



©2009

RGOS®10.2(4)

1.

5

Courier New

5

2.

Arial

[] []

{x|y|...}

[x|y|...]

//

3.





1)

2)

CLI

alias

no

alias

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	globe configure mode

*

**command-alias=original-command*

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

show aliases	

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
security 15 password security
 15 password security
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



TCP

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*

<i>hh:mm:ss</i>		24	:	:
<i>day</i>	1-31			
<i>month</i>	1-12			
<i>year</i>	1993-2035			

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

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%   mtddblock
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

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

Physical Memory	
Image	

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

reload
show reload

show

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

prompt

```
no prompt prompt  
prompt string  
  
string 32  
  
EXEC  
  
RGOS  
Ruijie(config)# prompt RGOS  
Ruijie(config)# end
```

RGOS

banner motd

```
?U5p4" 1»"ªÙ•[ ÁÝ'æïÀsÁ!Dr T õ ã ß ;> Q , banner motd
no banner motd
80%
banner motd c message c
```

c

message

Ruijie(config)

Ruijie(config)# **banner motd5EE2DB952ws62T568c1**

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

speed

```
no speed
speed speed
```

```
speed speed
```

```
Speed          bps
  9600  19200  38400  57600  115200
9600
```

```
9600
```

```
57600 bps
```

```
Ruijie(config)#
```

```
Ruijie(config)# line console
soe1/TT2 9Tf0 Tc 3 006 0 Td[]Tj/TT6 1 Tf-0.00
```

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*]

<i>memory</i>	running-config	NVRAM	copy
running-config	startup-config		
<i>network</i>		TFTP	copy
running-config	tftp		
<i>terminal</i>		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*

LINE

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	

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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 list
Line
```

access-class
show running

```
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://** *location / filename*

copy tftp:// *location/filename* **flash:** *filename*

filename

TFTP

TFTP

:
config.bak

ip 192.168.12. 1

ping
traceroute

ping

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

<i>ip-address</i>	IPv4
<i>length</i>	
<i>times</i>	
timeout	
<i>data</i>	
<i>source</i>	IPv4

IP 2 5 100Byte

Ping

ping
ping

ping

IP 2 5 100Byte
'.' '!'
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
```

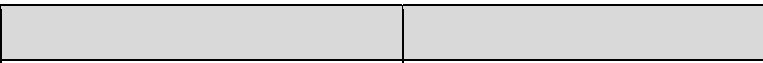
```
1    192.168.217.1    0 msec  0 msec  0 msec
2    10.10.25.1       0 msec  0 msec  0 msec
3    10.10.24.1       0 msec  0 msec  0 msec
4    10.10.30.1      10 msec 0 msec  0 msec
```

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
```

description

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	

clear interface

clear interface *interface-id*

interface-id

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

Ruijie# **clear interface gigabitethernet 1/1**

shutdown	

switchport

```

2
3
switchport
no switchport

```

2

switchport

2

3

2

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

show interfaces	

switchport mode

```

access port      trunk port,      switch 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 VLAN trunk port
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 <i>vlan-list</i>	Trunk	VLAN	vlan-list
	VLAN	VLAN	VLAN
	VLAN ID	VLAN ID	
	-	10-20	,
	all	1-10,20-25,30,33	
VLAN	VLAN		
add	VLAN	VLAN	
remove	VLAN	VLAN	
except	VLAN	VLAN	
	VLAN		
native vlan <i>vlan-id</i>	Native VLAN		

VLAN all Native VLAN VLAN 1

Native VLAN

```

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

```

VLAN

```

Trunk                                      VLAN 1    4094
                                          Trunk                                      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
Access 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

<i>port-group-number</i>	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	AP MAC MAC MAC
src-mac	AP MAC MAC MAC
ip	IP IP IP—— IP IP—— IP
dst-ip	AP IP IP IP
src-ip	AP IP 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 VLAN no
 VLAN
vlan *vlan-id*
no vlan *vlan-id*

<i>vlan-id</i>	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

<i>vlan-name</i>	VLAN

VLAN

VLAN

show vlan vlan

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

show vlan	VLAN

switchport mode

access port trunk port, switch port
802.1Q

switch port access

switch port access VLAN
switchport access vlan VLAN

switch port trunk VLAN
VLAN VLAN VLAN trunk port
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

```

          VLAN ID          VLAN ID
    VLAN
VLAN ID      VLAN
              trunkport
    
```

```

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

switchport mode	switch port
switchport trunk	trunkport native VLAN Trunk VLAN

switchport trunk

```

trunkport native VLAN Trunk VLAN
no trunk
    
```

```

switchport trunk {allowed vlan { all | [add | remove | except]
vlan-list }| native vlan vlan-id}
no switchport trunk {allowed vlan | native vlan }
    
```

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

show vlan

VLAN

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

<i>vlan-id</i>	VLAN ID

VLAN

switchport access	Vlan
--------------------------	------

Super-vlan

supervlan

VLAN **supervlan**

supervlan

no supervlan

VLAN

end

Ctrl+C

exit

Ruijie(config)# **vlan 3**

Ruijie(config-vlan)# **supervlan**



no subvlan [*vlan-id-list*]

<i>Vlan-id-list</i>	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*

<i>vlan-id</i>	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*

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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*}

<i>community</i>	community VLAN
<i>isolated</i>	isolated VLAN
<i>primary</i>	primary VLAN
<i>no</i>	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

50

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]
vlist

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 <i>mac-addr</i>	
interface <i>interface-id</i>	
vlan <i>vlan-id</i>	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*]

filtering	
address <i>mac-addr</i>	
vlan <i>vlan-id</i>	VLAN

show mac-address-table filtering

00d0.f800.0c0c

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

Q,

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

show
clear

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 [interval | history-size]

interval <i>value</i>	MAC Trap 1
history-size <i>value</i>	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

```
MAC IP MAC IP
IP MAC IP
```

```
ip 3.3.3.3 mac 00d0.f811.1112
```

address-bind ip-address

address-bind *ip-address mac-address*

no address-bind *ip-address*



<i>intf-id</i>	

```
IP          IP          MAC          IP
MAC          IP          MAC          IP
( 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 <i>interface-id</i>	
vlan <i>vlan-id</i>	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]
```

<i>mac-addr</i>	MAC
<i>vlan-id</i>	VLAN
<i>interface-id</i>	(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*]

<i>mac-addr</i>	MAC
<i>vlan-id</i>	VLAN

Ruijie# **show mac-address-table filtering**

```
Vlan      MAC Address      Type      Interface
-----
1         0000.2222.2222   FILTER   Not available
```

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

show mac-address-table interface

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

<i>interface-id</i>	(AggregatePort)
<i>vlan-id</i>	VLAN

Ruijie# **show mac-address-table interface**

gigabitethernet 1/1

