

廈門大學



信息学院软件工程系

《计算机网络》实验报告

题 目 实验五 CISCO IOS 路由器基本配置

班 级 软件工程 2018 级 2 班

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实验时间 2020 年 4 月 8 日

2020 年 4 月 11 日

1 实验目的

使用 Router eSIM v1.1 模拟器来模拟路由器的配置环境；使用 CCNA Network Visualizer 6.0 配置静态路由、动态路由和交换机端口的 VLAN（虚拟局域网）。

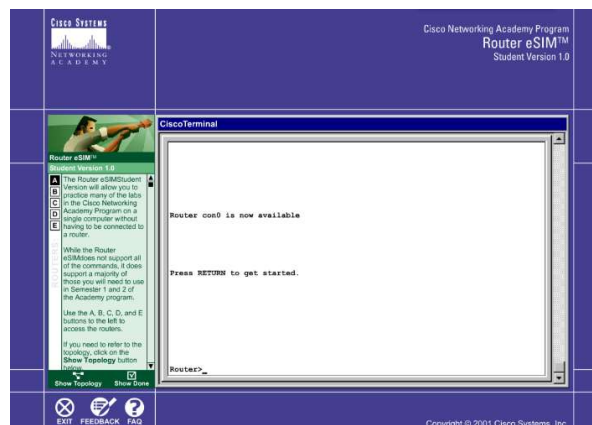
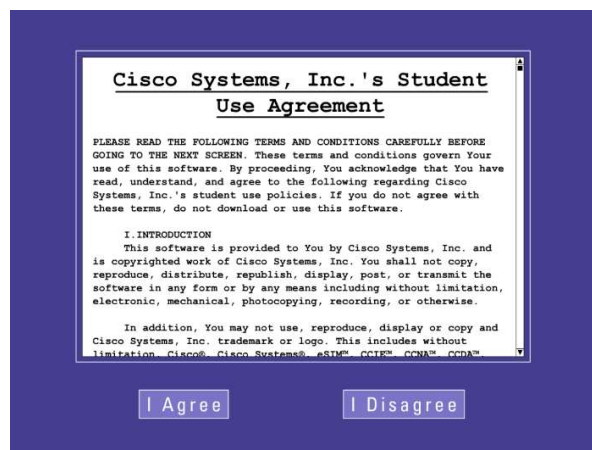
2 实验环境

操作系统：Windows 10

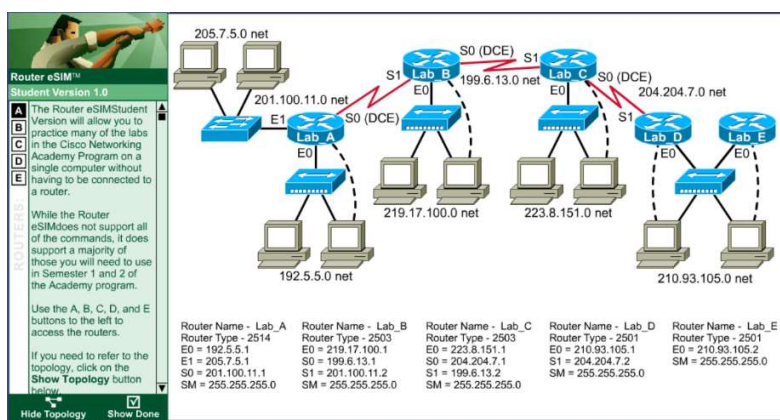
3 实验结果

1、使用 Router eSIM v1 模拟器来模拟路由器的配置环境

① 启动



② Show Topology



Show Done

The screenshot shows the 'Checking Your Configuration' screen in the Router eSIM Student Version 1.0. It indicates that the activity is not completed and provides a list of tasks to be checked or set. The tasks are categorized into 'Check' and 'Set' sections, each with buttons A, B, C, D, and E. A table on the right lists the tasks and their completion status.

Task	Status
Hostname	Not Done
Enable Secret	Not Done
Line Console Login	Not Done
Line Console Password	Not Done
Line vty Login	Not Done
Line vty Password	Not Done
E0 IP	Not Done
E0 Shutdown	Not Done
E1 IP	Not Done
E1 Shutdown	Not Done
S0 IP	Not Done
S0 Clock Rate	Not Done
S0 Shutdown	Not Done
Routing Protocol	Not Done
Network 1	Not Done
Network 2	Not Done
Network 3	Not Done
IP Host Lab_A	Not Done
IP Host Lab_B	Not Done
IP Host Lab_C	Not Done
IP Host Lab_D	Not Done
IP Host Lab_E	Not Done
Time elapsed	01:11

③ 常规设置:

```
Router>?
access-profile  Apply user-profile to interface
clear           Reset functions
connect        Open a terminal connection
disable        Turn off privileged commands
disconnect      Disconnect an existing network connection
enable         Turn on privileged commands
exit           Exit from the EXEC
help           Description of the interactive help system
lock           Lock the terminal
login          Log in as a particular user
logout         Exit from the EXEC
minfo          Request neighbor and version information from a multicast
router         router
mstat          Show statistics after multiple multicast traceroutes
mtrace         Trace reverse multicast path from destination to source
name-connection Name an existing network connection
pad            Open a X.29 PAD connection
ping           Send echo messages
ppp            Start IETF Point-to-Point Protocol (PPP)
resume         Resume an active network connection
rlogin         Open an rlogin connection
set            Set system parameter (not config)
--More--
```

