厦門大學

信息学院软件工程系

《计算机网络》实验报告

题　　目 实验五　路由器模拟配置

班　　级 软件工程 2018 级 2 班

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2020 年 4 月 17 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

Router eSIM v1.1、CCNA Network Visualizer 6.0。

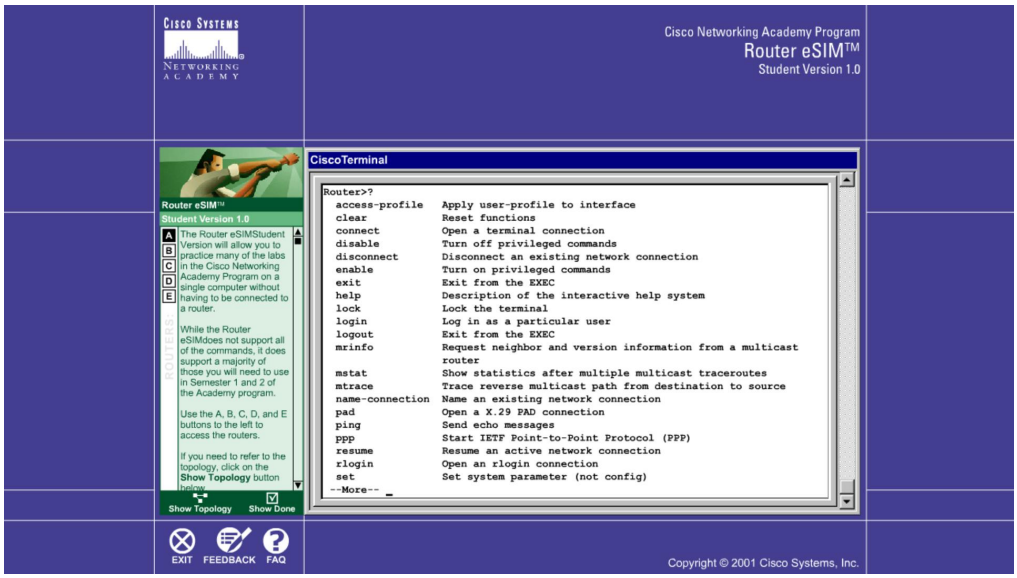
3 实验结果

一、软件安装

实验所需软件为 Router eSIM v1.1、CCNA Network Visualizer 6.0。

二、使用 Router eSIM v1.1 模拟器来模拟路由器的配置环境

查询可以使用的命令



进入超级用户模式

```
Router>enable
Router#
```

在超级用户模式下，显示当前配置

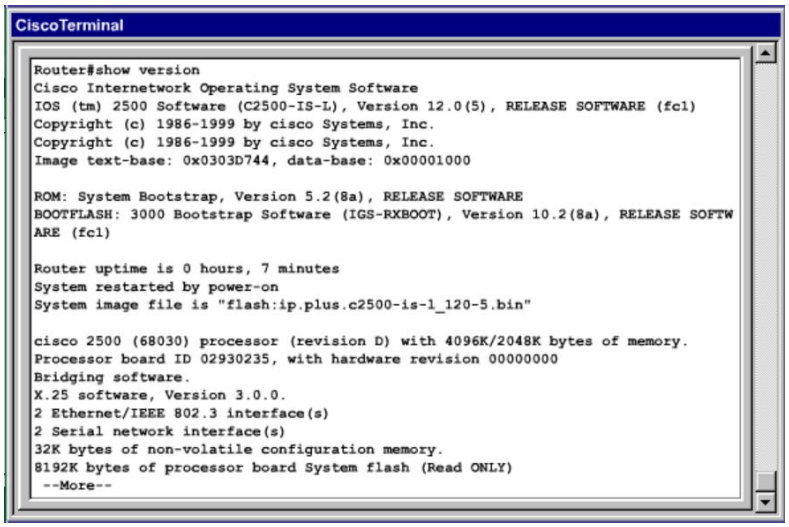
```
Router#show running-config
Building configuration...

Current configuration:
!
version 12.0
service timestamps debug uptime
service timestamps log uptime
no service password-encryption
!
hostname Router
!
enable password
!
!
ip subnet-zero
!
!
!
interface Ethernet0
 no ip address
 shutdown
!
 --More-- _
```

