```

rerp region	RERP

61.1.6 edge-ring

RERP ring

edge-ring *num* **role** [**primary-edge|secondary-edge**] **ctrl-vlan** *vid* **shared-port interface** *interface-id* **sub-port interface** *interface-id*
no ring *num*

num id

primary-edge|secondary-edge

vid vlan

interface-id

RERP

RERP
RERP ring

```
Ruijie(config)# rerp region 1
Ruijie(config-rerp)# edge-ring 2 role primary-edge
ctrl-vlan 200 shared-port interface GigabitEthernet 0/1
sub-port interface GigabitEthernet 0/3
```

rerp region	RERP
ring	rerp

61.1.7 major-ring

major-ring *num* **edge-ring-vlan** *vid*

num id

vid vlan

RERP

majory-ring

```
Ruijie(config)# rerp region 1
Ruijie(config-rerp)# major-ring 1 edge-ring-vlan 100
```

rerp region	RERP
ring	rerp

61.2

- **show rerp**
- **show rerp statistics**
- **clear rerp statistics**
- **debug rerp**

61.2.1 show rerp

RERP

show rerp

EXEC

:

```
Ruijie# show rerp
rerp state                 : enable
rerp admin hello interval  : 1(*1s)
rerp admin fail interval   : 3(*1s)
rerp edge interval         : 1(*300 ms)
rerp local bridge          : 001a.a902.fe0b
-----------------------------------
region 1
ring                       : 1
rerp oper hello interval   : 1
rerp oper fail  interval   : 3
ring master                : 001a.a902.fe0b
ctrl-vlan                  : 100
edge-vlan                  :
role                       : master
primary-port               : Gi 0/4(forwarding)
secondary-port             : Gi 0/21(down)
```

61.2.2 show rerp statistics

RERP

show rerp statistics region *num* **ring** *ring_id*

EXEC

```
Ruijie# sh rerp statistics regiong 1 ring 1
The statistics for region 1 ring 1 GigabitEthernet 0/4
TX hello packets      23, RX hello packets       0
TX edge-hello packets 0, RX edge-hello packets   0
TX flush packets      0, RX flush packets        0
TX down packets       0, RX down packets       0
TX up packets        0, RX up packets          0
TX major fail packets   0,RX major fail packets    0
TX major resume packets 0,RX major resume packets 0
TX sub complete packets 0,RX sub complete packets 0

The statistics for region 1 ring 1 GigabitEthernet 0/5
```

```
TX hello packets       23,RX hello packets        0
TX edge-hello packets   0,RX edge-hello packets    0
TX flush packets        0,RX flush packets         0
TX down packets         0,RX down packets          0
TX up packets           0,RX up packets            0
TX major fail packets   0,RX major fail packets    0
TX major resume packets 0,RX major resume packets  0
TX sub complete packets 0,RX sub complete packets  0
```

61.2.3 clear rerp statistics

RERP

clear rerp statistics

EXEC

61.2.4 debug rerp

RERP no

debug rerp [**packet** | **event**]

undebug rerp [**packet** | **event**]

packet

event

EXEC

62 REUP

62.1

REUP

- **mac-address-table move update receive**
- **mac-address-table move update transmit**

- **switchport backup interface** *interface-id*
- **switchport backup interface** *interface-id* **preemption**
- **mac-address-table update group**

show interface switchport backup	

62.1.2 switchport backup interface *interface-id*! c î

preemption delay 40

show interface switchport backup	

62.1.3 mac-address-table move update receive

REUP MAC

mac-address-table move update receive

no mac-address-table move update receive

MAC

MAC MAC

MAC

```
Ruijie(config)# mac-address-table move update receive
```

MAC

MAC

```
Ruijie(config)# mac-address-table move update transit
```

mac-address-table move update transit	MAC

62.1.5 mac-address-table update group

MAC

mac-address-table update group [*group-num*]

no mac-address-table update group

group-num : MAC ID

ID 1

MAC

MAC

MAC

MAC

MAC

```
Ruijie(config-if)# mac-address-table update group 2
```

show mac-address-table update group detail	MAC

62.2

- Õ **show interfaces** [*interface-id*] **switchport backup** [**detail**]
- Õ **show mac-address-table update group** [**detail**]

62.2.1 show mac-address-table update group [detail]

MAC

detail : MAC

MAC

EXEC

```
Ruijie# show mac-address-table update group detail
Mac-address-table Update Group:1
Received mac-address-table update message count:0
Group member  Receive Count    Last Receive Switch-ID
Receive Time
------------------------------------------------------
Gi0/1         0              0000.0000.0000
Gi0/2         0              0000.0000.0000
```

62.2.2 show interfaces [*interface-id*] switchport backup [detail]

63 ď

63.1.3 rldp detect-max

RLDP

rldp detect-max *num*

no rldp detect-max

num

RLDP RLDP

