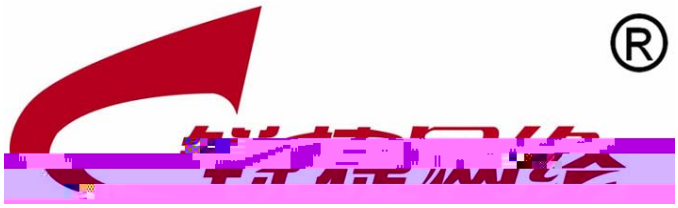

RGOS®10.2(4)

1.

5

Courier New 5

2.

Arial

г

[ ] [ ]

{ x | y | ... }

[x | y | ...]

//

3.

~

- 1)

  2)

CLI

alias

alias

no

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

mode
command-alias
original-command

EXEC

EXEC

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

no alias exec

alias ?

```
Ruijie(config)# alias ?
```

```
aaa-gs              AAA server group mode
acl                  acl configure mode
bgp                  Configure bgp Protocol
config              globle configure mode
                                         *
```

**command-alias=original-command*

```
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	

privilege

privilege **no**

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

mode CLI

[**all**]

level *level* 0-15

reset

command-string

privilege CLI

privilege ? CLI

config	

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

CLI 1 ”test” **reload**

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

1 **1** 67<1j/T64

mode

EXEC

EXEC

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

alias	

CLI

disable
enable
enable password
enable secret
password
login
login local
login authentication
username
lock
lockable
telnet
enable service
ip http authentication
ip http port

disable

disable

disable [*privilege-level*]

privilege-level

disable

```
Ruijie# disable 10
```

enable	

enable

enable

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

~

EXEC

pw10

```
Ruijie(config)# enable password pw10
```

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	

password

line line **password**
no line

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

no password

password line

0|*7* 0 7

encrypted-password

line

line

line red

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

login	

login

AAA

login **no**

login

no login

line

AAA

VTY console

VTY

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

password	line

login local

AAA

login local **no**

login local

no login local

line

AAA

username

VTY

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

username	

login authentication

AAA AAA

no

login authentication {**default**

```
Ruijie#
```

lockable	

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#
```

telnet

telnet EXEC

telnet

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

Host IP

Port TCP 23

Keyword

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

no enable service

enable service ssh-server, SSH Server

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

show service	

ip http authentication

Http Server Web Web **ip http authentication**

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

enable	enable password enable secret 15 enable
local	username 15

Web **no ip http authentication**

ip http authentication local, Web
local
```
Ruijie(Config  # ip http authentication local
```

enable service	

ip http port

HTTP **ip http port**

ip http port *number*

number HTTP Server 80

HTTP **no ip http port**

HTTP 8080
```
Ruijie(Config  # ip http port 8080
```

enable service	

clock set
clock update-calendar
exec-timeout
hostname
session-timeout
show clock
show cpu
show cpu slot
show memory
show memory slot
show running-config
show stD.config
reload
show reload
prompt
banner motd
banner login
speed
show line
write

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			

ụ

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
```

hostname

hostname

hostname *name*

name
63

Ruijie

CHAP

BeiJingAgenda

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

detail

show clock

```
Ruijie# show clock detail
05:54:43 CHN-BJ Wed 2008-01-30
Clock read from calendar when system boot.
```

clock set	

show cpu

CPU

show cpu

CPU

show cpu

```
Ruijie# show cpu
CPU utilization in five seconds: 0%
CPU utilization in one minute  : 35%
CPU utilization in five minutes: 33%
  NO   5Sec   1Min   5Min   Process
  0     0%     0%     0%    LISR INT
  1     0%     0%     0%    HISR INT
  2     0%     0%     0%    ktimer
  3     0%     0%     0%    atimer
  4     0%     0%     0%    printk_task
```

```
 5     0%     0%     0%    waitqueue_process
 6     0%     0%     0%    tasklet_task
 7     0%     0%     0%    kevents
 8     0%     0%     0%    snmpd
 9     0%     0%     0%    snmp_trapd
10     0%     0%     0%    mtdblock
11     0%    35%    33%    gc_task
12     0%     0%     0%    Context
13     0%     0%     0%    kswapd
14     0%     0%     0%    bdflush
15     0%     0%     0%    kupdate
16     0%     0%     0%    buffcopy
17     0%     0%     0%    ll_mt
18     0%     0%     0%    ll main process
19     0%     0%     0%    ISDN MAIN
20     0%     0%     0%    tnet
21     0%     0%     0%    Tarptime
22     0%     0%     0%    gra_arp
23     0%     0%     0%    Ttcptimer
24     0%     0%     0%    gk process
25     0%     0%     0%    rl_con
26   100%    65%    67%    idle
```

show cpu

CPU utilization in five seconds	5 CPU
CPU utilization in one minute	1 CPU
CPU utilization in five minutes	5 CPU
NO	
Process	
5Sec	5 CPU
1Min	1 CPU
5Min	5 CPU

show cpu slot	CPU

show cpu slot

CPU

show cpu slot [*slot-number*]

slot-number CPU

CPU

1 1 CPU

```
Ruijie# show cpu slot 1
CPU utilization for five seconds: 3%
CPU utilization for one minute  : 2%
CPU utilization for five minutes: 1%
```

2 CPU

```
Ruijie# show cpu slot
slot 1 CPU information
 CPU utilization for five seconds: 3%
 CPU utilization for one minute  : 2%
 CPU utilization for five minutes: 1%
slot 3 CPU information
 CPU utilization for five seconds: 5%
 CPU utilization for one minute  : 2%
 CPU utilization for five minutes: 1%
```

show cpu	CPU

show memory

show memory

show memory

```
Ruijie# show memory
Physical Memory: 256M total
 Image: 78M
 Application Memory: 178M (57M used  121M available)
 Utilization: 52.7%
```

show memory

[redacted]	
Physical Memory	
Image	[redacted]

```
  1     1
Ruijie# show memory slot 1
Physical Memory: 256M total
 Image: 45M
 Application Memory: 211M (55M used  156M available)
 Utilization: 39.1%


  2
ruijie# show memory slot
slot 1 memory information
 Physical Memory: 256M total
  Image: 45M
  Application Memory: 211M (55M used
```

show startup-config

NVRAM

show startup-config

show startup-config

NVRAM

startup-config

reload

reload

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

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

10

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

show reload

show reload

show reload

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

prompt

prompt **no prompt**

prompt *string*

string 32

EXEC

RGOS

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

RGOS

banner motd

banner motd

no banner motd

banner motd *c message c*

c

message

```
Ruijie(config)
Ruijie(config)# banner motd
```

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

speed

speed *speed*

no speed

speed *speed*

Speed bps

9600 19200 38400 57600 115200

9600

9600

57600 bps

```
Ruijie(config)#
Ruijie(config)# line console      soe]JTT2 9Tf0 Tc 3 006 0 Td[()Tj/TT6 1 Tf-0.000
```

aux aux

vty vty

line-num line

console

```
Ruijie# show line console 0
CON    Type    speed   Overruns
* 0    CON    9600    45927
Line 0, Location: "", Type: "vt100"
Length: 24 lines, Width: 79 columns
Special Chars: Escape  Disconnect  Activation
            ^^x    none       ^M
Timeouts:     Idle EXEC    Idle Session
            never       never
History is enabled, history size is 10.
Total input: 53564 bytes
Total output:  395756 bytes
Data overflow:  27697 bytes
stop rx interrupt:  0 times
```

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	

LINE

LINE

line

LINE

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

First-line first-line

Last-line last-line

LINE

LINE VTY 1 3 LINE

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

line vty

VTY **no**
VTY

line vty *line-number*
no line vty *line-number*

VTY 5 0--4

VTY

VTY 20 VTY 0--19

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

VTY 10 VTY 0—9

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

transport input

Line

Line

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	

RGOS10.1

access-class

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

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

access-list-number	access-list
in	
out	

Line

Line

Line

access-class

access list **show running**

Line

line vty 0 4 access-list 10

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

show running	

RGOS10.1

copy tftp

tftp tftp

copy flash: *filename* **tftp**:// l*ocation* / *filename*

copy tftp:// l*ocation*/*filename* **flash:** *filename*

filename

TFTP TFTP

: ip 192.168.12. 1
config.bak

ping

traceroute

ping

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

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
```

Traceroute

traceroute

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

IP

202.108.37.42 1 17

4

```
Ruijie# traceroute www.ietf.org

Translating " www.ietf.org "...[OK]
< press Ctrl+C to break >
Tracing the route to 64.170.98.32

1     192.168.217.1   0 msec  0 msec  0 msec
2     10.10.25.1        0 msec  0 msec  0 msec
3     10.10.24.1        0 msec  0 msec  0 msec
4     10.10.30.1        10 msec 0 msec  0 msec
```

aggregate port **show interfaces show**

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

show interfaces	

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

no medium-type

fiber

copper

Ap SVI

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

show interfaces	

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

SFP 10/100/1000M BASE-T

descriptioin

no .

description *string*

no description

string

clear interface	
show interfaces	

no shutdown

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	

duplex

no

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

no duplex

auto

full

half

show interfaces

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

show interfaces	

flowcontrol

no

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

no flowcontrol

clear counters

clear counters [*interface-id*]

interface-id

show interfaces

clear counters

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

show interfaces	

shutdown	

switchport

switchport

2 **no switchport**

3

switchport

no switchport

2

switchport

2 3 2

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

show interfaces	

switchport mode

switch port

access port trunk port, 802.1Q **no**

switchport mode {**access | trunk**}

no switchport mode

access	switch port access port
trunk	switch port trunk port

switch port access

switch port access VLAN
switchport access vlan VLAN

switch port trunk VLAN
VLAN VLAN trunk port
VLAN VLAN **switchport trunk**
VLAN

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

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
```

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

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

Trunk VLAN 1 4094
Trunk VLAN VLAN
Trunk

show interfaces switchport

VLAN 2 1/15

```
Ruijie(config)# interface fastethernet 1/15
Ruijie(config-if)# switchport trunk allowed vlan remove
2
Ruijie(config-if)# end
Ruijie# show interfaces fastethernet1/15 switchport
Switchport is enabled
Mode is trunk port
Acsess vlan is 1,Native vlan is 1
```

```
Protected is disabled
Vlan lists is
1,3-4094
```

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

show interfaces

Aggregate Port

port-group

Aggregate Port no
Aggregate Port

port-group *port-group-number*

no port-group

Aggregate Port

port-group-number	Aggregate Port Aggregate Port

AP VLAN trunk port
native VLAN AP

1/3 AP 3

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

aggregateport load-balance

AP no

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

no aggregateport load-balance

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

MAC 86

29

show aggregateport load-balance

```
Ruijie(config)# aggregateport load-balance dst-mac
```

show aggregateport load-balance	aggregateport

show aggregateport

aggregateport

show aggregateport {[*aggregate-port-number*] **summary** | **load-balance**}

aggregateport load-balance	AP

VLAN

vlan

VLAN no VLAN

vlan *vlan-id*

no vlan *vlan-id*

vlan-id	VLAN ID VLAN VLAN 1

end **Ctrl+C**

exit

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

show vlan	VLAN

name

VLAN **no**

name *vlan-name*

no name

vlan-name	VLAN

VLAN

VLAN

show vlan vlan

```
Ruijie(config)# vlan 10
Ruijie(config-vlan)# name vlan10
```

show vlan	VLAN

switchport mode

switch port

access port trunk port, 802.1Q

switch port access

switch port access VLAN
switchport access vlan VLAN

switch port trunk VLAN
VLAN VLAN trunk port
VLAN VLAN **switchport trunk**
VLAN

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

switchport access	statics accessport VLAN
switchport trunk	trunkport native VLAN Trunk VLAN

switchport access

access port VLAN
no

show vlan

VLAN

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

vlan-id	VLAN ID

switchport access	Vlan

Super-vlan

supervlan

VLAN **supervlan**

supervlan

no supervlan

VLAN

end **Ctrl+C**

no subvlan [*vlan-id-list*]

Vlan-id-list	VLAN subvlan ID, vlan

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

subvlan-address-range

subvlan ip

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

no subvlan-address-range

end

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
```

Protocol VLAN

protocol-vlan ipv4 *addr* **mask** *addr* **vlan** *id*

protocol-vlan profile *num* **frame-type** [*type*] **ether-type** [*type*]

protocol-vlan profile *num* **vlan** *id*

protocol-vlan ipv4 addr mask addr vlan id

mask

IP Q¸

num profile

type

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

show protocol-vlan profile

show protocol-vlan profile *num*

no protocol-vlan profile

no protocol-vlan profile *num*

RGOS10.1

protocol-vlan profile num vlan id

profile

num profile

id VLAN ID 1- VLAN

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

show protocol-vlan profile

show protocol-vlan profile *num*

no protocol-vlan profile

no protocol-vlan profile *num*

RGOS10.1

show protocol-vlan

show protocol-vlan

Protocol VLAN

show vlan protocol-vlan

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

RGOS10.1

PrivateVLAN

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

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

VLAN

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

show vlan private-vlan

RGOS10.1

private-vlan association

secondary VLAN primary VLAN

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

no private-vlan association

svlist secondary VLAN list

no primary VLAN secondary VLAN

Primary VLAN

```
Ruijie(config)# vlan 22
Ruijie(config-vlan)# private-vlan association add 24-26
```

show vlan private-vlan

RGOS10.1

private-vlan mapping

secondary VLAN SVI

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

no private-vlan mapping

svlist secondary VLAN list

no

Primary VLAN

```
Ruijie(config)# interface vlan 22
Ruijie(config-if)# private-vlan mapping add 24-26
```

no: VLAN

show vlan private-vlan

RGOS10.1

show vlan private-vlan

show vlan private-vlan

private VLAN

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

primary	primary VLAN
community	community VLAN
isolated	isolated VLAN

private VLAN

```
Ruijie#
```

switchport mode hybrid

switchport mode hybrid

no switchport mode

hybrid

no hybrid

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

RGOS10.1

switchport hybrid native vlan

switchport hybrid native vlan *vid*

no switchport hybrid native vlan

hybrid vlan

no hybrid VLAN

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

RGOS10.1

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
```

RGOS10.1

802.1Q Tunneling

switchport mode dot1q-tunnel
switchport mode uplink
frame-tag tpid *tpid*
inner-priority-trust enable

switchport mode dot1q-tunnel

802.1Q tunneling

switchport mode dot1q-tunnel
no switchport mode

no 802.1Q tunneling

802.1Q tunneling

```
Ruijie(config)# interface gi 0/1
Ruijie(config-if)# switchport access vlan 22
Ruijie(config-if)# switchport mode dot1q-tunnel
Ruijie(config)# end
```

show vlan private-vlan

RGOS10.1

switchport mode uplink

uplink

switchport mode uplink

no switchport mode

no uplink

uplink

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

show vlan private-vlan

RGOS10.1

frame-tag tpid tpid

tpid

frame-tag tpid <*tpid*>

no frame-tag tpid

no

```
Ruijie(config)# interface g0/3
Ruijie(config-if)# frame-tag tpid 9100
Ruijie(config-if)# end
```

```
Ruijie# show frame-tag tpid
Port    tpid
------  ---------
Gi0/3   0x9100
```

show frame-tag tpid

RGOS10.1

inner-priority-trust enable

/ tag tag

inner-priority-trust enable

no inner-priority-trust enable

no tag tag

```
Ruijie(config)# interface gigabitEthernet 0/2
Ruijie(config-if)# inner-priority-trust enable
```

show inner-priority-trust

RGOS10.1 S37

show frame-tag tpid

show inner-priority-trust

show frame-tag tpid

private VLAN

show frame-tag tpid [**interface <***interface***>**]

<*interface***>**

tpid

```
Ruijie# show frame-tag tpid
Ruijie# show frame-tag tpid interface gi0/1
Port    tpid
-----  ---------
Gi0/1   0x9100
```

RGOS10.1

show inner-priority-trust

show inner-priority-trust

MAC

mac-address-table aging-time
clear mac-address-table dynamic
clear mac-address-table filtering
clear mac-address-table static
mac-address-table static
mac-address-table filtering
mac-address-table notification
snmp trap mac-notification
address-bind
address-bind ip-address
address-bind uplink
address-bind ipv6-mode

mac-address-table aging-time

no

mac-address-table aging-time *seconds*

no mac-address-table aging-time

seconds

300

show mac-address-table aging-time

show mac-address-table dynamic

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

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

clear mac-address-table dynamic

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

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

show mac-address-table dynamic

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

show mac-address-table dynamic	

clear mac-address-table filtering

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

v l a n i l t e r filtering	
address *mac-addr*	
vlan *vlan-id*	VLAN

Ø

show mac-address-table filtering

00d0.f800.0c0c

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

show

mac-address-table static **clear**

mac-address-table static

00d0.f800.073c VLAN 4

show mac-address-table filtering

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

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

mac-address-table notification

MAC **no**

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

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

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

1 50

MAC

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

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

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

address-bind ip-address

address-bind *ip-address mac-address*

no address-bind *ip-address*

intf-id	

IP MAC
IP IP MAC IP
MAC
(address-bind install)

fa 0/1

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

show address-bind uplink	

RGOS10.1

address-bind install

/

address-bind install

no address-bind install