显示接口配置

CiscoTerminal

```
Router#show interfaces
Ethernet0 is administratively down, line protocol is down
   Hardware is Lance, address is 0010.7b81.4e2c(bia 0010.7b81.4e2c)
   MTU 1500 bytes, BW 10000 Kbit, DLY 1000 usec,
      reliability 252/255, txload 1/255, rxload 1/255
   Encapsulation ARPA, loopback not set
   Keepalive set (10 sec)
   ARP type: ARPA, ARP Timeout 04:00:00
   Last input never, output 00:00:20, output hang never
   Last clearing of "show interface" counters never
   Queueing strategy: fifo
   Output queue 0/40, 0 drops; input queue 0/75, 0 drops
   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 input packets with dribble condition detected
      6 packets output, 360 bytes, 0 underruns
      6 output errors, 0 collisions, 3 interface resets
      0 babbles, 0 late collision, 0 deferred
      6 lost carrier, 0 no carrier
      0 output buffer failures, 0 output buffers swapped out
 --More--
```

显示版本号和路由器信息



根据实验手册的例子，更改配置路由器等内容

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 219.17.100.1 199.6.13.1 201.100.11.2
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
lab_A(config)#_
```

接口、中断配置

```
lab_A(config)#interface ethernet 0
lab_A(config-if)#description engineering LAN,Bldg,18
lab_A(config-if)#exit
lab_A(config)#line console 0
lab_A(config-line)#login
lab_A(config-line)#password cisco
lab_A(config-line)#exit
lab_A(config)#line vty 0 4
lab_A(config-line)#login
lab_A(config-line)#password software
lab_A(config-line)#password cisco
lab_A(config-line)#exit
lab_A(config)#
```

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
lab_A(config-if)#
```

配置充当 DCE 端的串行端口

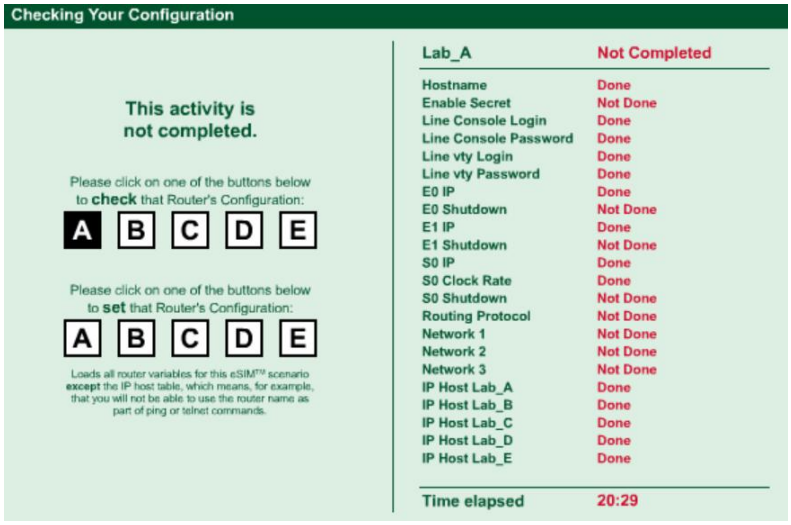
```
lab_A(config)#exit
00:17:15: %SYS-5-CONFIG_I: Configured from console by console
lab_A#config t
Enter configuration commands, one per line.  End with END.
lab_A(config)#interface serial 0
lab_A(config-if)#clock rate 56000
lab_A(config-if)#
```

