

# 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 2 班

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学 号 24320182203231

实验时间 2020 年 4 月 8 日

2020 年 4 月 21 日

## 1 实验目的

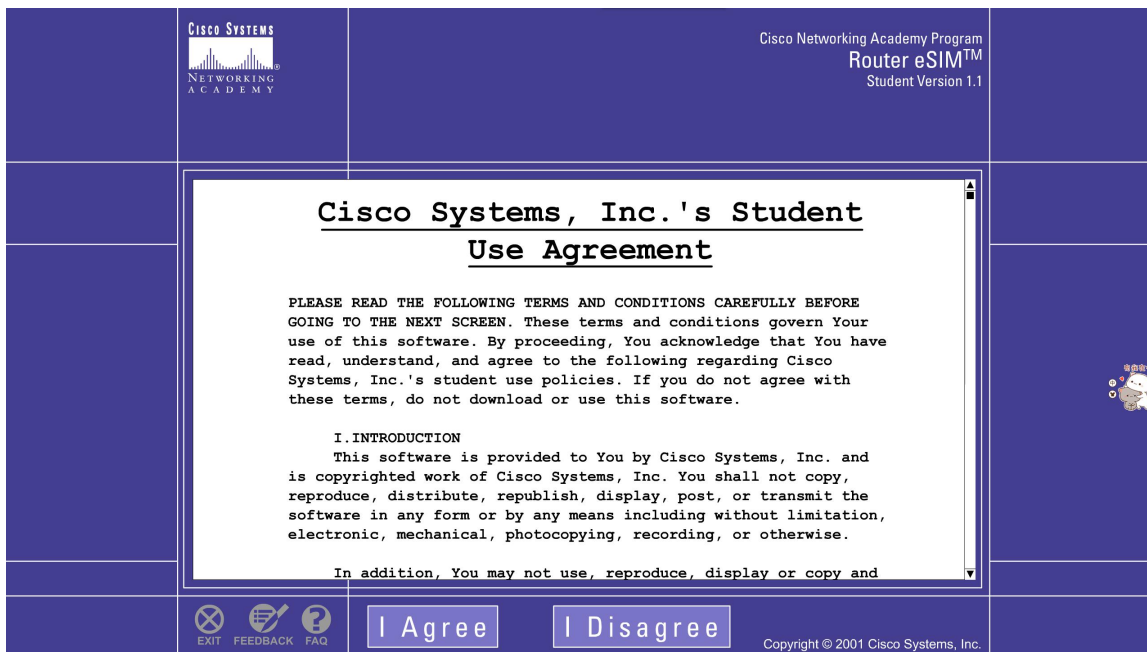
使用 Router eSIM v1.1 模拟器来模拟路由器的配置环境；使用 CCNA Network Visualizer 6.0 配置静态路由、动态路由和交换机端口的 VLAN（虚拟局域网）。

## 2 实验环境

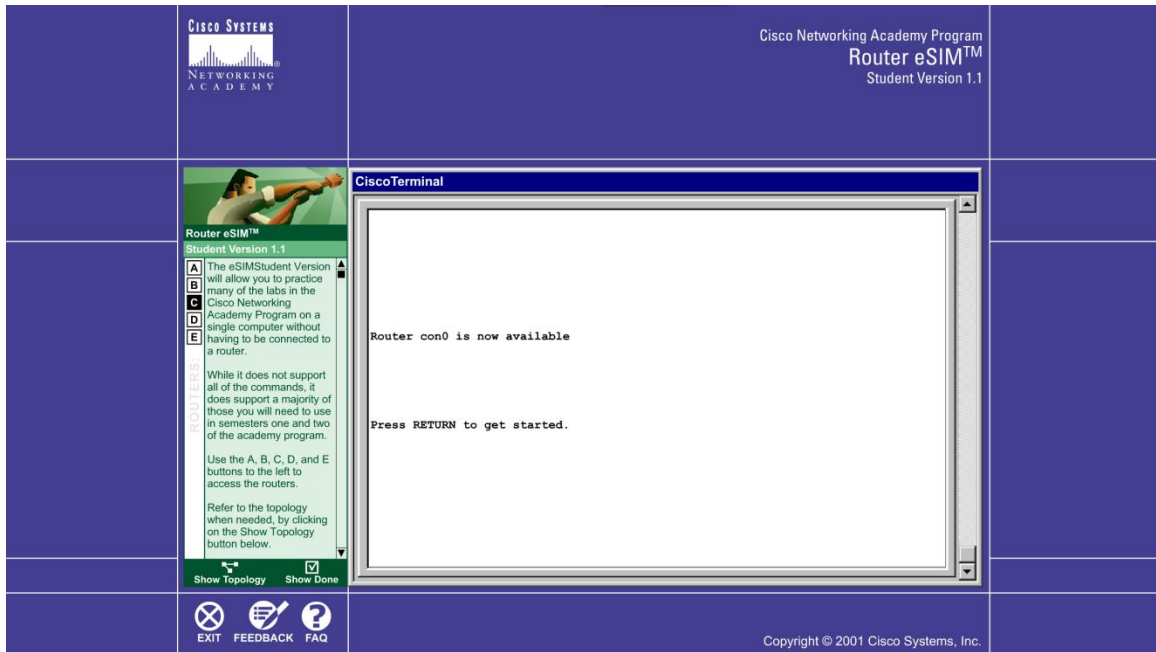
操作系统：Windows 10，实验工具：Router eSIM v1.1，CCNA Network Visualizer 6.0。

## 3 实验结果

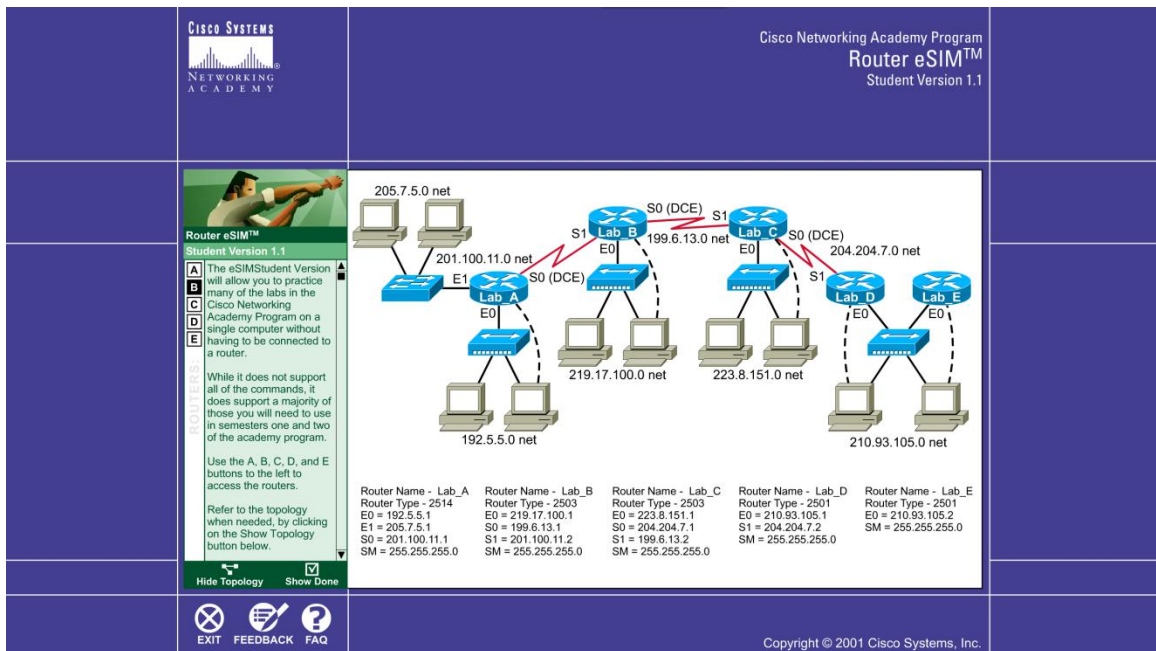
Router eSIM v1.1 启动界面：



主界面：



拓扑图：



改变路由器的名字:

```
Router#config t
Enter configuration commands, one per line.  End with END.
Router(config)#hostname lab_A
lab_A(config)#
```

