

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 3 班

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2020 年 4 月 8 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）。

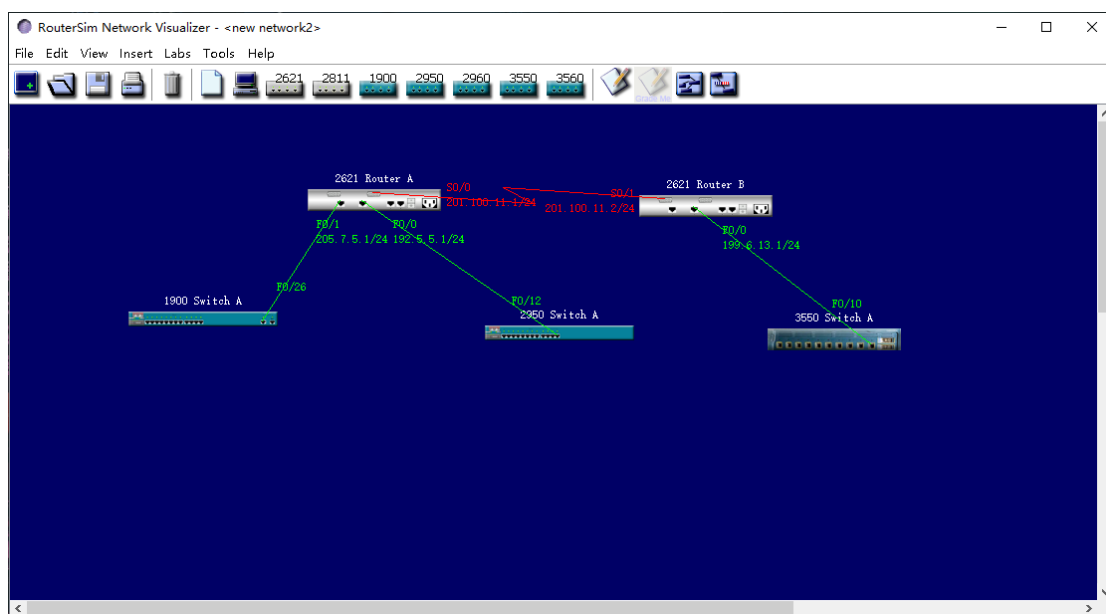
2 实验环境

使用软件：CCNA Network Visualizer 6.0 ； Router eSIM v1.1。

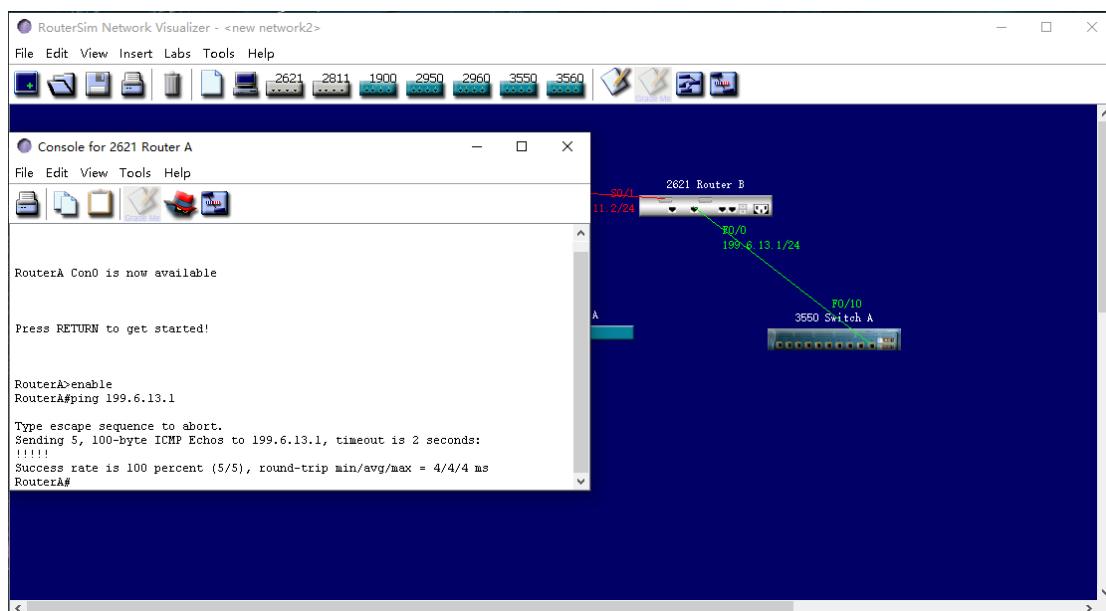