查看端口配置情况

CiscoTerminal

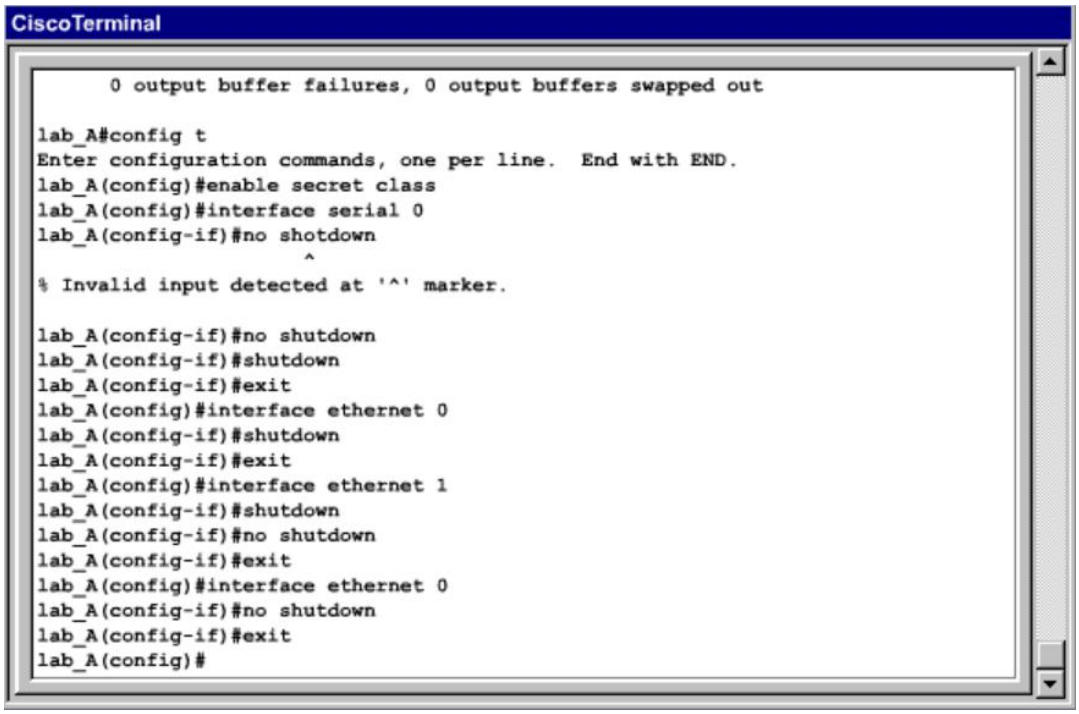
```
lab_A#show interface serial 0
Serial0 is administratively down, line protocol is down
   Internet address is 201.100.11.1/24
   Hardware is HD64570
   MTU 1500 bytes, BW 1544 Kbit, DLY 20000 usec,
      reliability 255/255, txload 1/255, rxload 1/255
   Encapsulation HDLC, loopback not set
   Keepalive 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-- _
```

