



RG-S5750-28GT-S

RGOS 10.4(2b11)p1

©2000-2012



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! ?Ô

RGOS®10.4(2b11)p1

Z

Z

Z

1.

Courier New

5

2.

Arial

[] []

{x|y|...}

[x|y|...]

//

3.

a !

!

a

1.

2.

3.

1 CLI ǺǺǺǺǺ

1.1 " - ' a —

1.1.1 alias

alias no

alias mode command-alias original-command

no alias mode [original-command]

mode	
command-alias	
original-command	

EXEC

EXEC h p s u un help ping show
 undebug undebug
 no alias exec

alias ?

Ruijie(config)# alias ?
 aaa-gs AAA server group mode
 acl acl configure mode
 bgp Configure bgp Protocol
 config goble configure mode

*

*command-alias=original-command

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

-	-

1.1.2 privilege

privilege

no

privilege mode [**all**] {**level** level | **reset**} command-string

no privilege mode [**all**] [**level** level] command-string

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

privilege

CLI

privilege ?

CLI

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

CLI

1

"test"

reload

```

Ruijie(config)# enable secret level 1 0 test
Ruijie(config)# privilege exec level 1 reload
1 CLI reload
Ruijie> reload ?
<cr>
reload 1 all
Ruijie(config)# privilege exec all level 1 reload
1 CLI reload
Ruijie> reload ?
at reload at a specific time/date
cancel cancel pending reload scheme
in reload after a time interval
<cr>
    
```

enable secret	CLI

-	-

1.2 i μ - ' a —

1.2.1 show aliases

EXEC **show aliases**

show aliases [mode]

mode	

EXEC

EXEC

Ruijie# show aliases exec

exec mode alias:

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

alias	

-	-
---	---

2.1.2 enable

enable

	-	-

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	-	-

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	-	-

2.1.3 enable password

enable password

no

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

Password	EXEC	
Level		
0 7	0	7
encrypted-password		

```

”          1 26
”

```

```

a          EXEC

```

```

Ruijie(config)#          pw10
enable password          pw10

```

enable secret	

-	-

2.1.4 enable secret

enable secret **no**

enable secret [level level] {secret | [0 | 5] encrypted-secret}

no enable secret

Secret	EXEC
Level	
0 5	0 5
encrypted-password	

```

password security password 15
security 0 15
password security 15 password
security password security
password
Ruijie(config)# pw10
enable secret 0 pw10

```

enable password	

-	-

2.1.5 enable service

SSH Server/Telnet Server/Web Server/Snmp Agent
enable service

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

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

|

|

no enable service

|

Ruijie(Config) enable service ssh-sesrver, SSH Server
enable service ssh-sesrver

|

show service	

|

|

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2.1.6 execute

execute

execute {[flash:] filename}

|

flash:	
filename	

|

|

|

TFTP Flash PC
CLI

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Telnet line_rcms_script.text
configure terminal

```

line tty 1 16
transport input all
no exec
end

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

```

-	-

-	-

2.1.7 ip http authentication

Http Server

Web

Web

ip http authentication

ip http authentication { enable | local }

enable	enable password	enable secret 15
local	username 15	

enable

┌

┌

Web **no ip http authentication**

┌

Ruijie(config)# Web local
ip http authentication local

┌

enable service	

┌

┌

-	-

2.1.8 ip http port

┌

HTTP **ip http port**

ip http port number

┌

number	HTTP Server 80

┌

80

┌

┌

HTTP **no ip http port**

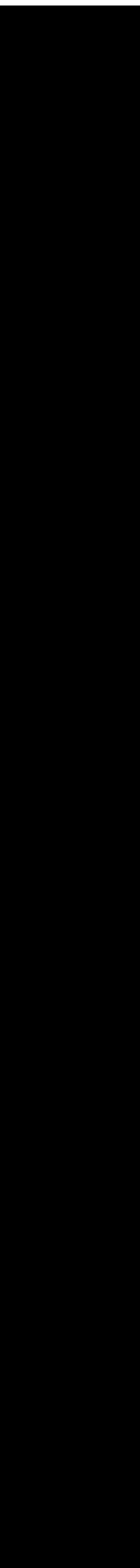
┌

Ruijie(config)# HTTP 8080
ip http port 8080

┌

enable service	

┌



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lockable

no lockable

	-	-

|

|

line

|

lock

EXEC

|

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

|

	lock	

|

|

	-	-

2.1.12 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

┌

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|

line

|

AAA

|

VTY

radius

Ruijie(config)# aaa new-model

Ruijie(config)# aaa authentication login default radius

Ruijie(config)# line vty 0

Ruijie(config-line)# login authentication default



```

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

```

username	

-	-

2.1.15 privilege mode

CLI

-	-

CLI

CLI

CLI

CLI

-	-

-	-

2.1.16 password

line

line

password

no

line

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

no password

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|

-	-

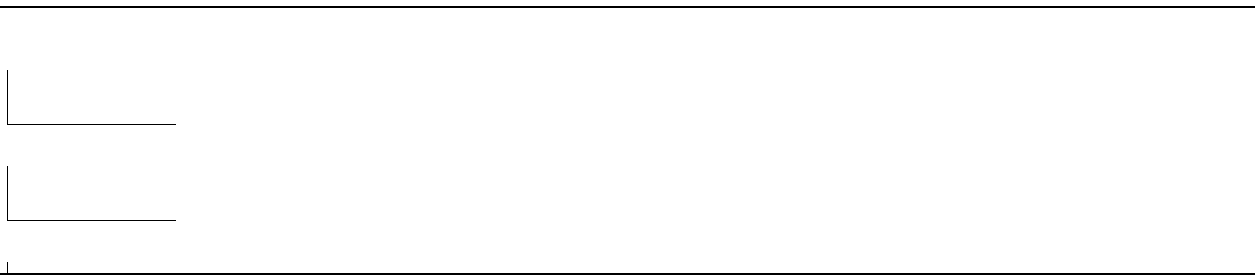
|

|

service password-encryption
password

show running write

service password-encryption



```

1          telnet          IPV4          192.168.1.1
          vlan 1          VRF          vpn1
Ruijie# telnet 192.168.1.1 /source interface vlan 1 /vrf vpn1

```

ip telnet source-interface	IP Telnet
show session	TTY
exit	

-	-

2.1.19 username

username

username name{**no**password|password{password | [0|7]encrypted-password }}

username name **privilege** privilege-level

no username name

name	
password	
0 7	0 7
encrypted-password	

┌

┌

7
a 7 7

┌

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

┌

login local	

┌

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2.2 " n ‡ , Ä • 8 - ' a —

2.2.1 banner login

banner login

no banner login

banner login c message c

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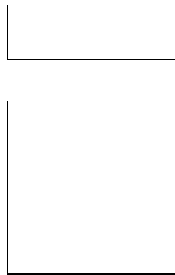
c	
message	

┌

┌

┌

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



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-	-

2.2.3 boot system

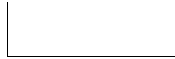
no

boot system url

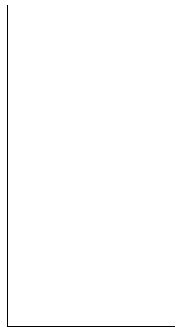
no boot system



url	

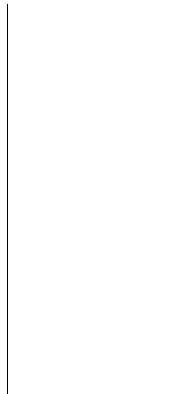


“ flash:/rgos.bin”



url

	1	flash	URL	flash
a	2	Boot ROM		



```
Ruijie#show boot system
system boot file: flash:/rgos.bin
```

```
Ruijie#dir
Directory of flash:/
11015744 2008-01-01 08:00:46 rgos.bin
12019754 2008-02-01 08:00:46 s5750_10_4.bin
```

399 2006-01-01 08:01:37 config.text
 33,030,144 bytes total. (10,590,592 bytes free)

```
Ruijie(config)# boot system s5750_10_4.bin
Ruijie(config)# show boot system
system boot file: flash:/ s5750_10_4.bin
s5750_10_4.bin
```

show boot system	

-

-	-

2.2.4 clock set

clock set

clock set hh:mm:ss month day year

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

clock set

```

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

```

show clock	

-	-

2.2.5 clock update-calendar

clock update-calendar

-	-

calendar

Ruijie# clock update-calendar

-	-

	-	
	-	-

2.2.6 exec-timeout

	LINE	exec-timeout	no exec-timeout
	LINE		
	exec-timeout minutes [seconds]		
	no exec-timeout		
	minutes		
	seconds		
	10 min		
	LINE		
			LINE
	line vty 0	5 30	
	Ruijie(config-line)#	exec-timeout 5 30	
	-	-	
	-	-	

2.2.7 hostname

hostname

hostname name

name	63

Ruijie

CHAP


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

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-	-

2.2.10 session-timeout

```

LINE
no session-timeout
LINE
session-timeout minutes [output]
no session-timeout

```

minutes	
output	

```
0 min
```

```
LINE
```

```

LINE
LINE

```

```

line vty 0 5 30
Ruijie(config-line)# exec-timeout 5 30

```

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	-	-

2.2.11 speed

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

```

1          boot config
Ruijie# write
Building configuration...
[OK]
2          boot config          U
          U          write
Ruijie(config)# boot config /mnt/usb1/config.text
Ruijie# write
Building configuration...
Write to boot config file: [/mnt/usb1/config.text]
[OK]
Ruijie# usb remove 1
0:1:1:38 Ruijie: USB-5-          USB_DISK_REMOVED: USB Device <USB Mass
Storage Device> Removed!
Ruijie# write
Building configuration...
Write to boot config file: [/mnt/usb1/config.text]
[Failed]
The device [usb1] does not exist, write to the default config file
[/config.text]? [no]          yes
Write to the default config file: [/config.text]
[OK]

```

boot config	
copy	
show running-config	

-	-

2.3 接口配置

2.3.1 show clock

show clock

show clock

-	-

detail

show clock

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

clock set	

--	--

2.3.2 show line

show line

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

console	
aux	aux
vty	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

```

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└───

-	-

2.3.3 show reload

show reload

show reload

-	-

└───

└───

└───

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

-	-

└───

-	-

2.3.4 show running-config

show running-config

show running-config

	-	-

└───┘

└───┘

└───┘

└───┘

	-	-

└───┘

	-	-

2.3.5 show startup-config

NVRAM
show startup-config

show startup-config

	-	-

└───┘

└───┘

	NVRAM	startup-config
	startup-config	Flash " /config.text"

|

|

-	-

|

|

-	-

2.3.6 show version

show version

show version [slots | devices]

|

|

|

slots	
devices	

|

|

|

|

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

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L

	-	-

3 LINE a —

3.1 LINE " - ' a —

3.1.1 access-class

```

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

```

access-list-number	access-list
in	

LINE

	-	-

3.1.2 line

LINE

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

aux	
console	
tty	
vty	telnet/ssh

	VTY	VTY	no
	line vty line-number		
	no line vty line-number		
	-	-	
	VTY	5	0--4
	VTY		
	1 VTY	20	VTY 0--19
	Ruijie(config)# line vty	19	
	2 VTY	10	VTY 0—9
	Ruijie(config)# line vty	10	
	-	-	
	-	-	

3.1.4 transport input

Line	transport input	Line
default transport input	LINE	
transport input {all ssh telnet none}		
default transport input		
all	Line	
ssh	Line	SSH

LINE

telnet	Line	Telnet
none	Line	

VTY TTY NONE
default transport input

Line

Line VTY VTY **show**
running Line **default transport input no transport**
input LINE
transport input none

4 " îU¹ÿ Ë]na—

4.1 " - ' a —

4.1.1 ping

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

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

2 5 100Byte IP

Ping z 1 0 0 B y t l e P N

DNS

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

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

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-	-

4.1.2 traceroute

traceroute

traceroute [**vrf**] [**vrf-name**] [**ip ip-address**][**ip-address** [**probe number**] [**source source**]
[**timeout seconds**] [**tll minimum maximum**]]

vrf-name	VRF
ip-address	IPv4

number	
source	IPv4 127.0.0.1
seconds	
minimum maximum	TTL

8ac46 200-2(3 25296/C2_0 1 Tf 0 Tc 0 Tw 60 Td [<0A51>521355522531D0E3

Traceroute

DNS

-

traceroute

q

-

```
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
```

```
IP 202.108.37.42
```

```
1 17 4
```

```
Ruijie# traceroute www.ietf.org
```

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

```
< press Ctrl+C to break >
```

```
Tracing the route to 64.170.98.32
```

```
1 192.168.217.1 0 msec 0 msec 0 msec
2 10.10.25.1 0 msec 0 msec 0 msec
3 10.10.24.1 0 msec 0 msec 0 msec
4 10.10.30.1 10 msec 0 msec 0 msec
5 218.5.3.254 0 msec 0 msec 0 msec
6 61.154.8.49 10 msec 0 msec 0 msec
7 202.109.204.210 0 msec 0 msec 0 msec
8 202.97.41.69 20 msec 10 msec 20 msec
9 202.97.34.65 40 msec 40 msec 50 msec
10 202.97.57.222 50 msec 40 msec 40 msec
11 219.141.130.122 40 msec 50 msec 40 msec
12 219.142.11.10 40 msec 50 msec 30 msec
```

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5.1

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5.1.2 clear counters

clear counters [interface-id]

	interface-id	

┌

┌

	show interfaces	clear
counters		

Ruijie# clear counters gigabitethernet 1/1

	show interfaces	

┌

	-	-

5.1.3 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	

┌

┌

-	-

5.1.4 description

no

description string

no description

┌

string	

┌

┌

┌

show interfaces

┌

Ruijie(config)# interface gigabitethernet

1/1

Ruijie(config-if)# description GBIC-1

┌

show interfaces	

	-	-

5.1.5 duplex

no

duplex {auto | full | half}

no duplex

	auto	
	full	
	half	

--

--

show interfaces

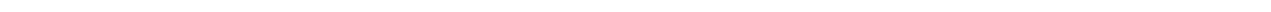
Ruijie(config-if)# duplex full

	show interfaces	

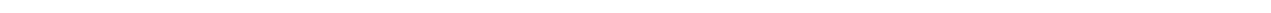
--

	-	-

5.1.6 flowcontrol



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



	show interfaces	

|

-

	-	-

5.1.9 interface giagbitEthernet

interface gigabitEthernet mod-num/port-num

	mod-num/port-num	/

|

|

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

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

	show interfaces	

|

	-	-

5.1.10 interface vlan

switch virtual interface SVI

no SVI

interface vlan vlan-id

no interface vlan vlan-id

vlan-id	VLAN ID

|

|

|

show interfaces **show interfaces vlan**

Ruijie(config)#
Ruijie(config-if)#

interface vlan 2

show interfaces	

|

-	-

5.1.11 line-detect

line-detect

line-detect

|

|

line-detect

Ruijie(config)#interface gigabitEthernet
Ruijie(config-if-GigabitEthernet 0/1)#line-detect
Interface : GigabitEthernet 0/1

0/1

start cable-diagnoses,please wait...

cable-daignoses end!this is result:

4 pairs

pair state length(meters)

A Ok 1

pair state length(meters)

B Ok 2

pair state length(meters)

C Short 1

pair state length(meters)

D Short 1

	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
	-	-

5.1.13 mtu

	mtu
Mtu num	





show interfaces

clear interface	
show interfaces	

-	-

5.1.15 snmp trap link-status

```

LinkTrap
SNMP LinkTrap, LinkTrap no SNMP Link
LinkTrap

```

snmp trap link-status

no snmp trap link-status


```

Link SNMP LinkTrap

```

```

Ap SVI LinkTrap
Link SNMP LinkTrap,

```

```

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

```

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

-	-
---	---

5.1.16 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	
------------------------	--

-	-

5.1.17 switchport access

no **access port** VLAN

switchport access vlan vlan-id

no **switchport access vlan**

vlan-id	VLAN ID

switch port access VLAN VLAN 1

VLAN ID VLAN ID VLAN VLAN

VLAN 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

trunk port, 802.1Q switch port no access port

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 trunk port VLAN

1 “ S

Access vlan is 1,Native vlan is 1

Protected is disabled

Vlan lists is

1,3-4094

diagnosis	
------------------	--

<pre>Ruijie# show interfacesgigabitEthernet 0/1 switchport Interface Switchport ModeAccess Native Protected VLAN lists ----- GigabitEthernet 0/1 enabled Access 11 Disabled ALL</pre>

6 Aggregate Port a —

6.1 " - ' a —

6.1.1 aggregateport load-balance

AP no

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

no aggregateport load-balance

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

MAC

```

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

```

show aggregateport load-balance	aggregateport
-	-

6.1.2 port-group

```

Aggregate Port
Aggregate Port
port-group port-group-number
no port-group

```

port-group-number	Aggregate Port Aggregate Port

```

Aggregate Port

```

AP	VLAN	trunk port	native
VLAN	AP		
Ruijie(config)#	1/3 interface gigabitethernet	AP 3	1/3
Ruijie(config-if)#	port-group 3		
-	-	-	-

┌

┌

-	-

6.2 配置

6.2.1 show aggregateport

aggregateport

┌

aggregate-port-number	Aggregate Port
load-balance	aggregate port
summary	aggregate port

┌

┌

┌

aggregate port

aggregate port

┌

```
Ruijie# show aggregateport 1 summary
AggregatePort MaxPorts SwitchPort Mode Ports
-----
Ag1      8      Enabled ACCESS
```

┌

aggregateport load-balance	AP

┌

┌

-	-

7 VLAN a —

7.1 " - ' a —

7.1.1 name

VLAN no

name vlan-name

no name



switchport access vlan vlan-id

no switchport access vlan

	vlan-id	VLAN ID

```
switch port access VLAN VLAN 1
```

```

                VLAN ID          VLAN ID          VLAN
                VLAN              VLAN ID          VLAN

                trunk port
```

```

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

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

	-	-

7.1.3 switchport mode

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

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

no switchport mode

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

switch port access

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

Ruijie(config-if)# switchport mode trunk

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

-	-

7.1.4 switchport trunk

trunk port 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		

VLAN all Native VLAN VLAN 1

Native VLAN

Trunk native VLAN native VLAN
 UNTAG VLAN VLAN ID
 IEEE 802.1Q PVID native VLAN VLAN ID Trunk
 native VLAN UNTAG
VLAN
 Trunk VLAN 1 4094
 Trunk VLAN VLAN Trunk

show interfaces switchport

```

VLAN 2 1/15
Ruijie(config)# interface fastethernet 1/15
Ruijie(config-if)# switchport trunk allowed vlan remove 2
Ruijie(config-if)# end
Ruijie# show interfaces fastethernet 1/15 switchport
Interface Switchport Mode Access Native Protected VLAN lists
-----
FigabitEthernet 1/15 enabled TRUNK 1 1 Disabled 1,3-4094
    
```

show interfaces	
switchport access	access port VLAN

VLAN

-	-
---	---

7.2 配置 VLAN

7.2.1 show vlan

VLAN

show vlan [id vlan-id]

vlan-id	VLAN ID
---------	---------

└──

└──

└──

end **Ctrl+C**
exit

Ruijie# show vlan id 1
VLAN Name Status Ports

1 VLAN0001 STATIC Fa0/1, Fa0/2

name	VLAN
switchport access	Vlan

└──

└──

-	-
---	---

Super-vlan

subvlan ip

subvlan-address-range start-ip end-ip

no subvlan-address-range



VLAN

end **Ctrl+C**
exit

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

show supervlan	supervlan

-	-

8.1.4 proxy-arp

VLAN ARP

proxy-arp

no proxy-arp

-	-

VLAN

end **Ctrl+C**
exit

Ruijie(config)# vlan

	show supervlan	supervlan
	-	-

8.2 配置

8.2.1 show supervlan

SuperVLAN SubVLAN

show supervlan

show supervlan id vlan-id

	vlan-id	VLAN ID

┌

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```

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


┌



9 Protocol VLAN a —

9.1 " - ' a —

9.1.1 protocol-vlan ipv4 addr mask addr vlan id

IP	VLAN
addr	IP x.x.x.x
id	VLAN ID 1- VLAN

┌

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┌

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

show protocol-vlan ipv4	-
no protocol-vlan ipv4 addr mask addr	-
no protocol-vlan ipv4	-

┌ RGOS10.1

-	-
---	---

9.1.2 protocol vlan ipv4

IP VLAN

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

RGOS10.1

-	-

9.1.4 protocol-vlan profile num vlan id

profile

num	profile
id	VLAN ID 1- VLAN

Ruijie(config-if)#

protocol-vlan profile 1 vlan 101

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

RGOS10.1

	-	-

9.2 ıµ - ' a —

9.2.1 show protocol-vlan

Protocol VLAN

show vlan protocol-vlan

	-	-

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└───┘

└───┘

└───┘ Ruijie# show protocol-vlan

	-	-

└───┘ RGOS10.1



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VLAN

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VLAN

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Ruijie(config)# vlan 22

Ruijie(config-vlan)# private-vlan primary

|

show vlan private-vlan	-

RGOS10.1

|

show vlan private-vlan	-

RGOS10.1

-	-

10.1.5 switchport private-vlan host-association

private VLAN primary VLAN secondary VLAN

switchport private-vlan host-association p_vid s_vid

no switchport private-vlan host-association

p_vid	primary VID
s_vid	secondary VID
no	VLAN

|

|

|

```

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

show vlan private-vlan	-

RGOS10.1

--	--

Private VLAN

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

primary	primary VLAN
community	community VLAN
isolated	isolated VLAN

private VLAN

Ruijie# show vlan private-vlan

-	-

RGOS10.1

-	-

10.3 Hybrid a —

10.3.1 switchport hybrid allowed vlan

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

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

┌
└

-	-

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└

RGOS10.1

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└

-	-

10.3.2 switchport hybrid native vlan

switchport hybrid native vlan vid

no switchport hybrid native vlan

hybrid vlan

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└

no	hybrid VLAN

┌
└

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└

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└

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

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└

-	-

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RGOS10.1

	-	-

10.3.3 switchport mode hybrid

switchport mode hybrid

no switchport mode

hybrid

no		hybrid

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Ruijie(config-if)# switchport mode hybrid

	-	-

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RGOS10.1

	-	-

11 QinQ a —

11.1 " - ' a —

11.1.1 dot1q outer-vid vid register inner-vid v_list

tunnel vid

dot1q outer-vid vid register inner-vid v_list

no dot1q outer-vid vid register inner-vid v_list



	-
--	---

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

access trunk hybrid uplink vid

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

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

v_list	vid
vid	tag vid
no	

--

--

--

```

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

show translation-table [interface intf-id]	-

RGOS10.3

-	-

11.1.3 dot1q relay-vid vid translate inner-vid v-list

access trunk hybrid uplink vid

dot1q relay-vid vid translate inner-vid v-list

no dot1q relay-vid vid translate inner-vid v-list

v_list		vid
vid	tag	vid
no		

┌

┌

┌

```

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

show translation-table [interface intf-id]	-

┌

RGOS10.4

-	-

11.1.4 dot1q-Tunnel cos inner-cos-value remark-cos outer-cos-value

/ tag tag

dot1q-Tunnel cos inner-cos-value remark-cos outer-cos-value

no dot1q-Tunnel cos inner-cos-value remark-cos outer-cos-value

no	


```

ruijie(config-if)#      frame-tag tpid      0x9100
ruijie(config-if)#      end
ruijie#      show frame-tag tpid
Ports tpid
-----
Gi0/3  0x9100
    
```

show frame-tag tpid	-

RGOS10.1

-	-

11.1.6 inner-priority-trust enable

/ tag tag

inner-priority-trust enable

no inner-priority-trust enable

no	tag tag

┌

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```

tag                    tag
ruijie#      configure
ruijie(config)#      interface      gigabitEthernet      0/2
ruijie(config-if)#      inner-priority-trust enable
ruijie(config-if)#      end
    
```

--	--

	show inner-priority-trust	-
	RGOS10.1	
	-	-

11.1.7 mac-address-mapping x source-vlan src-vlan-list

destination-vlan dst-vlan-id

vlan mac vlan

mac-address-mapping x destination-vlan dst-vlan-id source-vlan src-vlan-list

no mac-address-mapping x destination-vlan dst-vlan-id source-vlan src-vlan-list

	no	vlan vlan

┌

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```

tag                      tag
ruijie# configure
ruijie(config)# interface gigabitEthernet 0/2
ruijie(config-if)#
    
```

-	-

11.1.8 switchport mode dot1q-tunnel

dot1q-tunnel

switchport mode dot1q-tunnel

no switchport mode

--	--

	no		uplink
		uplink	
	ruijie(config)#	uplink	
	ruijie(config-if)#	interface gigabitEthernet	0/1
	ruijie(config-if)#	switchport mode uplink	
	ruijie(config)#	end	
	show vlan		-
		RGOS10.1	
		-	-

11.1.10 switchport dot1q-tunnel allowed vlan

dot1q-tunnel vlan

switchport dot1q-tunnel allowed vlan [add] {tagged|untagged} v_list

switchport dot1q-tunnel allowed vlan remove v_list

-

|
|

|
|

|
|
|

```
                dot1q-tunnel   vlan 3-6   vlan   tag
ruijie(config)#   interface gigabitEthernet   0/1
ruijie(config-if)#       switchport dot1q-tunnel allowed vlan tagged           3- 6
ruijie(config)#       end
```

|
|
|

show interface dot1q-tunnel	-

RGOS10.3

```
|  
| ruijie(config)# end
```



	show traffic-redirect	-

RGOS10.3

	-	-

11.1.13

show traffic-redirect	-

┌

RGOS10.3

-	-

11.1.14 traffic-redirect access-group acl nested-vlan

dot1q-tunnel vid

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

no traffic-redirect access-group acl nested -vlan

acl	acl
vid	vid
no	vid

┌

┌

┌

```

1.1.1.3 vid 9
ruijie# configure
ruijie(config)# ip access-list standard 20
ruijie(config-acl-std)# permit host 1.1.1.3
ruijie(config-acl-std)# exit
ruijie(config)# interface gigabitEthernet 0/1
ruijie(config-if)# switchport mode dot1q-tunnel
ruijie(config-if)# traffic-redirect access-group 20 nested-vlan 10
in
ruijie(config-if)# end
    
```



	-	-

11.1.16 I2protocol-tunnel proto-type enable

I2protocol-tunnel { stp|gvrp } enable

no I2protocol-tunnel { stp|gvrp } enable

stp		stp
gvrp		gvrp
no		

┌

┌

┌

┌

```

ruijie# configure
ruijie(config)# interface fa 0/1
ruijie(config-if)# I2protocol-tunnel gvrp enable
ruijie(config-if)# end
    
```

show I2protocol-tunnel { gvrp stp }		-

┌

RGOS10.3



l2protocol-tunnel { stp|gvrp } tunnel-dmac mac-address

no l2protocol-tunnel { stp|gvrp } tunnel-dmac mac-address

stp	stp
gvrp	gvrp
no	01d0f8 3 (stp 000005 gvrp 000006)

┌
└
┌
└

```

ruijie# configure
ruijie(config-if)# l2protocol-tunnelgvrptunnel-dmac 011AA9000005
ruijie(config-if)# end
    
```

show l2protocol-tunnel { gvrp stp }	-

┌
└

RGOS10.4

-	-

11.2 j μ - ' a —

11.2.1 show dot1q-tunnel

```

dot1q-tunnel
show dot1q-tunnel [interface intf-id]
    
```

	intf-id	

└──

└──

└──

```

ruijie# show dot1q-tunnel
Ports Dot1q-tunnel
---- -
Gi0/1 Enable
    
```

	-	-

RGOS10.3

	-	-

11.2.2 show frame-tag tpid

tpid

show frame-tag tpid [interface intf-id]

	intf-id	

tpid

└──

└──

```

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

-	-

RGOS10.1

-	-

11.2.3 show inner-priority-trust

show inner-priority-trust

-	-

└───┘

└───┘

└───┘

```

ruijie# show inner-priority-trust
Ports inner-priority-trust
-----
Gi0/1 enable
    
```

-	-

RGOS10.1

	-	-

11.2.4 show interface dot1q-tunnel

dot1q-tunnel

show interface [intf-id] dot1q-tunnel

	intf-id	

|

|

|

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

	-	-

RGOS10.3

[REDACTED]

T

-	-
---	---

┌

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```
Ruijie# show interface intf-name remark
Ports  Type  From value To value
-----
Gi0/1  Cos-To-Cos 3 5
```

-	-
---	---

┌ RGOS10.1

-	-
---	---

11.2.6 show interface mac-address-mapping x

MAC

show mac-address-mapping x

-	-
---	---

┌

┌

┌

```
ruijie# show mac-address-mapping 1
Ports  Destination-VID Source-VID-list
```

Gi0/1	5	1-3
[Redacted]		[Redacted]
-		-
RGOS10.1		
[Redacted]		[Redacted]
-		-

11.2.7 show registration-table

```
dot1q-tunnel  vid  
show registration-table [interface intf-id]  
[Redacted] 4 0.24 24.72 0 Td(21( )2814 0.24 24.72 0 Td(21( )2814 0.24 24.72 0
```

	-	-
--	---	---

11.2.8 show traffic-redirect

vid

show traffic-redirect [interface intf-id]



QinQ

show translation-table [interface intf-id]

|

|

```
ruijie# show l2protocol-tunnel stp
Destination mac      : 01d0f8000005
L2protocol-tunnel: Stp Enable
ruijie# show l2protocol-tunnel gvrp
Destination mac      : 01d0f8000006
L2protocol-tunnel: gvrp Disable
```

|

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|

RGOS10.3

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-	-

12 Share VLAN a —

12.1 " - ' a —

12.1.1 share

share vlan



Share VLAN

Status duplicated
share vlan

S

-

-

5 ,ÖG!5B

end

Ctrl+C

exit

Ruijie# show mac-address-table share

Vlan MAC Address Type Interface Status

1 0040.4650.1e1e DYNAMIC Gigabit 0/1 original

2 0040.4650.1e1e DYNAMIC Gigabit 0/1 duplicated

GVRP

no gvrp dynamic-vlan-creation enable

	-	-

┌
└

vlan

┌
└

┌
└

show gvrp configuration

┌
└

Ruijie(config)# gvrp dynamic-vlan-creation enable

┌
└

show gvrp configuration		GVRP

┌
└

┌
└

	-	-

13.1.3 gvrp enable

GVRP no

gvrp enable

no gvrp enable

┌
└

	-	-

┌
└

GVRP

	show gvrp configuration	GVRP
	-	-

13.1.4 gvrp registration mode

		VLAN
	no	
	gvrp registration mode {normal disabled}	
	no gvrp registration mode	
	-	-
		VLAN
	show gvrp configuration	

GVRP no

gvrp timer {join | leave | leaveall} timer_value

no gvrp timer

join timer_value	0		
leave timer_value	VLAN	Leave Message	
		Join Message	VLAN
leaveall timer_value	Empty	Join Message	
		VLAN	
leaveall timer_value	LeaveAll timer		LeaveAll
	Message		
	LeaveAll Message		
	Message	LeaveAll Message	LeaveAll
	Leave timer		
	leaveall	leaveall + join	

```

join timer          200ms  leave timer          600ms  leaveall timer
10,000ms
    
```

┌

```

show gvrp configuration
no gvrp timer  join  leave  leaveall timer
    
```

```

Ruijie(config)#  gvrp timer join  200
    
```

show gvrp configuration	GVRP
--------------------------------	------

13.2 配置

13.2.1 clear gvrp statistics

GVRP

clear gvrp statistics { interface-id | all}

	interface-id	ID

|

|

|

show gvrp statistics

|

Ruijie# clear gvrp statistics all

|

	show gvrp statistics	GVRP

|

|

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show gvrp configuration

```
Ruijie# show gvrp configuration
Global GVRP Configuration:
GVRP Feature:enabled
GVRP dynamic VLAN creation:enabled
Join Timers(ms):200
Join Timers(ms):600
Join Timers(ms):10000
Port based GVRP Configuration:
Port:GigabitEthernet 3/1 app mode:normal reg mode:normal
Port:GigabitEthernet 3/2 app mode:normal reg mode:normal
Port:GigabitEthernet 3/3 app mode:normal reg mode:normal
Port:GigabitEthernet 3/4 app mode:normal reg mode:normal
Port:GigabitEthernet 3/5 app mode:normal reg mode:normal
Port:GigabitEthernet 3/6 app mode:normal reg mode:normal
Port:GigabitEthernet 3/7 app mode:normal reg mode:normal
Port:GigabitEthernet 3/8 app mode:normal reg mode:normal
Port:GigabitEthernet 3/9 app mode:normal reg mode:normal
Port:GigabitEthernet 3/10 app mode:normal reg
mode:normal
Port:GigabitEthernet 3/11 app mode:normal reg
mode:normal
Port:GigabitEthernet 3/12 app mode:normal reg
mode:normal
```

GVRP

show gvrp statistics {interface-id | all}

interface-id	ID

┌

┌

┌

show gvrp statistics

GVRP

```

Ruijie# show gvrp statistics gigabitethernet 1/1
Interface GigabitEthernet 3/1
RecValidGvrpPdu 0
RecInvalidGvrpPdu 0
RecJoinEmpty 0
RecJoinIn 0
RecEmpty 0
RecLeaveEmpty 0
RecLeaveIn 0
RecLeaveAll 0
SentGvrpPdu 0
SentJoinEmpty 0
SentJoinIn 0
SentEmpty 0
SentLeaveEmpty 0
SentLeaveIn 0
SentLeaveAll 0
JoinIndicated 0
LeaveIndicated 0
JoinPropagated 0
LeavePropagated 0
    
```

┌

clear gvrp statistics	GVRP

|

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-	-

13.2.4 show gvrp status

GVRP

VLAN

VLAN

show gvrp status

|

-	-

|

|

|

show gvrp status

GVRP

|

Ruijie# show gvrp status

|

-	-

|

|

-	-

14 MAC a —

14.1 " - ' a —

14.1.1 address-bind

ip mac

address-bind ip-address mac-address

no address-bind ip-address

ip-address	IP
mac-address	mac

┌

┌

	IP		MAC		IP	IP
		MAC		IP	MAC	

┌
Ruijie(config)#

```

ip 3.3.3.3 mac 00d0.f811.1112
address-bind 3.3.3.3 00d0.f811.1112
    
```

┌
show address-bind

show address-bind	

┌

┌
-

-	-

14.1.2 address-bind install

/

address-bind install

no address-bind install

	-	-

|

|

|

```
fa 0/1
Ruijie(config)# address-bind uplink fa0/1
Ruijie(config)# address-bind install
```

	show address-bind uplink	

|

RGOS10.1

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```

                IP           MAC           IP           IP
                MAC           IP           MAC
    
```

```

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

show address-bind	

-	-

14.1.4 address-bind uplink

```

        ip      mac      .
    