查看路由器的配置文件:

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

Current configuration:
!
version 12.0
service timestamps debug uptime
service timestamps log uptime
no service password-encryption
!
hostname lab_A
!
enable password
!
!
ip subnet-zero
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
!
!
```

显示串口的配置情况:

```
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
```

查看 IOS 的版本信息:

```
lab_A#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 SOFTWARE (fc1)

Router uptime is 0 hours, 33 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.
Basic Rate ISDN software, Version 1.1.
2 Ethernet/IEEE 802.3 interface(s)
2 Serial network interface(s)
32K bytes of non-volatile configuration memory.
```

设置当日消息标题:

```
lab_A(config)#
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)#_
```

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
lab_A(config)#
```

为路由器接口配置 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
lab_A(config-if)#_
```

配置充当 DEC 端的串行端口：

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

查看串口的配置情况：

```
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
```

Lab\_A 配置完成：

**Checking Your Configuration**

This activity is not completed.

Please click on one of the buttons below to **check** that Router's Configuration:

A

B

C

D

E

Please click on one of the buttons below to **set** that Router's Configuration:

A

B

C

D

E

Loads all router variables for this eSIM™ scenario except the IP host table, which means, for example, that you will not be able to use the router name as part of ping or telnet commands.

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	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



Lab\_B 配置完成:

### Checking Your Configuration

**This activity is not completed.**

Please click on one of the buttons below to **check** that Router's Configuration:

A B C D E

Please click on one of the buttons below to **set** that Router's Configuration:

A B C D E

Loads all router variables for this eSIM™ scenario **except** the IP host table, which means, for example, that you will not be able to use the router name as part of ping or telnet commands.

Lab_B	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
S0 IP	Done
S0 Clock Rate	Done
S0 Shutdown	Done
S1 IP	Done
S1 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

Lab\_C 配置完成:

### Checking Your Configuration

**This activity is not completed.**

Please click on one of the buttons below to **check** that Router's Configuration:

A B C D E

Please click on one of the buttons below to **set** that Router's Configuration:

A B C D E

Loads all router variables for this eSIM™ scenario **except** the IP host table, which means, for example, that you will not be able to use the router name as part of ping or telnet commands.

Lab_C	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
S0 IP	Done
S0 Clock Rate	Done
S0 Shutdown	Done
S1 IP	Done
S1 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

Lab\_D 配置完成:

**This activity is not completed.**

Please click on one of the buttons below to **check** that Router's Configuration:

A

B

C

D

E

Please click on one of the buttons below to **set** that Router's Configuration:

A

B

C

D

E

Loads all router variables for this eSIM™ scenario **except** the IP host table, which means, for example, that you will not be able to use the router name as part of ping or telnet commands.

Lab_D	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
S1 IP	Done
S1 Shutdown	Done
Routing Protocol	Not Done
Network 1	Not Done
Network 2	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

Lab\_E 配置完成:

**This activity is not completed.**

Please click on one of the buttons below to **check** that Router's Configuration:

A

B

C

D

E

Please click on one of the buttons below to **set** that Router's Configuration:

A

B

C

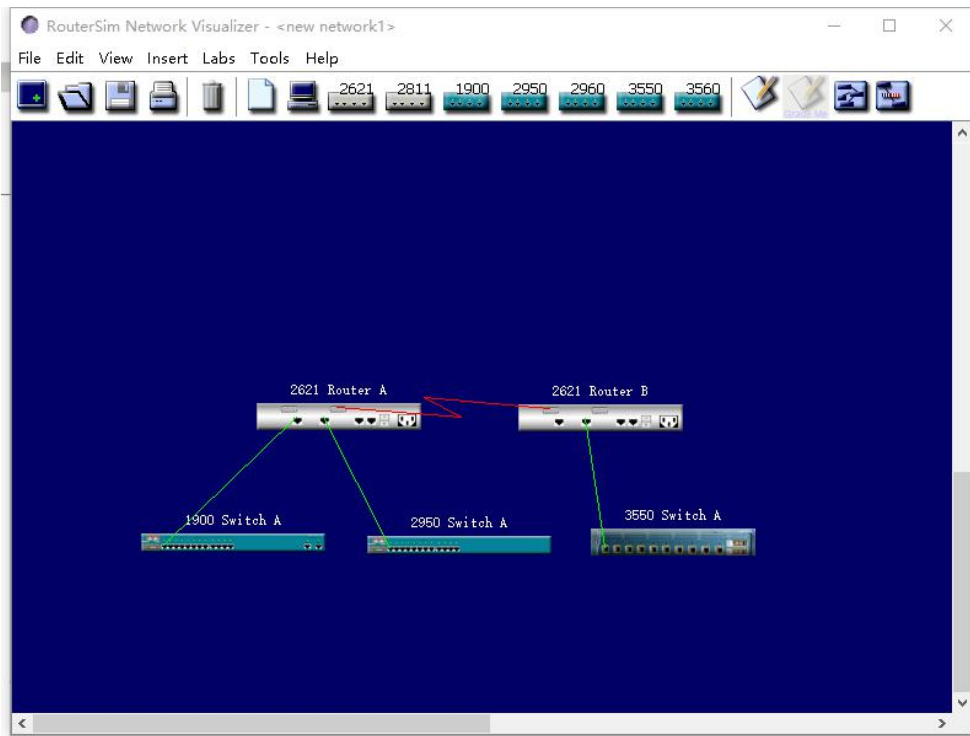
D

E

Loads all router variables for this eSIM™ scenario **except** the IP host table, which means, for example, that you will not be able to use the router name as part of ping or telnet commands.

Lab_E	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	Done
Routing Protocol	Not Done
Network 1	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

设备连接图：



路由器 A 设置：

```
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 f0/0
Router(config-if)#ip address 192.5.5.1 255.255.255.0
Router(config-if)#no shutdown
14:18:08 %LINK-3-UPDOWN: Interface FastEthernet0/0, changed state to up
14:18:08 %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0, change

Router(config-if)#int f0/1
Router(config-if)#ip addr 205.7.5.1 255.255.255.0
Router(config-if)#no shutdown
14:18:34 %LINK-3-UPDOWN: Interface FastEthernet0/1, changed state to up
14:18:34 %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/1, change

