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 1 班

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实验时间 2020 年 4 月 8 日

2020 年 4　月 16　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）。

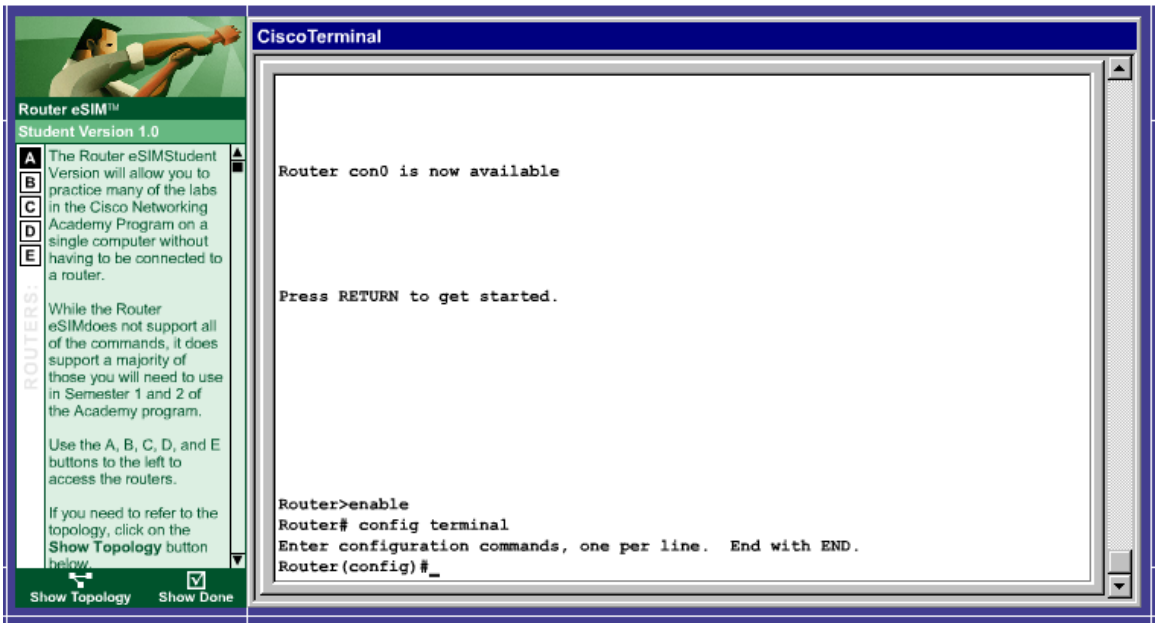
2 实验环境

Windows10, Router eSIM v1.1, CCNA Network Visualizer 6.0。

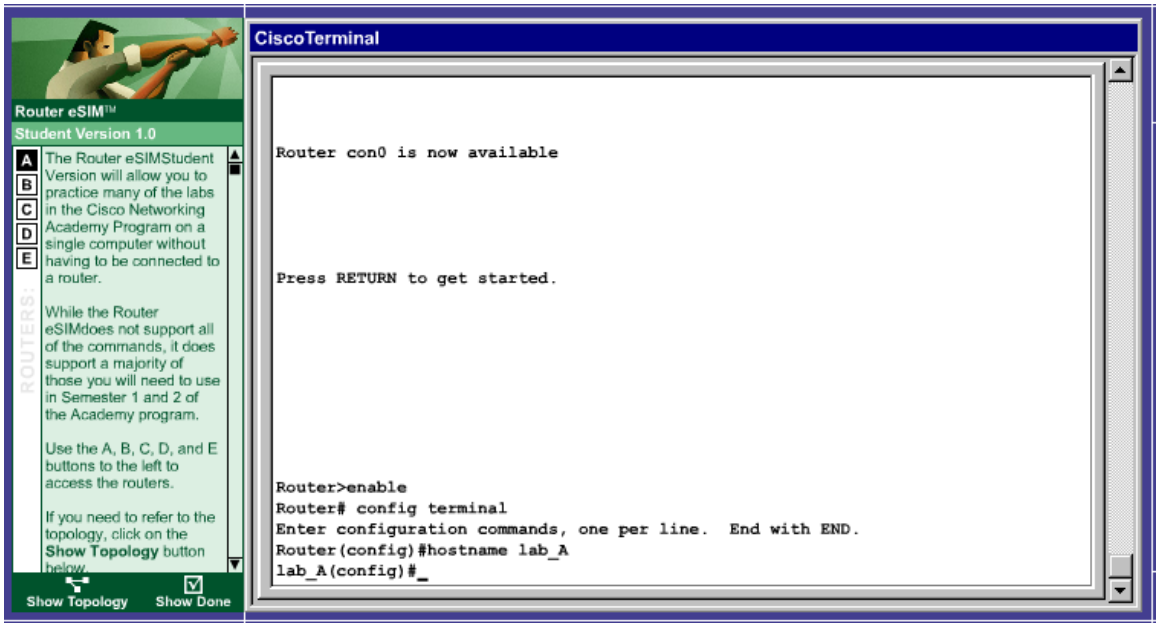
3 实验结果

1.使用 Router eSIM v1.1 模拟器来模拟路由器的配置环境。

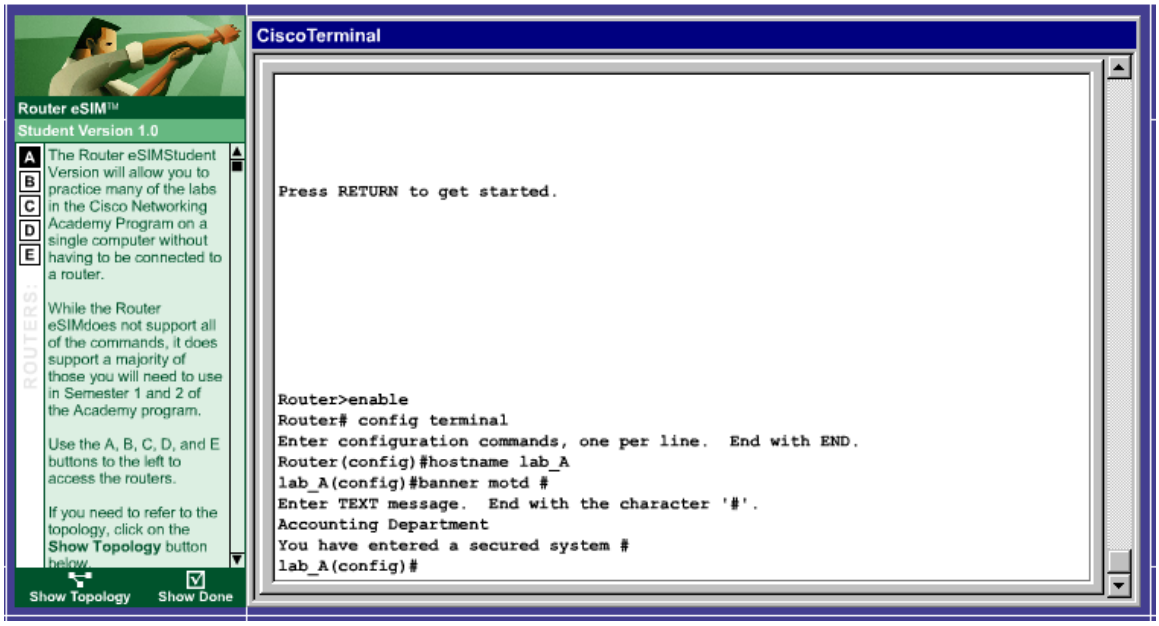
进入全局配置模式



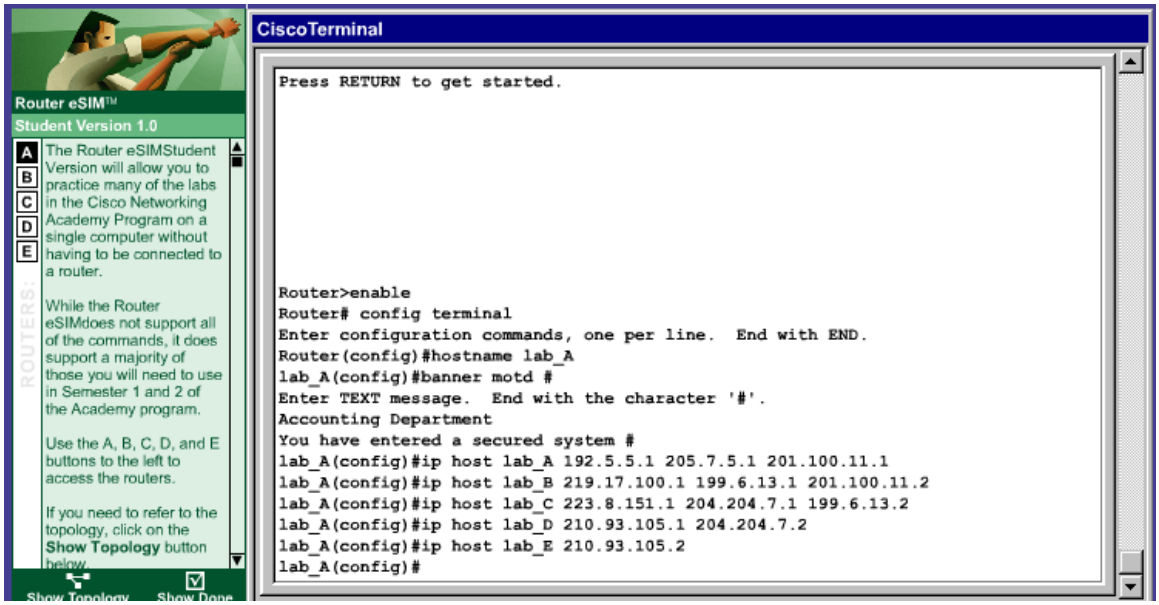
改变路由器名字



设置当日消息标题



建立名字解析的映射表



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
```