```

address-bind uplink intf-id

no address-bind uplink intf-id



intf-id	



```

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

MAC

14.1.6 clear mac-address-table filtering

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

filtering	
address mac-addr	
vlan vlan-id	VLAN

└───┘

└───┘

└───┘

show mac-address-table filtering

└───┘

```

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



interface interface-id	
vlan vlan-id	VLAN

|

|

|

show mac-address-table static

|

MAC 00d0.f800.073c
Ruijie# clear mac-address-table static address 00d0.f800.073c

|

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

|

|

)
--	---

show mac-address-table dynamic

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

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

-	-

14.1.9 mac-address-table filtering

no

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

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

mac-address	
vlan vlan-id	VLAN ID

show mac-address-table filtering

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

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

MAC

┌

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-	-

14.1.10 mac-address-table notification

MAC no

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

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

┌

interval value	MAC Trap 1
history-size value	MAC 50

┌

1

50

┌

MAC

Trap

snmp-server enable traps mac-notification

MAC

Trap

1

U4@

-	-
---	---

14.1.11 mac-address-table static

no

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

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

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

--

--

--

show mac-address-table static

clear mac-address-table static

```

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

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

--

-	-

14.1.12 snmp trap mac-notification

MAC

no

snmp trap mac-notification {added | removed

```

mac-address-learning
-----
MAC
1
Ruijie(config-if)# no mac-address-learning
    
```

14.2 接口地址绑定

14.2.1 show address-bind

```

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

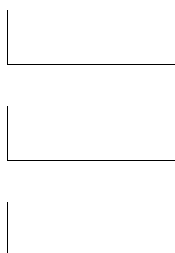
--	--	--

14.2.3 show mac-address-table address

MAC

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

address mac-addr	MAC
interface interface-id	
vlan vlan-id	VLAN



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

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



MAC

	-	
--	---	--

14.2.4 show mac-address-table aging-time

show mac-address-table aging-time

	-	-

|

|

|

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

"		
---	--	--

|

|

|

```
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

|

|

-	-

14.2.6 show mac-address-table dynamic

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

|

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

|
|
|

|
|
|

|
|
|
|
|

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



```

1 00d0.f800.1002 STATIC gigabitethernet 1/1
1 00d0.f800.1003 STATIC gigabitethernet 1/1
1 00d0.f800.1004 STATIC gigabitethernet 1/1
    
```

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

-	-

14.2.9 show mac-address-table notification

MAC

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

interface interface-id	MAC
history	MAC

MAC

Ruijie#

```
GigabitEthernet1/14 Disabled Disabled
Ruijie# show mac-address-table notification
MAC Notification Feature : Disabled
Interval between Notification Traps : 1 secs
Maximum Number of entries configured in History Table :1
Current History Table Length : 0
Ruijie# show mac-address-table notification history
History Index : 0
MAC Changed Message :
Operation:ADDVlan:1MACAddr:00f8.d012.3456GigabitEthernet3/1
```

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

-	-

14.2.10 show mac-address-table static

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

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

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

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

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

14.2.1


```

Ruijie(config-ext-nacl)# permit ip host 1.1.1.1 host 233.3.3.3
Ruijie(config)# interface ethernet 0
Ruijie(config-if)# ip igmp access-group ext_acl
    
```

-	-

┌

-	-

15.1.2 ip igmp join-group

no

ip igmp join-group group-address

no ip igmp join-group group-address

--	--

┌

┌

-	-

15.1.3 ip igmp immediate-leave group-list

IGMPversion2 IGMPversion3

no

ip igmp immediate-leave group-list access-list

no ip igmp immediate-leave group-list

┌

access-list	

┌

┌

┌

```
IGMP                2s
IGMP                IGMP
```

┌

```
Ruijie# configure terminal
Ruijie(config)# access-list 1 permit 225.192.20.0 0.0.0.255
Ruijie(config)# interface ethernet 0/1
Ruijie(config-if)# ip igmp immediate-leave group-list 1
Ruijie(config-if)# exit
```

┌

ip igmp last-member-query-interval	-

┌

	-	-

15.1.4 ip igmp last-member-query-count

last-member-query-count leave
 last-member-query-count no

ip igmp last-member-query-count number

no ip igmp last-member-query-count

	number	, <2-7>
	,	, 2 ,

	except	access-list limit
	access-list	

1024

IGMP IGMP
IGMP

Ruijie(config-if)# 300 ip igmp limit 300

	-	-

	-	-

15.1.7 ip igmp limit (æ e ")

igmp no
ip igmp limit number [except access-list]
no ip igmp limit number [except access-list]

	number	IGMP
	except	access-list limit

65536

IGMP
IGMP

300
Ruijie config # ip igmp limit 300

-	-

-	-

15.1.8 ip igmp mroute-proxy

ip igmp mroute-proxy interfname

no ip igmp mroute-proxy

interfname	

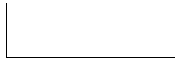
gmp proxy-service

mroute-proxy

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

15.1.9 ip igmp proxy-service

	mroute-proxy	
	mroute-proxy	
	ip igmp proxy-service	
	no ip igmp proxy-service	
	-	-
	proxy-service	
		32 IGMP Proxy
	proxy-service	proxy-service
	proxy-service	mroute-proxy
	switchport	ip igmp
	mroute-proxy interface	
	proxy-service	
Ruijie(config-if)#	ip igmp proxy-service	
	-	-



no

ip igmp query-max-response-time seconds

no ip igmp query-max-response-time

255s

IGMPv2
query-interval Ruijie 255s **ip igmp**

1 Ethernet 0 200s
 Ruijie(config-if)# ip igmp query-timeout 200
 2 Ethernet 0
 Ruijie(config-if)# no ip igmp query-timeout

-	-

-	-

15.1.13 ip igmp robustness-variable

no

ip igmp robustness-variable number

no ip igmp robustness-variable

number	2-7

2

```

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

-	-

┌

-	-

15.1.14 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

-	-

┌

-	-

15.1.15 ip igmp ssm-map static

ssm-map

ip igmp ssm-map static access-list a.b.c.d

no ip igmp ssm-map static access-list a.b.c.d

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

┌

┌

┌

ip igmp ssm-map enable

v3

┌

```

ACL 11 192.168.2.2
Ruijie(config)# ip igmp ssm-map static 11 192.168.2.2.
    
```

-	-

no ip igmp static-group group-address

group-address	

┌

┌

┌

```

                                Eth0      236.6.6.6
Ruijie#      configure terminal
Ruijie(config)#      interface ethernet      0
Ruijie(config-if)#      ip igmp static-group      236.6.6.6
Ruijie(config-if)#      exit
    
```

-	-

┌

-	-

15.1.17 ip igmp version

IGMP

no

ip igmp version {1 | 2 }

no ip igmp version

{1 2 }	<1-23>

┌

2

|

|

|

```

                igmp                igmp
                2
Ruijie# configure terminal
Ruijie(config)# interface ethernet 0
Ruijie(config-if)# ip igmp version 2
    
```

|

-	-

|

|

-	-

15.2 i μ - ' a —

IGMP

	-	-

15.2.3 show ip igmp groups

IGMP

show ip igmp groups [group-address | interface-type interface-number] [detail]

group-address	32	IP	D	8

```

Uptime: 00:00:42
Group mode: Include
Last reporter: 192.168.50.111
TIB-A Count: 2
TIB-B Count: 0
Group source list: (R - Remote, M - SSM Mapping)
Source Address Uptime v3 Exp Fwd Flags
192.168.55.55 00:00:42 00:03:38 Yes R
192.168.55.66 00:00:42 00:03:38 Yes R
    
```

-	-

```

┌
└
    
```

-	-

15.2.4 show ip igmp interface

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

interface-type	
interface-number	

```

┌
└
    
```

```

┌
└
    
```

```

┌
└
    
```

```

Ruijie# show ip igmp interface
Interface vlan 1(Index 4294967295)
    
```

```

IGMP Active, Non-Querier, Version 3 (default)
IGMP querying router is 0.0.0.0
IGMP query interval is 125 seconds
IGMP querier timeout is 255 seconds
IGMP max query response time is 10 seconds
Last member query response interval is 1000 milliseconds
Group Membership interval is 260 seconds
IGMP Snooping is globally enabled
IGMP Snooping is enabled on this interface
IGMP Snooping fast-leave is not enabled
IGMP Snooping querier is not enabled
IGMP Snooping report suppression is enabled
    
```

-	-

-	-

15.2.5 show ip igmp ssm-mapping

```

IGMP      ssm-map
show ip igmp ssm-mapping ( A.B.C.D )
    
```

A.B.C.D	

```

IGMP      ssm-map
    
```

```

1      ssm-map
Ruijie# sh ip igmp ssm-mapping
    
```

SSM Mapping : Enabled
Database : Static mappings configured
2 233.3.3.3
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

-	-

-	-

16 DHCP Snooping a —

16.1 DHCP snooping æ e a —

16.1.1 ip dhcp snooping

```
DHCP Snooping
DHCP Snooping
```

no

[no] ip dhcp snooping

-	-

```

DHCP Snooping
snoping
show ip dhcp snooping
DHCP
a DHCP Snooping Private VLAN

```

```

DHCP snooping
Ruijie# configure terminal
Ruijie(config)# ip dhcp snooping
Ruijie(config)# end
Ruijie# show ip dhcp snooping
Switch DHCP snooping status          ENABLE
Verification of hwaddr field status   DISABLE
DHCP snooping database write-delay time: 0 seconds
DHCP snooping option 82 status: ENABLE
DHCP snooping Support Bootp bind status: ENABLE
Interface      Trusted  Rate limit (pps)
-----

```

--	--

show ip dhcp snooping	DHCP snooping
-	-

16.1.2 ip dhcp snooping bootp-bind

```
DHCP Snooping      Bootp
no                  DHCP snooping      Bootp
```

[no] ip dhcp snooping bootp-bind

-	-

```

                DHCP Snooping      Bootp
Snooping      Bootp                Bootp      DHCP
Snooping      Bootp                DHCP
```

```

                DHCP Snooping      Bootp
Ruijie# configure terminal
Ruijie(config)# ip dhcp snooping bootp-bind
Ruijie(config)# end
Ruijie# show ip dhcp snooping
Switch DHCP snooping status          ENABLE
Verification of hwaddr field status  DISABLE
DHCP snooping database write-delay time: 0 seconds
DHCP snooping option 82 status: ENABLE
DHCP snooping Support Bootp bind status: ENABLE
Interface      Trusted      Rate limit (pps)
-----
```

	show ip dhcp snooping	DHCP snooping
	-	-

16.1.3 ip dhcp snooping database write-delay

	DHCP Snooping	no	FLASH
			FLASH
	ip dhcp snooping database write-delay time		
	[no] ip dhcp snooping database write-delay		
	time	DHCP snooping	FLASH
		FLASH	
	DHCP Snooping	FLASH	
		IP	

show ip dhcp snooping	DHCP snooping

-	-

16.1.4 ip dhcp snooping database write-to-flash

DHCP Snooping

	-	-
--	---	---

16.1.5 ip dhcp snooping information option

DHCP

option82

DHCP Snooping

	-	-
--	---	---

[

DHCP

no

[no] ip dhcp snooping limit rate rate-value

rate-value	PPS[Packet Per Second]

┌

┌

┌

```

DHCP Snooping   VLAN
                CPP[CPU Protect Protocol]   CPP       DHCP
                CPP                         DHCP Snooping
CPP
show ip dhcp snooping
    
```

┌

```

          1          100pps
Ruijie# configure terminal
Ruijie(config)# interface fastEthernet 0/1
Ruijie(config-if)# ip dhcp snooping limit rate 100
Ruijie(config-if)# end
Ruijie# show ip dhcp snooping
Switch DHCP snooping status          ENABLE
Verification of hwaddr field status  DISABLE
DHCP snooping database write-delay time: 0 seconds
DHCP snooping option 82 status: ENABLE
DHCP snooping Support Bootp bind status: ENABLE
Interface      Trusted  Rate limit (pps)
-----
FastEthernet0/1  NO    100
    
```

show ip dhcp snooping	DHCP snooping

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16.2.2 ip dhcp snooping suppression

suppression no
no suppression

[no] ip dhcp snooping suppression

-	-

┌

┌

┌

DHCP

┌

```

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

-	-

┌

-	-

16.2.3 ip dhcp snooping trust

oooping

DHCP snooping
no

TRUST
UNTRUST

[no] ip dhcp snooping trust



16.3 DHCP snooping | μ a —

16.3.1 show ip dhcp snooping

DHCP Snooping

show ip dhcp snooping

-	-

DHCP Snooping

DHCP Snooping

Ruijie# show ip dhcp snooping

Switch DHCP snooping status ENABLE

Verification of hwaddr field status DISABLE

DHCP snooping database write-delay time: 0 seconds

DHCP snooping option 82 status: ENABLE

DHCP snooping Support Bootp bind status: ENABLE

Interface Trusted Rate limit (pps)

----- ----- -----

ip dhcp snooping	DHCP snooping
ip dhcp snooping verify mac-address	DHCP snooping mac
ip dhcp snooping write-delay	flash
ip dhcp snooping information option	DHCP option82
ip dhcp snooping bootp-bind	DHCP Snooping Bootp
ip dhcp snooping trust	DHCP snooping trust



16.4 DHCP snooping c Q " a —

16.4.1 clear ip dhcp snooping binding

DHCP Snooping

clear ip dhcp snooping binding

-	-

┌

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┌

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

┌

-	-

16.4.2 debug ip dhcp snooping

DHCP Snooping

debug ip dhcp snooping {event | packet}

	-	-

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└

DHCP snooping

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└

DHCP snooping

Ruijie# debug ip dhcp snooping event

Ruijie# debug ip dhcp snooping packet

	-	-

17 IGMP Snooping a —

17.1 " - ' a —

17.1.1 deny

	profile	profile	deny
deny			
	deny	profile	
	profile	deny	
	profile		
	profile	range	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		
	-	-	

17.1.2 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	

high-ip-address

```
a          pim snooping          igmp snooping  IVGL  IVGL-SVGL
          no ip igmp snooping  igmp snooping
          pim snooping          pim snooping
```

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



	vlan 2	igmp snooping
Ruijie(config)#	ip igmp snooping vlan 2	
	ip igmp snooping ivgl	igmp snooping ivgl
	ip igmp snooping ivgl-svgl	igmp snooping
	-	-

17.1.7 ip igmp snooping svgl vlan

	vlan	SVGL	vlan	ip igmp snooping svgl
vlan	no	Shared VLAN	vlan 1	
	ip igmp snooping svgl vlan vid			
	no ip igmp snooping svgl vlan			
	vid	vlan id		
	Shared VLAN	vlan 1		
	SVGL	IVGL-SVGL		
	vlan 2	igmp snooping svgl	vlan	
Ruijie(config)#	ip igmp snooping svgl vlan 2			
	ip igmp snooping svgl	igmp snooping	svgl	
	ip igmp snooping ivgl-svgl	igmp snooping		

-	-

17.1.8 ip igmp snooping svgl profile

profile SVGL ip igmp snooping svgl
 profile no
 ip igmp snooping svgl profile profile-number
 no ip igmp snooping svgl profile

profile-number	profile <1-65536>

svgl profile

SVGL IVGL-SVGL

Ruijie(config)# ip igmp snooping svgl profile 2
 ip igmp snooping svgl profile 2

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

-	-

17.1.9 ip igmp snooping dyn-mr-aging-time

ip igmp snooping dyn-mr-aging-time time

no ip igmp snooping dyn-mr-aging-time

time	,	<1-3600>

300s

Hello IGMP PIM

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

-	-	



		100s	
Ruijie(config)#	ip igmp snooping query-max-response-time		100
		-	-

17.1.12 ip igmp snooping suppression enable

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

	-	-

disable

IGMP vlan IGMP Report suppression IGMPv3 report	IGMP Report IGMPv1/v2 report
---	-------------------------------------

igmp snooping suppression

Ruijie(config)# ip igmp snooping suppression

|

|

-	-

17.1.13 ip igmp snooping mrouter learn pim-dvmrp

IGMP Query/Dvmrp/PIM Hello
ip igmp snooping mrouter learn no

ip igmp snooping mrouter learn pim-dvmrp

no ip igmp snooping mrouter learn pim-dvmrp

|

|

|

|

no

vlan

vlan

vlan

igmp snooping

|

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

|

--	--

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

┌

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-	-

17.1.14 ip igmp snooping vlan mrouter interface

ip igmp snooping vlan mrouter interface , no

ip igmp snooping vlan vid mrouter interface interface-id

no ip igmp snooping vlan vid mrouter interface interface-id

┌

vid	vlan id
interface-id	id

┌

┌

┌

IP

┌

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

--	--

17.1.15 ip igmp snooping vlan mrouter learn pim-dvmrp

IGMP Query/Dvmrp/PIM Hello	
ip igmp snooping vlan mrouter learn	no

ip igmp snooping vlan vid mrouter learn pim-dvmrp

igmp snooping
 IGMP
 no

ip igmp snooping vlan static interface

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	

|

-	-

17.1.17 ip igmp snooping filter

profile no profile

ip igmp snooping filter profile-number

no ip igmp snooping filter profile-number

--	--

profile-number	profile	<1-65536>
----------------	---------	-----------

┌

┌

IGMP Profile	IGMP Report
	IGMP Profile
	profile
	filter

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

ip igmp profile	profile

┌

-	-

17.1.18 ip igmp snooping max-groups

```

ip igmp snooping
max-groups no
ip igmp snooping max-groups number
no ip igmp snooping max-groups
    
```

number	<0 – 1024>

┌

┌

┌

```

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

```

ip igmp snooping filter	

-	-

17.2 igmp snooping

17.2.1 show ip igmp snooping

igmp snooping

Show ip igmp snooping [gda-table | interfaces | mrouter| statistics [vlan vlan-id]]

	igmp snooping
gda-table	
interfaces	igmp snooping filtering
mrouter	
statistics [vlan vlan-id]	snooping
vlan	vlan snooping

```

EXEC

```

	-	-

┌

	-	-

17.2.2 show ip igmp profile [profile-number]

		profile
profile-number		profile

┌

┌ EXEC

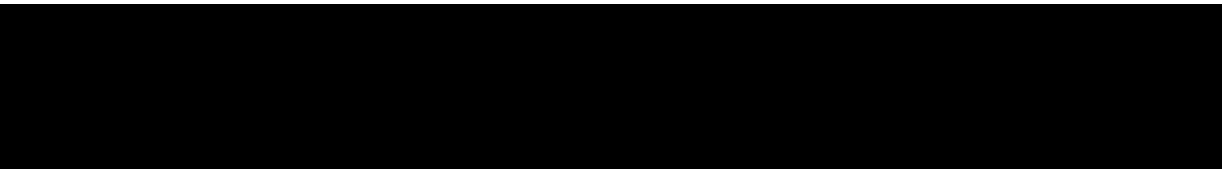
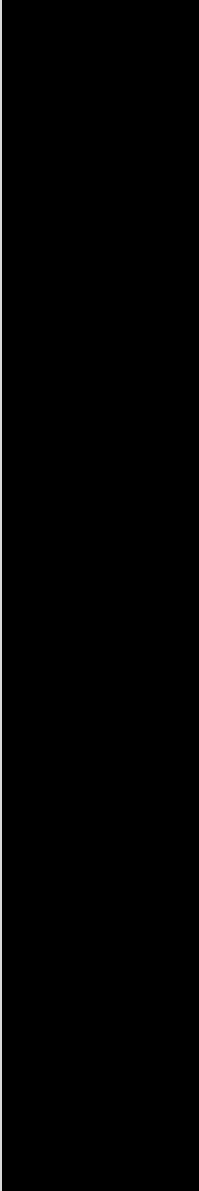
┌ profile

┌

[Redacted]

debug igmp-snp event
debug igmp-snp packet
debug igmp-snp msf
debug igmp-snp warning
undebug igmp-snp
undebug igmp-snp event
undebug igmp-snp packet
undebug igmp-snp msf
undebug igmp-snp warning





STP

clear spanning-tree counters [interface interface-id]

	interface-id	

┌
└

┌
└

┌
└

┌ Ruijie# clear spanning-tree counters

	show spanning-tree counters	STP

┌
└

	10.4(2b11)p1	

18.1.3 clear spanning-tree detected-protocols

RSTP BPDU BPDU

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

	interface-id	

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└

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└

┌
└

┌ Ruijie# clear spanning-tree detected-protocols

show spanning-tree interface	STP
-	-

18.1.4 spanning-tree

MSTP MSTP MSTP
 no spanning-tree no spanning tree

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

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

forward-time seconds	
hello-time seconds	BPDU
max-age seconds	BPDU

spanning-tree

forward-time hello-time max-age

$$2 * (\text{Hello Time} + 1.0\text{snd}) \leq \text{Max-Age Time} \leq 2 * (\text{Forward-Delay} - 1.0\text{snd})$$

```

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

2        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
-	-

18.1.5 spanning-tree autoedge

Autoedge disabled Autoedge

spanning-tree autoedge [disabled]

disabled	Autoedge
Ruijie(config)#	interface gigabitethernet 1/1
Ruijie(config-if)#	spanning-tree autoedge disabled
show spanning-tree interface	STP
-	-

18.1.6 spanning-tree bpdufilter

BPDU filter enabled disabled
BPDU filter

spanning-tree bpdufilter [enabled | disabled]

spanning-tree bpdufilter [enabled disabled]	
enabled	BPDU filter
disabled	BPDU filter

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

|
|_____

|
|_____

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

┌

┌

-	-

18.1.9 spanning-tree guard loop

loop guard

no
bpdu

loop guard

loop guard

spanning-tree guard loop

no spanning-tree guard loop

┌

-	-

┌

loop guard

┌

┌

┌

Ruijie(config-if)#

spanning-tree guard loop

┌

-	-

┌

┌

-	-

18.1.10 spanning-tree guard none

guard

no

guard

spanning-tree guard none

no spanning-tree guard none

	-	-

guard

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

	-	-

	-	-

18.1.11 spanning-tree guard root

root guard no root guard root guard

spanning-tree guard root

no spanning-tree guard root

	-	-

root guard

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

-	-

┌

-	-

18.1.12 spanning-tree link-type

“ ” no

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

no spanning-tree link-type

point-to-point	point-to-point.
shared	shared

┌

shared. point-to-point

┌

┌

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

show spanning-tree interface	STP

┌

--	--

hop-count	BPDU	1
	40	

hop-count 20

Region	Root Bridge	BPDU	Hot Count	Root Bridge
	Hop Count	1	0	BPDU
Hops	0	BPDU		
max-hops		Instance		

MST Instance Max-hops 10
 Ruijie(config)# spanning-tree max-hops 10
show spanning-tree mst

show spanning-tree	MSTP
---------------------------	------

-	-
---	---

18.1.15 spanning-tree mode

STP no
spanning-tree mode [stp | rstp | mstp]
no spanning-tree mode

┌

┌

┌

Ruijie(config)# spanning-tree mode stp

┌

[Redacted]	
show spanning-tree	

┌

┌

[Redacted]	
-	-

18.1.16 spanning-tree mst configure

MST MSTP Region no
name revision vlan map

spanning-tree mst configuration

no spanning-tree mst configuration

┌

[Redacted]	
-	-

ãÿ

```

10          VLAN      Instance 0      VLAN      Instance
          no      no instance instance-id [vlan vlan-range] (      no
Instance   1 64)
name name      MST          32          no name

revision version      MST          0 65535      no revision

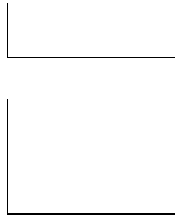
show          MST region
    
```

```

          MST          VLAN 3, 5-10      MST Instance 1.
Ruijie(config)# spanning-tree mst configuration
Ruijie(config-mst)# instance 1 vlan 3 5-10
Ruijie(config-mst)# name region 1
Ruijie(config-mst)# revision 1
Ruijie(config-mst)# show
MST configuration
Name [region1]
Revision 1
Instance Vlans Mapped
-----
0 1-2,4,11-4094
1 3,5-10
-----
Ruijie(config-mst)# exit
Ruijie(config)#
          VLAN 3      Instance 1          MST
Ruijie(config-mst)# no instance 1 vlan 3
          Instance 1
Ruijie(config-mst)# no instance 1
          MST          show
    
```

show spanning-tree mst		MST region	
instance instance-id	vlan vlan-range	Vlan	MST Instance
name		MST	
revision		MST	
show		MST	MST





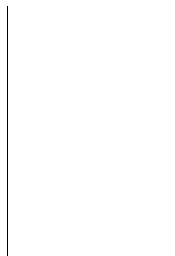
-	-

18.1.18 spanning-tree mst port-priority

Instance
Region no

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

no spanning-tree [mst instance-id] port-priority



Instance-id	Instance 0 64
priority	0 16 32 48 64 80 96 112 128 144 160 176 192 208 224 240 16 16



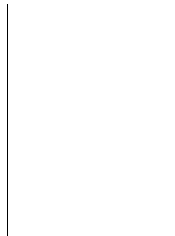
```
Instance-id 0
priority 128
```



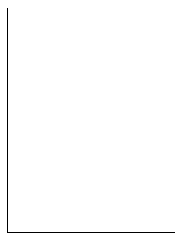
.



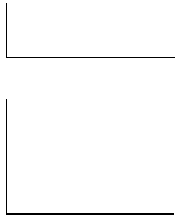
Region



```
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	MSTP
spanning-tree mst cost	
spanning-tree mst priority	Instance



-	-

18.1.19 spanning-tree mst priority

Instance

	disabled	Portfast
	-	
	Ruijie(config)# interface gigabitethernet 1/1	
	Ruijie(config-if)# spanning-tree portfast	
	show spanning-tree interface	STP
	-	-

18.1.22 spanning-tree portfast bpdudfilter default

	BPDU filter	no	BPDU filter
	spanning-tree portfast bpdudfilter default		
	no spanning-tree portfast bpdudfilter default		
	BPDU filter		
	BPDU Filter	BPDU	show spanning-tree
	Ruijie(config)# spanning-tree portfast bpdudfilter default		

	show spanning-tree interface	STP
	-	-

18.1.23 spanning-tree portfast bpduguard default

	BPDU guard	no	BPDU guard
	spanning-tree portfast bpduguard default		
	no spanning-tree portfast bpduguard default		
	-	-	

BPDU Guard.

	BPDU guard	BPDU	error-disabled
	show spanning-tree		
	Ruijie(config)#	spanning-tree portfast bpduguard	default
	show spanning-tree interface	STP	
	-	-	

18.1.24 spanning-tree portfast default

Portfast	no	Portfast
spanning-tree portfast default		
no spanning-tree portfast default		

Ruijie(config)# spanning-tree reset

show spanning-tree	STP
show spanning-tree interface	STP

-	-

18.1.26 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

-	-

-	-

18.1.27 spanning-tree tc-protection

tc- protection no tc- protection

spanning-tree tc- protection

no spanning-tree tc- protection

	-	-

tc- protection

Ruijie(config)# spanning-tree tc- protection

	-	-

	-	-

18.1.28 spanning-tree tc-protection tc-guard

tc- guard no tc- guard tc-guard
tc

spanning-tree tc-protection tc-guard

no spanning-tree tc-protection tc-guard

	-	-

tc- guard

|

|

|

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

|

-	-

|

|

-	-

18.2 μ -a —

18.2.1 show spanning-tree

spanning-tree forward-time

spanning-tree bpduguard	BPDU guard
spanning-tree link-type	“ ”

19 SPAN a —

19.1 " - ' a —

19.1.1 monitor session

SPAN . no

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

no monitor session session_number [**source interface** interface-id [**both** | **rx** | **tx**] | **destination interface** interface-id **switch**] | [**acl** name]

no monitor session all

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

switch port routed port AP

SPAN

|

|

|

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

|

monitor session	SPAN

|

|

-	-

20 RSPAN a —

20.1 " - ' a —

20.1.1 monitor session

```
RSPAN
no
```

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

monitor session session-num **destination remote vlan** vlan-id [**reflector-port**] **interface** interface-name [**switch**]

monitor session session-num **source interface** interface-name [**rx** | **tx** | **both**]

monitor session session-num **destination remote vlan** vlan-id **reflector-port** **interface** interface-name [**switch**]

session-num	
vlan-id	remote span vlan id
Interface-name	

```
┌
```

```
┌
```

```
┌
```

```
┌
```

```
end          Ctrl+C
```

```
exit
```

```
1
```

```
Ruijie(config)#
```

```
monitor session
```

```
2 remote-source
```

```
Ruijie(config)#
```

```
monitorsession
```

```
2 sourceinterface
```

```
gigabitEthernet
```

```
1/2 //
Ruijie(config)# monitor session 2 destination remote vlan 7
interface gigabitEthernet 1/3 switch //
Ruijie(config)# monitor session 2 destination remote vlan 7
reflector-port interface gigabitEthernet 1/1 switch
2
Ruijie(config)# monitor session 2 remote-destination
Ruijie(config)# monitor session 2 destination remote vlan 7
interface gigabitEthernet 1/1 switch
```

show monitor	

reflector-port

--	--

-

-

	show vlan	Vlan

21 ERSPAN a —

21.1 " - ' a —

21.1.1 monitor session

```
ERSPAN                                no
monitor session session_num {
```

	-		-
	no shutdown		
	ERSPAN		
		end	Ctrl+C
		exit	
	1		
	Ruijie(config)#	monitor session	2 erspan-source
	Ruijie(config-mon-erspan-src)#shutdown		
	show monitor		
	-		-

21.1.3 source

ERSPAN

source interface single-interface [rx|tx|both]

	single-interface		
	ERSPAN		
		end	Ctrl+C
		exit	

```
1
Ruijie(config)# monitor session 2 erspan-source
Ruijie(config-mon-erspan- src)#source interface gigabitethernet
0/1 both
```

show monitor	

-	-

21.1.4 destination ip address

```
GRE          IP
destination ip address ip_address
```

--	--

-	-

21.1.5 origin ip address

GRE IP

origin ip address ip_address

ip_address	GRE IP

└──

└──

ERSPAN

└──

end Ctrl+C
exit

└──

1
Ruijie(config)# monitor session 2 erspan-source
Ruijie(config-mon-erspan-src)origin ip address 11.1.1.2

└──

show monitor	

└──

└──

-	-

21.1.6 ip ttl

IP TTL

ip ttl ttl-value

ttl-value	IP ttl

|

64

|

ERSPAN

|

end Ctrl+C
exit

|

1
Ruijie(config)# monitor session 2 erspan-source
Ruijie(config-mon-erspan-src)#ip ttl 65

|

show monitor	

|

|

-	-

21.1.7 ip dscp

IP dscp

ip dscp dscp-value

|

dscp-value	IP dscp

|

0

|

ERSPAN

|

end Ctrl+C
exit

|

1
Ruijie(config)# monitor session 2 erspan-source

Ruijie(config-mon-erspan-src)#ip dscp 56

show monitor	

-	-

22 IP a —

22.1 Ç " a —

22.1.1 ip address

IP no IP

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

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

ip-address	32	IP	8	
network-mask	32		"1"	"0"
		8		
secondary			IP	

IP

IP IP IP
 IP IP IP
 32 IP IP
 " 1" IP " 0"
 IP A "



”

”

IP

IP

IP

IP

|
|
|
|
|

```
”  
”          SLIP HDLC PPP LAPB Frame-relay          X.25  
”          ping          IP  
          SNMP  
”
```

|
|
|

```
          FastEthernet 0/1  
IP  
ip unnumbered fastEthernet 0/1
```

|
|
|

[Redacted]	
show interface	
[Redacted]	

|
|

|
|

[Redacted]	
------------	--

┌

┌

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

┌

ARP
 arp 1.1.1.1 4e54.3800.0002 arpa

┌

clear arp-cache	ARP

┌

┌

-	-

22.2.2 arp gratuitous-send interval

arp no

arp gratuitous-send interval seconds

no arp gratuitous-send

┌

seconds	ARP <1-3600>

```
Ruijie(config-if)# arp gratuitous-send interval 1  
2
```