通过 show done 检查配置情况



继续完成其他配置

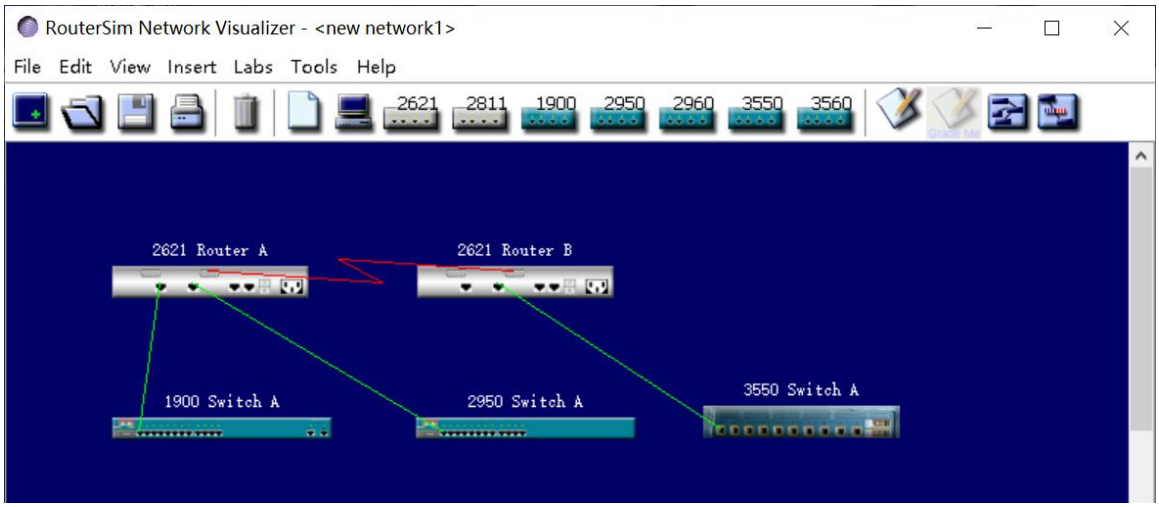
超级用户口令及手动打开和关闭端口



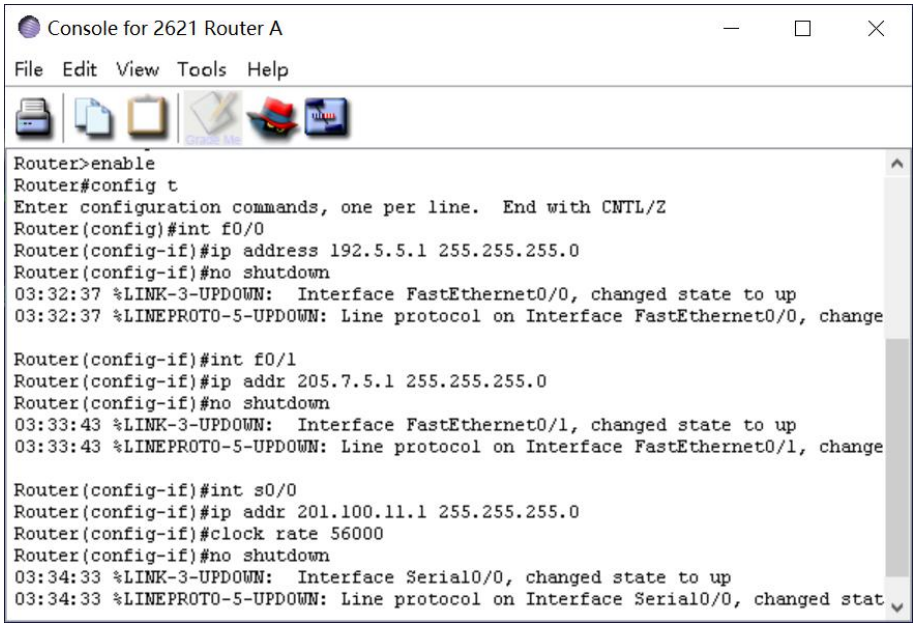
Lab_A	Not Completed
Hostname	Done
Enable Secret	Done
Line Console Login	Done
Line Console Password	Done
Line vty Login	Done
Line vty Password	Done
E0 IP	Done
E0 Shutdown	Done
E1 IP	Done
E1 Shutdown	Done
S0 IP	Done
S0 Clock Rate	Done
S0 Shutdown	Done
Routing Protocol	Not Done
Network 1	Not Done
Network 2	Not Done
Network 3	Not Done
IP Host Lab_A	Done
IP Host Lab_B	Done
IP Host Lab_C	Done
IP Host Lab_D	Done
IP Host Lab_E	Done
Time elapsed	31:17

