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 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 20 日

2020 年　4　月　20　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

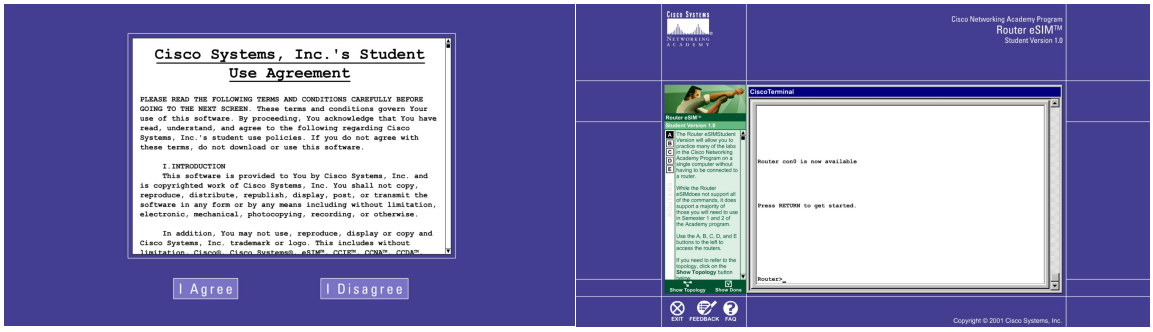
实验机：Windows10 x64 位

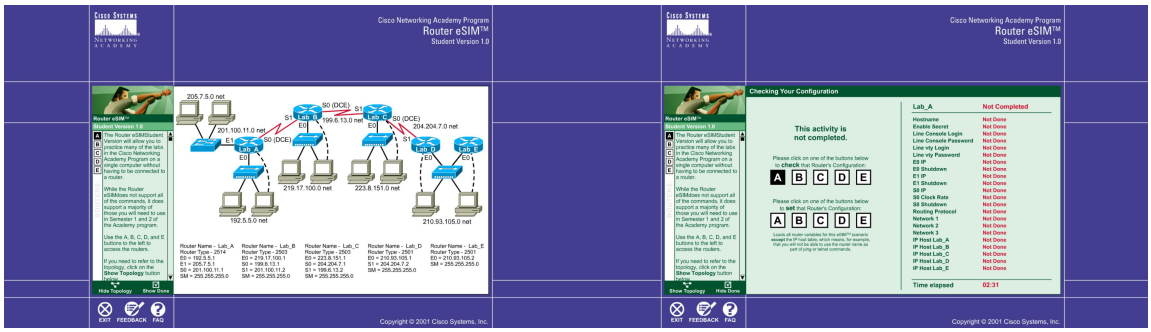
软件： Visual Studio 2019、Router eSIM v1、CCNA Network Visualizer 6.0

3 实验结果

使用 Router eSIM v1 模拟器来模拟路由器的配置环境：

1.Router eSIM v1 模拟器界面





2. 常规配置：

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
lab_A(config)#
```

设置当日消息标题：

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

查看配置文件以及版本信息等：

```
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
!
```

```
Router#show version
Cisco Internetwork Operating System Software
IOS (tm) 2500 Software (C2500-IS-L), Version 12.0(5), RELEASE SOFTWARE (fc1)
Copyright (c) 1986-1999 by cisco Systems, Inc.
Copyright (c) 1986-1999 by cisco Systems, Inc.
Image text-base: 0x0303D744, data-base: 0x00001000

ROM: System Bootstrap, Version 5.2(8a), RELEASE SOFTWARE
BOOTFLASH: 3000 Bootstrap Software (IGS-RXBOOT), Version 10.2(8a), RELEASE SOFTW
ARE (fc1)

Router uptime is 0 hours, 14 minutes
System restarted by power-on
System image file is "flash:ip.plus.c2500-is-l_120-5.bin"

cisco 2500 (68030) processor (revision D) with 4096K/2048K bytes of memory.
Processor board ID 02930235, with hardware revision 00000000
Bridging software.
X.25 software, Version 3.0.0.
2 Ethernet/IEEE 802.3 interface(s)
2 Serial network interface(s)
32K bytes of non-volatile configuration memory.
8192K bytes of processor board System flash (Read ONLY)
```

建立名字解析的映射表：

```
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 219.17.100.1 199.6.13.1 201.100.11.2
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
```

给路由器接口配置 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：