```
Ruijie(config)# rldp enable
```

rldp port	RLDP

-	-

63.1.5 rldp loop-detect enable

RLDP

rldp loop-detect enable

no rldp loop-detect enable

RLDP RLDP

```
Ruijie(config)# rldp loop-detect enable
```

RLDP

rldp enable	rldp

-	-

63.1.7 rldp reset

rldp shutdown **disable** rldp

rldp reset

-	-

```
Ruijie# rldp reset
```

rldp enable	Rldp

-	-

63.2

- show rldp
- debug rldp

63.2.1 show rldp

rldp

show rldp [**interface** *interface-id*]

Interface-id	

-	-

-	-

63.2.2 debug rldp

rldp no

debug rldp [**packet | event | error**]

undebug rldp [**packet | event | error**]

packet	rldp
event	
error	

-	-

-	-

64 DLDP

64.1

DLDP

- Â dldp
- Â dldp passive
- Â clear dldp

64.1.1 dldp

DLDP no IP DLDP

dldp *ip-address* [**next-hop** *ipv4-address*] [**interval** *tick* | **retry** *retry-num* | **resume** *resume-num*]

no dldp *ip-address*

ip-address	IP
Ipv4-address	IP
tick	5~6000 tick 5 1tick= 10ms
retry-num	1~3600
resume-num	DOWN UP DLDP 1~200

tick 100tick=1s retry-num 3 resume-num 3

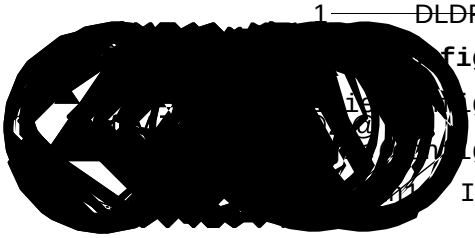
DLDP

```
Ruijie(config)#interface vlan 1
Ruijie(config-if-VLAN 1)#ip address 10.83.132.1 255.255.255.0 //
    vlan1    IP
Ruijie(config-if-VLAN 1)#dldp 10.83.132.10
  2                10.83.131.10    DLDP
Ruijie#config
Ruijie(config)#interface vlan 1
Ruijie(config-if-VLAN 1)#ip address 10.83.132.1 255.255.255.0 //
    vlan1    IP
Ruijie(config-if-VLAN 1)#dldp 10.83.131.10 next-hop 10.83.132.2 //
                      IP
  3           10.83.132.10    DLDP
Ruijie#config
Ruijie(config)#interface vlan 1
Ruijie(config-if-VLAN 1)#no dldp 10.83.132.10
```

DLDP ICMP Echo
ICMP Echo

CPU
ICMP Echo ICMP Echo

1 DLDP



```
fig
ig)#interface vlan 1
g-if-VLAN 1)#ip address 10.83.132.1 255.255.255.0 //
IP                          Ð
```

statistic

1