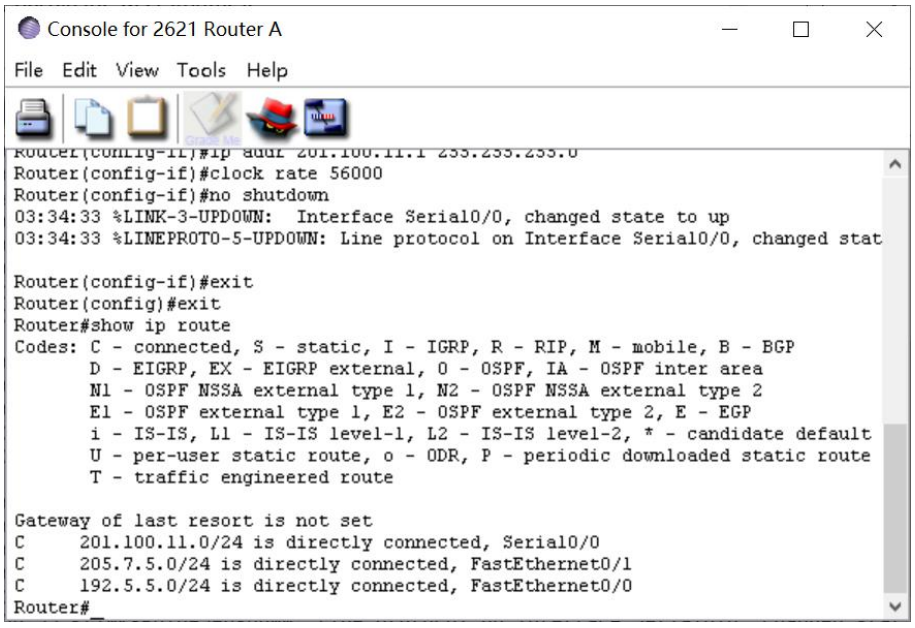
三、用 CCNA Network Visualizer 6.0 配置静态路由

在模拟器中放置设备，并连接



设置路由器 A





用相同方法配置路由 B

```
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, Serial0/1
```

配置静态路由

```
Router#config t
Enter configuration commands, one per line.  End with CNTL/Z
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     192.5.5.0/24 is directly connected, FastEthernet0/0
C     205.7.5.0/24 is directly connected, FastEthernet0/1
C     201.100.11.0/24 is directly connected, Serial0/0
```

检查连通性

```
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
```

四、动态路由协议 RIP 的配置

根据实验手册 5.4 配置 5.2 剩余的部分，配置 RIP

```
lab_A(config-if)#exit
lab_A(config)#router rip
lab_A(config-router)#network 192.5.5.1
lab_A(config-router)#network 205.7.5.1
lab_A(config-router)#network 201.100.11.1
lab_A(config-router)#
```

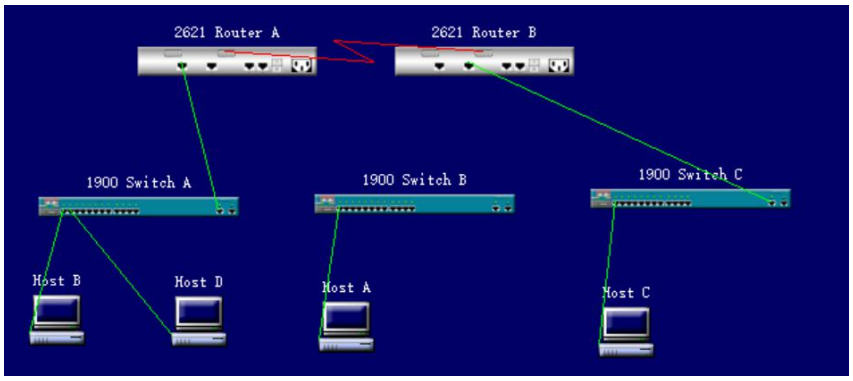
如图完成所有配置

Lab_A	Completed
Hostname	Done
Enable Secret	Done
Line Console Login	Done
Line Console Password	Done
Line vty Login	Done
Line vty Password	Done
E0 IP	Done
E0 Shutdown	Done
E1 IP	Done
E1 Shutdown	Done
S0 IP	Done
S0 Clock Rate	Done
S0 Shutdown	Done
Routing Protocol	Done
Network 1	Done
Network 2	Done
Network 3	Done
IP Host Lab_A	Done
IP Host Lab_B	Done
IP Host Lab_C	Done
IP Host Lab_D	Done
IP Host Lab_E	Done
Time elapsed	34:17