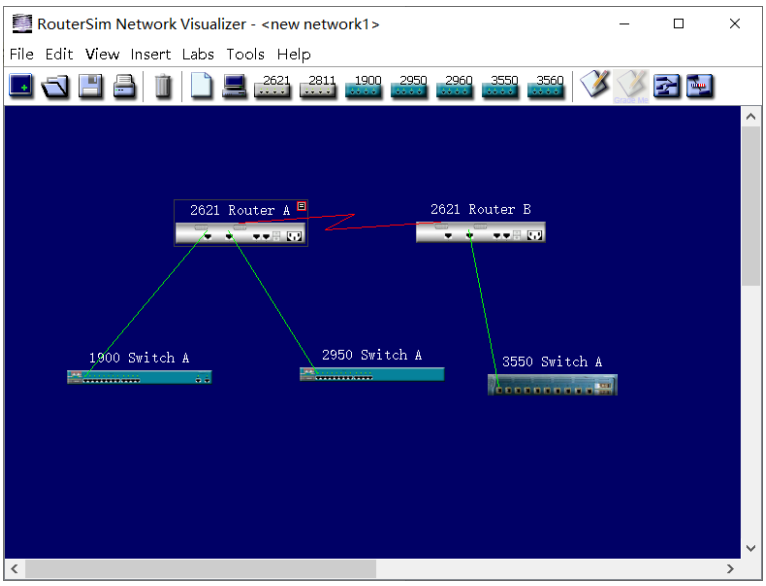
配置充当 DCE 端的串行端口

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

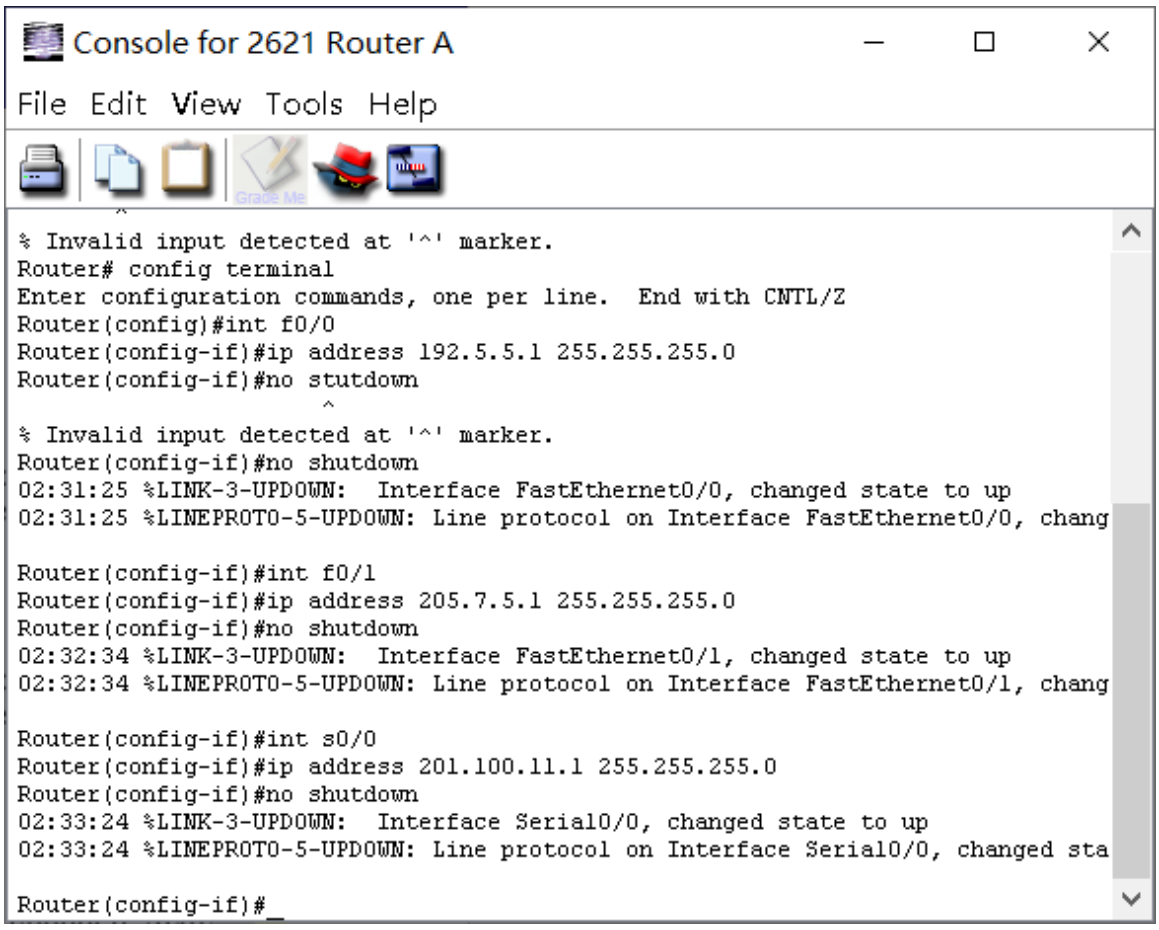
Lab_A	Not Completed
Hostname	Done
Enable Secret	Not Done
Line Console Login	Not Done
Line Console Password	Not Done
Line vty Login	Not Done
Line vty Password	Not Done
E0 IP	Done
E0 Shutdown	Not Done
E1 IP	Done
E1 Shutdown	Not Done
S0 IP	Done
S0 Clock Rate	Done
S0 Shutdown	Not Done
Routing Protocol	Not Done
Network 1	Not Done
Network 2	Not Done
Network 3	Not Done
IP Host Lab_A	Done
IP Host Lab_B	Done
IP Host Lab_C	Done
IP Host Lab_D	Done
IP Host Lab_E	Done