```
Vlan      MAC Address      Type      Interface
-----
1         00d0.f800.1001   STATIC   gigabitethernet 1/1
1         00d0.f800.1002   STATIC   gigabitethernet 1/1
1         00d0.f800.1003   STATIC   gigabitethernet 1/1
1         00d0.f800.1004   STATIC   gigabitethernet 1/1
```

--	--

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

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*]

<i>mac-addr</i>	MAC
<i>vlan-id</i>	VLAN
<i>interface-id</i>	(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*]

<i>vlan-id</i>	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	

MAC

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

```
FLASH                                     DHCP Snooping
ip dhcp snooping database write-to-flash
```

```
FLASH                                     DHCP Snooping
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

Snooping	IP	DHCP
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

B i

B i -

show ip dhcp snooping binding

DHCP Snooping

show ip dhcp snooping binding

```
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(p-[(s) dress]T)T0 1 2189 Tf0 -0..012 0 Td[Tj/C2_0 1 Tf-0.00013.038 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

snooping

VLAN
GDA

igmp

igmp snooping

ivgl

lg

ip igmp snooping source-check default-server	IP IP

ip igmp snooping max-groups

```

ip igmp snooping max-groups          ,          ip
no 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 source-check

address

ip IPMC IP
 Server IP
 Server

```
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

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

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

ip igmp snooping vlan mrouter interface

```

no 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 <i>vid</i> 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

report suppression IGMP v1/v2

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 bpdudfilter

```
disabled    BPDU filter    enabled  
disabled    BPDU filter  
spanning-tree bpdudfilter [enabled | disabled]
```

```
enabled    BPDU filter  
Disabled    BPDU filter
```

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

spanning-tree bpduguard [enabled | disabled]

enabled

```
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 vlan 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
```

```
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-0.22lan 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
```

```
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
```

<i>long</i>	802.1t	path-cost
<i>short</i>	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 bpduguard 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

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

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

show spanning-tree interface

STP

show spanning-tree interface *129 Tc8.306317E41DE0e*

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

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

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**]

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

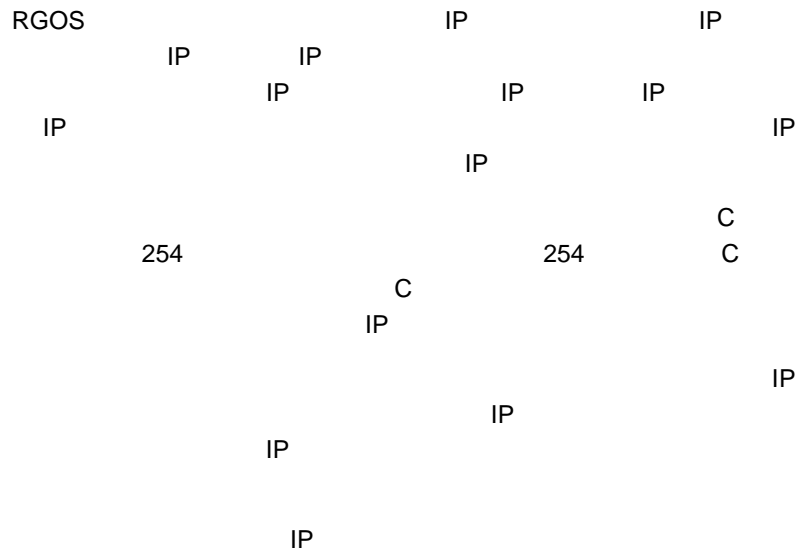
IP

IP IP IP

IP 32 IP IP

" 0" " 1" IP IP A

" 255.0.0.0"



255.255.255.0 IP 10.10.10.1
ip address 10.10.10.1 255.255.255.0

show interface	

secondary IP

ip unnumbered

IP IP no

ip unnumbered *interface-type interface-number*
no ip unnumbered *interface-type interface-number*

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

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 [*

Arp retry times <i>number</i>	ARP

arp retry times

```

                    ARP                    arp                    IP
                    ARP                    no
5 ARP
arp retry times number
no arp retry times

```

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

```

                    ARP                    ARP                    5
                    ARP
                    ARP
                    ARP

```

```

                    ARP
arp retry times 1
                    ARP                    1
arp retry times 2

```

arp retry interval <i>seconds</i>	arp

arp trusted NUM

ARP

no

arp trusted number

no arp trusted

<i>number</i>	

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
```

<i>seconds</i>	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      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

```

no      ARP      ip proxy-arp
      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*

<i>ip-address</i>	IP

IP 255.255.255.255

IP " 1" 255.255.255.255
RGOS IP
" 1"

IP 0.0.0.0

ip broadcast-address 0.0.0.0

ip directed-broadcast

```

IP
directed-broadcast no ip
ip directed-broadcast [ access-list-number ]
no ip directed-broadcast

```

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

```

IP 172.16.16.255 IP IP
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



```
clear arp 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**

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

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*] }

*	
<i>network</i>	

show ip arp

ARP

show ip arp

show ip arp

Ruijie# **show ip arp arp** Eg150

	"_"
Hardware	IP
Type	ARPA
Interface	IP

show ip interface

IP

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

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

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 unreachableled 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.

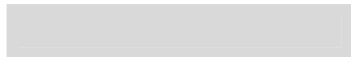
IP interface state is:	"UP"
IP interface type is:	
IP interface MTU is:	MTU
IP address is:	IP
IP address negotiate is:	IP
Forward direct-boardcast is:	
ICMP mask reply is:	ICMP
Send ICMP redirect is:	ICMP
Send ICMP unreachableled is:	ICMP
DHCP relay is:	DHCP
Fast switch is:	IP
Route horizontal-split 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 unreachable**

ip mask-reply

RGOS

ICMP
ip mask-reply

no ICMP
ICMP

- ip mask-reply**
- no ip mask-reply**

ICMP

ICMP

ICMP

a F "