```
Ruijie(config)# address-bind install
```

show address-bind uplink	
show address-bind summary	

RGOS10.1

address-bind ipv6-mode

ip IP

address-bind ipv6-mode compatible

address-bind ipv6-mode loose

address-bind ipv6-mode strict

:

	Ipv4	IPV6
	IPV4+MAC	ipv6
	IPV4+MAC	IPV6
	IPV4+MAC	MAC MAC IPV6

interface *interface-id*	
vlan *vlan-id*	VLAN

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

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

show mac-address-table aging-time

show mac-address-table aging-time

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

mac-address-table aging-time	

show mac-address-table count

show mac-address-table count

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

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

show mac-address-table dynamic

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

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

```
Ruijie# show mac-address-table dynamic
Vlan    MAC Address      Type       Interface
----   ------------    ------   ------------------
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.63c4     DYNAMIC  gigabitethernet 1/1
```

clear mac-address-table dynamic	

show mac-address-table filtering

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

mac-addr	MAC
vlan-id	VLAN

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

show mac-address-table address

```
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

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	

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 address-bind

```
Ruijie# show address-bind
Total Bind Addresses in System : 2
IP Address     Binding MAC Addr
-----------    -----------------
3.3.3.3        00d0.f811.1112
3.3.3.4        00d0.f811.1117
```

address-bind	

show address-bind summary

address-bind install

show address-bind summary

```
Ruijie# show address-bind summary
Total Bind Addresses in System : 0
Max Bind Addresses limit in System : 1000
System Address bind status:SUCCESS
```

address-bind	

show address-bind [**ip-address** *ip* **| mac-address** *mac*]

MAC mac

IP

DHCP Snooping

DHCP snooping

DHCP snooping

ip dhcp snooping

ip dhcp snooping bootp-bind

ip dhcp snooping verify mac-address

ip dhcp snooping binding

ip dhcp snooping database write-delay

ip dhcp snooping database write-to-flash

ip dhcp snooping information option

ip dhcp snooping

DHCP Snooping

no DHCP snooping

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

DHCP snooping **show ip dhcp snooping**
DHCP snooping

DHCP snooping

```
Ruijie# configure terminal
Ruijie(config)# ip dhcp snooping
Ruijie(config)# end
Ruijie# show ip 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
------------------------     -------
FastEthernet0/11             yes
```

show ip dhcp snooping	DHCP snooping

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
Bootp DHCP Snooping

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
------------------------     -------
FastEthernet0/11             yes
```

show ip dhcp snooping	DHCP snooping

ip dhcp snooping verify mac-address

MAC

no MAC

[**no**] **ip dhcp snooping verify mac-address**

MAC DHCP CLIENT

MAC DHCP CLIENT MAC

MAC

DHCP MAC

```
Ruijie# configure terminal
Ruijie(config)# ip dhcp snooping verify mac-address
Ruijie(config)# end
```

```
Ruijie# show ip dhcp snooping

Switch DHCP snooping status   ENABLE
Verification of hwaddr field status   DISABLE
DHCP snooping database write-delay time: 0 seconds
DHCP snooping option 82 status: ENABLE
DHCP snooping Support Bootp bind status: ENABLE
Interface                    Trusted
-------------------------    -------
FastEthernet0/11             yes
```

```
vlan 1 ip 192.168.4.243 interface fastethernet 0/1
Ruijie(config)# end
Ruijie# show ip dhcp snooping binding
Total number of bindings: 1
MacAddress   IpAddress  Lease  Type  VLAN  Interface
-----------------------------------------------------
00d0.f801.0101 192.168.1.1 - static 1 fastethernet 0/1
```

```
DHCP snooping Support Bootp bind status: ENABLE
Interface                    Trusted
-------------------------    -------
FastEthernet0/11             yes
```

show ip dhcp snooping	DHCP snooping

```
DHCP snooping option 82 status: ENABLE
DHCP snooping Support Bootp bind status: ENABLE
Interface                   Trusted
-----------------------     -------
FastEthernet0/11            yes
```

show ip dhcp snooping	DHCP snooping

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
```

DHCP snooping

DHCP snooping

ip dhcp snooping trust

ip dhcp snooping address-bind

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
------------------------    -------
FastEthernet0/11            yes
```

show ip dhcp snooping	DHCP snooping

ip dhcp snooping address-bind

no

[**no**] **ip dhcp snooping address-bind**

DHCP Snooping IP MAC IP VLAN ID

fastethernet 0/1

```
Ruijie# configure terminal
Ruijie(config)# interface fastethernet 0/1
Ruijie(config-if)# ip dhcp snooping address-bind
Ruijie(config-if)# end
```

DHCP snooping

show ip dhcp snooping

show ip dhcp snooping binding

show ip dhcp snooping

DHCP Snooping

show ip dhcp snooping

N Ð ɹ Ø N Ð ɹ ⌟ 9 ˜ ≈

show ip dhcp snooping binding

DHCP Snooping

show ip dhcp snooping binding

DHCP Snooping

```
Ruijie# show ip dhcp snooping binding
Total number of bindings: 1
MacAddress    IpAddress  Lease  Type  VLAN  Interface
------------------------------------------------------
00d0.f801.0101 192.168.1.1 - static 1 fastethernet 0/1
```

ip dhcp snooping binding	DHCP snooping
clear ip dhcp snooping binding	DHCP snooping

DHCP snooping

DHCP Snooping

clear ip dhcp snooping binding

debug ip dhcp snooping

clear ip dhcp snooping binding

DHCP Snooping

clear ip dhcp snooping binding

DHCP snooping

DHCP snooping

```
Ruijie# clear ip dhcp snooping binding
```

```
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

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
```

IGMP Snooping

IGMP Snooping profile

Profile

deny

permit

range

ip igmp profile

ip igmp snooping filter

ip igmp snooping ivgl

ip igmp snooping ivgl-svgl

ip igmp snooping limit-ipmc vlan

ip igmp snooping max-groups

ip igmp snooping source-check default-server

ip igmp snooping source-check port

ip igmp snooping svgl

ip igmp snooping fast-leave enable

ip igmp snooping fast-leave enable

ip igmp snooping vlan mrouter interface

ip igmp snooping vlan mrouter interface profile

ip igmp snooping vlan mrouter learn

ip igmp snooping vlan static

deny

profile profile

deny

deny

deny	profile

profile deny

profile

profile range
profile profile

224.2.2.2 profile :

```
Ruijie(config)# ip igmp profile 1
Ruijie(config-profile)# range 224.2.2.2
Ruijie(config-profile)# deny
```

ip igmp profile	profile
range	

permit

profile profile permit
profile

permit

permit	profile

profile deny

profile

profile range
profile profile

224.2.2.2 profile :

```
Ruijie(config)# ip igmp profile 1
Ruijie(config-profile)# range 224.2.2.2
Ruijie(config-profile)# permit
```

ip igmp profile	profile
range	

range

profile profile range

no

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

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

[low-10(ip-[(si)9(dress]TJ/TT0 1 2189 Tf0 -0..012 0 Td[ ]Tj/C2_0 1 Tf-0.00013.038 0 0 T4C3818D403FT04B38DB116

deny profile profile

224.2.2.2~224.2.2.244 profile :

```
Ruijie(config)# ip igmp profile 1
Ruijie(config-profile)# range 224.2.2.2 224.2.2.244
```

ip igmp profile	profile
deny	profile deny
permit	profile permit

ip igmp profile

profile-number igmp profile

range	profile

ip igmp snooping filter

profile no profile

ip igmp snooping filter *profile-number*

no ip igmp snooping filter *profile-number*

Profile-number profile

profile filter

0/1 profile 1

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

ip igmp profile	profile

ip igmp snooping ivgl

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

disable

VLAN igmp snooping GDA

igmp snooping ivgl lg

igmp snooping ivgl-svgl

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

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

ip igmp snooping limit-ipmc vlan server

IP **ip igmp snooping limit-ipmc vlan** no IP

ip igmp snooping limit-ipmc vlan *vid* **address** *gaddress* **server** *saddress*

ip igmp snooping source-check default-server	IP IP

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 – 4294967294

IGMP Report

0/1 100

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

ip igmp snooping filter	

ip igmp snooping source-check default-server

ip IPMC ip server 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

ip IPMC
IPMC IP
Server IP
Server

ip ip

```
Ruijie(config)# ip igmp snooping source-check default-server 192.168.4.243
```

ip igmp snooping limit-ipmc vlan server	ip

ip igmp snooping source-check port

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

ip igmp snooping source-check port

no ip igmp snooping source-check port

IPMC mroute

igmp snooping

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

ip igmp snooping source-check default-server	ip

ip igmp snooping svgl

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

ip igmp snooping svgl

no ip igmp snooping

disable

svgl svgl

igmp snooping لخ جمع ش

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

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 id

```
Ruijie(config)# ip igmp snooping vlan 1 mrouter interface
fastEthernet 0/1
```

ip igmp snooping source-check port	

ip igmp snooping vlan mrouter interface profile

VLAN

IGMP Profile

vid vlan id

igmp snooping

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

ip igmp snooping vlan *vid* **mrouter learn pim-dvmrp**	

ip igmp snooping dyn-mr-aging-time

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

no ip igmp snooping dyn-mr-aging-time

time

300s

100s

```
Ruijie(config)# ip igmp snooping dyn-mr-aging-time 100
```

ip igmp snooping	

ip igmp snooping vlan static interface

igmp snooping

IGMP **ip igmp snooping vlan static interface** no

ip igmp snooping vlan *vid* **static** *ip-addr* **interface** *interface-id*

no ip igmp snooping vlan *vid* **static** *ip-addr* **interface** *interface-id*

vid vlan id

ip-addr

interface-id id

```
Ruijie(config)# ip igmp snooping vlan 1 static 224.0.0.2
interface fastEthernet 0/1
```

ip igmp snooping vlan mrouter interface	

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

disable

fast-leave IGMP leave

igmp snooping fast-leave

```
Ruijie(config)# ip igmp snooping fast-leave
```

ip igmp snooping suppression enable

igmp snooping suppression **ip igmp snooping suppression enable** no igmp snooping suppression

ip igmp snooping suppression enable

no ip igmp snooping suppression enable

disable

suppression IGMP v1/v2 report

igmp snooping suppression

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

ip igmp snooping query-max-resposne-time

query

ip igmp snooping query-max-resposne-time *time*
no ip igmp snooping query-max-resposne-time

time

10s

query

query

100s

Ruijie(config)# **ip igmp snooping query-max-resposne-time** *100*

debug igmp

igmp no

debug igmp-snp

undebug igmp-snp

EXEC

MSTP

spanning-tree

MSTP MSTP

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

BridgeForwardDelay

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

show spanning-tree STP

spanning-tree mst cost STP PathCost

spanning-tree tx-hold-count STP TxHoldCount

spanning-tree bpdufilter

BPDU filter enabled disabled BPDU filter

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

enabled BPDU filter

Disabled BPDU filter

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

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

enabled *g*

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

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

.

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

show spanning-tree

.

end Ctrl+C

exit

MST

instance *instance-id* v**lan** *vlan-range* Vlan MST Instance
instance-id 0 64 vlan 1 4095 vlan-range
vlan VLAN ID VLAN ID
‘ ’ VLAN ID instance 10 vlan 2,3,6-9
VLAN 2 ƈ

```
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

spanning-tree mst cost

Instance no

spanning-tr

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

spanning-tree mst port-priority

Instance

Instance 20 Gigabitethernet 1/1
10

```
Ruijie(config)# interface gigabitethernet 1/1
Ruijie(config-if)# spanning-tree mst 20 port-priority
0
```

show spanning-tree mst instance interface *interface-id*

show spanning-tree mst

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

show spanning-tree mst instance interface interface-id

show spanning-tree mst	MSTP
spanning-tree mst cost	

3

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

show spanning-tree MSTP

spanning-tree pathcost method

no

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

no spanning-tree pathcost method

long 802.1t path-cost

short 802.1d path-cost

802.1T Path-cost

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

show spanning-tree interface STP

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

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

spanning-tree portfast bpdufilter default

BPDU filter no

spanning-tree portfast default

Portfast no
Portfast

spanning-tree portfast default

no spanning-tree portfast default

Portfast

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

show spanning-tree interface STP

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
```

spanning-tree tc-guard

tc- guard no tc- guard
tc-guard tc

spanning-tree tc-guard

no spanning-tree tc-guard

tc- guard

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

spanning-tree guard root

root guard no r1T0 f -0.0001 Tc 1.987 Td 7<284987D15FB>7<01C4

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

spanning-tree loopguard default

loop guard no loop guard
loop guard bpdu

spanning-tree loopguard default

no spanning-tree loopguard default

loop guard

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

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
```

spanning-tree guard none

guard no guard

spanning-tree guard none

no spanning-tree guard none

guard

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

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

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
```

clear spanning-tree detected-protocols

RSTP BPDU BPDU

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

interface-id

```
Ruijie(config)# clear spanning-tree detected-protocols
```

show spTc 2eaEng(-tree)-6 2eaEntew

show spanning-tree interface

STP

show spanning-tree interface

Instance

.

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

spanning-tree mst configuration

SPAN

monitor session

SPAN .

no

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

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

no monitor session all

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

switch	

switch port routed port 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
```

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

IP

ip address

ip unnumbered

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	

IP
secondary

ip unnumbered

IP IP no

ip unnumbered *interface-type interface-number*

no ip unnumbered *interface-type interface-number*

interface-type	
interface-number	

arp

arp retry

arp trusted

arp unresolved

arp gratuitous-send

arp timeout

ip proxy-arp

service trustedarp

arp

ARP IP MAC

no MAC

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

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

IP

Arp retry times *number*	ARP

arp retry times

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

arp trusted NUM

ARP no

arp trusted *number*

no arp trusted

number	ARP , <10-4096>

ARP ARP
ARP

1000 ARP

```
arp trusted 1000
```

service trustedarp	ARP

arp trusted aging

ARP no

arp trusted aging

no arp trusted aging

GSN ARP

ARP ARP

arp timeout

service trustedarp	ARP

arp unresolve

ARP no
8192

arp unresolve *number*

no arp unresolve

number	ARP < 1-8192 > 8192

ARP 8192

ARP

500

```
arp unresolved 500
```

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
```

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	

ip proxy-arp

ARP **ip proxy-arp**
no ARP

ip proxy-arp

no ip proxy-arp

service trustedarp

```
config
service trustedarp
```

s32

ip broadcast-addresss

ip directed-broadcast

ip broadcast-addresss

ip broadcast-addresss

no

ip broadcast-addresss *ip-address*

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
```

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
```

IP

IP

clear arp-cache

show arp

show arp counter

show arp timeout

clear ip route

show ip arp

show ip interface

clear arp-cache

ARP ARP IP
clear arp-cache

clear arp-cache [*A.B.C.D*] | **interface** *interface-name*]

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

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
incomplete	arp

show arp

```
Ruijie# show arp
Total Numbers of Arp: 7
Protocol  Address         Age(min)  Hardware
Type   Interface
Internet  192.168.195.68    0          0013.20a5.7a5f
arpa   VLAN 1
Internet  192.168.195.67    0          001a.a0b5.378d
```

```
arpa   VLAN 1
Internet  192.168.195.65    0          0018.8b7b.713e
arpa   VLAN 1
Internet  192.168.195.64    0          0018.8b7b.9106
arpa   VLAN 1
Internet  192.168.195.63    0          001a.a0b5.3990
arpa   VLAN 1
Internet  192.168.195.62    0          001a.a0b5.0b25
arpa   VLAN 1
Internet  192.168.195.5     --         00d0.f822.33b1
arpa   VLAN 1
```

ARP

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

show arp 192.168.195.68

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

show arp *192.168.195.0 255.255.255.0*

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

```
VLAN 1
```

show arp *001a.a0b5.378d*

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

show arp counter

ARP Â — wÞή ƒd G™ Äyœ — ‘C„-Þ •³Ş©žÁð hî©ž Q ¬ 0

I

show arp timeout

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

ARP

clear ip route

IP IP

clear ip route

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

*	

network Ŗ ♌ ş . $

show ip arp

ARP

show ip arp

show ip arp

```
Ruijie# show ip arp arp Eg1/6Ö
```

	“-”
Hardware	IP
Type	ARPA
Interface	IP

show ip interface

IP

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

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	

show ip redirects

show ip redirects

show ip redirects

```
Ruijie# show ip redirects
Default Gateway: 192.168.195.1
```

IP

IP

IP

ip mask-reply

ip mtu

ip redirects

ip source-route

ip unreachables

ip mask-reply

RGOS ICMP ICMP
ip mask-reply no ICMP

ip mask-reply

no ip mask-reply

ICMP

ICMP ICMP

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	

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
```