改变路由器的名字：

```
Router>enable
Router#config t
Enter configuration commands, one per line.  End with END.
Router(config)#hostname lab_A
```

设置消息标题：

```
lab_A(config)#banner motd #
Enter TEXT message.  End with the character '#'.
Accounting Department
You have entered a secured system.
Authorized access only' #
```

建立 IP 地址的映射表：

```
lab_A(config)#ip host lab_A 192.5.5.1 205.7.5.1 201.100.11.1
lab_A(config)#ip host lab_B 219.17.100.1 199.6.12.1 201.100.11.2
lab_A(config)#ip host lab_C 223.8.151.1 204.204.7.1 199.6.13.2
lab_A(config)#ip host lab_D 210.93.105.1 204.204.7.2
lab_A(config)#ip host lab_E 210.93.105.2
```

为路由器的一个接口配置 IP 地址：

```
lab_A(config)#int eth 0
lab_A(config-if)#ip address 192.5.5.1 255.255.255.0
lab_A(config-if)#int eth 1
lab_A(config-if)#ip address 205.7.5.1 255.255.255.0
lab_A(config-if)#int serial 0
lab_A(config-if)#ip address 201.100.11.1 255.255.255.0
```


配置充当 DCE 端的串行端口：

```
Router#config t
Enter configuration commands, one per line.  End with END.
Router(config)#interface serial 0
Router(config-if)#clock rate 56000
```

显示 串口的配置情况：

```
lab_A#show interface serial 0
Serial0 is administratively down, line protocol is down
Internet address is 201.100.11.1/24
Hardware is HD64570
MTU 1500 bytes, BW 1544 Kbit, DLY 20000 usec,
reliability 255/255, txload 1/255, rxload 1/255
Encapsulation HDLC, loopback not set
Keepalive set (10 sec)
Last input never, output never, output hang never
Last clearing of "show interface" counters never
Input queue: 0/75/0 (size/max/drops); Total output drops: 0
Queueing strategy: weighted fair
Output queue: 0/1000/64/0 (size/max total/threshold/drops)
Conversations 0/0/256 (active/max active/max total)
Reserved Conversations 0/0 (allocated/max allocated)
5 minute input rate 0 bits/sec, 0 packets/sec
5 minute output rate 0 bits/sec, 0 packets/sec
0 packets input, 0 bytes, 0 no buffer
Received 0 broadcasts, 0 runts, 0 giants, 0 throttles
0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort
0 packets output, 0 bytes, 0 underruns
0 output errors, 0 collisions, 1 interface resets
0 output buffer failures, 0 output buffers swapped out
--More--
```

配置后 Shoe Done:



Router eSIM™
Student Version 1.0

The Router eSIMStudent Version will allow you to practice many of the labs in the Cisco Networking Academy Program on a single computer without having to be connected to a router.

While the Router eSIM does not support all of the commands, it does support a majority of those you will need to use in Semester 1 and 2 of the Academy program.

Use the A, B, C, D, and E buttons to the left to access the routers.

If you need to refer to the topology, click on the **Show Topology** button below.

Checking Your Configuration

This activity is not completed.

Please click on one of the buttons below to **check** that Router's Configuration:

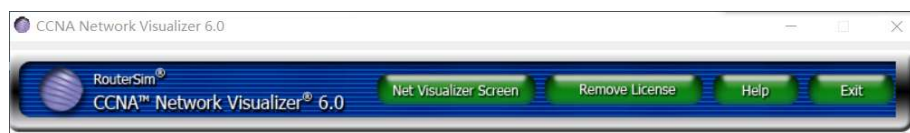
Please click on one of the buttons below to **set** that Router's Configuration:

Loads all router variables for this eSIM™ scenario except the IP host table, which means, for example, that you will not be able to use the router name as part of ping or telnet commands.

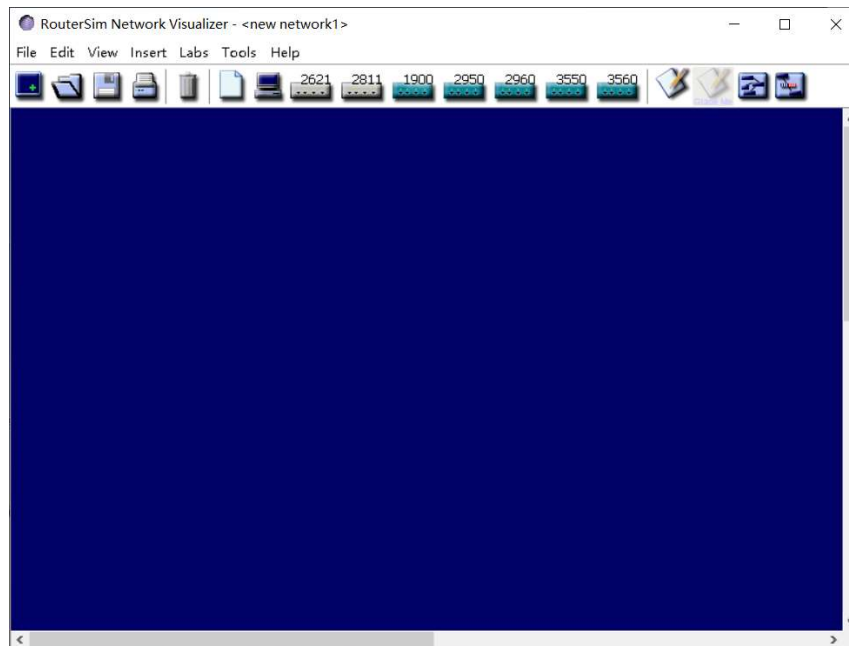
Lab_A	Not Completed
Hostname	Done
Enable Secret	Not Done
Line Console Login	Not Done
Line Console Password	Not Done
Line vty Login	Not Done
Line vty Password	Not Done
E0 IP	Done
E0 Shutdown	Not Done
E1 IP	Done
E1 Shutdown	Not Done
S0 IP	Done
S0 Clock Rate	Not Done
S0 Shutdown	Not Done
Routing Protocol	Not Done
Network 1	Not Done
Network 2	Not Done
Network 3	Not Done
IP Host Lab_A	Done
IP Host Lab_B	Not Done
IP Host Lab_C	Done
IP Host Lab_D	Done
IP Host Lab_E	Done
Time elapsed	20:56