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 MTU IP MTU
    
```

```

FastEthernet 0/1 IP MTU 512
interface fastEthernet 0/1
ip mtu 512
    
```

mtu	

ip redirects

```
RGOS
redirects          no          ICMP          ICMP          ip
ip redirects
no ip redirects
```

ICMP

RGOS ICMP

FastEthernet 0/1 ICMP

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

ip source-route

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

RGOS IP IP IP
RFC 791

ICMP

RGOS IP

IP

no ip source-route

ip unreachable

RGOS ICMP ip
unreachables no ICMP
ip unreachable
no ip unreachable

RGOS ICMP

RGOS
ICMP

ICMP

FastEthernet 0/1 ICMP

interface fastEthernet 0/1

no ip unreachablees

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



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

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

DNS

DHCP

DNS
DNS

DHCP
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**

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

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*]

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

DHCP IP

IP IP DHCP DHCP
DHCP IP DHCP

IP DHCP 192.168.12.100~150
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

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

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

500

ping

ping 600ms

ip dhcp ping timeout 600

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

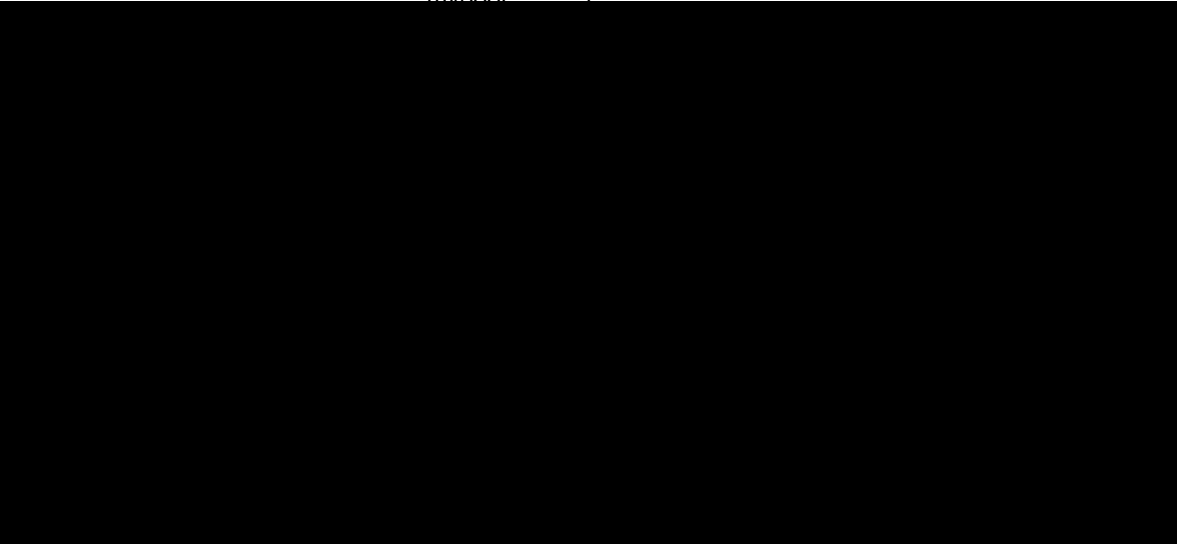
ip dhcp pool

DHCP DHCP

DHCP



pool-name
mypool 1



DHCP



no lease

<i>days</i>	
<i>hours</i>	
<i>minutes</i>	
infinite	

DHCP

DHCP

DHCP

DHCP 1

lease 0 1

DHCP 1

lease 0 0 1

ip dhcp pool	DHCP DHCP

no netbios-name-server

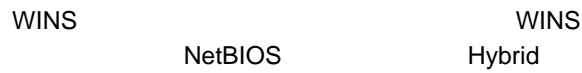
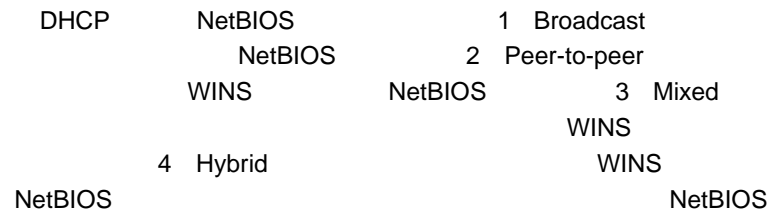
	WINS	IP
<i>ip-address</i>		
<i>ip-address2...ip-address8</i>		8

8

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

NetBIOS

DHCP



DHCP NetBIOS

netbios-node-type h-node

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

network DHCP

```
                DHCP                DHCP
network          no
network net-number net-mask
no network
```

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

DHCP

DHCP

DHCP
DHCP

```
show ip dhcp binding
show ip dhcp conflict
```

```
                DHCP                192.168.12.0
255.255.255.240
network 192.168.12.0 255.255.255.240
```

next-server

DHCP

next-server

no

DHCP

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

no next-server

option

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

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

no option

<i>code</i>	DHCP
ascii string	ASCII

hex string

ip dhcp pool	DHCP DHCP

service dhcp

```
dhcp          DHCP          service
             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* }

*	DHCP
<i>ip-address</i>	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
<i>ip-address</i>	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

100

100

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*]

<i>ip-address</i>	IP

IP IP
IP

show ip dhcp binding

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



```
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



ip dhcp relay information option82

no **ip dhcp relay information option82**
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

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

Service dhcp	DHCP

ip dhcp relay suppression

```
DHCP          DHCP          no
              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

no

ip name-server *ip-address*

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

<i>ip-address</i>	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

July @ By Ma Ke @ YMS @ 7" @ (NAR) f

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

no ip host host-name ip-address

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

show hosts	DNS

RGOS10.1

clear host

clear host [*host-name*]

<i>host-name</i>	***

DNS

1

ip host
DNS

2

-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
```



NTP

NTP

NTP

- no ntp**
- ntp authenticate**
- ntp authentication-key**
- ntp disable**
- ntp server**
- ntp synchronize**
- ntp trusted-key**

no ntp

ntp ntp
no ntp

NTP

NTP NTP NTP
NTP

NTP

no ntp

ntp authentication-key

NTP

NTP

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

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

md5

key-id

ntp trusted-key *key-id*

1024

ID 6

ntp authentication-key 6 md5 woooooop

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*

<i>ip-addr</i>	NTP IP

<i>version</i>	NTP 1-3 NTPv3
<i>if-name</i>	NTP
<i>keyid</i>	
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*

<i>key-id</i>	ID

NTP

ID

```
ntp authentication-key 6 md5 woooooop
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

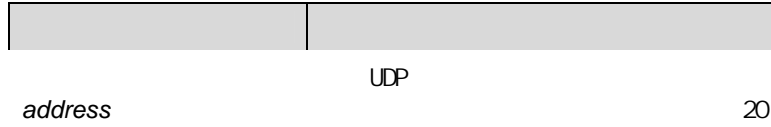
UDP

no

UDP

ip helper-address *address*

no ip helper-address *address*



ip forward-protocol

UDP 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*]

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

UDP

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

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

GI5, GI5AÈ à ò "Âât I±Vtd P T`uw'U 9aÀVtd h 'WdgF@B • utdwS8 9gWFFtd3•&€ Cp†Ftd P 7 d t I