Time elapsed	27:35

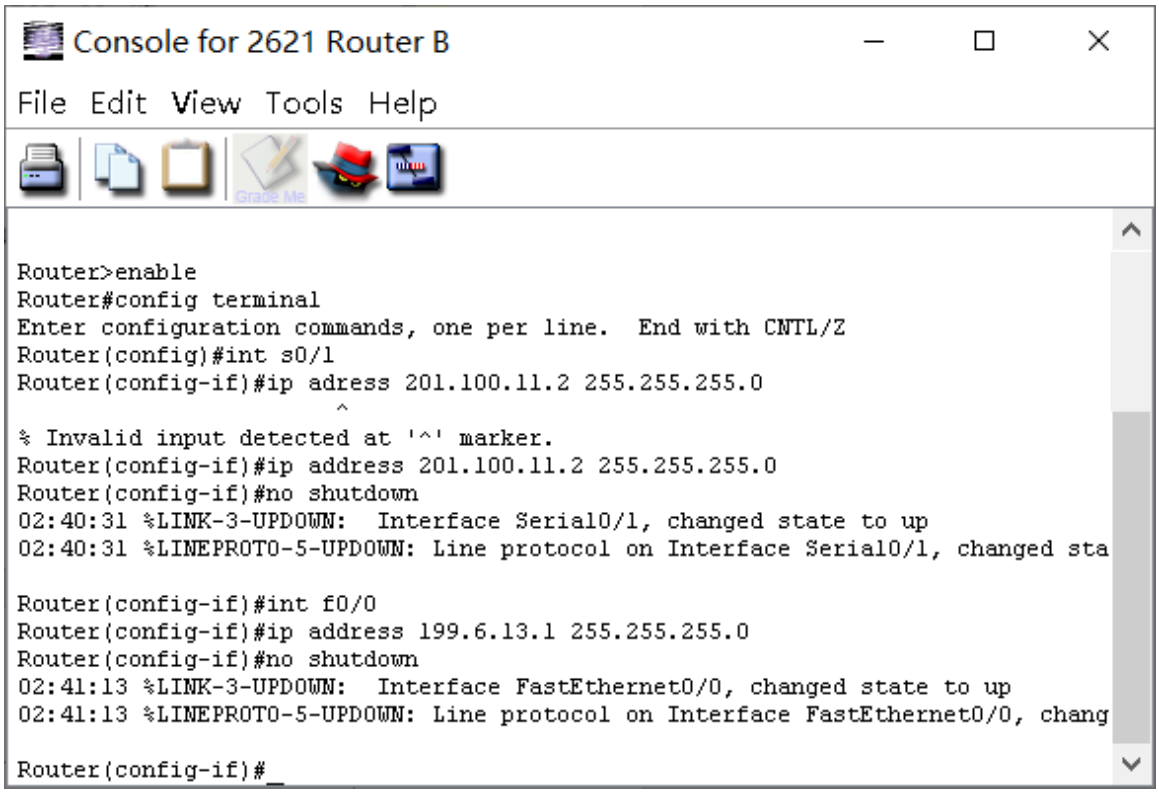
2. 使用 CCNA Network Visualizer 6.0 配置静态路由、动态路由和交换机端口的 VLAN（虚拟局域网）

①静态路由



配置路由器 A,B 各端口 IP 地址





配置路由表

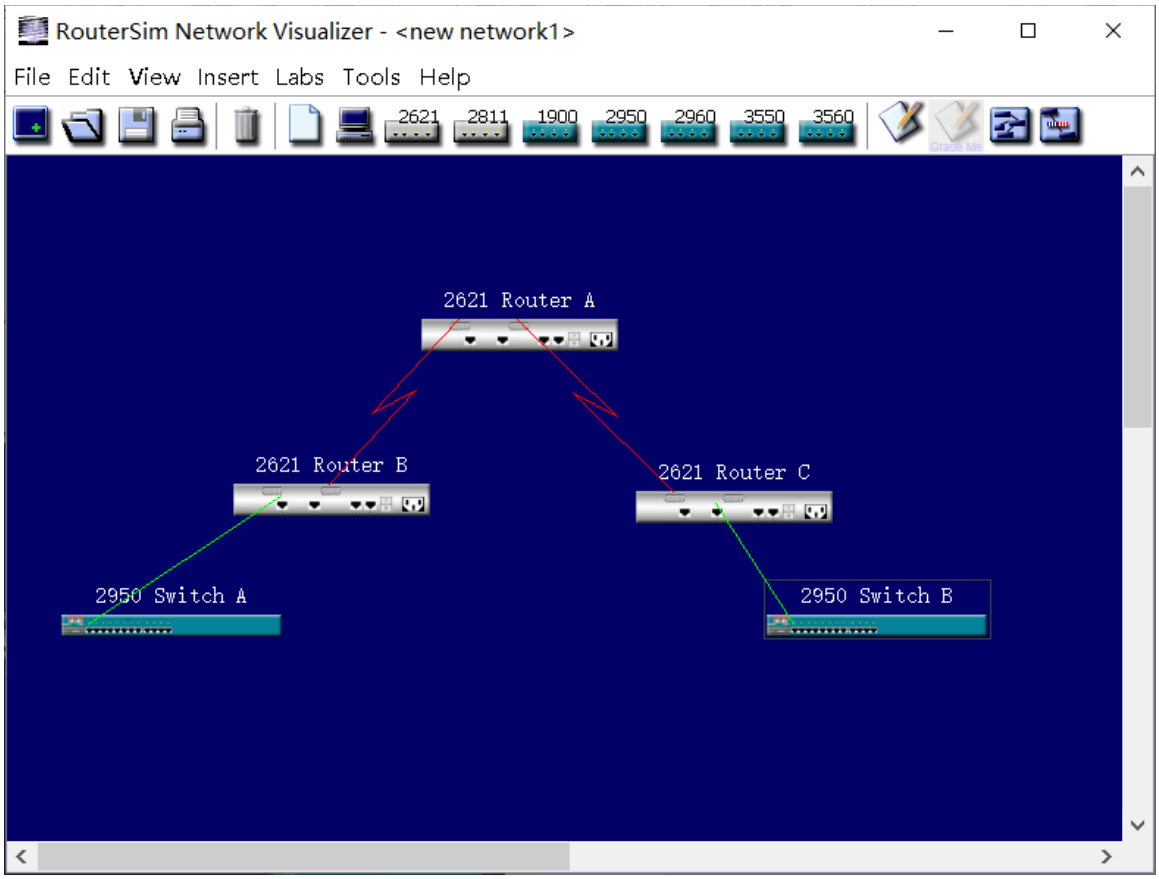
```
Router(config)#ip route 199.6.13.0 255.255.255.0 201.100.11.2
Router(config)#exit
Router#show ip route
Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B - BGP
       D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
       N1 - OSPF NSSA external type 1, N2 - OSPF NSSA 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
C     205.7.5.0/24 is directly connected, FastEthernet0/1
```

