



Ruijie Networks – Innovation Beyond Networks



Ruijie Switch PoC Guide (V1.2)

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Preface

This document providing technical guidance to help engineers test Switch products. This document may contain scenario, configuration, command, screenshot image, topology and any related material. This document may not help to solve a similar case due any differences in the real conditions.

Audience

- Network Engineers
- Network Administrator

Obtain Technical Assistance

- Ruijie Networks Websites: <http://www.ruijienetworks.com>
- Ruijie Service Portal: <http://caseportal.ruijienetworks.com>

Welcome to report error and give advice in any Ruijie manual to Ruijie Service Portal

Related Documents

- RG-Switch Implementation Cookbook
https://www.ruijienetworks.com/support/documents/slide_75577
- Ruijie RG-S2910XS-E Switch Series datasheet
https://www.ruijienetworks.com/support/documents/slide_40295
- RG-S2910XS-E Series Switch Hardware Installation and Reference Guide V1.14
https://www.ruijienetworks.com/support/documents/slide_75302
- RG -Switch RGOS Web-Based Configuration Guide
https://www.ruijienetworks.com/support/documents/slide_59640

Revision History

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1. Ruijie Switch Testing List

| Category | Test Item | Description | Pass | Fail |
|----------------------|--------------------------------|--|------|------|
| 1. Management | Telnet | Enable telnet and log into switch successfully | | |
| | SSH | Enable SSH and log into switch successfully | | |
| | WEB | Enable WEB and log into switch successfully | | |
| | Syslog | Configure the logging file name and buffered | | |
| 2. Basic Feature | POE | Enable POE and power up AP | | |
| | Standard Access Control List | Create standard access control list to block access. | | |
| | Extended Access Control List | Create extended access control list to block access. | | |
| | Expert Access Control List | Create expert access control list to block access. | | |
| | Time-Based Access Control List | Create time-based access control list to block access. | | |
| | DHCP server | Enable service DHCP and create IP Pool. Test to obtain IP address on computer. | | |
| | DHCP relay | Enable service DHCP and designated DHCP server IP address. | | |
| | Aggregate Port | Create aggregate port and check the bandwidth of aggregate port. | | |
| 3. Security Features | Multicast | Enable multicast routing and igmp snooping. | | |
| | Port Security | Enable port security, bind IP address and mac address to test the connection. | | |
| | Port Protect | Enable port protect, then test the connection between different ports. | | |
| | IP Source Guard | Enable IP source guard and change IP address for testing | | |
| | DHCP Snooping | Enable DHCP snooping and make the PC obtain the correct IP address | | |

| | | | | |
|-------------------|----------------------|---|--|--|
| | NFPP | Enable NFPP and check the threshold | | |
| 4. Redundancy | VSU | Enable VSU and check the status of VSU | | |
| | VRRP+MSTP | Enable MSTP and VRRP, check the status of MSTP and VRRP | | |
| 5. Authentication | Dot1X authentication | Enable Dot1X authentication and the terminal can pass the authentication to access to Internet. | | |
| | WEB authentication | Enable WEB authentication and the terminal can pass the authentication to access to Internet. | | |


Note: Before PoC, please check whether the switch has been upgraded to the latest version by execute command "*show version detail*", the example is shown as below:

```
S2910-1#show version detail
System description      : Ruijie 10G Ethernet Switch with PoE (S2910-24GT4XS-UP-H) By Ruijie Networks
System start time      : 2019-07-13 11:52:16
System uptime          : 110:04:47:40
System hardware version : 3.32
System software version : S29_RGOS 11.4(1)B12P11
System patch number    : NA
System software number  : M17443310122017
System serial number    : G1MwB7E001109
System boot version     : 1.2.28.0c4a1bf(170209)
System core version     : 3.10.18.1dd134f0b86bd9
Module information:
  Slot 0 : S2910-24GT4XS-UP-H
    Hardware version : 3.32
    Boot version      : 1.2.28
    Software version  : S29_RGOS 11.4(1)B12P11
    Software number   : M17443310122017
    Serial number     : G1MwB7E001109
S2910-1#
```

2. Testing Lists

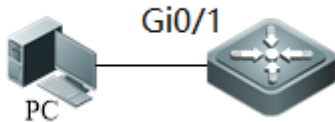
2.1 Management

2.1.1 Telnet

| | |
|---|--|
| Testing project : | Telnet |
| Testing purpose : | Enable telnet and log into switch successfully |
| Testing procedure and expected results: |  |


| | |
|---------------------|---|
| | <ol style="list-style-type: none"> 1. assign IP 192.168.0.1/24 to switch assign IP 192.168.0.2/24 to PC 2. add the following configuration Ruijie(config)#interface VLAN 1 Ruijie(config-if-vlan)#ip address 192.168.0.1 255.255.255.0 Ruijie(config-if-vlan)#exit Ruijie(config)#enable password ruijie Ruijie(config)#line vty 0 4 Ruijie(config-line)#password ruijie Ruijie(config-line)#login Ruijie(config-line)#end Ruijie#wr 3. verify telnet access |
| Measured record: | |
| Testing conclusion: | |

2.1.2 SSH


| | |
|---|--|
| Testing project : | SSH |
| Testing purpose : | Enable SSH and log into switch successfully |
| Testing procedure and expected results: | <div style="text-align: center;">  </div> <ol style="list-style-type: none"> 1. assign IP 192.168.0.1/24 to switch assign IP 192.168.0.2/24 to PC third-party client networking software must be used such as SecureCRT or PuTTY. 2. add the following configuration Ruijie(config)#interface VLAN 1 Ruijie(config-if-vlan)#ip address 192.168.0.1 255.255.255.0 Ruijie(config-if-vlan)#exit Ruijie(config)#enable service ssh-server Ruijie(config)#crypto key generate dsa Choose the size of the key modulus in the range of 360 to 2048 for your Signature Keys. Choosing a key modulus greater than 512 may take a few minute |

| | | |
|---------------------|---|---------------|
| | <pre> How many bits in the modulus [512]: % Generating 512 bit DSA keys ...[ok] Ruijie(config)#line vty 0 4 Ruijie(config-line)#login local Ruijie(config-line)#exit Ruijie(config)#username admin password ruijie Ruijie(config)#enable password ruijie Ruijie(config)#end Ruijie#wr 3. verify SSH access using SecureCRT </pre> | //press enter |
| Measured record: | | |
| Testing conclusion: | | |