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

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

snmp-server chassis-id

```

SNMP
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
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
location no SNMP snmp-server
snmp-server location text
no snmp-server location
```

text

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

snmp-sever contact	SNMP

snmp-server packetsize

```
SNMP
packetsize no snmp-sever
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

SNMP

SNMP IP
SNMP IP
0 IP SNMP 00

snmp-server enable host	NMS
--------------------------------	-----

snmp-server user

SNMP	snmp-server user
no	
snmp-server user <i>username groupname</i> {v1 v2 v3 [<i>encrypted</i>]} [<i>auth</i> {md5 sha} auth-password] [<i>priv</i> des56 <i>priv-password</i>]} [access {num name}]	
no snmp-server user <i>username groupname</i> {v1 v2c v3 }	
<i>username</i>	
<i>groupname</i>	
v1 v2 v3	SNMP v3
encrypted	16 16

show snmp user	SNMP

snmp-server group

SNMP	snmp-server group
no	
snmp-server group <i>groupname</i> { <i>v1</i> <i>v2c</i> <i>v3</i> { <i>auth</i> <i>noauth</i> <i>priv</i> }}	
[<i>read readview</i>][<i>write writeview</i>] [<i>access</i> { <i>num</i> <i>name</i> }]	
no snmp-server group <i>groupname</i> { <i>v1</i> <i>v2c</i> <i>v3</i> }	
<i>v1</i> <i>v2c</i> <i>v3</i>	SNMP
<i>auth</i>	v3
<i>noauth</i>	v3
<i>priv</i>	v3
<i>readview</i>	
<i>writeview</i>	



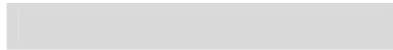
snmp-server view

```
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 <i>index [owner owner-name]</i> buckets <i>bucket-number</i> interval <i>seconds</i>	

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 <i>index [owner owner-name]</i>	

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 <i>number [log] [trap community] [description-string]</i>	

rmon event

no

rmon event *number [log] [trap community] [description-string]
 no rmon alarm number*

02 012601E2141F 1 3F 02-2F 1 Rconfig 1 3F 60w 1 mon event1 1 3F 60w 1 3F 1 3F 1 3F 02-60w 3g 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 <i>index</i> [owner owner-string]	

show rmon history

show rmon history

```
Ruijie# show rmon history  
Entry : 1  
Data source : Gil/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 <i>number variable</i> <i>interval {absolute delta }</i> rising-threshold <i>value</i> <i>[event-number]</i> falling-threshold <i>value [event-number]</i> owner <i>ownername]</i>	

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 <i>number</i> [log] [trap <i>community</i>] [<i>description-string</i>]	

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
no

auto-summary

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

<i>metric</i>	16	1	16 metric
	RGOS		

1

```
redistribute
RIP
```

```
RIP
RIP 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
no

distance

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

no distance [*distance ip-address wildcard*]

<i>distance</i>	RIP <1-255>
<i>ip-address</i>	IP
<i>wildcard</i>	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]]
```

<i>access-list-number</i>	
prefix <i>prefix-list-name</i>	
<i>interface</i>	()
<i>protocol</i>	()
<i>process-id</i>	() <i>protocol</i> OSPF OSPF id
<i>process-name</i>	() <i>protocol</i> 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

30nÂ1 ã Â4Æ ì\$ I™ %R Äna

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

<i>text</i>	RIP
<i>md5</i>	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 RIPv2	RIP 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

no RIP
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
ip rip receive version
no ip rip receive version
RIP
no ip rip receive version

```

1	RIPv1
2	RIPv2

version

```

RIP
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

no RIP
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
ip rip receive version
RIP
no

```

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

```
no ip rip send version
```

1	RIPv1
2	RIPv2

version

```

RIP
vesion
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

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

<http://www.ruijie.com.cn>

no ip split-horizon

IP

X.25

IP

RIP

neighbor

show ip rip
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
summary-address rip no ip

```

```
ip summary-address rip ip-address ip-network-mask
```

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

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

RIP

ip summary-address rip

RIP

```

RIPv2
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 2TT4 1 Tf-18.604 -1.445 Td Td

```

network (RIP)

RIP
network no
network *network-number*
no network *network-number*



neighbor (RIP)

```

RIP      IP      neighbor
no
neighbor ip-address
no neighbor
```

<i>ip-address</i>	IP

```

RIPv1      IP      255.255.255.255      RIPv2
           224.0.0.9
passive-interface
passive      RIP
```

offset-list(RIP)

```

RIP      metric
```

offset-list no offset

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

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

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

offset

```

RIP
offset-list 7 out 7
      acl 7
Ruijie(config-router)# offset-list 7 out 7
      fastEthernet1/0
RIP      metric 7
      acl 8
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

```

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

```

RIP 25 512 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*}

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

passive

passive-interface default passive

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

passive

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

RIP

redistribute RIP

```
redistribute  
no  
redistribute {bgp | isis [process-name] | ospf [A09j00900C100E9i
```

OSPF

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

RIP

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

default-metric <i>metric</i>	

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

<i>update</i>	<i>update</i> 30 <i>invalid Flush</i>
<i>invalid</i>	<i>invalid</i> <i>invalid invalid</i> <i>Invalid 180</i>
<i>flush</i>	<i>flush</i> <i>Flush</i> RIP <i>invalid</i> 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 2
Redistributing: connected
Default version control: send version 2, receive version
2
Interface          Send  Recv  Key-chain
FastEthernet 1/1      2     2     ripkey1
FastEthernet 1/0      2     2     ripkey2
Routing for Networks:
192.168.26.0
192.168.64.0
Distance: (default is 50)
```

```
                vrf      RIP
```

```
Ruijie(config-router)# sh ip rip vrf 1
VRF 1 VRF-id:1
Routing Protocol is "rip"
Sending updates every 30 seconds, next due in 4 seconds
Invalid after 180 seconds, flushed after 120 seconds
Outgoing update filter list for all interface is: not
set
Incoming update filter list for all interface is: not
set
```

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

```
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]
q
```

```
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
no OSPF
area authentication
no area authentication [message-digest]
    
```

<i>area-id</i>	OSPF IP
<i>message-digest</i>	5 MD5 message digest

```

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

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
                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]

```

<i>area-id</i>	
<i>acl-name</i>	acl
<i>prefix-name</i>	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]
```

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

NSSA

default-information-originate Type-7 LSA
nssa ABR ASBR ABR
Type-7 LSA ASBR (
ABR) Type-7 LSA
no-redistribution ASBR OSPF redistribute

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
```


[[**authentication-key** *key*] | [**message-digest-key** *key-id md5 key*]]
no area *area-id virtual-link router-id*

<i>area-id</i>	OSPF IP
<i>router-id</i>	show ip ospf
dead-interval <i>seconds</i>	40
hello-interval <i>seconds</i>	OSPF Hello 10
retransmit-interval <i>seconds</i>	OSPF LSA 5
transmit-delay <i>seconds</i>	OSPF LSA LSA 1 LSA LSA
authentication-key <i>key</i>	OSPF service password-encryption
message-digest-key <i>key-id md5 key</i>	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 Stub Area NSSA ABR

router-id OSPF
show ip ospf neighbor

router-id
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**

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

RFC2328

OSPF

OSPF 1

Ruijie# **clear ip ospf 1 process**

compatible rfc1583

AS
 RFC1583 RFC2328

compatible rfc1583
no compatible rfc1583

RFC1583

rfc 2328

```
Ruijie(config)# router ospf 1
Ruijie(config-router)# no compatible 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 <i>metric</i>	1
metric-type <i>type</i>	OSPF 1 2 1 2
route-map <i>map-name</i>	route-map , route-map

redistribute **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