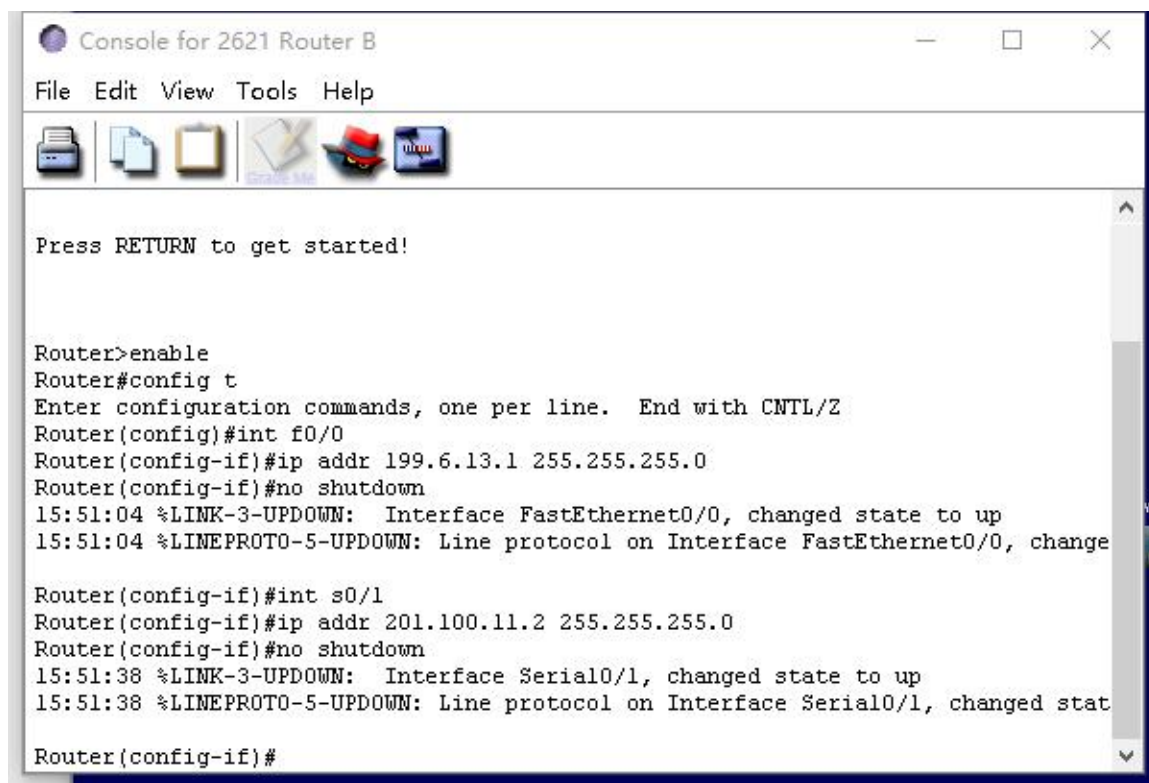
Router(config-if)#int s0/0
Router(config-if)#ip addr 201.100.11.1 255.255.255.0
Router(config-if)#clock rate 56000
Router(config-if)#no shutdown
14:19:01 %LINK-3-UPDOWN: Interface Serial0/0, changed state to up
14:19:01 %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/0, changed stat
```

路由器 A 路由表:

```
Router(config-if)#exit
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    192.5.5.0/24 is directly connected, FastEthernet0/0
C    201.100.11.0/24 is directly connected, Serial0/0
C    205.7.5.0/24 is directly connected, FastEthernet0/1
Router#
```

路由器 B 设置:



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

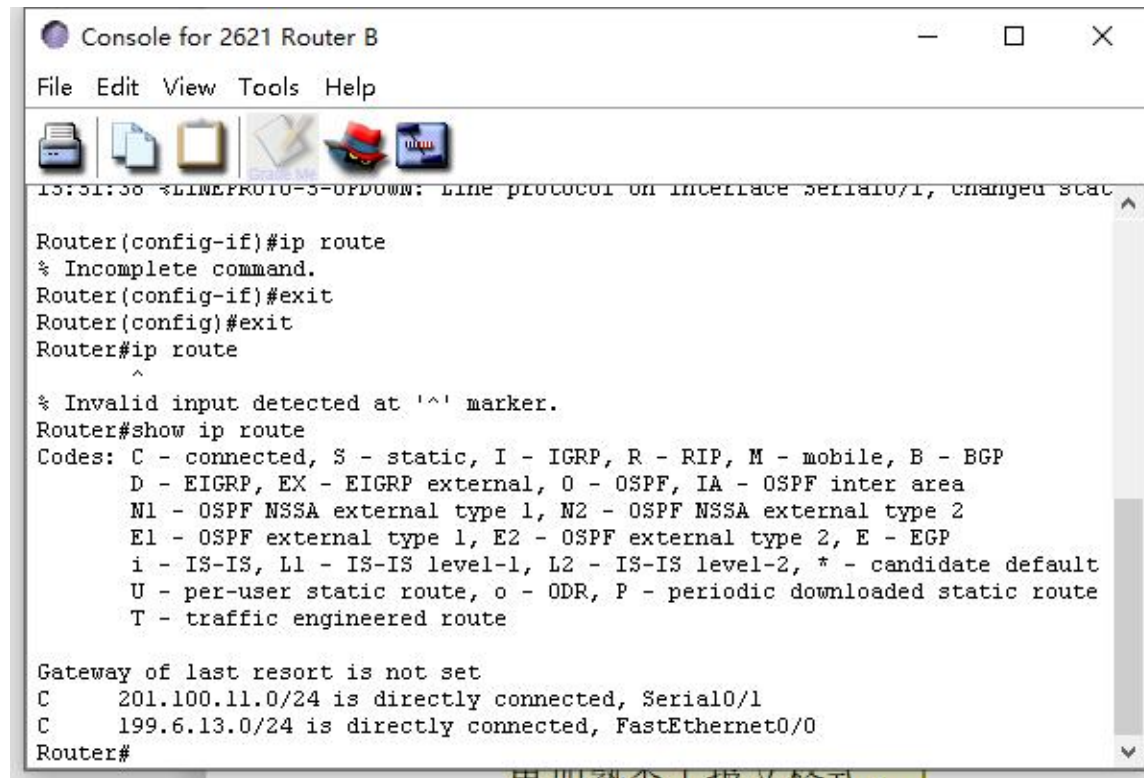
Press RETURN to get started!

Router>enable
Router#config t
Enter configuration commands, one per line. End with CNTL/Z
Router(config)#int f0/0
Router(config-if)#ip addr 199.6.13.1 255.255.255.0
Router(config-if)#no shutdown
15:51:04 %LINK-3-UPDOWN: Interface FastEthernet0/0, changed state to up
15:51:04 %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0, change

Router(config-if)#int s0/1
Router(config-if)#ip addr 201.100.11.2 255.255.255.0
Router(config-if)#no shutdown
15:51:38 %LINK-3-UPDOWN: Interface Serial0/1, changed state to up
15:51:38 %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/1, changed stat

Router(config-if)#
```