2.1.3 WEB

| | |
|---|--|
| Testing project : | WEB |
| Testing purpose : | Enable WEB and log into switch successfully |
| Testing procedure and expected results: |  <pre> 1. assign IP 192.168.0.1/24 to switch assign IP 192.168.0.2/24 to PC browser must be IE and other major browsers and open compatible mode. 2. add the following configuration Ruijie(config)#enable service web-server Ruijie(config)#interface vlan 1 Ruijie(config-if)#ip address 192.168.0.1 255.255.255.0 Ruijie(config-if)#exit Ruijie(config)#webmaster level 0 username ruijie password ruijie Ruijie(config)#exit Ruijie#wr 3. verify Web access </pre> |
| Measured record: | |
| Testing conclusion: | |

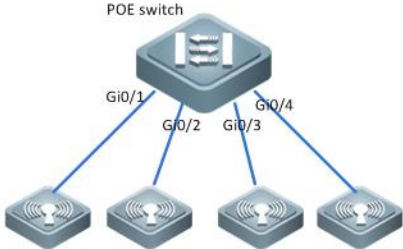
2.1.4 Syslog

| | |
|---|---|
| Testing project : | Syslog |
| Testing purpose : | Configure the logging file name and buffered |
| Testing procedure and expected results: |  <p>1. assign IP 192.168.0.1/24 to switch assign IP 192.168.0.2/24 to PC</p> <p>2. add the following configuration</p> <pre>Ruijie(config)#logging file flash:syslog 7 Ruijie(config)#logging file flash:syslog 131072 Ruijie(config)#logging buffered 131072 Ruijie(config)#logging userinfo Ruijie(config)#logging userinfo command-log</pre> <p>3. Execute command "show log" to display logs in buffer Execute command "dir" privilege EXEC command to check log files in flash Execute command "more flash:syslog.txt" to display logs in flash Execute command "clear logging" privilege EXEC command to clear logs in buffer</p> |
| Measured record: | |
| Testing conclusion: | |


2.2 Basic Feature

2.2.1 POE

| | |
|---|---|
| Testing Project | poe |
| Testing Purpose | Switch can power up AP |
| Testing procedure and expected results: | 1. Power on the Switch, the AP connect to the switch interface. |


| | |
|---------------------|---|
| |  <ol style="list-style-type: none"> 2. add the following configuration <pre>Ruijie(config)#interface gigabitEthernet 0/1 Ruijie(config-if)#poe enable Ruijie(config)#poe mode auto</pre> 3. execute “show poe interfaces status” command on switch to check POE power supply status |
| Measured record: | |
| Testing conclusion: | |

2.2.2 Standard Access Control List


| | |
|---|--|
| Testing project : | Standard Access Control List |
| Testing purpose : | Create standard access control list to block access. |
| Testing procedure and expected results: |  <ol style="list-style-type: none"> 1. PC1 and PC2 are in the same vlan assign IP 192.168.0.1/24 to PC1 assign IP 192.168.0.2/24 to PC2 2. add the following configuration <pre>Ruijie(config)#ip access-list standard 1 Ruijie(config-std-nacl)#10 deny host 192.168.0.1 Ruijie(config-std-nacl)#20 permit any Ruijie(config-std-nacl)#exit Ruijie(config)#interface gigabitEthernet 0/1 Ruijie(config-if)#ip access-group 1 in Ruijie(config-if)#end Ruijie#wr</pre> 3. PC1 ping PC2 Expected results: ping unsuccessfully 4. assign IP 192.168.0.3/24 to PC1 |

| | |
|---------------------|--|
| | 5. PC1 ping PC2 Expected results: ping successfully |
| Measured record: | |
| Testing conclusion: | |

2.2.3 Extended Access Control List


| | |
|---|---|
| Testing project : | Extended Access Control List |
| Testing purpose : | Create standard extended control list to block access. |
| Testing procedure and expected results: |  <pre> graph LR PC1[PC1] --- Gi0_1[Gi0/1] --- Switch[Ruijie Switch] Switch --- Gi0_2[Gi0/2] --- PC2[PC2] </pre> <ol style="list-style-type: none"> PC1 and PC2 are in the same vlan assign IP 192.168.1.1/24 to PC1 assign IP 192.168.2.2/24 to PC2 add the following configuration Ruijie(config)# ip access-list extended 101 Ruijie(config-std-nacl)# 10 deny ip host 192.168.1.1 any Ruijie(config-std-nacl)#20 permit ip any any Ruijie(config-std-nacl)#exit Ruijie(config)#interface gigabitEthernet 0/1 Ruijie(config-if)#ip access-group 101 in Ruijie(config-if)#end Ruijie#wr PC1 ping PC2 Expected results: ping unsuccessfully assign IP 192.168.1.3/24 to PC1 PC1 ping PC2 Expected results: ping successfully |
| Measured record: | |
| Testing conclusion: | |

2.2.4 Expert Access Control List


| | |
|---|--|
| Testing project : | Expert Access Control List |
| Testing purpose : | Create expert access control list to block access. |
| Testing procedure and expected results: |  <pre> graph LR PC1[PC1] --- Gi0/1[Gi0/1] --- Switch[Switch] Switch --- Gi0/2[Gi0/2] --- PC2[PC2] </pre> <ol style="list-style-type: none"> PC1 and PC2 are in the same vlan assign IP 192.168.1.1/24 to PC1 assign IP 192.168.1.2/24 to PC2 add the following configuration Ruijie(config)#expert access-list extended 2701 Ruijie(config-exp-nacl)#10 deny tcp host 192.168.1.1 any any any eq www Ruijie(config-exp-nacl)#20 permit tcp host 192.168.1.1 any any any eq pop3 Ruijie(config-exp-nacl)#exit Ruijie(config)#interface gigabitEthernet 0/1 Ruijie(config-if)#expert access-group 2701 in Ruijie(config-if)#end Ruijie#wr Start service of web and pop3 on PC2 Test web service and pop3 service Expected results: access to web service and pop3 service successfully |
| Measured record: | |
| Testing conclusion: | |