```
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]
```

<i>listname</i>	acl
gateway <i>plist-name</i>	gateway
prefix <i>plist-name</i>	prefix-list
interface-type <i>num</i>	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**]

```
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          OSPF.j9/0t      100      uiji(cnfig)#( )TjTT40 1 Tf9.5909 0 Td[interfaci)-6e (seral
```

, 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
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 @!4B!Y-8%&-l3&u!r#"t~@@

```

OSPF
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
```

--	--

<i>broadcast</i>	OSPF
<i>non-broadcast</i>	OSPF NBMA
<i>point-to-multipoint</i> <i>[non-broadcast]</i>	OSPF non-broadcast
<i>point-to-point</i>	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
no
ip ospf priority priority
no ip ospf priority
    
```

<i>Priority</i>	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
    
```

<i>Seconds</i>	LSU 5

5

```

LSU LSU
ip ospf retransmit-interval
LSA

virtual-link retransmit-interval LSU area

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

<i>Seconds</i>	OSPF LSU 1

1

LSU LSAs Age
 ip ospf transmit delay

area virtual-link	OSPF

log-adj-changes

H

max-concurrent-dd

DD

max-concurrent-dd <1-65535>



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

RGOS

IP

IP

NBMA

Hello

OSPF

Hello

Hello

OSPF

0

Hello

0

DR/BDR

DR/BDR

Hello

i

hÒu îêó&•!£ þ dÓ! •?0%

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
```

<i>max-dbsize</i>	external lsa AS
<i>wait-time</i>	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
    
```

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

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

: 240

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 incoming current DD exchange neighbors 0/5
Number of outgoing current DD exchange neighbors 0/5
Number of external LSA 4. Checksum 0x0278E0
Number of opaque AS LSA 0. Checksum 0x000000
Number of non-default external LSA 4
External LSA database is unlimited.
Number of LSA originated 6
Number of LSA received 2
Log Neighbor Adjacency Changes : Enabled
Number of areas attached to this router: 1
Area 0 (BACKBONE)
Number of interfaces in this area is 1(1)
Number of fully adjacent neighbors in this area is 1
Area has no authentication
SPF algorithm last executed 00:01:26.640 ago
SPF algorithm executed 4 times
Number of LSA 3. Checksum 0x0204bf
Area 1 (NSSA)
Number of interfaces in this area is 1(1)
Number of fully adjacent neighbors in this area is 0
Number of fully adjacent virtual neighbors through this
area is 0
Area has no authentication
SPF algorithm last executed 02:09:23.040 ago
SPF algorithm executed 4 times
Number of LSA 6. Checksum 0x028638
NSSA Translator State is elected
```

Router ID	
Process uptime	OSPF 0.0.0.0 router-id
Bound to VRF	OSPF VRF
Conforms to RFC2328	RFC2328
RFC1583Compatibility flag	RFC2328 ASBR RFC1583
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	exstart incomming
Outgoing current DD exchange neighbors	exstart outgoing
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

OSPF	ABR	ASBR	OSPF	"	-
------	-----	------	------	---	---

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

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

OSPF

OSPF

show ip ospf databaseRuijie# **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				
20.0.0.0	1.1.1.1	1	0x80000001	0x033c E2
20.0.0.0/24				
100.0.0.0	1.1.1.1	1	0x80000001	0x9469 E2
100.0.0.0/28				

AS External Link States

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

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 /AJO(5T @


```

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
  : 1290
  : 0x2 (*|-|-|-|-|E|-)
LS Type: AS-external-LSA
Link State ID: 20.0.0.0 (External Network Number)
Advertising Router: 1.1.1.1
  : 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	OSPF	32
		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]
    
```

--	--

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

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	Down UP
Internet Address	IP

OSPF2

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(l-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	(Hello DR)
BDR	(Hello BDR)
Options	Hello E 0 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*]

<i>process-id</i>	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
```

istribute-list in

istribute-list in **no**

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

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

<i>access-list-number</i>	
prefix <i>prefix-list-name</i>	
gateway <i>prefix-list-name</i>	
<i>interface-type</i> <i>interface-number</i>	()

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*]

<i>access-list-number</i>	
prefix <i>prefix-list-name</i>	
<i>interface</i>	()
<i>protocol</i>	()

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
```

dGHdGHdGH#

<i>seq-number</i>	1 2147483647 5 5
deny	
permit	
<i>ip-prefix</i>	IP 0 32
<i>minimum-prefix-length</i>) ge
<i>maximum-prefix-length</i>) le

is 1 t658 Td<47213542352534B00D06<02C542 8JTJ0.001 TTc 0Tc 08 0 Tc 62 06.012j/C2_0 1 Tf0-60.1204

```

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

ip prefix-list description

no

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

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

Ruijie# R (OSPF IP RIP IP 201.1.1.0/24) conf i

no SIP + DIP + Port no ip ref ecmp route dip port Key

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*]

<i>vrf_name</i>	VRF
<i>network</i>	
<i>net-mask</i>	
<i>ip-address</i>	
<i>interface</i>	
<i>distance</i>	
<i>tag</i>	Tag
permanent	
<i>number</i>	

disable/enable	
----------------	--

```
1
OSPF 110
125 OSPF
vrf vrf
1 show ip route weight
weight WCMP
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],iP0k)Zw@Q65BM-@!aUE%B
```

show ip route	IP

ip routing

no RGOS IP
IP

ip routing

no ip routing

IP

RGOS IP VOIP RGOS IP
RGOS IP
no ip routing

ip static route-limit

no **ip static route-limit**
ip static route-limit *number*
ip static route-limit *number*

<i>number</i>	1-10000

1000

route-limit

ip static

show running config

900

ip static route-limit 900

ipv6 prefix-list

IPv6 **no** **ip** **static**

prefix-list

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

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

<i>prefix-lis-name</i>	
<i>seq-number</i>	1 2147483647 5 5

ipv6 prefix-list description

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

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

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

OSPF RIP
IP IP
(IP 201.1.1.0/24)

(IP 201.1.1.0/24 OSPF RIP IP

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

match community

COMMUNITY

match community **no**

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

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

<i>standard-list-number</i>	1 99
<i>expanded-list-number r</i>	100 199
<i>communitys-list-name</i>	80
exact-match	

match community

6

exact-match

		1	match	1
set	match			set

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



Q

Q

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...*]}

<i>access-list-number</i>	
<i>access-list-name</i>	

prefix-list *prefix-list-name*

```

                                OSPF          RIP
                                10  RIP      OSPF
                                type-1      40

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

access-list 10 permit 200.168.23.0

route-map redrip permit 10
match ip address 10
set metric 40
set metric-type type-1