3 实验结果

3.1 CCNA Network Visualizer 6.0 配置静态路由、动态路由和交换机端口的 VLAN

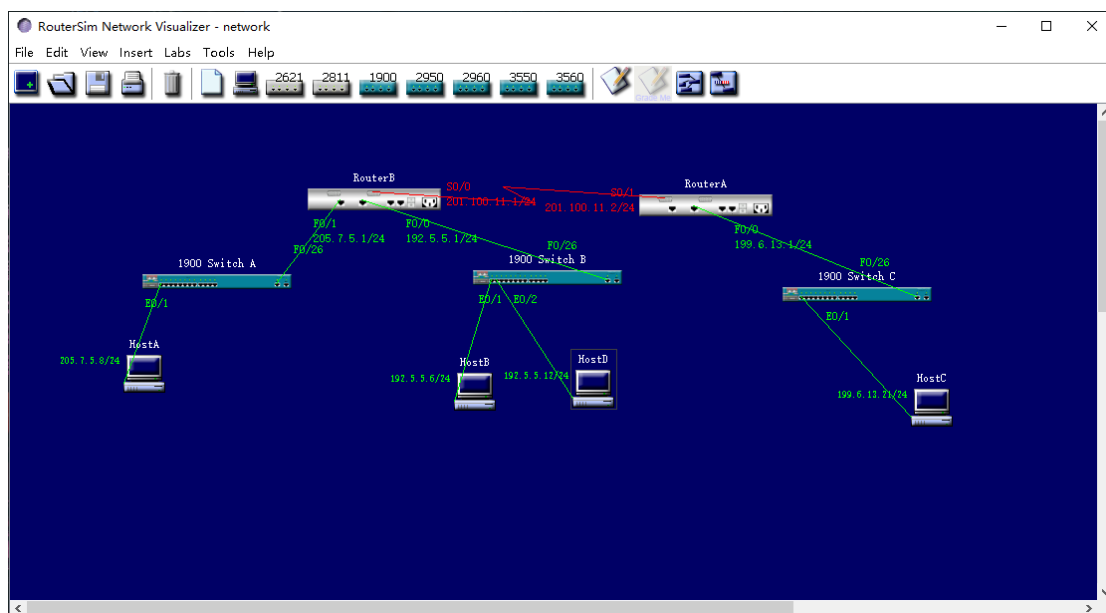
3.1.1 Cisco 路由器访问列表配置



3.1.1-1 实验拓扑图 1

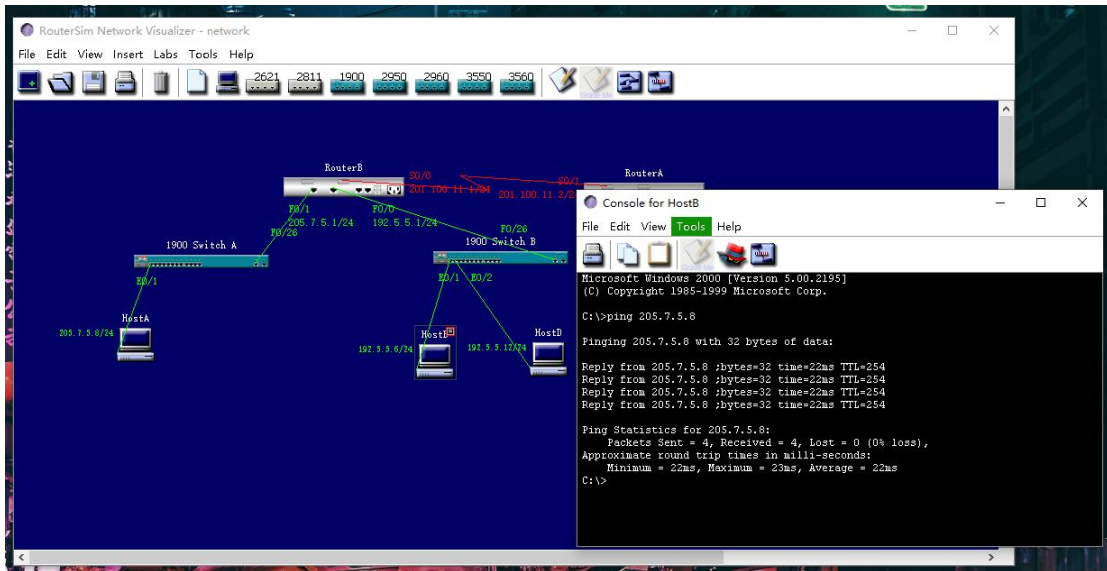


3.1.1-2 设置静态路由，并 ping 199.6.13.1 成功

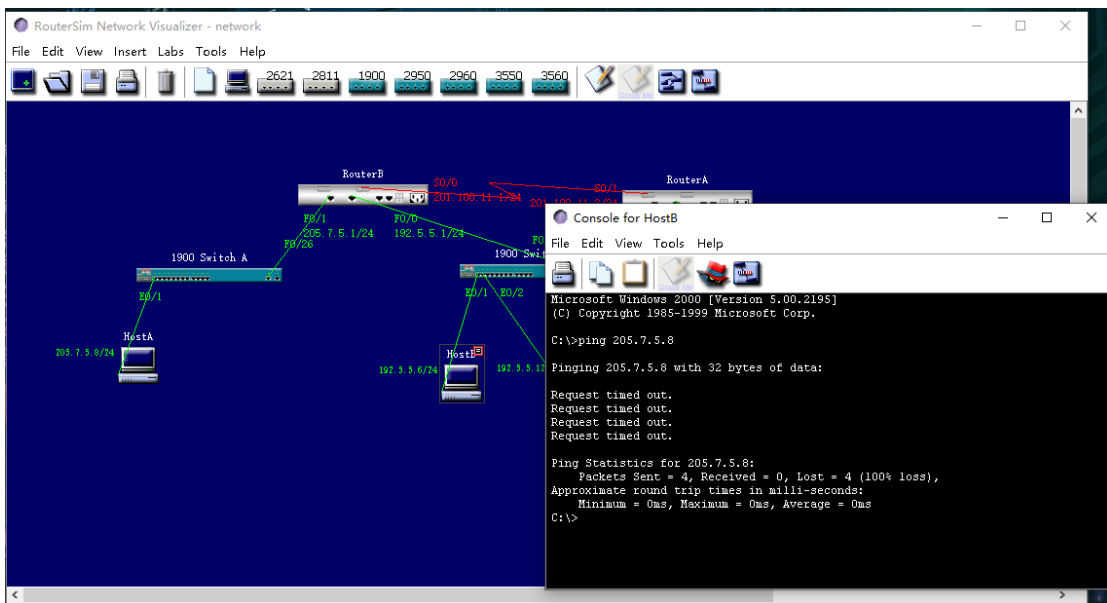


3.1.1-3 实验拓扑图 2

利用标准访问列表限制主机 HostB 对子网 205.7.5.0 网络的访问:

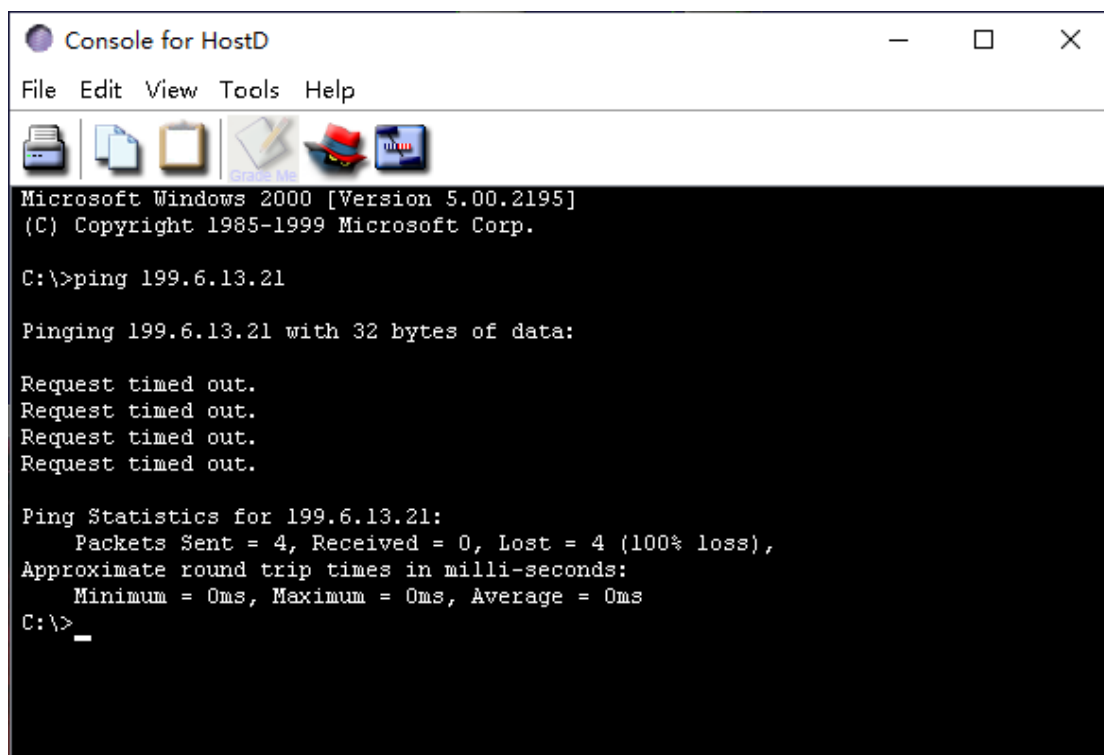


3.1.1-4 限制前 HostB 可以访问子网 205.7.5.0 的主机 HostA



3.1.1-5 限制后 HostB 已不能访问子网 205.7.5.0

利用访问列表限制子网对子网 199.6.13.0 的访问：



The screenshot shows a Windows 2000 console window titled "Console for HostD". The window has a menu bar with "File", "Edit", "View", "Tools", and "Help". Below the menu bar is a toolbar with icons for printer, document, folder, notepad, and a red hat. The main text area displays the following output:

```
Microsoft Windows 2000 [Version 5.00.2195]
(C) Copyright 1985-1999 Microsoft Corp.

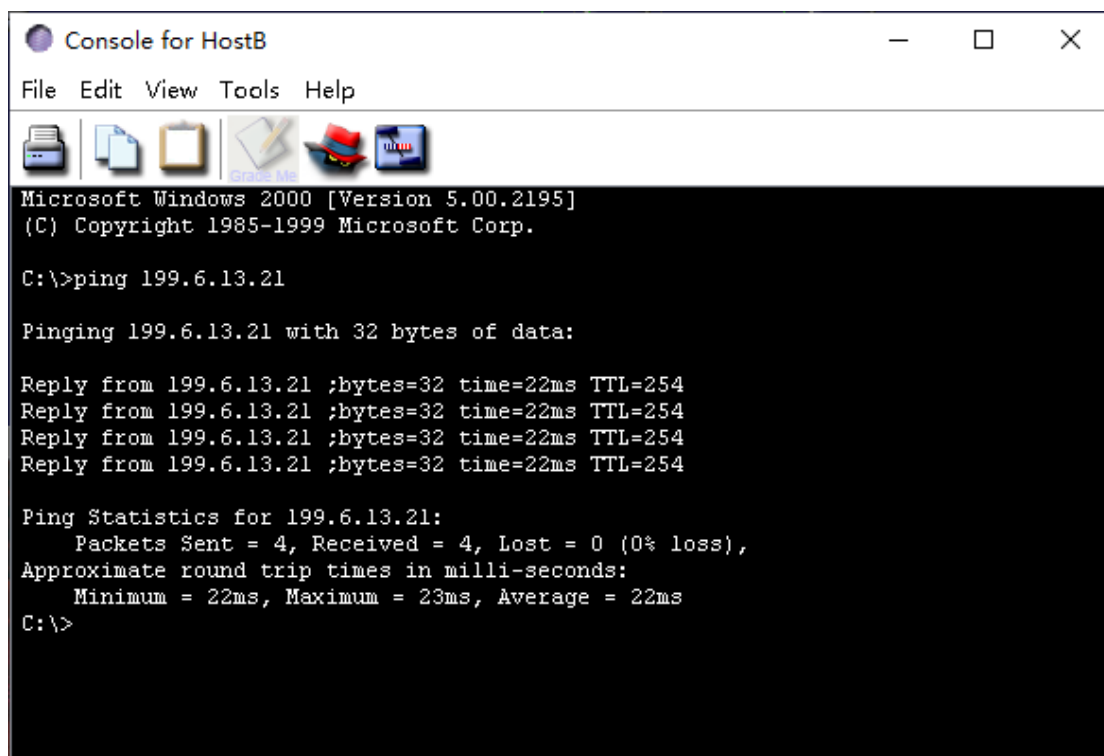
C:\>ping 199.6.13.21

Pinging 199.6.13.21 with 32 bytes of data:

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

Ping Statistics for 199.6.13.21:
    Packets Sent = 4, Received = 0, Lost = 4 (100% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms
C:\>
```

