

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5 CISCO IOS路由器基本配置

班 级 软件工程2018级1班

姓 名 方浩南

学 号 24320182203188

实验时间 2020年4月8日

2020 年 4 月 21 日

1 实验目的

使用Router eSIM v1.1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。

2 实验环境

WINE 5.5(Windows XP), Router eSIM v1.1, CCNA Network Visualizer 6.0

3 实验结果

Router eSIM路由器的常规配置（附录一 5.2）

以路由器A为例，进入特权模式进行配置，包括：修改主机名、添加其他主机记录、设置网络设备接口IP和开启网络设备。

```
# enter privilege mode
enable
# enter configuration mode
config t
# change hostname
hostname Lab_A

# add hosts
ip host Lab_A 192.5.5.1 205.7.5.1 201.100.11.1
ip host Lab_B 219.17.100.1 199.6.13.1 201.100.11.2
ip host Lab_C 223.8.151.1 204.204.7.1 199.6.13.2
ip host Lab_D 210.93.105.1 204.204.7.2
ip host Lab_E 210.93.105.2

# configure eth0
int eth 0
# set ip
ip addr 192.5.5.1 255.255.255.0
# start interface
no shutdown
```

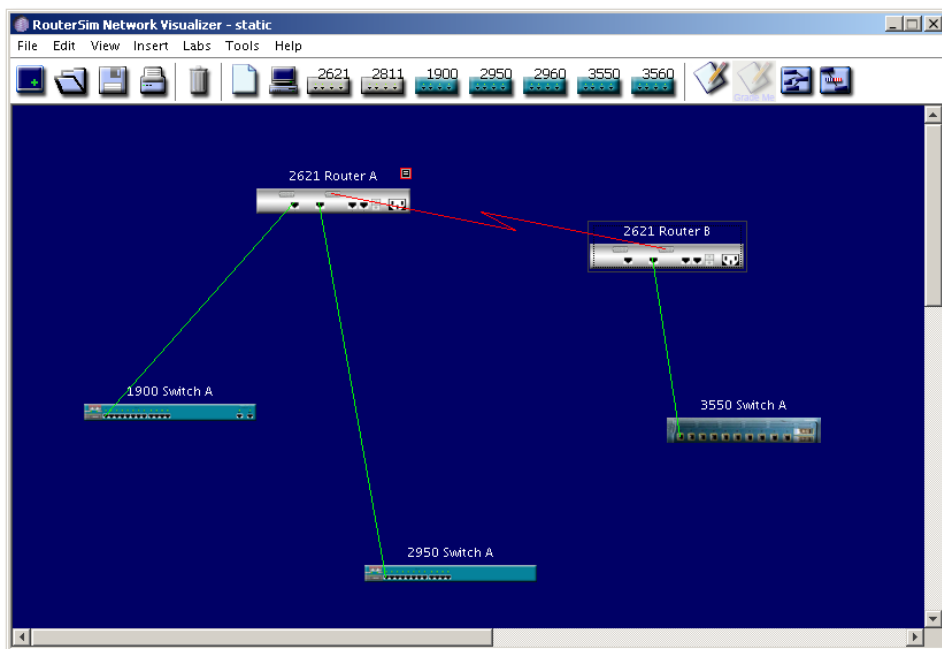
配置之后查看接口状态信息