2.2.5 Time-Based Access Control List

| | |
|-------------------|--|
| Testing project : | Time-Based Access Control List |
| Testing purpose : | Create time-based access control list to block access. |

| | |
|---|--|
| Testing procedure and expected results: |  <ol style="list-style-type: none"> 1. PC1 and PC2 are in the same vlan assign IP 192.168.0.1/24 to PC1 assign IP 192.168.0.2/24 to PC2 2. add the following configuration Ruijie(config)#time-range time1 Ruijie(config-time-range)#periodic daily 8:00 to 18:00 Ruijie(config-time-range)#exit Ruijie(config)#ip access-list standard 2 Ruijie(config-std-nacl)#10 permit any time-range time1 Ruijie(config-std-nacl)#20 deny any Ruijie(config-std-nacl)#exit Ruijie(config)#interface gigabitEthernet 0/1 Ruijie(config-if)#ip access-group 2 in Ruijie(config-if)#end Ruijie#wr 3. PC1 ping PC2 Expected results: ping unsuccessfully 4. Change the switch clock at 20 PM Ruijie#clock set 20:37:11 3 16 2007 5. PC1 ping PC2 Expected results: ping successfully |
| Measured record: | |
| Testing conclusion: | |

2.2.6 DHCP Server

| | |
|---|--|
| Testing project : | DHCP Server |
| Testing purpose : | Enable service DHCP and create IP Pool. Test to obtain IP address on computer. |
| Testing procedure and expected results: |  |

| | |
|---------------------|--|
| | <ol style="list-style-type: none"> add the following configuration <pre>Ruijie(config)#service dhcp Ruijie(config)#interface vlan 10 Ruijie(config-if-VLAN 10)#ip address 192.168.1.254 255.255.255.0 Ruijie(config-if-VLAN 10)#exit Ruijie(config)#ip dhcp pool vlan10 Ruijie(dhcp-config)#network 192.168.1.0 255.255.255.0 Ruijie(dhcp-config)#dns-server 218.85.157.99 Ruijie(dhcp-config)#default-router 192.168.1.254 Ruijie(dhcp-config)#exit Ruijie(config)#int range gigabitEthernet 0/1-2 Ruijie(config-if-range)#switchport access vlan 10 Ruijie(config-if)#end Ruijie#wr</pre> PC1 and PC2 can obtain IP address. |
| Measured record: | |
| Testing conclusion: | |


2.2.7 DHCP Relay

| | |
|---|---|
| Testing project : | DHCP Relay |
| Testing purpose : | Enable service DHCP and designated DHCP server IP address. |
| Testing procedure and expected results: | <p>The diagram illustrates a DHCP Relay setup. At the top is the Core switch, which has a DHCP Server interface labeled G0/24 with IP address 172.16.1.1/30. Below it is the Distribution switch, which has a DHCP Relay interface labeled G0/24 with IP address 172.16.1.2/30. The two switches are connected via their G0/24 interfaces. The Distribution switch is also connected to two PCs, PC1 and PC2, via its G0/1 and G0/2 interfaces respectively.</p> |

| | |
|---------------------|---|
| | <p>1. add the following configuration</p> <p>Core switch:</p> <pre>Ruijie(config)#interface gigabitEthernet 0/24 Ruijie(config-if-GigabitEthernet 0/24)#no switchport Ruijie(config-if-GigabitEthernet 0/24)#ip address 172.16.1.1 255.255.255.252 Ruijie(config-if-GigabitEthernet 0/24)#exit Ruijie(config)#ip route 192.168.1.0 255.255.255.0 172.16.1.2 Ruijie(config)#service dhcp Ruijie(config)#ip dhcp pool vlan10 Ruijie(dhcp-config)#network 192.168.1.0 255.255.255.0 Ruijie(dhcp-config)#dns-server 218.85.157.99 Ruijie(dhcp-config)#default-router 192.168.1.254 Ruijie(dhcp-config)#end Ruijie#wr</pre> <p>Distribution switch:</p> <pre>Ruijie(config)#interface vlan 10 Ruijie(config-if-VLAN 10)#ip address 192.168.1.254 255.255.255.0 Ruijie(config-if-VLAN 10)#exit Ruijie(config)#interface gigabitEthernet 0/24 Ruijie(config-if-GigabitEthernet 0/24)#no switchport Ruijie(config-if-GigabitEthernet 0/24)#ip address 172.16.1.2 255.255.255.252 Ruijie(config-if-GigabitEthernet 0/24)#exit Ruijie(config)#ip route 0.0.0.0 0.0.0.0 172.16.1.1 Ruijie(config)#service dhcp Ruijie(config)#ip helper-address 172.16.1.1 Ruijie(config)#end Ruijie#wr</pre> <p>2. PC1 and PC2 can obtain IP address.</p> |
| Measured record: | |
| Testing conclusion: | |

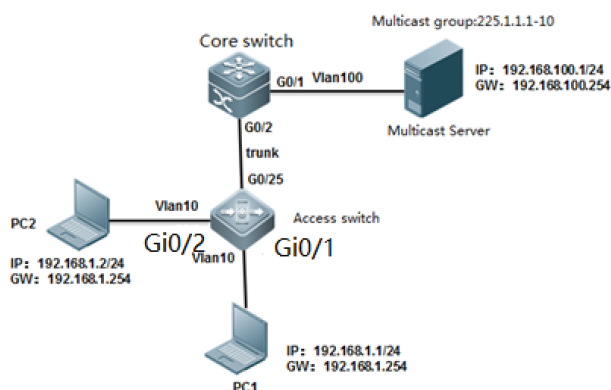
2.2.8 Aggregate Port

| | |
|-------------------|--|
| Testing project : | Aggregate Port |
| Testing purpose : | Create aggregate port and check the bandwidth of aggregate port. |

| | |
|--|--|
| <p>Testing procedure and expected results:</p> | <div style="text-align: center;">  </div> <ol style="list-style-type: none"> add the following configuration <pre> SW1>enable SW1#configure terminal SW1(config)#interface range gigabitEthernet 0/1-2 SW1(config-if-range)#port-group 1 SW1(config-if-range)#exit SW1(config)#interface aggregateport 1 SW1(config-if-AggregatePort 1)#switchport mode trunk SW1(config-if-AggregatePort 1)#exit SW1(config)#aggregateport load-balance src-mac SW1(config)#exit SW1#wr SW2>enable SW2#configure terminal SW2(config)#interface range gigabitEthernet 0/1-2 SW2(config-if-range)#port-group 1 SW2(config-if-range)#exit SW2(config)#interface aggregateport 1 SW2(config-if-AggregatePort 1)#switchport mode trunk SW2(config-if-AggregatePort 1)#exit SW2(config)#aggregateport load-balance src-mac SW2(config)#exit SW2#wr </pre> Execute command 'show int agg 1' to check the bandwidth of the Aggregate port 1. |
| Measured record: | |
| Testing conclusion: | |