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

ip unreachables

RGOS ICMP **ip unreachables** no ICMP

ip unreachables

no ip unreachables

RGOS
ICMP

RGOS
ICMP

ICMP

FastEthernet 0/1 ICMP

interface fastEthernet 0/1

```
no ip unreachables
```

DHCP

DHCP

DHCP

bootfile

client-identifier

client-name

default-router

dns-server

domain-name

hardware-address

host

ip address dhcp

ip dhcp excluded-address

DHCP

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

DHCP

MAC 00d0.f822.33b4 DHCP

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

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

client-name

DHCP DHCP **client-name**
no DHCP

client-name *client-name*

no client-name

DHCP ASCII

client-name

DHCP

DHCP DHCP
DHCP IP

192.168.12.1

```
default-router 192.168.12.1
```

ip dhcp pool	DHCP DHCP

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

ip-address	DNS IP
ip-address2…ip-address8	8 DNS
use-dhcp-client *interface-type* *interface-number*	RGOS DHCP DNS DHCP DNS

DNS

DHCP

DNS DHCP
DNS DNS

RGOS DHCP DH[(RGO)-8(S)]TJ/C2_0 1 Tf--29.467TJ-24.571

DHCP i-net.com.cn

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

dns-server	DHCP DNS
ip dhcp pool	DHCP DHCP

hardware-address

DHCP DHCP
hardware-address **no**

hardware-address *hardware-address type*

no hardware-address

hardware-address	DHCP MAC
type	DHCP ethernet ieee802 1 10M ethernet 6 IEEE 802

ethernet

DHCP

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

ip address dhcp

PPP HDLC FR DHCP FR Ό ɖ

dns-server	DHCP DNS
ip dhcp pool	DHCP DHCP

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

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

ip dhcp ping packet

DHCP ping
ip dhcp ping packet **no**

ip dhcp ping packet [*number*]

no ip dhcp ping packet

number	0 10 0 ping ping

ping 2

DHCP DHCP IP ping

DHCP Ping
10

ping 3

```
ip dhcp ping packets 3
```

clear ip dhcp conflict	DHCP
ip dhcp ping timeout	DHCP ping ping
show ip dhcp conflict	DHCP

ip dhcp ping timeout

DHCP ping
ip dhcp ping timeout **no**

ip dhcp ping timeout *milli-seconds*
no ip dhcp ping timeout

milli-seconds	DHCP ping 100 10000

500

ping

ping 600ms

```
ip dhcp ping timeout 600
```

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

ip dhcp pool

DHCP DHCP

pool-name	
mypool	1

no lease

days	
hours	
minutes	
infinite	

DHCP

DHCP DHCP

DHCP 1

```
lease 0 1
```

DHCP 1

```
lease 0 0 1
```

ip dhcp pool	DHCP DHCP

no netbios-name-server

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

NetBIOS
0~FF

type

1 b-node
2 p-node
4 m-node
8 h-node

b-node
p-node
m-node
h-node

NetBIOS

DHCP

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

WINS WINS
NetBIOS Hybrid

DHCP NetBIOS

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

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

network DHCP

DHCP DHCP
network **no**

network *net-number net-mask*

no network

net-number	DHCP IP
net-mask	DHCP IP

DHCP

DHCP

DHCP
DHCP

show ip dhcp binding
show ip dhcp conflict

DHCP 192.168.12.0
255.255.255.240

```
network 192.168.12.0 255.255.255.240
```

next-server

DHCP DHCP

next-server **no**

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

no next-server

option

DHCP DHCP **option**
no option

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

no option

code	DHCP
ascii *string*	ASCII
hex *string*	o ` o

ip dhcp pool	DHCP DHCP

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

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

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

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

clear ip dhcp server statistics

DHCP **clear ip dhcp server statistics**

clear ip dhcp server statistics

DHCP DHCP
DHCP **clear ip dhcp server statistics**

DHCP

```
clear ip dhcp server statistics
```

show ip dhcp server statistics	DHCP

debug ip dhcp client

DCg ip d(p c

dhcp

```
debug ip dhcp client
```

debug ip dhcp server

DHCP Server **debug ip dhcp server**

debug ip dhcp server

no debug ip dhcp server

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
```

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
```


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

dhcpd excluded ipaddress
192.168.12.100
```

IP address	DHCP IP
Detection Method	
dhcpd excluded ipaddress	

clear ip dhcp confict	DHCP

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
```

ip helper-address

DHCP no

DHCP

/

dhcp DHCP

vrf

vrf

vrf vrf

vrf

vrf

61.154.26.49 vrf local 192.168.197.1

```
ip helper-address 61.154.26.49
ip helper-address vrf local 192.168.197.1
```

service dhcp	DHCP

ip dhcp relay information option dot1x

dhcp option dot1x no

dhcp option dot1x

DHCP relay 802.1x

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

	˜Ω

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
ip dhcp relay information option dot1x	DHCP option dot1x

ip dhcp relay check server-id

ip dhcp relay check *server-id*

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

Service dhcp	DHCP

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

DNS

ip domain-lookup

DNS no DNS

ip domain-lookup

no ip domain-lookup

DNS

DNS DNS

DNS

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

show hosts	DNS

RGOS10.1

ip name-server

IP

no

ip name-server *ip-address*

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

ip-address	IP

DNS Server IP DNS Server Server Server DNS

6 DNS Server ip-address DNS

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

show hosts	DNS AËUalÿ@BÿM1•Kã3y@ÿM8ãKãh7”ËÿNAR)•f

host-name	
ip-address	IP

no ip host host-name ip-address

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

show hosts	DNS

RGOS10.1

clear host

clear host [*host-name*]

host-name	“*”

1 ip host 2
DNS DNS

-IP

```
clear host *
```

show hosts	

RGOS10.1

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

RGOS10.1

SNTP

sntp enable
sntp server
sntp interval

sntp enable

SNTP **no**
—Disable

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

SNTP Disable

show sntp SNTP

```
RedGiant(config)# sntp enable
```

show sntp	SNTP
clock update-calendar	
clock set	

RGOS10.0

sntp server

SNTP Server

seconds “ ” 60 --65535

1800s

show sntp SNTP

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

show sntp SNTP

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


SNTP Q,

ntp authentication-key

NTP NTP

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

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

key-id	ID
key-string	
enc-type	0 7

md5 key-id
ntp trusted-key key-id

1024

ID 6

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

ntp disable

NTP

ntp disable

NTP

NTP

NTP

~

IP

NTP

```
no ntp
```

ntp server

NTP NTP

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

no ntp server *ip-addr*

ip-addr	NTP IP

version	NTP 1-3 NTPv3
if-name	NTP
keyid	
prefer	Prefer

NTP

20

prefer

NTP
IP NTP

NTP server

```
ntp server 192.168.210.222
```

no ntp	NTP

ntp synchronize

NTP

ntp synchronize

no ntp synchronize

NTP 8

NTP

```
Ntp synchronize
```

ntp server	NTP

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

debug ntp

show ntp status

debug ntp

NTP

debug ntp

no debug ntp

NTP

NTP

```
debug ntp
```

show ntp status

NTP

show ntp status

NTP NTP

NTP

```
show ntp status
```

UDP-Helper

udp-helper enable

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

UDP

udp-helper enable

no udp-helper enable

UDP

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

UDP :

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

ip forward-protocol	UDP

RGOS10.1

ip helper-address

UDP no UDP

ip helper-address *address*

no ip helper-address *address*

	UDP

address 20

ip forward-protocol

UDP **no** UDP

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

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

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

UDP

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

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

SNMP

SNMP

no snmp-server
show snmp
snmp-server chassis-id
snmp-server community
snmp-server contact
snmp-server enable traps
snmp-server host
snmp-server location
snmp-server packetsize
snmp-server queue-length
snmp-server system-shutdown
snmp-server trap-source
snmp-server trap-timeout

no snmp-server

SNMP **no snmp-server**

no snmp-server

SNMP

SNMP

SNMP

SNMP

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

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

snmp-server community

SNMP **snmp-server community** no SNMP

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

no snmp-server community *string*

string NMS SNMP

view-name

ro NMS MIB

rw NMS MIB

number 0-99
MIB NMS

ipaddr NMS MIB NMS

SNMP
MIB NMS

SNMP **no snmp-server**

MIB 192.168.12.1
NMS MIB

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

access-list	

snmp-server contact

SNMP **snmp-server contact** no SNMP

snmp-server contact text

no snmp-server contact

text

SNMP i-net800@i-net.com.cn

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

show snmp-server	SNMP
no snmp-server	SNMP

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 SNMP

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

snmp-server enable traps	

snmp-server location

SNMP **snmp-server location** no SNMP

snmp-server location *text*

no snmp-server location

text

```
Ruijie(config)# snmp-server location net-technology-c
ity 4F of A Buliding
```

snmp-sever contact	SNMP

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

snmp-server queue-length

snmp-server queue-length

snmp-server queue-length *length*

length 1 1000

10

4

4

SNMP

SNMP IP

IP

SNMP

0 IP SNMP

snmp-server enable host	NMS

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 **16**

show snmp user	SNMP

snmp-server group

SNMP **snmp-server group**
no

snmp-server group *groupname* {*v1* | *v2c* | *v3* {*auth* | *noauth* | *priv*}} [**read** *readview*][**write** *writeview*] [**access** {**num** | **name**}]

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

v1 | *v2c* |*v3* SNMP

auth v3

noauth v3

priv v3

readview

writeview

v[illegible]

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

MIB-2 oid 1.3.6.1

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

SNMP

RMON

```
Ruijie(config-if)# rmon collection stats 1 zhansan
```

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

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
```

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

rmon alarm

MIB no

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

no rmon alarm *number*

RGOS
variable interval absolute/delta owner interval rising-threadhold/falling-threadhold event

MIB ifInNUcastPkts.6

```
Ruijie(config)# rmon alarm 10 1.3.6.1.2.1.2.2.1.12.6 30 delta rising-threshold 20 1 falling-threshold 10 1 owner zhangsan
```

rmon event *number* [**log**] [**trap** *community*] [*description-string*]	

rmon event

no

rmon event *number* [**log**] [**trap** *community*] [*description-string*]

no rmon alarm *number*

Ò 02 0 1 2 141 2 1 4 1 F 1 3 [4 - 2 T 1 (Ri config) F 1 4 [6 0 w f mon event1 1 3 [gs) F 1 5 1 1 3 F 1 4 [4 - 6 0 w 4 log tra

```
Octets : 1884085
Pkts : 3096
BroadcastPkts : 161
MulticastPkts : 97
CRCAlignErrors : 0
UndersizePkts : 0
OversizePkts : 1200
Fragments : 0
Jabbers : 0
Collisions : 0
Pkts64Octets : 128
Pkts65to127Octets : 336
Pkts128to255Octets : 229
Pkts256to511Octets : 3
Pkts512to1023Octets : 0
Pkts1024to1518Octets : 1200
Owner : zhangsan
```

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

show rmon history

show rmon history

```
Ruijie#  show rmon history
Entry : 1
Data source : Gi1/1
```

```
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*]	

show rmon event

show rmon event

```
Ruijie#  show rmon event
Alarm : 1
Interval : 1
Variable : 1.3.6.1.2.1.4.2.0
Sample type : absolute
```

```
Last value : 64
Startup alarm : 3
Rising threshold : 10
Falling threshold : 22
Rising event : 0
Falling event : 0
Owner : zhangsan
```

rmon event *number* [**log**] [**trap** *community*] [*description-string*]	

RIP

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**

vpn1 VRF vrf

RIP

```
Ruijie(config)# ip vrf vpn1
Ruijie(config-vrf)# exit
Ruijie(config)# interface FastEthernet 1/0
```

```
Ruijie(config-if)# ip vrf forwarding vpn1
Ruijie(config-if)# ip address 192.168.1.1
255.255.255.0
Ruijie(config)# router rip
Ruijie(config-router)# address-family ipv4 vrf vpn1
Ruijie(config-router)# network 192.168.1.0
Ruijie(config-router)# exit-address-family
```

exit-address-family	
ip vrf	VRF

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
```

version	RIP v1 v2 v1&v2

default-metric (RIP)

RIP **default-metric**

no

default-metric *metric*

no default-metric

metric	1 16 metric 16 RGOS

1

redistribute

RIP

RIP

RIP default-metric

default-metric

default-metric 1

RIP OSPF

RIP 3

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


redistribute

distance

RIP distance
no

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

no distance [*distance ip-address wildcard*]

distance	RIP <1-255>
ip-address	IP
wildcard	IP

120

RIP

RIP
RIP

RIP 160, 192.168.12.1
123

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

```
Ruijie(config)#access-list 10 permit 172.16.0.0
0.0.255.255
```

access-list	
prefix-list	

distribute-list out RIP

distribute-list out no

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

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

access-list-number	
prefix *prefix-list-name*	
interface	( )
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	

exit

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

address-family	

ip rip authentication key-chain

RIP RIP Ã r 3ÒnÂ1 ã Â4Æ Ì$ Ì Ø' %RõÄna

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 receive version	RIP RIP
ip rip send version	RIP RIP
key chain	

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
key chain	

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
```

ip rip send enable	RIP
passive-interface	RIP

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

ip rip send enable

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

ip rip send enable

no ip rip send enable

RIP

RIP

no
default RIP

Fastethernet 0/0 RIP

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

ip rip receive enable	RIP
passive-interface	RIP

ip rip send version

RIP RIP
ip rip receive version no

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

no ip rip send 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 send version 1 2
```

version	RIP

ip rip v2-broadcast

RIP version 2

* rnv212(-bro(dca76(st)]TJ /C2_0 1 Tf -0.0001 Tc 0 Tw 91992 0 Td

no ip split-horizon

IP

X.25

IP

RIP

show ip rip

neighbor RIP

Fastethernet 0/0 RIP

```
Ruijie(config)# interface fastethernet 0/0
Ruijie(config-if)# no ip split-horizon
```

neighbor RIP	RIP IP
validate update source	RIP

ip summary-address rip

RIP **ip summary-address rip** no

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

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

ip-address	IP
ip-network-mask	IP

RIP

ip summary-address rip
RIP

RIPv2
FastEthernet 1/0 172.16.0.0/16

```
Ruijie(config)# interface FastEthernet 1/0
Ruijie(config-if)# ip summary-address rip 172.16.0.0
255.255.0.0
Ruijie(config-if)# ip address 172.16.1.1 255.255.255.0
Ruijie(config)# router rip
Ruijie(config-router)# network 172.16.0.0
Ruijie(config-router)# version ¥,QE_WPÀrLÁBB*Ò28auto-pTJryTcc 0 Tw 7.644 0 Td
```

network (RIP)

RIP

network no

network *network-number*

no network *network-number*

neighbor (RIP)

RIP IP **neighbor** no

neighbor *ip-address*

no neighbor

ip-address	IP

RIPv1 IP 255.255.255.255 RIPv2 224.0.0.9

passive-interface RIP passive

offset-list(RIP)

RIP metric

offset-list no offset

offset-list access-list-number {*in* | *out*} *offset* [*interface-type interface-number]*

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

access-list-number	acl
in	acl metric
out	acl metric
offset	metric
interface-type	acl
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
```

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
```

passive-interface

passive-interface no

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

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

default	passive
interface-type interface-num	

passive

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

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

redistribute RIP

redistribute

no

redistribute {**bgp** | **isis** [*process-name*] |**ospf** }[*process-id*] [**level-1** | **level-1-2** | **level-2**] [**metric** *metric-value*] [**route-map** *route-map-name*]

RIP

OSPF

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

ospf match
ospf match match
no
match

RIP

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

default-metric *metric*	

router rip

RIP
router rip no RIP

router rip

no router rip

RIP

RIP

async default routing

RIP

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

network (RIP)	RIP

timers basic

RIP **timers basic**

no

timers basic *update invalid flush*

no timers basic

update	*update* *invalid* *Flush* 30
invalid	*invalid* *invalid* *invalid* *Invalid* 180
flush	RIP *invalid* *flush* *invalid* *Flush* 120

30 180 120

1Ä

RIP
RIP IP

RIP
validate-update-source

ip unnumbered RIP
validate-update-source

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

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

version (RIP)

RIP **version**
no

version {*1* | *2*}

no version

1	RIP 1
2	RIP 2

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 1
Redistributing:
Default version control: send version 1, receive any
version
Routing for Networks:
Distance: (default is 120)
```

```
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	

show ip rip external

RIP **show ip rip external**

show ip rip external [*bgp* |

```
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	

show ip rip interface

RIP **show ip rip interface**

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

```
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
```

OSPF2

area authentication

OSPF **area authentication**
no OSPF

area *area-id* **authentication** [*message-digest*]
no area *area-id* **authentication** [*message-digest*]

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
```

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

50

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

area stub	OSPF
area nssa	OSPF NSSA

area filter-list

ABR intra-area

area *area-id* **filter-list** [**access** *acl-name*| **prefix** *prefix-name*] [**in** | **out**]

no area *area-id* **filter-list** [**access** *acl-name* | **prefix** *prefix-name*] [**in** | **out**]

area-id	
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
```

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

ABR

advertise not-advertise

OSPF

172.16.16.0/20

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

OSPF2

[[**authentication-key** *key*] | [**message-digest-key** *key-id* **md5** *key*]]

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

area-id	OSPF IP
router-id	show ip ospf
dead-interval *seconds*	40
hello-interval *seconds*	OSPF Hello 10
retransmit-interval *seconds*	OSPF LSA 5
transmit-delay *seconds*	OSPF LSA 1 LSA LSA LSA
authentication-key *key*	OSPF service password-encryption
message-digest-key *key-id* **md5** *key*	OSPF MD5 MD5 service password-encryption
authentication	
message-digest	MD5
null	

dead-interval 40

hello-interval 10

retransmit-interval 5

transmit-delay 1

;