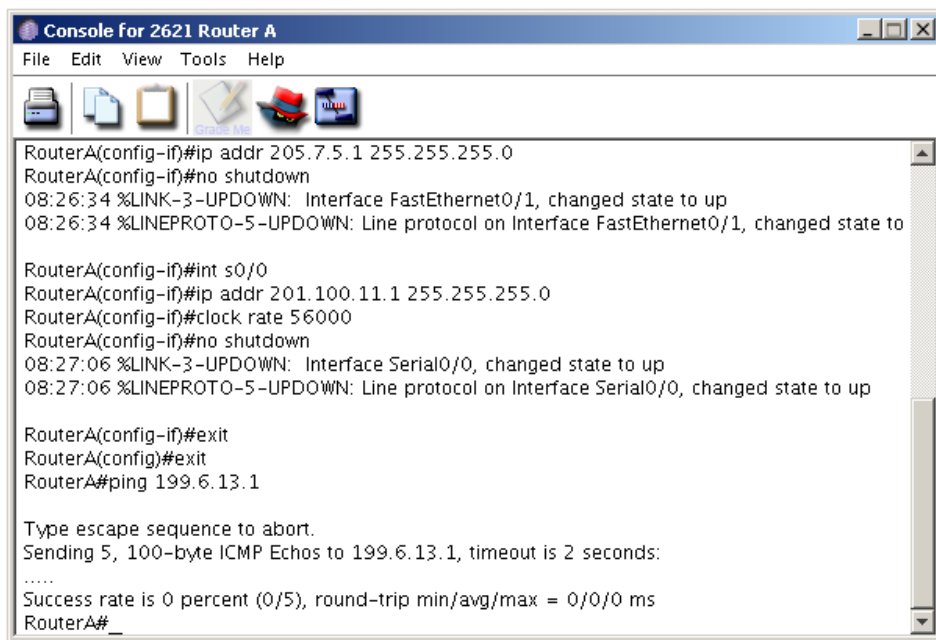
其它接口和其它路由器的基本配置同理，详细命令见src文件夹。

Network Visualizer静态路由配置

添加和连接物理设备



配置前设置，和Router eSIM同理



```

Console for 2621 Router A
File Edit View Tools Help

RouterA(config-if)#ip addr 205.7.5.1 255.255.255.0
RouterA(config-if)#no shutdown
08:26:34 %LINK-3-UPDOWN: Interface FastEthernet0/1, changed state to up
08:26:34 %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/1, changed state to up

RouterA(config-if)#int s0/0
RouterA(config-if)#ip addr 201.100.11.1 255.255.255.0
RouterA(config-if)#clock rate 56000
RouterA(config-if)#no shutdown
08:27:06 %LINK-3-UPDOWN: Interface Serial0/0, changed state to up
08:27:06 %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/0, changed state to up

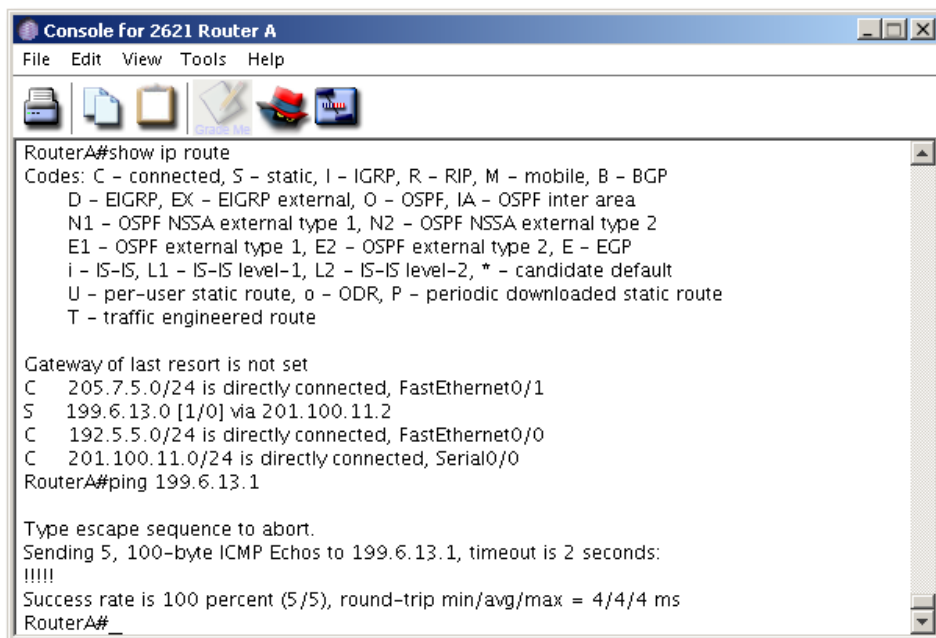
RouterA(config-if)#exit
RouterA(config)#exit
RouterA#ping 199.6.13.1

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
RouterA#_