-	-

22.2.4 arp retry times

arp IP ARP
no 5 ARP

arp retry times number

no arp retry times

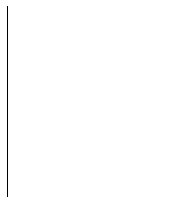
number	1 ARP ARP <1-100> 1 ARP



ARP ARP 5



ARP ARP



1 ARP
arp retry times 1
2 ARP 1
arp retry times 2



22.2.5 arp timeout

ARP

ARP

no

arp timeout seconds

no arp timeout

	seconds	0-2147483

3600

ARP
ARP

IP

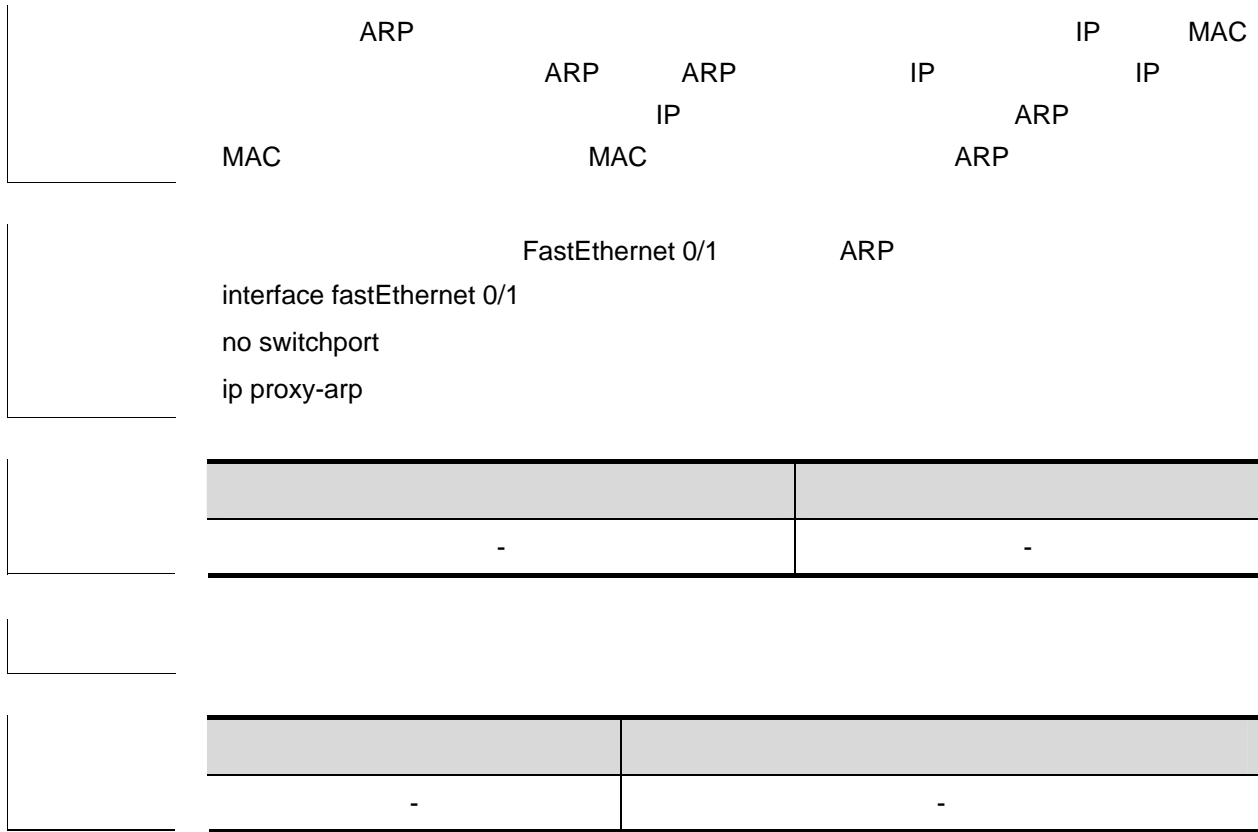
MAC
ARP

no arp unresolve

number	>	ARP 8192	< 1-8192
ARP		8192	
		ARP	
arp unresolved		500	
		-	-
		-	-

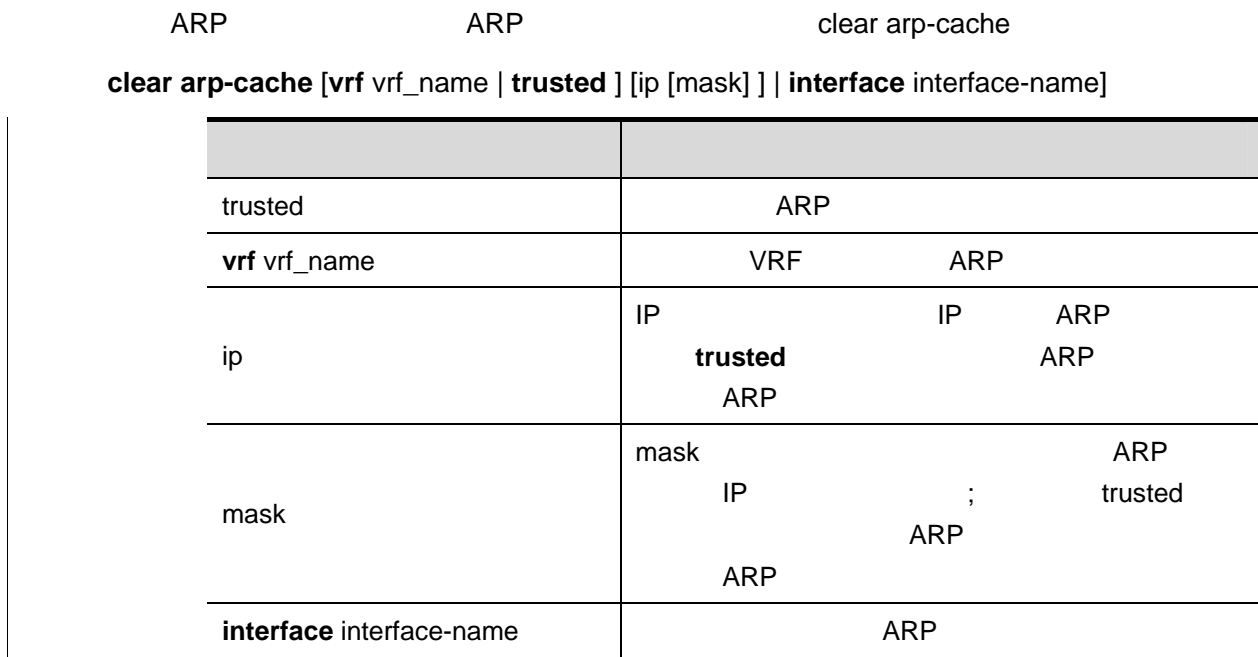
22.2.7 ip proxy-arp

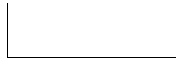
ARP ARP **ip proxy-arp** no
 ARP
ip proxy-arp
no ip proxy-arp



22.3 IP 3 Ê ä a —

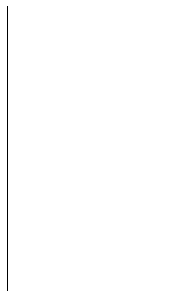
22.3.1 clear arp-cache





```

ARP
-----
NFPP(Network Foundation Protection Policy , )
a clear arp mac ( IP) ARP
   clear arp 1s
   ARP
-----
    
```



```

1 ARP
clear arp-cache

2 ARP 1.1.1.1
clear arp-cache 1.1.1.1

3 SVI1 ARP
clear arp-cache interface Vlan 1
    
```



arp	ARP

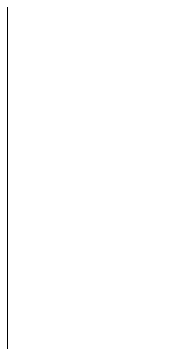


-	-

22.3.2 show arp

ARP

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



vrf vrf_name	VRF VRF ARP
trusted	ARP VRF
ip	IP ARP trusted ARP ARP

mask	IP ARP ; trusted ARP
static	arp
mac-address	mac ARP
complete	arp
incomplete	arp
oob	(interface of mgmt) ARP

|
 |
 |
 |

```

1      show arp
Ruijie# show arp
Total Numbers of Arp: 7
Protocol Address    Age(min) Hardware
Type Interface
> < N M      Ä  shoc[(" 00"Tc0 Tw 4.305 0Td [<B766.2F0E31.28 0.c-0.0037 677
  
```

```

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

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

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

-	-

-	-

22.3.3 show arp counter

ARP arp

show arp counter

-	-

┌

┌

show arp counter

Ruijie# show arp counter

The Arp Entry counter:0

The Unresolve Arp Entry:0

┌

-	-

┌

┌

-	-

22.3.4 show arp detail

ARP

show arp detail [interface-type interface-number] ip [mask] | mac-address | **static** | **complete** | **incomplete**]

┌

interface-type interface-number	ARP
ip	ip ip ARP
ip mask	ip mask ARP
mac-address	mac ARP
static	arp
complete	arp
incomplete	arp

┌

┌

┌

ARP

ARP

show arp detail

Ruijie# show arp detail

IP Address	MAC Address	Type	Age(min)	Interface	Port
20.1.1.1	000f.e200.0001	Static	-- --	--	
20.1.1.1	000f.e200.0001	Static	--	VI3	--
20.1.1.1	000f.e200.0001	Static	--	VI3	Gi2/0/1
193.1.1.70	00e0.fe50.6503	Dynamic	1	VI3	Gi2/0/1
192.168.0.1	0012.a990.2241	Dynamic	10	Gi2/0/3	Gi2/0/3
192.168.0.1	0012.a990.2241	Dynamic	20	Ag1	Ag1
192.168.0.1	0012.a990.2241	Dynamic	30	VI2	Ag2
192.168.0.39	0012.a990.2241	Local	--	VI3	--
192.168.0.39	0012.a990.2241	Local	--	Gi2/0/3	--
192.168.0.1	0012.a990.2241	Local	--	VI3	--
192.168.0.1	0012.a990.2241	Local	--	Gi2/3/2	--

ARP

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

-	-
---	---

IP

	10.4	10.4

22.3.5 show arp timeout

ARP

Help address is: 0.0.0.0

Proxy ARP is: ON

22.4.1 ip default-gateway

ip default-gateway no

ip default-gateway

no ip default-gateway

	-	-

|

|

|

show ip redirects

|

192.168.1.1

ip default-gateway 192.168.1.1

|

	show ip redirects	

|

|

	-	-

23 DHCP a —

23.1 DHCP " - ' a —

23.1.1 bootfile

	DHCP	DHCP	bootfile
	no		
	bootfile file-name		
	no bootfile		
	DHCP		
		DHCP	DHCP
		next-server	TFTP
		router.conf	
	bootfile router.conf		
	ip dhcp pool		DHCP
			DHCP
	next-server		DHCP
			IP
	-		-

23.1.2 client-identifier

DHCP	no	DHCP
client-identifier		
client-identifier unique-identifier		
no client-identifier		
DHCP		
DHCP	DHCP	IP
00d0.f822.33b4	GigabitEthernet 0/1	MAC
0100.d0f8.2233.b467.6967.6162.6974.4574.6865.726e.6574.302f.31	01	MAC
67.6967.6162.6974.4574.6865.726e.6574.302f.31	GigabitEthernet0/1	RFC1700
Parameters”	DHCP	“ Address Resolution Protocol
DHCP	MAC	00d0.f822.33b4
client-identifier	DHCP	DHCP
0100.d0f8.2233.b467.6967.6162.6974.4574.6865.726e.6574.302f.31		
hardware-address	DHCP	
host	IP	DHCP
ip dhcp pool	DHCP	DHCP

┌

┌

-	-

23.1.3 client-name

DHCP
DHCP

DHCP

client-name

no

client-name client-name

no client-name

┌

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

┌

┌

DHCP

┌

DHCP

DHCP

┌

client-name river river

┌

host	IP DHCP
ip dhcp pool	DHCP DHCP

┌

┌

-	-

23.1.4 default-router

DHCP

DHCP

default-router

no

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

no default-router

ip-address	IP
ip-address2...ip-address8	8



DHCP



DHCP

IP

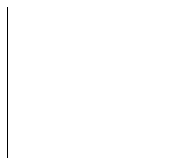
DHCP

DHCP



192.168.12.1

default-router 192.168.12.1



ip dhcp pool	DHCP DHCP



-	-

23.1.5 dns-server

DHCP

DNS

DHCP

dns-server

no

DHCP

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

DNS

DHCP

DNS
 RGOS
 DHCP

DNS DHCP DNS
 DNS
 DHCP DNS

DHCP
 dns-server 192.168.12.3

DHCP DNS 192.168.12.3

domain-name	DHCP
ip address dhcp	DHCP IP
ip dhcp pool	DHCP DHCP

-	-

23.1.6 domain-name

DHCP DHCP domain-name no

domain-name domain-name

no domain-name

domain-name	DHCP	

--

DHCP

DHCP

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

dns-server	DHCP	DNS
ip dhcp pool	DHCP	DHCP

--

-	-

23.1.7 hardware-address

no DHCP DHCP hardware-address

hardware-address hardware-address type

no hardware-address

hardware-address	DHCP MAC

	DHCP
type	„ ethernet „ ieee802 „ 1 10M ethernet „ 6 IEEE 802

ethernet

DHCP

DHCP

ethernet MAC 00d0.f838.bf3d
 hardware-address 00d0.f838.bf3d

client-identifier	DHCP
host	IP DHCP
ip dhcp pool	DHCP DHCP

-	-

23.1.8 host

no DHCP DHCP IP DHCP host
 host ip-address [

ip-address	DHCP	IP
netmask	DHCP	

IP

DHCP

DHCP IP A
 255.0.0.0 B 255.255.0 C
 255.255.255.0
 DHCP

IP 192.168.12.91 255.255.255.240
 host 192.168.12.91 255.255.255.240

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

-	-

23.1.9 ip address dhcp

DHCP IP ip address dhcp
 no
 ip address dhcp
 no ip address dhcp

-	-

|
|_____

DHCP IP

|
|_____

|
|
|
|_____

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

FastEthernet 0 IP



IP DHCP DHCP IP
IP DHCP DHCP
DHCP 192.168.12.100~150 IP
ip dhcp excluded-address 192.168.12.100 192.168.12.150



ip dhcp pool

DHCP

```

ip dhcp ping packets 3
    
```

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

```

    
```

-	-

23.1.12 ip dhcp ping timeout

DHCP ping

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

0E0K6R)à .tttB dRU402tr140B G@NáhtRUUSg&GÄÈ

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

23.1.14 lease

DHCP
no

DHCP

lease

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

no lease

days	
hours	
minutes	
infinite	

DHCP

DHCP

DHCP

lease 0 1 DHCP 1

lease 0 0 1 DHCP 1



-	-

23.1.16 netbios-node-type

DHCP NetBIOS DHCP

netbios-node-type **no** NetBIOS

netbios-node-type type

no netbios-node-type

type	<p style="text-align: center;">NetBIOS</p> <p style="text-align: center;">0~FF</p> <p>” b-node</p> <p>” p-node</p> <p>” m-node</p> <p>” 8 h-node</p> <p>” b-node</p> <p>” p-node</p> <p>” m-node</p> <p>” h-node</p>

NetBIOS

DHCP

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

	DHCP	NetBIOS
	netbios-node-type h-node	
	ip dhcp pool	
	DHCP	
	DHCP	
	netbios-name-server	
	WINS	DHCP NETBIOS
	-	-

23.1.17 network DHCP

	DHCP	DHCP	network
	no		
	network	net-number	net-mask
	no network		
	net-number	DHCP	IP
	net-mask	DHCP	IP
	DHCP		
	DHCP		

DHCP	192.168.12.0	255.255.255.240
------	--------------	-----------------

bootfile

DHCP

```

        IP
option 19 hex 1
    2                33                DHCP
        DHCP
    1      172.16.12.0    192.168.12.12
    2      172.16.16.0    192.168.12.16
option 33 ip 172.16.12.0 192.168.12.12 172.16.16.0 192.168.12.16
    
```

ip dhcp pool	DHCP DHCP

┌

-	-

23.1.20 service dhcp

```

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

-	-

┌ DHCP

┌

```

DHCP                IP                DNS
DHCP                DHCP                DHCP
DHCP                DHCP
DHCP
    
```

┌ DHCP

┌

service dhcp

┌

show ip dhcp server statistics	DHCP

┌

┌

-	-

23.2 DHCP

23.2.1 clear ip dhcp binding

DHCP

clear ip dhcp binding

clear ip dhcp binding { * | ip-address }

┌

*	DHCP
ip-address	IP

┌

┌

┌

DHCP

DHCP

no ip dhcp pool

┌

IP 192.168.12.100 DHCP
clear ip dhcp binding 192.168.12.100

┌

show ip dhcp binding	DHCP

┌

	-	-

23.2.2 clear ip dhcp conflict

DHCP

clear ip dhcp conflict

clear ip dhcp conflict { * | ip-address }

*		DCHP
ip-address		IP

└───┘

└───┘

~

~

DHCP

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

|

|

-	-

23.2.4 debug ip dhcp client

DHCP Client

debug ip dhcp client

debug ip dhcp client

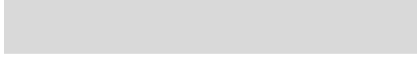
no debug ip dhcp client

|

-	-

|

|



	-	-
--	---	---

23.2.8 show ip dhcp conflict

DHCP EXEC show ip dhcp conflict

show ip dhcp conflict

	-	-

DHCP

show ip dhcp conflict

Ruijie# show ip dhcp conflict

IP address Detection Method

192.168.12.1 Ping

dhcpd excluded ipaddress

192.168.12.100

IP address	DHCP	IP
Detection Method		
dhcpd excluded ipaddress		

--	--

23.2.9 show ip dhcp server statistics

DHCP EXEC show ip dhcp server statistics

show ip dhcp server statistics

-	-

└───┘

└───┘

└───┘

DHCP

show ip dhcp server statistics

Ruijie# show ip dhcp server statistics

Address pools 4

Automatic bindings 4

Manual bindings 0

Expired bindings 0

Malformed messages 2

Message Received

BOOTREQUEST 216

DHCPDISCOVER 33

DHCPREQUEST 25

DHCPDECLINE 0

DHCPRELEASE 1

DHCPINFORM 150

Message Sent

BOOTREPLY 16

DHCPOFFER 9

DHCPACK 7

DHCPNAK 0

Address pools	
Automatic bindings	

DHCP

Manual bindings	
Expired bindings	
Malformed messages	DHCP
Message Received or Sent	DHCP

clear ip dhcp server statistics	DHCP

-	-

24 DHCP Relay a —

24.1 " - ' a —

24.1.1 ip dhcp relay check server-id

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

[no] ip dhcp relay check server-id

	-	-

┌

┌

┌

```
                DHCP Relay    DHCP          option server-id
                DHCP          DHCP          DHCP          DHCP
```

┌

```
                DHCP relay    check server-id
Ruijie#    configure terminal
Ruijie(config)#    ip dhcp relay check server-id
```

--	--	--

DHCP Relay manage-vlan
default

1

no

ip dhcp relay information manage-vlan vlanid

no ip dhcp relay information manage-vlan

|

|

|

DHCP

802.1x

DHCP

option dot1x

Ruijie# configure terminal

Ruijie(config)# ip dhcp relay information option dot1x



```

DenyAccessEachOtherOfUnauthorize
Ruijie(config-ext-nacl)#      permit ip any host      192.168.3.1
//
Ruijie(config-ext-nacl)#      permit ip any host      192.168.4.1
Ruijie(config-ext-nacl)#      permit ip any host      192.168.5.1
Ruijie(config-ext-nacl)#      permit ip host      192.168.3.1      any
//      IP
Ruijie(config-ext-nacl)#      permit ip host      192.168.4.1      any
Ruijie(config-ext-nacl)#      permit ip host      192.168.5.1      any
Ruijie(config-ext-nacl)#      denyip  192.168.3.00.0.0.255192.168.3.0
0.0.0.255
//
Ruijie(config-ext-nacl)#      deny  ip      192.168.3.0      0.0.0.255
192.168.4.0 0.0.0.255
Ruijie(config-ext-nacl)#      deny  ip      192.168.3.0      0.0.0.255
192.168.5.0 0.0.0.255
Ruijie(config-ext-nacl)#      deny  ip      192.168.4.0      0.0.0.255
192.168.4.0 0.0.0.255
Ruijie(config-ext-nacl)#      deny  ip      192.168.4.0      0.0.0.255
192.168.5.0 0.0.0.255
Ruijie(config-ext-nacl)#      deny  ip      192.168.5.0      0.0.0.255
192.168.5.0 0.0.0.255
Ruijie(config-ext-nacl)#      deny  ip      192.168.5.0      0.0.0.255
192.168.3.0 0.0.0.255
Ruijie(config-ext-nacl)#      deny  ip      192.168.5.0      0.0.0.255
192.168.4.0 0.0.0.255
Ruijie(config-ext-nacl)#      exit
Ruijie(config)#      ipdhcprelayinformationoptiondot1xaccess-group
DenyAccessEachOtherOfUnauthorize
    
```

service dhcp	DHCP
ip dhcp relay information option dot1x	DHCP option dot1x

-	-

24.1.5 ip dhcp relay information option vpn

	DHCP Relay	DHCP Relay Aware VRF
	no	
	-	-

┌

┌

DHCP

┌

```

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

┌

service dhcp	DHCP

┌

┌

-	-

24.1.7 ip helper-address

┌

```

DHCP no
DHCP
    
```

```

[no] ip helper-address [vrf vrf-name] A.B.C.D
    
```

┌

-	-

┌

┌

/

┌

```

20 DHCP
DHCP DHCP Relay DHCP
DHCP DHCP Relay
vrf
    
```

```

vrf
vrf
vrf
vrf

1          192.168.1.1
2          vrf      dep1      192.168.2.1
Ruijie#    configure terminal
Ruijie(config)# ip helper-address 192.168.1.1
Ruijie(config)# ip helper-address vrf dep1 192.168.2.1
    
```

service dhcp	DHCP

-	-

24.1.8 service dhcp

DHCP no

[no] service dhcp

-	-

┌

┌

```

DHCP      DHCP      DHCP      DHCP
DHCP      DHCP
    
```

```

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

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

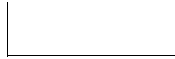
	-	-



ip name-server {ip-address}

no ip name-server [ip-address]

ip-address	IP



DNS Server IP/IPv6
Server

DNS Server

|

|

no ip host host-name ip-address

|

Ruijie(config)# ip host switch 192.168.5.243

|

show hosts	DNS

|

|

-	-

25.2 ip - a -

25.2.1 clear host

clear host [host-name]

|

host-name	**

|

|

|

2 DNS 1 ip host DNS

|

clear host * -IP

	show hosts	

┌

	-	-

25.2.2 show hosts

DNS

show hosts [hostname]

	-	-

┌

┌

┌

DNS

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

	ip host	IP
	ip name-server	DNS

┌

--	--	--

DNS

	-	-
--	---	---

26 SNTP a —

26.1 " - ' a —

26.1.1 sntp enable

SNTP

no

no sntp interval

seconds	“ ” 60 --65535

1800s

show sntp	SNTP
a	sntp enable

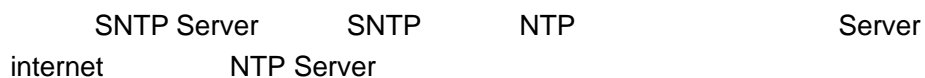
Ruijie(config)# sntp interval 3600

sntp enable	SNTP
show sntp	SNTP
clock update-calendar	

RGOS10.0

-	-

26.1.3 sntp server



sntp server ip-addr

no sntp server



|

|

|

show sntp SNTP

Ruijie(config)# sntp server 192.168.4.12



|



Q,

27 NTP a —

27.1 NTP " - ' a —

27.1.1 no ntp

ntp ntp
no ntp



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

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

NTP

	-	-

27.1.3 ntp authenticate

NTP NTP

ntp authenticate

no ntp authenticate

	-	-

NTP

ntp authentication-key ntp trusted-key

ntp authentication-key 6 md5 woooooop

ntp trusted-key 6

ntp authenticate

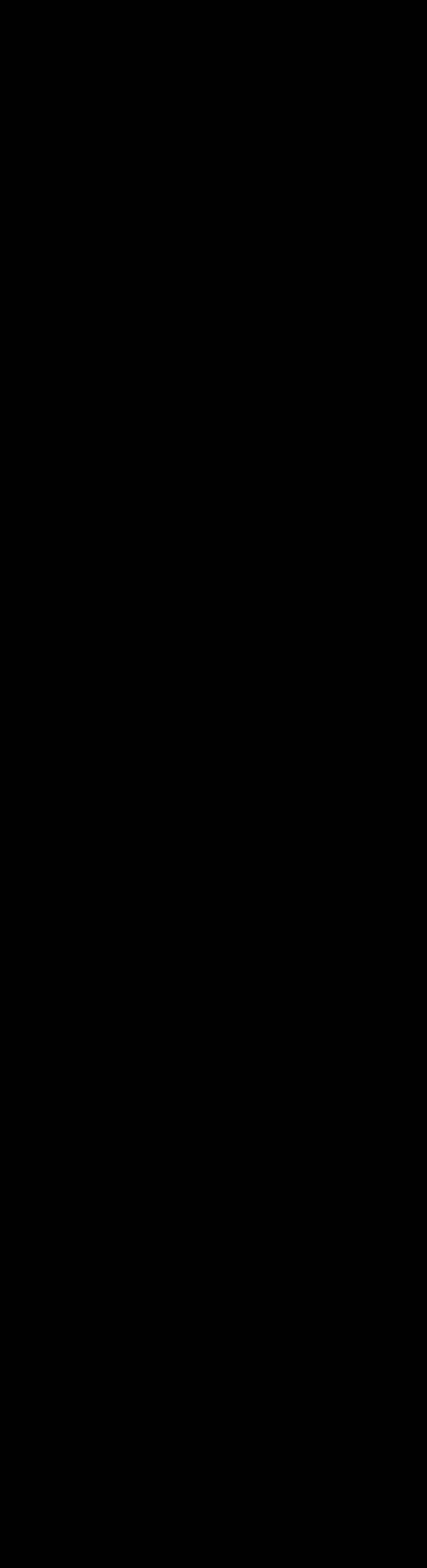
NTP

NTP

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

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





A small, solid black rectangular redaction block is positioned horizontally, partially overlapping the bottom edge of the large redaction on the left.

NTP

┌

┌

20

prefer

NTP

IP

NTP

┌

NTP server

IPv4

Ruijie(config)#

ntp server

192.168.210.222

┌

no ntp	NTP

┌

┌

-	-

27.1.8 ntp synchronize

NTP

ntp synchronize

no ntp synchronize

┌

-	-

┌

┌

┌

NTP

8

NTP

Ntp synchronize

ntp server	NTP

à@ [PLDg H\ S" i PW! ~ Qr " W E% ! • @ ñ 56 Y, \ N) ga" B @ d d Af # B \$ à . (A à . ! A ed \$ R se ' YA - . ũ C i Q y Af X a " B

	ntp server	NTP
	-	-

27.1.10 ntp update-calendar

NTP

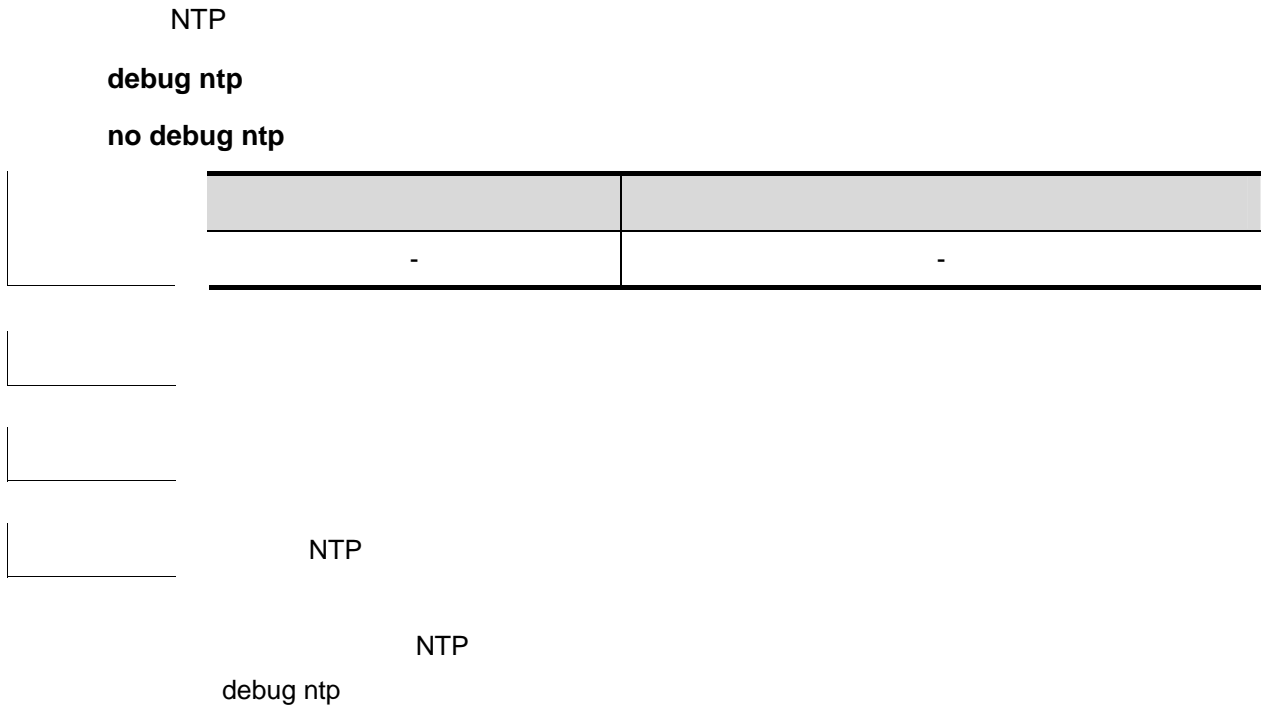
1

|

|

27.2 $i \mu 0^3 \text{Å} a -$

27.2.1 debug ntp



|

|

|

NTP

NTP

|

NTP

show ntp status

|

[Redacted]	
-	-

|

|

[Redacted]	
-	-

28 FTP Server a —

28.1 " - ' a —

28.1.1 debug ftpserver

FTP

no

debug ftpserver

no debug ftpserver

	-	-

└──

└──

└──

debug ftpserver

FTP

1

	-	-
--	---	---

28.1.2 ftp-server enable

FTP no FTP

ftp-server enable

no ftp-server enable

	-	-

--

--

	FTP	FTP		
a	FTP	ftp-server topdir	FTP	

1 FTP

ftp-server password [type] password

no ftp-server password

type	0 7 0
password	7

┌

┌

FTP

	1	25	4
	52		
a	FTP		

```

1 pass
Ruijie(config)# ftp-server password pass

Ruijie(config)# ftp-server password 0 pass
2 8001
Ruijie(config)# ftp-server password 7 8001
3
Ruijie(config)# no ftp-server password
    
```

-	-

┌

-	-

28.1.4 ftp-server topdir

```
FTP
FTP no
```

ftp-server topdir directory

no ftp-server topdir

directory	FTP

┌

┌

```
FTP
FTP FTP
FTP
1 FTP syslog
Ruijie(config)# ftp-server topdir /syslog
Ruijie(config)# ftp-server enable
2
Ruijie(config)# no ftp-server topdir
```

-	-

┌

-	-

28.1.5 ftp-server timeout

```
FTP Session idle timeout no
30
```

ftp-server timeout time

no ftp-server timeout

time	1-3600

30

FTP
FTP

a

FTP

FTP

FTP
FTP

┌

┌

┌

```

                FTP
                64
                FTP
-----
a                FTP
-----
    
```

┌

```

1                user
Ruijie(config)# ftp-server username user
2
Ruijie(config)# no ftp-server username
    
```

┌

-	-

┌

┌

-	-

28.2 配置FTP

28.2.1 show ftp-server

```

FTP
show ftp-server
┌
```

-	-

┌

|
|

FTP

```
"  
" IP Port  
" IP Port  
"  
"  
"  
"
```

|
|

FTP

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

|
|

-	-

|
|

|
|

--	--

29 UDP-Helper a —

29.1 " - ' a —

29.1.1 ip forward-protocol

UDP no UDP

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

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

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

UDP

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

└───┘

└───┘

-	-

29.1.3 udp-helper enable

udp-helper enable

UDP

no udp-helper enable

UDP

UDP

udp-helper enable

no udp-helper enable

└───┘

-	-

└───┘

UDP

└───┘

UDP-Helper

!