2.2.9 Multicast

| | |
|-------------------|---|
| Testing project : | Multicast |
| Testing purpose : | Enable multicast routing and igmp snooping. |



1. add the following configuration

core switch:

```
Ruijie#configure terminal
Ruijie(config)#vlan 10
Ruijie(config-vlan)#vlan 100
Ruijie(config-vlan)#exit
Ruijie(config)#ip multicast-routing
Ruijie(config)#interface gigabitEthernet 0/1
Ruijie(config-if-GigabitEthernet 0/1)#switchport access vlan 100
Ruijie(config-if-GigabitEthernet 0/1)#exit
Ruijie(config)#interface vlan 100
Ruijie(config-if-VLAN 100)#ip address 192.168.100.254
255.255.255.0
Ruijie(config-if-VLAN 100)#ip pim dense-mode
Ruijie(config)#interface vlan 10
Ruijie(config-if-VLAN 10)#ip address 192.168.10.254 255.255.255.0
Ruijie(config-if-VLAN 10)#ip pim dense-mode
Ruijie(config-if-VLAN 10)#exit
Ruijie(config)#interface gigabitEthernet 0/2
Ruijie(config-if-GigabitEthernet 0/2)#switchport mode trunk
Ruijie(config-if-GigabitEthernet 0/2)#exit
Ruijie(config)#end
Ruijie#wr
```

Access switch:


```
Ruijie(config)#vlan 10
Ruijie(config-vlan)#exit
Ruijie(config)#interface gigabitEthernet 0/25
Ruijie(config-if-GigabitEthernet 0/25)#switchport mode trunk
Ruijie(config-if-GigabitEthernet 0/25)#exit
```

Testing procedure and expected results:

| | |
|---------------------|--|
| | <pre>Ruijie(config)#interface range gigabitEthernet 0/1-2 Ruijie(config-if-range)#switchport access vlan 10 Ruijie(config-if-range)#exit Ruijie(config)#ip igmp snooping ivgl Ruijie(config)#ip igmp snooping vlan 10 mrouter interface g0/25 Ruijie(config)#end Ruijie(config)#ip igmp profile 1 Ruijie<config-profile>#permit Ruijie<config-profile>#range 225.1.1.1 225.1.1.10 Ruijie<config-profile>#exit Ruijie(config)#interface range gigabitEthernet 0/1-2 Ruijie(config-if-range)#ip igmp snooping filter 1 Ruijie(config-if-range)#exit Ruijie(config)#ip igmp snooping fast-leave enable Ruijie(config)#ip igmp snooping suppression enable Ruijie(config)#end Ruijie#wr</pre> <ol style="list-style-type: none"> Execute command 'show ip igmp snooping gda-table' to display IGMP Snooping table on access switch Execute command 'show ip igmp snooping statistics ' to display IGMP Snooping statistics |
| Measured record: | |
| Testing conclusion: | |

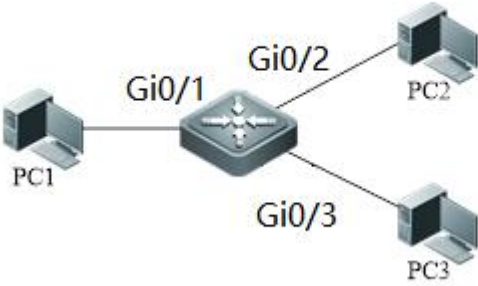
2.3 Security Features

2.3.1 Port Security

| | |
|---|---|
| Testing project : | Port Security |
| Testing purpose : | Enable port security, bind IP address and mac address to test the connection |
| Testing procedure and expected results: | <div style="text-align: center;">  </div> <ol style="list-style-type: none"> assign IP 192.168.0.1/24 to PC1 assign IP 192.168.0.2/24 to PC2 |


| | |
|---------------------|--|
| | <p>The MAC address of PC1 is "00:f0:4c:87:19:1e"</p> <p>Both PC1 and PC2 are in vlan 1</p> <ol style="list-style-type: none"> add the following configuration <pre>Ruijie(config)#interface gigabitEthernet 0/1 Ruijie(config-if)#switchport port-security binding 00f0.4c87.191e vlan 1 192.168.0.1 Ruijie(config-if)#switchport port-security Ruijie(config-if)#end Ruijie#wr</pre> PC1 ping PC2 <p>Expected results: ping successfully</p> Change the ip address or mac-address of PC1 <p>Expected results: ping unsuccessfully</p> |
| Measured record: | |
| Testing conclusion: | |

2.3.2 Port Protect


| | |
|---|---|
| Testing project : | Port Protect |
| Testing purpose : | Enable port protect, then test the connection between different ports |
| Testing procedure and expected results: |  <pre> graph LR PC1 --- Gi0_1[Gi0/1] --- Switch Switch --- Gi0_2[Gi0/2] --- PC2 Switch --- Gi0_3[Gi0/3] --- PC3 </pre> <ol style="list-style-type: none"> assign IP 192.168.0.1/24 to PC1 assign IP 192.168.0.2/24 to PC2 assign IP 192.168.0.3/24 to PC3 add the following configuration <pre>Ruijie(config)#interface gigabitEthernet 0/1 Ruijie(config-if)#switchport protected Ruijie(config)#interface gigabitEthernet 0/2 Ruijie(config-if)#switchport protected</pre> PC1 ping PC2 |

| | |
|---------------------|--|
| | <p>Expected results: ping unsuccessfully</p> <p>4. PC1 ping PC3 Expected results: ping successfully</p> <p>5. PC2 ping PC3 Expected results: ping successfully</p> |
| Measured record: | |
| Testing conclusion: | |