```
lab_A(config)#interface serial 0
lab_A(config-if)#clock rate 56000
lab_A(config-if)#_
```

手工开启端口：

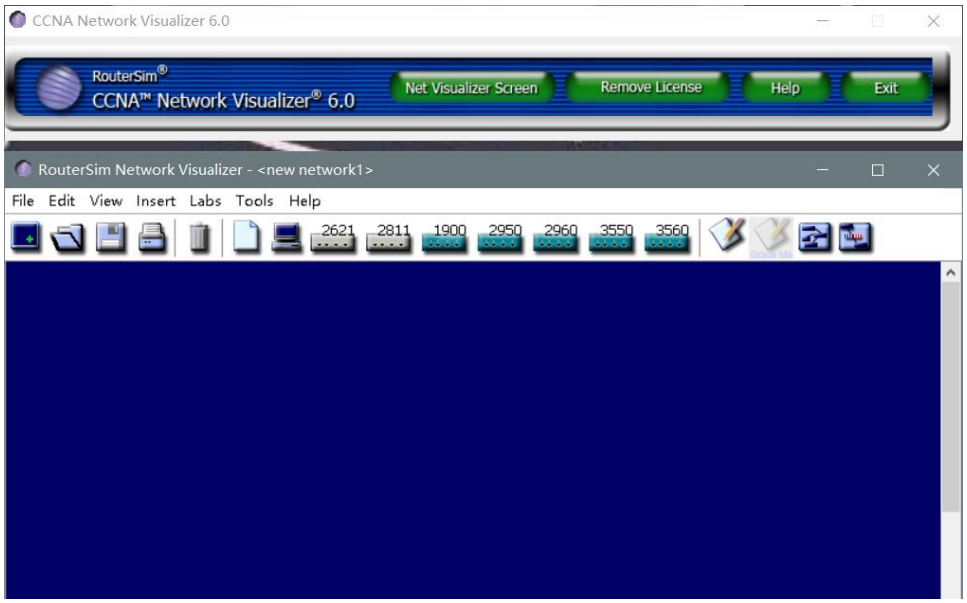
```
lab_A#config t
Enter configuration commands, one per line.  End with END.
lab_A(config)#interface serial 0
lab_A(config-if)#no shutdown
```

检查串口的配置情况（已完成）：

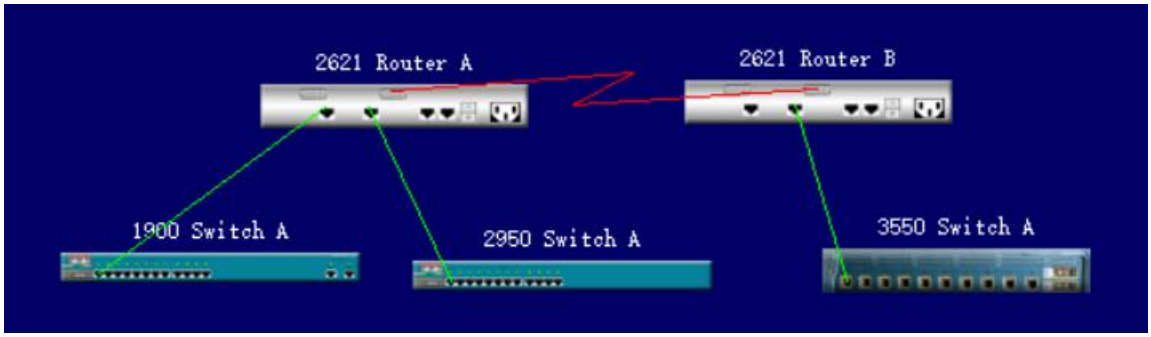