```

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

set metric

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 [
```

<i>access-list-number</i>	
<i>access-list-name</i>	

~~prefix-list-name~~ @

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

match ipv6 address

```

match ipv6 address          IPv6
                             no
match ipv6 address { access-list-name | prefix-list prefix-list-name }
no match ipv6 address

```

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

```

OSPF          OSPF          RIP          RIP
              IP
              OSPF
              route maps

```

```

set match 1 match 1
set match 1 set

```

```

10 OSPF OSPF RIP
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

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

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

```

OSPF                                RIP                                RIP
      IP                                OSPF
                                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*

<i>min-length</i>	IP
<i>max-length</i>	IP

<i>Metric</i>	0-4294967295
---------------	--------------

```

OSPF                                RIP                                RIP
                                OSPF
                                IP
                                route maps
                                1
                                match
                                1
                                set
                                match
                                set

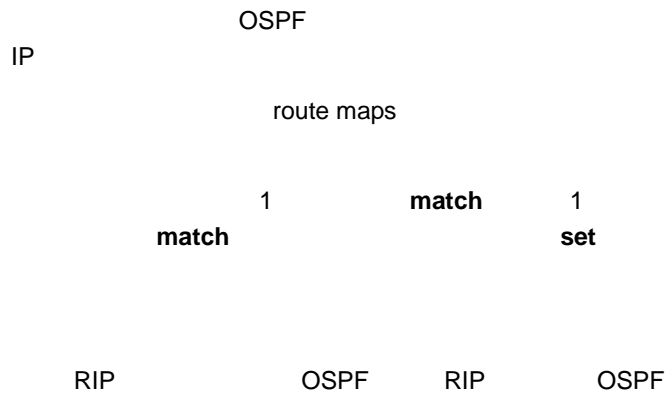
RIP                                OSPF                                RIP                                10
RIP                                OSPF

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	



```

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*]

<i>tag</i>	

```
match tag tag
tag
OSPF OSPF RIP RIP
IP OSPF
route maps
set match 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

no

maximum-paths *number*

no maximum-paths *number*

maximum-paths

--	--



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

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]

```

<i>as-number</i>	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	

```
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

dampening

--	--

half-life) 15

<i>reuse</i>	1..20000 750
<i>suppress</i>	1..20000 2000
<i>max-suppress-time</i>	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
<i>extend-community-value</i>	

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*]]

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

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*]]

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

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

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

set ip next-hop verify-availability

IP
next-hop verify-availability no set ip

set ip next-hop verify-availability ip-address track track-object-nx0jm6]T/T1 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
```

<i>number</i>	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

```
metric match set
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

```

<i>type</i>	

```

OSPF type-2

```

```

OSPF OSPF RIP RIP
IP OSPF

```

route maps

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

 OSPF RIP
 type-1

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

```
route-map redrip permit 10
set metric-type type-1
```

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

set next-hop

 match IP
set next-hop **no**

```
set next-hop ip-address
```

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
no

set tag

set tag tag

no set tag

<i>tag</i>	

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

<i>number</i>	0...65535

BGP

neighbor weight
32768

BGP

```

Ruijie# show route-map
route-map AAA, permit, sequence 10
Match clauses:
ip address 2
Set clauses:
metric 10

```

route-map	
permit	permit
sequence 10	
Match clauses	deny permit set
Set clauses	match

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

IGMP

```
clear ip igmp group
clear ip igmp interface
ip igmp access-group
ip igmp join-group
ip igmp static-group
ip igmp immediate-leave group-list
ip igmp last-member-query-count
ip igmp last-member-query-interval
ip igmp limit (          )
ip igmp querier-timeout
ip igmp query-interval
ip igmp query-max-response-time
ip igmp robustness-variable
ip igmp ssm-map enable
ip igmp ssm-map static
ip igmp version
ip igmp limit (          )
show ip igmp groups
show ip igmp interface
```

clear ip igmp group

IGMP

IGMP

ifname

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

ip igmp access-group

no

```
ip igmp access-group access-list
```

```
no ip igmp access-group
```

<i>access-list</i>	<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*

<i>group-address</i>	
----------------------	--

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

<i>access-list</i>	

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

<i>interval</i>	<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

<i>seconds</i>	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

<i>seconds</i>	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

<i>seconds</i>	300	s	60

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

<i>number</i>	2-7

2

3

```
Ruijie# configure terminal
```

```
Ruijie(config)# interface ethernet 0
```

```
Ruijie(config-if)# ip igmp robustness-variable 3
```

ip igmp version

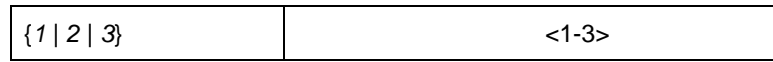
IGMP

no

ip igmp version {1 | 2 | 3}

no ip igmp version

--	--



2.

igmp

igmp

2

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

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

proxy-service 255 32
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

<i>interfname</i>	

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*

<i>access-list</i>	Acl <1-99> <1300-1999> WORD
<i>a.b.c.d</i>	

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*]

<i>group-address</i>	32 IP D 8
<i>interface-type</i>	

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

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

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

```
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*)

<i>A.B.C.D</i>	

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

```
no PIM-DM ip pim dense-mode
no PIM-DM 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-SM DVMRP PIM-DM
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

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

```
ip pim state-refresh disable
```

```
no ip pim state-refresh disable
```

```
SR Cap                          Hello          Hello
```

```
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

<i>interval-seconds</i>	<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**]

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

/ /

show ip pim dense-mode interface

Ruijie# **show ip pim dense-mode interface**

Address	Interface	VIFIndex	Ver/ Mode	Nbr 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*]

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

/ /

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
<i>group_address</i>	pimsm
<i>group_address</i> <i>source_address</i>	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*

<i>access-list</i>	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*]

<i>access-list</i>	access-list <1 99> <1300 1999> acl group-list access-list

PIM

PIM 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*

--	--

<i>priority-value</i>	<0-4294967294>	1
-----------------------	----------------	---