路由器 B 路由表:



```

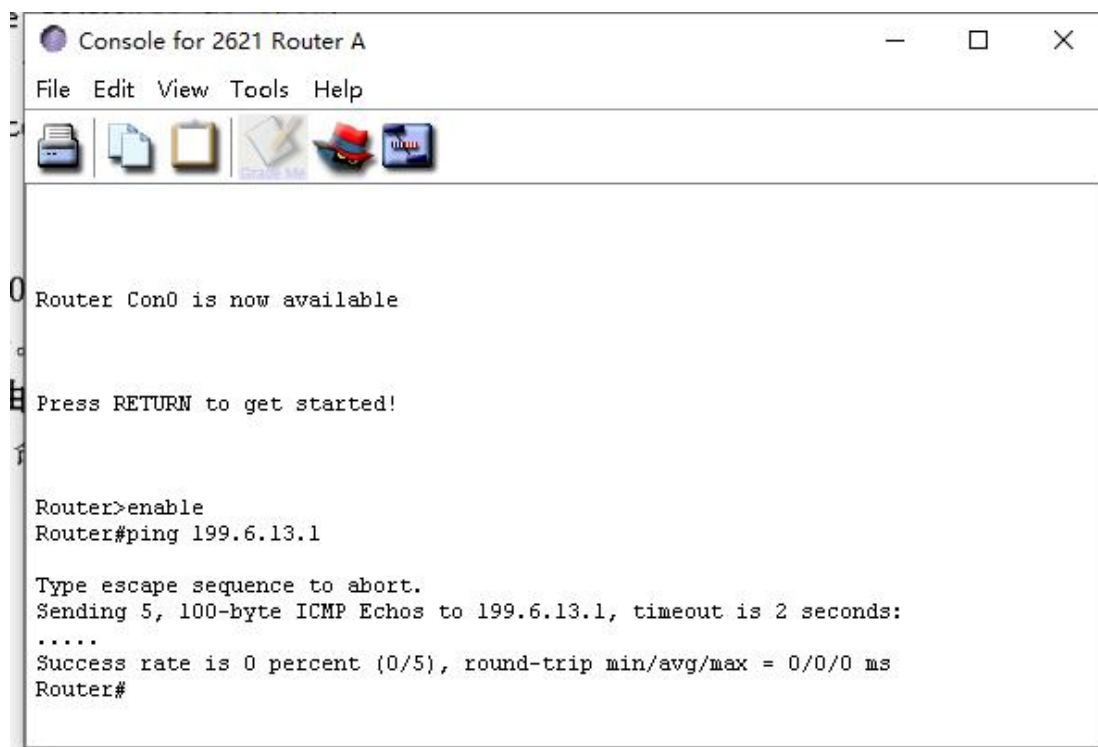
Console for 2621 Router B
File Edit View Tools Help

13:51:38 *LINEPROTO-3-UPDOWN: Line protocol on Interface Serial0/1, changed state to up

Router(config-if)#ip route
% Incomplete command.
Router(config-if)#exit
Router(config)#exit
Router#ip route
^
% Invalid input detected at '^' marker.
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    201.100.11.0/24 is directly connected, Serial0/1
C    199.6.13.0/24 is directly connected, FastEthernet0/0
Router#
  
```

Ping 199.6.13.1:



```

Console for 2621 Router A
File Edit View Tools Help

Router Con0 is now available

Press RETURN to get started!

Router>enable
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 0 percent (0/5), round-trip min/avg/max = 0/0/0 ms
Router#
  
```



设置路由器 A 静态路由：

```

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)#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    192.5.5.0/24 is directly connected, FastEthernet0/0
C    201.100.11.0/24 is directly connected, Serial0/0
C    205.7.5.0/24 is directly connected, FastEthernet0/1
S    199.6.13.0 [1/0] via 201.100.11.2
Router#

```

检验连通性：良好

```

Console for 2621 Router A
File Edit View Tools Help

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

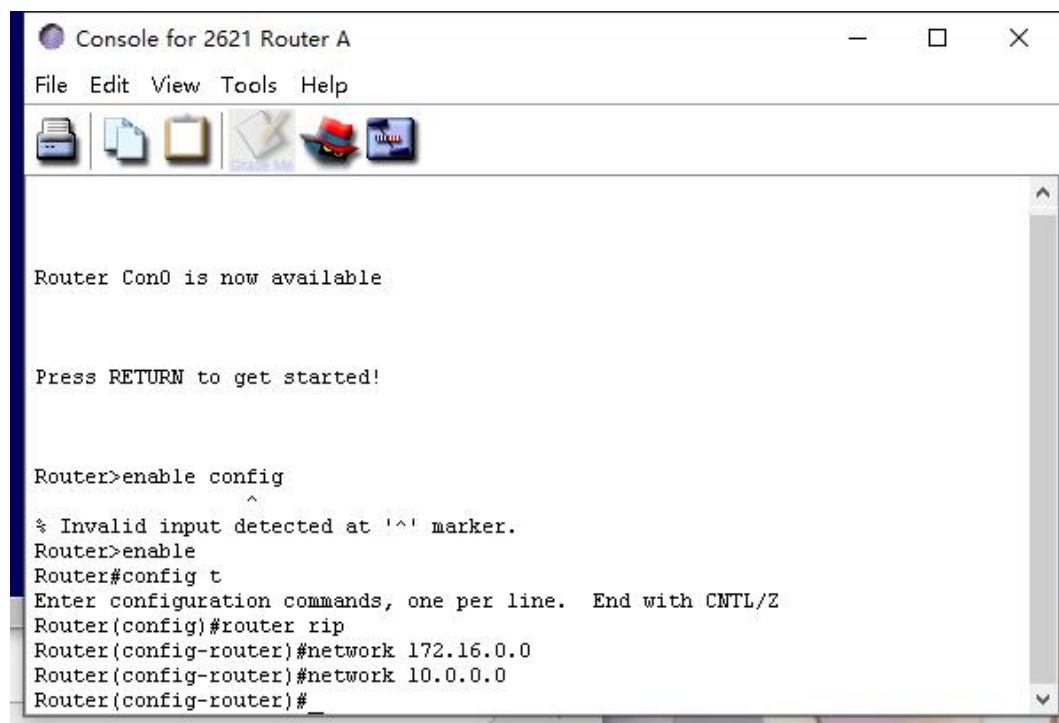
Gateway of last resort is not set
C    192.5.5.0/24 is directly connected, FastEthernet0/0
C    201.100.11.0/24 is directly connected, Serial0/0
C    205.7.5.0/24 is directly connected, FastEthernet0/1
S    199.6.13.0 [1/0] via 201.100.11.2
Router#ping 199.6.13.1

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
Router#

```

动态路由：

配置 Router A: RIP



```

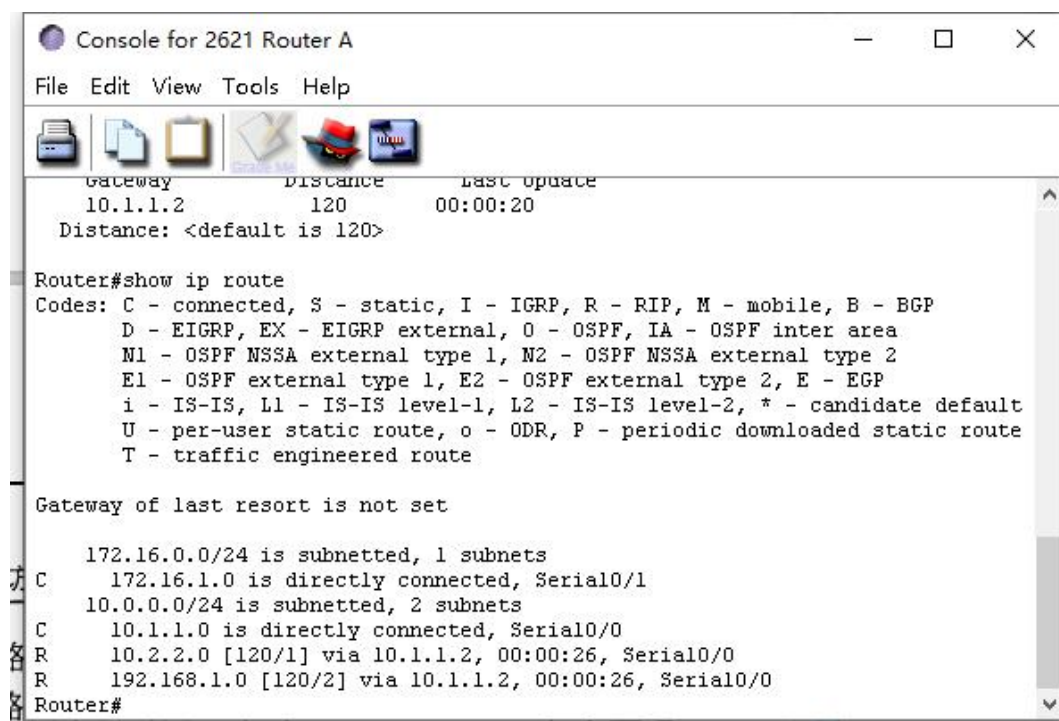
Console for 2621 Router A
File Edit View Tools Help

Router Con0 is now available

Press RETURN to get started!

Router>enable config
      ^
% Invalid input detected at '^' marker.
Router>enable
Router#config t
Enter configuration commands, one per line. End with CNTL/Z
Router(config)#router rip
Router(config-router)#network 172.16.0.0
Router(config-router)#network 10.0.0.0
Router(config-router)#
  