~

30 SNMP a —

30.1 " - ' a —

30.1.1 no snmp-server

SNMP	no snmp-server
no snmp-server	



no snmp-server chassis-id

text	

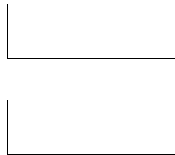
60FF60

SNMP
show snmp

SNMP 123456:
Ruijie(config)# snmp-server chassis-id 123456

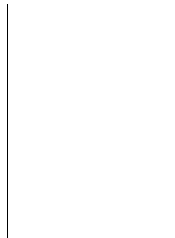
show snmp	SNMP

aclnumber	1-99 MIB ipv4 NMS
aclname	MIB ipv4 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	



-	-

30.1.4 snmp-server contact

```

SNMP snmp-server contact no
SNMP
    
```

snmp-server contact text

no snmp-server contact



text	

└──

└──

└──

└──

```

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

└──

show snmp-server	SNMP
no snmp-server	SNMP

└──

└──

-	

30.1.5 snmp-server enable traps

```

SNMP      NMS      Trap
snmp-server enable traps      no      SNMP      NMS
Trap
snmp-server enable traps [snmp ]
    
```

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

snmp-server host	SNMP

-	-

30.1.6 snmp-server group

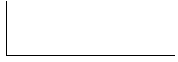
SNMP **snmp-server group** no

snmp-server group groupname {v1 | v2c | } [read readview][write writeview] [access {[aclnum | aclname]num | name}]

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

v1 v2c	SNMP
readview	
writeview	
aclnum	MIB ipv4 NMS
aclname	MIB ipv4 NMS

```
Ruijie(config)# snmp-server group mib2user v3 priv read mib2
```

SNMP

SNMP

┌

┌

-	-

30.1.9 snmp-server packetsiz

SNMP
no

snmp-sever packetsize

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

┌

┌

-	-

30.1.10 snmp-server queue-length

snmp-server queue-length

snmp-server queue-length length

	length	1	1000
	10		
		4	
	Ruijie(config)#	snmp-server queue-length	4
	snmp-server packetsize		SNMP
	-		-

30.1.11 snmp-server system-shutdown

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

SNMP RGOS reload/reboot NMS

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

-	-

┌

-	-

30.1.12 snmp-server trap-source

SNMP snmp-server trap-source no

snmp-server trap-source interface

no snmp-server trap-source

interface	SNMP

SNMP IP

┌

SNMP IP IP SNMP

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

snmp-server enable traps	
snmp-server enable host	NMS

┌

┌

-	-

30.1.13 snmp-server trap-timeout

snmp-server trap-timeout

no

snmp-server trap-timeout seconds

no snmp-server trap-timeout

┌

seconds	1 – 1000

┌

30

┌

┌

┌

60

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

┌

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

┌

┌

-	-

30.1.14 snmp-server user

SNMP

snmp-server user

no

snmp-server user username groupname {v1 | v2 | [encrypted] [auth {md5

show snmp user	SNMP
-	-

30.1.15 snmp-server view

SNMP **snmp-server view** no

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

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

view-name	
oid-tree	MIB MIB
include	MIB
exclude	MIB

default MIB

Ruijie(config)# MIB-2 oid 1.3.6.1
 snmp-server view mib2 1.3.6.1 include

show snmp view	SNMP

	-	-
--	---	---

30.1.16 snmp trap link-status

30.2 i μ - ' a —

30.2.1 show snmp

	SNMP	show snmp
	show snmp [mib user view group host]	
	-	-

--

show snmp	SNMP
show snmp mib	snmp mib
show snmp user	snmp
show snmp view	snmp
show snmp group	snmp
show snmp host	

	SNMP
Ruijie#	show snmp
	Chassis: 60FF60
	0 SNMP packets input
	0 Bad SNMP version errors
	0 Unknown community name
	0 Illegal operation for community name supplied
	0 Encoding errors
	0 Number of requested variables
	0 Number of altered variables

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

snmp-server chassis-id	SNMP

-	-

31 RMON a —

31.1 " - ' a —

31.1.1 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
 absolute/delta owner interval rising-threshold/falling-threshold event

┌

MIB ifInNUcastPkts.6
 Ruijie(config)# rmon alarm 10 1.3.6.1.2.1.2.2.1.12.6 30 delta
 rising-threshold 20 1 falling-threshold 10 1 owner zhangsan

--	--

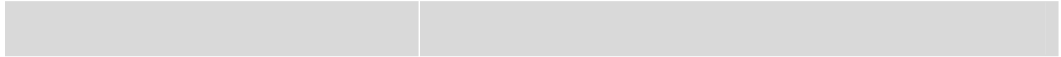
rmon event number [**log**] [**trap** community]
 [description-string]

31.1.2 rmon collection history

no

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

no rmon collection history index





|

|

```

                                trap
Ruijie(config)#      rmon event  1 log trap rmon description
"ifInNUcastPkts is too much "      owner  zhangan
    
```

|

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

|

|

-	-

31.2 配置 RMON 报警

31.2.1 show rmon alarm

show rmon alarm

|

-	-

|

|

|

|

```

Ruijie#      show rmon alarm
Event : 1
Description : firstevent
    
```

```

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

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

0.0023 Tc 7.9414 Tw 10.02 0 0 10.02 135.36 390.3803 Tm (245.7) 27.934 0 Td (-) Tj ET 66.84 404 0.24 0.481 Tfe f 141.6 404 394.98

31.2.2 show rmon event

show rmon event

--	--

```

Ruijie# show rmon event
Alarm : 1
Interval : 1
Variable : 1.3.6.1.2.1.4.2.0
Sample type : absolute
Last value : 64
Startup alarm : 3
Rising threshold : 10
Falling threshold : 22
Rising event : 0
Falling event : 0
Owner : zhangsan
    
```

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

-	-
---	---

31.2.3 show rmon history

```
show rmon history
```

-	-
---	---

```

Ruijie# show rmon history
Entry : 1
Data source : Gi1/1
Buckets requested : 65535
Buckets granted : 10
Interval : 1
Owner : zhangsan
Sample : 198
Interval start : 0d:0h:15m:0s
DropEvents : 0
Octets : 67988
Pkts : 726
BroadcastPkts : 502
MulticastPkts : 189
CRCAlignErrors : 0
UndersizePkts : 0
OversizePkts : 0
Fragments : 0
Jabbers : 0
Collisions : 0
Utilization : 0
    
```

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

-	-

31.2.4 show rmon statistics

show rmon statistics

	-	-

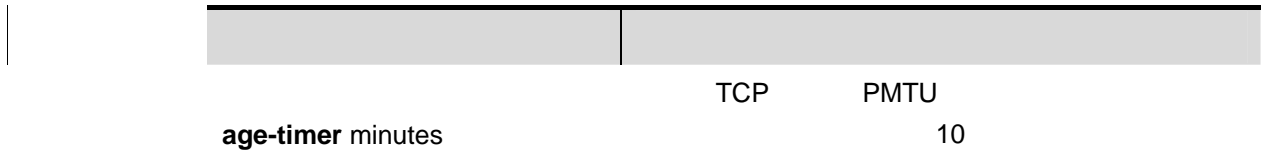
	-	-

32 TCP a —

32.1 TCP - ' " a —

32.1.1 ip tcp path-mtu-discovery

TCP (PMTU) ip tcp
 path-mtu-discovery no
 ip tcp path-mtu-discovery [age-timer {minutes | infinite}]
 no ip tcp path-mtu-discovery [age-timer {minutes | infinite}]



show tcp pmtu		TCP	PMTU
RGOS 10.4	RGOS 10.4		

32.2 TCP - ' i μ a —

32.2.1 show tcp pmtu

TCP PMU

show tcp pmtu

TCP PMTU

show tcp pmtu

show tcp pmtu

Ruijie# show tcp pmtu

No.	Local Address	Foreign Address	PMTU
[1]	2002::1.18946	2002::2.23	1440
[2]	192.168.195.212.23	192.168.195.112.13560	1440

No.	
Local Address	“ ” “2002::2.23” “192.168.195.212.23” “23”

Foreign Address	“ ” “2002::2.23” “192.168.195.212.23” “23”
PMTU	PMTU

ip tcp path-mtu-discovery	TCP PMTU
----------------------------------	----------

10.4	
-------------	--

33 RIP a —

33.1 " - ' a —

33.1.1 auto-summary (RIP)

RIP auto-summary no

auto-summary
no auto-summary

-	-

┌

┌

```

RIP
RIPv1  RIPv2
RIP

"      RIP
"      RIP
"

RIPv1                                RIPv2

```

```

RIPv2
Ruijie(config)#  router rip
Ruijie(config-router)#  version 2
Ruijie(config-router)#  no auto-summary

```



RIP

ip rip bfd [disable]		RIP BFD
	-	-

33.1.3 default-metric (RIP)

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

default-metric metric-value

no default-metric

metric-value		1	16	metric-value
	16	RGOS		

1

redistribute

RIP

RIP

RIP

default-metric

default-metric

default-metric 1

RIP

OSPF

RIP

3

Ruijie(config)# router rip

Ruijie(config-router)# default-metric 3

Ruijie(config-router)# redistribute ospf 100

--	--

	redistribute	
	-	-

33.1.4 default-information originate (RIP)

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

always	RIP
metric metric-value	metric-value 1-15
route-map map-name	route-map , route-map

metric 1

p RIP
default-information originate
 V always RIP

	RIP	RIP
a	ip default-network	
	default-information originate	RIP

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

ip rip default-information		
redistribute		RIP

-		-

33.1.5 distance

RIP **distance** **no**

distance distance [ip-address wildcard]

no distance [distance ip-address wildcard]

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

```
120
```

```
RIP
RIP
```

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

33.1.6 distribute-list in RIP

no

distribute-list in

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

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

--	--

access-list-number | name

g a t e w a y p r e f i x T 0 1 T f 0 5 . 6 4 7 . . .

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

```

RIP                                  192.168.12.0/24
Ruijie(config)#      router rip
Ruijie(config-router)#      network 200.4.4.0
Ruijie(config-router)#      network 192.168.12.0
Ruijie(config-router)#      distribute-list      10 out
Ruijie(config-router)#      version 2
Ruijie(config)#      access-list 10 permit 192.168.12.0 0.0.0.255

```

access-list	
prefix-list	
redistribute	

-	-

33.1.8 exit-address-family

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

33.1.9 ip rip authentication key-chain

RIP	RIP	ip rip authentication
key-chain	no	
ip rip authentication key-chain name-of-keychain		
no ip rip authentication key-chain		
name-of-keychain	RIP	

┌

┌

┌

key chain

RIP

RIPv1 RIP RIPv2

┌

Serial 0 RIP ripchain

Ruijie(config)# interface serial 0/ 0

Ruijie(config-if)# ip rip authentication key-chain

ripchain

┌

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

┌

┌

-	-

33.1.10 ip rip authentication mode

RIP **ip rip authentication mode** no

RIP

ip rip authentication mode {text | md5}

no ip rip authentication mode

┌

--	--

no ip rip authentication text-password

password-string	1 16

┌

┌

┌
RIPv1 RIP RIPv2

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

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

┌

10.4(1)	

33.1.12 ip rip bfd

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

disable	RIP BFD

┌

RIP

BFD

┌

┌

bfd all-interfaces

ip rip bfd

BFD

RIP

bfd all-interfaces

RIP

BFD

ip rip bfd disable

BFD

┌

┌

router rip	RIP
bfd all-interfaces	RIP BFD

┌

┌

-	-

33.1.13 ip rip default-information

RIP

default-information

no

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

no ip rip default-information

┌

only	
originate	
metric metric-value	1-15

┌

metric 1

┌

┌

```

ip rip default-information originate
RIP default-information
a ip rip default-information RIP
    
```

┌

```

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

┌

default-information originate	RIP

┌

┌

-	-

33.1.14 ip rip receive enable

RIP
no

```

RIP
RIP
RIP
    
```

ip rip receive enable

ip rip receive enable

no ip rip receive enable

┌

-	-

┌

RIP

┌

┌

RIP

```

default
no RIP
    
```

```

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

ip rip send enable	RIP
passive-interface	RIP

-	-

33.1.15 ip rip receive version

```

RIP          RIP          ip rip receive
version      no
    
```

ip rip receive version [1] [2]

no ip rip receive version

1	RIPv1
2	RIPv2

version

```

vesion          RIP
RIPv1  RIPv2
version
    
```

```

Fastethernet 0/0          RIPv1  RIPv2
Ruijie(config)# interface fastethernet 0/ 0
Ruijie(config-if)# ip rip receive version 1 2
    
```

	version	RIP
	-	-

33.1.16 ip rip send enable

	RIP	RIP	RIP	ip rip send enable
	no	RIP	RIP	
	ip rip send enable			
	no ip rip send enable			
		RIP		
		RIP	default	no
				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

	-	-

33.1.17 ip rip send supernet-routes

RIP
supernet-routes no RIP
RIP **ip rip send**
RIP
ip rip send supernet-routes
no ip rip send supernet-routes

--

RIP

--

RIPv1 RIPv2 RIPv1
RIPv2 **no**
RIPv2

33.1.18 ip rip send version

	RIP		RIP		ip rip receive
	version	no			
	ip rip send version [1] [2]				
	no ip rip send version				
	<hr/>				
	1				RIPv1
	2				RIPv2
	<hr/>				
	version				
	<hr/>				
			vesion		RIP
			RIPv1	RIPv2	
		version			
		Fastethernet 0/0		RIPv1	RIPv2
	Ruijie(config)#	interface fastethernet		0/ 0	
	Ruijie(config-if)#	ip rip send version		1 2	
	<hr/>				
	version				RIP
	<hr/>				
	<hr/>				
	-				-
	<hr/>				

33.1.19 ip rip split-horizon (RIP)

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

RIP

ip-address	IP
ip-network-mask	IP

RIP

```

ip rip summary-address

```

```

RIPv2
172.16.0.0/16
FastEthernet 1/0
Ruijie(config)# interface FastEthernet 1/0
Ruijie(config-if)# ip rip summary-address 172.16.0.0 255.255.0.0
Ruijie(config-if)# ip address 172.16.1.1 255.255.255.0
Ruijie(config)# router rip
Ruijie(config-router)# network 172.16.0.0
Ruijie(config-router)# version 2
Ruijie(config-router)# no auto-summary

```

auto-summary	RIP

-	-

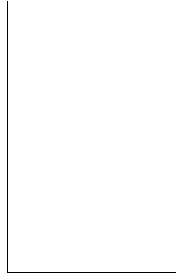
33.1.21 ip rip v2-broadcast

```

RIP version 2
ip rip v2-broadcast          no
ip rip v2-broadcast
no ip rip v2-broadcast

```

RIP



```
network-number wildcard
RIP
wildcard RGOS
RIP
RIP RIP
RIP 192.168.12.0/24
172.16.0.0/24 RIP config)#Tj /TT3 4 Tf 9 08 00 Td (Rlrouter ripTj /TT3
```

RIP

|

|

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

|

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

passw...9 #0+...gbèA!RžQ," d6p"Ŧ6q)!RžQA•đU@

```

offset
RIP
RIP offset-list offset-list metric offset-list
acl 7 RIP metric 7
Ruijie(config-router)# offset-list 7 out 7
fastEthernet1/0 acl 8 RIP
metric 7
Ruijie(config-router)# offset-list 7 in 7
Ruijie(config-router)# offset-list 8 in 7 fastEthernet 1/ 0

```

-	-

-	-

33.1.25 output-delay

```

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

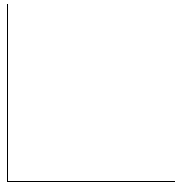
```

delay	<8-50>

```

RIP 512 25

```



25

output-delay



```

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



-	-



-	-

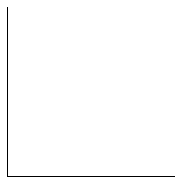
33.1.26 passive-interface

no

passive-interface

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

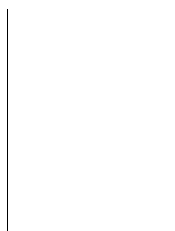
no passive-interface {default | interface-type interface-num}



default	passive
interface-type interface-num	



passive



```

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

```

rip receive enable

Ruijie(config-router)# passive ethernet0/0 passive
Ruijie(config-router)# passive-interface default
Ruijie(config-router)# no passive-interface ethernet 0/0
    
```

ip rip receive enable	RIP
ip rip send enable	RIP

-	-
---	---

33.1.27 redistribute RIP

redistribute

no

redistribute {bgp | connected | isis [area-tag] | ospf process-id | static} [{level-1 | level-1-2 | level-2} | match {internal | external [1|2] | nssa-external [1|2]} | metric metric-value] route-map route-map-name]

no redistribute {bgp | connected | isis [area-tag] | ospf process-id | static} [{level-1 | level-1-2 | level-2} | match {internal | external [1|2] | nssa-external [1|2]} | metric metric-value] route-map route-map-name]

bgp	bgp
connected	
isis area-tag	isis area-tag isis
ospf process-id	ospf process-id ospf <1-65535>
static	
level-1 level-1-2 level-2	IS-IS level
match	OSPF

RIP

metric metric-value	metric	metric	metric-value
route-map route-map-name		1-16	

	OSPF		
	ISIS	level-2	
	metric	1	
	route-map		

RIP

RIP

OSPF

isis

level level-2

×

RIP

RIP

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

30
180
120

```

RIP
RIP
RIP
show ip rip
a
2Mbps
  
```

```

RIP      10      30
invalid   invalid   90

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

-	-

-	-
---	---

33.1.30 validate-update-source

RIP
validate-update-source no
validate-update-source
no validate-update-source

-	-

RIP IP RIP
validate-update-source
ip unnumbered RIP
validate-update-source

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

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

-	-

33.1.31 version (RIP)

RIP

version

no

version {1 | 2}

no version

1	RIP	1
2	RIP	2

RIPv1 RIPv2 RIPv1

RIP ip rip receive version ip rip send
version RIP

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

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

-	-
---	---

33.2 ip - 'a -

33.2.1 show ip rip

RIP

show ip rip

show ip rip [vrf vrf-name]



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)

-	-

--	--

```

192.168.1.0/24 auto-summary
192.168.1.0/30 directly connected, Loopback 3
192.168.1.8/30 directly connected, FastEthernet 0/0
192.168.121.0/24 auto-summary
192.168.121.0/24 redistributed
[1] via 192.168.2.22, FastEthernet 0/1
    2                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
    3                RIP
    
```

```

Ruijie# show ip rip database count
      All  Valid  Invalid
database  5   5   0
auto-summary 5   5   0

connected  1   1   0
rip        4   4   0
    
```

show ip rip	

-	-

33.2.3 show ip rip external

RIP show ip rip external

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

bgp connected isis ospf static	

RIP

vrf vrf-name	VRF	RIP
process-name	ISIS	
<1-65535>	OSPF	

vrf vrf-name	VRF RIP

RIP RIP

RIP

```
Ruijie# show ip rip interface
FastEthernet 1/0 is up, line protocol is up
  Routing Protocol: RIP
    Receive RIPv2 packets only
    Send RIPv2 packets only
    Passive interface: Disabled
    Split horizon: Enabled
    V2 Broadcast: Disabled
    Multicast registe: Registered
    Interface Summary Rip:
    Not Configured
    Authentication mode: Text
    Authentication key-chain: ripk1
    Authentication text-password: ruijie
    Default-information: only, metric 5
    IP interface address:
      192.168.64.100/24, next update due in 14 seconds
      2.2.1.1/24, next update due in 24 seconds
      neighbor 2.2.1.6, next update due in 3 seconds
      neighbor 2.2.1.77, next update due in 13 seconds
      2.2.2.57/24, next update due in 16 seconds
```

RIP BFD BFD :

```
Ruijie#show ip rip interface
VLAN 1 is up, line protocol is up
  Routing Protocol: RIP
    Receive RIPv1 and RIPv2 packets
    Send RIPv1 packets only
    Receive RIP packet: Enabled
```

Send RIP packet: Enabled
Send RIP supernet routes: Enabled
Passive interface: Disabled
Split horizon: Enabled
 BFD: Enabled
V2 Broadcast: Disabled
Multicast registe: Registered
Interface Summary Rip:
 Not Configured
IP interface address:
 2.2.2.111/24, next update due in 14 seconds

show ip rip	

	-	-

33.2.5 show ip rip peer

```
RIP                RIP                (RIP                )
                                                RIP                RIP
```

show ip rip peer

RIP

Ruijie# show ip rip peer

Peer 192.168.3.2:

Local address: 192.168.3.1

Input interface: GigabitEthernet 0/2

Peer version: RIPv1

Received bad packets: 3

Received bad routes: 0

BFD session state up

34 OSPF a —

34.1 " - ' a —

34.1.1 area

	no	OSPF
area area-id		
no area area-id		
	area-id	OSPF IP
	OSPF	
	no	OSPF
area authentication	area default-cost	area filter-list area nssa
	OSPF	
1.		
2.	network area	
	OSPF 2	
Ruijie(config)#	router ospf 2	
Ruijie(config-router)#	no area 2	
	network area	OSPF

10.4(1)	

34.1.2 area authentication

```

OSPF
OSPF

```

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

no area area-id **authentication**

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

└──

└──

```

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

```

```

OSPF 0 MD5
backbone
Ruijie(config)# interface FastEthernet 0/0
Ruijie(config-if)# ip address 192.168.12.1 255.255.255.0
Ruijie(config-if)# ip ospf message-digest-key 1 md5 backbone
# OSPF
Ruijie(config)# router ospf 1
Ruijie(config-router)# network 192.168.12.0 0.0.0.255 area 0
Ruijie(config-router)# area 0 authentication message-digest

```

--	--

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

-	-

34.1.3 area default-cost

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

--	--

STUB NSSA

area stub	OSPF	
area nssa	OSPF	NSSA

┌

-	-	

-	-
-	-

34.1.5 area nssa

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

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

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

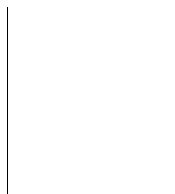
area-id	NSSA
z no-redistribution	NSSA ABR
	NSSA
z default-information-originate	7 LSA NSSA NSSA ABR ASBR
z metric value	LSA metric 0-16777214
z metric-type <1-2>	LSA E-1 E-2
z no-summary	nssa (ABR) summary LSAs Type-3 LSA

NSSA

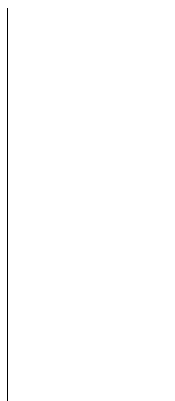
default-information-originate Type-7 LSA NSSA
 ABR ASBR ABR Type-7
 LSA ASBR (ABR) Type-7
 LSA
no-redistribution ASBR OSPF redistribute

NSSA

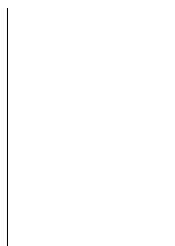
NSSA



cost RFC1583 RFC1583 cost

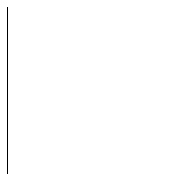


ABR
 advertise not-advertise
 cost
 OSPF
 area range



```

172.16.16.0/20
Ruijie(config)# router ospf 1
Ruijie(config-router)# network 172.16.0.0 0.0.15.255 area 0
Ruijie(config-router)# network 172.16.17.0 0.0.15.255 area 1
Ruijie(config-router)# area 1 range 172.16.16.0 255.255 . 240. 0
    
```



discard-route	discard
summary-address	OSPF

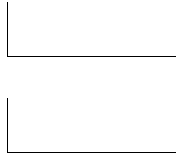


-	-

34.1.7 area stub

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

area-id	STUB
no-summary	ABR ABR



OSPF (LSA) 1 1 area stub LSA 2 2 ABR LSA 3 3
 LSA OSPF ¶

OSPF

area virtual-link

no

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

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

area-id	OSPF	IP		
z router-id	show ip ospf			
z dead-interval seconds	1-65535			
z hello-interval seconds	OSPF	Hello	1-65535	
z retransmit-interval seconds	OSPF	LSA	1-65535	
z transmit-delay seconds	OSPF	LSA	1-65535	LSA
	LSA			
	OSPF	1-0087138 081 Tf0 Tc 2. [(1-058> Tf(0		
z authentication-key key				

-	-

34.1.9 auto-cost

no

auto-cost [reference-bandwidth ref-bw]

no auto-cost [reference-bandwidth]

ref-bw	Mbps : 1-4294967

100Mbps

```

    ,
    ( )
    .
    default auto-cost no auto-cost
    ip ospf cost cost cost
  
```

```

    10M
    Ruijie(config)# router ospf 1
    Ruijie(config-router)# network 172.16.10.0 0.0.0.255 area 0
    Ruijie(config-router)# auto-cost reference-bandwidth 10
  
```

show ip ospf	ospf

-	-

34.1.10 bfd all-interfaces (OSPF)

	OSPF	BFD	OSPF	bfd
	all-interfaces	no		
	bfd all-interfaces			
	no bfd all-interfaces			
	<hr/>		<hr/>	
	-		-	
	<hr/>		<hr/>	
	OSPF	Hello	OSPF	BFD
	FULL	BFD	BFD	BFD
	OSPF			
			ip ospf bfd [disable]	BFD
			bfd all-interfaces	
	<hr/>		<hr/>	
	router ospf process-id [vrf vrf-name]		OSPF	OSPF
	ip ospf bfd [disable]		OSPF	BFD
	<hr/>		<hr/>	
	<hr/>		<hr/>	
	-		-	
	<hr/>		<hr/>	

34.1.11 clear ip ospf process

OSPF
clear ip ospf [process-id] process

OSPF

process-id	OSPF	OSPF OSPF

┌

RFC2328

┌

┌

OSPF

┌

Ruijie# clear ip ospf OSPF 1
1 process

┌

-	-

OSPF

└───

───

└───

└───

└───

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--	--

34.1.13 default-information originate

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

└───

└───

└───


```

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

metric	OSPF 1-16777214

```

    20
  
```

```

  default-metric redistribute
  default-metric default-information originate OSPF
  
```

```

    OSPF 50
  Ruijie(config)# router ospf 1
  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
  
```

discard

no

discard

discard-route {internal|external}

no discard-route {internal|external}

distance	1-255
intra-area distance	1-255
inter-area distance	1-255
external distance	1-255

```

110
      110
      110
      110
    
```

```

OSPF
    
```

```

      OSPF
    
```

```

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

-	-

-	-

34.1.17 distribute-list in

LSA

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

no distribute-list {[access-list-number | name] | **prefix** prefix-list-name

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

┌
└

LSA	SPF	OSPF
ABR	ASBR	

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

distribute-list out	
----------------------------	--

┌
└

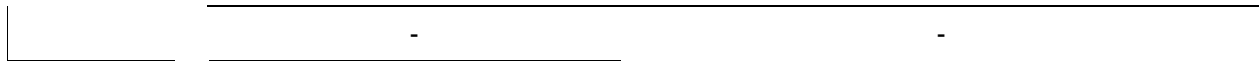
-	-
---	---

34.1.18 distribute-list out

redistribute

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

bgp | connected | isis
z [area-tag] | **ospf** process-id



[LsdbApproachOverflow | LsdbOverflow | MaxAgeLsa | OriginateLsa] |
 retransmit [IfTxRetransmit | VirtIfTxRetransmit] | state-change
 [IfStateChange | NbrRestartHelperStatusChange | NbrStateChange |
 RestartStatusChange | VirtIfStateChange |
 VirtNbrRestartHelperStatusChange | VirtNbrStateChange]]

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



traps



traps ospf

snmp-server
enable traps
MIB

ospf trap

snmp-server enable

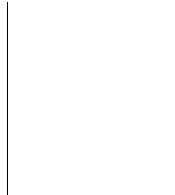
TRAP

OSPFv2

12252 78.36 593.9003 Tm[<4721>-6<35420412055F>]TJ/TT1 1

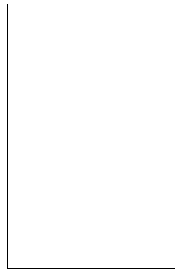


null ,



```

FastEthernet 0/0      OSPF      MD5
Ruijie(config)#      interface fastethernet 0/0
Ruijie(config-if)#   ip address 172.16.10.0 255.255.255.0
Ruijie(config-if)#   ip ospf authentication message-digest
    
```



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



-	-

34.1.22 ip ospf authentication-key

OSPF
no

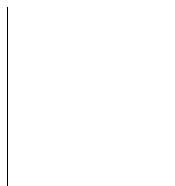
ip ospf authentication-key

ip ospf authentication-key key

no ip ospf authentication-key



Key	8



```

ip ospf authentication-key      OSPF
                                OSPF
                                OSPF
    
```

```
OSPF
,
area authentication
ip ospf authentication
```

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



┌

┌

┌

router ospf process-id [vrf vrf-name]	OSPF	OSPF
bfd all-interfaces	OSPF	BFD

┌

┌

-	-

34.1.24 ip ospf cost

OSPF
no

OSPF

ip ospf cost

ip ospf cost cost

no ip ospf cost

┌

cost	OSPF

┌

/Bandwidth

100Mbps

┌

┌

```

OSPF          100Mbps/Bandwidth  Bandwidth
  bandwidth
  OSPF
"    64K      cost  1562
"    E1      cost   48
"    10M     cost   10
"    100M    cost    1
ip ospf cost      OSPF
    
```

```

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

bandwidth	
show ip ospf	Ospf

```


```

-	-

34.1.25 ip ospf database-filter all out

LSA =

	-	-

┌
└

	-	-

34.1.26 ip ospf dead-interval

OSPF
no

ip ospf dead-interval

ip ospf dead-interval seconds

no ip ospf dead-interval

--	--	--

seconds

1

	ip ospf hello-interval	OSPF	Hello
	-		-

34.1.27 ip ospf disable all

	ospf		
	ip ospf disable all		
	no ip ospf disable all		
	-		-
	network	network area	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	
	-		-
	-		-

34.1.28 ip ospf hello-interval

```

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

```

seconds	OSPF 1-

```

10
PPP HDLC 10
10
X.25 30

```

```


```

```

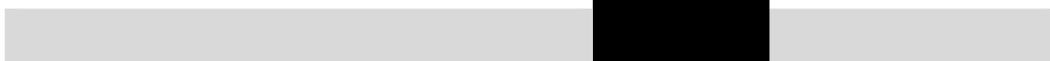
hello hello

```

```

serial 1/0 OSPF 15
Ruijie(config)# interface serial 1/0
Ruijie(config-if)# ip address 172.16. 55.0
Ruijie(config-if)# encapsulation ppp
Ruijie(config-if)# ip ospf hello-interval

```



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
key-id	1 255

┌
└
└

MD5

ip ospf message-digest-key OSPF OSPF

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

	area authentication	OSPF
	ip ospf authentication	
	-	-

34.1.30 ip ospf mtu-ignore

mtu

no

ip ospf mtu-ignore

no ip ospf mtu-ignore

	-	-
	mtu	

OSPF

X.25 OSPF
 X.25 map Frame-relay map X.25
 OSPF X.25
 OSPF

”
 ”
 X.25 IP
 broadcast

1
 Ruijie(config)# interface Serial 1/0
 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

2
 Ruijie(config)# interface Serial 1/0
 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

3 DR/RDR

DR/BDR
 Ruijie(config)# interface Serial 1/0
 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

	-	-

34.1.34 ip ospf transmit delay

OSPF		LSU		ip ospf transmit delay	
no					
ip ospf transmit delay seconds					
no ip ospf transmit delay					
seconds		OSPF	LSU		
		1-65535			
1					
LSU LSAs Age					
ip ospf transmit delay					
area virtual-link transmit-delay					
RGOS	Age	3600	LSA		
LSA					
serial1/ 0 5					
Ruijie(config)#	interface serial		1/0		
Ruijie(config-if)#	ip ospf transmit delay		10		
area virtual-link		OSPF			
-					
-					

34.1.35 log-adj-changes

no default

log-adj-changes [detail]

no log-adj-changes [detail]

	detail		

	detail	Full	Full
--	--------	------	------

--

--

DD



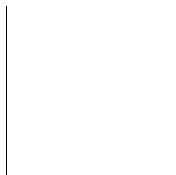
```

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



```

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



ip ospf priority	OSPF
ip ospf network	OSPF



-	-

34.1.38 network area

```

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



ip-address	IP

OSPF

wildcard	IP	0	1
area-id	OSPF	OSPF	OSPF

└──

OSPF

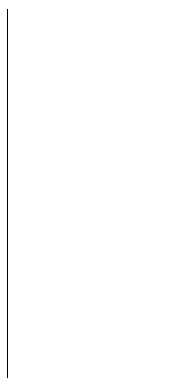
└──

no overflow database

<1-4294967294>	LSA
hard soft	hard LSA



external-LSA
external-LSA external-LSA

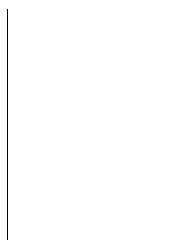


external-LSA max-dbsize
external-LSA external-LSA wait-time
external-LSA

OSPF

max-dbsize

a 1 Full
2
3 AS-External-LSA



external lsa 10 overflow overflow
3

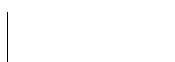
Ruijie# config terminal

Ruijie(config)# router ospf 10

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



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34.1.41 overflow memory-lack

OSPF OVERFLOW no

overflow memory-lack

no overflow memory-lack

no	OSPF OVERFLOW
	OSPF OVERFLOW
	OSPF OVERFLOW
OSPF OVERFLOW	OSPF OVERFLOW
	OSPF OVERFLOW NULL
clear ip ospf process	OSPF OVERFLOW OSPF
OVERFLOW	OSPF OVERFLOW
no	OSPF OVERFLOW OSPF
	OSPF OVERFLOW
1 OSPF	OVERFLOW
Ruijie(config)# router ospf 1	
Ruijie(config-router)# no overflow memory-lack	
clear ip ospf process	OSPF
show ip protocols ospf	OSPF
10.3(4b3)	

34.1.42 passive-interface

no

passive-interface [default | type number]

no passive-interface [default | type number]



isis [area-tag]	isis	area-tag	isis
ospf process-id	ospf	process-id 1-65535	ospf
rip	rip		
static			
level-1 level-1-2 level-2	level IS-IS	IS-IS	level-2
match		OSPF	OSPF
metric metric-value	metric-value	OSPF external 2 LSA metric	metric 0-16777214
metric-type {1 2}		E-1	E-2
route-map route-map-name			
subnets			
tag tag-value		OSPF	tag 0-4294967295

OSPF
 ISIS level-2
 BGP metric 1 LSA metric 20
 metric-type E-2
 route-map

LSA ASBR OSPF type-5
 isis level level-2
 level level
 level 1, level 2 level-1-2
 ospf match ospf
 match match
 no match
 route-map route-map match

```

level                                OSPF  ISIS                                match
                                route-map