```
Router(config)#ip route 0.0.0.0 0.0.0.0 201.100.11.1
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 201.100.11.1 to network 0.0.0.0
C     199.6.13.0/24 is directly connected, FastEthernet0/0
S*  0.0.0.0 [1/0] via 201.100.11.1
```

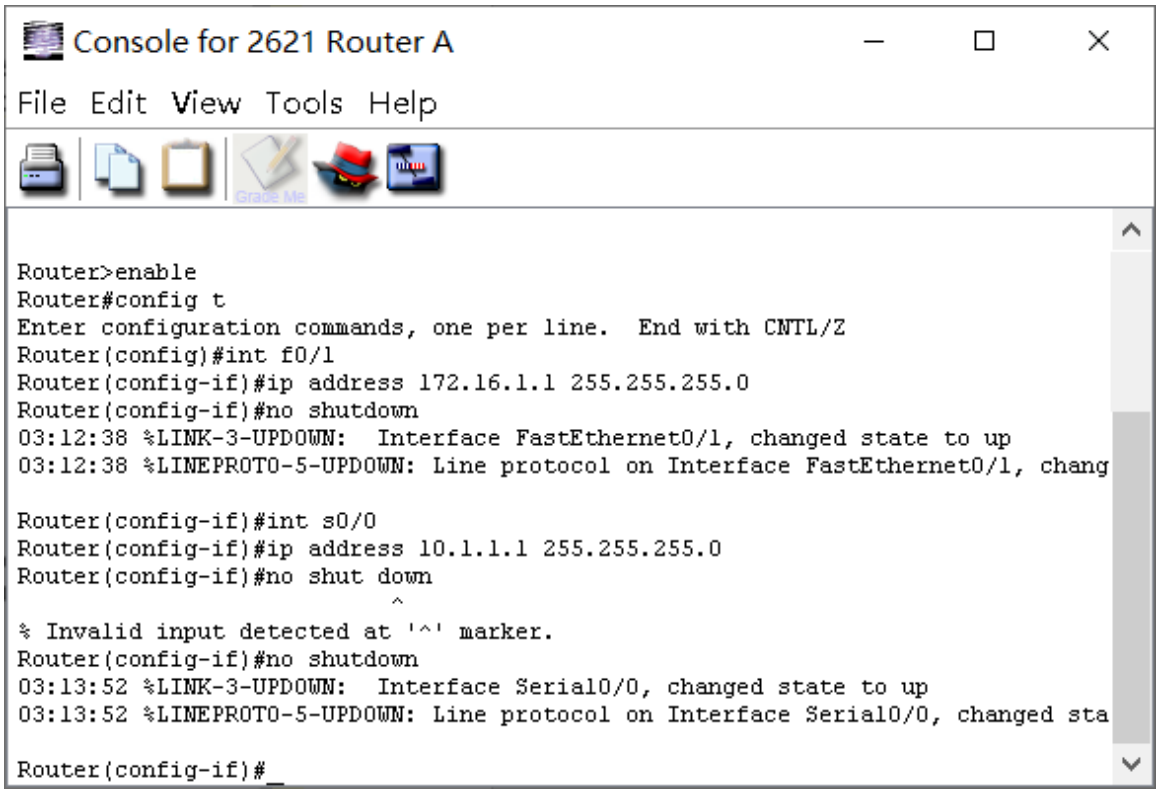
Ping 命令测试

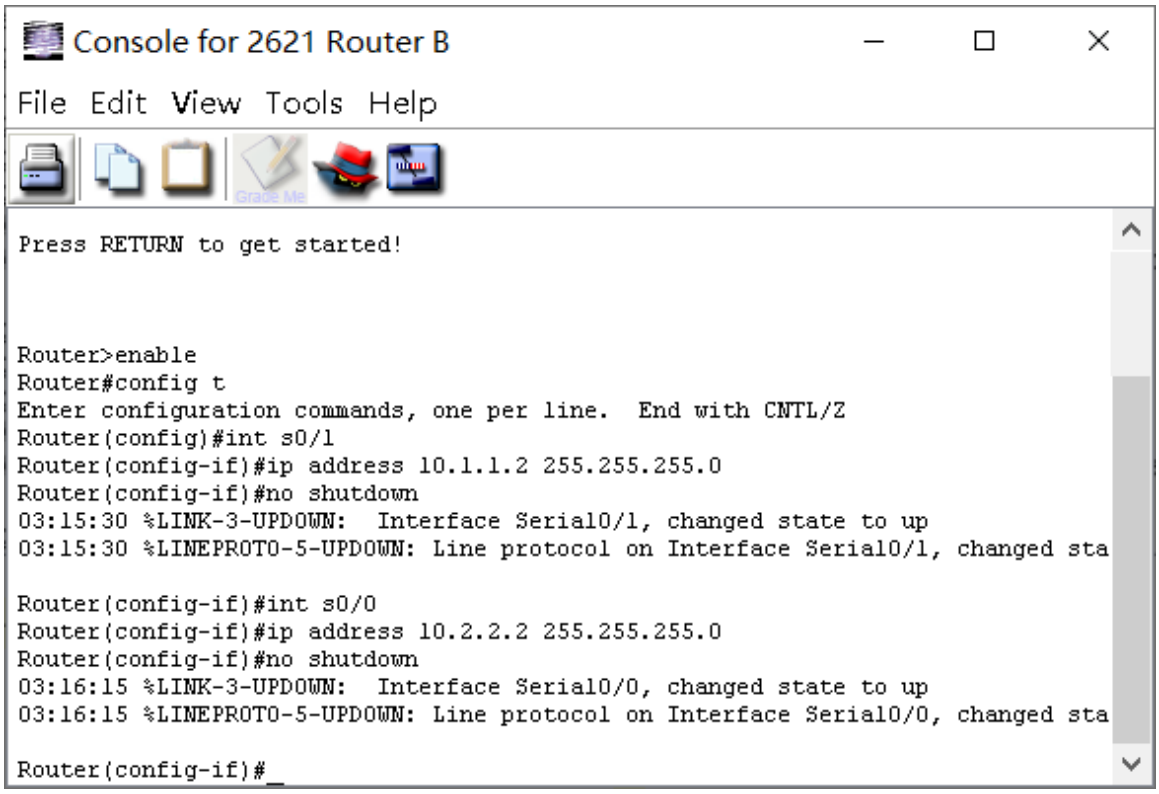
```
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.5.5.1, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 4/4/4 ms
Router#ping 205.7.5.1