DR 1

DR

hello

DR

IP

DR

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

<i>Interval-seconds</i>	<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}

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

IP

IP

IP

IP RP
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

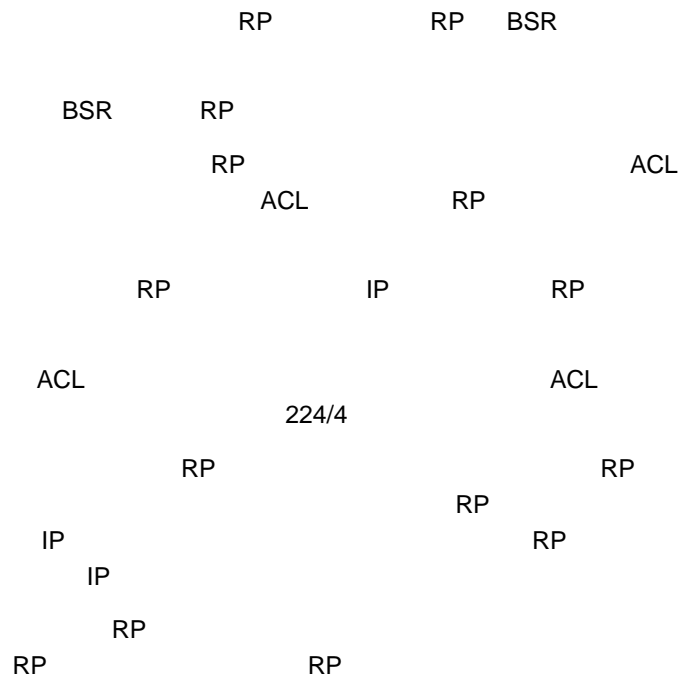
ip pim register-suppression *seconds*



seconds

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

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*]

<i>interface-type</i> <i>interface-number</i>	
<i>priority-value</i>	<0-255> priority priority-value 192
<i>Interval-seconds</i>	<1-16383> interval interval-seconds seconds interval-seconds 60s
<i>access_list</i>	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
    
```

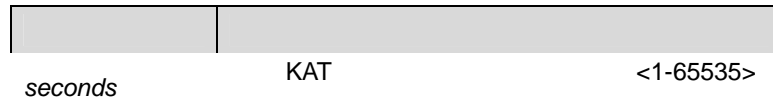
```

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*



```
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]

<i>access-list</i>	access-list 1300-1999 group-list access-list SPT	acl acl	1-99

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		
<i>access_list</i>	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, BSRPriority: 64, Hashmask length:
10
Next bootstrap message in 00:00:42
```

Role: Candidate BSR Priority: 64, Hash mask length: 10
 State: Elected BSR

Candidate RP: 30.30.100.200(GigabitEthernet 0/3)
 Advertisement interval 60 seconds
 Next Cand_RP_advertisement in 00:00:32

show ip pim sparse-mode interface

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

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

/ /

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*]

--	--

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

/ /

PIM SM

IGMP

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

```
GigabitEthernet 0/3:
(*, 225.1.1.1) : Include
```

```
Loopback 1:
```

show ip pim sparse-mode mroute

```
show ip pim sparse-mode mroute {group_address | source_address
/}
```

<i>group_address</i>	A.B.C.D
<i>source_address</i>	A.B.C.D
	(
)

/ /

show ip pim sparse-mode neighbor

```
show ip pim sparse-mode neighbor [detail]
```

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*

<i>group-address</i>	

/ /

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 mroute
```

show ip mroute	
clear ip mroute	

ip mroute

no

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

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

<i>source-address</i>	
<i>mask</i>	
<i>protocol</i>	
<i>rpf-address</i>	
<i>interface-type</i> <i>interface-number</i>	

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*]

<i>limit</i>	1024 1~1024
<i>threshold</i>	1024.

limit 1024

threshold 1024

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

<i>tvl-value</i>	TTL , 0~255

tvl-value 1

TTL TTL
TTL

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-routing
```

```
/ v4
```

ip multicast boundary

```
IP IP no
```

```
ip multicast boundary access-list
```

```
no ip multicast boundary access-list
```

access-list	IP access-list ACL

```
ACL IP IP 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**]

<i>group-address</i>	
<i>source-address</i>	
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 rcv 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 rcv/Reg NACK rcv/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 rcv
Client msg counts: WRONGVIF/WHOLEPKT/Imm Stat/Timed Stat
sent
Reg pkt counts: Reg ACK rcv/Reg NACK rcv/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* }

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

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**

storm-control
switchport protected
switchport port-security
switchport port-security aging
switchport port-security mac-address
port-security arp-check

storm-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

IP() MAC
()

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	1440 0 0

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

```
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

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

show port-security	

show storm-control

show port-security

show storm-control

show storm-control [*interface-id*]

<i>interface-id</i>	

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

Gil/1 Disabled Disabled Disabled

storm-control	

show port-security

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

address	
interface <i>interface-id</i>	

<code>switchport port-security mac-address</code>	
---	--

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 ref154.025gf1.527T4 1 70.0061DB9CDF24 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 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 ethernet 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(2Q/QS'xWzT

```
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#
```



```
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 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
enable Enable
aaa authentication
no

```

```

aaa authentication enable default method1 [method2...]

```

```

no aaa authentication enable default

```

```

default Enable
Enable

```

```

method 4

```

local	
none	
group	TACACS+ RADIUS

AAA Enable

aaa authentication (i)57(c)2(tion eEna()8(le)]TC2_0 1 Tf-0.0001 Tc 0 Tw -24763 0 Td<

ê

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

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

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**

AAA



RADIUS

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



```
aaa new-model
```

RADIUS 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

```
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

```
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+

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

periodic **aaa accounting update**
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

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

aaa new-model	
aaa accounting commands	

Exec
accounting exec

accounting exec {default | *list-name*}

no accounting exec

default Exec

list-name Exec

Exec

Exec

Exec

Exec

```
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

aaa group server	aaa
show aaa group	aaa

server

AAA

no

AAA

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 logout-time

login

aaa local authentication logout-time *logout-time*

logout-time

1~2147483647

15

login

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

show running-config	
show aaa logout	login

aaa new-model

```
AAA          AAA          aaa new-model
AAA          no          AAA
aaa new-model
no aaa new-model
```

AAA

AAA
aaa new-model AAA AAA AAA AAA

AAA

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

aaa authentication	
aaa authorization	
aaa accounting	

clear aaa local user logout

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

<word> ID

Ruijie# **clear aaa local user logout 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 authorizing 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	

AAA

show aaa lockout	login
-------------------------	-------

RADIUS

RADIUS

RADIUS

ip radius 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

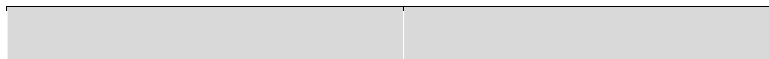
3

AAA

RADIUS

4

Ruijie(config)# **radius-server retransmit** 4



A

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
t deadtime RGOS RADIUS
radius-server deadtime
no
radius-server deadtime minutes
no
```

minutes

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

ÏÀ ~x9bD7 ïÂ—%•X0 •l rP —%y" %BtF—Y"éI96Âœçf"C-7 nü)qWõf L #f•q#f—' Jmn IÂ ð0 • “ y0 @')€G!B