```
lab_A#show interface serial 0
Serial0 is up, line protocol is up
   Internet address is 201.100.11.1/24
   Hardware is HD64570
   MTU 1500 bytes, BW 1544 Kbit, DLY 20000 usec,
```

静态路由配置：

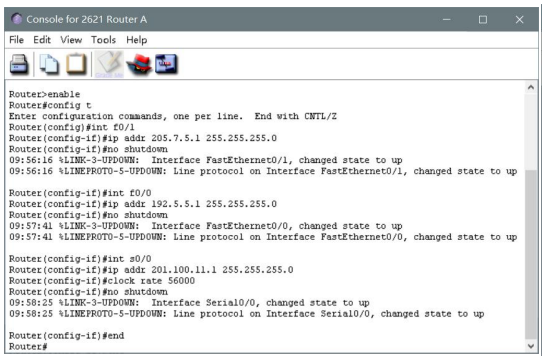
CCNA Network Visualizer 6.0 界面：

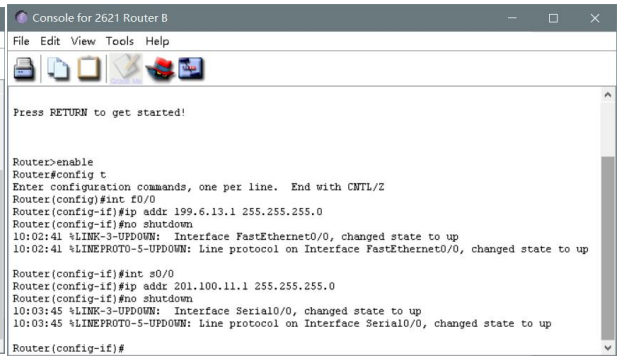


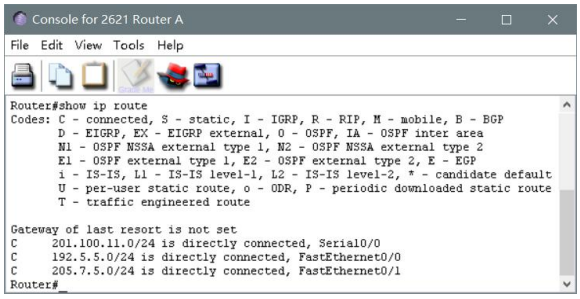