OSPF

ABR ABR
Stub Area NSSA

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

area virtual-link
OSPF **area authentication**

1 2.2.2.2

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

1 1.1.1.1
10 OSPF
MD5

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

area authentication	OSPF

show ip ospf	OSPF

auto-cost

no

show ip ospf	OSPF

clear ip ospf process

OSPF

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

process-id	OSPF OSPF

RFC2328

OSPF

OSPF 1

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

compatible rfc1583

AS

RFC1583 RFC2328

commpatible rfc1583

no commpatible rfc1583

RFC1583

rfc 2328

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

show ip ospf	OSPF

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

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

distance ospf

OSPF

OSPF 160

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

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
```

distribute-list out

redistribute

distribute-list *listname* | **gateway** *plist-name* | **prefix** *plist-name* | **out** [**bgp** | **connected** | **ospf** *process-id* | **rip** | **static**]

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

plism

```
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.
```

ip ospf authentication

```
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

OSPF 100Mbps/Bandwidth Bandwidth bandwidth

OSPF

64K cost 1562

E1 cost 48

10M cost 10

100M cost

ip ospf cost OSPF

Ä serial.j9/0t 100 uiji(cnfig)#( )TjTT40 1 Tf9.5909 0 Td[interfaci)-6e (seralı

, LSA

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

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
```

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

ip ospf message-digest-key

OSPF MD5 ip ospf message-digest-key no OSPF MD5

ip ospf message-digest-key *key-id* **md5** *key*

no ip ospf message-digest-key

Key	16

OSPF **area authentication** , **ip ospf authentication** , .

RGOS MD5 OSPF MD5

OSPF

FastEthernet 0/0 OSPF hello5

```
Ruijie(config)# interface Serial 1/0
Ruijie(config-if)# ip address 172.16.24.2
255.255.255.0
Ruijie(config-if)# ip ospf authentication
message-digest
Ruijie(config-if)# ip ospf message-digest-key 10 md5
hello10
Ruijie(config-if)# ip ospf message-digest-key 5 md5
hello5
```

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

area authentication	OSPF
ip ospf authentication	

no

ip ospf mtu-ignore

no ip ospf mtu-ignore

mtu

OSPF MTU
MTU , MTU
MTU, , MTU

serial 1/0 MTU

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

ip ospf network

OSPF **ip ospf network**
no

ip ospf network *broadcast* *non-broadcast*
point-to-multipoint [*non-broadcast*] *point-to-point*

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

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

PPP SLIP X.25

NBMA X.25

OSPF

FDDI

X.25

HDLC PPP SLIP

OSPF

(NBMA) NBMA

SVC X.25 PVC

OSPF NBMA

Designated Router

NBMA

OSPF

OSPF

, .

X.25 OSPF

X.25 map

Frame-relay map X.25

OSPF X.25

OSPF

X.25 IP

broadcast .

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

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

dialer map ip	IP
frame-relay map	IP DLCI

neighbor OSPF	IP NBMA
X25 map	IP X.25

ip ospf priority

OSPF **ip ospf priority**
no

ip ospf priority *priority*
no ip ospf priority

Priority	OSPF

OSPF hello OSPF
DR/BDR

ip ospf network	OSPF

ip ospf retransmit-interval

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
```

area virtual-link	OSPF

ip ospf transmit delay

OSPF LSU **ip ospf transmit delay** **no**

ip ospf transmit delay *seconds*

no ip ospf transmit delay

Seconds	OSPF LSU 1

1

LSU LSAs Age ip ospf transmit delay Age E ɒ L

max-concurrent-dd

DD

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

<*1-65535*>	DD

172.16.16.0/20

LSA 10 OSPF 10

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

overflow database external

external LSA overflow

overflow database external *max-dbsize wait-time*

no overflow database external

max-dbsize	external lsa AS
wait-time	overflow

max-dbsize -1 *wait-time* 0

external lsa 10 overflow
overflow 3

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

passive-interface

OSPF2

route-map route-map match
OSPF
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
```

Show run :

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

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
```


router-id 0.0.0.36

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


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

timers lsa-group-pacing

LSA

no

timers lsa-group-pacing *seconds*

no timers lsa-group-pacing

seconds	LSA : 10-1800

: 240

spf-delay *spf-holdtime* OSPF
CPU

OSPF 3 9

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

show ip ospf	OSPF

show ip ospf

OSPF show ip ospf

show ip ospf [*process-id*]

process-id	OSPF

OSPF

show ip ospf

```
Ruijie# show ip ospf
Routing Process "ospf 1" with ID 1.1.1.1
Process uptime is 4 minutes
Process bound to VRF default
Conforms to RFC2328, and RFC1583Compatibility flag
isenabled
Supports only single TOS(TOS0) routes
Supports opaque LSA
This router is an ASBR (injecting external routing
information)
SPF schedule delay 5 secs, Hold time between two SPFs
10 secs
LsaGroupPacing: 240 secs
Number of incomming current DD exchange neighbors 0/5
Number of outgoing current DD exchange neighbors 0/5
Number of external LSA 4. Checksum 0x0278E0
Number of opaque AS LSA 0. Checksum 0x000000
Number of non-default external LSA 4
External LSA database is unlimited.
Number of LSA originated 6
Number of LSA received 2
Log Neighbor Adjency Changes : Enabled
Number of areas attached to this router: 1
Area 0 (BACKBONE)
Number of interfaces in this area is 1(1)
Number of fully adjacent neighbors in this area is 1
Area has no authentication
SPF algorithm last executed 00:01:26.640 ago
SPF algorithm executed 4 times
Number of LSA 3. Checksum 0x0204bf
Area 1 (NSSA)
Number of interfaces in this area is 1(1)
Number of fully adjacent neighbors in this area is 0
Number of fully adjacent virtual neighbors through this
area is 0
Area has no authentication
SPF algorithm last executed 02:09:23.040 ago
SPF algorithm executed 4 times
Number of LSA 6. Checksum 0x028638
NSSA Translator State iselected
```

Router ID	
Process uptime	OSPF router-id 0.0.0.0
Bound to VRF	OSPF VRF
Conforms to RFC2328	RFC2328
RFC1583Compatibility flag	RFC1583 RFC2328 ASBR
Support Tos	TOS0
Supports opaque LSA	opaque-LSA
Router Type	OSPF normal ABR ASBR
SPF Delay	SPF
SPF-holdtime	SPF
LsaGroupPacing	LSA
Incomming current DD exchange neighbors	incomming exstart
Outgoing current DD exchange neighbors	outgoing exstart
Number of external LSA	LSA
External LSA Checksum Sum	LSA
Number of opaque LSA	opaque-LSA
Opaque LSA Checksum Sum	opaque-LSA
Number of non-default external LSA	external-LSA
External LSA database limit	external-LSA
Exit database overflow state interval	overflow
Database overflow state	OSPF overflow
Number of LSA originated	LSA
Number of LSA received	LSA

ABR ASBR OSPF

OSPF طمٍ Ůٌ ا i 9 صم Ẋ “ 9

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

Area-id	
adv-router	
link-state-id	OSPF
self-originate	
maxage	LSA
router	OSPF
network	OSPF
summary	OSPF
asbr-summary	ASBR
external	OSPF
nssa-external	OSPF
opaque-area	LSA
opaque-as	LSA
opaque-link	LSA
database-summary	OSPF LSA

OSPF

OSPF

show ip ospf database

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

         Router Link States (Area 0.0.0.0)
```

```
Link ID         ADV Router      Age  Seq#       CkSum
Link count
1.1.1.1       1.1.1.1       2    0x80000011 0x6f39 2
3.3.3.3       3.3.3.3       120  0x80000002 0x26ac 1

         Network Link States (Area 0.0.0.0)

Link ID       ADV Router     Age  Seq#      CkSum
192.88.88.27   1.1.1.1        120  0x80000001 0x5366

         Summary Link States (Area 0.0.0.0)

Link ID         ADV Router      Age  Seq#       CkSum
Route
10.0.0.0       1.1.1.1        2    0x80000003 0x350d
10.0.0.0/24
100.0.0.0      1.1.1.1        2    0x8000000c 0x1ecb
100.0.0.0/16

      Router Link States (Area 0.0.0.1 [NSSA])

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

      Summary Link States (Area 0.0.0.1 [NSSA])

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

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

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

              AS External Link States

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

show ip ospf database

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

ADV Router

OSPF Router with ID	OSPF
AS Summary Link States	AS
LS age	
Options	

LS Type

OSPF Router with ID	OSPF
Type-5 AS External Link States	
LS age	
Options	
LS Type	
Link State ID	
Advertising Router	/AJÒ(ÕT @

```
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: summary-LSA
Link State ID: 10.0.0.0 (summary Network Number)
```

```
Advertising Router: 1.1.1.1
LS Seq Number: 80000004
Checksum: 0x330e
Length: 28
Network Mask: /24
TOS: 0  Metric: 11
```

show ip ospf database summary

OSPF Router with ID	OSPF
Summary Net Link States	
LS age	
Options	
LS Type	
Link State ID	
Advertising Router	

LS Seq Number

```
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	

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

show ip ospf database external

OSPF Router with ID	OSPF
Type-7 AS External Link States	
LS age	
Options	
LS Type	
Link State ID	
Advertising Router	
LS Seq Number	
Checksum	

Length

External Route Tag	32 OSPF OSPF

show ip ospf database database-summary

```
Ruijie# show ip ospf database database-summary

OSPF process 1:

Router Link States      : 4
Network Link States     : 2
Summary Link States     : 4
ASBR-Summary Link States : 0
AS External Link States  : 4
NSSA-external Link States: 2
```

show ip ospf database database-summary

OSPF Process	
Router Link	OSPF LSA
Network Link	OSPF LSA
Summary Link	OSPF LSA
ASBR-Summary Link	OSPFASBR LSA
AS External Link	OSPF LSA
NSSA-external Link	,OSPF NSSA LSA

show ip ospf interface

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
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 aedTm[59.9-6(aer(I-6(aD))6(conf)-7(i)9(g)-6(

show ip ospf neighbor

OSPF **show ip ospf neighbor**

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

detail

```
Link State Request List 0
Link State Retransmission List 0
Crypt Sequence Number is 0
Thread Inactivity Timer on
Thread Database Description Retransmission off
Thread Link State Request Retransmission off
Thread Link State Update Retransmission off
Thread Poll Timer on
```

show ip ospf neighbor

Neighbor ID	
Pri	DR
State	
Dead Time	Dead
Address	
Interface	
interface address	
In the area	
via interface	
Neighbor priority	OSPF
State	OSPF FULL DR BDR DROTHER DR/BDR DR BDR
State changes times	
Dead Time	
DR	DR (Hello DR)
BDR	BDR (Hello BDR)
Options	Hello E 0 STUB STUB
Dead timer due in	

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

show ip ospf route

ospf

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

process-id	OSPF OSPF
count	OSPF

```
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	

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	

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
```

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** *prefix-list-name* [**gateway** *prefix-list-name*]} **in** [*interface-type interface-number*]

access-list-number	
prefix *prefix-list-name*	
gateway *prefix-list-name*	
i*nterface-type interface-number*	( )

OSPF

OSPF

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
```

access-list	
prefix-list	

distribute-list out

distribute-list out **no**

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

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

access-list-number	
prefix *prefix-list-name*	
interface	( )
protocol	( )

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	

default-network

“*”

connected

192.168.100.0

```
ip route 192.168.100.0 255.255.255.0 serial  0/1
ip default-network 192.168.100.0
```

200.200.200.0

200.200.200.0

```
ip default-network 200.200.200.0
```

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

is 1 t658 Td<47213542352534B00D06<02C542 8]TJ0.001 TTc 0Tc 08 0 Tc 62 06.012j/C2_0 1 Tf0-60.1204 1

ف П

```
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
```

ip prefix-list description

ª G Ḱ Ş

descripton-text	

R(config)u

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
```

3

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

OSPF 110
125 OSPF

vrf vrf

1 **show ip route weight**
weight WCMP

weight
WCMP 32
WCMP

ip
route 0.0.0.0 0.0.0.0 Fastethernet 0/0
43E3543C[(sho)1j/0 1 Tf-0 CPU0001 Tc 0.555 0 Td<02C809Cho],¡P0K}Z•w@Q6BM-@!a

show ip route	IP

ip routing

RGOS IP
no IP

ip routing

no ip routing

IP

VOIP
RGOS IP RGOS IP

RGOS IP

```
no ip routing
```

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
```

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

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)

OSPF RIP
IP IP
(IP 201.1.1.0/24

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 interface

match ip address

match ip address **no**

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

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

access-list-number	
access-list-name	

prefix-list *prefix-list-name*

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 10 permit 192.168.100.1
access-list 20 permit 172.16.10.1

route-map redrip permit 10
match ip next-hop 10 20
```

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

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	

p *prefix-list-na*

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

match ipv6 address

IPv6

match ipv6 address **no**

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

no match ipv6 address

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

OSPF RIP RIP

OSPF

IP

route maps

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

OSPF RIP
10 RIP OSPF
type-1 40

```
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	
set metric-type	
set tag	

match ipv6 next-hop

IPv6

match ipv6 address **no**

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

no match ipv6 next-hop

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

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

OSPF RIP RIP
OSPF
IP
route maps

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

OSPF RIP
10 RIP OSPF
type-1 40

```
ipv6 router ospf
redistribute rip subnets route-map redrip

ipv6 access-list v6acl
10 permit ipv6 5200::/64 any

route-map redrip permit 10
match ipv6 route-source v6acl
set metric 50
```

ipv6 access-list	IPv6

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

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

Metric	0-4294967295

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	

match origin

match origin **no**

match origin {**egp** | **igp** | **incomplete**}

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

egp	EGP
igp	IGP
Incomplete	

```
route-map MY_MAP 10 permit
match origin egp
set community 109

route-map MAP20 20 permit
match origin incomplete
set community no-export
```

OSPF

IP

route maps

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

RIP OSPF RIP OSPF

```
router rip
redistribute ospf route-map redrip
network 192.168.12.0

route-map redrip permit 10
match route-type internal
```

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

match tag

match tag **no**

match tag *tag* [*…tag*]

no match tag *tag* [*…tag*]

tag	

match tag tag

OSPF RIP RIP
OSPF
IP

route maps

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

RIP OSPF RIP OSPF
50 80

```
router rip
redistribute ospf 100 route-map redrip
network 192.168.12.0

route-map redrip permit 10
match tag 50 80
```

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

maximum-paths

maximum-paths

no

maximum-paths *number*

no maximum-paths *number*

number	1-32 Ï G5 D,Õ5B ²

show running

config

10

```
maximum-paths 10
no maximum-paths
```

route-map

route-map

no

route-map *route-map-name* [**permit** | **deny**] [*sequence-number*]

no route-map *route-map-name* [**permit** | **deny**] [*sequence-number*]

route-map-name

RGIOS

OSPF RIP RIP
OSPF
IP

route maps

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

1) *sequence-number*
10

2) *sequence-number*

OSPF RIP
4 RIP OSPF type-1
40 40

```
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 metric 4
set metric 40
set metric-type type-1
set tag 40
```

Redistribute	

set aggregator as

match AS

set aggregator as **no**

match metric	
match origin	
set community	COMMUNITY
set metric	
set metric-type	

set as-path prepend

match AS_PATH
set as-path prepend **no**

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

as-number	AS_PATH AS

AS_PATH

as-path 15 as

```
route-map set-as-path
match as-path 1
set as-path prepend 100 101 102
```

match as-path	AS_PATH
match community	

match metric	
match origin	
set community	COMMUNITY
set metric	
set metric-type	

set comm-list delete

match COMMUNITY_LIST community **set comm-list delete** **no**

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

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

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

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

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

set community

match COMMUNITY
set community **no**

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

no set community { *community-number*[*community-number …*] **additive** | **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 as-path	
match community	
match metric	
match origin	
set as-path prepend	
set origin	
set metric-type	

set dampening

set

ampening

half-life) 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	

set extcommunity

match
set extcommunity **no**

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

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

rt	RT
soo	SOO
extend-community-value	

9 Rs Ã $˜ ž 9

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

set ip default next-hop

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

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

ip-address	IP
weight	

set WCMP

(nexthop)

1

set

1 1.1.1.1
6.6.6.6 2.2.2.2
7.7.7.7

```
access-list 1 permit ip 1.1.1.1 0.0.0.0
access-list 2 permit ip 2.2.2.2 0.0.0.0

interface async 1
ip policy route-map equal-access

route-map equal-access permit 10
match ip address 1
set ip default next-hop 6.6.6.6
route-map equal-access permit 20
match ip address 2
set ip default next-hop 7.7.7.7
route-map equal-access permit 30
set default interface null0
```

route-map	
match ip address	

$

set default interface

set ip next-hop

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

set

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

Ï(AÈ â Ð

set ip next-hop verify-availability

?U Û n.BAx ß ÔCQ‡P **set ip next-hop verify-availability** ÄA¹ Q ¸,X **no**

set ip next-hop verify-availability *ip-address* **track** *track-object-nx0jm*ç]TJ/TT1 1 T7-1.439 0 Td()Tj/TT3 1 T

```
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

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* | *internet* | *network* | *priority* | *routine* }

IP IP

set ip precedence

IP

fastEthernet 0/0

192.168.217.68 precedence 4