3.1.1-6 限制后子网 192.5.5.9~192.5.5.14 范围的 HostD 已不能访问子网
199.6.13.0



The screenshot shows a Windows 2000 console window titled "Console for HostB". The window has a menu bar with "File", "Edit", "View", "Tools", and "Help". Below the menu bar is a toolbar with icons for printer, document, folder, notepad, and a red hat. The main text area displays the following output:

```
Microsoft Windows 2000 [Version 5.00.2195]
(C) Copyright 1985-1999 Microsoft Corp.

C:\>ping 199.6.13.21

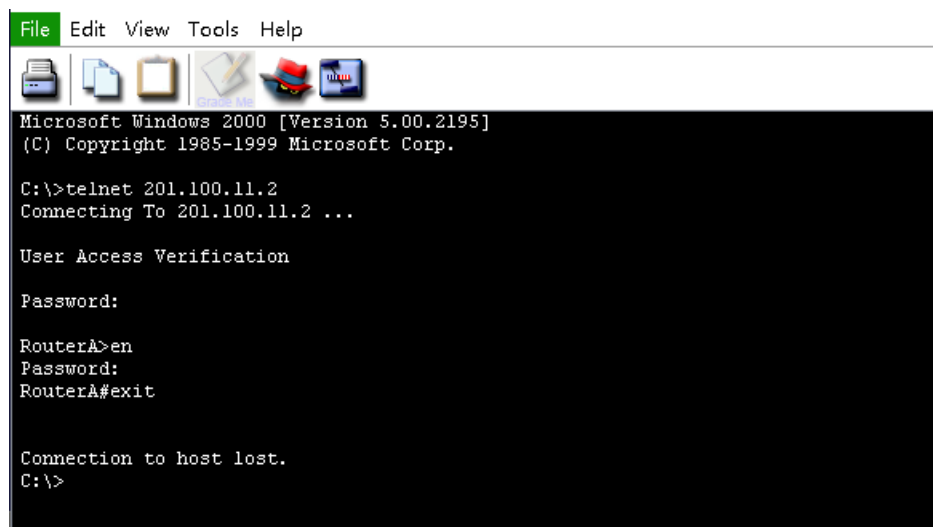
Pinging 199.6.13.21 with 32 bytes of data:

Reply from 199.6.13.21 :bytes=32 time=22ms TTL=254
Reply from 199.6.13.21 :bytes=32 time=22ms TTL=254
Reply from 199.6.13.21 :bytes=32 time=22ms TTL=254
Reply from 199.6.13.21 :bytes=32 time=22ms TTL=254

Ping Statistics for 199.6.13.21:
    Packets Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 22ms, Maximum = 23ms, Average = 22ms
C:\>
```

3.1.1-7 不在该子网范围内的 HostB 对子网 199.6.13.0 的访问不受影响

在 RouterA 上建立访问列表，使主机 HostA 不能远程登陆 RouterA:



```
File Edit View Tools Help
Microsoft Windows 2000 [Version 5.00.2195]
(C) Copyright 1985-1999 Microsoft Corp.

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

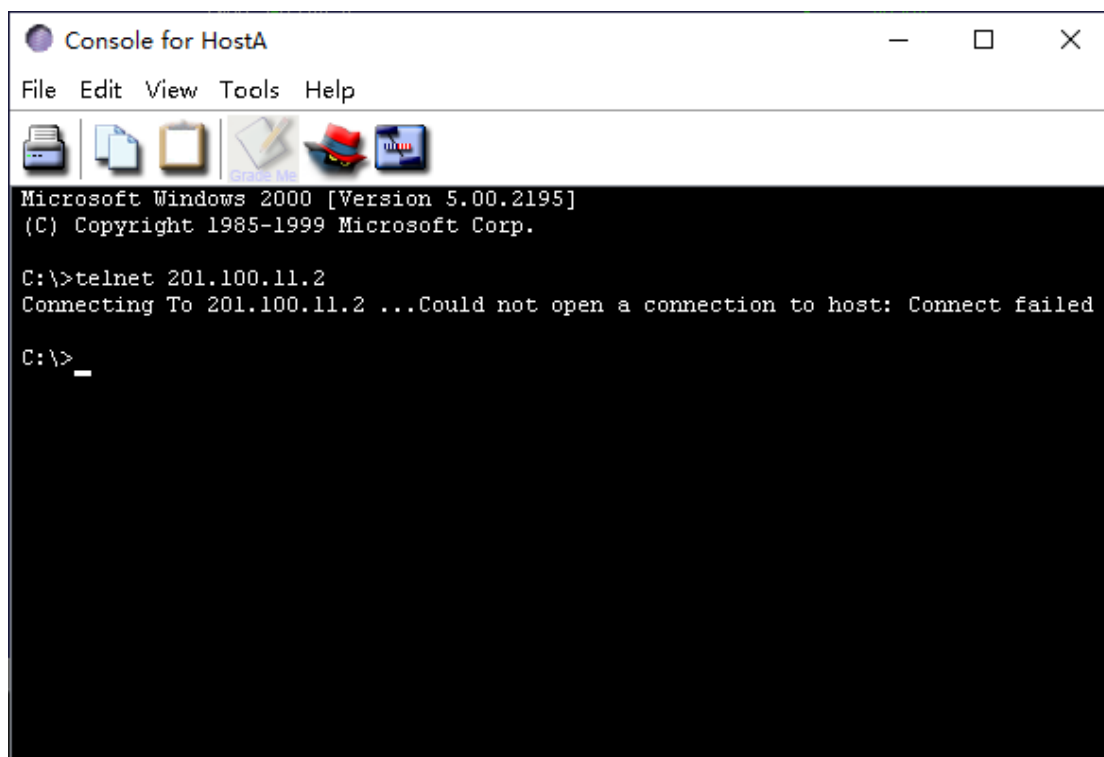
User Access Verification

Password:

RouterA>en
Password:
RouterA#exit

Connection to host lost.
C:\>
```