连接各模拟器设备：

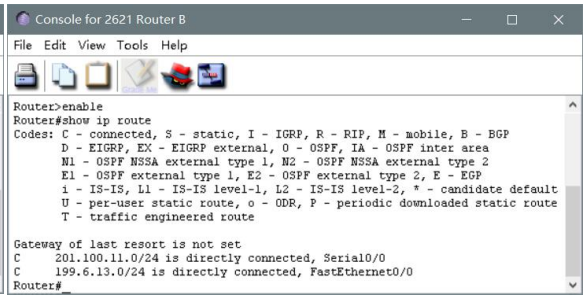


配置路由器 A、B 的环境

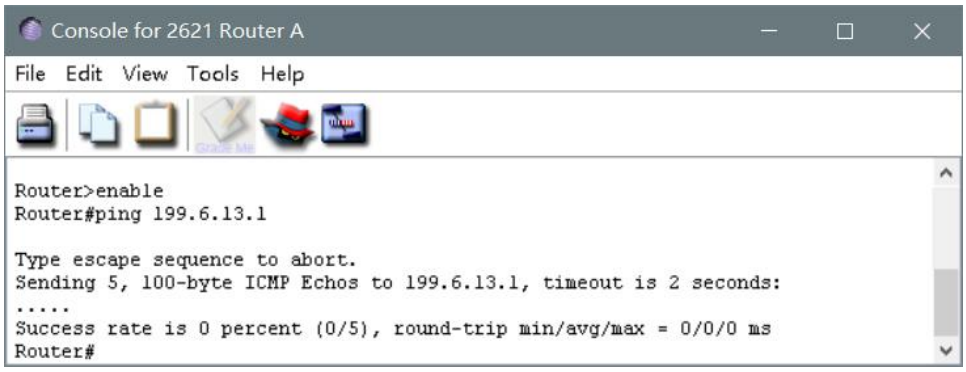




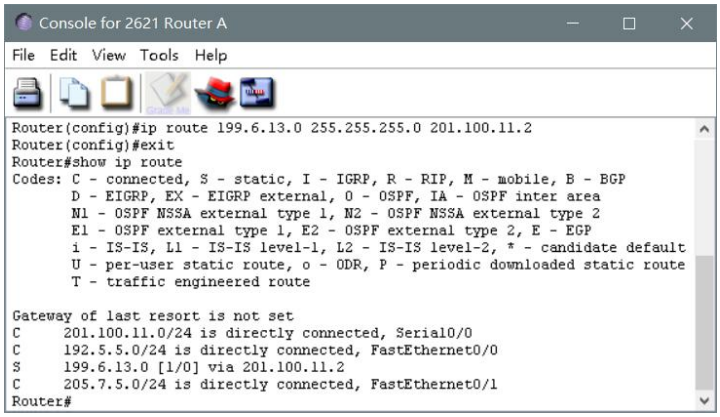




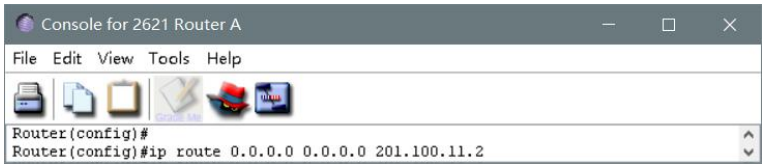
查看是否连通：

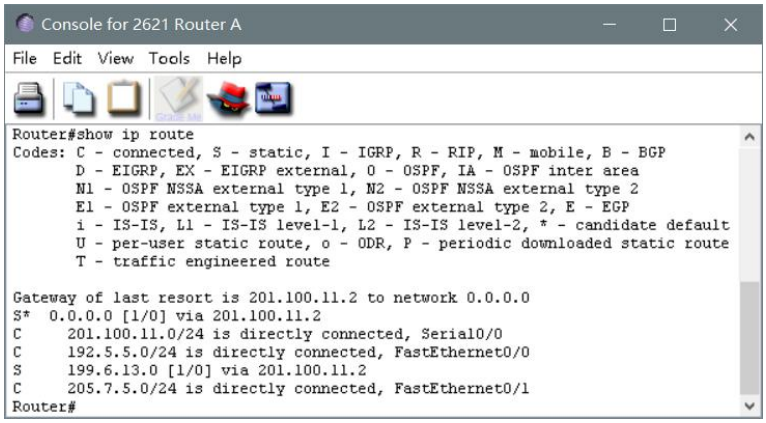


配置静态路由表：



配置默认路由：



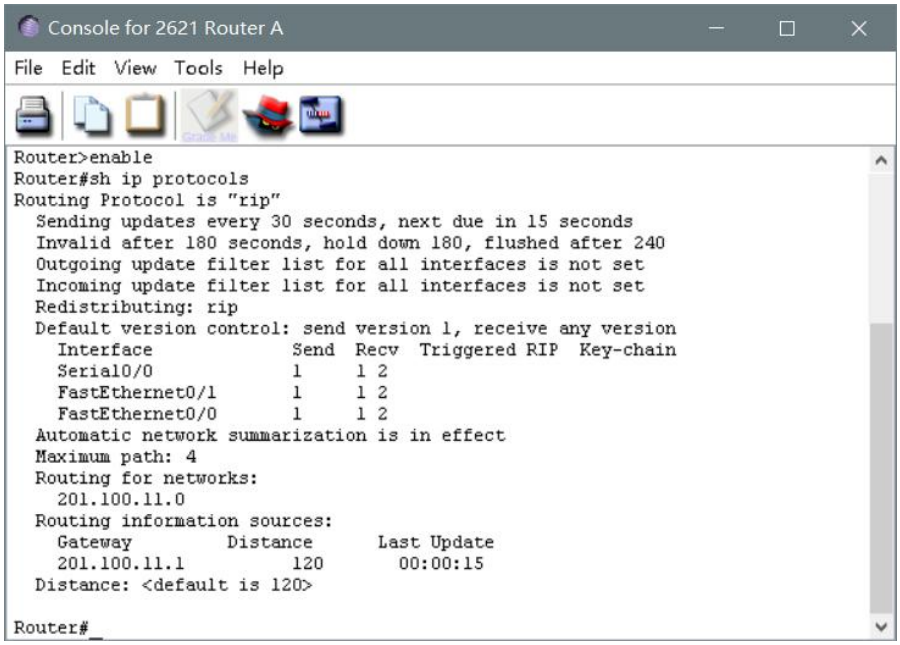


配置动态路由：