```
Ruijie#show dldp
```

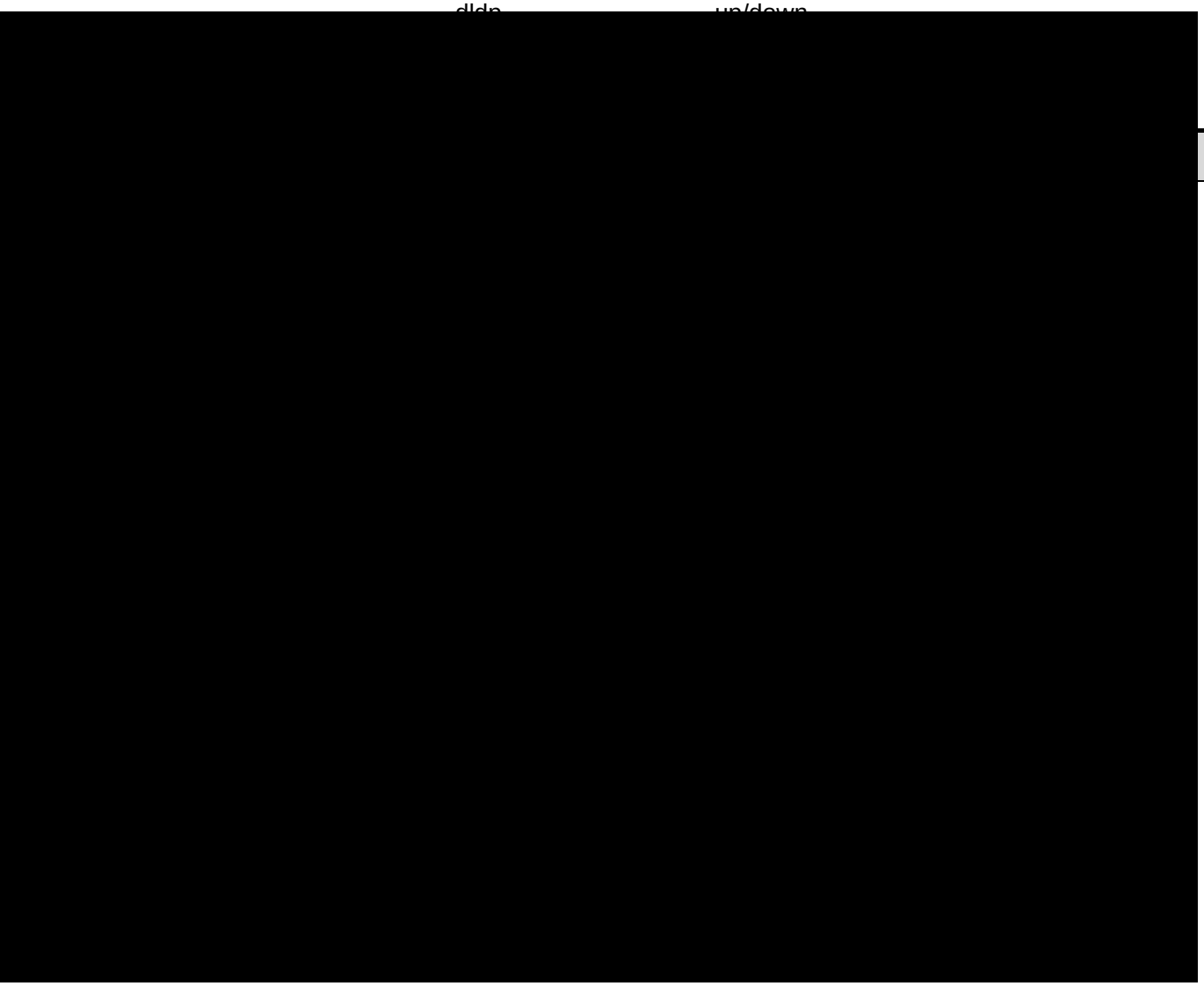
10.3(5)

-	-

64.3

64.3.1 clear dldp

dldp up/down



-	-

65 TPP

65.1

65.1.1 topology guard

topology guard

no

[**no**] **topology guard**

cpu topology-limit

```
Ruijie(config)# topology guard
Ruijie(config)# no topology guard
```

tp-guard port enable

cpu topology-limit CPU

65.1.2 tp-guard port enable

no

[**no**] **tp-guard port enable**

CPU

(AP)

```
Ruijie(config-if)# tp-guard port enable
Ruijie(config-if)# no tp-guard port enable
```

topology guard

65.2 TPP

65.2.1 show tpp

show tpp

tpp

```
Ruijie# show tpp
```

topology guard

66

66.1

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

66.1.1 cd

cd *DIRECTORY*

ls	

66.1.2 cp

,

PATHNAME

.

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

66.1.4 makefs

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

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

DEVNAME ( )

FSNAME

a

b

jffs2 dev/mtdblock/1

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

66.1.5 mkdir

mkdir *DIRECTORY*

DIRECTORY

( )

test

```
Ruijie# mkdir test
```

66.1.6 mv

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

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

SOURCE_FILE

DESTINE_FILE/DIRECTORY

a (**type** **file**); b1(p)9.2(e)]TJ/TT161 Tf1.44 Tm0 g

s,óK õ”ã +

rm *FILE*

FILE ( )

,

, ,

rm

tmp

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

```
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

- No
- 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%

67.1.2 cpu-log

CPU , **cpu-log**

cpu-T5 1 Tf4cTj87j/TT3 1 Tf0.28102 Tc0.9734 s

100% 90%

CPU CPU
CPU ,
CPU , ,
CPU CPU

CPU 70% CPU
80%

```
ruijie(config)# cpu-log log-limit 70 80
```

CPU 80%

```
Oct 20 15:47:01 %SYSCHECK-5-CPU_USING_RATE: CPU
utilization in one minute : 95% Using most cpu's task
is ktimer : 94%
```

CPU 70%

```
Oct 20 15:47:01 %SYSCHECK-5-CPU_USING_RATE: CPU
utilization in one minute :68% Using most cpu's task
is ktimer : 60%
Oct 20 15:47:01 %SYSCHECK-5-CPU_USING_RATE: The CPU
using rate has down!
```

67.2

show memory
memory-lack exit-policy
show memory protocols

67.2.1 show memory

show

memory

show memory

show memory

```
Ruijie#show memory
System Memory Statistic:
  Free pages: 1079
    watermarks : min 379, lower 758, low 1137, high 1516
  System Total Memory : 128MB, Current Free Memory :
5283KB
  Used Rate : 96%
```

1. 4k

2.