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

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

summary-address	OSPF
default-metric	OSPF

-	-

34.1.44 router ospf

```

OSPF                                OSPF                                router ospf
no                                  OSPF

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

process-id	OSPF 1
vrf-name	VRF OSPF VRF

|

OSPF

|

|

RGOS10.1

OSPF

OSPF

|

Ruijie(config)#

vrf vpn_1 OSPF
router ospf 10 vrf vpn_1

10

|

show ip protocols	
show ip ospf	ospf

|

--	--

OSPF



NSSA

summary-address

NSSA

ABR



```

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

```

spf-delay spf-holdtime OSPF
CPU
a timers spf timers throttle spf
    
```

```

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

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

10.1	

34.1.49 timers throttle spf

```

OSPF SPF SPF
timers throttle spf no
    
```

```

timers throttle spf spf-delay spf-holdtime spf-max-waittime
no timers throttle spf
    
```

--	--

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

```

spf-delay 1000
spf-holdtime 5000
spf-max-waittime 10000
    
```

```

spf-delay          SPF          SPF          SPF
                SPF          spf-holdtime    SPF
                                spf-max-waittime
                                SPF
                SPF
                spf-holdtime
spf-delay  spf-holdtime    spf-max-waittime
                SPF
timers spf          SPF          timers
throttle spf          SPF          timers
-----
1  spf-holdtime    spf-delay    spf-holdtime
    spf-delay
2  spf-max-waittime    spf-holdtime
a  spf-max-waittime    spf-holdtime
3  timers throttle spf    timers spf
4  timers spf    timers throttle spf    timers
    throttle spf
    
```

```

                OSPF  SPF          5
                1000  90000          SPF
5ms 1s 3s 7s 15s 31s 63s 89s 179s 179+90 .....
Ruijie(config)#    router  ospf  20
Ruijie(config-router)#    timers  spf 5 1000 90000
    
```



show ip ospf	ospf
timers spf	SPF 10.4 RGOS SPF timers throttle spf timers spf

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10.4(1)	

~~OSPF~~

```
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
Graceful-restart disabled
Graceful-restart helper support enabled
Number of areas attached to this router: 1
Area 0 (BACKBONE)
Number of interfaces in this area is 1(1)
Number of fully adjacent neighbors in this area is 1
Area has no authentication
SPF algorithm last executed 00:01:26.640 ago
SPF algorithm executed 4 times
Number of LSA 3. Checksum 0x0204bf
Area 1 (NSSA)
Number of interfaces in this area is 1(1)
Number of fully adjacent neighbors in this area is 0
Number of fully adjacent virtual neighbors through this area is 0
Area has no authentication
SPF algorithm last executed 02:09:23.040 ago
SPF algorithm executed 4 times
Number of LSA 6. Checksum 0x028638
NSSA Translator State is elected
    OSPF   BFD   ,           "BFD enabled",
Ruijie# show ip ospf
Routing Process "ospf 1" with ID 1.1.1.1
Process uptime is 4 minutes
Process bound to VRF default
Conforms to RFC2328, and RFC1583Compatibility flag is enabled
Supports only single TOS(TOS0) routes
Supports opaque LSA
```

Supports Graceful Restart
 This router is an ASBR (injecting external routing information)
 SPF schedule delay 5 secs, Hold time between two SPFs 10 secs
 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 Adjency Changes : Enabled
 Graceful-restart disabled
 Graceful-restart helper support enabled
 Number of areas attached to this router: 1
 BFD enabled
 Area 0 (BACKBONE)
 Number of interfaces in this area is 1(1)
 Number of fully adjacent neighbors in this area is 1
 Area has no authentication
 SPF algorithm last executed 00:01:26.640 ago
 SPF algorithm executed 4 times
 Number of LSA 3. Checksum 0x0204bf
 Area 1 (NSSA)
 Number of interfaces in this area is 1(1)
 Number of fully adjacent neighbors in this area is 0
 Number of fully adjacent virtual neighbors through this area is 0
 Area has no authentication
 SPF algorithm last executed 02:09:23.040 ago
 SPF algorithm executed 4 times
 Number of LSA 6. Checksum 0x028638
 NSSA Translator State is elected

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

Conforms to RFC2328	RFC2328
RFC1583Compatibility flag	RFC2328 RFC1583 ASBR
Support Tos	TOS0
Supports opaque LSA	opaque-LSA
Graceful-restart	RFC3623 Graceful Restart GR Restart
Graceful-restart helper	RFC3623 Graceful Restart GR Help
Router Type	OSPF normal ABR ASBR
SPF Delay	SPF
SPF-holdtime	SPF
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
Log Neighbor Adjency Changes	

Number of interfaces in this
area

```

show ip route

```

ABR ASBR OSPF OSPF
OSPF OSPF

```

show ip ospf border-routers
Ruijie# show ip ospf border-routers
OSPF internal Routing Table
Codes: i - Intra-area route, I - Inter-area route
i1.1.1.1[2]via10.0.0.1,FastEthernet 0/1,ABR,ASBR,Area0.0.0.1
select

```

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

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---	---

34.2.3 show ip ospf database

OSPF

show ip ospf database

LSAs

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

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

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└──┘
OSPF
OSPF

└──┘
1 **show ip ospf database**
Ruijie# show ip ospf database
OSPF Router with ID (1.1.1.1) (Process ID 1)

Router Link States (Area 0.0.0.0)

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

Network Link States (Area 0.0.0.0)

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

Summary Link States (Area 0.0.0.0)

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

Router Link States (Area 0.0.0.1 [NSSA])

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

Summary Link States (Area 0.0.0.1 [NSSA])

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

000T-6(0ag0 1.1.1)2 1.1.1.1 (1.1.6(Route))T1)-6(.1)-102xbb2d 1926088.033c92608E2926082

ADV Router	
Age	
Seq#	

Network Mask	
TOS	TOS 0
Metric	

3 **show ip ospf database external**

```
Ruijie# show ip ospf database external
OSPF Router with ID (1.1.1.35) (Process ID 1)
AS External Link States
LS age: 752
Options: 0x2 (*|---|E|)
LS Type: AS-external-LSA
Link State ID: 20.0.0.0 (External Network Number)
Advertising Router: 1.1.1.1
LS Seq Number: 8000000a
Checksum: 0x7627
Length: 36
Network Mask: /24
Metric Type: 2 (Larger than any link state path)
TOS: 0
Metric: 20
Forward Address: 0.0.0.0
External Route Tag: 0
```

show ip ospf database external

	OSPF
OSPF Router with ID	
Type-5 AS External Link States	
LS age	
Options	
LS Type	
Link State ID	
Advertising Router	
LS Seq Number	
Checksum	
Length	

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

4 **show ip ospf database network**

```

Ruijie# show ip ospf database network
OSPF Router with ID (1.1.1.1) (Process ID 1)
Network Link States (Area 0.0.0.0)
LS age: 572
Options: 0x2 (*|---|---|E|)
LS Type: network-LSA
Link State ID: 192.88.88.27 (address of Designated Router)
Advertising Router: 1.1.1.1
LS Seq Number: 80000001
Checksum: 0x5366
Length: 32
Network Mask: /24
Attached Router: 1.1.1.1
Attached Router: 3.3.3.3
    
```

show ip ospf database network

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

Network Mask	
Attached Router	

```

5          show ip ospf database router
Ruijie#   show ip ospf database router
OSPF Router with ID (1.1.1.1) (Process ID 1)
Router Link States (Area 0.0.0.0)
LS age: 322
Options: 0x2 (*|---|E|)
Flags: 0x3 : ABR ASBR
LS Type: router-LSA
Link State ID: 1.1.1.1
Advertising Router: 1.1.1.1
LS Seq Number: 80000012
Checksum: 0x6d3a
Length: 48
Number of Links: 2
Link connected to: Stub Network
(Link ID) Network/subnet number: 100.0.1.1
(Link Data) Network Mask: 255.255.255.255
Number of TOS metrics: 0
TOS 0 Metric: 0
    
```

show ip ospf database router

OSPF Router with ID	OSPF
Router Link States	
LS age	
Options	
Flag	router
LS Type	
Link State ID	
Advertising Router	
LS Seq Number	
Checksum	
Length	
Number of Links	

SPF

Link connected to

```
7          show ip ospf database nssa-external
Ruijie#   show ip ospf database nssa-external
OSPF Router with ID (1.1.1.1) (Process ID 1)
NSSA-external Link States (Area 0.0.0.1 [NSSA])
LS age: 1
```

NSSA:Forward Address	0.0.0.0	IP
External Route Tag	OSPF	32
	OSPF	

8 **show ip ospf database external**

```

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

show ip ospf database external

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

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

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

Ruijie# show ip ospf database database-summary

OSPF process 1:

Router Link States : 4

Network Link States : 2

Summary Link States : 4

ASBR-Summary Link States : 0

AS External Link States : 4

NSSA-external Link States: 2

show ip ospf database database-summary

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

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34.2.4 show ip ospf interface

OSPF

show ip ospf interface

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

interface-type	
z interface-number	

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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
InternetAddress192.88.88.27/24,Iindex4,Area0.0.0.0,MTU1500
Matching network config: 192.88.88.0/24
Process ID 1, Router ID 1.1.1.1, Network Type BROADCAST, Cost: 1
Transmit Delay is 1 sec, State DR, Priority 1
Designated Router (ID) 1.1.1.1, Interface Address 192.88.88.27
Backup Designated Router (ID) 3.3.3.3, Interface Address
192.88.88.72
Timer intervals configured,Hello 10,Dead 40,Wait 40,Retransmit 5
Hello due in 00:00:03
Neighbor Count is 1, Adjacent neighbor count is 1
Crypt Sequence Number is 70784
Hello received 1786 sent 1787, DD received 13 sent 8
LS-Req received 2 sent 2, LS-Upd received 29 sent 53
LS-Ack received 46 sent 23, Discarded 1
```

BFD

:

```
Ruijie# show ip ospf interface fa 1/0
FastEthernet 1/0 is up, line protocol is up
InternetAddress192.88.88.27/24,Iindex4,Area0.0.0.0,MTU1500
```

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

show ip ospf interface serial 1/0

FastEthernet 0/0 State	UP	Down
Internet Address	IP	
Area	OSPF	
MTU	MTU	
Matching network config	OSPF	network area
Process ID		
Router ID	OSPF	
Network Type	OSPF	
Cost	OSPF	
Transmit Delay is	OSPF	
State	DR/BDR	
Priority		
Designated Router(ID)		

Neighbor count	
Adjacent neighbor count	Full
Crypt Sequence Number	md5
Hello received send	HELLO
DD received send	DD
LS-Req received send	LS
LS-Upd received send	LS
LS-Ack received send	LS
Discard	
BFD enabled	

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	-	-

34.2.5 show ip ospf neighbor

OSPF

show ip ospf neighbor

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

detail	
interface-type interface-number	
neighbor-id	

OSPF

show ip ospf neighbor

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

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

Graceful-restart helper disabled

BFD

” BFDsessionstateup”

```
Ruijie# show ip ospf neighbor
OSPF process 1, 1 Neighbors, 1 is Full:
```

Database Summary List 0

Link State Request List 0

Link State Retransmission List 0

Crypt Sequence Number is 0

Thread Inactivity Timer on

Thread Database Description Retransmission off

Thread Link State Request Retransmission off

Thread Link State Update Retransmission off

Thread Poll Timer on

Graceful-restart helper disabled

BFD session state up

Neighbor up time	
Database Summary List	DD
Link State Request List	LS
Link State Retransmission List	
Crypt Sequence Number	MD5
Thread Inactivity Timer	
Thread Database Description Retransmission	DD
Thread Link State Request Retransmission	LS
Thread Link State Update Retransmission	LS
Thread Poll Timer	Poll Timer
Graceful-restart helper	GR Helper

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34.2.6 show ip ospf route

OSPF

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

process-id	OSPF OSPF
count	OSPF

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

34.2.7 show ip ospf summary-address

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

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NSSA ABR

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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

Summary Address	
Summary Mask	
Advertise	
Status	
Aggregated subnets	

|

-	-

|

show ip

ospf neighbor

show ip ospf virtual-links

```
Ruijie# show ip ospf virtual-links
Virtual Link VLINK0 to router 1.1.1.1 is up
Transit area 0.0.0.1 via interface FastEthernet 0/1
Local address 10.0.0.37/32
Remote address 10.0.0.27/32
Transmit Delay is 1 sec, State Point-To-Point,
Timer intervals configured,Hello 10,Dead 40,Wait 40,Retransmit 5
Hello due in 00:00:05
Adjacency state Full
```

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

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---	---

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35.1 " - ' a —

35.1.1 distribute-list in

distribute-list in

no

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

no distribute-list {[

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

access-list	
prefix-list	

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

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BGP

```
Ruijie(config)# ip community-list standard test deny 100:20200:20
Ruijie(config)# ip community-list standard test2 permit internet
```



35.1.4 ip default-network

```
ip default-network no
```

```
ip default-network network
```

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

network	

```
0.0.0.0/0
```

```
default-network
```

```
***
```

```
connected
```

```
1 192.168.100.0
```

```
Ruijie(config)# ip route 192.168.100.0 255.255.255.0 serial 0/1
```

```
Ruijie(config)# ip default-network 192.168.100.0
```

```
2 200.200.200.0 200.200.200.0
```

show ip route	IP

	-	-

35.1.5 ip prefix-list

ip prefix-list **no**

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

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

	prefix-lis-name	
		1
		2147483647
	seq-number	

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

35.1.7 ip prefix-list sequence-number

	ip prefix-list description	no
	-	-
Ruijie#	configure terminal	
Ruijie(config)#	ip prefix-list sequence-number	
	-	-

--	--	--

```
ip route 0.0.0.0
0.0.0.0 Fastethernet 0/0
Fastethernet 0/0 ARP CPU
```

```
172.16.100.0/24
192.168.12.1 115
ip route 172.16.100.0 255.255.255.0 192.168.12.1 115
```

```
172.16.100.0/24
fastethernet 0/0
Ruijie(config)# ip route 172.16.100.0 255.255.255.0 fastethernet
0/0 192.168.12.1
```

show ip route	IP
-	-

ting

```
RGOS IP no
```

ng

outing

```
1 T8 63.12 Tc961B4.006 Tc 2 Tr 10.02 0 0 10.02 439.33 Tm[<28
```

		RGOS	IP
		RGOS	IP
		Ruijie(config)# no ip routing	
		-	-
		-	-

35.1.10 ip static route-limit

			ip static route-limit	no
		ip static route-limit	number	
		no ip static route-limit		
			number	1-10000
			1024	
			ip static route-limit	show
		running-config		
			900	
		Ruijie(config)#	ip static route-limit	900
		Ruijie(config)#	no ip static route-limit	
			-	-

L

--	--	--

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

-	-

35.1.13 match interface

match interface **no**

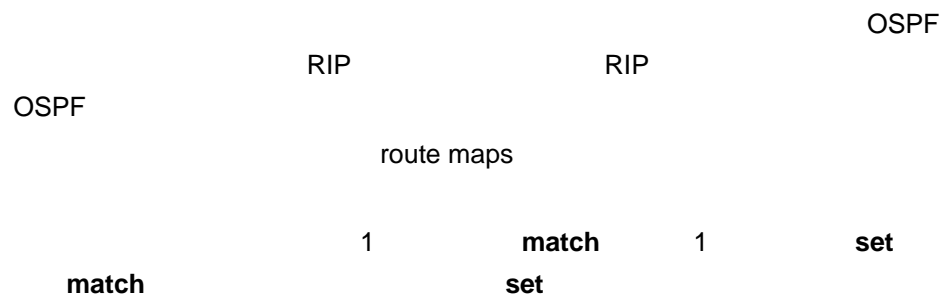
match interface interface-type interface-number [...interface-type interface-number]

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

interface-type	
interface-number	



match interface



```

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

```

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

-	-

match ip

address **no**

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

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

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

match ip address

```

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

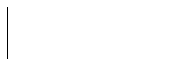
```

```

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

```

access-list	
match interface	



match ip next-hop

RIP

RIP
IP

OSPF

OSPF

OSPF

route maps

match

1

match

1

set

	-	-

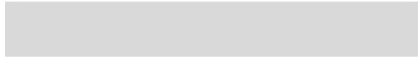
35.1.16 match ip route-source

IP

match ip route-source **no**

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

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



```

Ruijie(config-router)#      route-map  redrip
Ruijie(config-router)#      network  192.168.12.0 0.0.0.255      area  0
Ruijie(config-router)#      exit
Ruijie(config)#      access-list  5 permit host  192.168.100.1
Ruijie(config)#      route-map  redrip  permit  10
Ruijie(config-route-map)#  match ip route-source      5

```

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

-	-

35.1.17 match length

no IP **match length**
match length min-length max-length
no match length min-length max-length

min-length	IP
max-length	IP

L

L

L

1

	-	-
--	---	---

35.1.18 match metric

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

```

Ruijie(config-route-map)#      exit
Ruijie(config)#      route-map  MAP20 20  permit
Ruijie(config-route-map)#      match origin incomplete
Ruijie(config-route-map)#      set community no-export

```

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

-	-

35.1.20 match route-type

OSPF

RIP

RIP
IP

OSPF

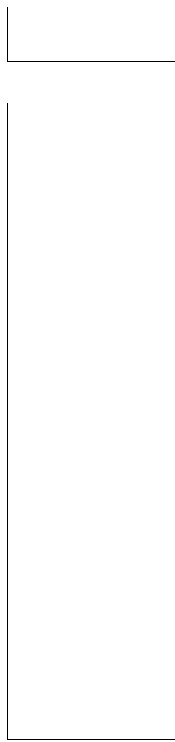
match tag tag [...tag]

no match tag tag [...tag]



	set metric-type	
	set tag	

--	--	--



```
RGIOS
OSPF
RIP
RIP
IP
route maps
1 match 1 set
match set
" sequence-number 10
" sequence-number
"
OSPF OSPF RIP 4 RIP
OSPF type-1 40
Ruijie(config)# router ospf
Ruijie(config-router)# redistribute rip subnets route-map redrip
Ruijie(config-router)# network 192.168.12.0 0.0.0.255 area 0
Ruijie(config-router)# exit
```

35.1.23 set aggregator as

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

as-number	AS
ip_addr	

35.1.24 set as-path prepend

```

match AS_PATH set
as-path prepend no
set as-path prepend as-number
no set as-path prepend [as-number]

```

as-number	AS_PATH	AS

└──

└──

```

AS_PATH as-path
15 as

```

```

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

```

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

└──

-	-

35.1.25 set comm-list delete

match COMMUNITY_LIST community
set comm-list delete no

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

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

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

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

G \Á• €0 gđ0 aY`ýbîÂ 1Äp G L0 ` % Mii WLG•6 ãA'5A<aíÓ€ 2 û y4{

```

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

```

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

-	-

35.1.27 set dampening

```

match set dampening
no
set dampening half-life reuse suppress max-suppress-time
no set dampening

```

half-life	1..45()	15
reuse	1..20000	750

35.1.28 set default interface

match
set default interface **no**

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

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

interface-type	
interface-number	

set default interface

1

set down set

serial 1/0

500

fastethernet 1/0

Ruijie(config)# interface serial 1/0

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

Ruijie(config-if)# exit

Ruijie(config)# route-map smallpak permit 10

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

Ruijie(config-route-map)# set default interface fastethernet 1/0

--	--

route-map	
------------------	--

match ip address	
-------------------------	--

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

-	-

35.1.30 set ip default next-hop

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

ip-address	IP
weight	

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

```

a
      next-hop      weight      set
      WCMP          WCMP
      weight      nexthop      weight
      1
set ip next-hop      set ip default next-hop      set ip next-hop
set ip default next-hop      set ip default next-hop
      (nexthop)
      1
      set

```

```

      1      1.1.1.1
      6.6.6.6      2.2.2.2
      7.7.7.7
Ruijie(config)#      access-list      1      permit      ip      1.1.1.1      0.0.0.0
Ruijie(config)#      access-list      2      permit      ip      2.2.2.2      0.0.0.0
Ruijie(config)#      interface      async      1
Ruijie(config-if)#      ip      policy      route-map      equal-access
Ruijie(config)#      route-map      equal-access      permit      10
Ruijie(config- route-map)#      match      ip      address      1
Ruijie(config-route-map)#      set      ip      default      next-hop      6.6.6.6
Ruijie(config)#      route-map      equal-access      permit      20
Ruijie(config-route-map)#      match      ip      address      2
Ruijie(config-route-map)      #set      ip      default      next-hop      7.7.7.7
Ruijie(config)#      route-map      equal-access      permit      30
Ruijie(config- route-map)#      set      default      interface      null      0

```

route-map	
match ip address	
set default interface	

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

-

-	-

35.1.31 set ip dscp

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

dscp_value	IP IP DSCP

--	--

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

└──┘

-	-

35.1.32 set vrf

set vrf match IP VRF
no set vrf name
no set vrf name

name	VRF

└──┘

└──┘

└──┘

match IP VRF

```

1      set vrf          VRF          set          VRF
      VRF          set
"      set vrf          VRF
      % route-map VRF table vrf-name does not exist.
" VRF          route-map          set vrf
      % route-map set vrf vrf-name configuration removed from all
      route-maps.
2
      set vrf          set ip
nexthop set ip next-hop verify-availability          set
a vrf set ip tos set ip precedence set ip dscp
      set vrf

"      set ip nexthop          set vrf
      % route-map can not set vrf .
      % Remove other set clauses to set vrf.
"      set vrf          set ip nexthop
      % route-map can not set next-hop.
      % Remove set vrf clause before set ip next-hop.

```

```

serial 1/0          10.0.0.0/8
      vrf_A          172.16.0.0/16
      vrf_B
1      route-map          ACL
Ruijie(config)# access-list 10 permit 10.0.0.0 0.255.255.255
Ruijie(config)# access-list 20 permit 172.16.0.0 0.0.255.255
2      route-map
Ruijie(config)# route-map PBR permit 10
Ruijie(config-route-map)# match ip address 10
Ruijie(config-route-map)# set vrf vrf_A
Ruijie(config)# route-map PBR permit 20
Ruijie(config-route-map)# match ip address 20
Ruijie(config-route-map)# set vrf vrf_B
3
Ruijie(config)# interface serial 1/0
Ruijie(config-if)# ip policy route-map PBR

```

1

set

serial 1/0

10.0.0.0/8

192.168.100.1

172.16.0.0/16

172.16.100.1

Ruijie(config)# interface serial 1/0

Ruijie(config-if)# ip policy route-map load-balance

load-ba6ria7 load-ba<1417e

load-ba6ria7 load-ba1(93)Tj /TT2 1 Tf 0 Tc 9.581 0 Td ()Tj /TT4 1 Tf 001 Tc0.8 0 0 T55 T55.377 0 Td (lo

	-	-

35.1.34 set ip next-hop verify-availability

IP

route-map

match ip address

```

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

```

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

-	-

35.1.36 set ip tos

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

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

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

--	--

	-	-
--	---	---

└───

└───

└───

IP

TOS

IP

IP

TOS

fastEthernet 0/0

192.168.217.68

tos 4

Ruijie(config)# access-list 1 permit 192.168.217.68 0.0.0.0

) g i f n o c (e i j i u R 4

35.1.37 set level

match
no

set level

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

no set level

-	-

```

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

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

	-	-

35.1.38 set local-preference

match LOCAL_PREFERENCE set
local-preference no
set local-preference number
no set local-preference

	number	0-4294967295

-	-

35.1.39 set metric

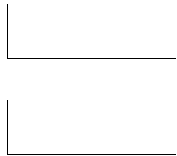
match **set metric**

no

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

no set metric

+	metric
-	metric
metric-value	



```

set metric ' +' ' -' metric
RIP metric 1-16 OSPF
OSPF RIP RIP IP
route maps
match 1 match 1 set

```

```

40 OSPF RIP
Ruijie(config)# router ospf
Ruijie(config-router)# r edistribute rip subnets route-map redrip
Ruijie(config-router)# network 192.168.12.0 0.0.0.255 area 0
Ruijie(config-router)# exit

```

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

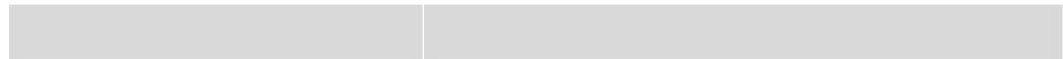
match interface	
match ip address	
match ip next-hop	
match ip route-source	
match metric	
match route-type	
match tag	
set metric-type	
set tag	



35.1.40 set metric-type

```
match
no
set metric-type type
no set metric-type
```

set metric-type



```
OSPF
type-2
```

RIP

RIP

OSPF

```

route maps
1 match 1 set
match set

```

```

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

```

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

```


```

-	-

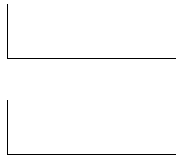
35.1.41 set next-hop

```

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

```

ip-address	IP
------------	----



```

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

```

```

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

```

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



-	-

35.1.42 set origin

match

set origin

no

set origin {egp | igp | incomplete}

no set origin

egp	EGP
igp	IGP
incomplete	

35.1.43 set originator-id

```

match
no

```

set originator-id

set originator-id ip-addr

no originator-id [ip-addr]

ip-addr	

┌

┌

┌

```

Ruijie(config)#      route-map  SET_ORIGIN 10 permit
Ruijie(config-route-map)#  match as-path      1
Ruijie(config-route-map)#  set originator-id  5.5.5.5
Ruijie(config-route-map)#  exit
Ruijie(config)#      route-map  SET_ORIGIN 20 permit
Ruijie(config-route-map)#  match as-path      2
Ruijie(config-route-map)#  set originator-id  5.5.5.6

```

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

┌

-	-

35.1.44 set tag

match set tag no

set tag tag

no set tag

tag	

```

Ruijie(config)#          OSPF          RIP          100
Ruijie(config)#          router ospf
Ruijie(config-router)#   redistribute rip subnets route-map   redrip
Ruijie(config-router)#   network 192.168.12.0 0.0.0.255   area 0
Ruijie(config-router)#   exit
Ruijie(config)#          route-map redrip permit 10
Ruijie(config-route-map)# set tag 100

```

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

	set metric-type	
	-	-

35.1.45 set weight

match BGP set weight
no

set weight number

no set weight

number		0-65535

```

BGP
neighbor weight
32768
BGP

```

```

BGP in 1.1.1.1
100
Ruijie(config)# router bgp 1
Ruijie(config-router)# neighbor 1.1.1.1 route-map nei-rmap-in in
Ruijie(config-router)# exit
Ruijie(config)# route-map nei-rmap-in permit 10
Ruijie(config-route-map)# set weight 100

```

match as-path		AS_PATH

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

└──

-	-

35.2 ip - a —

35.2.1 show ip community-list

show ip community-list [community-list-number|community-list-name]

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

└──

└──

└──

```
Ruijie# show ip community-list
Community-list standard local
permit local-AS
Community-list standard Red-Giant
```


35.2.3 show ip route

IP **show ip route**

show ip route [[vrf vrf_name] [network [mask] | count | protocol [process-id] | weight]]

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

1 **show ip route**

Ruijie# show ip route e

Codes: C - connected, S - static, R - RIP, B - BGP

O - OSPF, IA - OSPF inter area

N1-OSPF NSSA external type 1,N2 - OSPF NSSA external type 2

E1 - OSPF external type 1, E2 - OSPF external type 2

i - IS-IS,su - IS-IS summary,L1 - IS-IS level-1,L2 - IS-IS level-2

ia - IS-IS inter area, * - candidate default

Gateway of last resort is no set

S 20.0.0.0/8 is directly connected, VLAN 1

S 22.0.0.0/8 [1/0] via 20.0.0.1

O E2 30.0.0.0/8 [110/20] via 192.1.1.1, 00:00:06, VLAN 1
 R 40.0.0.0/8 [120/20] via 192.1.1.2, 00:00:23, VLAN 1
 B 50.0.0.0/8 [120/0] via 192.1.1.3, 00:00:41
 C 192.1.1.0/24 is directly connected, VLAN 1
 C 192.1.1.254/32 is local host.

show ip route

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

2 **show ip route** network
 Ruijie# show ip route 30.0.0.0
 Routing entry for 30.0.0.0/8

Routing Descriptor
Blocks

IP

Match clauses:

ip address 2

Set clauses:

metric 10

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

-	-

-	-

36 n jÇ Å% a—

36.1 " - ' a—

36.1.1 protected-ports route-deny

no

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

no storm-control {**broadcast** | **multicast** | **unicast**} [{**level** percent | **pps** packets | rate-bps}]

broadcast	
multicast	
unicast	
percent	20 20%
packets	pps packets per second
Rate-bps	
64k-2M	64k
2-100M	1M
100M	8M

show storm-control

```
GigabitEthernet 1/1
    4M
Ruijie# configure terminal
Ruijie(config)# interface GigabitEthernet 1/1
Ruijie(config-if)# storm-control multicast 4096
Ruijie(config-if)# end
```

show storm-control	

|

-

|

-	-

36.1.3 switchport protected

no

switchport protected

no switchport protected

|

-	-

|

|

|

3

show interfaces

|

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

|

show interfaces	

|

-

|

-	-

36.1.4 switchport port-security

no

switchport port-security [violation {protect | restrict | shutdown}]

no switchport port-security [violation]

port-security	

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
no switchport port-security aging static

show port-security

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

show port-security	

-	-
---	---

36.1.6 switchport port-security binding

	-	-

36.1.7 switchport port-security binding interface

IP+ MAC IP

no

[no] switchport port-security binding interface interface-id mac-address **vlan** vlan_id
 ipv4-address

[no] switchport port-security binding interface interface-id ipv4-address | ipv6-address

interface-id	ID

4¥ n ì\$ n\ ð „Å æd” @H è5Ù ™\$d

	switchport port-security aging	
	show port-security	
	-	-

36.1.8 switchport port-security maximum

no

switchport port-security maximum value

[no] switchport port-security maximum

	value	1-128

128

128

```

1      10      2
Ruijie(config)#  inter  g0/10
Ruijie(config-if)#  switchport port-security maximum 2

```

	switchport port-security	
	switchport port-security binding	
	Switchport port-security mac-address	
	switchport port-security aging	

	show port-security	
	-	-

36.1.9 switchport port-security mac-address

no

[no] **switchport port-security mac-address** mac-address [vlan vlan-id]

	mac-address	
	vlan-id	MAC VID TRUNK vlan-id

┌
└
┌
└

```

1      TRUNK      10                      00d0.f800.5555 VID=2
Ruijie(config)#      inter g0/10
Ruijie(config-if)#              switchport      port-security      mac-address
00d0.f800.5555      vlan      2

```

	switchport port-security	
	switchport port-security binding	
	switchport port-security mac-address interface	
	switchport port-security aging	

show port-security	
-	-

36.1.10 switchport port-security mac-address interface

no

[no] **switchport port-security interface** interface-id **mac-address** mac-address [vlan vlan-id]

interface-id	ID
mac-address	
vlan-id	MAC VID TRUNK vlan-id

```

1      TRUNK      10                      00d0.f800.5555 VID=2
Ruijie(config)#      switchport   port-security   interface   g0/10
mac-address   00d0.f800.5555      vlan   2

```

switchport port-security	
switchport port-security binding	
Switchport port-security mac-address	
switchport port-security aging	

show port-security	
-	-

36.1.11 switchport port-security sticky mac-address

Sticky MAC no

[no] switchport port-security mac-address sticky mac-address [vlan vlan-id]

Sticky MAC no Sticky MAC

[no] switchport port-security mac-address sticky

mac-address			
vlan-id	MAC	VID	
		TRUNK	vlan-id

Sticky MAC

```

1          10  Sticky MAC
Ruijie(config)#  inter g0/10
Ruijie(config-if)#  switchport port-security
Ruijie(config-if)#  switchport port-security sticky mac-address
Ruijie(config-if)#  end
2          TRUNK  10  Sticky          00d0.f800.5555 VID=2
Ruijie(config)#  inter g0/10
Ruijie(config-if)# no          switchport port-security sticky mac-address
00d0.f800.5555  vlan  2
Ruijie(config-if)#  end

```

switchport port-security	
switchport port-security binding	
Switchport port-security mac-address	
switchport port-security mac-address interface	
switchport port-security aging	
show port-security	

RGOS 10.4(3)	Sticky MAC	10.4(3)

36.2 i μ - ' a —

36.2.1 show storm-control

show storm-control [interface-id]

interface-id	

```
Ruijie# show storm-control gigabitethernet 1/1
Interface Broadcast Control Multicast Control Unicast Control
-----
Gi1/1 Disabled Disabled Disabled
```

storm-control	

└───┘

-	-

36.2.2 show port-security

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

address	
interface interface-id	
all	

└───┘

└───┘

└───┘

```
Ruijie# show port-security
Secure Port MaxSecureAddr(count) CurrentAddr(count) Security
Action
-----
Gi1/1 128 1 Restrict
Gi1/2 128 0 Restrict
Gi1/3 8 1 Protect
```

--	--

switchport port-security	
switchport port-security aging	
switchport port-security mac-address	

└──

--	--

37 802.1X a —

-	-

37.1.2 dot1x auto-req packet-num

no

dot1x auto-req packet-num num

no dot1x auto-req packet-num

num	

num = 0;

show dot1x auto-req

```

802.1x
Ruijie# configure terminal
Ruijie(config)# dot1x auto-req packet-num 0
Ruijie(config)# end
Ruijie# show dot1x auto-req
Auto-Req: Enabled
User-Detect : Enabled
Packet-Num : 0
Req-Interval: 30 Second