2.3.3 IP Source Guard

| | |
|---|---|
| Testing project : | IP Source Guard |
| Testing purpose : | Enable IP source guard and change IP address for testing |
| Testing procedure and expected results: | <div style="text-align: center;">  </div> <ol style="list-style-type: none"> PC MAC : 0000:0100:0001 The MAC address of PC1 is "0000-0100-0001" DHCP Pool : 10.1.1.100-200/24 add the following configuration <pre>Ruijie(config)#ip dhcp snooping Ruijie(config)#ip source binding 0000.0100.0001 vlan 1 10.1.1.10 interface gigabitEthernet 0/1 Ruijie(config)#interface gigabitEthernet 0/1 Ruijie(config-if)# ip verify source port-security Ruijie(config)#interface gigabitEthernet 0/2 Ruijie(config-if)# ip dhcp snooping trust Ruijie(config-if)#end Ruijie#wr</pre> PC ping DHCP Server after obtaining IP address Expected results: ping successfully PC ping DHCP Server after changing the address as 10.1.1.10 Expected results: ping successfully PC ping DHCP Server after changing the address Expected results: ping unsuccessfully |
| Measured record: | |
| Testing conclusion: | |

2.3.4 DHCP Snooping

| | |
|---|--|
| Testing project : | DHCP Snooping |
| Testing purpose : | Enable DHCP snooping and make the PC obtain the correct IP address |
| Testing procedure and expected results: |  <ol style="list-style-type: none"> assign IP 192.168.0.2/24 to PC2(DHCP Server) Enable DHCP Snooping Ruijie(config)#ip dhcp snooping DHCP client PC1 are obtaining IP address (ipconfig/renew) Expected results: PC1 obtains IP unsuccessfully Configure the port connected to DHCP server as DHCP Snooping trusted port. Ruijie(config)#int Gi0/2 Ruijie(config-if)#ip dhcp snooping trust DHCP client PC1 are obtaining IP address (ipconfig/renew) Expected results: PC1 obtains IP successfully, login switch, excute "show ip dhcp snooping binding" to check the DHCP snooping table |
| Measured record: | |
| Testing conclusion: | |

2.3.5 NFPP

| | |
|---|--|
| Testing project : | NFPP |
| Testing purpose : | Enable NFPP and check the threshold |
| Testing procedure and expected results: |  <ol style="list-style-type: none"> add the following configuration |

| | |
|---------------------|---|
| | <pre>Ruijie(config)#nfpp Ruijie(config-nfpp)#arp-guard rate-limit per-port 256 Ruijie(config-nfpp)# arp-guard rate-limit per-src-mac 30 Ruijie(config-nfpp)# arp-guard rate-limit per-src-ip 30 Ruijie(config-nfpp)#end Ruijie#wr 2. Check the threshold of NFPP Ruijie#show nfpp arp-guard summary Ruijie#show nfpp arp-guard summary (Formate of column Rate-limit and Attack-threshold is per-src-ip/per-src-mac/per-port.) Interface Status Isolate-period Rate-limit Attack-threshold Scan-threshold Global Enable 0 30/30/256 200/200/400 100 Maximum count of monitored hosts: 20000 Monitor period: 600s Ruijie#</pre> |
| Measured record: | |
| Testing conclusion: | |

2.4 Redundancy

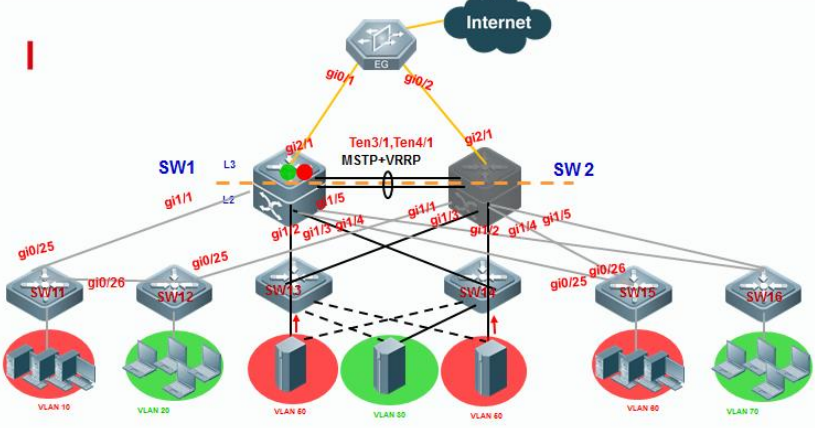
2.4.1 VSU

| | |
|---|--|
| Testing project : | VSU |
| Testing purpose : | Enable VSU and check the status of VSU |
| Testing procedure and expected results: | <div data-bbox="635 1435 1385 1749" data-label="Diagram"> </div> <ol style="list-style-type: none"> 1. Prepare 4*10G optical module and 2 optical fiber as the VSL 2. Add the following configuration <p>Main switch</p> |

| | |
|--|---|
| | <pre> Switch1(config)# switch virtual domain 1 Switch1(config-vs-domain)# switch 1 Switch1(config-vs-domain)# switch 1 priority 200 ----->Priority is 100 by default , switch with the higher priority becomes the active chassis Switch1(config-vs-domain)# exit Switch1(config)#vsl-port ----->VSL is the heartbeat and traffic channel between 2 VSU members. You must configure at least 2 pair of VSL Switch1(config-vsl-port)#port-member interface TenGigabitEthernet 0/25 Switch1(config-vsl-port)#port-member interface TenGigabitEthernet 0/26 Switch1(config-vsl-port)#exit Slave switch Switch2(config)# switch virtual domain 1 ----->domain ID must be the same to that of active chassis Switch2(config-vs-domain)# switch 2 ----->switch ID must be different from that of active chassis Switch2(config-vs-domain)# switch 2 priority 150 Switch2(config-vs-domain)# exit Switch2(config)#vsl-port ----->VSL is the heartbeat and traffic channel between 2 VSU members. You must configure at least 2 pair of VSL Switch2(config-vsl-port)#port-member interface TenGigabitEthernet 0/25 Switch2(config-vsl-port)#port-member interface TenGigabitEthernet 0/26 3. Connect VSL cable and confirm that links come up 4. Save configuration and convert both VSU members to virtual mode at the same time 5. Add the following configuration Main switch Switch1# wr Switch1# switch convert mode virtual ----->convert switch working mode from standalone mode to virtual mode Are you sure to convert switch to virtual mode[yes/no] : yes Do you want to </pre> |
|--|---|

| | |
|----------------------------|---|
| | <pre> recovery"config.text"from"virtual_switch.text"[yes/no] : no Slave switch Switch2#wr Switch2# switch convert mode virtual Are you sure to convert switch to virtual mode[yes/no] : yes Do you want to recovery"config.text"from"virtual_switch.text"[yes/no] : no 6. Both VSU members reloads automatically 7. Execute command " show switch virtual" to display status of VSU. 8. Execute command " show switch virtual link" to display status of VSL. 9. Execute command " show switch virtual role" to display roles of VSU. 10. Execute command " show switch virtual config" to display configurations of VSU. </pre> |
| <p>Measured record:</p> | |
| <p>Testing conclusion:</p> | |