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

3.

67.2.2 memory-lack exit-policy

worsen

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	

-

67.2.3 show memory protocols

show memory protocols

&	BGP,OSPF,RIP,LDP,PIM,ISIS

1 show memory protocols

```
Ruijie(config)# show memory protocols
==================================================
protocol      |memory(byte)
BGP            102000000
OSPF            24000000
RIP             10000000
PIM             50000000
LDP             20000000
--------------------------------------------------
Total          206000000
```

show memory	

-

67.3

67.3.1

Â threshold set

67.3.1.1 threshold set

3 CPU
CPU
MIB CPU syslog
syslog

no

2 CPU

```
Ruijie(config)# threshold set cpu member 2 70 90
```

2

```
Ruijie# show threshold memory
```

threshold set	

S5750

68

68.1

68.1.1 logging on

no

logging on

no logging on

0 ḿ

logging monitor	VTY (telnet)

logging trap lo Servert

no logging buffered

buffer-size	4K

6 6 10000

```
Ruijie(config)# logging buffered 10000 6
```

logging on	
show logging	
clear logging	

68.1.4 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 RGOS

5 Syslog Server Syslog Server

202.101.11.1 syslog server

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

IPV6 AAAA:BBBB::FFFF

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

logging on	
show logging	
logging trap	syslog server

68.1.5 logging file flash

FLASH

FLASH no

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

no logging file

filename txt

max-file-size 128K 6M bytes 128K

levelI

FLASH 6 1

FLASH

Syslog Server

FLASH

txt

~

1.
2. _
txt
3. 15
FLASH FLASH
16

FLASH trace.txt
64K, 6

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

logging on	
show logging	
more flash	FLASH

68.1.6 logging console

no

logging console *level*

no logging console

level 0 7
1

Debugging (7)

show logging

6

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

logging on	
show logging	

68.1.7 logging monitor

VTY telnet SSH

no VTY

logging monitor *level*

no logging monitor

level

1

Debugging (7)

VTY **terminal monitor** VTY

logging monitor

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

logging on	
show logging	

68.1.8 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

Ä

no

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

no logging source {**ip** | **ipv6**}

ip-address	IPV4	IPV4
ipv6-address	IPV6	IPV6

Syslog Server

Loopback 0 Syslog

```
Ruijie(config)# logging source ip 192.168.1.1
```

Local7(23)

2 Syslog

2

Numerical

13	log audit
14	log alert
15	clock daemon
16	local use 0 (local0)
17	local use 1 (local1)
18	local use 2 (local2)
19	local use 3 (local3)
20	local use 4 (local4)
21	local use 5 (local5)
22	local use 6 (local6)
23	local use 7 (local7)

RGOS (local7) 23

no logging count

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

show logging count	
show logging	

68.1.13 logging rate-limit

no

logging rate-limit {*number* | *all number* | *console* {*number* | *all number*}} [*except severity*]

no logging rate-limit

number 1—10000

all 0—7

console

except
error(3) error

severity 0—7;

```
Ruijie(config)#
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	

68.1.15 service sequence-numbers

no

service sequence-numbers

no service sequence-numbers

1

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

logging on	
service timestamps	

68.1.16 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 * * * *

datetime Jul 27 16:53:07

msec : : .
Jul 27 16:53:07.299

year : :
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
```

```
Ruijie(config)# service sysname
Ruijie(config)# end
Ruijie#
Mar 22 15:35:57 S3250 %SYS-5-CONFIG: Configured from
console by console
```

show logging	

68.1.18 more flash

FLASH

more flash:filename

Filename

FLASH ”//f2/” ”//f3/’