2、使用 CCNA Network Visualizer 6.0 配置静态路由

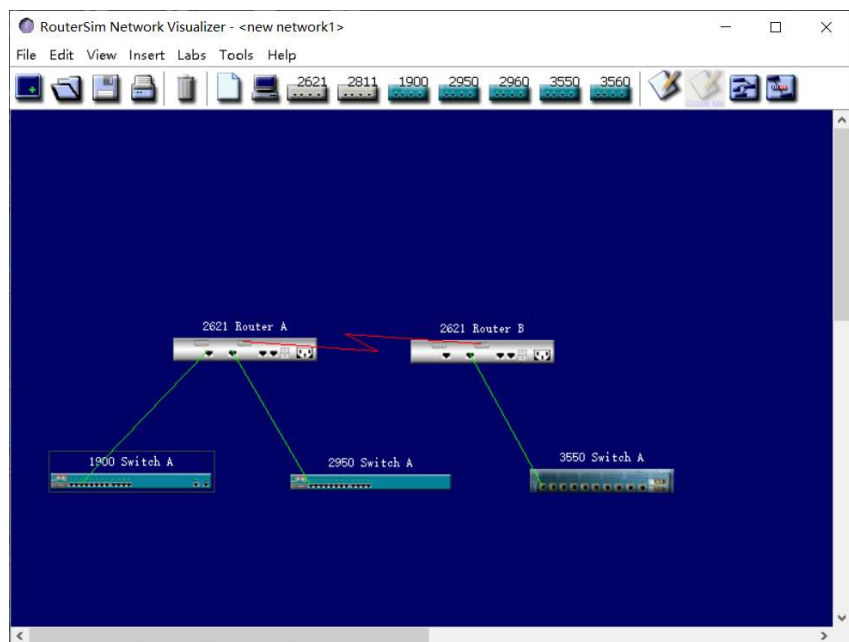
① 启动界面:



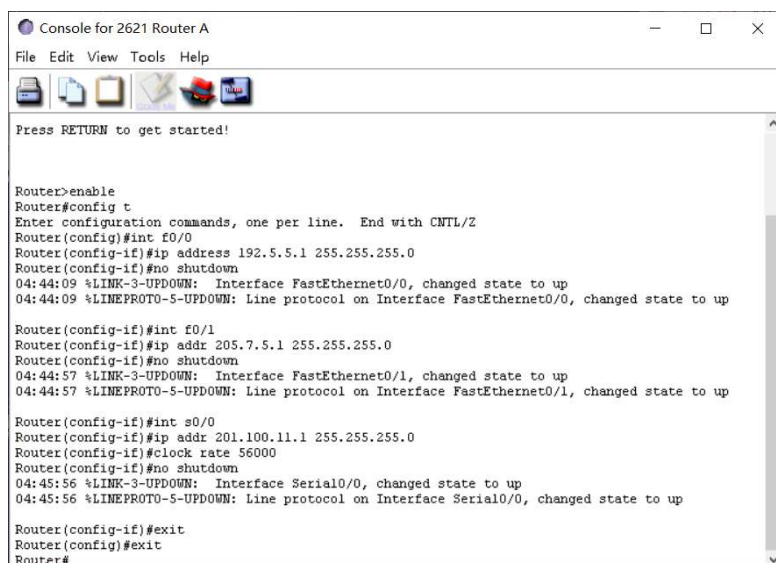
设计界面:



② 实验设备的连接图：



③ 准备工作：



```

Console for 2621 Router A
File Edit View Tools Help

Press RETURN to get started!

Router>enable
Router#config t
Enter configuration commands, one per line. End with CNTL/Z
Router(config)#int f0/0
Router(config-if)#ip address 192.5.5.1 255.255.255.0
Router(config-if)#no shutdown
04:44:09 %LINK-3-UPDOWN: Interface FastEthernet0/0, changed state to up
04:44:09 %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0, changed state to up

Router(config-if)#int f0/1
Router(config-if)#ip addr 205.7.5.1 255.255.255.0
Router(config-if)#no shutdown
04:44:57 %LINK-3-UPDOWN: Interface FastEthernet0/1, changed state to up
04:44:57 %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/1, changed state to up

Router(config-if)#int s0/0
Router(config-if)#ip addr 201.100.11.1 255.255.255.0
Router(config-if)#clock rate 56000
Router(config-if)#no shutdown
04:45:56 %LINK-3-UPDOWN: Interface Serial0/0, changed state to up
04:45:56 %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/0, changed state to up

Router(config-if)#exit
Router(config)#exit
Router#