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 Timeout: 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
```

RADIUS

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
```

tacacs-server host	TACACS+
ip address	ip

tacacs-server host

```
TACACS+          IP
tacacs-server host ip-address [port integer] [timeout integer] [key
string]
no tacacs-server host ip-address
```

```
ip-address          TACACS+          IP
```

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

1 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



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

configure terminal
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}

rsa	RSA
dsa	DSA

DISABLE SSH Server SSH Server
service ssh-server **no enable**

2

configure terminal
ip ssh version 2

show ip ssh	SSH Server

RGOS10.1

ip ssh time-out

SSH Server **no**

ip ssh time-out *time*
no ip ssh time-out

<i>time</i>	

time-out 120s **no ip ssh**

SSH Server
120s
show ip ssh SSH server

100s

configure terminal
ip ssh time-out 100

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**

<i>retry times</i>	

3

no ip ssh**authentication-retries**

SSH Server

SSH Server

ip ssh

SSH Server

show

2

configure terminal**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 SSH VTY

show ssh

RGOS10.1

show crypto key mypubkey

SSH Server

show crypto key mypubkey {rsa/dsa}

--	--

rsa	RSA
dsa	DSA

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 interval

security event interval *interval*

no security event interval

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 <i>interval</i>	

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*]

<i>vlan-id</i>	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

```

trust          no          ip arp inspection
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	
<i>limit-rate</i>	1 2048

```

                                15 ARP /
0

```

(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) IP 1 - 99 1300 - 1999

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

2) IP 100 - 199 2000 - 2699

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

3) MAC 700 - 799

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

4) Expert 2700 - 2899

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

Ethernet-type cos

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

Protocol

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

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

z

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
ftp
time
who
xdmcp

Ethernet-type

aarp
appletalk
decnet-iv
diagnostic
etype-6000
etype-8042
lat
larc-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

```

no      IP ACL      IP ACL
no      ACL
ip access-list {extended | standard} {id | name}
no ip access-list {extended | standard} {id | name}

id IP      1-99 1300-1999      100-199
2000-2699

```

name IP

ACL

ACL deny permit ACL
access-lists ACL **show ip**

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 | host destination-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                MAC  0013.0049.8272
                100                        1

Ruijie(config)# mac access-list extended mac1
Ruijie(config-mac-nacl)# deny host 0013.0049.8272 any
aarp
Ruijie(config-mac-nacl)# show access-lists
mac access-list extended mac1
10 deny host 0013.0049.8272 any aarp
Ruijie(config-mac-nacl)#
```

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]] [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

```

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

```

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)#
```

show access-lists	gr4.12oupC2_0

```
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**

```

1          access-list accept_00d0f8xxxxxx_only          Gigabit
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

```

1          access-list accept_00d0f8xxxxxx_only          Gigabit
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)]T/T0 1 Tf-0004 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

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* ACLRuijie(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
1 policy-map
policy-map class-map
class-map 1 ACL ACL ACE
ACE "ACL"
QoS
Policy Map
QoS Policy Map QoS 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
<i>ip-precedence</i>	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

```
Ruijie(config)# no priority-queue
```

```
show mls qos queueing
```

wrr-queue bandwidth

WRR

```
wrr-queue bandwidth weight1 ... weightn
```

```
no wrr-queue bandwidth
```

```
weight1...weightn      n          n
```

```
no
```

```
weight1: ...: weightn = 1:...:1
```

```
Ruijie(config)# wrr-queue bandwidth 1 2 3 4 5 6 7 8
```

```
show mls qos queueing
```

wrr-queue cos-map

CoS

```
wrr-queue cos-map qid cos0 [cos1 [cos2 [cos3 [cos4 [cos5 [cos6  
[cos7]]]]]]]]
```

```
no wrr-queue cos-map
```

```
qid          id
```

```
cos0 ... cos7      CoS
```

no

```
Ruijie(config)# wrr-queue cos-mapE 1 TT5 1 Tf10.85 0 Td(1.501)Tj/TT3 1 Tf0 Tc 3 0
```

dscp

no

```
Ruijie(config)# mls qosE 02mapEc -026s4dscp 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 by 0 dscp3(d[(d)8(2.16c03 TmsÖ)6()])T/C.01ETTf0 Tc 2A61350

```
config-if#2 01000 interface fastEthernet0/24 ip address 10.1.1.1 255.255.255.0
nd#2 01000 ip cef 01000 ip 10.1.1.1 255.255.255.0
```

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 | c7(eccp )0T0 1 Tf-0.0004 Tc 0 T509T5.9]
```

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 <i>ipaddress [secondary]</i>	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          IP
                VRRP          IP          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

VRRP                                VRRP                                VRRP
Master                                VRRP                                Master
VRRP                                VRRP                                IP
VRRP                                VRRP                                VRRP

VRRP                                (200)
15

vrrp 1 preempt delay 15
vrrp 1 priority 200
    
```

Ruijie(config-if)# vrrp group ip <i>ipaddress [secondary]</i>	VRRP IP
Ruijie(config-if)# vrrp group priority <i>level</i>	VRRP

interval VRRP ()

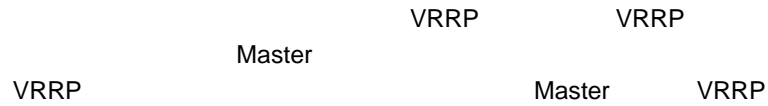
VRRP
1 VRRP

VRRP VRRP
VRRP

VRRP 4

vrrp 1 timers advertise 4





VRRP 1

vrrp 1 timers learn

Ruijie(config-if)# vrrp group ip <i>ipaddress [secondary]</i>	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

10

VRRP

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
<i>group</i>	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 <i>ip address [secondary]</i>	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 interface-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
```

[no] topology guard

cpu topology-limit

```
Ruijie(config)# topology guard
Ruijie(config)# no topology guard
```

tp-guard port enable

cpu topology-limit CPU

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 ()



(347BE_FIL01CF350E>-6<2CD51660.0024 Tc 3.9:6.01 0 31 Tf-0.000

ls

ls *PATHNAME*

PATHNAME

Ruijie# **ls**

Ruijie# **ls tmp**

makefs

Q

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
Server FLASH Syslog
1 Log

Ruijie(config)# no logging on

gg15.816<2 To

logging console	
logging monitor) VTY (telnet
logging trap	Syslog Server

terminal monitor

```

VTY
no
terminal monitor
terminal no monitor

```

```

VTY VTY

```

```

VTY VTY

```

```

no RGOS
, 0 1

```

```

VTY
Ruijie# terminal monitor
Ruijie#

```

logging buffered

```
no
```

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 host

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
level 1 FLASH 6

FLASH

Syslog Server
FLASH
txt

```



```

FLASH FLASH
FLASH logging file flash

```

64K, FLASH trace.txt
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

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	disabled enabled,
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*

1

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