```

检查路由器 A 的路由表



```

Console for 2621 Router A
File Edit View Tools Help

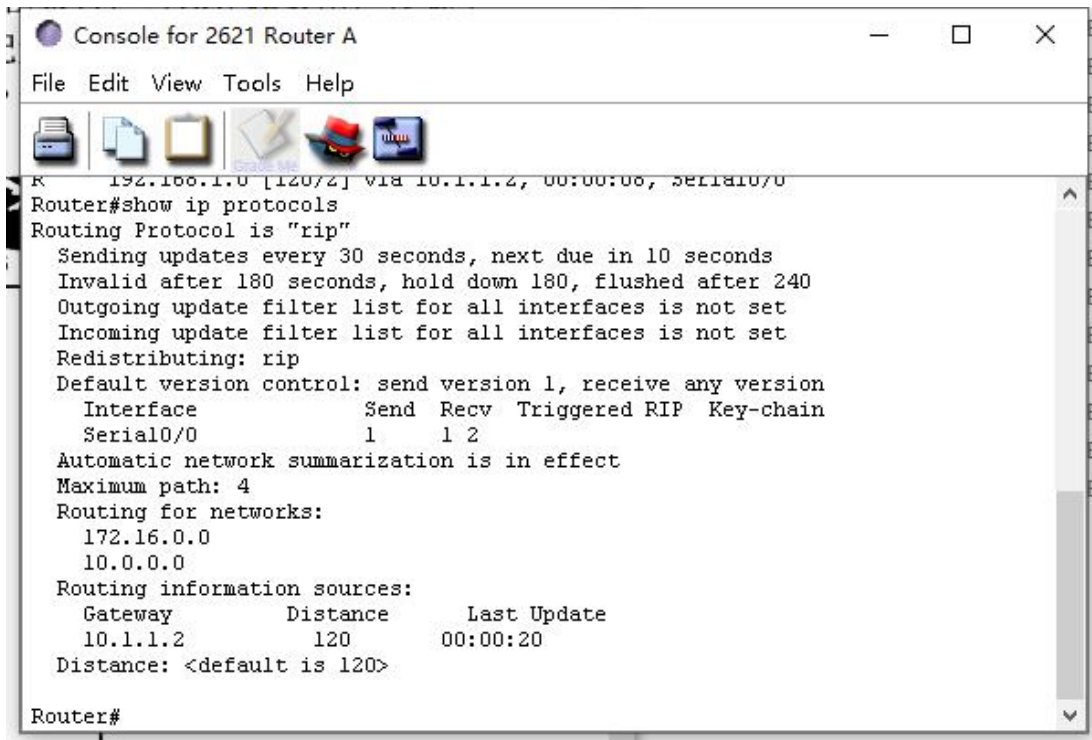
Gateway          Distance      Last Update
10.1.1.2          120           00:00:20
Distance: <default is 120>

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, Serial0/1
    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, 00:00:26, Serial0/0
R      192.168.1.0 [120/2] via 10.1.1.2, 00:00:26, Serial0/0
Router#
  
```

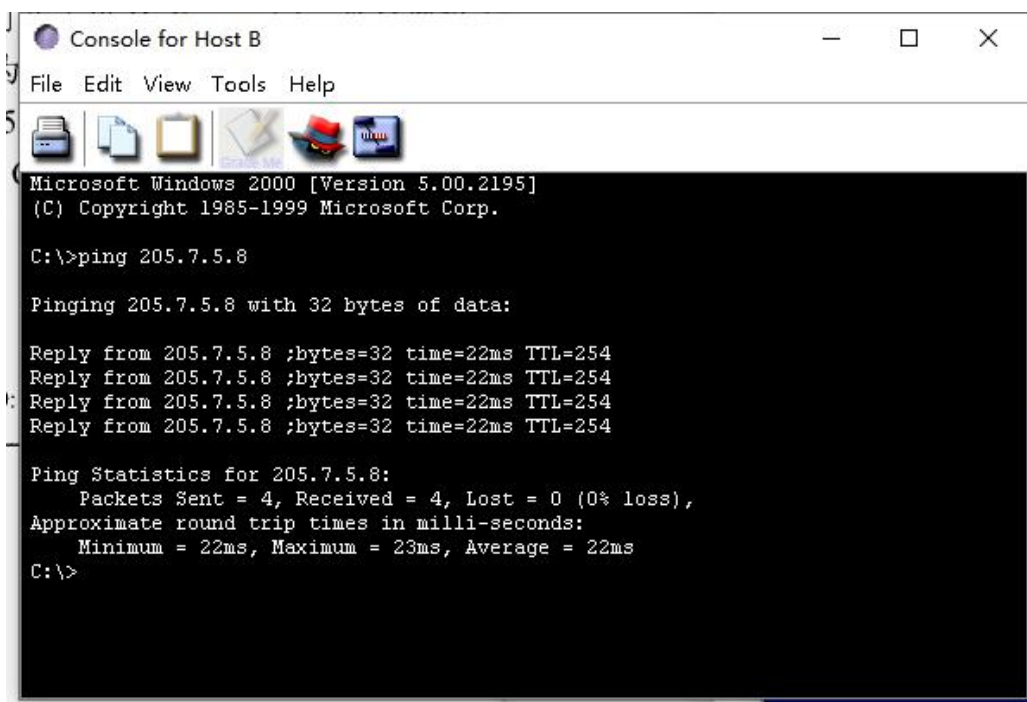
同理设置路由器 B 和路由器 C 后，检查配置路由协议是否正确：



```
Console for 2621 Router A
File Edit View Tools Help
192.168.1.0 [120/2] via 10.1.1.2, 00:00:00, Serial0/0
Router#show ip protocols
Routing Protocol is "rip"
  Sending updates every 30 seconds, next due in 10 seconds
  Invalid after 180 seconds, hold down 180, flushed after 240
  Outgoing update filter list for all interfaces is not set
  Incoming update filter list for all interfaces is not set
  Redistributing: rip
  Default version control: send version 1, receive any version
    Interface          Send Recv Triggered RIP Key-chain
  Serial0/0            1      1 2
  Automatic network summarization is in effect
  Maximum path: 4
  Routing for networks:
    172.16.0.0
    10.0.0.0
  Routing information sources:
    Gateway      Distance    Last Update
    10.1.1.2      120        00:00:20
  Distance: <default is 120>
Router#
```