```
access-list 1 permit 192.168.217.68 0.0.0.0
route-map name
match ip address 1
set ip precedence 4
interface fa0/0
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 tos	IP tos

set ip tos

match IP TOS,

set ip tos **no** tos

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

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

IP TOS IP

IP TOS

fastEthernet 0/0
192.168.217.68 tos 4

```
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

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	

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	

set metric

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

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 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
```


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
```

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 origin

match

set origin **no**

set origin {**egp** | **igp** | **incomplete**}

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

set tag

match **set tag**
no

set tag *tag*

no set tag

tag	

OSPF RIP
100

```
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 tag 100
```

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

set weight

match BGP

set weight **no**

set weight *number*

no set weight

number	0…65535

BGP

neighbor weight

32768

```
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

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
```

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	

```
type 2
E1 - OSPF external type 1, E2 - OSPF external type 2
i - IS-IS, su - IS-IS summary, L1 - IS-IS level-1, L2
- IS-IS level-2
ia - IS-IS inter area, * - candidate default

Gateway of last resort is no set
S    20.0.0.0/8 is directly connected, VLAN 1
S    22.0.0.0/8 [1/0] via 20.0.0.1
O E2 30.0.0.0/8 [110/20] via 192.1.1.1, 00:00:06, VLAN
1
R    40.0.0.0/8 [120/20] via 192.1.1.2, 00:00:23, VLAN
1
B    50.0.0.0/8 [120/0] via 192.1.1.3, 00:00:41
C    192.1.1.0/24 is directly connected, VLAN 1
C    192.1.1.254/32 is local host.
```

show ip route

O	C S R RIP B BGP O OSPF i IS-IS
E2	E1 OSPF E2 OSPF N1 OSPF NSSA 1 N2 OSPF NSSA 2 IA OSPF su IS-IS L1 IS-IS 1 L2 IS-IS 2 ia IS-IS
20.0.0.0/8	
[1/0]	
Via 20.0.0.1	IP
00:00:06	
VLAN 1	

show ip route network

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

show ip route network

Routing Descriptor Blocks	IP

show ip route count

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

show ip route weight

```
Ruijie# show ip route weight
------------[distance/metric/weight]-----------
S    23.0.0.0/8 [1/0/2] via 192.1.1.20
S    172.0.0.0/16 [1/0/4] via 192.0.0.1
```

show ipv6 prefix-list

IPv6 **show ipv6 prefix-list**

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

prefix-name	IPv6

IPv6

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

IGMP ifname

```
Ruijie# clear ip igmp interface eth1
```

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
```

ip igmp join-group

no

ip igmp join-group *group-address*

no ip igmp join-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
```

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	

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
```

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 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
```

ip igmp query-max-response-time

no

ip igmp query-max-response-time *seconds*

no ip igmp query-max-response-time

seconds	s 1 25

10s

IGMPv2

Ethernet 0 20s

```
Ruijie(config-if)# ip igmp query-max-response-time 20
```

Ethernet 0

```
Ruijie(config-if)# no ip igmp query-max-response-time
```

ip igmp query-timeout

no

ip igmp query-timeout *seconds*

no ip igmp query-timeout

seconds	s 60 300

255s

IGMPv2
ip igmp query-interval Ruijie 255s

Ethernet 0 200s

```
Ruijie(config-if)# ip igmp query-timeout 200
```

Ethernet 0

```
Ruijie(config-if)# no ip igmp query-timeout
```

ip igmp robustness-variable

no

ip igmp robustness-variable *number*

no ip igmp robustness-variable

number	2-7

2

3

```
Ruijie# configure terminal
Ruijie(config)# interface ethernet 0
Ruijie(config-if)# ip igmp robustness-variable 3
```

ip igmp version

IGMP

no

ip igmp version {*1* | *2* | *3*}

no ip igmp version

{*1*	*2*	*3*}	<1-3>

2.

igmp igmp

2

```
Ruijie# configure terminal
Ruijie(config)# interface ethernetconfig#
```

IGMP
IGMP

300

```
Ruijie  config  # ip igmp limit 300
```

ip igmp proxy-service

mroute-proxy
mroute-proxy

ip igmp proxy-service

no ip igmp proxy-service

proxy-service

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
```

ip igmp mroute-proxy

ip igmp mroute-proxy *interfname*

no ip igmp mroute-proxy

interfname	

proxy-service

gmp

mroute-proxy

```
Ruijie(config-if)# ip igmp mroute-proxy fa 0/1
```

ip igmp ssm-map enable

igmp ssm-map

ip igmp ssm-map enable

no ip igmp ssm-map enable

ip igmp ssm-map static

igmp ssm-map

```
Ruijie(config)# ip igmp ssm-map enable
```

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.
```

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	

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
```

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
```

PIM-DM

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

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

ip pim neighbor-filter

ip pim neighbor-filter

PIM-DM

Peering

no

ip pim neighbor-filter access-list

no ip pim neighbor-filter access-list

```
Ruijie(config)# interface fastethernet 0/1
Ruijie(config-if)# ip pim hello-interval 123
```

ip pim state-refresh disable

PIM **ip pim state-refresh disable** no PIM-DM

ip pim state-refresh disable

no ip pim state-refresh disable

Hello

Hello

SR Cap

PIM

```
Ruijie# configure terminal
Ruijie(config)# ip pim state-refresh disable
```

~

ip pim state-refresh disable

PIM-DM

---

ip pim state-refresh origination-interval

PIM-DM **ip pim state-refresh origination-interval**

no

ip pim state-refresh origination-interval *interval-seconds*

no ip pim state-refresh origination-interval

interval-seconds	<1-100>

60

```
Ruijie# configure terminal
Ruijie(config)# interface fastethernet 0/1
Ruijie(config-if)# ip pim state-refresh
origination-interval 65
```

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

show ip pim dense-mode neighbor

PIM-DM **show ip pim dense-mode neighbor**

show ip pim dense-mode neighbor [*interface-type interface-number*]

interface-type interface-number	

/ /

show ip pim dense-mode neighbor

Nexthop Interface	
Metric	
Pref	

show ip pim dense-mode mroute

PIM-DM **show ip pim dense-mode mroute**

show ip pim dense-mode mroute [**A.B.C.D** *A.B.C.D*] [*summary*]

A.B.C.D *A.B.C.D*	

summary

PIM-SM

PIM-SM

PIM-SM

clear ip mroute

clear ip mroute statistics

clear ip pim sparse-mode bsr rp-set

ip multicast-routing

ip pim accept-register list

ip pim bsr-candidate

ip pim cisco-register-checksum

ip pim dr-priority

ip pim ignore-rp-set-priority

ip pim jp-timer

ip pim mib

ip pim neighbor-filter

ip pim query-interval

ip pim register-rate-limit

ip pim register-rp-reachability

ip pim register-source

ip pim register-suppression

ip pim rp-address

ip pim rp-candidate

ip pim rp-register-kat

ip pim sparse-mode

ip pim spt-threshold

ip pim ssm

show debugging

show ip pim sparse-mode bsr-router

show ip pim sparse-mode interface

show ip pim sparse-mode local-members

show ip pim sparse-mode mroute

show ip pim sparse-mode neighbor

show ip pim sparse-mode nexthop

show ip pim sparse-mode rp mapping

show ip pim sparse-mode rp-hash

clear ip mroute

clear ip mroute {* | *group_address* [*source_address*] }

*	pimsm
group_address	pimsm
group_address *source_address*	pimsm

*	pimsm
group_address	pimsm
group_address source_address	pimsm

pimsm

```
Ruijie# clear ip mroute statistics *
Ruijie# clear ip mroute statistics 224.2.2.2
Ruijie# clear ip mroute statistics 224.2.2.2 2.2.2.2
```

clear ip pim sparse-mode bsr rp-set

clear ip pim sparse-mode bsr rp-set *

*

pimsmRP4C38>Tj /TT0 1 2 0 61 Tf .630 Td ( )<f -0.000113<

Ruijie#**w 2 Tr -79142 T Tf0 Tcj/TT71 Tf2.604e#**

pimsm

ip pim sparse-mode pimsm

```
Ruijie(config)# ip multicast-routing
```

ip pim accept-register list

ip pim accept-register list *access-list*

access-list	access-list <100 199> <2000 2699> acl

RP

RP

```
Ruijie (config)# ip pim accept-register list 100
Ruijie (config)# access-list 100 permit ip 192.168.195.0
0.0.0.255 225.1.1.1 0.0.0.255
```

access-list

ip pim bsr-candidate

ip pim bsr-candidate *interface-type interface-number*
[*hash-mask-length*][*priority-value*]

ip pim cisco-register-checksum

ip pim cisco-register-checksum [**group-list** *access-list*]

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

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
```

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
```

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
```

ip pim mib

ip pim mib dense-mode

sparse-mode MIB

dense-mode MIB

```
Ruijie# configure terminal
Ruijie(config)# ip pim mib dense-mode
```

ip pim neighbor-filter

ip pim neighbor-filter *access_list*

hello 30s

Hello Hello
Hello Hello 3.5
Hello * 3.5 > 65535 Hello
65535

```
Ruijie# configure terminal
Ruijie(config)# interface g 0/3
Ruijie(config-if)# ip pim query-interval 123
```

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
```

ip pim register-rp-reachability

ip pim register-rp-reachability

RP

RP

```
Ruijie# configure terminal
Ruijie(config)# ip pim register-rp-reachability
```

ip pim register-source

ip pim register-source {*local_address* | *interface-type* interface-number}

local_address	ip
interface-type *interface-number*	ip ip

IP IP

IP

RP

IP Register-Stop

~

PIM-SM

```
Ruijie# configure terminal
Ruijie(config)# ip pim register-source 192.168.195.80
Ruijie(config)# ipv6 pim register-source g 0/3
```

ip pim register-suppression

ip pim register-suppression *seconds*

seconds

rp-address	RP IP
access_list	access-list acl <1-99> <1 300-1999> acl

rp

RP RP BSR

BSR RP

RP ACL
ACL RP

RP IP RP

ACL ACL
224/4

RP RP
RP
IP RP
IP

RP
RP RP

```
Ruijie# configure terminal
Ruijie(config)# ip pim rp-address 210.34.0.55
Ruijie(config)# ip pim rp-address 210.34.0.55 4
Ruijie(config)# access-list 4 permit 225.1.1.1
0.0.0.255
```

access-list

ip pim rp-candidate

ip pim rp-candidate *interface-type interface-number [***priority** *priority-value][***interval** *interval-seconds][***group-list** *access_list]*

interface-type interface-number	
priority-value	<0-255> priority priority-value 192
Interval-seconds	<1-16383> interval interval-seconds interval-seconds 60s
access_list	acl 1-99 acl group-list access_list

RP

PIM-SM RPT RP
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

ip pim rp-register-kat

ip pim rp-register-kat *seconds*

seconds	KAT <1-65535>

```
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

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

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

show debugging

show debugging

/ /

```
Ruijie #show debugging
PIM-SM Debugging status:
PIM packet debugging is on
```

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 secoy9s
Next Cand_RP_advertisement in 00:00:32
```

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
```

show ip pim sparse-mode local-members

show ip pim sparse-mode local-members
[*interface-type interface-number*]

interface-type *interface-number*	

/ /

PIM SM IGMP

```
Ruijie# show ip pim sparse-mode local-members
PIM Local membership information
```

detail	

/

RP

```
Ruijie (config)#sh ip pim sparse-mode rp mapping
PIM Group-to-RP Mappings
Group(s): 224.0.0.0/4
RP: 30.30.200.1
Info source: 30.30.200.1, via bootstrap, priority 192
Uptime: 00:00:51, expires: 00:01:39
RP: 30.30.100.1
Info source: 30.30.200.1, via bootstrap, priority 192
Uptime: 00:19:14, expires: 00:01:38
Group(s): 224.0.0.0/4, Static
RP: 100.100.100.100
Uptime: 00:45:35
```

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
```

clear ip mroute

clear ip mroute statistics

ip mroute

ip multicast route-limit

ip multicast ttl-threshold

ip multicast-routing

ip multicast boundary

ip multicast static

show ip mrout Td[(002 Tc -0.0067 Tw 1.252 0 Td<007A>T7.004.0004 0 61.252 0252 0d( )Tj/TT2 1 T

show ip mroute	
clear ip mroute	

ip mroute

no

ip mroute *source-address mask* [*protocol as-number*] {*rpf-addrress* | *interface-type interface-number*} [*distance*]

no ip mroute *source-address mask* [*protocol as-number*] {*rpf-addrress* | *interface-type interface-number*} [*distance*]

source-address	
mask	
protocol	
rpf-address	
interface-type interface-number	

distance RPF 0

172.30.10.13

```
Ruijie(config)# ip mroute 172.16.0.0 255.255.0.0
172.30.10.13
```

ip multicast route-limit

ip multicast route-limit *limit* [*threshold*]

no ip multicast route-limit *limit* [*threshold*]

limit	1~1024 1024
threshold	1024.

limit 1024

threshold 1024

IPv6

500

```
Ruijie(config)# ip multicast route-limit 500
```

ip multicast ttl-threshold

TTL Time-To-Live **no**

ip multicast ttl-threshold *ttl-value*

no ip multicast ttl-threshold

ttl-value	TTL , 0~255

ttl-value 1

TTL TTL
TTL
TTL 0

TTL 5

```
Ruijie(config-if)# ip multicast ttl-threshold 5
```

ip multicast-routing

no

ip multicast-routing

no ip multicast-routing

IPv4 IPv4

```
Ruijie(config)# ip multicast-rounting
```

/ v4

ip multicast boundary

IP IP **no**

ip multicast boundary *access-list*

no ip multicast boundary *access-list*

access-list	IP access-list ACL

IP IP ACL
ACL ACL ACL

IP IGMP PIMSM

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
```

ip multicast static

no

ip multicast static

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
Incoming interface: FastEthernet 2/1
Outgoing interface list:
FastEthernet 1/3
```

```
Ruijie# show ip mroute 10.10.1.52 224.0.1.3
IP Multicast Routing Table
Flags: I - Immediate Stat, T - Timed Stat, F - Forwarder
installed
Timers: Uptime/Stat Expiry
Interface State: Interface (TTL)
(10.10.1.52, 224.0.1.3), uptime 00:03:24, stat expires
00:01:28
Owner PIM-SM, Flags: TF
Incoming interface: FastEthernet 2/1
Outgoing interface list:
FastEthernet 1/3


Ruijie# show ip mroute count
IP Multicast Statistics
Total 1 routes using 132 bytes memory
Route limit/Route threshold: 2147483647/2147483647
Total NOCACHE/WRONGVIF/WHOLEPKT recv from fwd: 1/0/0
Total NOCACHE/WRONGVIF/WHOLEPKT sent to clients: 1/0/0
Immediate/Timed stat updates sent to clients: 0/0
Reg ACK recv/Reg NACK recv/Reg pkt sent: 0/0/0
Next stats poll: 00:01:10
Forwarding Counts: Pkt count/Byte count, Other Counts:
Wrong If pkts
Fwd msg counts: WRONGVIF/WHOLEPKT recv
Client msg counts: WRONGVIF/WHOLEPKT/Imm Stat/Timed Stat
sent
Reg pkt counts: Reg ACK recv/Reg NACK recv/Reg pkt sent
(10.10.1.52, 224.0.1.3), Forwarding: 2/19456, Other: 0
Fwd msg: 0/0, Client msg: 0/0/0/0, Reg: 0/0/0


Ruijie# show ip mroute summary
IP Multicast Routing Table
Flags: I - Immediate Stat, T - Timed Stat, F - Forwarder
installed
Timers: Uptime/Stat Expiry
Interface State: Interface (TTL)
(10.10.1.52, 224.0.1.3), 00:01:32/00:03:20, PIM-SM,
Flags: T
```

Flags	I- T- F-

Timers:Uptime/Stat Expiry	
Interface State	
Owner	
Incoming interface	
Outgoing interface list	
Forwarding Counts Pkt count/Byte count,	/
Other Counts: Wrong If pkts	

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
```

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
```

IP

IP

debug nsm mcast all

debug nsm mcast fib-msg

debug nsm mcast vif

debug nsm mcast register

debug nsm mcast stats

debug nsm mcast all

no

debug nsm mcast all

```
Ruijie# debug nsm mcast all
```

debug nsm mcast fib-msg

no

debug nsm mcast fib-msg

```
Ruijie# debug nsm mcast fib-msg
```

debug nsm mcast vif

no

debug nsm mcast vif

```
Ruijie# debug nsm mcast vif
```

debug nsm mcast register

no

debug nsm mcast register

```
Ruijie# debug nsm mcast register
```

debug nsm mcast stats

no

debug nsm mcast stats