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 205.7.5.1, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 4/4/4 ms
Router#ping 199.6.13.1
```

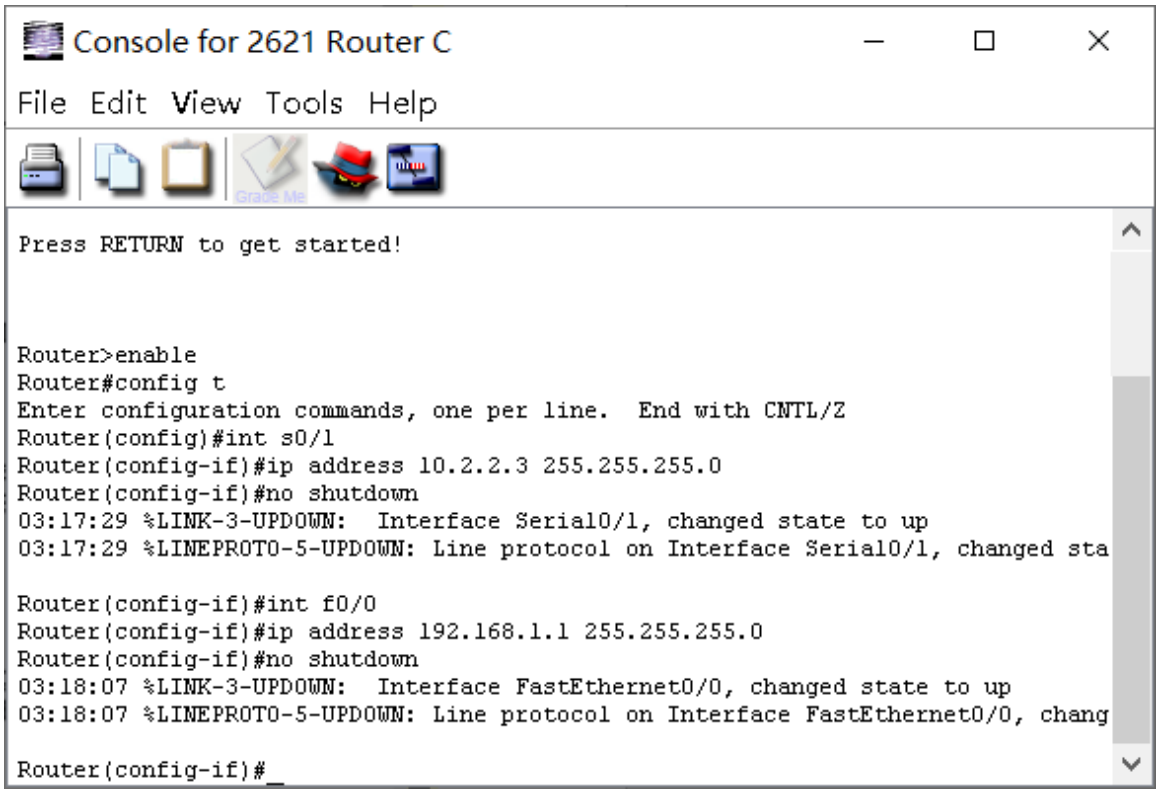
②动态路由



路由器端口 IP 配置


Console for 2621 Router A
File Edit View Tools Help
Router>enable
Router#config t
Enter configuration commands, one per line. End with CNTL/Z
Router(config)#int f0/1
Router(config-if)#ip address 172.16.1.1 255.255.255.0
Router(config-if)#no shutdown
03:12:38 %LINK-3-UPDOWN: Interface FastEthernet0/1, changed state to up
03:12:38 %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/1, chang
Router(config-if)#int s0/0
Router(config-if)#ip address 10.1.1.1 255.255.255.0
Router(config-if)#no shut down
^
% Invalid input detected at '^' marker.
Router(config-if)#no shutdown
03:13:52 %LINK-3-UPDOWN: Interface Serial0/0, changed state to up
03:13:52 %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/0, changed sta
Router(config-if)#_


Console for 2621 Router B
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 s0/1
Router(config-if)#ip address 10.1.1.2 255.255.255.0