Cisco 路由器访问列表配置：

主机 B ping 主机 A（配置后）：



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

C:\>ping 205.7.5.8

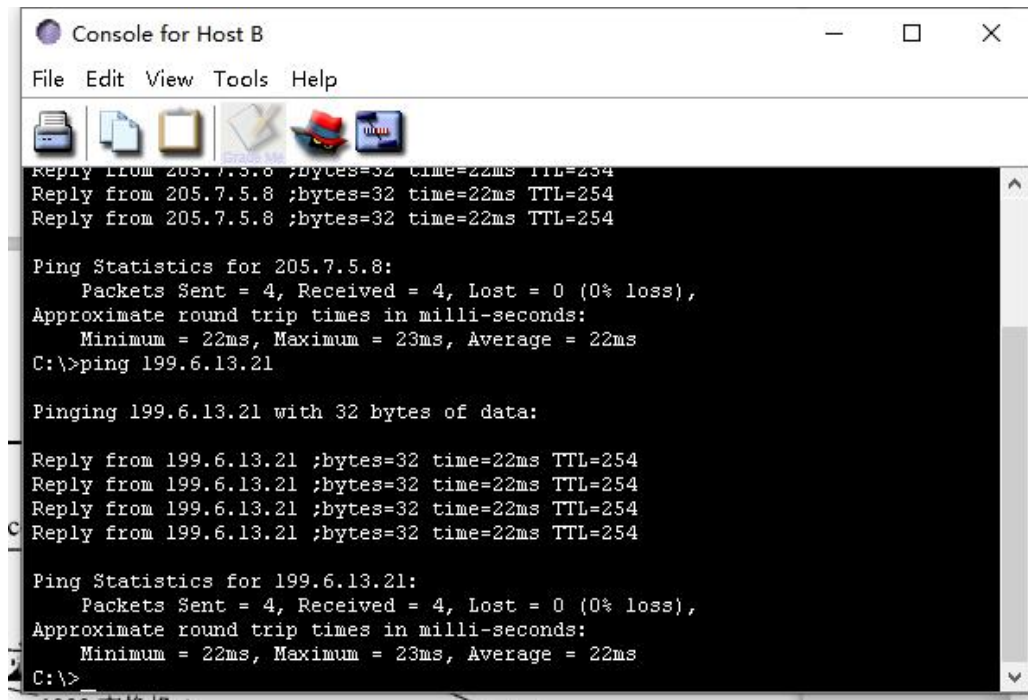
Pinging 205.7.5.8 with 32 bytes of data:

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
C:\>
```



主机 B ping 主机 C（配置后）：



```
Console for Host B
File Edit View Tools Help

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

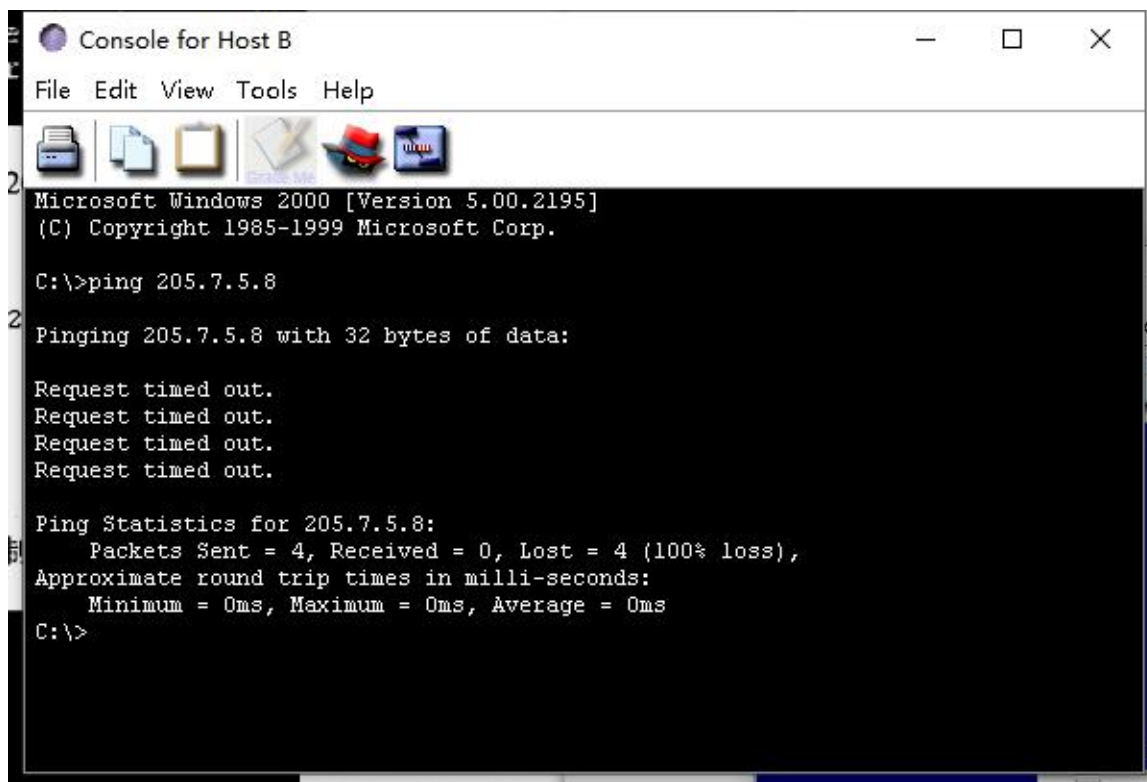
Ping Statistics for 205.7.5.8:
    Packets Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 22ms, Maximum = 23ms, Average = 22ms
C:\>ping 199.6.13.21

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:\>
```

限制主机 B 后访问 205.7.5.8：



```
Console for Host B
File Edit View Tools Help

Microsoft Windows 2000 [Version 5.00.2195]
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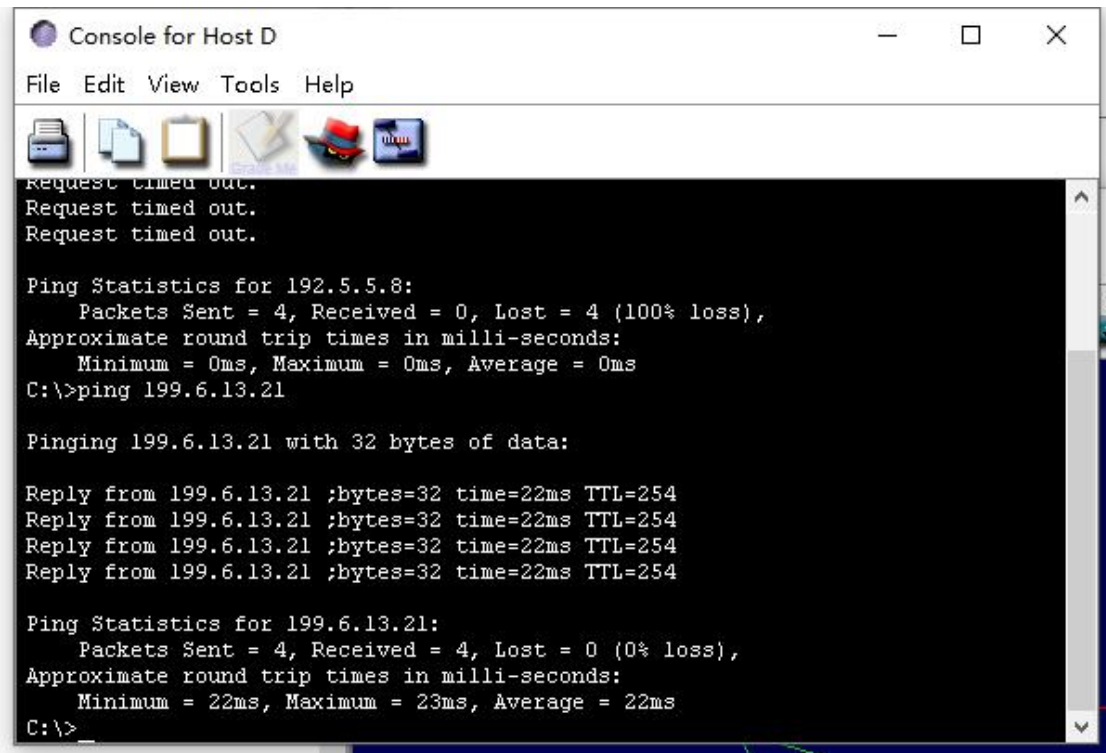
C:\>ping 205.7.5.8