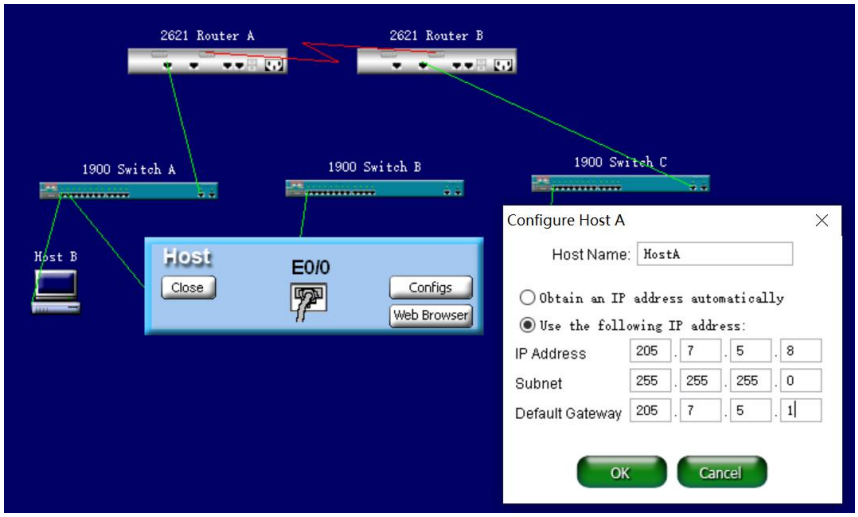
```
lab_A(config)#exit
00:71:12: %SYS-5-CONFIG_I: Configured from console by console
lab_A#show ip route
Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B - BGP
       D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
       N1 - OSPF NSSA external type 1, N2 - OSPF NSSA 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

Gateway of last resort is not set

R   204.204.7.0     /24 [120/2] via 201.100.11.2, 00:00:03, Serial0
R   223.8.151.0     /24 [120/2] via 201.100.11.2, 00:00:04, Serial0
C   201.100.11.0    /24 is directly connected, Serial0
R   219.17.100.0    /24 [120/1] via 201.100.11.2, 00:00:04, Serial0
C   192.5.5.0       /24 is directly connected, Ethernet0
R   199.6.13.0      /24 [120/1] via 201.100.11.2, 00:00:04, Serial0
C   205.7.5.0       /24 is directly connected, Ethernet1
R   210.93.105.0    /24 [120/3] via 201.100.11.2, 00:00:04, Serial0
```

五、Cisco 路由器访问列表配置

设备连接



配置 IP 地址



配置路由 B

```
Router>enable
Router#config t
Enter configuration commands, one per line.  End with CNTL/Z
Router(config)#line console 0
Router(config-line)#password koalaB
Router(config-line)#login
Router(config-line)#exit
Router(config)#line vty 0 4
Router(config-line)#password tigerB
Router(config-line)#exit
Router(config)#enable secret ciscoB
Router(config)#int f0/0
Router(config-if)#ip addr 192.5.5.1 255.255.255.0
Router(config-if)#no shutdown
04:09:42 %LINK-3-UPDOWN:  Interface FastEthernet0/0, changed state to up
04:09:42 %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
04:10:12 %LINK-3-UPDOWN:  Interface FastEthernet0/1, changed state to up
04:10:12 %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/1, changed state to up

Router(config)#router rip
Router(config-router)#network 192.5.5.0
Router(config-router)#network 205.7.5.0
Router(config-router)#network 201.100.11.0
```

配置路由 A

```
Enter configuration commands, one per line.  End with CNTL/Z
Router(config)#hostname RouterA
RouterA(config)#line console 0
RouterA(config-line)#passwork koalaA
                    ^
% Invalid input detected at '^' marker.
RouterA(config-line)#password koalaA
RouterA(config-line)#login
RouterA(config-line)#exit
RouterA(config)#line vty 0 4
RouterA(config-line)#password tigerA
RouterA(config-line)#exit
RouterA(config)#enable secret ciscoA
RouterA(config)#int f0/0
RouterA(config-if)#ip addr 199.6.13.1 255.255.255.0
RouterA(config-if)#no shutdown
04:17:11 %LINK-3-UPDOWN:  Interface FastEthernet0/0, changed state to up
04:17:11 %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0, changed state to

RouterA(config-if)#int s0/1
RouterA(config-if)#ip addr 201.100.11.2 255.255.255.0
RouterA(config-if)#no shutdown
04:17:40 %LINK-3-UPDOWN:  Interface Serial0/1, changed state to up
04:17:40 %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/1, changed state to up

RouterA(config-if)#exit
RouterA(config)#router rip
RouterA(config-router)#network 201.100.11.0
RouterA(config-router)#network 199.6.13.0
```