Router(config-if)#no shutdown
03:15:30 %LINK-3-UPDOWN: Interface Serial0/1, changed state to up
03:15:30 %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/1, changed sta
Router(config-if)#int s0/0
Router(config-if)#ip address 10.2.2.2 255.255.255.0
Router(config-if)#no shutdown
03:16:15 %LINK-3-UPDOWN: Interface Serial0/0, changed state to up
03:16:15 %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/0, changed sta
Router(config-if)#_

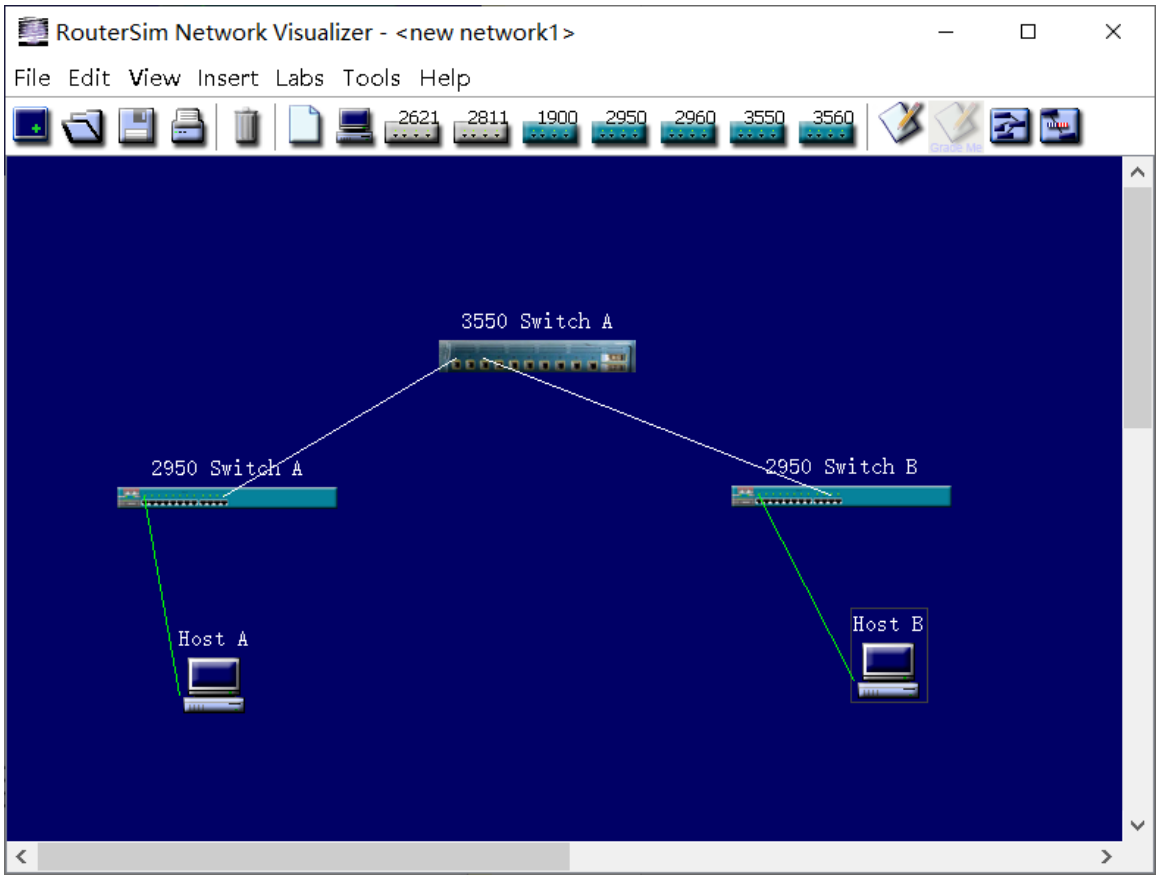


RIP 配置

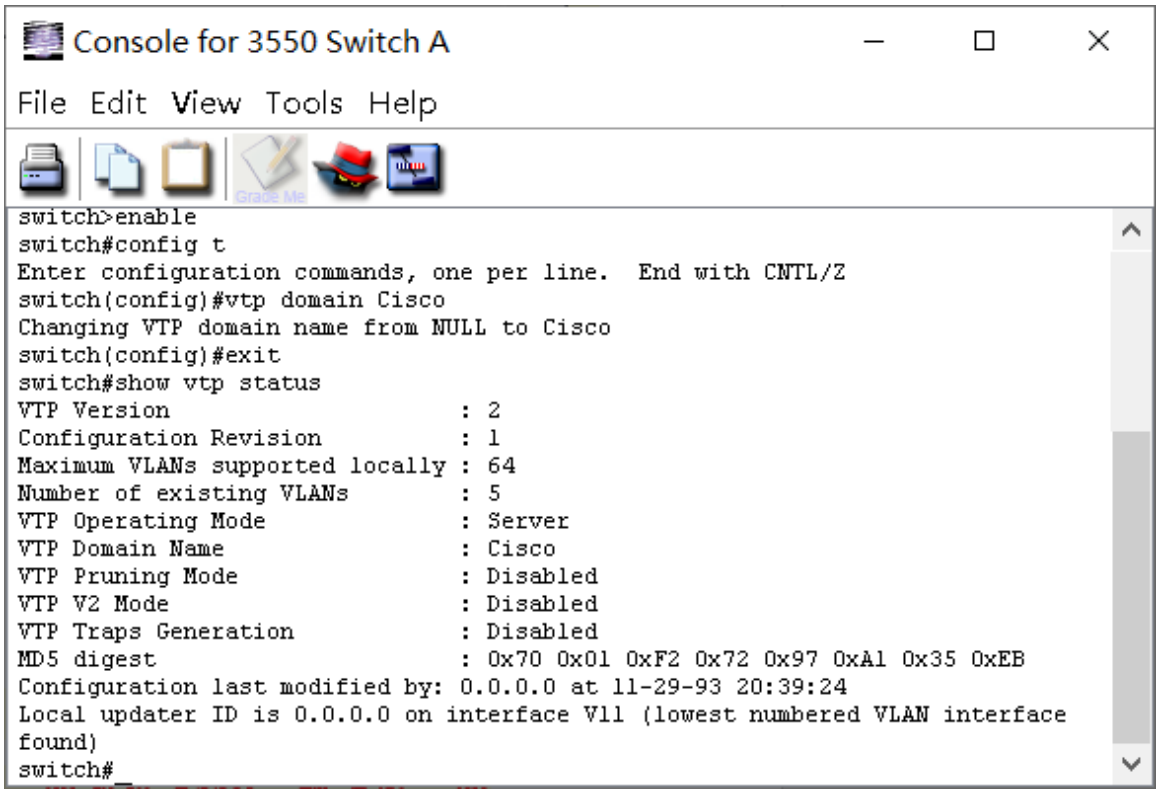
```
Router>enable
Router#config t
Enter configuration commands, one per line.  End with CNTL/Z
Router(config)#router rip
Router(config-router)#network 10.0.0.0
Router(config-router)#network 172.16.0.0
```

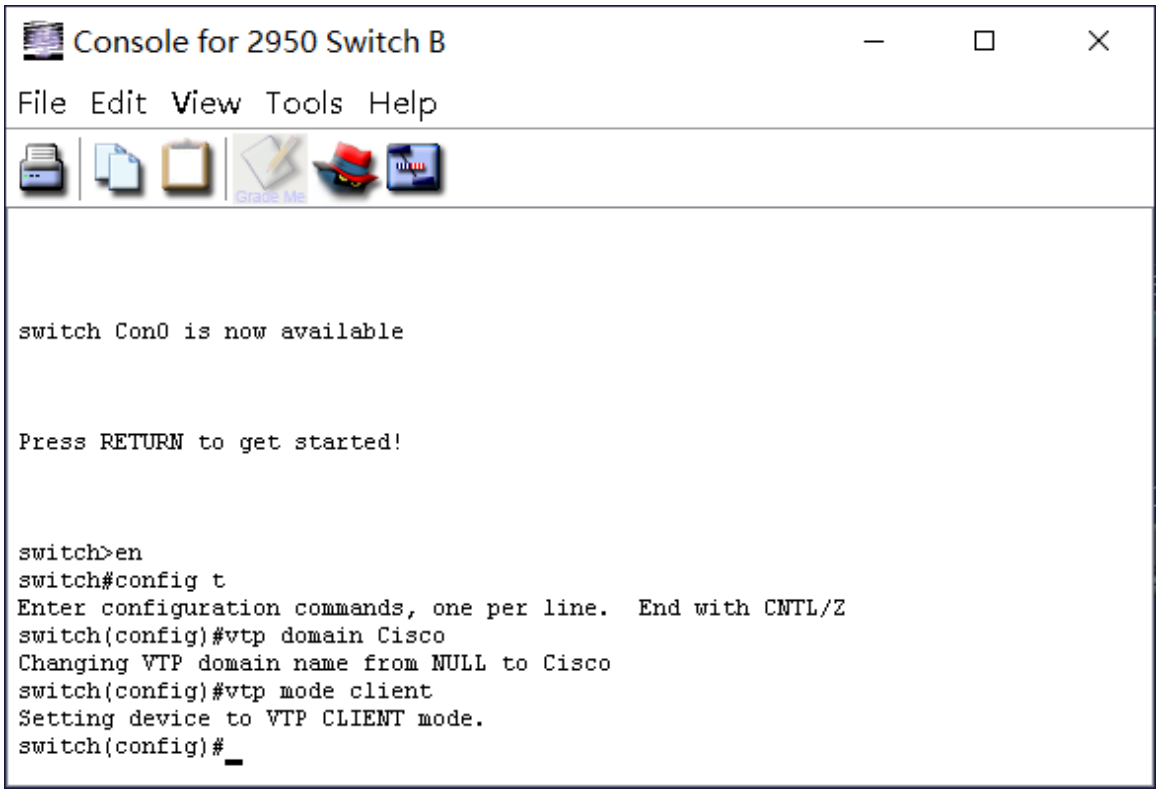
```
Router>enable
Router#show ip route
Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B - BGP
       D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
       N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
       E1 - OSPF external type 1, E2 - OSPF external 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