```
Router>enable
Router#config t
Enter configuration commands, one per line.  End with CNTL/Z
Router(config)#router rip
Router(config-router)#network 201.100.11.0
```

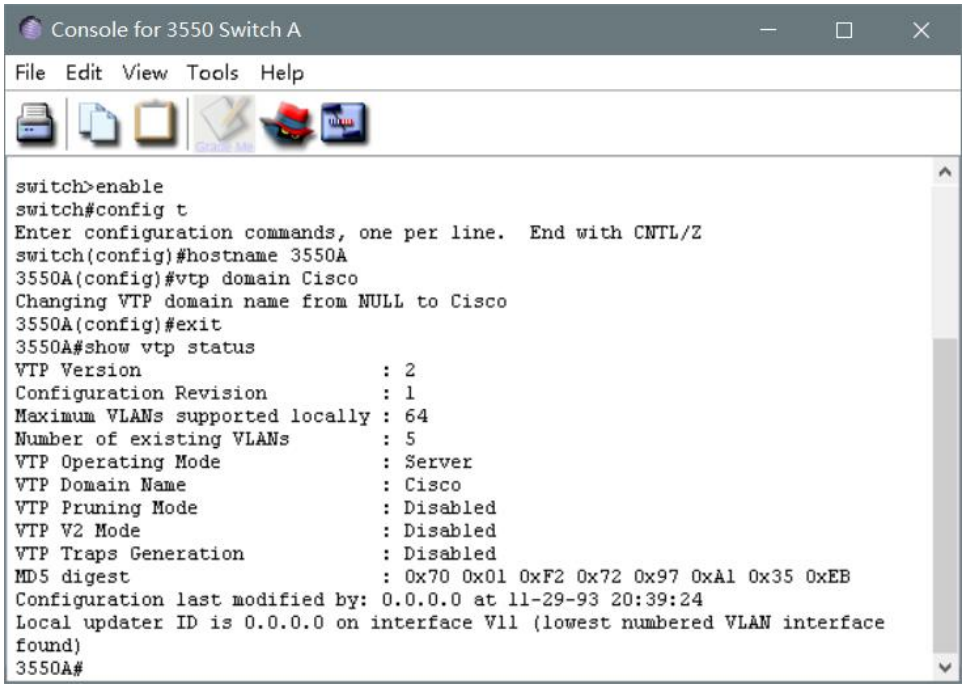
```
Router>enable
Router#config t
Enter configuration commands, one per line.  End with CNTL/Z
Router(config)#router rip