测试 HostB，限制前 HostB 可以访问子网

```
C:\>ping 205.7.5.8

Pinging 205.7.5.8 with 32 bytes of data:

Reply from 205.7.5.8 ;bytes=32 time=22ms TTL=254
Reply from 205.7.5.8 ;bytes=32 time=22ms TTL=254
Reply from 205.7.5.8 ;bytes=32 time=22ms TTL=254
Reply from 205.7.5.8 ;bytes=32 time=22ms TTL=254

Ping Statistics for 205.7.5.8:
    Packets Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 22ms, Maximum = 23ms, Average = 22ms
```

对主机的访问列表控制

```
RouterB(config)#access-list 50 deny host 192.5.5.6
RouterB(config)#access-list 50 permit any
RouterB(config)#int f0/1
RouterB(config-if)#ip access-group 50 out
RouterB(config-if)#exit
```

限制后主机 HostB 不能访问子网

```
C:\>ping 205.7.5.8

Pinging 205.7.5.8 with 32 bytes of data:

Request timed out.
Request timed out.
Request timed out.
Request timed out.

Ping Statistics for 205.7.5.8:
    Packets Sent = 4, Received = 0, Lost = 4 (100% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms
```

对子网进行访问列表控制

```
RouterB(config)#access-list 51 deny 192.5.5.8 255.255.255.248
RouterB(config)#access-list 51 permit any
RouterB(config)#int s0/0
RouterB(config-if)#ip access-group 51 out
RouterB(config-if)#exit
RouterB(config)#
```

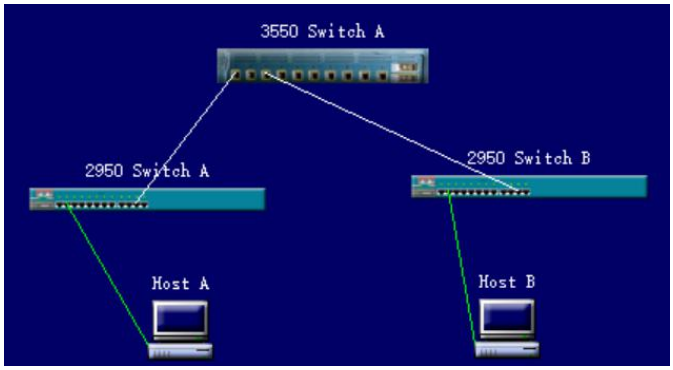
在主机 HostA 上远程登录 RouterA

```
C:\>telnet 201.100.11.2
Connecting To 201.100.11.2 ...

Password required, but none set


Connection to host lost.
```

配置 RouterA，使 HostA 不能 telnet 到 RouterA 上

```
C:\>telnet 201.100.11.2
Connecting To 201.100.11.2 ...Could not open a connection to host: Connect failed
```

六、基于交换机端口的 VLAN（虚拟局域网）配置



配置 VTP 域

```
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 Vl1 (lowest numbered VLAN interface
found)
```

在交换机 2950 将 VTP 管理域名设置为 Cisco，并设置为客户模式

```
2950A(config)#vtp domain Cisco
Changing VTP domain name from Cisco 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 Vl1 (lowest numbered VLAN interface
found)
```

配置 2950B 的 VTP

```
switch>en
switch#conf t
Enter configuration commands, one per line.  End with CNTL/Z
switch(config)#hostname 2590B
2590B(config)#vtp domain Cisco
Changing VTP domain name from NULL to Cisco
2590B(config)#vtp mode client
Setting device to VTP CLIENT mode.
```

配置 Trunk

```
switch>en
switch#conf t
Enter configuration commands, one per line.  End with CNTL/Z
switch(config)#hostname 3550A
3550A(config)#interface fa0/1
3550A(config-if)#switchport trunk encapsulation ?
  dotlq      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 dotlq
```

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

```
2590B(config)#interface fa0/11
2590B(config-if)#switch mode trunk
2590B(config-if)#
```

创建 VLAN

```
3550A>en
3550A#config t
Enter configuration commands, one per line.  End with CNTL/Z
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
```

将 2950A 和 2950B 交换机加入 VLAN

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

```
2590B(config)#interface fa0/2
2590B(config-if)#switch access vlan 20
```

设置 IP

```
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-if)#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
```