    172.16.0.0/24 is subnetted, 1 subnets
C      172.16.1.0 is directly connected, FastEthernet0/1
```

③交换机端口 VLAN

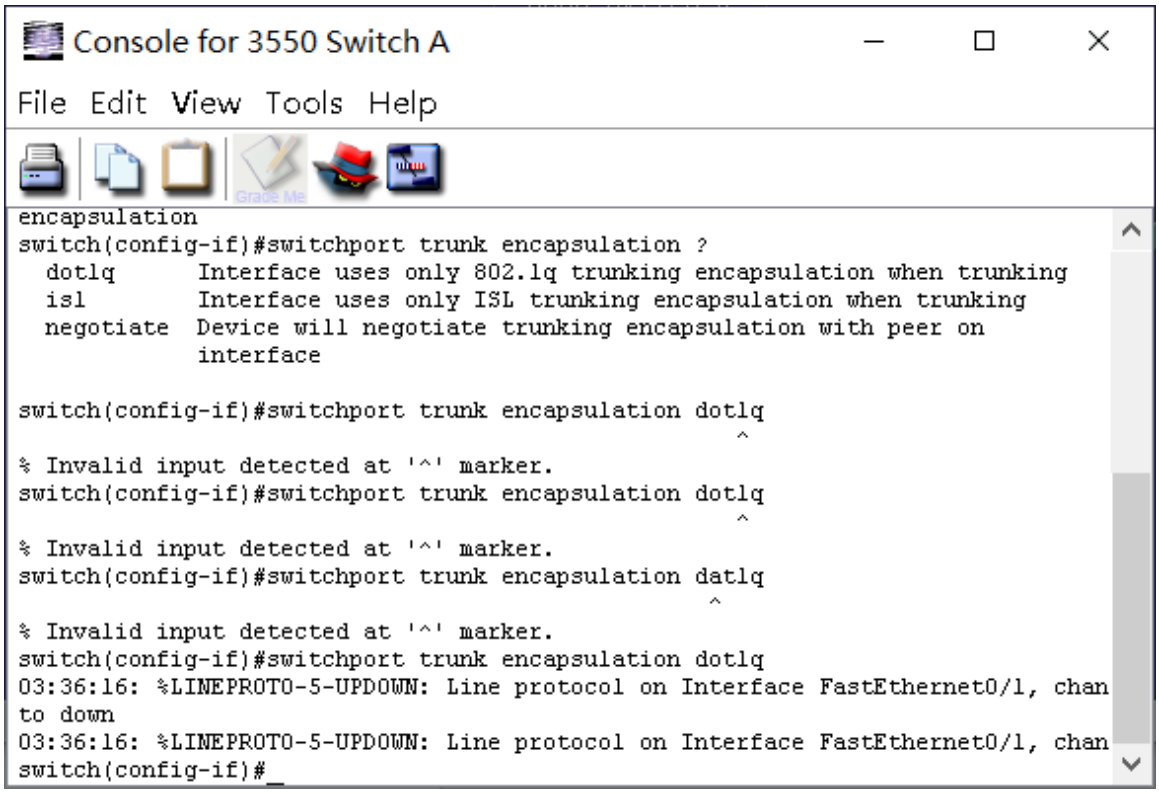

RouterSim Network Visualizer - <new network1>
File Edit View Insert Labs Tools Help
2621
2811
1900
2950
2960
3550
3560
3550 Switch A
2950 Switch A
2950 Switch B
Host A
Host B

设置 VTP


Console for 3550 Switch A
File Edit View Tools Help
switch>enable
switch#config t
Enter configuration commands, one per line. End with CNTL/Z
switch(config)#vtp domain Cisco
Changing VTP domain name from NULL to Cisco
switch(config)#exit
switch#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 : 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)
switch#


Console for 2950 Switch B
File Edit View Tools Help
switch Con0 is now available
Press RETURN to get started!
switch>en
switch#config t
Enter configuration commands, one per line. End with CNTL/Z
switch(config)#vtp domain Cisco
Changing VTP domain name from NULL to Cisco
switch(config)#vtp mode client
Setting device to VTP CLIENT mode.
switch(config)#

配置 trunk