2.4.2 VRRP+MSTP

| | |
|--|---|
| <p>Testing project :</p> | <p>VRRP+MSTP</p> |
| <p>Testing purpose :</p> | <p>Enable MSTP and VRRP, check the status of MSTP and VRRP</p> |
| <p>Testing procedure and expected results:</p> |  <p>1. SW1 is the master VRRP gateway for users on all vlans, and SW2 is the backup VRRP gateway for users on all vlans. Connect SW1 and SW2 through an Aggregate port to ensure reliability and configure this AP as Trunk port.</p> |

2. The IP address of SW1 on VLANs from 10 to 80 are 192.168.10.1 to 192.168.80.1 , and IP address of SW2 on VLANs from 10 to 80 are 192.168.10.2 to 192.168.80.2 , and VRRP IP address are 192.168.10.254 to 192.168.80.254.
3. Add the following configuration

Configuring SW1

```
Ruijie#config terminal
```

```
Ruijie(config)#spanning-tree mst 0 priority 0 ----->instance id=0 ,
priority=0(The lower the number, the more likely the switch will be
chosen as the root bridge) by default , all vlans are mapped to
instance 0 .
```

```
Ruijie(config)#spanning-tree ----->enable STP feature and the
default STP mode is MSTP
```

```
Ruijie(config)#interface aggregateport 1
```

```
Ruijie(config-if-AggregatePort 1)#switchport mode trunk
```

```
Ruijie(config-if-AggregatePort 1)#exit
```

```
Ruijie(config)#interface tengigabitEthernet 3/1
```

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

```
Ruijie(config-if-TenGigabitEthernet 3/1)#exit
```

```
Ruijie(config)#interface tengigabitEthernet 3/2
```

```
Ruijie(config-if-TenGigabitEthernet 3/2)#port-group 1
```

```
Ruijie(config-if-TenGigabitEthernet 3/2)#exit
```

```
Ruijie(config)#interface range gigabitEthernet 1/1-5
```

```
Ruijie(config-if-range)#switchport mode trunk ----->don't
forget to prune trunk port
```

```
Ruijie(config-if-range)#exit
```

```
Ruijie(config)#vlan 10
```

```
Ruijie(config)#inter vlan 10
```

```
Ruijie(config-if-VLAN 10)#ip address 192.168.10.1 255.255.255.0
```

```
Ruijie(config-if-VLAN 10)#vrrp 10 ip 192.168.10.254
```

```
Ruijie(config-if-VLAN 10)#vrrp 10 priority 120 ----->
vrrp group id=10 , priority value=120 (the bigger the number , the
more likely the switch will be chosen as the master ,and default
value is 100)
```

```
Ruijie(config-if-VLAN 10)#exit
```

```
Ruijie(config)#vlan 20
```

```
Ruijie(config)#inter vlan 20
```

```
Ruijie(config-if-VLAN 20)#ip address 192.168.20.1 255.255.255.0
```

```
Ruijie(config-if-VLAN 20)#vrrp 20 ip 192.168.20.254
```

```
Ruijie(config-if-VLAN 20)#vrrp 20 priority 120
```

```
Ruijie(config-if-VLAN 20)#exit
```

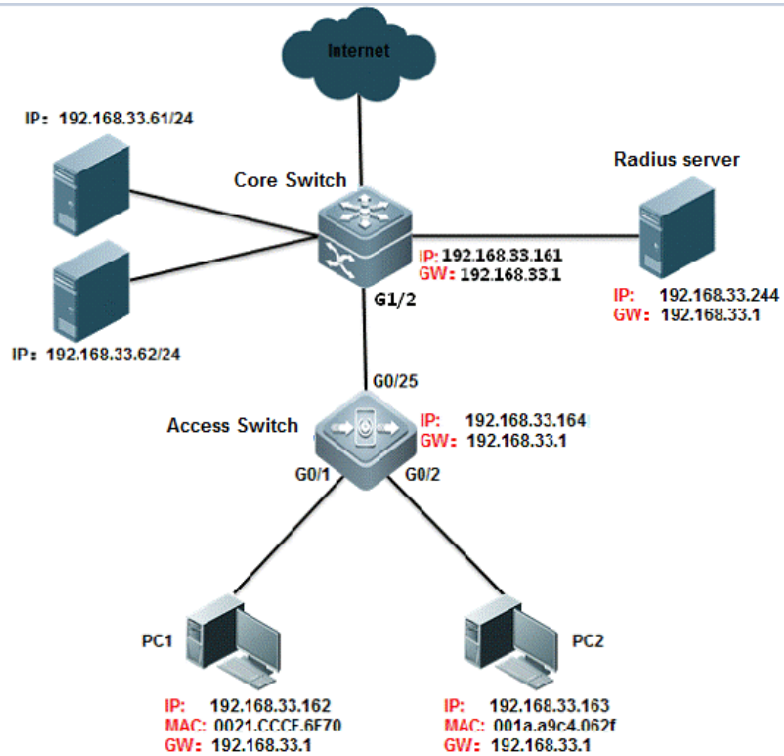
| | |
|--|---|
| | <pre>.....configuration of VLAN 30 ~ VLAN 70 are omitted..... Ruijie(config)#vlan 80 Ruijie(config)#inter vlan 80 Ruijie(config-if-VLAN 80)#ip address 192.168.80.1 255.255.255.0 Ruijie(config-if-VLAN 80)#vrrp 80 ip 192.168.80.254 Ruijie(config-if-VLAN 80)#vrrp 80 priority 120 Ruijie(config-if-VLAN 80)#end Ruijie#wr Configuring SW2 Ruijie#config terminal Ruijie(config)#spanning-tree mst 0 priority 4096 ----->instance id=0 , priority=4096(The lower the number, the more likely the switch will be chosen as the root bridge) by default , all vlans are mapped to instance 0 Ruijie(config)#spanning-tree ----->enable STP feature and default mode is MSTP Ruijie(config)#interface aggregateport 1 Ruijie(config-if-AggregatePort 1)#switchport mode trunk Ruijie(config-if-AggregatePort 1)#exit Ruijie(config)#interface tengigabitEthernet 3/1 Ruijie(config-if-TenGigabitEthernet 3/1)#port-group 1 Ruijie(config-if-TenGigabitEthernet 3/1)#exit Ruijie(config)#interface tengigabitEthernet 3/2 Ruijie(config-if-TenGigabitEthernet 3/2)#port-group 1 Ruijie(config-if-TenGigabitEthernet 3/2)#exit Ruijie(config)#interface range gigabitEthernet 1/1-5 Ruijie(config-if-range)#switchport mode trunk ----->don't forget to prune trunk port Ruijie(config)#vlan 10 Ruijie(config)#inter vlan 10 Ruijie(config-if-VLAN 10)#ip address 192.168.10.2 255.255.255.0 Ruijie(config-if-VLAN 10)#vrrp 10 ip 192.168.10.254 ----- ->vrrp group id=10 , priority value remains default setting(the bigger the number , the more likely the switch will be chosen as the master ,and default value is 100) Ruijie(config-if-VLAN 10)#exit Ruijie(config)#vlan 20 Ruijie(config)#inter vlan 20 Ruijie(config-if-VLAN 20)#ip address 192.168.20.2 255.255.255.0 Ruijie(config-if-VLAN 20)#vrrp 20 ip 192.168.20.254</pre> |
|--|---|