```

查看 RouterA 的路由表:

```

Router#show ip route
Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B - BGP
        D - EIGRP, EX - EIGRP external, 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, E - EGP
        i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, * - candidate default
        U - per-user static route, o - ODR, P - periodic downloaded static route
        T - traffic engineered route

Gateway of last resort is not set
C    201.100.11.0/24 is directly connected, Serial0/0
C    192.5.5.0/24 is directly connected, FastEthernet0/0
C    205.7.5.0/24 is directly connected, FastEthernet0/1
Router#

```

查看 RouterB 的路由表:

```

Router#show ip route
Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B - BGP
        D - EIGRP, EX - EIGRP external, 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, E - EGP
        i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, * - candidate default
        U - per-user static route, o - ODR, P - periodic downloaded static route
        T - traffic engineered route

Gateway of last resort is not set
C    199.6.13.0/24 is directly connected, FastEthernet0/0
C    201.100.11.0/24 is directly connected, Serial0/0
Router#

```

查看是否连通: (此时 ping 不通)

```

Router#ping 199.6.13.1

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 199.6.13.1, timeout is 2 seconds:
.....
Success rate is 0 percent (0/5), round-trip min/avg/max = 0/0/0 ms

```

④ 配置静态路由:

配置查看路由表:

```
Router(config)#ip route 199.6.13.0 255.255.255.0 201.100.11.2
Router(config)#exit
Router#show ip route
Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B - BGP
        D - EIGRP, EX - EIGRP external, 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, E - EGP
        i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, * - candidate default
        U - per-user static route, o - ODR, P - periodic downloaded static route
        T - traffic engineered route

Gateway of last resort is not set
S    199.6.13.0 [1/0] via 201.100.11.2
C    201.100.11.0/24 is directly connected, Serial0/0
C    192.5.5.0/24 is directly connected, FastEthernet0/0
C    205.7.5.0/24 is directly connected, FastEthernet0/1
```

检验连通性: (此时连通性良好, 路由配置正确)

```
Router#ping 199.6.13.1

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 199.6.13.1, timeout is 2 seconds:
!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 4/4/4 ms
```

3、使用 CCNA Network Visualizer 6.0 配置动态路由

① 配置 RIP 协议:

RouterA:

```
Router(config)#router rip
Router(config-router)#network 172.16.0.0
Router(config-router)#network 10.0.0.0
```

RouterB:

```
Router(config)#router rip
Router(config-router)#network 10.0.0.0
```

RouterC:

```
Router(config)#router rip
Router(config-router)#network 192.168.1.0

Router(config-router)#network 10.0.0.0
```

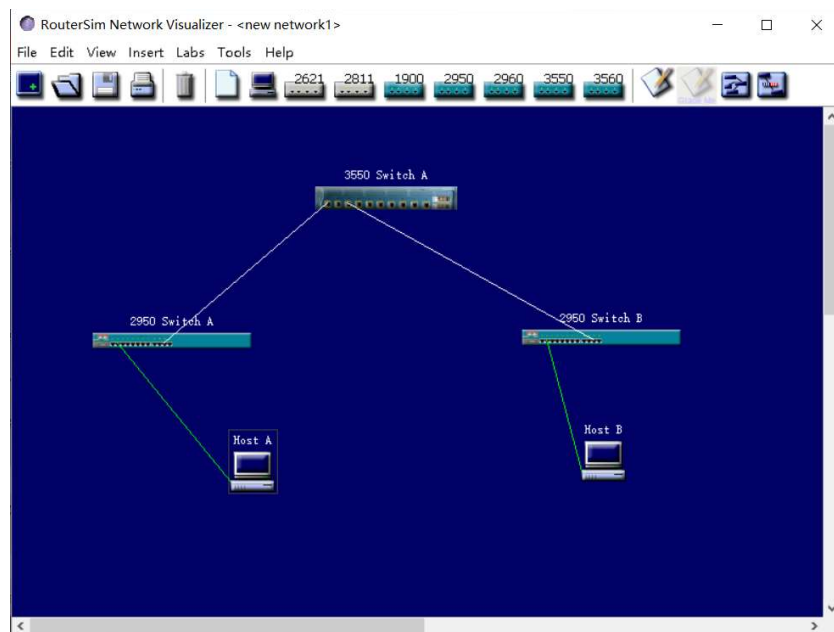
② 查看 RIP 协议的路由信息:


```
Router#show ip protocols
Routing Protocol is "rip"
  Sending updates every 30 seconds, next due in 28 seconds
  Invalid after 180 seconds, hold down 180, flushed after 240
  Outgoing update filter list for all interfaces is not set
  Incoming update filter list for all interfaces is not set
  Redistributing: rip
  Default version control: send version 1, receive any version
    Interface          Send Recv Triggered RIP Key-chain
  Automatic network summarization is in effect
  Maximum path: 4
  Routing for networks:
    10.0.0.0
    172.16.0.0
  Routing information sources:
    Gateway      Distance      Last Update
  Distance: <default is 120>
```

4、使用 CCNA Network Visualizer 6.0 配置交换机端口的 VLAN

实例 1:

① 设备连接图:



② 设置 VTP 域:

3550A:

```
Console for 3550 Switch A
File Edit View Tools Help

switch>en
switch#conf t
Enter configuration commands, one per line. End with CNTL/Z
switch(config)#hostname 3550A
3550A(config)#vtp domain Cisco
Changing VTP domain name from NULL to Cisco
3550A(config)#exit
3550A#sh vtp status
VTP Version                : 2
Configuration Revision      : 1
Maximum VLANs supported locally : 64
Number of existing VLANs    : 5
VTP Operating Mode          : Server
VTP Domain Name             : Cisco
VTP Pruning Mode            : Disabled
VTP V2 Mode                 : Disabled
VTP Traps Generation        : Disabled
MD5 digest                  : 0x70 0x01 0xF2 0x72 0x97 0xA1 0x35 0xEB
Configuration last modified by: 0.0.0.0 at 11-29-93 20:39:24
Local updater ID is 0.0.0.0 on interface V11 (lowest numbered VLAN interface found)
3550A#
```

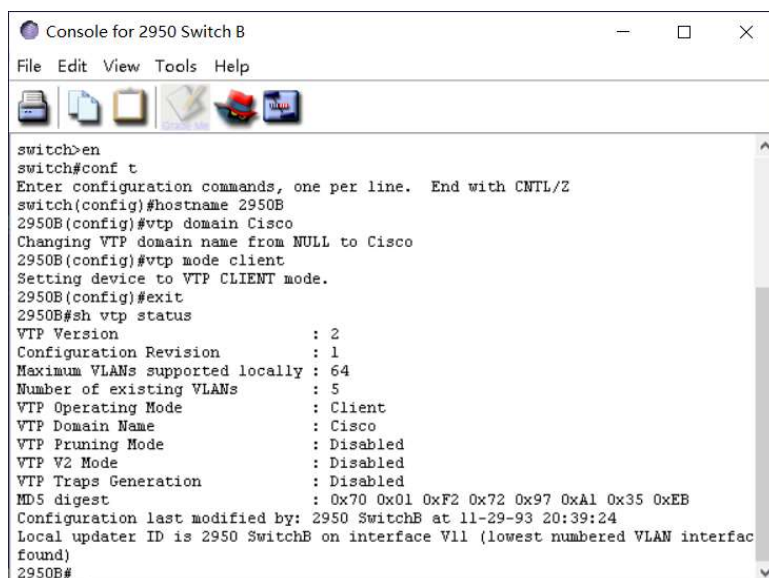
2950A:

```
Console for 2950 Switch A
File Edit View Tools Help

switch>en
switch#conf t
Enter configuration commands, one per line. End with CNTL/Z
switch(config)#hostname 2950A
2950A(config)#vtp domain Cisco
Changing VTP domain name from NULL to Cisco
2950A(config)#vtp mode ?
    client      Set the device to client mode.
    server      Set the device to server mode.
    transparent Set the device to transparent mode.

2950A(config)#vtp mode client
Setting device to VTP CLIENT mode.
2950A(config)#exit
2950A#sh vtp status
VTP Version                : 2
Configuration Revision      : 1
Maximum VLANs supported locally : 64
Number of existing VLANs    : 5
VTP Operating Mode          : Client
VTP Domain Name             : Cisco
VTP Pruning Mode            : Disabled
VTP V2 Mode                 : Disabled
VTP Traps Generation        : Disabled
MD5 digest                  : 0x70 0x01 0xF2 0x72 0x97 0xA1 0x35 0xEB
Configuration last modified by: 2950 SwitchA at 11-29-93 20:39:24
Local updater ID is 2950 SwitchA on interface V11 (lowest numbered VLAN interface found)
2950A#
```

2950B:



```

switch>en
switch#conf t
Enter configuration commands, one per line. End with CNTL/Z
switch(config)#hostname 2950B
2950B(config)#vtp domain Cisco
Changing VTP domain name from NULL to Cisco
2950B(config)#vtp mode client
Setting device to VTP CLIENT mode.
2950B(config)#exit
2950B#sh vtp status
VTP Version                : 2
Configuration Revision      : 1
Maximum VLANs supported locally : 64
Number of existing VLANs    : 5
VTP Operating Mode         : Client
VTP Domain Name            : Cisco
VTP Pruning Mode           : Disabled
VTP V2 Mode                : Disabled
VTP Traps Generation       : Disabled
MD5 digest                 : 0x70 0x01 0xF2 0x72 0x97 0xA1 0x35 0xEB
Configuration last modified by: 2950 SwitchB at 11-29-93 20:39:24
Local updater ID is 2950 SwitchB on interface V11 (lowest numbered VLAN interface found)
2950B#

```

③ 配置 Trunk

3550A:

```

3550A(config)#interface fa0/1
3550A(config-if)#switchport trunk encapsulation ?
    dot1q      Interface uses only 802.1q trunking encapsulation when trunking
    isl        Interface uses only ISL trunking encapsulation when trunking
    negotiate   Device will negotiate trunking encapsulation with peer on
                interface

3550A(config-if)#switchport trunk encapsulation dot1q
05:39:37: %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/1, changed state
to down
05:39:37: %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/1, changed state to up
3550A(config-if)#switchport mode trunk
3550A(config-if)#interface fa0/3
3550A(config-if)#switchport trunk encapsulation dot1q
05:41:12: %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/3, changed state
to down
05:41:12: %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/3, changed state to up
3550A(config-if)#switchport mode trunk

```

2950A:

```

2950A(config)#interface fa0/11
2950A(config-if)#switchport mode trunk

```

2950B:

```

2950B(config)#interface fa0/11
2950B(config-if)#switchport mode trunk

```

④ 创建 VLAN:

```

3550A(config)#vlan 10
3550A(config-vlan)#vlan 20
3550A(config-vlan)#exit
3550A(config)#exit
3550A#sh vlan