```

show dot1x auto-req	

	-	-

37.1.3 dot1x auto-req req-interval

no

dot1x auto-req req-interval interval

no dot1x auto-req req-interval

	interval	s

30

37.2.1 dot1x timeout quiet-period

no

dot1x timeout quiet-period seconds

no dot1x timeout quiet-period



0 65535 fig)#d()Tj4TT1 1 9.581725 0 Tno

	show dot1x	802.1x
	-	-

37.2.2 dot1x timeout re-authperiod

no

dot1x timeout re-authperiod seconds

no dot1x timeout re-authperiod

	seconds	0	65535	s

3600

show dot1x 802.1x

1000s

Ruijie# configure terminal

Ruijie(config)# dot1x timeout re-authperiod 1000

Ruijie(config)# end

Ruijie# show dot1x

802.1X Status: Enabled

Authentication Mode: EAP-MD5

Authed User Number: 0

Re-authen Enabled: Disabled

Re-authen Period: 1000 sec

Quiet Timer Period: 1000 sec

Tx Timer Period: 3 sec

Supplicant Timeout: 3 sec
Server Timeout: 5 sec
Re-authen Max: 3 times
Maximum 2Request: 3 times
Filter Non-RG Supp: Disabled
Client Oline Probe: Disabled
Eapol Tag Enable: Disabled
Authorization Mode: Group Server

show dot1x	802.1x

-	-

37.2.3 dot1x timeout server-timeout

no

dot1x timeout server-timeout

```
Ruijie(config)# dot1x timeout server-timeout 10
Ruijie(config)# end
Ruijie# show dot1x
802.1X Status: Enabled
Authentication Mode: EAP-MD5
Authed User Number: 0
Re-authen Enabled: Disabled
Re-authen Period: 1000 sec
Quiet Timer Period: 1000 sec
```

3

show dot1x 802.1x

10s

```

Ruijie# configure terminal
Ruijie(config)# dot1x timeout supp-timeout 10
Ruijie(config)# end
Ruijie# show dot1x
802.1X Status: Enabled
Authentication Mode: EAP-MD5
Authed User Number: 0
Re-authen Enabled: Disabled
Re-authen Period: 1000 sec
Quiet Timer Period: 1000 sec
Tx Timer Period: 3 sec
Supplicant Timeout: 10 sec
Server Timeout: 10 sec
Re-authen Max: 3 times
Maximum Request: 3 times
Filter Non-RG Supp: Disabled
Client Oline Probe: Disabled
Eapol Tag Enable: Disabled
Authorization Mode: Group Server
    
```

show dot1x	802.1x

-	-

37.2.5 dot1x timeout tx-period

no

dot1x timeout tx-period seconds

no dot1x timeout tx-period

seconds	0 65535

3

show dot1x 802.1x

10s

Ruijie# configure terminal

Ruijie(config)# dot1x timeout tx-period 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: 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

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	-	-

37.3 dot1x 7 a —

37.3.1 dot1x re-authentication

no

[no] dot1x re-authentication

	-	-

┌
└

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└

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

-	-

37.3.2 dot1x reauth-max

no

dot1x reauth-max count

no dot1x reauth-max

count	

3

show dot1x

802.1x

```

Ruijie# configure terminal
Ruijie(config)# dot1x reauth-max 5
    
```

```
Ruijie(config)# end
Ruijie# show dot1x
802.1X Status: Enabled
Authentication Mode: EAP-MD5
Authenticated 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 Online Probe: Disabled
Eapol Tag Enable: Disabled
Authorization Mode: Group Server
```

interval	hello
alive	
interval	

```
Hello          20
                250
```

```
show dot1x      802.1x
```

```
hello          30 ,          120
Ruijie# configure terminal
Ruijie(config)# dot1x probe-timer interval          30
Ruijie(config)# dot1x probe-timer alive          120
Ruijie(config)# end
Ruijie# show dot1x probe-timer
Hello Interval: 30 Seconds
Hello Alive: 120 Seconds
```

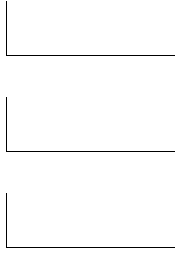
Show dot1x probe-timer	

-	-

37.4.2 dot1x client-probe enable

[no] dot1x client-probe enable

-	-



```
Ruijie# configure termina    I
Ruijie(config)# dot1x client-probe enable
Ruijie(config)# end
Ruijie# show dot1x
802.1X Status: Enabled
```

37.5.1 dot1x authentication

AAA

AAA

no**dot1x authentication {default | list-name}****no dot1x authentication {default | list-name}**

default	
list-name	

AAA

AAA

AAA

dot1x

group radius

```

Ruijie# configure terminal
Ruijie(config)# aaa new-model
Ruijie(config)# aaa authentication dot1x default group radius
Ruijie(config)# interface fastEthernet 0/1
Ruijie(config-if)# dot1x authentication default
Ruijie(config-if)# end

```

aaa new-model	AAA
aaa authentication dot1x	

-	-

37.5.2 dot1x auth-address-table

num	VLAN , 1-3

3

show dot1x

```

Ruijie# configure terminal
Ruijie(config)# dot1x auth-fail max-attempt 5
Ruijie(config)# end
Ruijie#write
    
```

show dot1x	802.1x

10.3(5)	

37.5.4 dot1x auth-fail vlan

```

802.1x vlan
dot1x auth-fail vlan vid
no dot1x auth-fail vlan
    
```

vid	vlan vid

vlan

show dot1x interface

```

      802.1x    vlan
Ruijie# configure terminal
Ruijie(config)# interface fa    0/1
Ruijie(config-if)# dot1x auth-fail vlan    2
Ruijie(config-if)# end
Ruijie#write

```

show dot1x interface	802.1x
-----------------------------	--------

10.3(5)

37.5.5 dot1x auth-mode

802.1x

dot1x auth-mode {eap-md5 | chap | pap}**no dot1x auth-mode**

eap-md5	802.1x	EAP-MD5
chap	802.1x	CHAP
pap	802.1x	PAP

EAP-MD5

show dot1x 802.1x

802.1x

```
Ruijie# configure terminal
Ruijie(config)# dot1x auth-mode chap
Ruijie(config)# end
Ruijie#
```

show dot1x	802.1x

```
┌
```

-	-

37.5.6 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

```
┌
```

-	-

37.5.7 dot1x eapol-tag

EAPOL TAG

dot1x eapol-tag

no dot1x eapol-tag

-	-

┌

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┌

show dot1x 802.1x

┌
Ruijie#
Ruijie(config)#
Ruijie(config)#
Ruijie#

802.1X tag
configure terminal
dot1x eapol-tag
end

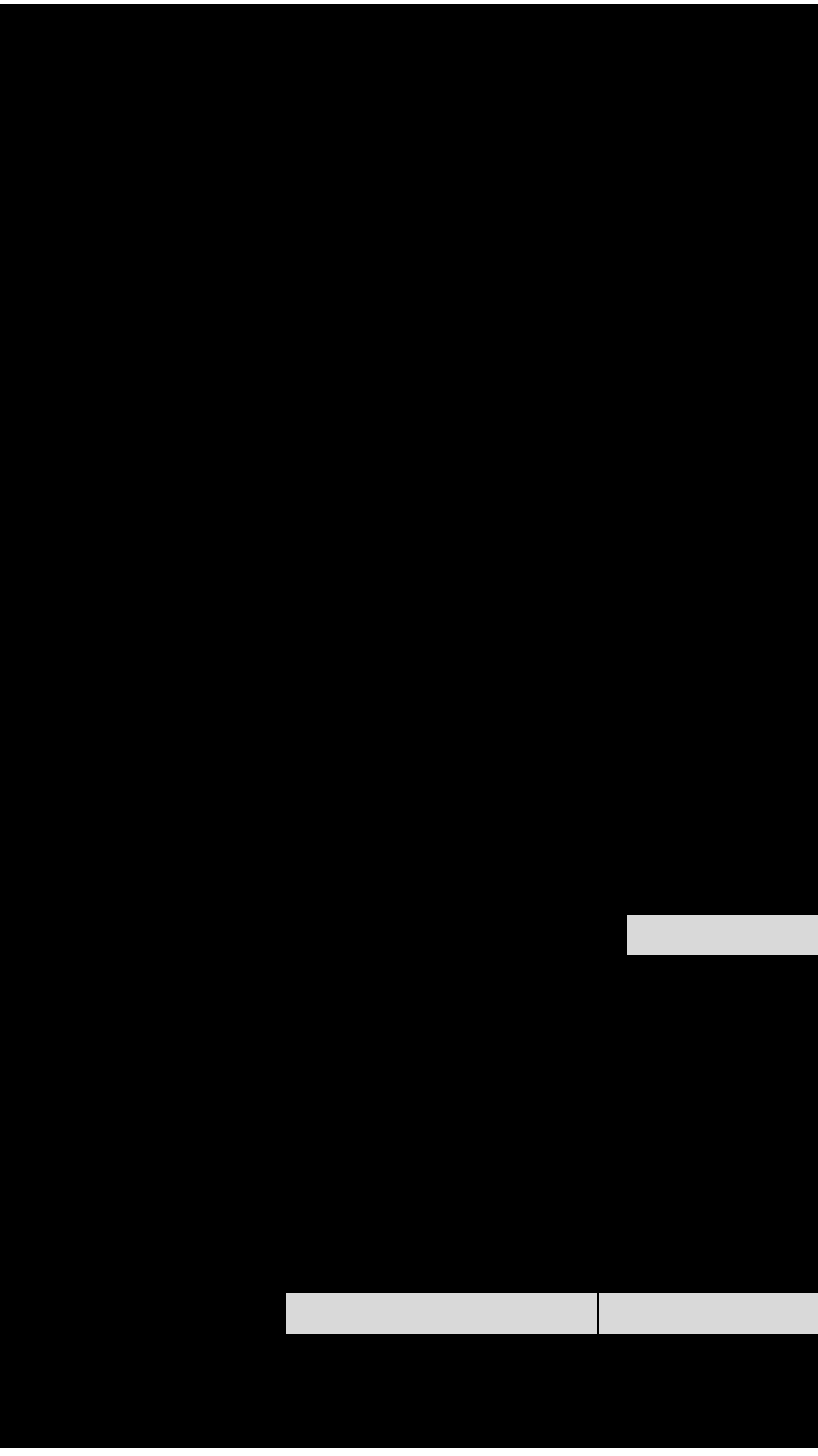
show dot1x	802.1x

┌

-	-

37.5.8 dot1x mac-auth-bypass

MAC



[Redacted]

[Redacted]

802.1x

[Redacted]

[Redacted]

1-65535

```
show run      802.1x
```

```

      802.1x MAC
Ruijie# configure terminal
Ruijie(config)# interface fa 0/1
Ruijie(config-if)# dot1x mac-auth-bypass timeout-activity 3600
Ruijie(config-if)# end
Ruijie#write
```

show dot1x port-control interface	802.1x

10.3(5)	

37.5.10 dot1x mac-auth-bypass violation

802.1x MAC

dot1x mac-auth-bypass violation

no dot1x mac-auth-bypass violation

```
show run      802.1x
```

```

802.1x MAC
Ruijie# configure terminal
Ruijie(config)# interface fa 0/1
Ruijie(config-if)# dot1x mac-auth-bypass violation
Ruijie(config-if)# end
Ruijie#write
    
```

show dot1x port-control interface	802.1x

10.3(5)	

```

DOT1X DOT1X
DOT1X
no
dot1x max-req count
no dot1x max-req
    
```

count	

3

```

show dot1x 802.1x
    
```

```

802.1x 7
Ruijie# configure terminal
Ruijie(config)# dot1x max-req 7
Ruijie(config)# end
Ruijie#
    
```

show dot1x	802.1x
-	-

37.5.12 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	

-	-

37.5.13 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 g 0/1
Ruijie(config-if)# dot1x port-control auto
Ruijie(config-if)# end
Ruijie#

```

\$

802.1x

MAC

{|{

[K> -ò ß À ÁbiÅ~‡

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

show dot1x port-control	802.1x
Show running-config	

-	-

37.5.15 dot1x stationarity enable

802.1x

802.1X

dot1x stationarity enable

no dot1x stationarity enable

-	-

```
└───┘
```

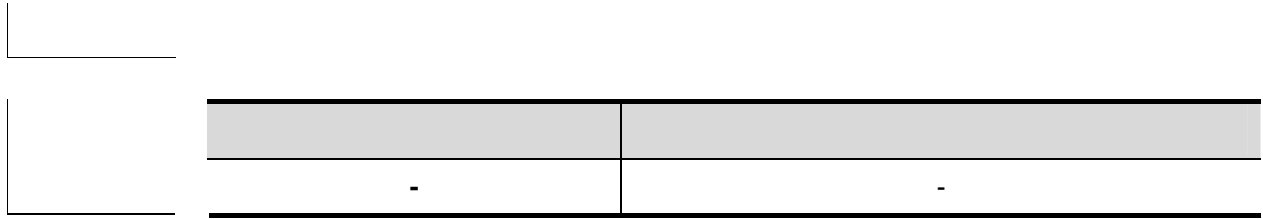
```
└───┘
```

```
└───┘
```

```

                        802.1x
Ruijie# configure terminal
Ruijie(config)# dot1x stationarity enable
Ruijie(config)# end
Ruijie#
```

-	-



37.5.17 dot1x redirect for special tcp-destination port

16 TCP ip ip web 80 8080

	-	-
--	---	---

37.5.18 dot1x redirect time-out

(), 3 1-10 no

dot1x redirect time-out port time-out-interval

no dot1x redirect time-out port

	time-out-interval	

3

1 5
Ruijie(config)# dot1x redirect time-out 5

	dot1x redirect url	web ip ip
	dot1x redirect for special tcp-destination port	
	dot1x redirect num for special source-ip	
	show dot1x	dot1x

	-	-

37.5.19 dot1x redirect num for special source-ip

1

1-10

no

dot1x redirect num for special source-ip num

no dot1x redirect num for special source-ip

	num	

1

1 Ruijie(config)# 3 dot1x redirect num for special source-ip 3

dot1x redirect url		
dot1x redirect for special tcp-destination port	web	ip ip
dot1x redirect time-out		
show dot1x	dot1x	

-		-

37.6 dot1x i μ a —

37.6.1 show dot1x

802.1x

show dot1x

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	

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37.6.3 show dot1x auto-req

802.1x

show dot1x auto-req

-	-

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└

```

Ruijie# show dot1x auto-req
Auto-Req: Disabled
User-Detect : Enabled
Packet-Num : 0
Req-Interval: 30 Seconds

```

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	

-	-

37.6.4 show dot1x private-supPLICANT-only

```
show dot1x private-supPLICANT-only
```

|
|
|

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|

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|
|
|
|

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

[REDACTED]	
-	-

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

```
Ruijie# show dot1x max-req  
max-req: 2 times  
Ruijie#
```

[REDACTED]	[REDACTED]
------------	------------

dot1x auth-mode

802.1x

A'5B Q PQ` ,Hi t" ,DžöhG `

37.6.6 show dot1x port-control

show dot1x port-control [interface interface]

	interface	

|

|

|

```
Ruijie# show dot1x port-control
interface dyn-user static-user max-user qos
ctrl-mode status
-----
```

	dot1x timeout tx-period	
	-	-

37.6.7 show dot1x probe-timer

show dot1x probe-timer

	-	-

```
Ruijie# show dot1x probe-timer
Hello Interval: 20 Seconds
Hello Alive: 250 Seconds
Ruijie#
```

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

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

|

| 

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	

-	-

37.6.10 show dot1x summary

802.1X

show dot1x summary

-	-

```

Ruijie# show dot1x summary
ID MAC Interface VLAN Auth-State
Backend-State Port-Status Type
-----
1 00d0f8000000 Gi0/1 1 Authenticated Idle
Authed Static
Ruijie#
    
```

dot1x auth-mode	802.1x
dot1x max-req	
dot1x port-control auto	
dot1x reauth-max	
dot1x re-authentication	
dot1x timeout quiet-period	
dot1x timeout re-authperiod	
dot1x timeout server-timeout	
dot1x timeout supp-timeout	
dot1x timeout tx-period	

-	-
---	---

37.6.11 show dot1x user id

802.1X

show dot1x user id <id>

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
    
```

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	

-	-

37.6.12 show dot1x timeout

802.1X

show dot1x timeout quiet-period

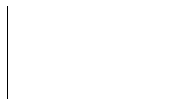
show dot1x timeout re-authperiod

show dot1x timeout server-timeout

show dot1x timeout supp-timeout

show dot1x timeout tx-period

-	-



quiet-period: 60 sec

Ruijie#

	-	-
--	---	---

|

|

|

|
Ruijie# configure terminal
Ruijie(config)# dot1x redirect

--	--	--

|

|

```

Ruijie# configure terminal
Ruijie(config)# http redirect 172.16.0.1
Ruijie(config)# end

```

show http redirect	HTTP
http redirect homepage	

10.2(5)	
----------------	--

37.7.3 http redirect direct-site

no

http redirect direct-site ip-address [ip-mask] [**arp**]

no http redirect direct-site ip-address [ip-mask] [**arp**]

ip-address	IP
ip-mask	IP
arp	ARP CHECK ARP arp

802.1x

|

50

|

IP 172.16.0.1

Ruijie# configure terminal

Ruijie(config)# http redirect direct-site 172.16.0.1

|

show http redirect	HTTP

|

|

10.2(5)	

37.7.4 http redirect homepage

no

http redirect homepage url-string

no http redirect homepage

|

url-string	url-string
	“http://” “https://”
	255

|

|

|

www.su-download.net/

Ruijie# configure terminal

Ruijie(config)# http redirect homepage www.su-download.net/

|

--	--

show http redirect	HTTP
10.2(5)	

37.7.5 http redirect port

redirect port	HTTP	http
no	no	
http redirect port port-num		
no http redirect port port-num		
-		-
80	HTTP	
	HTTP	HTTP
80	HTTP	
10	PC	HTTP
		80
PC	8080	HTTP
Ruijie#	configure terminal	
Ruijie(config)#	http redirect port	8080

L

L

10.2(5)	

37.7.6 http redirect session-limit

```

HTTP                               HTTP
3                               no                               HTTP

```

http redirect session-limit session-num [port port-session-num]

no http redirect session-limit

L

session-num	HTTP 1-255
port-session-num	HTTP 1-300

L

```

HTTP                               HTTP   255
300

```

L

L

```

HTTP                               TCP
HTTP
HTTP                               HTTP
HTTP                               1

```

L

```

HTTP                               4
Ruijie# configure terminal
Ruijie(config)# http redirect session-limit 4

```

L

show http redirect	HTTP

┌

┌

10.2(5)	

37.7.7 http redirect timeout

no

3

http redirect timeout seconds

no http redirect timeout

┌

seconds	1-10

┌

3

┌



38 AAA a —

38.1 - ' a —

38.1.1 aaa authentication dot1x

AAA 802.1X

aaa authentication dot1x 802.1Xno 658/

aaa authentication dot1x {c

no aaa authentication dot1

default	/TT0 1]TJ/C2_0 1 Tf0 Tc
method	
local	

aaa new-model	AAA
dot1x authentication	802.1X
username	

	-

38.1.2 aaa authentication enable

AAA Enable

aaa authentication enable Enable

no

aaa authentication enable default method1 [method2...]

no aaa authentication enable default

--	--

default

	AAA Enable		RADIUS
		RADIUS	
Ruijie(config)#	aaaauthenticationenabledefaultgroupradiuslocal		

```

AAA
aaa authentication login
Login
AAA Login
Login

```

```

list-1 AAA Login
RADIUS
Ruijie(config)# aaa authentication login list-1 group radius local
RADIUS

```

aaa new-model	AAA
username	
login authentication	Login

-	-
---	---

38.1.4 aaa authentication ppp

```

AAA PPP
aaa authentication ppp
no

```

aaa authentication ppp {default | list-name} method1 [method2...]

no aaa authentication ppp {default | list-name}

default	PPP
list-name	PPP
method	“ local none group” 4
local	

group

TACACS+

RADIUS

└──

└──

└──

```

Login
Login
                                Login
                                Login
                                Login
    
```

└──

```

list-1 AAA Login
                                VTY 0 - 4
Ruijie(config)# aaa authentication login list-1 local
Ruijie(config)# line vty 0 4
Ruijie(config-line)# login authentication list-1
    
```

└──

aaa new-model	AAA
username	
login authentication	Login

└──

└──

-	-

38.2 Ñ ã - ' a —

38.2.1 aaa authorization commands

	NAS	CLI	AAA	
				aaa authorization
commands	no	AAA		
aaa authorization commands level {default list-name} method1 [method2...]				
no aaa authorization commands level {default list-name}				

└──

--	--

level	0~15
default	
list-name	
method	“ none group” 4
none	
group	TACACS+

└── AAA

└──

RGOS

@ãÐ

AAA
aaa authorization config-commands no AAA

aaa authorization config-commands

no aaa authorization config-commands

	-	-

|

|

|

no

|

Ruijie(config)# aaa authorization config-commands

aaa new-model		AAA
aaa authorization commands		AAA

|

	-	-

38.2.3 aaa authorization console

AAA authorization console no AAA aaa

aaa authorization console

no aaa authorization console

--	--	--

	-	-
	RGOS	
	Ruijie(config)#	aaa authorization console
	aaa new-model	AAA
	aaa authorization commands	AAA
	authorization commands	
	-	-

38.2.4 aaa authorization exec

AAA NAS CLI Exec
aaa authorization exec no AAA Exec

aaa authorization exec {default | list-name} method1 [method2...]

no aaa authorization exec {default | list-name}

default	Exec
list-name	Exec
method	“ local none group” 4

default	Network
method	" none group" 4
none	
group	TACACS+ RADIUS

AAA Network

RGOS PPP SLIP

RADIUS TACACS+

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

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

-	-
---	---

38.2.6 authorization commands

authorization

Exec

authorization exec

no

Exec

authorization exec {default | list-name}**no authorization exec**

default	Exec
list-name	Exec

AAA Exec

Exec

Exec

Exec

Exec

exec-1 Exec

RADIUS

none

VTY 0 – 4

Ruijie(config)# aaa authorization exec exec-1 group radius none

Ruijie(config)# line vty 0 4

Ruijie(config-line)# authorization exec exec-1

aaa new-model	AAA
aaa authorization commands	AAA Exec

-	-

38.3 š Ě - ' a —

38.3.1 aaa accounting commands

-	-

38.3.2 aaa accounting exec

NAS aaa

accounting exec no Exec

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

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

default	Exec
list-name	Exec
method	“ none group” 4
none	
group	RADIUS TACACS+

RGOS

none Exec Exec Start

NAS CLI


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

aaa new-model	AAA
aaa authorization network	AAA
aaa authentication	AAA
username	

-	-
---	---

38.3.4 aaa accounting update

aaa accounting update

no

aaa accounting update

no aaa accounting update

-	-
---	---

AAA

AAA

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

--	--

-	-

38.3.6 accounting commands

accounting commands

no

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

no accounting commands level

level	0~15
default	
list-name	

└──

└──

└──

```

                                cmd                15                TACACS+
                                none                VTY 0-4

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

aaa new-model	AAA
aaa accounting commands	AAA

└──

--	--

38.4 n 7` AAA û` - ' a —

38.4.1 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	

--



38.4.2 aaa domain enable

AAA

AAA

no

aaa domain enable

no aaa domain enable



|

|

|

|

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



Network

Network

Ruijie(config)# aaa domain m.14.101235QC2_om3 1 Tf 9.581 0904 05.988

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

-	-

38.4.6 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	

|

|

-	-

38.4.7 state

no

state {block | active}

no state

|

block	
active	

|

|

|

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

|

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

|

|

--	--

AAA

	-	-
--	---	---

38.4.8 show aaa domain

show aaa domain [default | domain-name]

	default	
	domain-name	

|

|

|

domain.com

38.4.9 username-format

NAS

no

username-format {without-domain | with-domain}

no username-format

aaa group server {radius | tacacs+} name

no aaa group server {radius | tacacs+} name

name	" tacacs+"	RADIUS	" radius" TACACS+

┌

┌

┌

AAA

RADIUS

TACACS+

┌
Ruijie(config)#
Ruijie(config-gs-radius)#
Ruijie# show aaa group
Group Name: ss
Group Type: radius
Referred: 1
Server List:

aaa group server radius ss

end

show aaa group

Group Name: ss

Group Type: radius

Referred: 1

Server List:

show aaa group	aaa
-----------------------	-----

┌

-	-
---	---

38.5.2 ip vrf forwarding

AAA vrf no

ip vrf forwarding vrf_name

no ip vrf forwarding

	vrf_name	vrf

```

Ruijie(config)#      aaa group server radius ss
Ruijie(config-gs-radius)#      server  192.168.4.12
acct-port 5 authen-port 6
Ruijie(config-gs-radius)# end
Ruijie# show aaa group
Group Name: ss
Group Type: radius
Referred: 2
Server List:
IP Address: 192.168.4.12
Authentication Port: 6
Accounting Port: 5
Referred: 1

```

aaa group server	aaa
show aaa group	aaa

-	-

38.5.4 show aaa group

AAA

show aaa group

-	-

|

|

Login

|

Ruijie# configure terminal

Ruijie(config)# aaa local authentication attempts 6

|

Show running-config	
Show aaa lockout	login

|

|

-	-

38.6.2 aaa local authentication lockout-time

login

aaa local authentication lockout-time lockout-time

|

lockout-time	1~2147483647

|

15

|

|

login

|

Ruijie# configure terminal

Ruijie(config)# aa local authentication lockout-time 5

|

--	--

	Show running-config	
	Show aaa lockout	login
	-	-

38.6.3 aaa new-model

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

aaa new-model

no aaa new-model

	-	-

AAA

AAA AAA AAA **aaa new-model**

Ruijie(config)# AAA
 aaa new-model

	aaa authentication	
	aaa authorization	
	aaa accounting	

--	--	--

	-	-
--	---	---

38.6.4 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 logout	login

┌

|

| EXEC

|

|

-	-

|

-	-

38.6.6 show aaa method-list

AAA

show aaa method-list

-	-

|

|

| AAA

AAA
Ruijie# show aaa method-list
Authentication method-list
aaa authentication login default group radius
aaa authentication ppp default group radius
aaa authentication 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	

-	-

38.6.7 show aaa user lockout

show aaa user lockout {all | user-name <word>}

<word>	ID

```
Ruijie# show aaa user lockout all
```

show running-config	

	show aaa lockout	login
	-	-

39 SSH a —

39.1 SSH " - ' a —

39.1.1 crypto key generate

crypto key generate {rsa | dsa}

rsa	RSA
dsa	DSA

SSH Server

```

SSH Server          SSH
enable service ssh-server  SSH Server  SSH 1  RSA  SSH
2  RSA  DSA          RSA  SSH1  SSH2
          DSA          SSH2
a          no crypto key generate
          crypto key zeroize
    
```

```

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

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

RGOS10.1

retry times	

	3	no ip ssh
authentication-retries		

SSH Server

SSH Server
show ip ssh

3

SSH

└───

└───

SSH

VTY

SSH

└───

Ruijie# show ssh

└───

[Redacted]	
-	-

└───

RGOS10.1

└───

[Redacted]	
-	-

40 CPU | a —

40.1 " - ' a —

40.1.1 cpu-protect type packet-type pps pps_value

CPU

cpu-protect type { arp | bpdu | dhcp | ipv6mc | igmp | rip | ospf | vrrp | pim | ttl1 | unknown-ipmc | dvmrp | ...} pps pps_value

	pps_value	

CPU 1000

CPU BPDU
 Ruijie(config)# cpu-pr type bpdu pps 100
 Set packet type bpdu pps 100 .

cpu-protect type packet-type pri pri_num	CPU

CPU

cpu-protect type { arp | bpdu | dhcp | ipv6mc | igmp | rip | ospf | vrrp | pim | ttl1 | unknown-ipmc | dvmrp | ...} pri pri_num

	pri_num	ID	0 7

0

BPDU 7
 Ruijie(config)# cpu-protect type bpdu pri 7
 Set packet type bpdu pri 7.

	cpu-protect type packet-type pps pps_value	

	-	-

40.2 i μ - ' a —

40.2.1 show cpu-protect mboard

CPU

show cpu-protect mboard

CPU



CPU

slot_num	1-16

41 DoS I a —

41.1 " - ' a —

41.1.1 ip deny invalid-l4port

no

ip deny invalid-l4port

no ip deny invalid-l4port



1	Land
Ruijie(config)#	ip deny land
2	Land
Ruijie(config)#	no ip deny land

show ip deny land	Land

-

	-	-

41.2.2 show ip deny invalid-tcp

TCP

show ip deny invalid-tcp

	-	-

|

|

|

```
Ruijie# show ip deny invalid-tcp
DoS Protection Mode      State
-----
protect against invalid tcp attack  On
```

	(no) ip deny invalid-tcp	TCP

|

	-	-

41.2.3 show ip deny land

Land

show ip deny land

--	--	--

	-	-
--	---	---

|

|

|

|

Ruijie# show ip deny land
DoS Protection Mode State

protect against land attack On

|

(no) ip deny land	Land

|

|

-	-

42 DAI a —

42.1 s ä ' ž G VLAN DAI q 3 ž _ Ÿ a —

42.1.1 ip arp inspection vlan

```

vlan-id          vlan-id          VLAN  DAI          no
vlan-id          VLAN  DAI          vlan-id          VLAN
DAI
    
```

ip arp inspection vlan vlan-id

no ip arp inspection vlan [vlan-id]

vlan-id		vlan

```

VLAN  DAI
    
```

```

DAI
    
```

```

Ruijie(config)# VLAN 1      ARP
Ruijie(config)# ip arp inspection
Ruijie(config)# ip arp inspection vlan 1
    
```

show ip arp inspection vlan	VLAN DAI

42.2 • jÇ ¾ î ¶ ð " a —

42.2.1 ip arp inspection trust

ip arp inspection trust no

ip arp inspection trust

no ip arp inspection trust

-	-

┌

┌

ARP	DAI
NFPP()	NFPP
DAI	show ip arp inspection interface

┌
Ruijie(config)#
Ruijie(config-if)#

```
gigabitEthernet 0/19
interface gigabitEthernet 0/19
ip arp inspection trust
```

	\$ È ñ 0A Xÿ- ö lsC-næXAÈ â
--	-----------------------------

VLAN	DAI	ARP	DHCP Snooping	.
ARP			DHCP Snooping	DHCP
Snooping				

43 ½ ‘ arp Z , a —

43.1 ½ ‘ar p Z , " a —

43.1.1 anti-arp-spoofing ip

arp no

anti-arp-spoofing ip ip-address

no anti-arp-spoofing ip ip-address

ip-address	IP

show anti-arp-spoofing

```
Ruijie(config)# interface fastEthernet 0/1
Ruijie(config-if)# anti-arp-spoofing ip 192.168.1.1
```

show anti-arp-spoofing

arp

44 IP Source Guard a —

44.1 IP Source Guard æ e a —

44.1.1 ip source binding

IP no

[no] ip source binding mac-address vlan vlan-id ip-address interface interface-id

mac-address	MAC
vlan-id	vlan id
ip-address	IP
interface-id	

┌

┌

┌

IP Source Guard DHCP

```

1
Ruijie# configure terminal
Ruijie(config)# ip source binding 0000.0000.0001 vlan 1 1.1.1.1
interface FastEthernet 0/1
Ruijie(config)# end
Ruijie# show ip source binding
MacAddress IpAddress Lease(sec) Type VLAN Interface
-----
0000.0000.0001 1.1.1.1 infinite static 1 FastEthernet 0/1
Total number of bindings: 1
    
```

--	--

	show ip source binding	IP
	-	-

44.2 IP Source Guard Ç f ' a —

44.2.1 ip verify source

IP Source Guard **no**

┌

┌

-	-

44.3.2 show ip verify source

IP Source Guard

show ip verify source [interface interface-id]

┌

interface-id	

┌

┌

┌

```

interface                               IP Source Guard
      "IP source guard is not configured on the interface FastEthernet 0/10"
      IP Source Guard      (      mode      )
      " inactive-no-snooping-vlan      DHCP Snooping
      " inactive-trust-port      DHCP Snooping
      " active      DHCP Snooping
    
```

┌

```

Ruijie # show ip verify source
Interface Filter-type Filter-mode Ip-address Mac-address VLAN
-----
FastEthernet 0/3 ip active 3.3.3.3 1
FastEthernet 0/3 ip active deny-all
FastEthernet 0/4 ip+mac active 4.4.4.4 0000.0000.0001 1
FastEthernet 0/4 ip+mac active deny-all
    
```

┌

ip verify source	IP Source Guard

|

|

-	-

45 NFPP a —

45.1 " \$ + q 3 m « Ö Û Ú - ' a —

45.1.1 cpu-protect sub-interface {manage|protocol|route} pps

cpu-protect sub-interface {manage |protocol |route } **pps** pps_vaule

cpu-protect sub-interface {manage|protocol|route} percent percent_vaule

percent_vaule	1 100

(Manage)	30
(Route)	25
(Protocol)	45

┌

┌

Ruijie(config)# **cpu-protect sub-interface manage percent 60**

cpu-protect sub-interface { manage protocol route } pps	

┌

-	-

45.3 ARP | ^ | " - ' a —

45.3.1 arp-guard attack-threshold

arp-guard attack-threshold {per-src-ip | per-src-mac | } pps

per-src-ip	IP
per-src-mac	MAC
per-port	

	pps	[1,9999]
--	-----	----------

	IP	MAC	8
	200		

NFPP

```
Ruijie(config)# nfpp
Ruijie(config-nfpp)# arp-guard attack-threshold per-src-ip 2
Ruijie(config-nfpp)# arp-guard attack-threshold per-src-mac 3
Ruijie(config-nfpp)# arp-guard attack-threshold per-port 50
```

	nfpp arp-guard policy	
	show nfpp arp-guard summary	
	show nfpp arp-guard hosts	
	clear nfpp arp-guard hosts	

	-	-

45.3.2 arp-guard enable

ARP

arp-guard enable

	-	-

ARP

NFPP

┌

┌
Ruijie(config)# nfp
Ruijie(config-nfpp)# arp-guard enable

┌

nfp arp-guard enable	ARP
show nfp arp-guard summary	

┌

┌

-	-

45.3.3 arp-guard isolate-period

arp-guard isolate-period {seconds | permanent}

┌

seconds	0 [30, 86400]
permanent	

┌

0

┌
NFPP

┌

┌
Ruijie(config)# nfp
Ruijie(config-nfpp)# arp-guard isolate-period 180

┌

nfp arp-guard isolate-period	
show nfp arp-guard summary	

┌

┌

-	-

45.3.4 arp-guard monitor-period

arp-guard monitor-period seconds

┌

seconds	[180, 86400]

┌

600

┌

NFPP

┌

"

0

0

"

┌

Ruijie(config)# nfpp

Ruijie(config-nfpp)# arp-guard monitor-period 180

┌

show nfpp arp-guard summary	
show nfpp arp-guard hosts	
clear nfpp arp-guard hosts	

┌

┌

-	-

45.3.5 arp-guard monitored-host-limit

arp-guard monitored-host-limit number

number	4294967295	1

1000

NFPP

1000

1000 “ %ERROR The value that you configured is smaller than current monitored hosts 1000 please clear a part of monitored hosts.”