```
Ruijie# debug nsm mcast stats
```

strom-control

switchport protected

switchport port-security

switchport port-security aging

switchport port-security mac-address

port-security arp-check

strom-control

no

storm-control {**broadcast** | **multicast** | **unicast**} [{**level** *percent* | **pps** *packets* | *rate-bps*}]

no storm-control {**broadcast** | **multicast** | **unicast**} [{**level** ..r8 3420 Td (|)Tj /TT2 1 Tf 0.0030 Tc 0 Tw

3

show interfaces

```
Ruijie(config)# interface gigabitethernet 1/1
Ruijie(config-if)# switchport protected
```

show interfaces	

S32 S37 acl

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	

switchport port-security aging

no

switchport port-security aging {**static** | **time time** }

no switchport port-security aging {**static** | **time }**

Static	
time time	0 1440 0

no switchport port-security aging time **no switchport port-security aging static**

show port-security

```
Ruijie(config)# interface gigabitethernet 1/1
Ruijie(config-if)# switchport port-security aging time 8
Ruijie(config-if)# switchport port-security aging static
```

IP MAC

Arp-check

Arp arp

```
Ruijie(config-if)# arp-check
```

show port-security	

show storm-control

show port-security

show storm-control

show storm-control [*interface-id*]

interface-id	

```
Ruijie# show storm-control gigabitethernet 1/1
Interface Broadcast Control Multicast Control Unicast
Control
------------------------------------ ---------------
```

```
Gi1/1 Disabled Disabled Disabled
```

storm-control	

show port-security

show port-security [**address**] [**interface** *interface-id*]

address	
interface *interface-id*	

switchport port-security mac-address	

802.1X

dot1x

dot1x

dot1x auto-req

dot1x auto-req packet-num

dot1x auto-req req-interval

dot1x auto-req user-detect

dot1x auto-req

802.1X **dot1x auto-req**
no

[**no**] **dot1x auto-req**

802.1x **show dot1x auto-req**

802.1x

```
Ruijie# configure terminal
Ruijie(config)# dot1x auto-req
Ruijie(config)# end
Ruijie# show dot1x auto-req
Ruijie(config)# dot1x auto-req
Auto-Req: Enabled
User-Detect : Enabled
```

```
Packet-Num  : 0
Req-Interval: 30 Second
```

show dot1x auto-req	

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	

dot1x auto-req req-interval

no

dot1x auto-req req-interval *interval*

no dot1x auto-req req-interval

interval s

30

show dot1x auto-req

802.1x 60s

```
Ruijie# configure terminal
Ruijie(config)# dot1x auto-req req-interval 60
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	

dot1x auto-req user-detect

no

dot1x auto-req user-detect

no dot1x auto-req user-detect

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	

dot1x

dot1x

dot1x timeout quiet-period

dot1x timeout re-authperiod

dot1x timeout server-timeout

dot1x timeout supp-timeout

dot1x timeout tx-period

dot1x timeout quiet-period

no

dot1x timeout quiet-period *seconds*

no dot1x timeout quiet-period

seconds

0 65535 s

10

show dot1x

1000s

```
Ruijie# configure terminal
Ruijie(config)# dot1x timeout quiet-period 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:     3600 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
```

```
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

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 dot05[5 ref154.925gf1.527T4 1 70.0061DB2CDF24 0 Td<0A510ref12/TT0 1 1f0 Tc2 Tw 0 ion x d

show dot1x 802.1x

```
Ruijie# configure terminal
Ruijie(config)# dot1x re-authentication
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:        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 802.1x .42 18.84 ef443.

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
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:   Disabled
Re-[Tpol
Authorization
```

show dot1x	802.1x

dot1x

dot1x probe-timer

dot1x client-probe enable

dot1x probe-timer

.

dot1x probe-timer{**interval** | **alive**}*interval*

no dot1x probe-timer

no

Show dot1x probe-timer	

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
```

AAA dot1x

group radius

```
Ruijie# configure terminal
Ruijie(config)# aaa new-model
Ruijie(config)# aaa authentication dot1x default group
radius
Ruijie(config)# interface fastEthernet0/1
```

```
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

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)# end
Ruijie#
```

show dot1x	802.1x

dot1x default

802.1x

dot1x default

show dot1x 802.1x

802.1x

```
Ruijie# configure terminal
Ruijie(config)# dot1x default
Ruijie(config)# end
Ruijie# end
```

show dot1x	802.1x

dot1x dynamic-vlan enable

vlan **no**

dot1x dynamic-vlan enable

no dot1x dynamic-vlan enable

show dot1x dynamic-vlan 802.1x

802.1x vlan

show dot1x	802.1x

dot1x private-supplicant-only

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	

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

dot1x port-control-mode

802.1x MAC

mac-based

show dot1x port-control 802.1x

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#
```

show dot1x port-control	802.1x

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#
```

yrV[illegible]2Q/QS[illegible]zrT

```
Ruijie# show dot1x
802.1X Status:       Enabled
Authentication Mode:  EAP-MD5
Authed User Number:   0
Re-authen Enabled:    Disabled
Re-authen Period:     3600 sec
Quiet Timer Period:   10 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
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	

show dot1x auth-address-table

802.1X

show dot1x auth-address-table[*addressmac-addr*][*interface interface*]

mac-addr

interface

```
Ruijie# show dot1x auth-address-table
interface:g3/1
----------------------------------
mac addr: 00D0.F800.0001
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	

show dot1x auto-req

802.1x

show dot1x auto-req

```
Ruijie# show dot1x auto-req

Auto-Req: Disabled
User-Detect : Enabled
Packet-Num  : 0
Req-Interval: 30 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	

show dot1x private-supplicant-only

show dot1x private-supplicant-only

```
Ruijie# show dot1x private-supplicant-only
private-supplicant-only:: disabled
Ruijie#
```

dot1x auth-mode	802.1x
dot1x max-req	
dot1x port-control auto	
dot1x reauth-max	

dot1x re-authentication

dot1x reauth-max	

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	

show dot1x probe-timer

show dot1x probe-timer

```
Ruijie# show dot1x probe-timer
```

```
Hello Interval: 20 Seconds
Hello Alive: 250 Seconds
Ruijie#
```

802.1X

```
Ruijie# show dot1x summary
ID    MAC       Interface VLAN Auth-State
Backend-State Port-Status Type42>Tj/Tif.2003 Tm<284D1D171FF51405I/1FF5  LAN   L
```

id show summary id

```
Ruijie# show dot1x user id 1

User name: caikov
id: 1
Type: static
Mac address is 0013.2049.8272
Vlan id is 217
Access from port Gi0/13
User ip address is 192.168.217.64
Max user number on this port is 6000
COS on this port is 5
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#
```

dot1x auth-mode	802.1x
dot1x max-req	
dot1x port-control auto	

dot1x re-authentication	
dot1x timeout quiet-period	
dot1x timeout re-authperiod	
dot1x timeout server-timeout	
dot1x timeout supp-timeout	
dot1x timeout tx-period	

show dot1x timeout

802.1X

show dot1x timeout quiet-period

show dot1x timeout re-authperiod

show dot1x timeout server-timeout

show dot1x timeout supp-timeout

show dot1x timeout tx-period

```
Ruijie# show dot1x timeout quiet-period
quiet-period: 60 sec
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	

AAA

aaa authentication dot1x

aaa authentication enable

aaa authentication login

aaa authentication ppp

login authentication

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	

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 authentication enable

method 4

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

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

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

aaa authorization commands

aaa authorization config-commands

aaa authorization console

aaa authorization exec

aaa authorization network

authorization commands

authorization exec

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

aaa authorization console

AAA

aaa authorization console **no** AAA

aaa authorization console

no aaa authorization console

```
Ruijie(config)# aaa authorization console
```


RADIUS Exec

```
Ruijie(config)# aaa authorization exec default group
radius
```


aaa new-model

RADIUS
RADIUS RADIUS RADIUS
RADIUS

RADIUS

```
Ruijie(config)# aaa authorization network default group
radius
```

aaa new-model	AAA
aaa accounting	AAA
aaa authentication	AAA
username	

authorization commands

authorization commands **no**

authorization commands *level* {**default** | *list-name*}

no authorization commands *level*

level 0~15

default

list-name

AAA

cmd 15
TACACS+ none
VTY 0 – 4

```
Ruijie(config)# aaa authorization commands 15 cmd group
tacacs+ none
Ruijie(config)# line vty 0 4
Ruijie(config-line)# authorization commands 15 cmd
```

aaa new-model	AAA
aaa authorization commands	AAA

authorization exec

Exec
authorization exec **no** Exec

authorization exec {**default** | *list-name*}

no authorization exec

default Exec

list-name Exec

AAA Exec

Exec

Exec

Exec

Exec

exec-1 Exec RADIUS

none VTY 0 –

4

```
Ruijie(config)# aaa authorization exec exec-1 group
radius none
Ruijie(config)# line vty 0 4
Ruijie(config-line)# authorization exec exec-1
```

aaa new-model	AAA
aaa authorization commands	AAA Exec

RADIUS

aaa accounting commands

aaa accounting exec

aaa accounting network

aaa accounting update

aaa accounting update periodic

accounting commands

accounting exec

aaa accounting commands

NAS

aaa accounting commands **no**

aaa accounting commands *level* {**default** | *list-name*} **start-stop** *method1* [*method2*...]

no aaa accounting commands *level* {**default** | *list-name*}

level 0~15

default

list-name

method 4

none	
group	TACACS+

aaa accounting exec

NAS

aaa accounting exec **no** Exec

aaa accounting exec {**default** | *list-name*} **start-stop** *method1* [*method2*...]

no aaa accounting exec {**default** | *list-name*}

default Exec

list-name Exec

method 4

none	
group	RADIUS TACACS+

Exec

none Exec

NAS CLI

Start Stop

Start

Stop

Exec

RADIUS NAS

```
Ruijie(config)# aaa accounting exec default start-stop
```

group radius

```
Ruijie(config)# aaa accounting network default
start-stop group radius
```

C1 704..8 151.5 1.26

aaa new-model	AAA
aaa accounting network	

aaa accounting update periodic

aaa accounting update periodic **no**

aaa accounting update periodic *interval*

no aaa accounting update periodic

interval 1

5 minutes

AAA AAA

1

```
Ruijie(config)# aaa new-model
Ruijie(config)# aaa accounting update
Ruijie(config)# aaa accounting update periodic 1
```

aaa new-model	AAA
aaa accounting network	

accounting commands

accounting commands **no**

accounting commands *level* {**default** | *list-name*}

no accounting commands *level*

level 0~15

default

list-name

cmd 15

TACACS+ none

VTY 0 – 4

```
Ruijie(config)# aaa accounting commands
```

aaa new-model AAA	
aaa accounting commands AAA	

Exec

accounting no Exec

accounting exec {**default** | *list-name*}

no accounting exec

default Exec

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

AAA

AAA

aaa domain

aaa domain enable

access-limit

accounting network

authentication dot1x

authorization network

state

show aaa domain

username-format

aaa domain

no

aaa domain {**default** | *domain-name*}

no aaa domain {**default** | *domain-name*}

default

domain-name

AAA default

domain-name

32

```
Ruijie(config)# aaa domain ruijie.com
Ruijie(config-aaa-domain)#
```

aaa new-model	AAA
aaa domain enable	AAA
show aaa domain	

aaa domain enable

AAA

AAA **no**

aaa domain enable

no aaa domain enable

AAA

AAA

AAA

```
Ruijie(config)# aaa domain enable
```

num IEEE802.1x

ruijie.com 20

```
Ruijie(config)# aaa domain ruijie.com
Ruijie(config-aaa-domain)# access-limit 20
```

aaa new-model	AAA
aaa domain enable	AAA
show aaa domain	

accounting network

Network **no**

accounting network {**default |** *list-name*}

no accounting network

default

list-name

default

aaa new-model	AAA
aaa domain enable	AAA
show aaa domain	

authorization network

Network **no**

authorization network {**default** | *list-name*}

no authorization network

default

list-name

default

```
Ruijie(config)# aaa domain ruijie.com
Ruijie(config-aaa-domain)# authorization network
default
```

aaa new-model	AAA
aaa domain enable	AAA
show aaa domain	

state

no

state {**block** | **active**}

no state

active

block

```
Ruijie(config)# aaa domain ruijie.com
Ruijie(config-aaa-domain)# state block
```

aaa new-model	AAA
aaa domain enable	AAA
show aaa domain	

show aaa domain

show aaa domain [**default** | *domain-name*]

default

domain-name

AAA

```
Ruijie(config)# aaa domain ruijie.com
Ruijie(config-aaa-domain)# username-domain
without-domain
```

aaa new-model	AAA
aaa domain enable	AAA
show aaa domain	

AAA

aaa group server

ip vrf forwarding

server

show aaa group

aaa group server

AAA **no**

aaa group server {**radius** | **tacacs+**} *name*

no aaa group server {**radius** | **tacacs+**} *name*

name “ radius ” “ tacacs+ ”
RADIUS TACACS+

AAA RADIUS TACACS+

```
Ruijie(config)# aaa group server radius ss
```

aaa group server	aaa
show aaa group	aaa

server

AAA **no**

aaa group server	aaa
show aaa group	aaa

show aaa group

AAA

show aaa group

AAA

```
Ruijie# show aaa group
Group Name:  ss
Group Type:  radius
Referred:    2
Server List:
IP Address: 192.168.217.64
Authentication Port: 1812
Accounting Port: 1813
Referred:  1
```

aaa group server	AAA

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

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

aaa local authentication lockout-time

login

aaa local authentication lockout-time *lockout-time*

lockout-time 1~2147483647

15

login

```
Ruijie# configure terminal
Ruijie(config)# aaa local authentication lockout-time
5
```

show running-config	
show aaa lockout	login

aaa new-model

AAA **aaa new-model**
AAA **no** AAA

aaa new-model

no aaa new-model

AAA

AAA AAA
aaa new-model AAA AAA AAA

AAA

```
Ruijie(config)# aaa new-model
```

aaa authentication	
aaa authorization	
aaa accounting	

clear aaa local user lockout

clear aaa local user lockout {**all** | **user-name** <*word*>}

<*word*> ID

```
Ruijie# clear aaa local user lockout all
```

show running-config	
show aaa lockout	login

```
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	

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

RADIUS

RADIUS

ip raius source-interface
radius-server host
radius-server key
radius-server retransmit
radius-server timeout
radius-server dead-time
radius attribute
radius set qos cos
radius vendor-specific extend

ip radius source-interface

radius **ip radius source-interface** **no** RADIUS

ip radius source-interface *interface*
no radius source-interface

Interface radius

radius

radius nas
radius ip
radius

RADIUS

```
Ruijie(config)# radius-server host 192.168.12.1
```

aaa authentication	AAA
radius-server key	RADIUS
radius-server retransmit	RADIUS
radius-server timeout	RADIUS

radius-server key

RADIUS
radius-server key no

radius-server key *text-string*
no radius-server key

text-string

RADIUS
RADIUS RADIUS

RADIUS aaa

```
Ruijie(config)# radius-server key aaa
```


radius-server host	RADIUS
radius-server retransmit	RADIUS
radius-server timeout	RADIUS

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 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

radius-server deadtime

t

t deadtime RGOS RADIUS

radius-server deadtime

no

radius-server deadtime *minnutes*

no

minnutes 1-1000

5

10

```
Ruijie(config)# radius-server deadtime 10
```

radius-server host	RADIUS

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	16
17	version to server	17
18	flux-max-high32	18
19	flux-max-low32	

7	user name	7
8	password	8
9	file-diractory	9
10	file-count	10
11	file-name-0	11
12	file-name-1	12
13	file-name-2	13
14	file-name-3	14
15	file-name-4	15
16	max up-rate	75
17	version to server	17
18	flux-max-high32	18
19	flux-max-low32	19
20	proxy-avoid	20
21	dailup-avoid	21
22	ip privilige	22
23	login privilige	42
24	limit to user number	50

max up-rate 211

```
Ruijie(config)# radius attribute 16 vendor-type 211
```

radius set qos cos	radius qos cos

À ~x9bD7 ïÂ—%•X0 •l rP —%y" %BtF—Y"él96Åœç*ƒ*‘C–7 nü)qWõ*ƒ* L #*ƒ*•q#*ƒ*–'–` Jmn lÂ ð0 • “ y0 @')€G!’B

[redacted]

[redacted]

id

```
Ruijie(config)# radius vendor-specific extend
```

radius attribute	
radius set	qos cos

RADIUS

debug radius [**event | detail**]
show radius server
show radius parameter
show radius vendor-specific

debug radius

RADIUS no RADIUS

debug radius [**event | detail**]
no debug radius [**event | detail**]

EXEC

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

show radius parameter

RADIUS

show radius parameter

radius

```
Ruijie# show radius parameter
Server Timout:   5 Seconds
Server Deadtime: 5 Minutes
Server Retries:  3
Server Key:      ******
```

radius-server host	RADIUS
radius-server retransmit	RADIUS
radius-server key	RADIUS
radius-server timeout	RADIUS

show radius vendor-specific

RADIUS

show radius vendor-specific

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

server	TACACS+ server
ip vrf forwarding	TACACS+ VRF

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

ip tacacs source-interface

TACACS+

ip tacacs source-interface *interface*

no ip tacacs source-interface

Interface TACACS+

TACACS+

TACACS+ nas
TACACS+ ip
TACACS+

TACACS+ fastEthernet 0/0 ip
TACACS+