启动路由

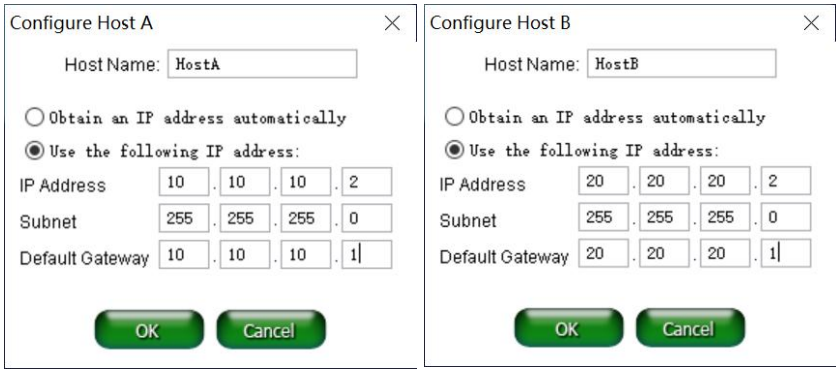
```
3550A(config)#ip routeing
```

配置交换机管理地址

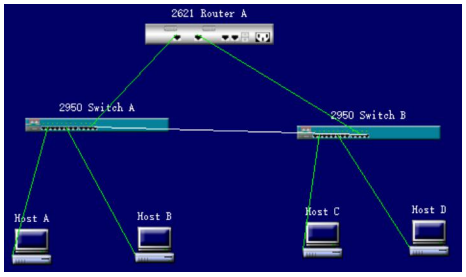
```
3550A(config)#int vlan 1
3550A(config-if)#ip address 192.168.10.1 255.255.255.0
3550A(config-if)#no shut
3550A(config-if)#int vlan 1
3550A(config-if)#ip address 192.168.10.2 255.255.255.0
```

```
3550A(config-if)#no shutdown
3550A(config-if)#int vlan 1
3550A(config-if)#ip address 192.168.10.3 255.255.255.0
3550A(config-if)#no shutdown
```

配置 HOSTA 和 HOSTB 并进行测试



实例 2



配置 VTP

```
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 Vl1 (lowest numbered VLAN interface
found)
```

启动 Trunk

```
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
```

```
switch(config)#hostname 2950B
2950B(config)#interface fa0/12
2950B(config-if)#switchport mode trunk
2950B(config-if)#exit
```

创建 VLAN

```
2950A>en
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....
```

分配端口到 VLAN

```
2950A>en
2950A#conf 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)#swirchport mode access
                 ^
% Invalid input detected at '^' marker.
2950A(config-if)#switchport mode access
2950A(config-if)#
```

用 slowvlan 命令验证

```
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 client 模式

```
2950B#config t
Enter configuration commands, one per line.  End with CNTL/Z
2950B(config)#vtp domain Test
Changing VTP domain name from NULL to Test
2950B(config)#vtp mode client
Setting device to VTP CLIENT mode.
```

配置 VLAN 之间的路由

```
R2600(config)#interface fastethernet 0/0
R2600(config-if)#no ip address
R2600(config-if)#no shutdown
05:36:52 %LINK-3-UPDOWN:  Interface FastEthernet0/0, changed state to up
05:36:52 %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0, changed state to up

R2600(config-if)#interface fastethernet 0/0.1
R2600(config-subif)#encapsulation dot1q 1
R2600(config-subif)#ip address 172.16.10.1 255.255.255.0
R2600(config-subif)#interface fastethernet 0/0.2
R2600(config-subif)#encapsulation dot1q 2
R2600(config-subif)#ip address 172.16.20.1 255.255.255.0
R2600(config-subif)#interface fastethernet 0/0.3
R2600(config-subif)#encapsulation dot1q 3
R2600(config-subif)#ip address 172.16.30.1 255.255.255.0
R2600(config-subif)#exit
```

验证连通性

在属于 VLAN2 的 HOSTA 上 ping172.16.20.1

```
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 HOSTA 上 ping172.16.30.1

```
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 HOSTA 上 ping HostB

```
C:\>ping hostB
Unknown host hostB
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
```

4 实验总结

通过本次实验，学习了用 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）。实验内容比较多，需依照实验手册一步步进行。