| | |
|---------------------|---|
| | <pre> Ruijie(config-if-VLAN 20)#exit configuration of VLAN 30 ~ VLAN 70 are omitted..... Ruijie(config)#vlan 80 Ruijie(config)#inter vlan 80 Ruijie(config-if-VLAN 80)#ip address 192.168.80.2 255.255.255.0 Ruijie(config-if-VLAN 80)#vrrp 80 ip 192.168.80.254 Ruijie(config-if-VLAN 80)#end Ruijie#wr Configuring SW11 , SW12 , S13 , S14 , S15 , S16 Ruijie#config terminal Ruijie(config)#interface range gigabitEthernet 0/25-26 Ruijie(config-if-range)#switchport mode trunk Ruijie(config-if-range)#exit Ruijie(config)#spanning-tree ----->enable STP feature and default mode is MSTP Ruijie(config)#exit Ruijie#wr 4. Execute command " show spanning-tree" to display status of MSTP. 5. Execute command " show vrrp brief" to display status of VRRP. 6. Execute command "show spanning-tree summary " to display summary information of MSTP. </pre> |
| Measured record: | |
| Testing conclusion: | |

2.5 Authentication

2.5.1 Dot1X authentication

| | |
|-------------------|---|
| Testing project : | Dot1X authentication |
| Testing purpose : | Enable Dot1X authentication and the terminal can pass the authentication to access to Internet. |



Testing and results:
procedure expected

1. Assign ip to the device according to the picture.
2. add the following configuration

Basic dot1x configuration

```
Ruijie(config)#aaa new-model ----->turn on aaa switch
Ruijie(config)#radius-server host 192.168.33.244 ----->configure radius server
Ruijie(config)#radius-server key ruijie ----->configure radius key
Ruijie(config)#aaa authentication dot1x ruijie group radius none ----->
Define an IEEE802.1x authentication method list.
Ruijie(config)#aaa accounting network ruijie start-stop group radius ----->
Define the AAA network accounting method list.
Ruijie(config)#aaa accounting update periodic 15 -----> Set the account update function.
Ruijie(config)#dot1x authentication ruijie -----> 802.1X to select the authentication method list
Ruijie(config)#dot1x accounting ruijie -----> 802.1X to select the accounting method list
Ruijie(config)#interface gigabitEthernet 1/2
Ruijie(config-if-GigabitEthernet 1/2)#switchport mode trunk
Ruijie(config-if-GigabitEthernet 1/2)#dot1x port-control auto ----->
Enable 802.1X authentication on the interface
Ruijie(config-if-GigabitEthernet 1/2)#ip add 192.168.33.161 255.255.255.0
-----> configure switch ip address
```

```
Ruijie(config-if-GigabitEthernet 1/2)#end
Ruijie#write -----> save configuration
```

Enable the secure channel function

```
Ruijie(config)#expert access-list extended ruijie
Ruijie(config-exp-nacl)#permit arp any any any any any any ----->make the ip
and arp packets free authentication
Ruijie(config-exp-nacl)#permit ip any any host 192.168.33.61 any -----> To
allow access to the home page of the site before authentication
Ruijie(config-exp-nacl)#permit ip any any host 192.168.33.62 any -----> To
allow access to the home page of the site before authentication
Ruijie(config-exp-nacl)#permit ip any any host 192.168.33.244 any
-----> To allow access to the home page of the site before authentication
Ruijie(config-exp-nacl)#permit host 192.168.33.163 host 001a.a9c4.062f any
any -----> This host implements authentication free
Ruijie(config-exp-nacl)#exit
Ruijie(config)#security global access-group ruijie
```

Smp server configuration

Edit SMP device template first , go to Authentication & Authority > Device > NAS Configuration Templates , modify Ruijie Wired Device , set the parameters as below ,

| All None | Template Name | SNMP v2c community |
|--------------------------|-------------------------|--------------------|
| <input type="checkbox"/> | VPN Device | public |
| <input type="checkbox"/> | Standard Radius Device | public |
| <input type="checkbox"/> | Ruijie Wireless Device | ruijie |
| <input type="checkbox"/> | Ruijie Wired Device | public |
| <input type="checkbox"/> | RG-EG Device | public |
| <input type="checkbox"/> | RG-ACE Device | public |
| <input type="checkbox"/> | Non-Ruijie Wired Device | public |

Totally 7 Records | Each Page 20 Records | Page 1 / totally 1 Pages | GO

Identity Authentication Key is used for Radius Server.

Identity Authentication Configuration

* Identity Authentication Key:

ⓘ Tips: The system and devices perform user authentication via the Radius Protocol. Identity authentication key is used for the encryption of the Radius protocol. The identity authentication key should be the same as that of the devices.

SNMP community is used for SNMP management.