Router(config-router)#network 199.6.13.0
Router(config-router)#
```

查看 RIP 协议路由信息：

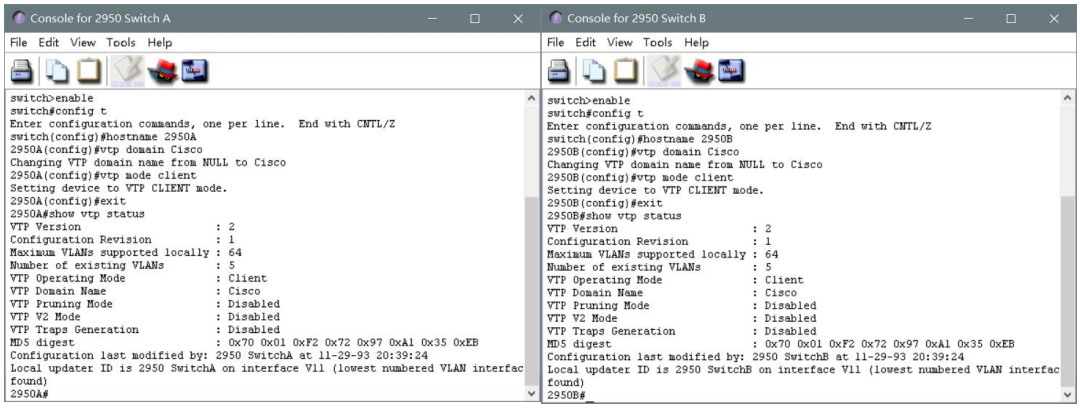


配置 VLAN：

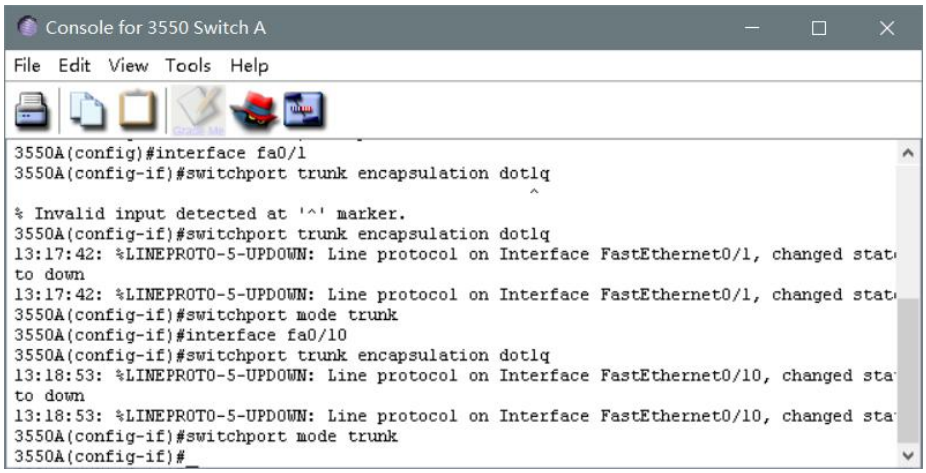
配置３５５０A 的 VTP：

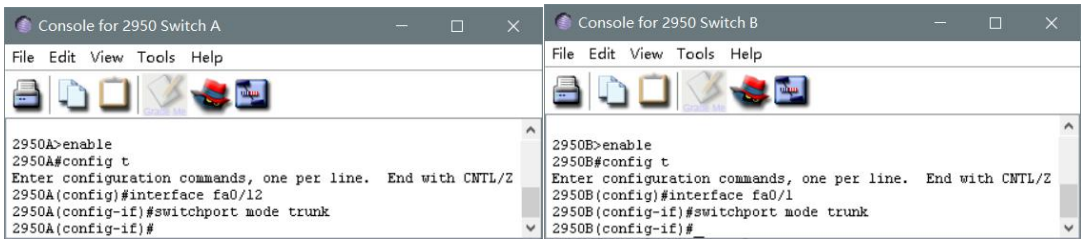


配置２９５０A与２９５０B的VTP：

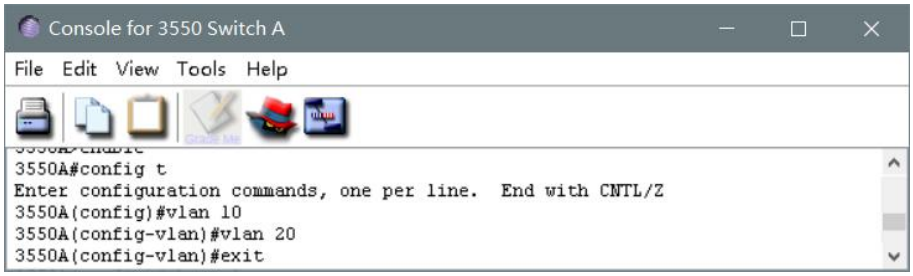


配置 Trunk：





创建 VLAN：

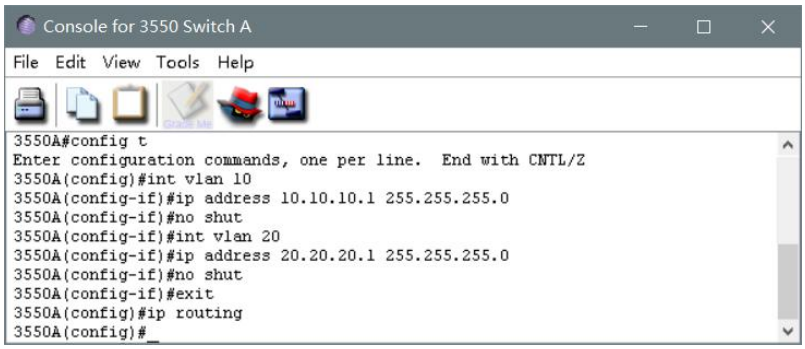