```

VLAN	Name	Status	Ports
1	default	active	Fa0/2, Fa0/4, Fa0/5, Fa0/6 Fa0/7, Fa0/8, Fa0/9, Fa0/10
10	VLAN0010	active	
20	VLAN0020	active	
1002	fddi-default	active	
1003	token-ring-default	active	
1004	fddinet-default	active	
1005	trnet-default	active	

VLAN	Type	SAID	MTU	Parent	RingNo	BridgeNo	Stp	BrdgMode	Transl	Trans2
1	enet	100001	1500	-	-	-	-	-	0	0
10	enet	100010	1500	-	-	-	-	-	0	0
20	enet	100020	1500	-	-	-	-	-	0	0
1002	fddi	101002	1500	-	-	-	-	-	0	0
1003	tr	101003	1500	-	-	-	-	-	0	0
1004	fdnet	101004	1500	-	-	-	ieee	-	0	0
1005	trnet	101005	1500	-	-	-	ibm	-	0	0

--More--

⑤ 分配交换机端口加入 VLAN:

```

2950A(config)#interface fa0/2
2950A(config-if)#switchport access vlan 10

2950B(config)#interface fa0/2
2950B(config-if)#switchport access vlan 20

```

⑥ 配置第三层交换机:

```

3550A(config)#int vlan 10
3550A(config-if)#ip address 10.10.10.1 255.255.255.0
3550A(config-if)#no shut
3550A(config)#int vlan 20
3550A(config-if)#ip address 20.20.20.1 255.255.255.0
3550A(config-if)#no shut
3550A(config-if)#exit
3550A(config)#ip routing

```

⑦ 配置各交换机的管理地址:

```

3550A(config-if)#int vlan 1
3550A(config-if)#ip address 192.168.10.1 255.255.255.0
3550A(config-if)#no shut

2950A(config)#int vlan 1
2950A(config-if)#ip address 192.168.10.2 255.255.255.0
2950A(config-if)#no shut

2950B(config)#int vlan 1
2950B(config-if)#ip address 192.168.10.3 255.255.255.0
2950B(config-if)#no shutdown

```

⑧ 配置主机 Host A 和 Host B:

Configure Host A	Configure Host B
Host Name: <input type="text" value="Host A"/>	Host Name: <input type="text" value="Host B"/>
<input type="radio"/> Obtain an IP address automatically	<input type="radio"/> Obtain an IP address automatically
<input checked="" type="radio"/> Use the following IP address:	<input checked="" type="radio"/> Use the following IP address:
IP Address: <input type="text" value="10"/> . <input type="text" value="10"/> . <input type="text" value="10"/> . <input type="text" value="2"/>	IP Address: <input type="text" value="20"/> . <input type="text" value="20"/> . <input type="text" value="20"/> . <input type="text" value="2"/>
Subnet: <input type="text" value="255"/> . <input type="text" value="255"/> . <input type="text" value="255"/> . <input type="text" value="0"/>	Subnet: <input type="text" value="255"/> . <input type="text" value="255"/> . <input type="text" value="255"/> . <input type="text" value="0"/>
Default Gateway: <input type="text" value="10"/> . <input type="text" value="10"/> . <input type="text" value="10"/> . <input type="text" value="1"/>	Default Gateway: <input type="text" value="20"/> . <input type="text" value="20"/> . <input type="text" value="20"/> . <input type="text" value="1"/>
<input type="button" value="OK"/> <input type="button" value="Cancel"/>	<input type="button" value="OK"/> <input type="button" value="Cancel"/>

⑨ 测试（配置成功）

交换机上:

```
3550A>en
3550A#ping 192.168.10.2

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.10.2, timeout is 2 seconds:
!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 4/4/4 ms
3550A#ping 192.168.10.3

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.10.3, timeout is 2 seconds:
!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 4/4/4 ms
```

主机 Host A ping 主机 Host B:

```
C:\>ping 20.20.20.2

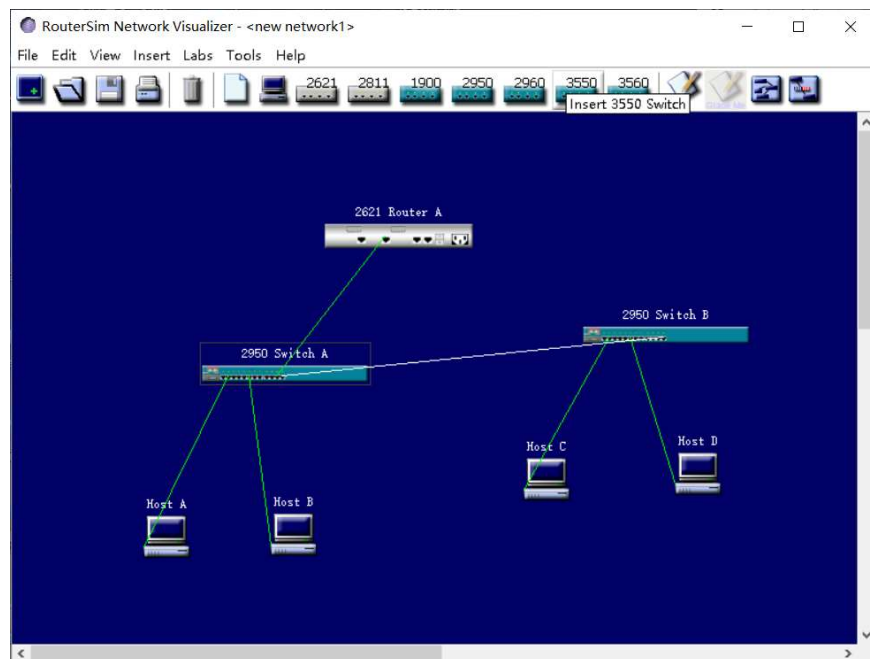
Pinging 20.20.20.2 with 32 bytes of data:

Reply from 20.20.20.2 :bytes=32 time=22ms TTL=254
Reply from 20.20.20.2 :bytes=32 time=22ms TTL=254
Reply from 20.20.20.2 :bytes=32 time=22ms TTL=254
Reply from 20.20.20.2 :bytes=32 time=22ms TTL=254

Ping Statistics for 20.20.20.2:
    Packets Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 22ms, Maximum = 23ms, Average = 22ms
```