```
switch>en
switch#config t
Enter configuration commands, one per line.  End with CNTL/Z
switch(config)#int fa0/11
switch(config-if)#exit
switch(config)#int fa0/12
switch(config-if)#switchport mode trunk
```

```
switch>en
switch#config t
Enter configuration commands, one per line.  End with CNTL/Z
switch(config)#int fa0/11
switch(config-if)#switchport mode trunk
switch(config-if)#
```

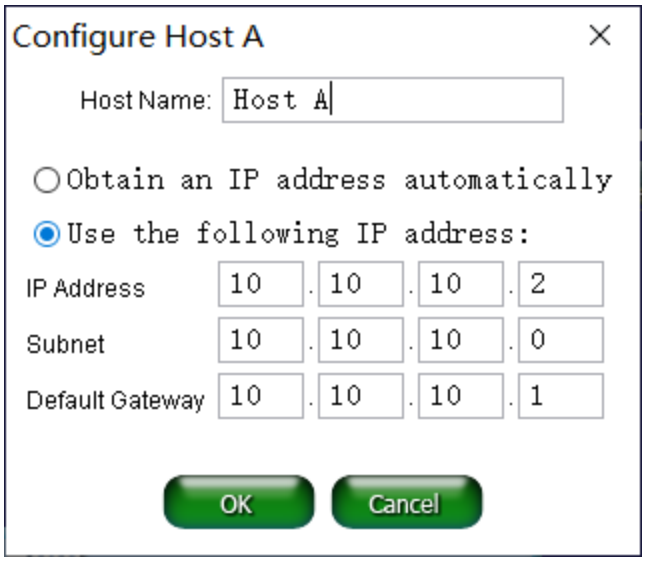
VLAN

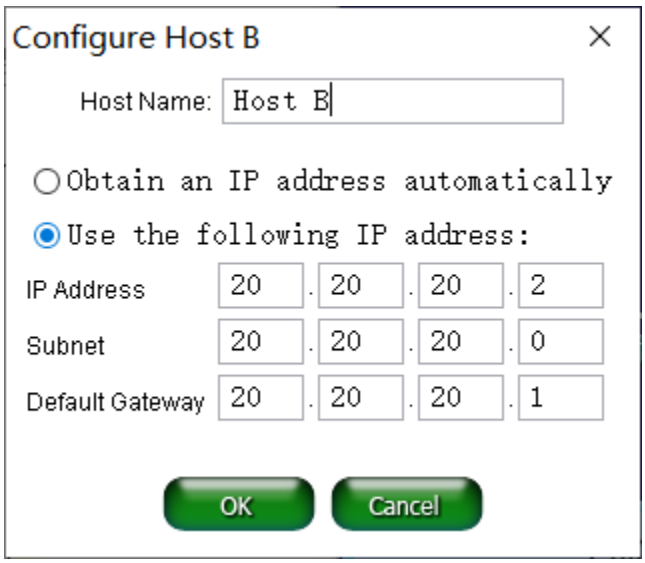
```
---- -------------------------------- --------- -------------------------------
1    default                          active    Fa0/2, Fa0/4, Fa0/5, Fa0/6
                                                Fa0/7, Fa0/8, Fa0/9, Fa0/10
10   VLAN0010                         active
20   VLAN0020                         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 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--

switch>en
switch#config t
Enter configuration commands, one per line.  End with CNTL/Z
switch(config)#int fa0/1
switch(config-if)#switchport access vlan 10

switch>en
switch#config t
Enter configuration commands, one per line.  End with CNTL/Z
switch(config)#int fa0/2
switch(config-if)#switchport access vlan 20
switch(config-if)#
```

配置交换机管理地址

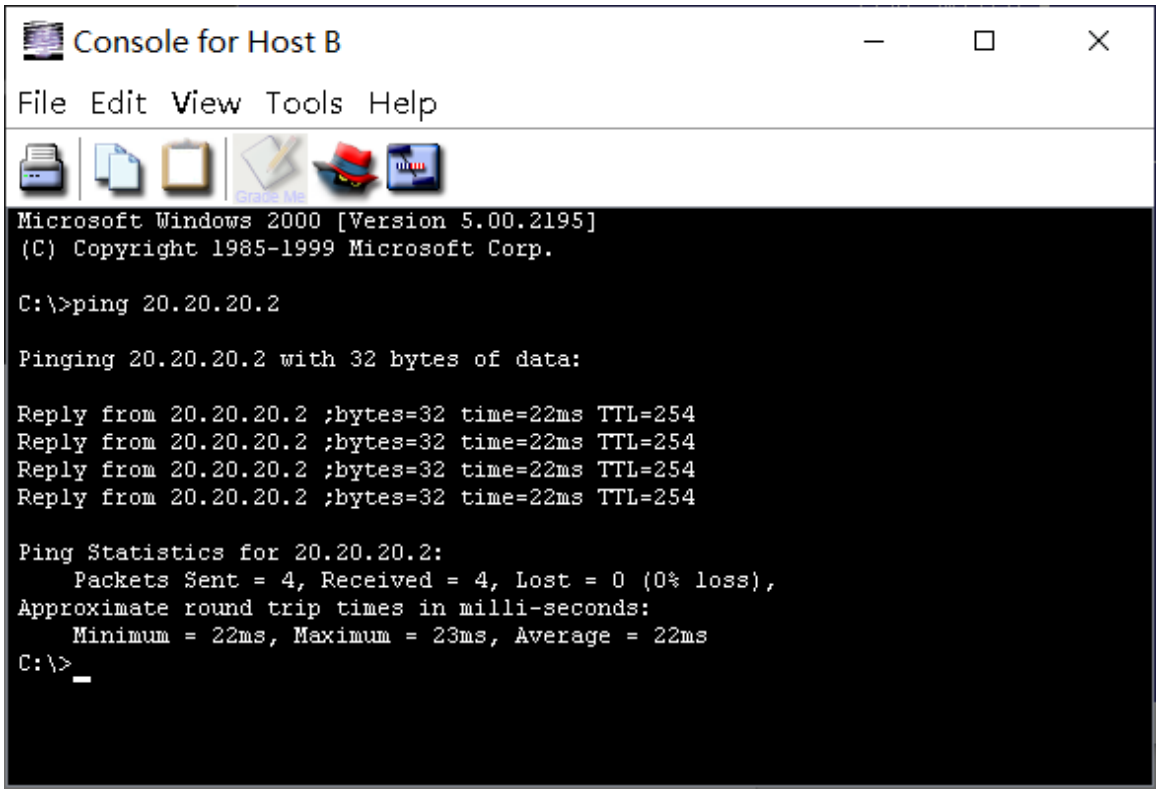
```
switch(config)#int vlan 1
switch(config-if)#ip address 192.168.10.1 255.255.255.0
switch(config-if)#no shut

switch>en
switch#config t
Enter configuration commands, one per line.  End with CNTL/Z
switch(config)#int vlan 1
switch(config-if)#ip address 192.168.10.2 255.255.255.0
switch(config-if)#no shut

switch>en
switch#config
Enter configuration commands, one per line.  End with CNTL/Z
switch(config)#int vlan 1
switch(config-if)#ip address 192.168.10.3 255.255.255.0
switch(config-if)#no shut
```

配置 hostA,hostB,测试






```
switch>en
switch#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
```



4 实验总结

学习到了路由器配置的相关知识，学习到了动态和静态路由以及 VLAN 的一些知识