```
3550A#show vlan

VLAN Name                             Status    Ports
---- -------------------------------- --------- -------------------------------
1    default                          active    Fa0/2, Fa0/3, Fa0/4, Fa0/5
                                                Fa0/6, Fa0/7, Fa0/8, Fa0/9
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 Trans1 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--
```

分配交换机端口加入 VLAN：

```
2950A(config)#interface fa0/1
2950A(config-if)#switchport access vlan 10

2950B(config)#interface fa0/12
2950B(config-if)#switchport access vlan 20
```

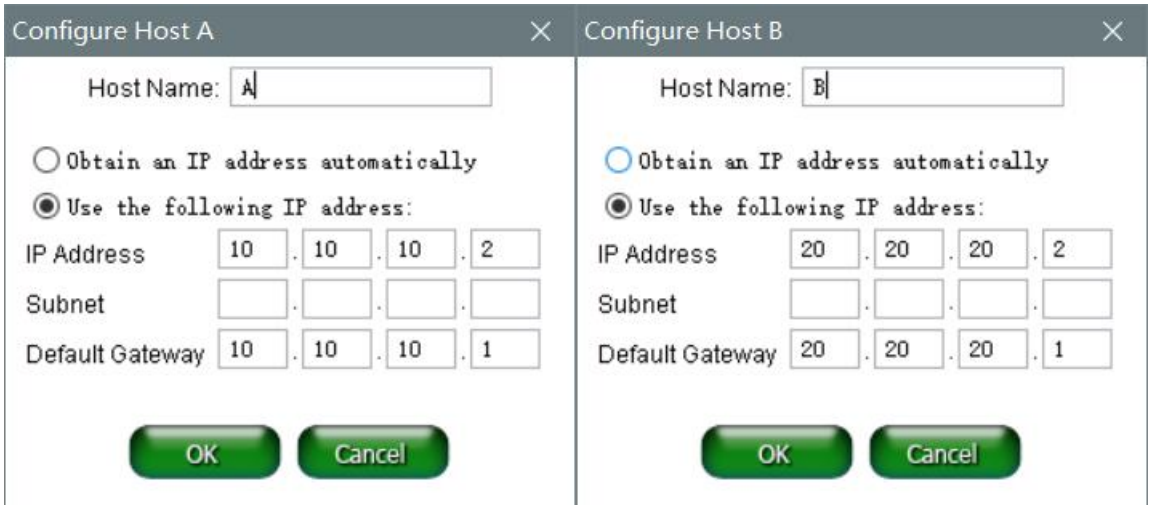
配置第三层交换机：



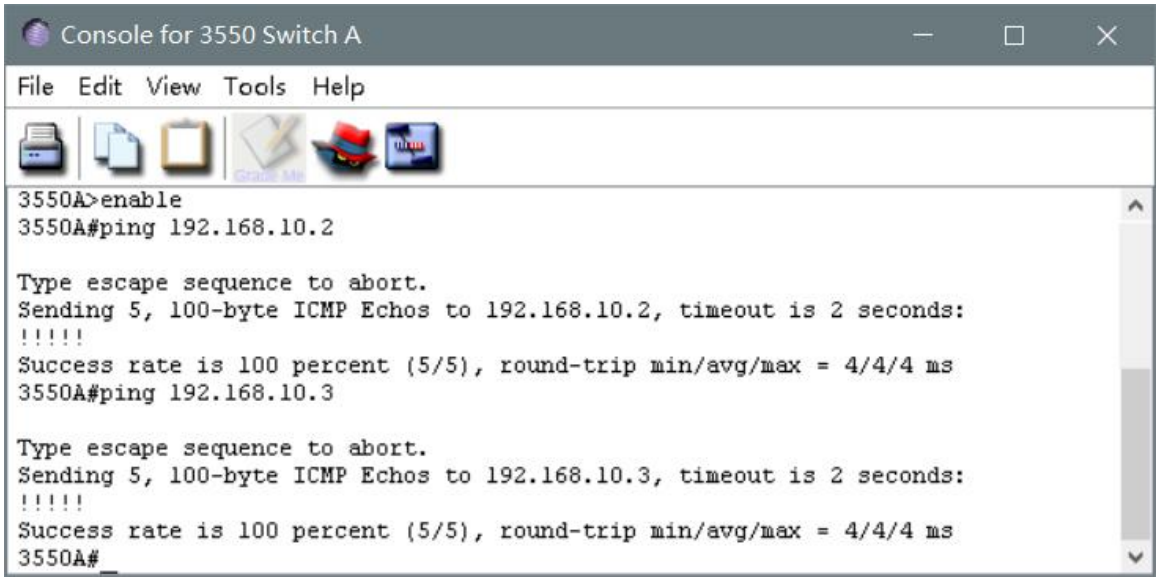
配置各交换机的管理地址：

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

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

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

配置主机 Host　A 和 Host　B 并测试：



测试成功：



4　实验总结

成功配置了静态路由、动态路由和交换机端口的 VLAN，并通过这些实验了解了路由器的基本结构及其在网络中的作用，对 IOS 配置环境有了一个初步的认识。