实例 2:

① 设备连接图：



② 配置 VTP：

```
Console for 2950 Switch A
File Edit View Tools Help

switch>en
switch#conf t
Enter configuration commands, one per line. End with CNTL/Z
switch(config)#hostname 2950A
2950A(config)#vtp domain Test
Changing VTP domain name from NULL to Test
2950A(config)#vtp mode ?
    client    Set the device to client mode.
    server    Set the device to server mode.
    transparent Set the device to transparent mode.

2950A(config)#vtp mode server
Device mode already VTP SERVER.
2950A(config)#exit
2950A#show vtp status
VTP Version                : 2
Configuration Revision      : 1
Maximum VLANs supported locally : 64
Number of existing VLANs    : 5
VTP Operating Mode          : Server
VTP Domain Name             : Test
VTP Pruning Mode            : Disabled
VTP V2 Mode                 : Disabled
VTP Traps Generation        : Disabled
MD5 digest                  : 0x70 0x01 0xF2 0x72 0x97 0xA1 0x35 0xEB
Configuration last modified by: 0.0.0.0 at 11-29-93 20:39:24
Local updater ID is 0.0.0.0 on interface V11 (lowest numbered VLAN interface found)
2950A#
```

③ 启动 Trunk

2950A:

```
2950A#config t
Enter configuration commands, one per line.  End with CNTL/Z
2950A(config)#interface fa0/12
2950A(config-if)#switchport mode?
mode
2950A(config-if)#switchport mode ?
access    Set trunking mode to ACCESS unconditionally
dynamic   Set trunking mode to dynamically negotiate access or trunk mode
trunk     Set trunking mode to TRUNK unconditionally

2950A(config-if)#switchport mode trunk
2950A(config-if)#interface fa0/11
2950A(config-if)#switchport mode trunk
2950A(config-if)#exit
2950A(config)#
```

2950B:

```
switch>en
switch#conf t
Enter configuration commands, one per line.  End with CNTL/Z
switch(config)#hostname 2950B
2950B(config)#interface fa0/12
2950B(config-if)#switchport mode trunk
2950B(config-if)#exit
2950B(config)#_
```

④ 创建 VLAN:

```
2950A#vlan database
2950A(vlan)#vlan 2 name vlan2
VLAN 2 added:
    Name: vlan2

2950A(vlan)#vlan 3 name vlan3
VLAN 3 added:
    Name: vlan3
2950A(vlan)#exit
APPLY completed.
Exiting....
```

⑤ 分配端口到 VLAN

将 2950A 的端口加入 VLAN:

```
2950A#config t
Enter configuration commands, one per line.  End with CNTL/Z
2950A(config)#interface fastethernet 0/2
2950A(config-if)#switchport access vlan 2
2950A(config-if)#switchport mode access
2950A(config-if)#interface fastethernet 0/6
2950A(config-if)#switchport access vlan 3
2950A(config-if)#switchport mode access
```

验证:


```
2950A#show vlan
```

VLAN Name	Status	Ports
1 default	active	Fa0/1, Fa0/3, Fa0/4, Fa0/5 Fa0/7, Fa0/8, Fa0/9, Fa0/10
2 vlan2	active	Fa0/2
3 vlan3	active	Fa0/6
1002 fddi-default	active	
1003 token-ring-default	active	
1004 fddinet-default	active	
1005 trnet-default	active	

VLAN	Type	SAID	MTU	Parent	RingNo	BridgeNo	Stp	BrdgMode	Trans1	Trans2
1	enet	100001	1500	-	-	-	-	-	0	0
2	enet	100002	1500	-	-	-	-	-	0	0
3	enet	100003	1500	-	-	-	-	-	0	0
1002	fddi	101002	1500	-	-	-	-	-	0	0
1003	tr	101003	1500	-	-	-	-	-	0	0
1004	fdnet	101004	1500	-	-	-	ieee	-	0	0
1005	trnet	101005	1500	-	-	-	ibm	-	0	0

```
--More--
```

设置 2950B 为 VTP 客户模式:

```
2950B(config)#vtp domain Test
Changing VTP domain name from NULL to Test
2950B(config)#vtp mode client
Setting device to VTP CLIENT mode.
```

将 2950B 的端口加入 VLAN 并验证:

```
2950B(config)#interface fastethernet 0/2
2950B(config-if)#switchport access vlan 2
2950B(config-if)#switchport mode access
2950B(config-if)#interface fastethernet 0/6
^
% Invalid input detected at '^' marker.
2950B(config-if)#interface fastethernet 0/6
2950B(config-if)#switchport access vlan 3
2950B(config-if)#switchport mode access
2950B(config-if)#exit
2950B(config)#exit
2950B#sh vlan
```