```

在RouterA添加静态路由记录并使用ping检验连通性

```
# establish static routing
ip route 199.6.13.0 255.255.255.0 201.100.11.2
```



```

Console for 2621 Router A
File Edit View Tools Help

RouterA#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

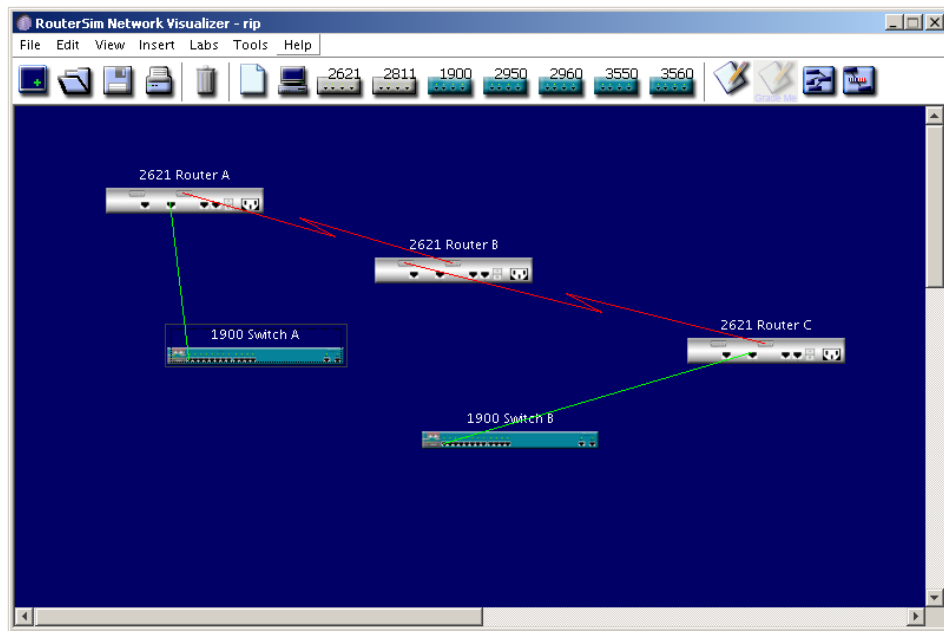
Gateway of last resort is not set
C    205.7.5.0/24 is directly connected, FastEthernet0/1
S    199.6.13.0 [1/0] via 201.100.11.2
C    192.5.5.0/24 is directly connected, FastEthernet0/0
C    201.100.11.0/24 is directly connected, Serial0/0
RouterA#ping 199.6.13.1

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
RouterA#_

```

Network Visualizer动态路由协议RIP的配置（附录一 5.4）

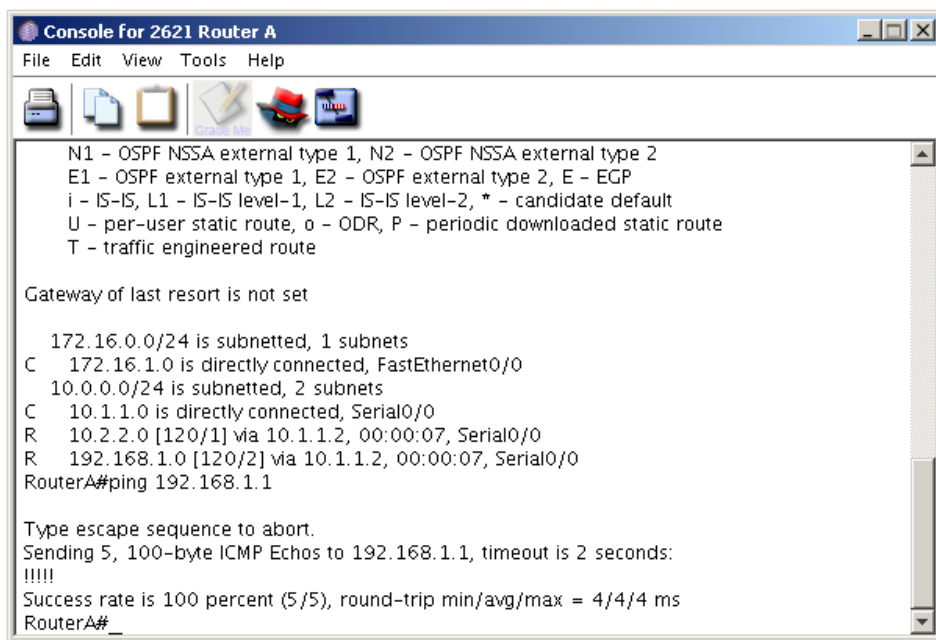
连接和配置IP



以RouterA为例为三台路由器配置RIP

```
# configure RIP
router rip
network 172.16.0.0
network 10.0.0.0
```