3.1.1-8 在主机 HostA 上远程登录 RouterA



```
Console for HostA
File Edit View Tools Help
Microsoft Windows 2000 [Version 5.00.2195]
(C) Copyright 1985-1999 Microsoft Corp.

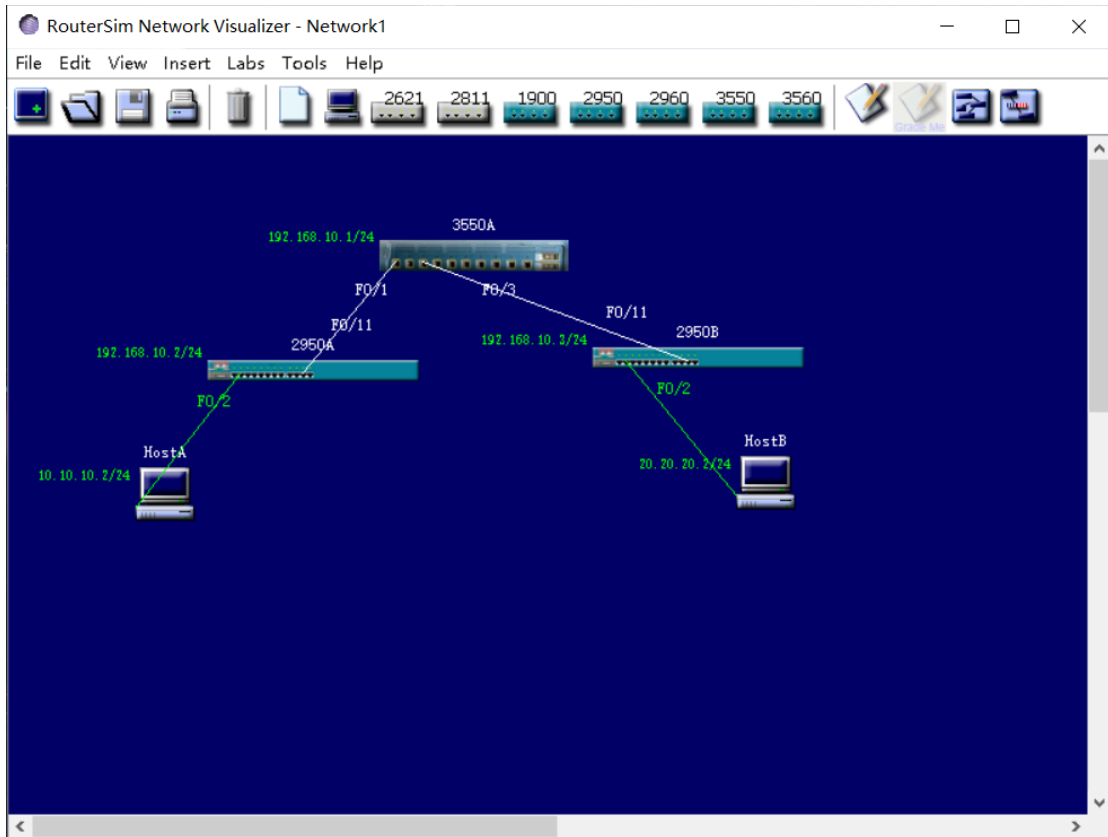
C:\>telnet 201.100.11.2
Connecting To 201.100.11.2 ...Could not open a connection to host: Connect failed

C:\>_
```

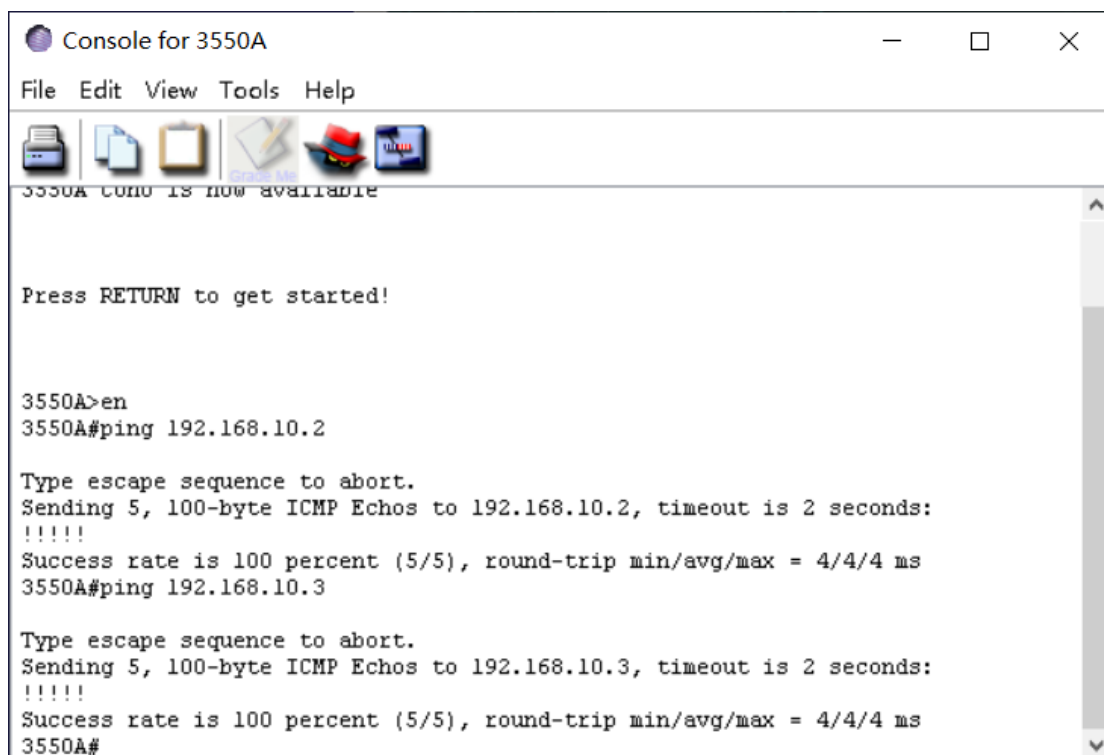
3.1.1-9 配置 RouterA,使 HostA 不能 telnet 到 RouterA 上，配置完成后验证结果

3.1.2 基于交换机端口的 VLAN 配置

VLAN 实例 1:



3.1.2-1 实例 1 拓扑图



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

3550A console is now available

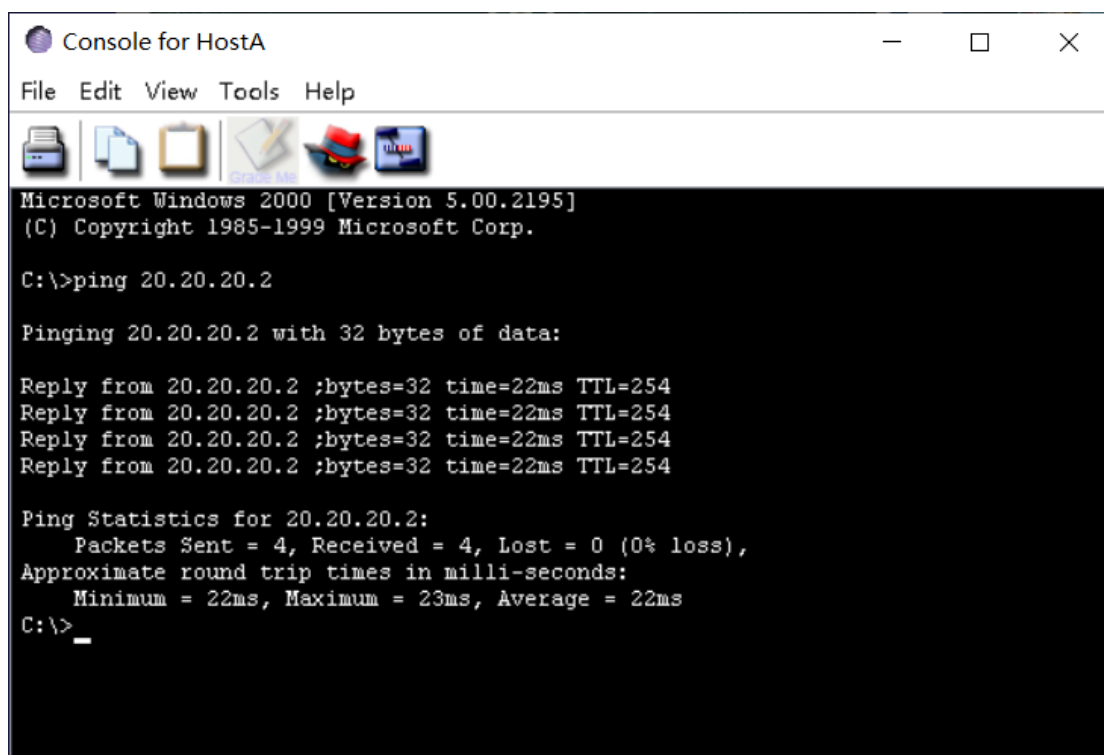
Press RETURN to get started!

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
3550A#
```

3.1.2-2 测试：在 3550 交换机上分别 ping 2950 交换机



```
Console for HostA
File Edit View Tools Help

Microsoft Windows 2000 [Version 5.00.2195]
(C) Copyright 1985-1999 Microsoft Corp.

C:\>ping 20.20.20.2

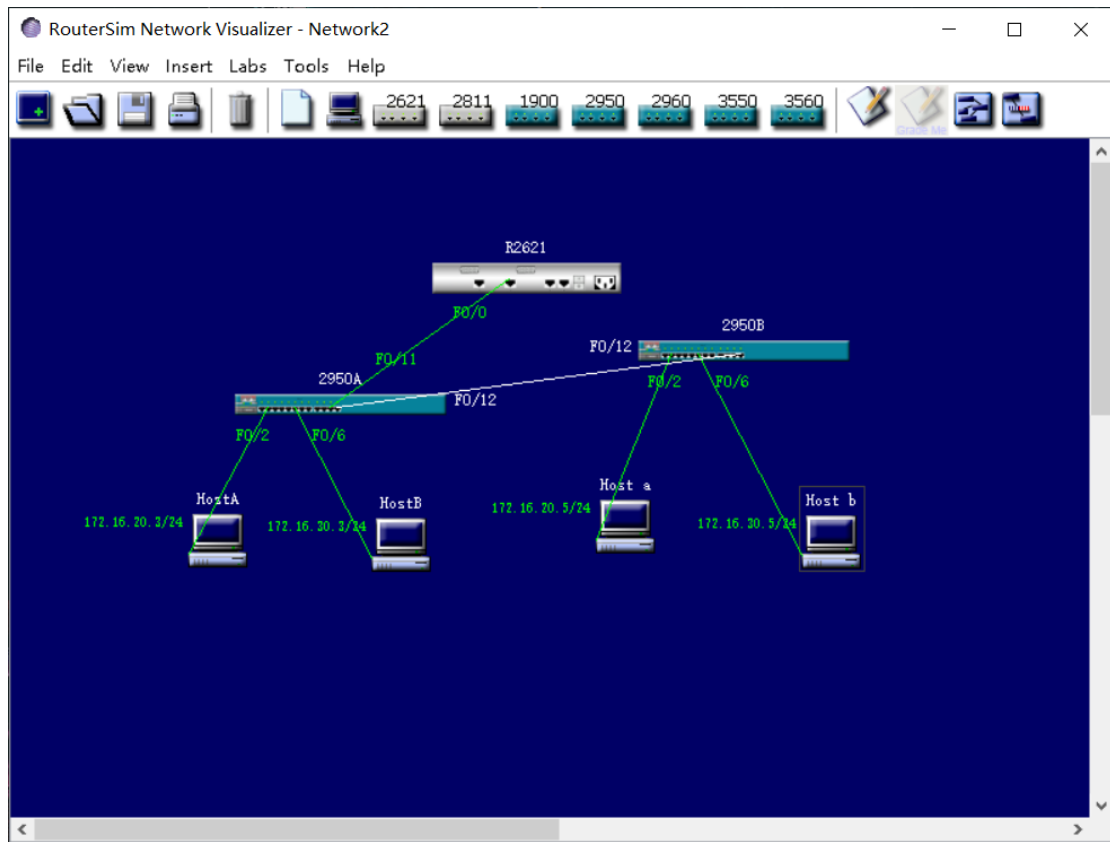
Pinging 20.20.20.2 with 32 bytes of data:

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

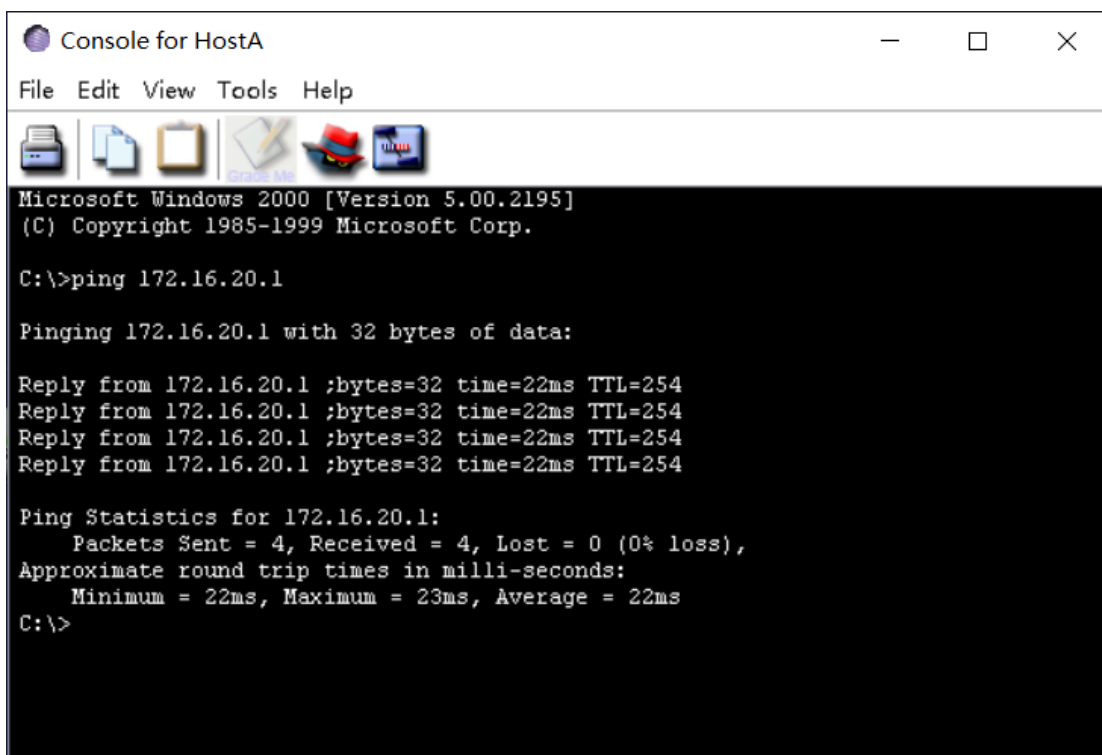
Ping Statistics for 20.20.20.2:
    Packets Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 22ms, Maximum = 23ms, Average = 22ms
C:\>
```

3.1.2-3 在主机 HostA 上 ping 主机 HostB 成功

VLAN 实例 2:



3.1.2-4 实例 2 拓扑图



```
Microsoft Windows 2000 [Version 5.00.2195]
(C) Copyright 1985-1999 Microsoft Corp.

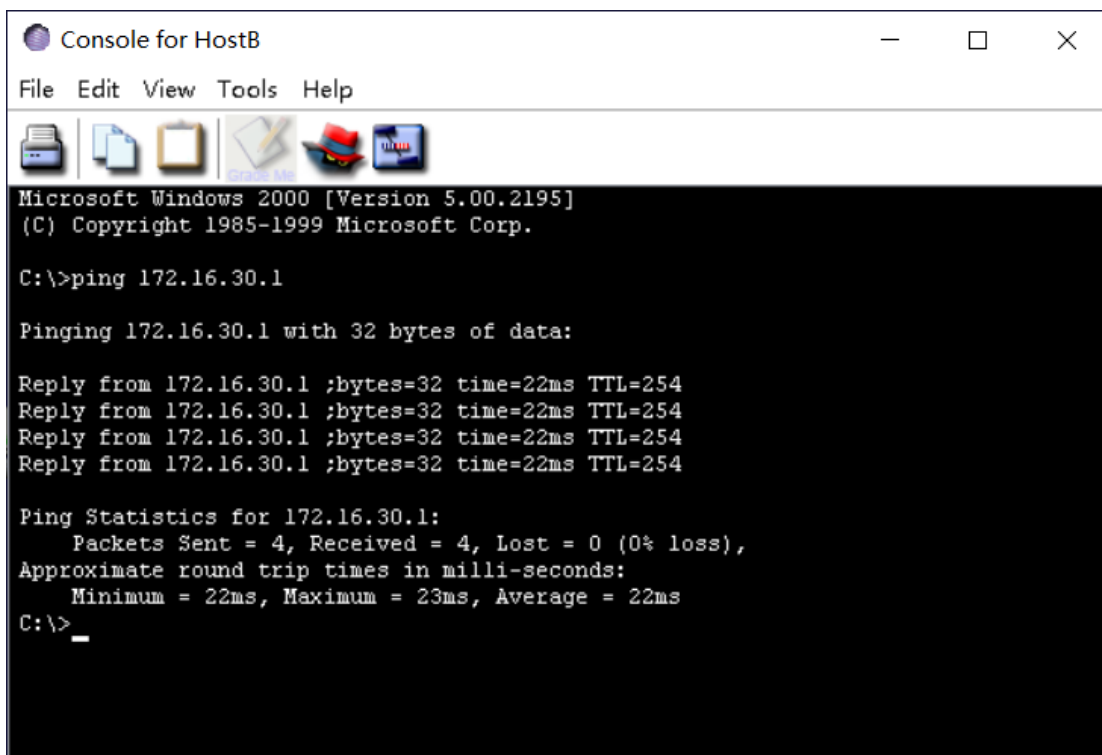
C:\>ping 172.16.20.1

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
C:\>
```

3.1.2-5 在属于 VLAN2 的主机 HostA 上 ping 172.16.20.1



```
Microsoft Windows 2000 [Version 5.00.2195]
(C) Copyright 1985-1999 Microsoft Corp.