VLAN Name	Status	Ports
1 default	active	Fa0/1, Fa0/3, Fa0/4, Fa0/5 Fa0/7, Fa0/8, Fa0/9, Fa0/10 Fa0/11
2 vlan2	active	Fa0/2
3 vlan3	active	Fa0/6
1002 fddi-default	active	
1003 token-ring-default	active	
1004 fddinet-default	active	
1005 trnet-default	active	

VLAN	Type	SAID	MTU	Parent	RingNo	BridgeNo	Stp	BrdgMode	Trans1	Trans2
1	enet	100001	1500	-	-	-	-	-	0	0
2	enet	100002	1500	-	-	-	-	-	0	0
3	enet	100003	1500	-	-	-	-	-	0	0
1002	fddi	101002	1500	-	-	-	-	-	0	0
1003	tr	101003	1500	-	-	-	-	-	0	0
1004	fdnet	101004	1500	-	-	-	ieee	-	0	0
1005	trnet	101005	1500	-	-	-	ibm	-	0	0

```
--More--
```

⑥ 配置 VLAN 之间的路由:

```
Router>en
Router#conf t
Enter configuration commands, one per line. End with CNTL/Z
Router(config)#hostname R2621
R2621(config)#interface fastethernet 0/0
R2621(config-if)#no ip address
R2621(config-if)#no shutdown
06:31:07 %LINK-3-UPDOWN: Interface FastEthernet0/0, changed state to up
06:31:07 %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0, changed state to up

R2621(config-if)#interface fastethernet 0/0.1
R2621(config-subif)#encapsulation dot1q 1
R2621(config-subif)#ip address 172.16.10.1 255.255.255.0
R2621(config-subif)#interface fastethernet 0/0.2
R2621(config-subif)#encapsulation dot1q 2
R2621(config-subif)#ip address 172.16.20.1 255.255.255.0
R2621(config-subif)#interface fastethernet 0/0.3
R2621(config-subif)#encapsulation dot1q 3
R2621(config-subif)#ip address 172.16.30.1 255.255.255.0
R2621(config-subif)#exit
R2621(config)#
```

⑦ 配置主机 Host A、Host B、Host a、Host b

Configure Host A

Host Name: Host A

☐ Obtain an IP address automatically
 ☒ Use the following IP address:

IP Address

Subnet

Default Gateway

Configure Host B

Host Name: Host B

☐ Obtain an IP address automatically
 ☒ Use the following IP address:

IP Address

Subnet

Default Gateway

Configure Host C

Host Name: Host a

☐ Obtain an IP address automatically
 ☒ Use the following IP address:

IP Address

Subnet

Default Gateway

Configure Host D

Host Name: Host b

☐ Obtain an IP address automatically
 ☒ Use the following IP address:

IP Address

Subnet

Default Gateway

⑧ 验证（配置成功）

在属于 VLAN2 的 Host A 上 ping 172.16.20.1:

```
C:\>ping 172.16.20.1

Pinging 172.16.20.1 with 32 bytes of data:

Reply from 172.16.20.1 :bytes=32 time=22ms TTL=254
Reply from 172.16.20.1 :bytes=32 time=22ms TTL=254
Reply from 172.16.20.1 :bytes=32 time=22ms TTL=254
Reply from 172.16.20.1 :bytes=32 time=22ms TTL=254

Ping Statistics for 172.16.20.1:
    Packets Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 22ms, Maximum = 23ms, Average = 22ms
```

在属于 VLAN3 的 Host B 上 ping 172.16.30.1:

```
C:\>ping 172.16.30.1

Pinging 172.16.30.1 with 32 bytes of data:

Reply from 172.16.30.1 :bytes=32 time=22ms TTL=254
Reply from 172.16.30.1 :bytes=32 time=22ms TTL=254
Reply from 172.16.30.1 :bytes=32 time=22ms TTL=254
Reply from 172.16.30.1 :bytes=32 time=22ms TTL=254

Ping Statistics for 172.16.30.1:
    Packets Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 22ms, Maximum = 23ms, Average = 22ms
```

在 Host A 上 ping Host B:

```
C:\>ping 172.16.30.3

Pinging 172.16.30.3 with 32 bytes of data:

Reply from 172.16.30.3 :bytes=32 time=22ms TTL=254
Reply from 172.16.30.3 :bytes=32 time=22ms TTL=254
Reply from 172.16.30.3 :bytes=32 time=22ms TTL=254
Reply from 172.16.30.3 :bytes=32 time=22ms TTL=254

Ping Statistics for 172.16.30.3:
    Packets Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 22ms, Maximum = 23ms, Average = 22ms
```

在 Host a 上 ping Host b:

```
C:\>ping 172.16.30.5

Pinging 172.16.30.5 with 32 bytes of data:

Reply from 172.16.30.5 :bytes=32 time=22ms TTL=254
Reply from 172.16.30.5 :bytes=32 time=22ms TTL=254
Reply from 172.16.30.5 :bytes=32 time=22ms TTL=254
Reply from 172.16.30.5 :bytes=32 time=22ms TTL=254

Ping Statistics for 172.16.30.5:
    Packets Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 22ms, Maximum = 23ms, Average = 22ms
```

4 实验总结

通过这次实验学习到了如何配置静态路由、动态路由和交换机端口的 VLAN，更加了解了交换机和路由器的配置环境、接口、功能，以及交换机、路由器与主机相互之间的连接方式。此外还学习到了如何使用 Router eSIM v1 模拟器及 CCNA Network Visualizer 6.0 软件。