用RouterA ping RouterC 检验联通性



```
Console for 2621 Router A
File Edit View Tools Help

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

  172.16.0.0/24 is subnetted, 1 subnets
C    172.16.1.0 is directly connected, FastEthernet0/0
  10.0.0.0/24 is subnetted, 2 subnets
C    10.1.1.0 is directly connected, Serial0/0
R    10.2.2.0 [120/1] via 10.1.1.2, 00:00:07, Serial0/0
R    192.168.1.0 [120/2] via 10.1.1.2, 00:00:07, Serial0/0
RouterA#ping 192.168.1.1

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.1.1, timeout is 2 seconds:
!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 4/4/4 ms
RouterA#_
```

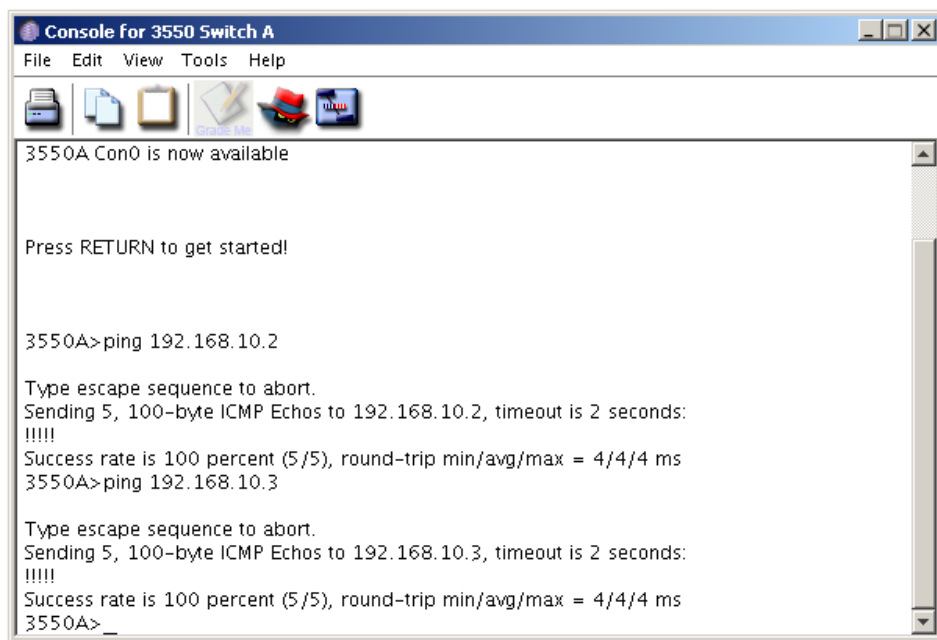
完整命令见src文件夹

Network Visualizer交换机端口VLAN的配置（附录一 5.6）

根据指引配置VLAN

```
en
conf t
hostname 3550A
# set VTP domain
vtp domain Cisco
# configure Trunk
int f0/1
switchport trunk encapsulation dot1q
switchport mode trunk
int f0/3
switchport trunk encapsulation dot1q
switchport mode trunk
exit
# create VLAN
vlan 10
vlan 20
# set VLAN IP
int vlan 10
ip addr 10.10.10.1 255.255.255.0
no shut
int vlan 20
ip addr 20.20.20.1 255.255.255.0
no shut
exit
# enable routing
ip routing
# set manage IP
int vlan 1
ip addr 192.168.10.1 255.255.255.0
no shut
```

用3550A ping 2950A和2950B检验连通性



4 实验总结

计算机网络的一个主要意义是连接计算机，通过这次实验可以体会到这个连接的多重意义。从物理连接、直接连接、到逻辑上的虚拟连接等等，这样也正体现了发展至今的计算机网络的分层结构。