FLASH

```
Ruijie# more  flash://f2/log.txt
look up  file in the extended flash://f2/log.txt
00004 2004-11-17 4:1:32  Ruijie: %5:Reload requested by
Administrator. Reload Reason :Reload command
```

logging file flash:	FLASH

68.1.19 clear logging

```
Monitor logging: level informational, 0 messages logged
Buffer logging: level debugging, 6 messages logged
Timestamp debug messages: datetime
Timestamp log messages: disabled
Sequence log messages: enable
Trap logging: level debugging, 2 message lines logged,0
reserved,0 fail
logging to  202.101.11.22
logging to  192.168.200.112
Log Buffer (Total 4096 Bytes) : have written 680
00001 2004-11-17 10:20:59  Ruijie: %7:%LINK CHANGED:
Interface FastEthernet 0/0, changed state to up
00002 2004-11-17 10:20:59  Ruijie: %7:%LINE PROTOCOL
CHANGE: Interface FastEthernet 0/0, changed state to UP
00003 2004-11-17 10:57:18  Ruijie: %7:%LINK CHANGED:
Interface  FastEthernet  0/1,  changed  state  to
administratively down
00004 2004-11-17 10:57:21  Ruijie: %7:%LINK CHANGED:
Interface FastEthernet 0/1, changed state to down
00005 2004-11-17 10:57:41  Ruijie: %7:%LINK CHANGED:
Interface  FastEthernet  0/1,  changed  state  to
administratively down
00006 2004-11-17 10:57:43  Ruijie: %7:%LINK CHANGED:
Interface FastEthernet 0/1, changed state to down
```

Syslog logging	enabled, disabled
Console logging	
Monitor logging	VTY

logging

count **show logging count**

show logging

```
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
00006 2004-11-17 10:57:43  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
00004 2004-11-17 10:57:21  Ruijie: %7:%LINK CHANGED:
Interface FastEthernet 0/1, changed state to down
00003 2004-11-17 10:57:18  Ruijie: %7:%LINK CHANGED:
Interface  FastEthernet  0/1,  changed  state  to
administratively down
00002 2004-11-17 10:20:59  Ruijie: %7:%LINE PROTOCOL
CHANGE: Interface FastEthernet 0/0, changed state to UP
00001 2004-11-17 10:20:59  Ruijie: %7:%LINK CHANGED:
Interface FastEthernet 0/0, changed state to up
```

logging on	
clear logging	

show logging

69 POE

POE

- **Poe enable**
- **Poe-power lower lower**
- **Poe-power upper upper**
- **Poe disconnect-mode mode**

69.1

69.1.1 poe enable

no

poe enable

no poe enable

```
Ruijie(config-if)# poe enable
Ruijie(config-if)# no poe enable
```

69.1.2 poe-power lower lower

no

poe-power lower *lower*

no poe-power lower

lower 45-47

POE 46

```
Ruijie# configure
Ruijie(config)# poe-power lower 46
Ruijie(config)# end
Ruijie#
```

69.1.3 poe-power upper upper

no

poe-power upper *upper*

no poe-power upper

upper 55-57

POE 56

```
Ruijie# configure
Ruijie(config)# poe-power upper 56
Ruijie(config)# end
```

69.1.4 poe disconnect-mode mode

no

poe disconnect-mode *mode*

no poe disconnect-mode

mode [ac/dc]

POE dc

```
Ruijie# configure
Ruijie(config)# poe disconnect-mode dc
```

```
Ruijie(config)# end
```

69.2

POE

- **show poe interfaces**
- **show poe powersupply**

69.2.1 show poe interfaces

POE

show poe interfaces *interface-id*

poe

```
Ruijie# show poe interface gigabitethernet 0/2
Interface : Gi0/2
Port power enabled : ENABLE
Port connect status : OFF
Port PD Class : no PD devices
Port max power : 15.4 W
Port current power : 0 W
Port peak power : 0 W
Port current : 0 mA
Port voltage : 48 V
Port trouble cause : normal
```

69.2.2 show poe powersupply

POE

show poe powersupply

```
Ruijie# show poe powersupply
```

```
PSE Total Power :1200.0 W
PSE Total Power Consumption : 0 W
PSE Available Power : 1200.0 W
PSE Peak Value : 0 W
PSE Min Allow Voltage : 45 V
PSE Max Allow Voltage : 57 V
PSE Disconnect Sense Mode : ac
```

- **device-priority**
- **device-descriptionm**
- **show memberm**

70.1.1mdevice-priority

device-priority

memberm	

10 10

8m

Ruijie(config)#m *2 8m*

show member	

70.1.2 device-description

device-description [**member** *member*] *description*

member *member*	ID member 1
description	31

write

2 red-giant

```
Ruijie(config)# device-description member 2 red-giant
```

show member	

70.2

70.2.1 show member

member	ID

```
Ruijie# show member
Member  Mac Address     Priority  Software Version
HardwareVersion  Description
------  --------------  -------  ----------------
1           00d0.f810.3323   1            RGOS  10.1.00(2),
ReleaJ c. 9  Priority  Software Version
HardwareVersion  Description
```