```
Ruijie(config)# ip tacacs source-interface fastEthernet 0/0
```

port *integer* TACACS+ TCP
timeout *integer* TACACS+
key *string* TACACS+ client

TACACS+

TACACS+ AAA TACACS+
tacacs-server TACACS+

TACACS+

```
Ruijie(config)# tacacs-server host 192.168.12.1
```

aaa authentication	AAA
tacacs-server key	TACACS+
tacacs-server timeout	TACACS+

tacacs-server key

TACACS+

tacacs-server key [**0** | **7**] *string*
no tacacs-server key

string

0 |

TACACS+

TACACS+

```
Ruijie(config)# tacacs-server timeout  10
```

tacacs-server host	TACACS+
tacacs-server key	TACACS+

:

TACACS+ /

debug tacacs+

show tacacs

debug tacacs+

TACACS+ no TACACS+

debug tacacs+

no debug tacacs+

EXEC

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+

SSH

SSH

~

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

RGOS10.1

crypto key zeroize

SSH

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

2

Ruijie# **configure terminal**
Ruijie(config)# **ip ssh version** *2*

show ip ssh	SSH Server

RGOS10.1 Ḱ

show ip ssh	ssh-server

RGOS10.1

ip ssh authentication-retries

SSH Server no

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

retry times	

3 **no ip ssh authentication-retries**

SSH Server SSH Server **show ip ssh** SSH Server

2

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

show ip ssh	SSH Server

RGOS10.1

Ip ssh authentication-retries retry times	SSH Server

RGOS10.1

show ssh

SSH

show ssh

SSH VTY
SSH

Ruijie# **show ssh**

RGOS10.1

show crypto key mypubkey

SSH Server

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

rsa	RSA
dsa	DSA

Ş˜ ⸗ Ọ Θ ⸗

SSH SSH
VTY SSH SSH

Ruijie# **disconnect ssh** *1*
Ruijie# **disconnect ssh vty** *1*

show ssh	SSH
Clear line vty *line_number*	VTY

RGOS10.1

GSN

security gsn enable
security community
snmp-server host
scurity event interval

security address-bind enable

security gsn enable

GSN no

security gsn enable
no security gsn enable

GSN GSN

```
Ruijie# configure terminal
Ruijie(config)# security gsn enable
```

RGOS10.1

security community

smp

security { [**v1 | v2**] **community** *community* | **v3 user** *username* }
no security { [**v1 | v2**] **community** *community* | **v3 user** *username* }

community

no smp-server host

ip-address smp server ip

smp server

show smp-server

```
Ruijie(config)#smp-server host 192.168.4.243
```

show smp-server	smp server

RGOS10.1

security event inteval

security event inteval *interval*
no security event inteval

interval

```
Ruijie(config)# security event interval 10
```

show security event interval	

RGOS10.1

security address-bind enable

security address-bind enable

no security address-bind enable

AP AP

GSN

```
Ruijie(config-if)# security address-bind enable
```

security gsn enable	GSN

RGOS10.1

:

show smp-server

show security event interval

show smp-server

smp server IP

smp server IP

```
Ruijie# show smp-server
SMP-Server IP  192.168.20.30
```

smp-server host	smp server ip

RGOS10.1

show security evnet interval

```
Ruijie# show security event interval
Event sending interval(Seconds):5
```

security event interval *interval*	

RGOS10.1

DAI

VLAN DAI

ip arp inspection vlan

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

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

ARP

ip arp inspection limit-rate

ip arp inspection limit-rate limit-rate

ARP **ip arp inspection limit-rate** **no**

ip arp inspection limit-rate {*limit-rate* **| none** }
no ip arp inspection limit-rate

none	
limit-rate	1 2048

15 ARP /
0

DAI
(Network Foundation Protection Policy)

VLAN 2 gigabitEthernet 0/2
10 ARP /

```
Ruijie(config)# ip arp inspection
Ruijie(config)# interface gigabitEthernet 0/2
Ruijie(config-if)# ip arp inspection limit-rate 10
```

DHCP Snooping

VLAN DAI ARP
ARP

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	
precedence precedence	0-7

time-range tm-rng-name	tm-rng-name
tos tos	0-15
cos cos	cos (0-7)
cos inner cos	tag cos
icmp-type	ICMP 0-255
icmp-code	ICMP 0-255
icmp-message	ICMP
operator port[port]	Operator lt- eq- gt- neq- range- port
src-mac-addr	
dst-mac-addr	
VID vid	vlan id
VID inner vid	tag vid
ethernet-type	0x
match-all tcpf	tcp flag
text	
in	
out	
{rule mask offset}+	rule mask offset “+”

AA AA AA AA AA AA BB BB BB BB BB BB CC CC DD DD
DD DD EE FF GG HH HH HH II II JJ KK LL LL MM MM
NN NN OO PP QQ QQ RR RR RR RR SS SS SS SS TT TT
UU UU VV VV VV VV WW WW WW WW XY ZZ aa aa bb bb

A	MAC	0	O	TTL	34
B	MAC	6	P		35
C		12	Q	IP	36
D	VLAN tag	14	R	ip	38

E	DSAP( )	18	S	ip	42
F	SSAP( )	19	T	TCP	46
G	Ctrl	20	U	TCP	48
H	Org Code	21	V		50

I f 5 50

ipv6 traffic-filter

access-list

no

1) 1 IP 1 - 99 1300 - 1999

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

2) IP 100 - 199 2000 - 2699

access-list *id* {**deny** | **permit**} **protocol** {*source source-wildcard* | **host** *source* | **any**} {*destination destination-wildcard* | **host** *destination* | **any**} [**precedence** *precedence*] [**tos** *tos*] [**fragments**] [**time-range** *time-range-name*]

3) MAC 700 - 799

access-list *id* {**deny** | **permit**} {**any** | **host** *source-mac-address*} {**any** | **host** *destination-mac-address*} [*ethernet-type*][**cos** [*out*][**inner** *in*]]

4) Expert 2700 - 2899

access-list *id* {**deny** | **permit**} [**protocol** | [*ethernet-type*][**cos** [*out*][**inner** *in*]]] [**VID** [*out*][**inner** *in*]] {*source source-wildcard* | **host** *source* | **any**} {**host** *source-mac-address* | **any**} {*destination destination-wildcard* | **host** *destination* | **any**} {**host** *destination-mac-address* | **any**}][**precedence** *precedence*] [**tos** *tos*] [**fragments**] [**time-range** *time-range-name*]

Ethernet-type cos

access-list *id* {**deny** | **permit**} {*ethernet-type*| **cos** [*out*][**inner** *in*]} [**VID** [*out*][**inner** *in*]] {**s***ource source-wildcard* | **host** *source* | **any**} {**host** *source-mac-address* | **any** } {*destination destination-wildcard* | **host** *destination* | **any**} {**host** *destination-mac-address* | **any**} [**time-range** *time-range-name*]

Protocol

access-list *id* {**deny** | **permit**} **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)

access-list *id* {**deny** | **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)

access-list *id* {**deny** | **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)

access-list *id* {**deny** | **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)

access-list *list-remark text*

id 1-99 100-199 1300-1999 2000-2699 2700 – 2899 700 - 799

deny

permit

source

source-wildcard 0.255.0.32

protocol IP EIGRP GRE IPINIP IGMP NOS OSPF ICMP ꞓ ¡ & 7

precedence 0-7

time-range

time-range-name

tos

tos 0-15

icmp-type ICMP 0-255

icmp-code ICMP 0-255

icmp-message ICMP

operator lt- eq- gt- neq- range-

port [*port*] *range*

host *source-mac-address*

host *destination-mac-address*

VID *vid* vid

ethernet-type

match-all *tcp flag*

tcp-flag tcp flag

ACL

access-list

IP 1-99 1300-1999

IP 100-199 2000-2699

MAC 700-799 MAC

syn

fin

critical

flash

flash-override

immediate

internet

network

priority

routine

max-reliability

max-throughput

min-delay

min-monetary-cost

normal

ICMP

administratively-prohibited

dod-host-prohibited

dod-net-prohibited

echo

echo-reply

fragment-time-exceeded

general-parameter-problem

host-isolated

host-precedence-unreachable

host-redirect

host-tos-redirect

host-tos-unreachable

host network]TJ08013 -i1host-precedence-unr

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

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

RGOS10.0

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 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

RGOS10.0

name MAC

MAC ACL

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

RGOS10.0

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

Expert ACL

show expert access-lists ACL

ACL

```
Ruijie(config)# expert access-list extended exp-acl
Ruijie(config-exp-nacl)# show expert access-lists
expert access-list extended exp-acl
Ruijie(config-exp-nacl)#
```

ACL

```
Ruijie(config)# expert access-list extended 2704
Ruijie(config-exp-nacl)# show expert access-lists
expert access-list extended 2704
Ruijie(config-exp-nacl)#
```

show expert access-lists	

RGOS10.0

ipv6 access-list

IPV6 ACL **no** ACL

ipv6 access-list *name*

no ipv6 access-list *name*

name ACL

show ipv6 access-lists ACL

IPV6 ACL

```
Ruijie(config)# ipv6 access-list v6-acl
Ruijie(config-ipv6-nacl)# show access-lists
ipv6 access-list extended v6-acl
Ruijie(config-ipv6-nacl)#
```

show access-lists	IPV6

RGOS10.0

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	

RGOS10.0

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*]

[*sn*] **deny 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*] **deny 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) 5 IPV6

[*sn*] **deny 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*] [**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

ACL

```
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 100 MAC 0013.0049.8272 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)#
```

ipv6 traffic-filter	IPV6
ip access-group	IP ACL
mac access-group	MAC ACL

User Datagram Protocol (UDP)

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

3) MAC

[*sn*] **permit** {**any** | **host** *source-mac-address*} {**any** | **host** *destination-mac-address*} [*ethernet-type*][**cos** [*out*] [**inner** *in*]]

4) Expert

[*sn*] **permit** [**protocol** | [*ethernet-type*][**cos** [*out*] [**inner** *in*]]] [**VID** [*out]***[**inner** *in]*] {*source source-wildcard* | **host** *source* | **any**} {**host** *source-***mac***-address* | **any** } {*destination destination-wildcard* | **host** *destination* | **any**} {**host** *destination-mac-address* | **any**} [**precedence** *precedence*] [**tos** *tos*][**fragments**] [**time-range** *time-range-name*]

Ethernet-type cos

[*sn*] **permit** {*ethernet-type*| **cos** [*out*] [**inner** *in*]} [**VID** [*out*][**inner** *in*]] {*source source-wildcard* | **host** *source* | **any**} {**host** *source-mac-address* | **any** } {*destination destination-wildcard* | **host** *destination* | **any**} {**host** *destination-mac-address* | **any**} [**time-range** *time-range-name*]

Protocol

[*sn*] **permit protocol** [**VID** [*out]***[**inner** *in*]] {*source source-wildcard* | **host** *Source* | **any**} {**host** *source-mac-address* | **any** } {*destination destination-wildcard* | **host** *destination* | **any**} {**host** *destination-mac-address* | **any**} [**precedence** *precedence*] [**tos** *tos*] [**fragments**] [**time-range** *time-range-name*]

Expert

Internet Control Message Protocol (ICMP)

[*sn*] **permit icmp** [**VID** [*out*][**inner** *in*]] {*source source-wildcard* | **host** *source* | **any**} {**host** *source-mac-address* | **any** } {*destination destination-wildcard* | **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*] [**fragments**] [**time-range** *time-range-name*]

IPV6

Internet Control Message Protocol (ICMP)

[*sn*] **permit 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*] **permit 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*] **permit 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*]

deny

ACL

ACL ACL

Expert Extended ACL ACL
IP 192.168.4.12 MAC 001300498272
TCP

```
Ruijie(config)# expert access-list extended exp-acl
Ruijie(config-exp-nacl)# permit tcp  host
192.168.4.12 host 0013.0049.8272 any any
Ruijie(config-exp-nacl)# deny any any any any
Ruijie(config-exp-nacl)# show access-lists
expert access-list extended exp-acl
10 permit tcp  host  192.168.4.12 host 0013.0049.8272 any
any
20 deny any any any any
Ruijie(config-exp-nacl)#
```

IP ACL IP 192.168.4.12
TCP 100 1

```
Ruijie(config)# ip access-list extended 102
Ruijie(config-ext-nacl)# permit tcp host 192.168.4.12
eq 100 any
Ruijie(config-ext-nacl)# show access-lists
ip access-list extended 102
10 permit tcp host 192.168.4.12 eq 100 any
Ruijie(config-ext-nacl)# exit
Ruijie(config)# interface gigabitethernet 1/1
Ruijie(config-if)# ip access-group 102 in
Ruijie(config-if)#
```

MAC ACL MAC 0013.0049.8272
100 1

```
Ruijie(config)# mac access-list extended 702
Ruijie(config-mac-nacl)# permit host 0013.0049.8272 any
aarp
Ruijie(config-mac-nacl)# show access-lists
mac access-list extended
10 permit host 0013.0049.8272 any aarp702
Ruijie(config-mac-nacl)# exit
Ruijie(config)# interface gigabitethernet 1/1
Ruijie(config-if)# mac access-group 702 in
```

ip ACL IP 192.168.4.12

J h*ü y· 1

```
Ruijie(config)# ip access-list standard std-acl
Ruijie(config-std-nacl)# permit host 192.168.4.12
Ruijie(config-std-nacl)# show access-lists
ip access-list standard std-acl
10 permit host 192.168.4.12
Ruijie(config-std-nacl)# exit
Ruijie(config)# interface gigabitethernet 1/1
Ruijie(config-if)# ip access-group std-acl in
```

IPV6 ACL IP 192.168.4.12
1

```
Ruijie(config)# ipv6 access-list extended v6-acl
Ruijie(config-ipv6-nacl)# 11 permit ipv6
host ::192.168.4.12 any
Ruijie(config-ipv6-nacl)# show access-lists
ipv6 access-list extended v6-acl
11 permit ipv6 host ::192.168.4.12 any
Ruijie(config-ipv6-nacl)# exit
Ruijie(config)# interface gigabitethernet 1/1
Ruijie(config-if)# ipv6 traffic-filter v6-acl in
```

Q¸	AÈâ
show access-lists	
ipv6 traffic-filter	IPV6
ip access-group	IP ACL
mac access-group	MAC ACL

list-remark text

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)#
```

ACL

ACL ACL

```
Ruijie(config)# ipv6 access-list extended v6-acl
Ruijie(config-ipv6-nacl)# permit ipv6
host ::192.168.4.12 any
Ruijie(config-ipv6-nacl)# 12 deny ipv6 host any any
Ruijie(config-ipv6-nacl)# show access-lists
ipv6 access-list extended v6-acl
10 permit ipv6 host ::192.168.4.12 any
12 deny ipv6 any any
Ruijie(config-ipv6-nacl)# no 12
Ruijie(config-ipv6-nacl)# show access-lists
ipv6 access-list extended v6-acl
10 permit ipv6 host ::192.168.4.12 any
Ruijie(config-ipv6-nacl)#
```


! n **show access-lists** E Ψ l ḡ ɔ * ŋ

id IP 1-199 1300-2699

name IP

in

out

ACL

ip access-group

fastEthernet0/0 120

```
Ruijie(config)# interface fastEthernet 0/0
Ruijie(config-if)#ip access-group 120 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

RGOS10.0

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

show access-group

access-list accept_00d0f8xxxxxx_only Gigabit

1

```
Ruijie(config)# interface GigaEthernet 0/1
Ruijie(config-if)# expert access-group
accept_00d0f8xxxxxx_only in
```

show access-group	ACL

RGOS10.0

ipv6 traffic-filter

IPV6 ACL no

ipv6 traffic-filter *name* {**in** | **out**}

no ipv6 traffic_0 1 Tf80.00w569903f-0.00041Tc 0 Tw 7.m38 Td[(na)-6(me)]TJ0TT0 1 Tf-9004 Tc 2.484 0 T

access-list v6-acl Gigabit 1

```
Ruijie(config)# interface GigaEthernet 0/1
Ruijie(config-if)# ipv6 traffic-filter
```

ACL

ip access-list	IP ACL

RGOS10.0

show expert access-group

Expert

show expert access-group [**interface** <*interface*>]

<*interface*>

Expert ACL

Expert ACL

```
Ruijie# show expert access-group interface
gigabitethernet 0/2
expert access-group ee in
Applied On interface GigabitEthernet 0/2.
```

expert access-list	Expert ACL

RGOS10.0

show mac access-group

MAC

show mac access-group[**interface** <*interface*>]

<interface>

MAC ACL

MAC ACL

```
Ruijie# show mac access-group interface gigabitethernet
0/3
mac access-group mm in
Applied On interface GigabitEthernet 0/3.
```

```
Applied On interface GigabitEthernet 0/4.
```

ipv6 access-list	IPV6 ACL

RGOS10.0

show access-group

ACL

show access-group [**interface** <*interface*>]

<*interface*>

ACL ACL