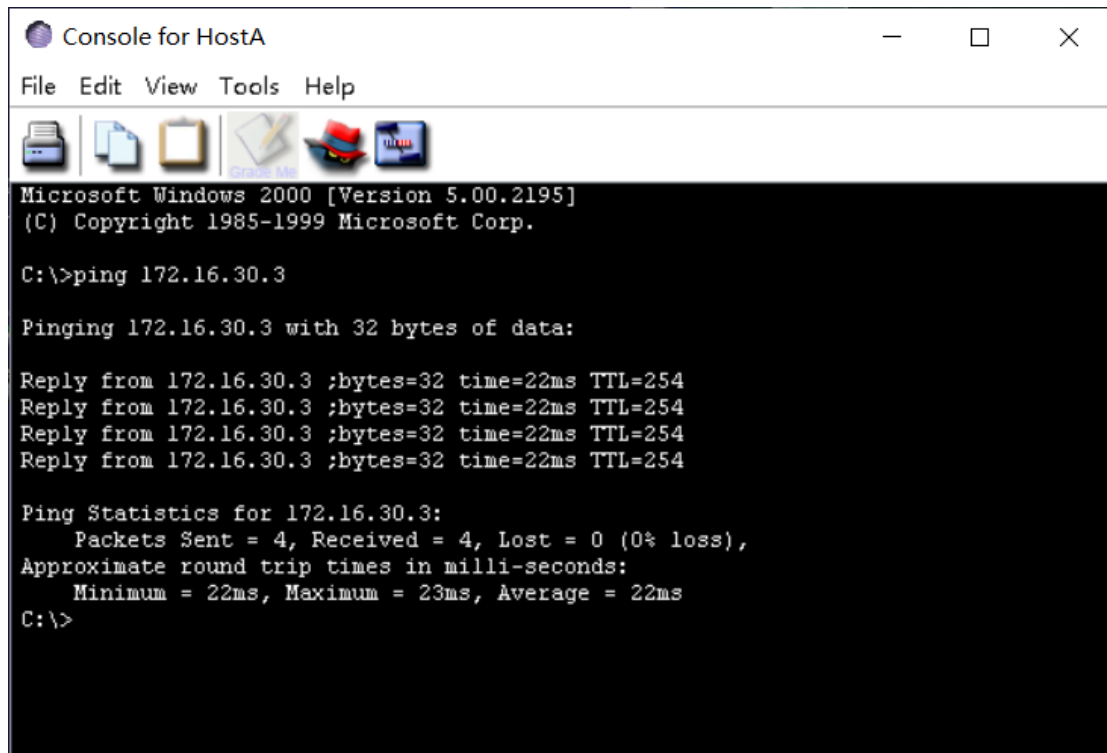
C:\>ping 172.16.30.1

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
C:\>
```

3.1.2-6 在属于 VLAN3 的主机 HostB 上 ping 172.16.30.1



```
Microsoft Windows 2000 [Version 5.00.2195]
(C) Copyright 1985-1999 Microsoft Corp.

C:\>ping 172.16.30.3

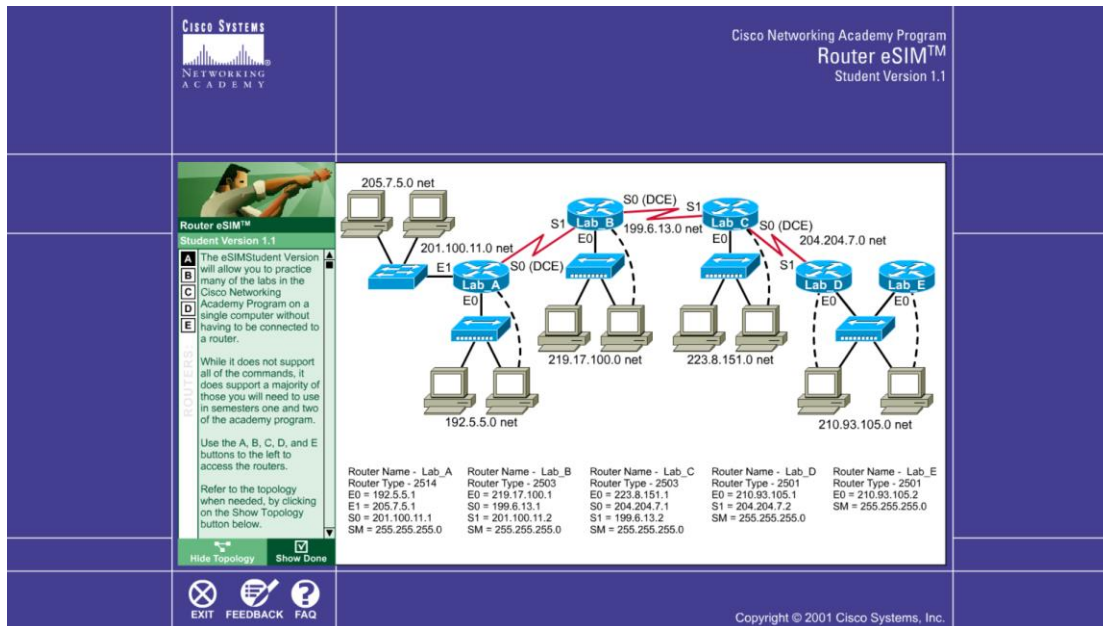
Pinging 172.16.30.3 with 32 bytes of data:

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
C:\>
```

3.1.2-7 在 HostA 上 ping HostB

3.2 Router eSIM 模拟路由器的配置环境



3.2.1 网络拓扑图

即根据此拓扑图来模拟路由器的配置环境。



3.2.2 Lab_A Completed



3.2.3 Lab_B Completed



3.2.4 Lab_C Completed



3.2.5 Lab_D Completed



3.2.6 Lab_E Completed

This activity is completed.



3.2.7 输入示例

4 实验总结

经过本次实验，我对于 Cisco IOS 路由器的基本配置有了较为深刻的认识，能自己动手配置静态路由、动态路由以及基于交换机端口的 VLAN。在实验过程中由于对软件使用的不熟练遇到了一定困难，经认真研究课程实验手册后得以解决。