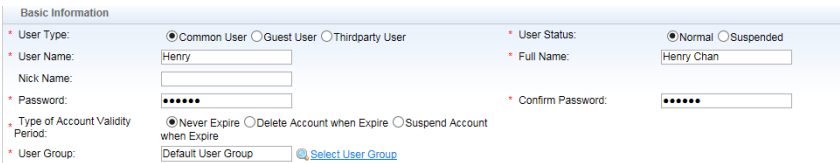
SNMP Configuration

* SNMP v2c Community:

ⓘ Tips: The SNMP configuration should be the same as that on the devices. Otherwise the system cannot manage the devices.

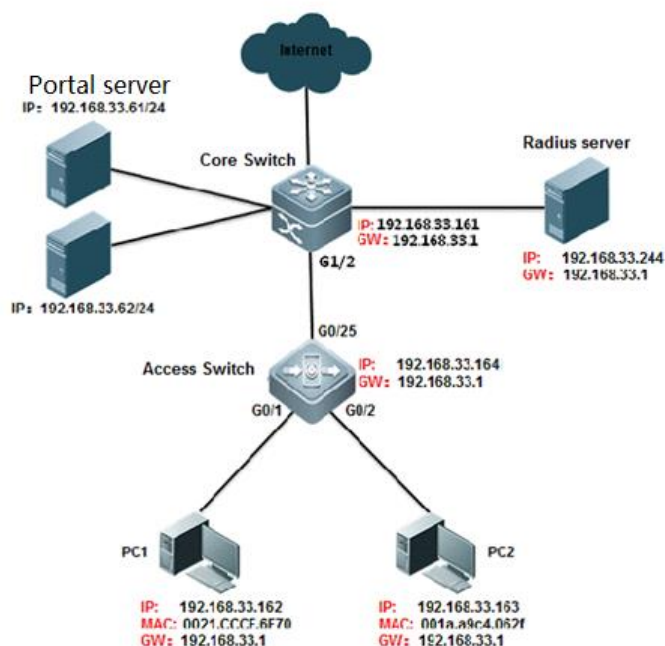
Click Modify when complete setting .

Go to Authentication & Authority > Device > Add , input NAS IP address , select Device Template , System will get relevant information via SNMP automatically. Click Add to finish.

| | |
|---------------------|--|
| |  <p>Go to Authentication & Authority > User > Add , fill in required fields , here we create a user named “Henry” and put it into Default User Group. Common User indicates it is a SMP local user account.</p>  <ol style="list-style-type: none"> verify dot1x authenticate. Execute command "show dot1x summary " to display summary information of dot1x authentication. |
| Measured record: | |
| Testing conclusion: | |

2.5.2 WEB authentication

| | |
|-------------------|---|
| Testing project : | WEB authentication |
| Testing purpose : | Enable WEB authentication and the terminal can pass the authentication to access to Internet. |



Testing procedure and expected results:

1. Assign ip to the device according to the picture.
2. add the following configuration


```
Ruijie#configure terminal
Ruijie(config)#aaa new-model
Ruijie(config)#aaa authentication web-auth default group radius
Ruijie(config)#aaa accounting net-work default start-stop group radius
Ruijie(config)#radius-server host 192.168.33.244
Ruijie(config)#radius-server key ruijie
Ruijie(config)#web-auth template eportalv2
Ruijie(config-tmplt-v2)#ip 192.158.33.61
Ruijie(config-tmplt-v2)#url http://192.168.33.61:8080/eportal/index.jsp
Ruijie(config-tmplt-v2)#exit
Ruijie(config)#interface Gi1/2
Ruijie(config-if)#web-auth enable eportalv2
Ruijie(config-if)#end
Ruijie#wr
```

Smp server configuration

Edit SMP device template first , go to Authentication & Authority > Device > NAS Configuration Templates , modify Ruijie Wired Device , set the parameters as below ,

| All None | Template Name | SNMP v2c community |
|--------------------------|-------------------------|--------------------|
| <input type="checkbox"/> | VPN Device | public |
| <input type="checkbox"/> | Standard Radius Device | public |
| <input type="checkbox"/> | Ruijie Wireless Device | ruijie |
| <input type="checkbox"/> | Ruijie Wired Device | public |
| <input type="checkbox"/> | RG-EG Device | public |
| <input type="checkbox"/> | RG-ACE Device | public |
| <input type="checkbox"/> | Non-Ruijie Wired Device | public |

Totally 7 Records | Each Page 20 Records | Page 1 / totally 1 Pages | [Go](#)

Identity Authentication Key is used for Radius Server.

Identity Authentication Configuration

* Identity Authentication Key:

ⓘ Tips: The system and devices perform user authentication via the Radius Protocol. Identity authentication key is used for the encr should be the same as that of the devices.

Web Authentication Key is used for Web Portal.

Web Authentication Configuration

Web authentication Key:

ⓘ Tips: After the Web authentication key is specified, the system will support Web authentication.

SNMP community is used for SNMP management.

SNMP Configuration

* SNMP v2c Community:

ⓘ Tips: The SNMP configuration should be the same as that on the devices. Otherwise the system cannot manage the devices.

Click Modify when complete setting .

Go to Authentication & Authority > Device > Add , input NAS IP address , select Device Template , System will get relevant information via SNMP automatically. Click Add to finish.

* NAS IP: (Format: 192.168.20.1)

* NAS Configuration Templates: [Obtain Device Information](#) | [View Template](#) | [Add Template](#)

NAS MAC: (Format: 00D0F8000001)

NAS Name:

NAS Location:

NAS Information:

ⓘ Tips: You can set a template for the devices sharing the same SNMP version, authentication and Telnet parameters.

Go to Authentication & Authority > User > Add , fill in required fields , here we create a user named "Henry" and put it into Default User Group. Common User indicates it is a SMP local user account.

Basic Information

* User Type: Common User Guest User Thirdparty User

* User Name:

* Nick Name:

* Password:

* Type of Account Validity Period: Never Expire Delete Account when Expire Suspend Account when Expire

* User Group: [Select User Group](#)

* User Status: Normal Suspended

* Full Name:

* Confirm Password:

- verify WEB authenticate.
- Execute command "show web-auth user all " to display user information of

| | |
|---------------------|---------------------|
| | WEB authentication. |
| Measured record: | |
| Testing conclusion: | |