“ % NFPP_ARP_GUARD-4-SESSION_LIMIT: Attempt to exceed limit of 1000 monitored hosts.”

```
Ruijie(config)# nfpp
Ruijie(config-nfpp)# arp-guard monitored-host-limit 200
```

show nfpp arp-guard summary	

-	-

45.3.6 arp-guard rate-limit

arp-guard rate-limit {per-src-ip | per-src-mac | per-port} pps

per-src-ip	IP
per-src-mac	MAC
per-port	
pps	[1,9999]

IP	MAC	4
100		

NFPP

```
Ruijie(config)# nfpp
Ruijie(config-nfpp)# arp-guard rate-limit per-src-ip 2
Ruijie(config-nfpp)# arp-guard rate-limit per-src-mac 3
Ruijie(config-nfpp)# arp-guard rate-limit per-port 50
```

nfpp arp-guard policy	
show nfpp arp-guard summary	

```

NFPP
    10      15      ARP      MAC      IP
           MAC      IP      IP
    
```

```

Ruijie(config)#      nfpp
Ruijie(config-nfpp)#      arp-guard scan-threshold      20
    
```

nfpp arp-guard scan-threshold	
show nfpp arp-guard summary	
show nfpp arp-guard scan	ARP
clear nfpp arp-guard scan	ARP

```


```

-	-

45.3.8 clear nfpp arp-guard hosts

clear nfpp arp-guard hosts [vlan vid] [interface interface-id] [ip-address | mac-address]

vid	
interface-id	
ip-address	IP
mac-address	MAC

```


```

```


```

```


```


seconds	0	[30, 86400]
permanent	0	

permanent-src-ip/C2_01-Tf0-Tc-15-461790115-Td[350154264E21A303FE4812464CTT0-1-Tf(-)Tf01-Tc84
permanent-src-ip/C2_01-Tf0-Tc-15-46695803-952-Td[497901DB9699F54264FF5105B

┌

┌

┌

```
Ruijie(config)# interface G 0/1
Ruijie(config-if)# nfp arp-guard policy per-src-ip 2 10
Ruijie(config-if)# nfp arp-guard policy per-src-mac 3 10
Ruijie(config-if)# nfp arp-guard policy per-port 50 100
```

┌

arp-guard attack-threshold	
arp-guard rate-limit	
show nfp arp-guard summary	
show nfp arp-guard hosts	
clear nfp arp-guard hosts	

┌

┌

10.4	

45.3.13 nfp arp-guard scan-threshold

nfp arp-guard scan-threshold pkt-cnt

┌

pkt-cnt	[1,9999]

┌

ARP ARP

┌

┌

```
Ruijie(config)# interface G 0/1
Ruijie(config-if)# nfpp arp-guard scan-threshold 20
```

arp-guard scan-threshold	
show nfpp arp-guard summary	
show nfpp arp-guard scan	ARP
clear nfpp arp-guard scan	ARP

10.4

45.4 DHCP | ^ | " - ' a —

45.4.1 dhcp-guard attack-threshold

dhcp-guard attack-threshold { per-src-mac | per-port } pps

per-src-mac	MAC
per-port	
pps	[1,9999]

```
MAC 10 300
```

NFPP

```
Ruijie(config)# nfpp
Ruijie(config-nfpp)# dhcp-guard attack-threshold per-src-mac 15
Ruijie(config-nfpp)# dhcp-guard attack-threshold per-port 200
```

nfpp dhcp-guard policy	
show nfpp dhcp-guard summary	
show nfpp dhcp-guard hosts	
clear nfpp dhcp-guard hosts	

└───┘

-	-

45.4.2 dhcp-guard enable

DHCP

dhcp-guard enable

-	-

DFP#15B(config)#13542>TT5 DHCP 9.62.0203 Tnfpp13542>TT4 1 Tf 119.62.- 14 Tr01C4Ruijie(config-nfpp)#13542>T

NFPP

	-	-
--	---	---

45.4.3 dhcp-guard isolate-period

dhcp-guard isolate-period {seconds | **permanent**}

seconds	0	0	[30, 86400]
permanent			

0

8"Á•ã NFPP



```

NFPP
1000
1000 " %ERROR The value that you
configured is smaller than current monitored hosts 1000
please clear a part of monitored hosts."
" % NFPP_DHCP_GUARD-4-SESSION_LIMIT: Attempt
to exceed limit of 1000 monitored hosts."
    
```

```

Ruijie(config)# nfp
Ruijie(config-nfp)# dhcp-guard monitored-host-limit 200
    
```

show nfp dhcp-guard summary	

-	-

45.4.6 dhcp-guard rate-limit

dhcp-guard rate-limit { per-src-mac | per-port} pps

per-src-mac	MAC
per-port	
pps	[1,9999]

```

MAC 5 150
    
```

```

NFPP
    
```

```

Ruijie(config)#      nfpp
Ruijie(config-nfpp)# dhcp-guard rate-limit per-src-mac      8
Ruijie(config-nfpp)# dhcp-guard rate-limit      per-port      100
    
```

nfpp dhcp-guard policy	
show nfpp dhcp-guard summary	

-	-

show nfpp dhcp-guard hosts	
-	-

45.4.8 nfpp dhcp-guard enable

DHCP

nfpp dhcp-guard enable

-	-

DHCP

DHCP

DHCP

```
Ruijie(config)# interface G0/1
Ruijie(config-if)# nfpp dhcp-guard enable
```

dhcp-guard enable	DHCP
show nfpp dhcp-guard summary	

10.4	

45.4.9 nfpp dhcp-guard isolate-period

nfpp dhcp-guard isolate-period {seconds | permanent}

seconds	0		[30, 86400]
permanent			

└──

└──

└──

```
Ruijie(config)# interface G 0/1
Ruijie(config-if)# nfpp dhcp-guard isolate-period 180
```

dhcp-guard isolate-period	
show nfpp dhcp-guard summary	

└──

10.4	

45.4.10 nfpp dhcp-guard policy

nfpp dhcp-guard policy { per-src-mac | per-port} rate-limit-pps attack-threshold-pps

--	--

└──

└──

```
Ruijie(config)# interface G 0/1
Ruijie(config-if)# nfp dhcp-guard policy per-src-mac 3 10
Ruijie(config-if)# nfp dhcp-guard policy per-port 50 100
```

dhcp-guard attack-threshold	
dhcp-guard rate-limit	
show nfp dhcp-guard summary	
show nfp dhcp-guard hosts	
clear nfp dhcp-guard hosts	

└──

10.4	

45.5 ICMP | ^ | " - ' a —

45.5.1 icmp-guard attack-threshold

icmp-guard attack-threshold { per-src-ip | per-port} pps

--	--

┌

NFPP

┌

┌
┌
┌

```
Ruijie(config)#      nfpp
Ruijie(config-nfpp)# icmp-guard attack-threshold per-src-ip      600
Ruijie(config-nfpp)# icmp-guard attack-threshold      per-port    1200
```

┌
┌
┌
┌
┌

nfpp icmp-guard policy	
show nfpp icmp-guard summary	
show nfpp icmp-guard hosts	
clear nfpp icmp-guard hosts	

┌

┌
┌

-	-

45.5.2 icmp-guard enable

ICMP

icmp-guard enable

┌
┌

-	-

┌

ICMP

┌

NFPP

┌

┌
┌

```
Ruijie(config)#      nfpp
Ruijie(config-nfpp)# icmp-guard enable
```

nffp icmp-guard enable		ICMP
show nffp icmp-guard summary		

└───┘

-		-

45.5.3 icmp-guard isolate-period

icmp-guard isolate-period {seconds | permanent}

seconds	0	[30, 86400]
permanent		

└───┘

0

└───┘

NFPP

└───┘

└───┘

```
Ruijie(config)# nffp
Ruijie(config-nfpp)# icmp-guard isolate-period 180
```

nffp icmp-guard isolate-period		
show nffp icmp-guard summary		

└───┘

	-	-

45.5.4 icmp-guard monitor-period

icmp-guard monitor-period seconds

	seconds	[180, 86400]

600

NFPP

" 0 0 "

```
Ruijie(config)# nfpp
Ruijie(config-nfpp)# icmp-guard monitor-period 180
```

	show nfpp icmp-guard summary	
	show nfpp icmp-guard hosts	
	clear nfpp icmp-guard hosts	

	-	-

45.5.5 icmp-guard monitored-host-limit

icmp-guard monitored-host-limit number

number	4294967295	1

1000

NFPP

	pps	[1,9999]
	IP	900 1000
	NFPP	
	Ruijie(config)# nfp	
	Ruijie(config-nfp)# icmp-guard rate-limit per-src-ip	500
	Ruijie(config-nfp)# icmp-guard rate-limit per-port	800
	nfp icmp-guard policy	
	show nfp icmp-guard summary	
	-	-

45.5.7 icmp-guard trusted-host

icmp-guard trusted-host ip mask

no icmp-guard trusted-host {all | ip mask}

	ip	IP
	mask	IP
	all	no
	NFPP	

```
          CPU  ICMP          CPU
          500
```

```
Ruijie(config)#      nfpp
Ruijie(config-nfpp)# icmp-guardtrusted-host 1.1.1.0255.255.255.0
```



```
show nfpp icmp-guard trusted-host
```

	nfpp icmp-guard policy	
	show nfpp icmp-guard hosts	
	-	-

45.5.9 nfpp icmp-guard enable

	ICMP	
	nfpp icmp-guard enable	
	-	-
	ICMP	
	ICMP	ICMP
	Ruijie(config)# interface G0/1	
	Ruijie(config-if)# nfpp icmp-guard enable	
	icmp-guard enable	ICMP
	show nfpp icmp-guard summary	
	10.4	

45.5.10 nfpp icmp-guard isolate-period

nfpp icmp-guard isolate-period {seconds | **permanent**}

```

Ruijie(config)#
Ruijie(config-if)#
Ruijie(config-if)#

```

```

Ruijie(config)# interface G 0/1
Ruijie(config-if)# nfp icmp-guard policy per-src-ip 5 10
Ruijie(config-if)# nfp icmp-guard policy per-port 100 200

```

icmp-guard attack-threshold	
icmp-guard rate-limit	
show nfpp icmp-guard summary	
show nfpp icmp-guard hosts	
clear nfpp icmp-guard hosts	

```

Ruijie(config-if)#

```

10.4	

45.6 IP ½ A M " - ' a —

IP

- „ ip-guard attack-threshold
- „ ip-guard enable
- „ ip-guard isolate-period
- „ ip-guard monitor-period
- „ ip-guard monitored-host-limit
- „ ip-guard rate-limit
- „ ip-guard scan-threshold
- „ ip-guard trusted-host
- „ clear nfpp ip-guard hosts
- „ nfpp ip-guard enable
- „ nfpp ip-guard isolate-period
- „ nfpp ip-guard policy

„ nfpp ip-guard scan-threshold

a

IP	IP	IP	IP	IP	CPP	CPU Protect	Policy
	IP				IP		

45.6.1 ip-guard attack-threshold

ip-guard attack-threshold {per-src-ip | per-port} pps

per-src-ip	IP
per-port	
pps	[1,9999]

IP 20 200

NFPP

```
Ruijie(config)# nfpp
Ruijie(config-nfpp)# ip-guard attack-threshold per-src-ip 2
Ruijie(config-nfpp)# ip-guard attack-threshold per-port 50
```

nfpp ip-guard policy	
show nfpp ip-guard summary	
show nfpp ip-guard hosts	
clear nfpp ip-guard hosts	

10.4

45.6.2 ip-guard enable

IP	
ip-guard enable	
-	-
IP	
NFPP	
Ruijie(config)# nfpf	
Ruijie(config-nfpf)# ip-guard enable	
nfpf ip-guard enable	IP
show nfpf ip-guard summary	
10.4	

45.6.3 ip-guard isolate-period

ip-guard isolate-period {seconds permanent}	
seconds	0 [30, 86400]
permanent	
0	

| NFPP

|

Ruijie(config)# nfpf
Ruijie(config-nfpp)# ip-guard isolate-period 180

nfpp ip-guard isolate-period	
show nfpp ip-guard summary	

```
Ruijie(config-nfpp)# ip-guard monitor-period 180
```

show nfpp ip-guard summary	
show nfpp ip-guard hosts	
clear nfpp ip-guard hosts	

10.4	

45.6.5 ip-guard monitored-host-limit

ip-guard monitored-host-limit number

number	1
	4294967295

```
1000
```

```
NFPP
```

```
1000
```


45.6.7 ip-guard scan-threshold

┌

┌ NFPP

┌

CPU IP CPU
500

┌
1.1.1.0/24
Ruijie(config)# nfpp
Ruijie(config-nfpp)#ip-guard trusted-host 1.1.1.0 255.255.255.0

┌

show nfpp ip-guard trusted-hosts	

┌

10.4	

45.6.9 clear nfpp ip-guard hosts

clear nfpp ip-guard hosts [vlan vid] [interface interface-id] [ip-address]

┌

vid	
interface-id	
ip-address	IP

┌

┌

┌

┌ VLAN 1 g 0/1

```
Ruijie# clear nfpp ip-guard hosts vlan 1 interface g0/1
```

ip-guard attack-threshold	
nfpp ip-guard policy	
show nfpp ip-guard hosts	

10.4	

45.6.10 nfpp ip-guard enable

```
IP
```

nfpp ip-guard enable

-	-


```
IP
```



```
IP
```

```
Ruijie(config)# interface G0/1
```

```
Ruijie(config-if)# nfpp ip-guard enable
```

ip-guard enable	IP
show nfpp ip-guard summary	

--	--

	10.4	
--	------	--

45.6.11 nfpp ip-guard isolate-period

nfpp ip-guard isolate-period {seconds | permanent}

seconds	0 [30, 86400]
permanent	

	per-port	
	rate-limit-pps	1 9999
	attack-threshold-pps	1 9999

└───┘

└───┘

└───┘

```
Ruijie(config)# interface G 0/1
Ruijie(config-if)# nfp ip-guard policy per-src-ip 2 10
Ruijie(config-if)# nfp ip-guard policy per-port 50 100
```

ip-guard attack-threshold	
ip-guard rate-limit	
show nfpp ip-guard summary	
show nfpp ip-guard hosts	
clear nfpp ip-guard hosts	

└───┘

10.4	

45.6.13 nfpp ip-guard scan-threshold

nfpp ip-guard scan-threshold pkt-cnt

pkt-cnt	[1,9999]

└───┘

IP

ARP

┌

┌

┌

```
Ruijie(config)# interface G 0/1
Ruijie(config-if)# nfp ip-guard scan-threshold 20
```

┌

ip-guard scan-threshold	
show nfp ip-guard summary	

┌

┌

10.4	

45.7 ND | ^ | " - ' a —

45.7.1 nd-guard attack-threshold

nd-guard attack-threshold per-port {ns-na | rs | ra-redirect} pps

┌

ns-na	
rs	
ra-redirect	
pps	[1,9999]

\$

Y

```

Ruijie(config)#      nfpp
Ruijie(config-nfpp)# nd-guard attack-threshold      per-port      ns-na 20
Ruijie(config-nfpp)# nd-guard attack-threshold      per-port      rs 10
Ruijie(config-nfpp)# nd-guard attack-threshold      per-port      ra-redir
ect 10
    
```

nfpp nd-guard policy	
show nfpp nd-guard summary	

10.4	

45.7.2 nd-guard enable

ND

nd-guard enable

-	-

ND

NFPP

```

Ruijie(config)#      nfpp
Ruijie(config-nfpp)#      nd-guard enable
    
```

nfpp nd-guard enable	ND
show nfpp nd-guard summary	

10.4	

45.7.3 nd-guard rate-limit

nd-guard rate-limit per-port {ns-na | rs | ra-redirect} pps

ns-na	
rs	
ra-redirect	
pps	[1,9999]

15 / 15

--

NFPP

--


```
Ruijie(config)# nfpp
Ruijie(config-nfpp)# nd-guard rate-limit per-port ns-na 10
Ruijie(config-nfpp)# nd-guard rate-limit per-port rs 5
Ruijie(config-nfpp)# nd-guard rate-limit per-port ra-redirect 5
```


nfpp nd-guard policy	
show nfpp nd-guard summary	

--

10.4	

45.7.4 nfpp nd-guard enable

ND

nfpp nd-guard enable

-	-

	ND
--	----

--	--

	ND
--	----

```
Ruijie(config)# interface G0/1
Ruijie(config-if)# nfpp nd-guard enable
```

nd-guard enable	ND
show nfpp nd-guard summary	

--	--

10.4	

45.7.5 nfpp nd-guard policy

nfpp nd-guard policy per-port {ns-na | rs | ra-redirect} rate-limit-pps attack-thresh old-pps

ns-na	
rs	
ra-redirect	

rate-limit-pps	1	9999
attack-threshold-pps	1	9999

┌
└

┌
└

```

ND snooping
          ND snooping          ND snooping
          ND guard              800
          900
ND guard      ND snooping
                    ND snooping
    
```

┌
└

```

Ruijie(config)# interface G 0/1
Ruijie(config-if)# nfpp nd-guard policy per-port ns-na 50 100
Ruijie(config-if)# nfpp nd-guard policy per-port rs 10 20
Ruijie(config-if)# nfpp nd-guard policy per-port ra-redirect 1020
    
```

┌
└

nd-guard attack-threshold	
nd-guard rate-limit	
show nfpp nd-guard summary	

┌
└

10.4	

45.8 NFPP " - ' a —

45.8.1 clear nfpp log

NFPP

clear nfpp log

-	-

└───

└───

└───

Ruijie# clear nfpp log
32 log-buffer entries were cleared.

show nfpp log	NFPP

└───

10.4	

45.8.2 log-buffer entries

NFPP

log-buffer entries number

number	[0,1024]

└─── 256

└─── NFPP

└───

```

NFPP                    50
Ruijie(config)#       nfpp
Ruijie(config-nfpp)# log-buffer entries    50
    
```

log-buffer logs number_of_message interval length_in_seconds	NFPP
show nfpp log	NFPP

10.4	

45.8.3 log-buffer logs

NFPP

log-buffer logs number_of_message interval length_in_seconds

number_of_message	0-1024 0
length_in_seconds	0-86400 1 0 number_of_message length_in_seconds 0 number_of_message /length_in_second

```

number_of_message      1 length_in_seconds      30
    
```

NFPP

```

Ruijie(config)#       nfpp
Ruijie(config-nfpp)# log-buffer logs        2 interval    12
    
```

log-buffer entries number	NFPP
show nfpp log summary	NFPP

10.4	

45.8.4 logging

NFPP VLAN

logging vlan vlan-range

logging interface interface-id

show nfpp log summary	NFPP
10.4	

45.8.5 show nfpp log

NFPP

show nfpp log summary

NFPP

show nfpp log buffer [statistics]

statistics	NFPP

"_"

%NFPP_ARP_GUARD-4-DOS_DETECTED: Host<IP=N/A,MAC=0000.0000.0004,port=Gi4/1,VLAN=1> was detected.(2009-07-01 13:00:00)

NFPP

Ruijie# show nfpp log summary

Total log buffer size : 10

Syslog rate : 1 entry per 2 seconds

Logging:

VLAN 1-3, 5

interface Gi 0/1

interface Gi 0/2

NFPP

Ruijie# show nfpp log buffer statistics

There are 6 logs in buffer.

NFPP

Ruijie# show nfpp log buffer

Protocol	VLAN	Interface	IP address	MAC address	Reason	Timestamp
----------	------	-----------	------------	-------------	--------	-----------

ARP	1	Gi0/1	1.1.1.1	-	DoS	2009-05-30 16:23:10
-----	---	-------	---------	---	-----	---------------------

2009-05-30 16:23:10

ARP	1	Gi0/1	1.1.1.1	-	ISOLATED	2009-05-30 16:23:10
-----	---	-------	---------	---	----------	---------------------

2009-05-30 16:23:10

ARP	1	Gi0/1	1.1.1.2	-	DoS	2009-05-30 16:23:15
-----	---	-------	---------	---	-----	---------------------

2009-05-30 16:23:15

ARP	1	Gi0/1	1.1.1.2	-	ISOLATE_FAILED	2009-05-30 16:23:15
-----	---	-------	---------	---	----------------	---------------------

2009-05-30 16:23:15

ARP	1	Gi0/1	-	0000.0000.0001	SCAN	2009-05-30 16:30:10
-----	---	-------	---	----------------	------	---------------------

2009-05-30 16:30:10

ARP	-	Gi0/2	-	-	PORT_ATTACKED	2009-05-30 16:30:10
-----	---	-------	---	---	---------------	---------------------

2009-05-30 16:30:10

Protocol

” ARP ARP

” IP IP

” ICMP ICMP

” DHCP DHCP

” NS-NA ND

” RS ND

” RA-REDIRECT ND

Reason 5

” DoS

” ISOLATED

” ISOLATE_FAILED

” SCAN

” PORT_ATTACKED

|



2 " remain-time(seconds)"

Ruijie# show nfpp arp-guard hosts

If column 1 shows '*', it means "hardware do not isolate user" .

```
Ruijie# show nfpp arp-guard scan statistics
ARP scan table has 4 record(s).
```

```
“ ARP          4          ”
```

```
Ruijie# show nfpp arp-guard scan
VLAN interface IP address MAC address timestamp
```

```
-----
1  Gi0/1  N/A    0000.0000.0001 2008-01-23
16:23:10
2  Gi0/2  1.1.1.1  0000.0000.0002 2008-01-23
16:24:10
3  Gi0/3  N/A    0000.0000.0003 2008-01-23
16:25:10
4  Gi0/4  N/A    0000.0000.0004 2008-01-23
16:26:10
```

```
Total 4 record(s)
```

```
“ timestamp”          ARP          “ 2008-01-23 16:23:10”
  2008  1  23  16  23  10          ARP
```

```
Ruijie# show nfpp arp-guard scan vlan          1 interface          G 0/1
0000.0000.0001
```

```
VLAN interface IP address MAC address timestamp
```

```
-----
1  Gi0/1  N/A    0000.0000.0001 2008-01-23
16:23:10
```

```
Total 1 record(s)
```

arp-guard scan-threshold	
nfpp arp-guard scan-threshold	
clear nfpp arp-guard scan	ARP

-	-

45.9.3 show nfpp arp-guard summary

```
show nfpp arp-guard summary
```

arp-guard rate-limit	
arp-guard scan-threshold	
nfpp arp-guard enable	ARP
nfpp arp-guard isolate-period	
nfpp arp-guard policy	
nfpp arp-guard scan-threshold	

└───

-	-

45.10

```

-----  ----  -----
100      20      120
          120          100          20
  
```

“ remain-time(seconds)”

Ruijie# **show nfpp dhcp-guard hosts**

If column 1 shows '*', it means "hardware failed to isolate host".

VLAN	interface	MAC address	remain-time(seconds)
------	-----------	-------------	----------------------

----	-----	-----	-----
1	gi0/2	0000.0000.0001	10
*2	gi0/1	0000.0000.0002	20
Total	2 host(s)		

clear nfpp dhcp-guard hosts	

10.4	

45.10.2 show nfpp dhcp-guard summary

show nfpp dhcp-guard summary

-	-

Ruijie# show nfpp dhcp-guard summary

Format of column Rate-limit and Attack-threshold is per-src-ip
/per-src-mac/per-port.

Interface	Status	Isolate-period	Rate-limit	Attack-threshold
Global	Enable	300	-/5/150	-/10/300
Gi 0/1	Enable	180	-/6/-	-/8/-
Gi 0/2	Disable	200	-/5/30	-/10/50

show nfpp icmp-guard hosts [statistics | [[vlan vid] [interface interface-id] [ip-address]]]

statistics	
vid	
interface-id	
ip-address	IP

Ruijie#**show nfpp icmp-guard hosts statistics**

```

success   fail   total
-----   ---   -----
100          20      120
          "      120          100          20          "
    
```

Ruijie# **show nfpp icmp-guard hosts**

If column 1 shows "*", it means "hardware failed to isolate host".

```

VLAN  interface IP address      remain-time(s)
----  -
1     Gi0/1     1.1.1.1      110
2     Gi0/2     1.1.2.1      61
Total 2 host(s)
    
```

clear nfpp icmp-guard hosts	

10.4	

icmp-guard rate-limit	
nfpp icmp-guard enable	ICMP
nfpp icmp-guard isolate-period	
nfpp icmp-guard policy	

10.4	

45.11.3 show nfpp icmp-guard trusted-host

show nfpp icmp-guard trusted-host

-	-

```

Ruijie# show nfpp icmp-guard trusted-host
IP address  mask
-----  -----
1.1.1.0    255.255.255.0
1.1.2.0    255.255.255.0
Total 2 record(s)
    
```

icmp-guard trusted-host	

	10.4	

45.12 IP ½ A M i μ - ' a —

- ” show nfpp ip-guard hosts
- ” show nfpp ip-guard summary
- ” show nfpp ip-guard trusted-host

45.12.1 show nfpp ip-guard hosts

```
show nfpp ip-guard hosts [statistics | [[vlan
```

----	-----	-----	-----	-----	
1	Gi0/1	1.1.1.1	ATTACK	110	

1 Interface Global
 2 Status
 3 Rate-limit IP / MAC /
 Attack-threshold " -"

ip-guard attack-threshold	
ip-guard enable	IP
ip-guard isolate-period	
ip-guard monitor-period	
ip-guard monitored-host-limit	
ip-guard rate-limit	
nfpp ip-guard enable	IP
nfpp ip-guard isolate-period	
nfpp ip-guard policy	

		AÈ
	10.4	

45.12.3 C25.605 -0.006 Td Tm[0A51>604B8095A09C6]2 TjET6dTow ()T/Ctc 0 trust

Ruijie# show nfpp ip-guard trusted-host

IP address mask

1.1.1.0 255.255.255.0

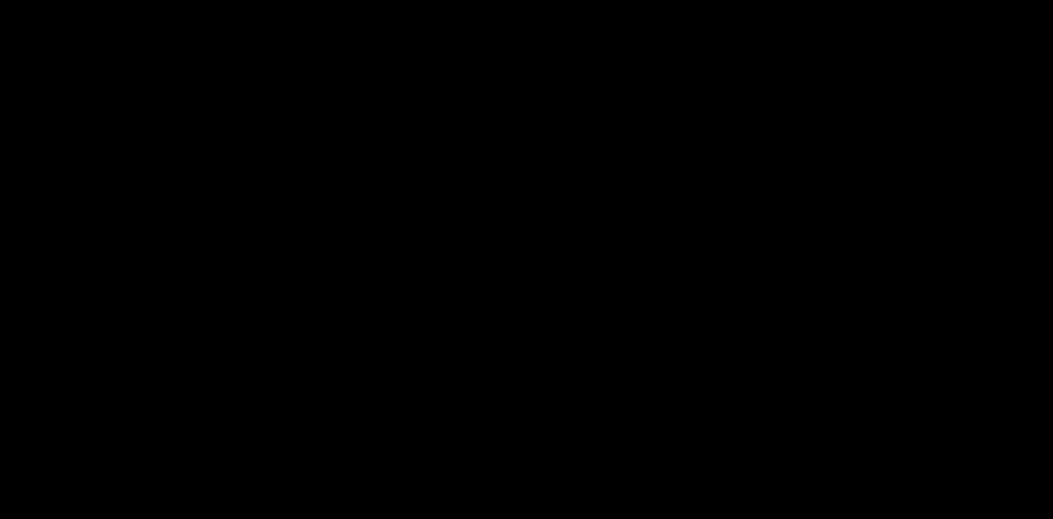
1.1.2.0 255.255.255.0

Total 2 record(s)

ip-guard trusted-host	

|

10.4	







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				

destination-mac-address | **any**] [**precedence** precedence] [**tos** tos] [**fragments**] [**range** lower upper] [**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**] [**range** lower upper] [**time-range** time-range-name]

„ Expert

Internet Control Message Protocol (ICMP)

access-list id {**deny** | **permit**} [**VID** [out][**inner** in]] {**source** source-wildcard

Permit	
Source	
source-wildcard	0.255.0.32
protocol	IP EIGRP GRE IPINIP IGMP NOS OSPF ICMP UDP TCP IP IP 0-255 ICMP/TCP/UDP
Destination	
destination-wildcard	
precedence	
precedence	0-7
range y [,X - 0Ã · È8x È	
lower	
upper	
time-range-name	
tos y [,X á u2O _	
tos	0-15
icmp-type	ICMP 0-589255
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 ð,Xd	
ethernet-type	
tcp-flag	tcp flag

ACL

- „ general-parameter-problem
- „ host-isolated
- „ host-precedence-unreachable
- „

```
    „ cmd
    „ daytime
    „ discard
    „ domain
    „ echo
    „ exec
    „ finger
    „ ftp
    „ ftp-data
    „ gopher
    „ hostname
    „ ident
    „ irc
    „ klogin
    „ kshell
    „ login
    „ nntp
    „ pim-auto-rp
    „ pop2
    „ pop3
    „ smtp
    „ sunrpc
    „ syslog
    „ tacacs
    „ talk
    „ telnet
    „ time
    „ uucp
    „ whois
    „ www
    „     UDP           UDP
    „ biff
    „ bootpc
    „ bootps
    „ discard
    „ dnsix
    „ domain
    „ echo
```

```
    „ isakmp
    „ mobile-ip
    „ nameserver
    „ netbios-dgm
    „ netbios-ns
    „ netbios-ss
    „ ntp
    „ pim-auto-rp
    „ rip
    „ snmp
    „ snmptrap
    „ sunrpc
    „ syslog
    „ tacacs
    „ talk
    „ tftp
    „ time
    „ who
    „ xdmcp
    „
    „ Ethernet-type
    „ aarp
    „ arp
    „ appletalk
    „ decnet-iv
    „ diagnostic
    „ etype-6000
    „ etype-8042
    „ lat
    „ lavc-sca
    „ mop-console
    „ mop-dump
    „ mumps
    „ netbios
    „ vines-echo
    „ xns-idp
```

```
1 IP
   IP 192.168.1.64 - 192.168.1.127
```

```

Ruijie(config)# access-list 1 permit 192.168.1.64 0.0.0.63
 2 IP
   IP          DNS      ICMP
Ruijie(config)# access-list 102 permit tcp any any eq domain
Ruijie(config)# access-list 102 permit udp any any eq domain
Ruijie(config)# access-list 102 permit icmp any any echo
Ruijie(config)# access-list 102 permit icmp any any echo-reply
 3 MAC
   MAC 00d0f8000c0c 100
 1
Ruijie(config)# access-list 702 deny host 00d0f8000c0c any aarp
Ruijie(config)# interface gigabitethernet 1/1
Ruijie(config-if)# mac access-group 702 in
 4 Expert
   Expert Extended ACL      ACL      IP
192.168.12.3 MAC 00d0.f800.0044 TCP
Ruijie(config)# access-list 2702 deny tcp host
192.168.12.3 mac 00d0.f800.0044 any any
Ruijie(config)# access-list 2702 permit any any any any
Ruijie(config)# show access-lists
expert access-list extended 2702
10 deny tcp host 192.168.12.3 mac 00d0.f800.0044 any any
10 permit any any any any
    
```

show access-lists	
mac access-group	MAC

V10.0	V10.0

46.1.2 deny

(deny)

ACL

[sn] **deny 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**] [**range** lower upper] [**time-range** time-range-name]

c) expert

„ **Internet Control Message Protocol (ICMP)**

[sn] **deny 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] **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**] [**range** lower upper] [**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**] [**range** lower upper] [**time-range** time-range-name]

„ **Address Resolution Protocol (ARP)**

[sn] **deny arp** {vid vlan-id}[source-mac-address source-wildcard |**host** source-mac-address | **any**] [**host** destination –mac-address | **any**] {sender-ip sender-ip–wildcard | **host** sender-ip | **any**} {sender-mac sender-mac-wildcard | **host** sender-mac | **any**} {target-ip target-ip–wildcard | **host** target-ip | **any**}

„ **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**] [**range** lower upper] [**time-range** time-range-name]