```
Ruijie# show access-group
ip access-list standard ipstd3
Applied On interface GigabitEthernet 0/1.
ip access-list standard ipstd4
Applied On interface GigabitEthernet 0/2.
ip access-list extended 101
Applied On interface GigabitEthernet 0/3.
ip access-list extended 102
Applied On interface GigabitEthernet 0/8.
```

ip access-group	ip
mac access-group	MAC
expert access-group	Expert
ipv6 traffic-filter	IPV6

RGOS10.0

:

show security [**interface** *idx*]

security global access-group

security access-group
security uplink enable

show security

show security [**interface** *idx*]

interface *idx*

```
Ruijie# show security
port      type     ¥MVÿ·
ÿ0$
```

security access-group	
security uplink enable	

RGOS10.2

security global access-group

security global access-group {*id*|*name*}

no security global access-group

id ACL id

name ACL

```
Ruijie(config)#security global access-group 1
```

show security	

RGOS10.2

security access-group

security access-group {*id*|*name*}

no security access-group

id ACL id

name ACL

```
Ruijie(config-if)#security access-group 1
```

show security	

RGOS10.2

security uplink enable

security uplink enable

no security uplink enable

```
Ruijie(config-if)#security uplink enable
```

show security	

RGOS10.2

QOS

QoS QoS

1 policy-map

policy-map class-map

class-map 1 ACL ACL ACE

ACE “ ACL”

QoS
Policy Map
QoS QoS
Policy Map Off

QOS

CoS	0
	8
	WRR
QueueWeight	1:1:1:1:1:1:1:1
WRR Weight Range	1:15
DRR Weight Range	1:15
	No Trust

Cos

CoS	0	1	2	3	4	5	6	7
	1	2	3	4	5	6	7	8

CoS to DSCP

CoS	0	1	2	3	4	5	6	7
DSCP	0	8	16	24	32	40	48	56

IP-Precedence to DSCP

IP-Precedence	0	1	2	3	4	5	6	7
DSCP	0	8	16	24	32	40	48	56

DSCP to CoS

DSCP	0	8	16	24	32	40	48	56
CoS	0	1	2	3	4	5	6	7

mls qos trust

Qos

mls qos trust [**cos** | **dscp** | *ip-precedence*]

no mls qos trust

cos	Qos	CoS
dscp	Qos	DSCP
ip-precedence	Qos	IP-PRE

no

```
Ruijie(config)# interface gigabitethernet 1/1
Ruijie(config-if)# mls qos trust cos
```

show mls qos interface *interface-id*

acl-id ACL id

class-map-name class map

no class-map *class-map-name* class map

no match access-group *acl-name*| *acl-id*

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

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

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
```

show mls qos interface

priority-queue

[**no**] **priority-queue**

priority-queue SP

no priority-queue WRR

WRR

no

Ruijie(config)# **wrr-queue cos-mapE TJ/TT5 1 Tf10.05 0 Td(1.501)Tj/TT3 1 Tf0 Tc 3 0**

dscp

no

Ruijie(config)# **mls qoE 02mapEc -026s 10dscp** *18E 022 -024 26 34*

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 maps10 16 18 to 0 byQN0dscp3(d[(d)8(2.16c03 Tms(Ö)6( )6( )]TJC.01ETTf0 Tc 2A61350

config)#2 0 [illegible] interfa(m)6 fastEthernet)#2F 7 26 T 02 0 [illegible] m2T 4T 02 0 [illegible] 38-18 Riu)(config-if)#2 0 [illegible] (rate-limmit input)#2F 026

nd[illegible] 1 F0 T 02 0 [illegible] 218 1 [illegible] c 0 [illegible] 1 F 08 T [illegible] 1 [illegible] 13 [illegible] m 4 S)

drr-queue bandwidth *weight1...weight8*

no drr-queue bandwidth

show mls qos maps	dscp-cos maps,dscp-cos maps ip-prec-dscp maps

wfq-queue bandwidth

wfq

wfq-queue *queue-id* **bandwidth** *min max*

no wfq-queue *queue-id* **bandwidth**

queue-id

min

max

min kbps

max kbps

wfq

wfq

```
Ruijie(config)# mls qos scheduler wfq
Ruijie(config)# show mls qos scheduler
```

```
Ruijie(config-if)# wfq-queue 2 bandwidth 10 10240
Ruijie(config-if)# wfq-queue 4 bandwidth 7 10240
Ruijie(config-if)# show running
```


show mls qos scheduler QOS

RGOS10.1

show class-map

class map

show class-map [*class-name*]

class-name class map

class map

```
Ruijie# show class-map
```

show policy-map

QoS policy map [class class-name]

show policy-map [*policy-name* [**class** *class-name*]]

policy-name policy name

class-name class map

policy name

```
Ruijie# show policy-map
```

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
```

show mls qos queueing

QoS (cos-to-queue map,wrr weight,drr weight)

show mls qos queueing

```
Ruijie# show mls qos queueing
```

show mls qos scheduler

show mls qos scheduler

```
Ruijie# show mls qos scheduler
```

show mls qos maps

dscp-cos maps,dscp-cos maps ip-prec-dscp maps

show mls qos maps [**cos-dscp** | **dscp-cos** |

VRRP

VRRP

vrrp authentication
vrrp description
vrrp ip
vrrp preempt
vrrp priority
vrrp timers advertise
vrrp timers learn
vrrp track

vrrp authentication

VRRP **no**

vrrp group authentication *string*
no vrrp *group* **authentication**

group

VRRP 1

```
vrrp 1 authentication x30dn78k
```

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

vrrp description

VRRP **no**

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

no vrrp group description

group VRRP

text VRRP

VRRP VRRP
VRRP

VRRP VRRP

E0 VRRP 1 Building A – Marketing and Administration

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


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

vrrp ip

VRRP IP **no** VRRP IP

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

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

group VRRP

ipaddress IP

secondary IP

VRRP

secondary IP IP VRRP IP no VRRP IP IP

0 VRRP VRRP 1 IP 10.0.1.20 IP 10.0.2.20

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

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

vrrp preempt

VRRP no VRRP

vrrp *group* **preempt** [**delay** *seconds*]

no vrrp *group* **preempt** [**delay**]

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

interval VRRP ( )

VRRP VRRP
1

VRRP VRRP
VRRP

VRRP 4

```
vrrp 1 timers advertise 4
```

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

vrrp track

no

vrrp *group* **track** *interface-type number* [*interface -priority*]
no vrrp *group* **track** *interface-type number*

group VRRP

interface-type

number

interface-priority VRRP
10

VRRP VRRP

(Routed Port SVI Loopback Tunnel)

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

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

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

VRRP

VRRP

debug vrrp

debug vrrp errors

debug vrrp events

debug vrrp packets

debug vrrp state

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

debug vrrp errors

debug vrrp events

VRRP no

debug vrrp events

no debug vrrp events

VRRP

VRRP

```
Ruijie# debug vrrp events
Ruijie#
VRRP: Grp 1 Event - Advert higher or equal priority
VRRP: Grp 1 Event - Advert higher or equal priority
VRRP: Grp 1 Event - Advert higher or equal priority
```

debug vrrp packets

VRRP **no**

debug vrrp packets

no debug vrrp packets

VRRP

VRRP

VRRP 1

```
Ruijie# debug vrrp packets
Ruijie#
VRRP: Grp 2 sending Advertisement checksum DD4D
VRRP: Grp 2 sending Advertisement checksum DD4D
VRRP: Grp 2 sending Advertisement checksum DD4D
```

, VRRP

VRRP 1 IP VRRP 1

```
Ruijie# debug vrrp packets
Ruijie#
VRRP: Grp 1 Advertisement priority 120, ipaddr
192.168.201.213
VRRP: Grp 1 Advertisement priority 120, ipaddr
192.168.201.213
VRRP: Grp 1 Advertisement priority 120, ipaddr
192.168.201.213
```

debug vrrp state

VRRP no

debug vrrp state

no debug vrrp state

VRRP

VRRP

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

Ruijie# config terminal
Enter configuration commands, one per line. End with
CNTL/Z.

Ruijie(config)# interface fastethernet 0/0
Ruijie(config-if)# no shutdown
Ruijie(config-if)# end
Ruijie#
%VRRP-6-STATECHANGE: FastEthernet 0/0 Grp 2 state Master
-> Init

Ruijie#
```

show vrrp

VRRP

show vrrp [**brief** | *group*]

brief VRRP

group VRRP

VRRP

VRRP

```
Ruijie# show vrrp
FastEthernet 0/0 - Group 1
State is Backup
Virtual IP address is 192.168.201.1 configured
Virtual MAC address is 0000.5e00.0101
Advertisement interval is 3 sec
Preemption is enabled
min delay is 0 sec
Priority is 100
Master Router is 192.168.201.213 , pritority is 120
Master Advertisement interval is 3 sec
Master Down interval is 9 sec
FastEthernet 0/0 - Group 2
State is Master
Virtual IP address is 192.168.201.2 configured
Virtual MAC address is 0000.5e00.0102
Advertisement interval is 3 sec
Preemption is enabled
min delay is 0 sec
Priority is 120
Master Router is 192.168.201.217 (local), priority is
120
Master Advertisement interval is 3 sec
```

```
Master Down interval is 9 sec
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
```

```
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

RLDP

RLDP

rldp enable

rldp detect-interval

rldp detect-max

rldp port {**unidirection-detect | bidirection-detect | loop-detect**} {**warning | shutdown-svi | shutdown-port | block**}

rldp reset

```
Ruijie(config)# rldp enable
```

rldp port	RLDP

rldp detect-interval

RLDP

rldp detect-interval *interval*

no rldp detect-interval

interval 2-15

3

stp ×
stp

5s :

```
Ruijie(config)# rldp detect-interval 5
```

rldp detect-max	

rldp detect-max

RLDP

rldp detect-max *num*

RLDP RLDP

fas 0/1 rldp

```
Ruijie(config)# interface fas 0/1
Ruijie(config-if)# rldp port loop-detect block
```

rldp enable	rldp

rldp reset

rldp shutdown **disable** rldp

rldp reset

```
Ruijie# rldp reset
```

rldp enable	Rldp

show rldp [**interface** *intervace-id*]

debug rldp {**packet | event | error**}

show rldp

rldp

show rldp [**interface** *interface-id*]

Interface-id

EXEC

debug rldp

rldp no

debug rldp [**packet | event | error**]
undebug rldp [**packet | event | error**]

packet rldp
event
error

EXEC

TPP

topology guard

topology guard no

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

TPP

show tpp

show tpp

tpp

```
Ruijie# show tpp
```

topology guard

cat

cd

cp

ls

makefs

mkdir

mv

pwd

rm

rmdir

cd

cd *DIRECTORY*

DIRECTORY

“..” “.”

ls

tmp

```
Ruijie# cd tmp
```

ls	

cp

,

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

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

DESTINE_FILE

DIRECTORY

SOURCE_FILE ( )

~

ls

ls *PATHNAME*

PATHNAME

.

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

makefs

DŽ ∟ ვ ق] ظ o ˚ ظ ˚

a

b

jffs2 dev/mtdblock/1

```
Ruijie# makefs dev /dev/mtdblock/1 fs jffs2
```

mv

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

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

SOURCE_FILE

DESTINE_FILE/DIRECTORY

a (**type** **file**); b '?'
'? '

,

log.txt , config.txt,

,

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

log.txt tmp

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

pwd

pwd

rmdir	, rm ,

rmdir

rmdir *DIRECTORY*

DIRECTORY ,

, ,

rm

tmp

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

logging on

no

logging on

no logging on

RGOS Console VTY
FLASH Syslog
Server
1 Log

```
Ruijie(config)# no logging on
```

gg15.816<2 To

logging console	
logging monitor	VTY (telnet)
logging trap	Syslog Server

terminal monitor

VTY VTY
no

terminal monitor

terminal no monitor

VTY VTY

VTY
VTY

RGOS
no , 0 1

VTY

```
Ruijie# terminal monitor
Ruijie#
```

logging buffered

no

logging buffered [*buffer-size* | *level*]

no logging buffered

buffer-size 4K 128K Bytes

levelI 0 7

4k Bytes

7

show logging

clear logging

FLASH Syslog Server

RGOS 8

1

Emergencies	0	
Alerts	1	
Critical	2	
Errors	3	
warnings	4	
Notifications	5	
informational	6	
Debugging	7	

0

6 6 10000

```
Ruijie(config)# logging buffered 10000 6
```

logging on	
show logging	
clear logging	

logging

Syslog Sever

Syslog server **Syslog Server**

no

logging *host*

no logging h*ost*

Host syslog server

Syslog server

Syslog server RGOS

5 Syslog Server Syslog Server

logging on	
show logging	
logging trap	syslog server

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

~

FLASH FLASH

FLASH logging file flash

FLASH trace.txt
64K, 6

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

logging on	
show logging	
more flash	FLASH

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	

logging monitor

VTY telnet SSH
no VTY

logging monitor *level*

no logging monitor

level
1

Debugging (7)

VTY **terminal monitor** VTY
logging m/TT2 A5 Td<07FF07ED2B05>Tj/TT2 1 Tf0.0025 Tc -0.0004F1C122F02ÄQ gging 5gi14

logging trap

Syslog Server

no Syslog Server

logging trap *level*

no logging trap

level

1

Informational(6)

Syslog Server logging

Syslog Server logging trap

show logging

6 202.101.11.22

Syslog Server

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

logging on	
logging	Syslog Server
show logging	

logging source interface

no

Syslog Server

Loopback 0 Syslog

```
Ruijie(config)# logging source ip 192.168.1.1
```

logging	Syslog server

logging facility

no (23)

logging facility *facility-type*

no logging facility

facility-type Syslog

Local7(23)

2 Syslog

2

Numerical Code	Facility
0	kernel messages

1	user-level messages
2	mail system
3	system daemons
4	security/authorization messages
5	messages generated internally by syslogd
6	line printer subsystem
7	network news subsystem
8	UUCP subsystem
9	clock daemon
10	security/authorization messages
11	FTP daemon
12	NTP subsystem
13	log audit
14	log alert
15	clock daemon
16	local use 0 (local0)
17	local use 1 (local1)
18	local use 2 (local2)
19	local use 3 (local3)
20	local use 4 (local4)
21	local use 5 (local5)
22	local use 6 (local6)
23	local use 7 (local7)

RGOS (local7) 23

Syslog kernel

```
Ruijie(config)# logging facility kern
```

logging console	

logging count

no

logging count

no logging count

no logging count

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

show logging count	
show logging	

service sequence-numbers

no

service sequence-numbers

no service sequence-numbers

1

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

logging on	
service timestamps	

datetime Jul 27 16:53:07

RTC

Uptime

Datetime

Log Debug Datetime

```
Ruijie(config)# service timestamps debug datetime
Ruijie(config)# service timestamps log datetime
```

logging on	
service sequence-numbers	

service sysname

no

service sysname

no service sysname

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

logging file flash:	FLASH

clear logging

clear logging

```
Ruijie# clear logging
```

logging on	
show logging	
logging buffered	

show logging

```
Ruijie# show logging
Syslog logging: enabled
Console logging: level debugging, 4 messages logged
Monitor logging: level informational, 0 messages logged
Buffer logging: level debugging, 6 messages logged
Timestamp debug messages: datetime
Timestamp log messages: disabled
Sequence log messages: enable
Trap logging: level debugging, 2 message lines logged,0
reserved,0 fail
logging to  202.101.11.22
logging to  192.168.200.112
Log Buffer (Total 4096 Bytes) : have written 680
00001 2004-11-17 10:20:59  Ruijie: %7:%LINK CHANGED:
Interface FastEthernet 0/0, changed state to up
00002 2004-11-17 10:20:59  Ruijie: %7:%LINE PROTOCOL
CHANGE: Interface FastEthernet 0/0, changed state to UP
00003 2004-11-17 10:57:18  Ruijie: %7:%LINK CHANGED:
Interface  FastEthernet  0/1,  changed  state  to
administratively down
00004 2004-11-17 10:57:21  Ruijie: %7:%LINK CHANGED:
Interface FastEthernet 0/1, changed state to down
00005 2004-11-17 10:57:41  Ruijie: %7:%LINK CHANGED:
Interface  FastEthernet  0/1,  changed  state  to
administratively down
00006 2004-11-17 10:57:43  Ruijie: %7:%LINK CHANGED:
Interface FastEthernet 0/1, changed state to down
```

Syslog logging	**enabled**, **disabled**
Console logging	
Monitor logging	VTY

Buffer logging	
Timestamp debug messages	Debug
Timestamp log messages	Log
Sequence log messages	
Trap logging	Syslog Server
Log Buffer	


```
-------------------------------------------------
SYS TOTAL                          1
```

logging count	

show member	

device-description

device-description [**member** *member*] *description*

]

no S3750

```
4         00d0.f822.33b0  1          RGOS 10.1.00(2),
Release(12889)  1.0             SWITCH
5         00d0.f822.33b2  1          RGOS 10.1.00(2),
Release(12889)  1.0             SWITCH
6         00d0.f824.23b4  1          RGOS 10.1.00(2),
Release(12889)  1.0             SWITCH
7         00d0.f833.44b4  1          RGOS 10.1.00(2),
Release(12889)  1.0             SWITCH
8         00d0.f855.33ae  1          RGOS 10.1.00(2),
Release(12889)  1.0             SWITCH
```