Sn	ACL
prefix-length	
dscp	
dscp	0-63.
flow-label	


```

10 deny host 0013.0049.8272 any aarp
Ruijie(config-mac-nacl)#      exit
Ruijie(config)#      interface gigabitethernet      1/1
Ruijie(config-if)#      mac access-group      mac1 in
                        IP      ACL      IP      192.168.4.12
                        1
Ruijie(config)#      ip access-list standard      34
Ruijie(config-ext-nacl)#      deny host      192.168.4.12
Ruijie(config-ext-nacl)#      show access-lists
ip access-list standard 34
10 deny host 192.168.4.12
Ruijie(config-ext-nacl)#      exit
Ruijie(config)#      interface gigabitethernet      1/1
Ruijie(config-if)#      ip access-group      34 in
    
```

show access-lists	
ip access-group	IP ACL
mac access-group	MAC ACL
ip access-list	IP ACL
mac access-list	MAC ACL
expert access-list	ACL
permit	

V10.0	V10.0 arp
-------	-----------

id	Expert 2700-2899
name	Expert
in	
out	

Expert ACL

ACL show
access-group

```

access-list accept_00d0f8xxxxxx_only Gigabit 1
Ruijie(config)# interface GigaEthernet 0/1
Ruijie(config-if)# expertaccess-groupaccept_00d0f8xxxxxx_onlyin
    
```

show access-group	ACL

V10.0	V10.0

46.1.4 expert access-list

ACL no ACL

expert access-list extended {id | name}

no expert access-list extended {id | name}

Id	Expert 2700-2899
name	ACL

Expert ACL



show expert access-lists

```

1          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)#
2          ACL
Ruijie(config)# expert access-list extended 2704
Ruijie(config-exp-nacl)# show expert access-lists
expert access-list extended 2704
Ruijie(config-exp-nacl)#
    
```



show expert access-lists	



V10.0	V10.0

46.1.5 ip access-group

ip access-group no

ip access-group {id | name} {in | out}

no ip access-group { id | name} {in | out}



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
    
```

┌
└

access-list	
show access-lists	
show ip access-list	IP 1300 – 2699 3000

┌

┌
└

V10.0	(V

46.1.6 ip access-list

IP ACL

IP ACL

┌
└

id	IP 1-99 1300-1999
name	IP

┌

ACL

┌

```

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

```

1 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)#

2 ACL
Ruijie(config)# ip access-list extended 123
Ruijie(config-ext-nacl)# show ip access-lists
ip access-list extended 123
    
```

show ip access-lists	IP

V10.0	V10.0

46.1.7 ip access-list resequence

```

ip ACL IPV6 ACL
no
    
```

ip access-list resequence {id | name} start-sn inc-sn

no ip access-list resequence {id | name}

id	ACL
name	ACL
start-sn	
inc-sn	

```

start-sn 10
inc-sn 10
    
```

|

|

show access-lists

|

```

ACL
Ruijie# show access-lists
ip access-list standard 1
10 permit host 192.168.4.12
20 deny any any
Ruijie# config
Ruijie(config)# ip access-list resequence 1 21 43
Ruijie(config)# exit
Ruijie# show access-lists
ip access-list standard 1
21 permit host 192.168.4.12
64 deny any any
    
```

|

show access-lists	

|

|

V10.0	V10.0

46.1.8 list-remark text

ACL **no**

list-remark text

|

Text	

|

|

ACL

ACL

```
Ruijie# ip access-list extended 102
Ruijie(config-ext-nacl)# list-remark t hisaclistofilterthehost
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

```
Ruijie(config-mac-nacl)# show mac access-lists
mac access-list extended 704
```

show mac access-lists	mac

show access-lists	
ip access-list	ip ACL
ipv6 access-list	IPV6 ACL
deny	

[**precedence** precedence] [**tos** tos] [**fragments**] [**range** lower upper] [**time-range** time-range-name]

3) MAC

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

4) Expert

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

[precedence precedence] [tos tos] [fragments] [range lower upper] [time-range time-range-name]

„ **Address Resolution Protocol (ARP)**

[sn] **permit arp** {vid vlan-id} [host source-mac-address | any] [host destination-mac-address | any] {sender-ip sender-ip-wildcard | host sender-ip | any} {sender-mac sender-mac-wildcard | host sender-mac | any} {target-ip target-ip-wildcard | host target-ip | any}

„ **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] [range lower upper] [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] [range lower upper] [time-range time-range-name]

deny	-

┌

┌ ACL

┌ ACL ACL

```

1                               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 any
Ruijie(config-exp-nacl)#
      2      IP      ACL      IP      192.168.4.12      TCP
      100      1
Ruijie(config)#      ip access-list extended      102
Ruijie(config-ext-nacl)#      permit tcp host      192.168.4.12 eq 100 any
Ruijie(config-ext-nacl)#      show access-lists
ip access-list extended 102
10 permit tcp host 192.168.4.12 eq 100 any
Ruijie(config-ext-nacl)#      exit
Ruijie(config)#      interface gigabitethernet      1/1
Ruijie(config-if)#      ip access-group      102 in
Ruijie(config-if)#
      3      MAC      ACL      MAC      0013.0049.8272
      100      1
Ruijie(config)#      mac access-list extended      702
Ruijie(config-mac-nacl)#      permit host      0013.0049.8272      any aarp
Ruijie(config-mac-nacl)#      show access-lists
mac access-list extended
10 permit host 0013.0049.8272 any aarp      702
Ruijie(config-mac-nacl)#      exit
Ruijie(config)#      interface gigabitethernet      1/1
Ruijie(config-if)#      mac access-group      702 in
      4      ip      ACL      IP      192.168.4.12
      1
Ruijie(config)#      ip access-list standard      std-acl
Ruijie(config-std-nacl)#      permit host      192.168.4.12
Ruijie(config-std-nacl)#      show access-lists
ip access-list standard std-acl
10 permit host 192.168.4.12
Ruijie(config-std-nacl)#      exit
Ruijie(config)#      interface gigabitethernet      1/1
Ruijie(config-if)#      ip access-group      std-acl in
      5      IPV6      ACL      IP      192.168.4.12
      1
Ruijie(config)#      ipv6 access-list extended      v6-acl

```

```
Ruijie(config-ipv6-nacl)#      11 permit ipv6
host ::192.168.4.12      any
Ruijie(config-ipv6-nacl)#      show access-lists
ipv6 access-list extended v6-acl
11 permit ipv6 host ::192.168.4.12 any
Ruijie(config-ipv6-nacl)#      exit
```

ACL

|
|
|

|
|
|

ACL

┌

┌

┌

```

acl          id  name          ACL
-----
Ruijie# show access-lists      n_acl
ip access-list standard n_acl
Ruijie# show access-lists      102
ip access-list extended 102
Ruijie# show access-lists
ip access-list standard n_acl
ip access-list extended 101
mac access-list extended mac-acl
expert access-list extended exp-acl
    
```

┌

ip access-list	IP ACL
mac access-list	MAC ACL
expert access-list	Expert ACL

┌

┌

V10.0	V10.0

```
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

V10.0	V10.0

46.2.4 show ip access-group

IP ACL

show ip access-group[interface <interface>]

<interface>	

|

V10.0	V10.0

46.2.5 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.
```

mac access-list	MAC ACL

|

V10.0	V10.0

47 VACL a —

47.1 " - ' a —

Vlan access map		map_name		map_sn	
		map		map	
1	vlan access map		map	map_sn	
	map		map	map	map_sn 10
2		map_sn	vlan access map		map_name
	Map_name		map		
3		map_sn	vlan access map		map
	map	map	map	map	
4		map	6553	map	

47.1.1 action forward/drop/redirect

	map	actions	vacl	no	map
	actions		forward		
	action forward				
	no action forward				
	map	actions	vacl	no	map
	actions		forward		
	action drop				
	no action drop				
	map	actions	vacl	no	map
	actions		forward		
	action redirect { GigabitEthernet Aggregateport FastEthernet } { port_id }				
	no action redirect { GigabitEthernet Aggregateport FastEthernet } { port_id }				

|
|
|

map

forward

map

|
|
|

vacl

a	+	acl,	8	acl
”	map	ip acl	map acl	
”	map	8	acl	
”	map	acl		
”	map	ace	acl	acl
”	map	ip acl (mac acl)		
	ip acl (mac acl)	ip acl (mac acl)		
	ip acl (mac acl)			
”	map	ip acl (mac acl)		
	mac acl (ip acl)			ip acl (mac
	acl)	mac acl (ip acl)		

map_name	map	100
map_sn	map	[0 - 65535]

┌

┌

┌

```

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

-	-

┌

-	-

47.1.4 vlan filter

```

map      vlan          map      vlan
no
    
```

vlan filter map_name **vlan-list** vlan_id

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

map_name	map
vlan_id	vlan id

┌

┌

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

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

⏪ ⏩ ⏴ ⏵ < (7

```

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

-	-

-	-

47.2.2 show vlan filter

map vlan

show vlan filter

-	-

Show vlan filter access-map aa

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

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

-	-

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

IP-Precedence to DSCP

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

DSCP to CoS

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

48.2 " - ' a —

48.2.1 class maps

ACL

ip access-list {**extended** | **standard**} {acl-id | acl-name }

mac access-list extended {acl-id | acl-name}

expert access-list extended {acl-id | acl-name}

access-list acl-id ACL

class map class map

[no] class-map class-map-name

class map

[no] match access-group acl-name| acl-id

acl-name	ACL
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	

└──

└──

└──

```

1      MAC ACL, me
Ruijie(config)#      mac access-list extended me
2      ACL
Ruijie(config-ext-macl)#      permit host 1111.2222.3333 any
3      ACL
Ruijie(config-ext-macl)#      exit
4      class-map, cm
    
```

```
Ruijie(config)# class-map cm
5 ACL
Ruijie(config-cmap)# match access-group me
6 class-map
Ruijie(config-cmap)# exit
```

show mac access-lists	-
show ip access-lists	-
show class-map	-

-	-

48.2.2 drr-queue bandwidth

DRR

drr-queue bandwidth weight1...weight8

no drr-queue bandwidth

weight1...weight8	
no	

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

show mls qos queueing	-

┌

┌

-	-

48.2.3 interface rate-limit

rate-limit {input | output} bps burst-size

no rate-limit

┌

input	
output	
bps	
burst-size	(Kbyte)dscp-list
no	

┌

┌

┌

┌

```
Ruijie(config)# interface fastEthernet 0/1
Ruijie(config-if)# rate-limit input 1000000 4096
```

┌

show mls qos interface	-

┌

┌

-	-

48.2.4 mls qos cos

CoS

mls qos cos default-cos

no mls qos cos

default-cos	0 7
no	

CoS 0

```
Ruijie(config)# interface gigabitethernet 1/ 1
Ruijie(config-if)# mls qos cos 7
```

show mls qos interface interface-id	-

-	-

48.2.5 mls qos map cos-dscp

CoS

DSCP

mls qos map cos-dscp dscp1...dscp8

no mls qos map cos-dscp

dscp	
no	

|

|

|

|

Ruijie(config)# mls qos map cos-dscp 8 10 16 18 24 26 32 34

|

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

|

|

-	-

48.2.6 mls qos map dscp-cos

DSCP CoS

mls qos map dscp-cos dscp-list to cos

no mls qos map dscp-cos

	-	-

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

--	--

mls qos scheduler [sp | rr | wrr | drr]

no mls qos scheduler



ip-precedence	Qos	IP-PRE
no		

┌

┌

┌

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

show mls qos interface interface-id	-

-	-

48.2.10 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

|
 |
 |
 |

```

1      policy map, po
Ruijie(config)#      policy-map po
2      class-map cm
Ruijie(config-pmap)#      class cm
3      dscp 10
Ruijie(config-pmap-c)#      set ip dscp 10
4      1M, 4096k, dscp 16
Ruijie(config-pmap-c)#      police 1000000 4096 exceed-action dscp 16
  
```

show policy-map	-

-	-

48.2.11 priority-queue

[no] priority-queue

--	--

priority-queue	SP
no priority-queue	WRR

|

WRR

|

|

|

Ruijie(config)# no priority-queue

|

show mls qos queueing	-

|

```
Ruijie(config)# priority-queue cos-map 1 0 1
```

show mls qos queueing	-
-	-

48.2.13 service-policy

policy map

service-policy {input | output} policy-map-name

no service-policy {input | output}

policy-map-name	polycymap
no	policy map

```
Ruijie(config)# interface fastEthernet 0/1
Ruijie(config-if)# service-policy input po
```

show mls qos interface	-
-	-

48.2.14 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

┌

┌

┌

Ruijie# show class-map

┌

-	-

┌

-	-

48.3.2 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

┌

-	-

┌

┌

-	-

48.3.3 show mls qos interface

QoS

show mls qos interface interface-id [**policers**]



└───

└───

└───

Ruijie# show mls qos maps

└───

-	-

└───

└───

-	-

48.3.5 show mls qos queueing

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

show mls qos queueing

└───

-	-

└───

└───

└───

└───

Ruijie# show mls qos queueing

└───

-	-

└───

-	-

48.3.6 show mls qos rate-limit

show mls qos rate-limit [interface interface-id]

interface	interface-id	rate-limit

Ruijie# show mls qos scheduler

--	--

49 Voice VLAN a —

49.1 " - ' a —

49.1.1

	show voice vlan	Voice VLAN
	10.4	

49.1.2 voice vlan aging

Voice VLAN
voice vlan aging minutes
no voice vlan aging

no

		.00[(no Td()Tj/0229.251 0 Td29Voic
--	--	-------------------------------------

49.1.3 voice vlan cos

Voice VLAN CoS **no**

voice vlan cos cos-value

no voice vlan cos

	cos-value	Voice VLAN	CoS

cos-value 6

Voice VLAN CoS DSCP

1 Voice VLAN CoS 5
 Ruijie(config)# voice vlan cos 5

show voice vlan	Voice VLAN

10.4	

49.1.4 voice vlan dscp

Voice VLAN DSCP **no**

voice vlan dscp dscp-value

no voice vlan dscp

--	--

Voice VLAN

	dscp-value	Voice VLAN	DSCP
	dscp-value	46	
		Voice VLAN	CoS DSCP
	1	Voice VLAN	DSCP 40

Uplink

Voice VLAN

1	OUI	0012.3400.0000	Voice VLAN	Company A
Ruijie(config)#		voice vlan mac-address	0012.3400.0000	mask
fff.ff00.0000		description	Company A	

⌘

⌘

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

```

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

show voice vlan	Voice VLAN Voice VLAN
------------------------	--------------------------

10.4	
------	--

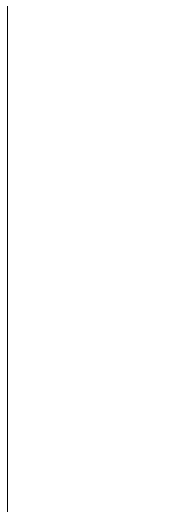
49.1.8 voice vlan security enable

```

Voice VLAN          no
voice vlan security enable
no voice vlan security enable
    
```

--	--

Voice VLAN



Voice VLAN

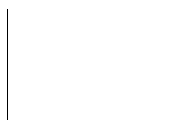
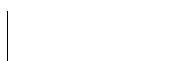
Voice VLAN

```

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



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



10.4	

49.2.2 show voice vlan oui

OUI OUI

show voice vlan oui

--	--

└──

└──

└──

OUI

```

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

show voice vlan oui

OUI	OUI MAC
Mask	OUI OUI
Description	OUI

└──

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

51 VRRP a —

51.1 " - ' a —

51.1.1 vrrp authentication

VRRP no

vrrp group authentication string

no vrrp group authentication

group	VRRP
string	VRRP (8)

┌

VRRP

VRRP

┌

VRRP

/

51.1.2 vrrp description

VRRP **no**

vrrp group **description** text

no vrrp group **description**

group	VRRP

vrrp group ip ipaddress [**secondary**]

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

group	VRRP
ipaddress	IP
secondary	IP

VRRP

secondary IP

VRRP

group	VRRP
level	VRRP

100 VRRP VRRP VRRP

VRRP

VRRP 1 254
vrrp 1 priority 254

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

--	--

--	--

┌

┌ VRRP VRRP VRRP

┌ VRRP 4
vrrp 1 timers advertise 4

┌

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

┌

┌

-	-

51.1.7 vrrp timers learn

no

vrrp group timers learn

no vrrp group timers learn

┌

group	VRRP

┌

┌

┌

VRRP VRRP

VRRP VRRP VRRP

Master VRRP Master

```

VRRP 1
vrrp 1 timers learn
    
```

Ruijie(config-if)# vrrp group ip ipaddress [secondary]	VRRP IP
Ruijie(config-if)# vrrp group timers advertise [msec] interval	VRRP

--	--

-

-

┌

┌

RGOS 10.4	-

51.2 VRRP 3 Å 0 a —

51.2.1 debug vrrp

VRRP VRRP VRRP no

debug vrrp

no debug vrrp

┌

-	-

┌

┌

┌

VRRP

Ruijie# debug vrrp

Ruijie#

VRRP: Grp 1 Advertisement priority 120, ipaddr 192.168.201.213

VRRP: Grp 1 Event - Advert higher or equal priority

%VRRP-6-STATECHANGE: FastEthernet0/0 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: FastEthernet0/0 Grp 1 state Backup -> Master

Ruijie#

┌

Ruijie# debug vrrp errors	VRRP
Ruijie# debug vrrp events	VRRP

	Ruijie# debug vrrp state	VRRP

	-	-

51.2.3 debug vrrp events

VRRP no

debug vrrp events

no debug vrrp events

	-	-

|

VRRP

|

|

|

VRRP

Ruijie# debug vrrp events

Ruijie#

VRRP: Grp 1 Event - Advert higher or equal priority

VRRP: Grp 1 Event - Advert higher or equal priority

VRRP: Grp 1 Event - Advert higher or equal priority

--	--	--

VRRP

show vrrp [brief | group]

brief	VRRP
group	

Ruijie# show vrrp brief

Interface	Grp	Pri	Time	Own	Pre	State	Masteraddr	Groupaddr
FastEthernet 0/0	1	100	-	-	P	Backup	192.168.201.213	192.168.201.1
FastEthernet 0/0	2	120	-	-	P	Master	192.168.201.217	192.168.201.2



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

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

-	-

52 RLDP a —

52.1 " - ' a —

52.1.1 rldp detect-interval

RLDP

rldp detect-interval interval

no rldp detect-interval

interval		2-15

3

stp × stp

Ruijie(config)# rldp detect-interval 5s : 5

rldp detect-max		

-		-

52.1.2 rldp detect-max

RLDP

rldp detect-max num

no rldp detect-max

	num	, 2-10

┌ 2

┌

┌

5
Ruijie(config)# rldp detect-max

	RLDP	RLDP
	Ruijie(config)#	rldp enable
	rldp port	RLDP
	-	-

52.1.4 rldp port

```

rldp
rldp port {unidirection-detect | bidir

```

┌
└

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

┌
└

rldp enable	rldp

┌
└

┌
└

-	-

52.1.5 rldp reset

```

rldp shutdown disable rldp
rldp reset

```

┌
└

-	-

┌
└

┌
└

┌
└

┌
└

```
Ruijie# rldp reset
```

┌
└

rldp enable	Rldp

┌
└

┌
└

-	-

52.2 配置 RLDPA

52.2.1 show rldp

rldp

show rldp [interface interface-id]

	Interface-id	

└───

└─── EXEC

└───

└───

└───

-	-

└───

└───

-	-

└───

53 TPP a —

53.1 " - ' a —

53.1.1 topology guard

topology guard

no

[no] topology guard



no

[no] tp-guard port enable



tpp

p

--	--

54 3 Ñ, Ä a —

54.1 " - ' a —

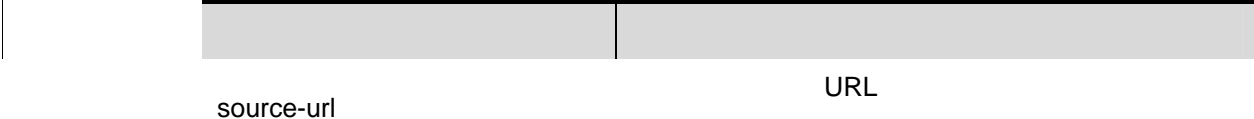
54.1.1 cd

`cd [filesystem:][directory]`

filesystem	“ ”
directory	

54.1.2 copy

copy source-url destination-url



```

Ruijie# copy tftp://192.168.201.54/rgos.bin flash:/
2          tftp
Ruijie# copy flash:/rgos.bin tftp://192.168.201.54/rgos.bin
3          xmodem
Ruijie# copy xmodem: flash:/config.text
4          U
Ruijie# copy flash:/config.text usb0:/config.text
5
Ruijie# copy flash:/config.text slave:/config.text
6          flash      sd
Ruijie# copy flash:/rgos.bin sd0:/rgos.bin
7          U          sd
Ruijie# copy usb0:/config.text sd0:/config.text
8          sd          U
Ruijie# copy sd0:/config.text usb0:/config.text

```

del	
rename	
dir	

dir75.36 422.4803 Tm()Tj/T6.58 457.28 -174.1 0.24-04A2T/T0 1 Tf7804CA/TT0 1 Tf441C81BE2T/TB

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

a .

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

copy	
dir	

a

1

Ruijie# dir slave0:/

Directory of slave:/

Mode	Link	Size	MTime	Name
------	------	------	-------	------

1 10838016 2008-01-01 00:01:53 rgos.bin

1 399 2008-01-01 00:01:37 config.text

1 399 2008-01-01 00:17:58 cfg.txt

3 Files (Total size 11210782 Bytes), 0 Directories.

Total 33030144 bytes (31MB) in this device, 20463616 bytes (19MB)
available.

54.1.5 mkdir

mkdir directory

	directory	

L

L

54.1.6 rename

rename url1 url2

url1	URL
url2	URL

usb0/1, flash, slave

```
1 log.txt , config.txt
Ruijie# rename tmp/log.txt ../config.txt
2 log.txt usb0
Ruijie# rename slave:/log.txt usb0:/log.txt
3 log.txt log.txt.bak
Ruijie# rename log.txt log.txt.bak
4 sd rgos.bin flash
Ruijie# rename sd0:/rgos.bin flash:/rgos_bak.bin
5 U test.txt sd
Ruijie# rename usb0:/test.txt sd0:/test2.txt
```

del	
copy	

54.1.7 rmdir

rmdir directory

directory	,

--

--

--

Ruijie# rmdir tmp

mkdir	

--

54.2 jμ-‘a—

54.2.1 pwd

pwd

└──

└──

└──

└──
1
Ruijie# pwd
flash:/

cd	

└──

54.2.2 show file systems

show file systems

└──

└──

└──

└──

1
Ruijie#show file systems

└──

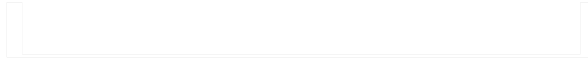
└──

└──

55 , Ä • 8 "

55.1 CPU F Ñ | a —

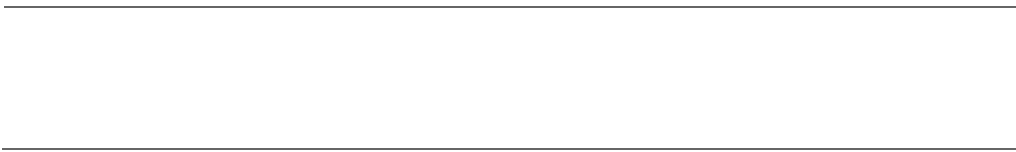
55.1.1 cpu-log



5	0%	0%	0%	waitqueue_process
6	0%	0%	0%	tasklet_task
7	0%	0%	0%	kevents
8	0%	0%	0%	snmpd
9	0%	0%	0%	snmp_trapd
10	0%	0%	0%	mtdblock
11	0%	0%	0%	gc_task
12	0%	0%	0%	Context
13	0%	0%	0%	kswapd
14	0%	0%	0%	bdflush
15	0%	0%	0%	kupdate
16	0%	3%	1%	ll_mt
17	0%	0%	0%	ll main process
18	0%	0%	0%	bridge_relay
19	0%	0%	0%	d1x_task
20	0%	0%	0%	secu_policy_task
21	0%	0%	0%	dhcpa_task
22	0%	0%	0%	dhcpsnp_task
23	0%	0%	0%	igmp_snp
24	0%	0%	0%	mstp_event
25	0%	0%	0%	GVRP_EVENT
26	0%	0%	0%	rldp_task
27	0%	2%	1%	reup_task
28	0%	0%	0%	reup_event_handler
29	0%	0%	0%	tpp_task
30	0%	0%	0%	ip6timer
31	0%	0%	0%	rtadvd
32	0%	0%	0%	tnet6
33	2%	0%	0%	tnet
34	0%	0%	0%	Tarptime
35	0%	0%	0%	gra_arp
36	0%	0%	0%	Ttcptimer
37	8%	1%	0%	ef_res
38	0%	0%	0%	ef_rcv_msg
39	0%	0%	0%	ef_inconsistent_daemon
40	0%	0%	0%	ip6_tunnel_rcv_pkt
41	0%	0%	0%	res6t
42	0%	0%	0%	tunrt6
43	0%	0%	0%	ef6_rcv_msg

44	0%	0%	0%	ef6_inconsistent_daemon
45	0%	0%	0%	imid
46	0%	0%	0%	nsmd
47	0%	0%	0%	ripd
48	0%	0%	0%	ripngd
49	0%	0%	0%	ospfd
50	0%	0%	0%	ospf6d
51	0%	0%	0%	bgpd
52	0%	0%	0%	pimd
53	0%	0%	0%	pim6d
54	0%	0%	0%	pdmd
55	0%	0%	0%	dvmrpd
56	0%	0%	0%	vtty_connect
57	0%	0%	0%	aaa_task
58	0%	0%	0%	Tlogtrap
59	0%	0%	0%	dhcp6c
60	0%	0%	0%	sntp_rcv_task
61	0%	0%	0%	ntp_task
62	0%	0%	0%	sla_daemon
63	0%	3%	1%	track_daemon
64	0%	0%	0%	pbr_guard
65	0%	0%	0%	vrpd
66	0%	0%	0%	psnpd
67	0%	0%	0%	igsnpd
68	0%	0%	0%	coa_rcv
69	0%	0%	0%	co_oper
70	0%	0%	0%	co_mac
71	0%	0%	0%	radius_task
72	0%	0%	0%	tac+_acct_task
73	0%	0%	0%	tac+_task
74	0%	0%	0%	dhcpd_task
75	0%	0%	0%	dhcps_task
76	0%	0%	0%	dhcpping_task
77	0%	0%	0%	dhcpc_task
78	0%	0%	0%	uart_debug_file_task
79	0%	0%	0%	ssp_init_task
80	0%	0%	0%	rl_listen
81	0%	0%	0%	ikl_msg_operate_thread
82	0%	0%	0%	bcmDPC

83	0%	0%	0%	bcmL2X.0
84	3%	3%	3%	bcmL2X.0
85	0%	0%	0%	bcmCNTR.0
86	0%	0%	0%	bcmTX
87	0%	0%	0%	bcmXGS3AsyncTX
88	0%	2%	1%	bcmLINK.0
89	0%	0%	0%	bcmRX
90	0%	0%	0%	mngpkt_rcv_thread
91	0%	0%	0%	mngpkt_recycle_thread
92	0%	0%	0%	stack_task
93	0%	0%	0%	stack_disc_task
94	0%	0%	0%	redun_sync_task
95	0%	0%	0%	conf_dispatch_task
96	0%	0%	0%	devprob_task
97	0%	0%	0%	rdp_snd_thread
98	0%	0%	0%	rdp_rcv_thread
99	0%	0%	0%	rdp_slot_change_thread
100	4%	2%	1%	datapkt_rcv_thread
101	0%	0%	0%	keepalive_link_notify
102	0%	0%	0%	rerp_msg_rcv_thread
103	0%	0%	0%	ip_scan_guard_task
104	0%	0%	0%	ssp_ipmc_hit_task
105	0%	0%	0%	ssp_ipmc_trap_task
106	0%	0%	0%	hw_err_snd_task
107	0%	0%	0%	rerp_packet_send_task
108	0%	0%	0%	idle_vlan_proc_thread
109	0%	0%	0%	cmic_pause_detect
110	1%	1%	1%	stat_get_and_send
111	0%	1%	0%	rl_con
112	75%	80%	90%	idle



BGP,OSPF,RIP,LDP,PIM,ISIS

```

1      show memory protocols
Ruijie(config)#      show memory protocols
=====
protocol |memory(byte)
BGP      102000000
OSPF     24000000
RIP      10000000
PIM      50000000
LDP      20000000
-----
Total    206000000

```

show memory	

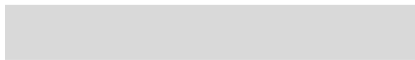
10.3(4b3)	

56 , Ä a —

56.1 " - ' a —

56.1.1 clear logging

clear logging



more flash:filename

Filename	

└──

└──

└──

FLASH

"//f2" "//f3"

└──

FLASH

Ruijie# more flash : //f2/ log.txt

look up file in the extended flash://f2/log.txt

00004 2004-11-17 4:1:32 Ruijie: %5:Reload requested by
Administrator. Reload Reason :Reload command

└──

logging file flash:	FLASH

└──

└──

-	-

56.1.3 logging buffered

A

level	0 7
-------	-----

┌

4k Bytes
7

┌

show logging

clear logging
FLASH

Syslog Server

8

e4203 Tm e4203 Tm



	-	-

56.1.4 logging console

no

logging console level

no logging console

	level	0 7
		1

Debugging (7)

show logging

Ruijie(config)# logging console informational 6

	logging on	

show logging

56.1.5 logging count

no

logging count

no logging count

	-	-

┌

┌

┌

no logging count

┌

Ruijie(config)# logging count

	show logging count	
	show logging	

┌

	-	-

56.1.6 logging facility

no

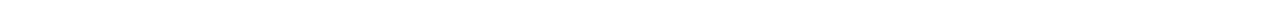
(23)

logging facility facility-type

no logging facility

--	--

facility-type



logging on	
show logging	
logging trap	syslog server

└──

-	-

56.1.12 logging source interface

no

logging source interface interface-type interface-number

no logging source interface

interface-type	
interface-number	

└──

└──

Syslog Server

IP

/ ZÑà³ YÚê%B EîE› Dç•Hš ý ø ¾±†œL

	-	-

56.1.14 logging trap

no Syslog Server

no Syslog Server

logging trap level

no logging trap

level

56.1.15 service sequence-numbers

no

service sequence-numbers

no service sequence-numbers

	-	-

--

--

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1

--

Ruijie(config)# service sequence-numbers

	logging on	
	service timestamps	

--

	-	-

56.1.16 service sysname

no

service sysname

no service sysname

--	--	--

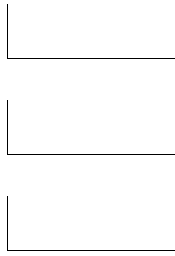
message-type	log debug log 0 6 debug 7
uptime	* * * * 07:00:10:41
datetime	Jul 27 16:53:07
msec	
year	2007 Jul 27 16:53:07

	VTY	VTY
	no	
	terminal monitor	
	terminal no monitor	
	-	-
	VTY	
	VTY	VTY
	VTY	
	Ruijie# terminal monitor	
	-	-
	-	-

56.2 i μ - ' a —

56.2.1 show logging

	show logging
	-



show logging

```
Ruijie# show logging
Syslog logging: enabled
Console logging: level debugging, 4 messages logged
Monitor logging: level informational, 0 messages logged
Buffer logging: level debugging, 6 messages logged
Timestamp debug messages: datetime
Timestamp log messages: disabled
Sequence log messages: enable
```

Buffer logging	
Timestamp debug messages	Debug
Timestamp log messages	Log
Sequence log messages	
Trap logging	Syslog Server
Log Buffer	

logging on	
clear logging	

┌

-	-

56.2.2 show logging count

show logging count

-	-

┌

┌

```

logging count          logging count    show
show logging

```

┌

```

show logging count
Ruijie# show logging count
Module Name Message Name Sev Occur Last Time
=====SYS

```

CONFIG_I 5 1 Jul 6 10:29:57

-----SYS TOTAL 1

--	--

logging count

57 USB a —

57.1 " - ' a —

CLI

USB

57.1.1 show usb

USB

show usb

-	-

└───

└───

└───

USB

USB

Ruijie# show usb

Device: Mass Storage:

ID: 0

URL prefix: usb0

Disk Partitions:

usb0(type:FAT32)

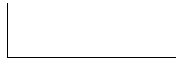
Size : 131,072,000B(125MB)

Available size 1,260,020B 1.2MB

Mass Storage Device

URL	U U
Size	U

-	-



10.4(1)	SD
10.4(2b4)	SD usb

57.1.2 usb remove

usb remove device-id

device-id	USB ID show usb



USB

USB

USB

Ruijie# usb remove 0

OK, now you can pull out the device 0.

*Jan 1 00:18:16: %USB-5- USB_DISK_REMOVED: USB Disk <Mass Storage>
has been removed from USB port 0!

USB

-	-

L

	10.4(1)	SD
	10.4(2b4)	SD usb

58 p ? • 8 a —

58.1 " - ' a —

58.1.1 device-priority

device-priority [member] priority





Ruijie# show member

Member Mac Address Priority Software Version

HardwareVersion Description

1 00d0.f810.3323 1 RGOS 10.1.00(2),Release(12889) 1.0 SWITCH
2 00d0.f822.33aa 1 RGOS 10.1.00(2),Release(12889) 1.0 SWITCH
3 00d0.f822.33ae 1 RGOS 10.1.00(2),Release(12889) 1.0 SWITCH
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

-	-

-	-

59.1.2 show fans

show fans

└───

└───

└───

1	
Ruijie# show fans	
Device : M7806-FAN I Temperature:30c	
Item State speed(0-4)	

1 stop --	
2 error --	
3 work 3	
4 work 5	
5 work 1	
Temperature	
Item	
State	stop error work
speed(0-5)	0-4 0 4

└───

	10.4(2b2)	