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
C:\>
```

主机 D ping 主机 C:



```
Console for Host D
File Edit View Tools Help

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

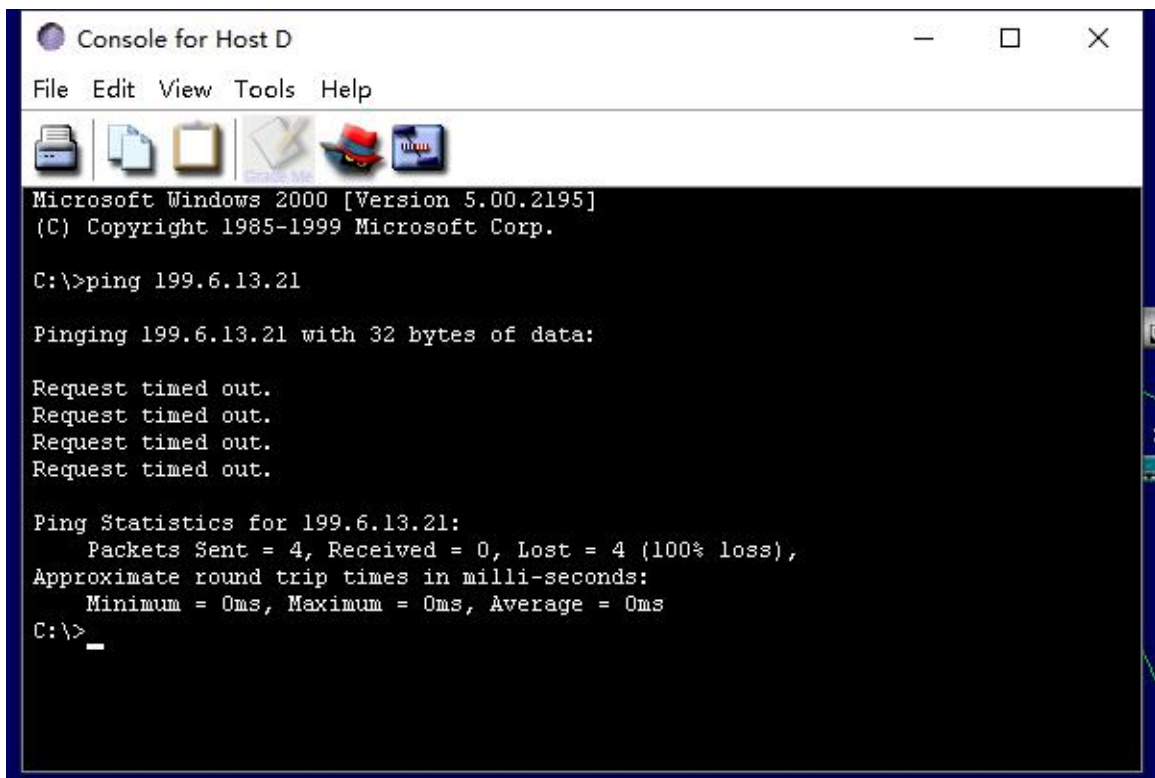
Ping Statistics for 192.5.5.8:
    Packets Sent = 4, Received = 0, Lost = 4 (100% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms
C:\>ping 199.6.13.21

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:\>
```

限制后主机 D ping 主机 C:



```
Console for Host D
File Edit View Tools Help

Microsoft Windows 2000 [Version 5.00.2195]
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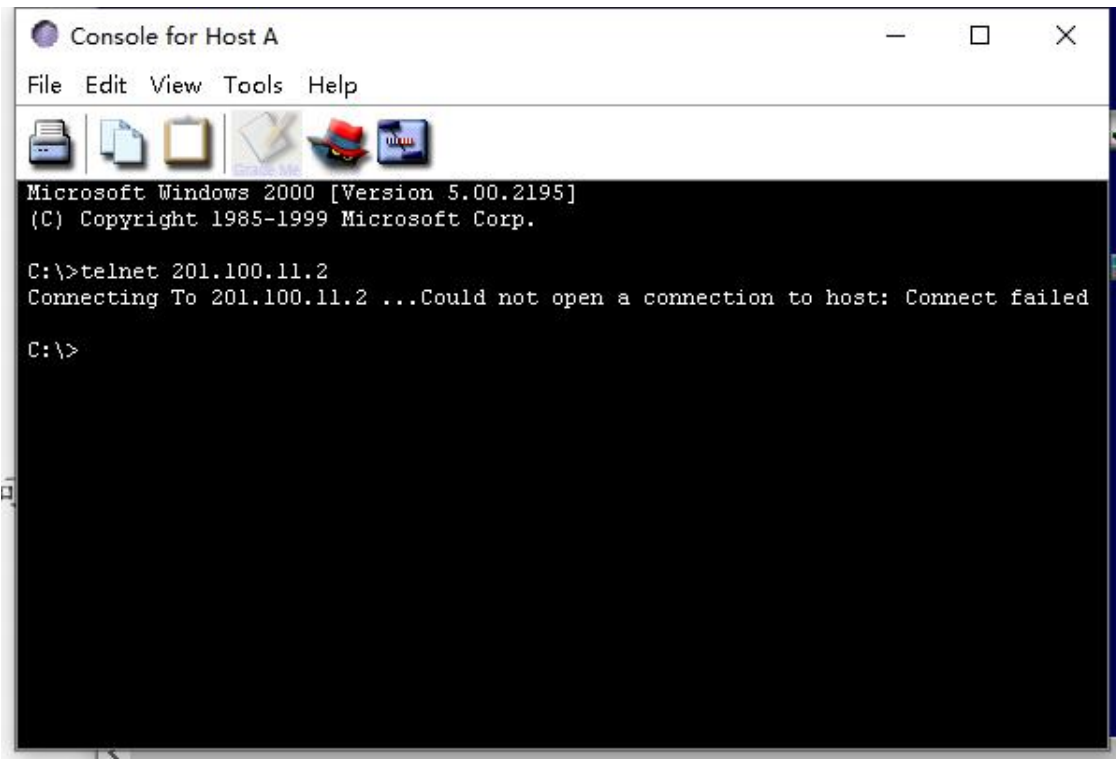
C:\>ping 199.6.13.21

Pinging 199.6.13.21 with 32 bytes of data:

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

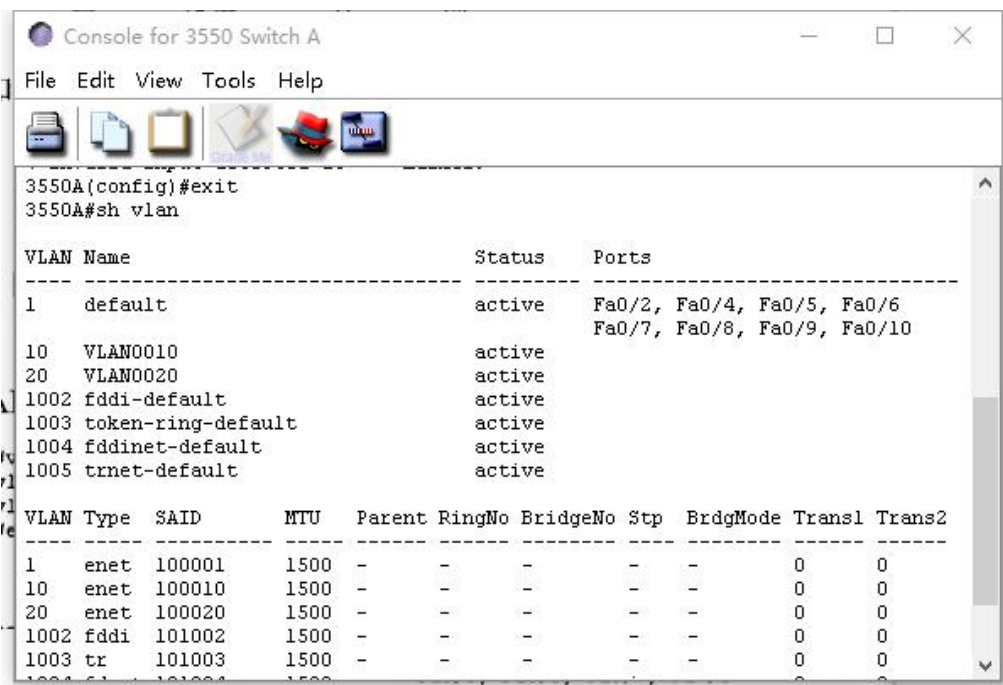
Ping Statistics for 199.6.13.21:
    Packets Sent = 4, Received = 0, Lost = 4 (100% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms
C:\>
```

限制后在主机 A 上远程登录 RouterA:

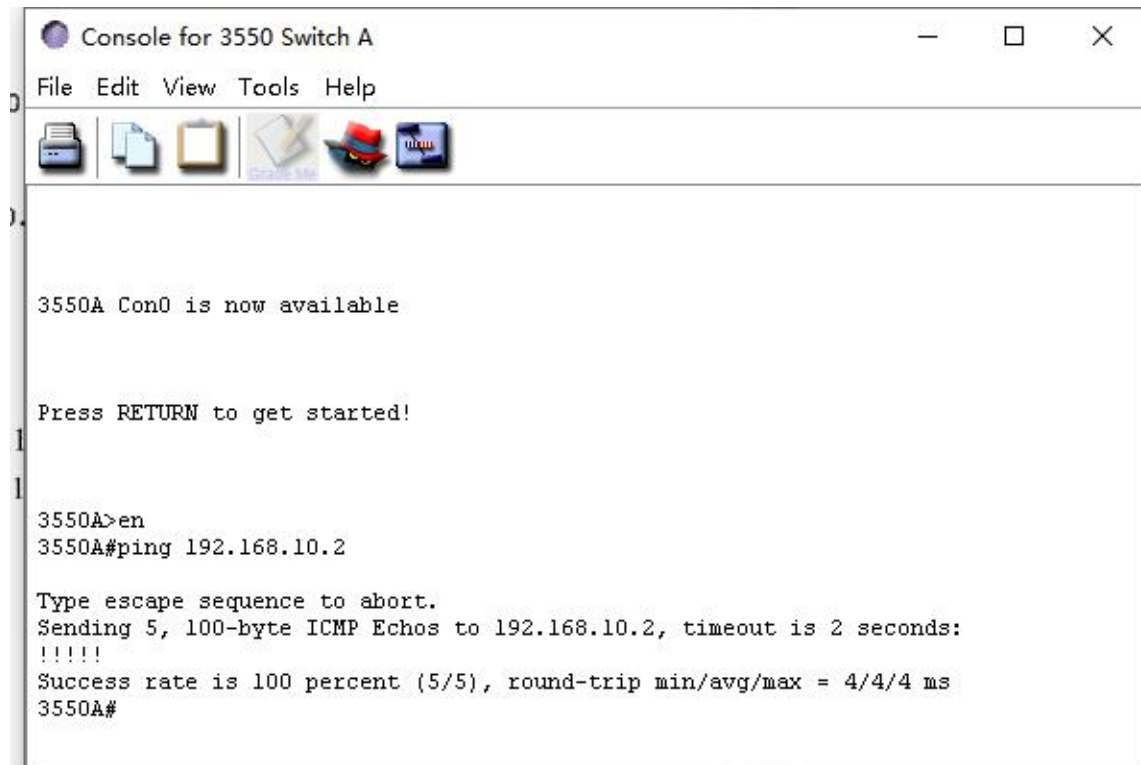


基于交换机端口的 VLAN 配置:

配置后, 创建 VLAN 并验证:



测试，在 3550 交换机上分别 ping 2950 交换机：



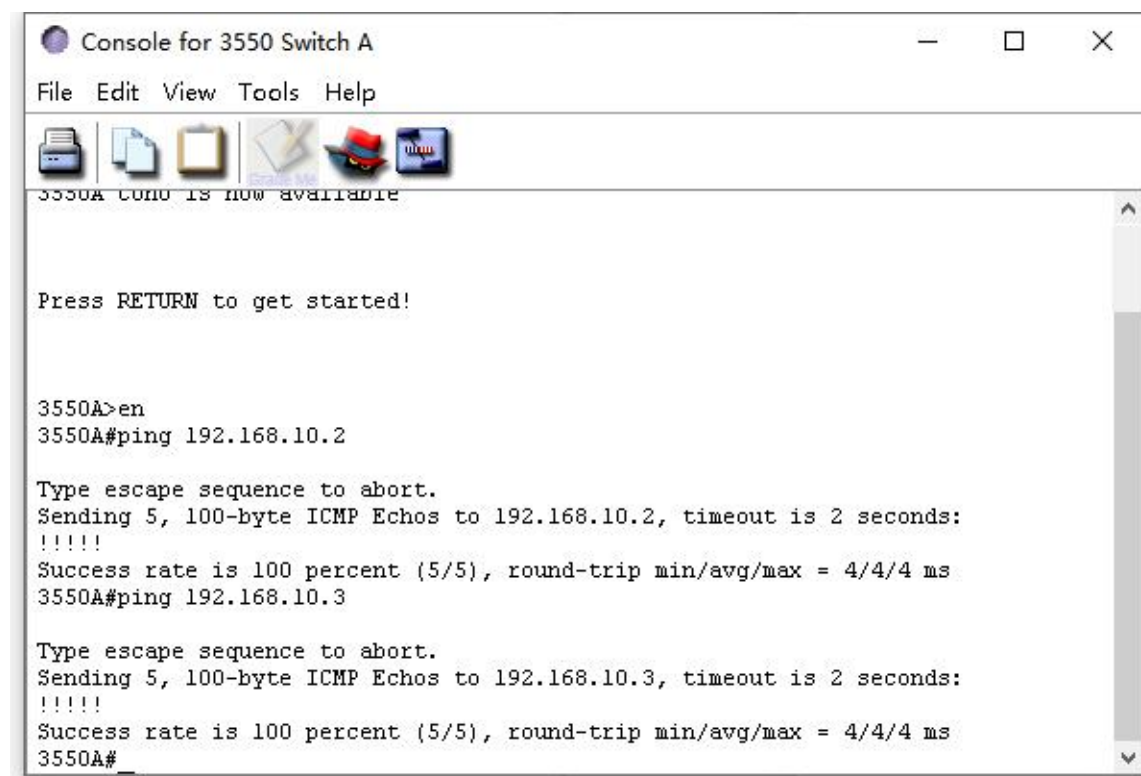
```
Console for 3550 Switch A
File Edit View Tools Help

3550A Con0 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#
```



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

3550A Con0 is now available

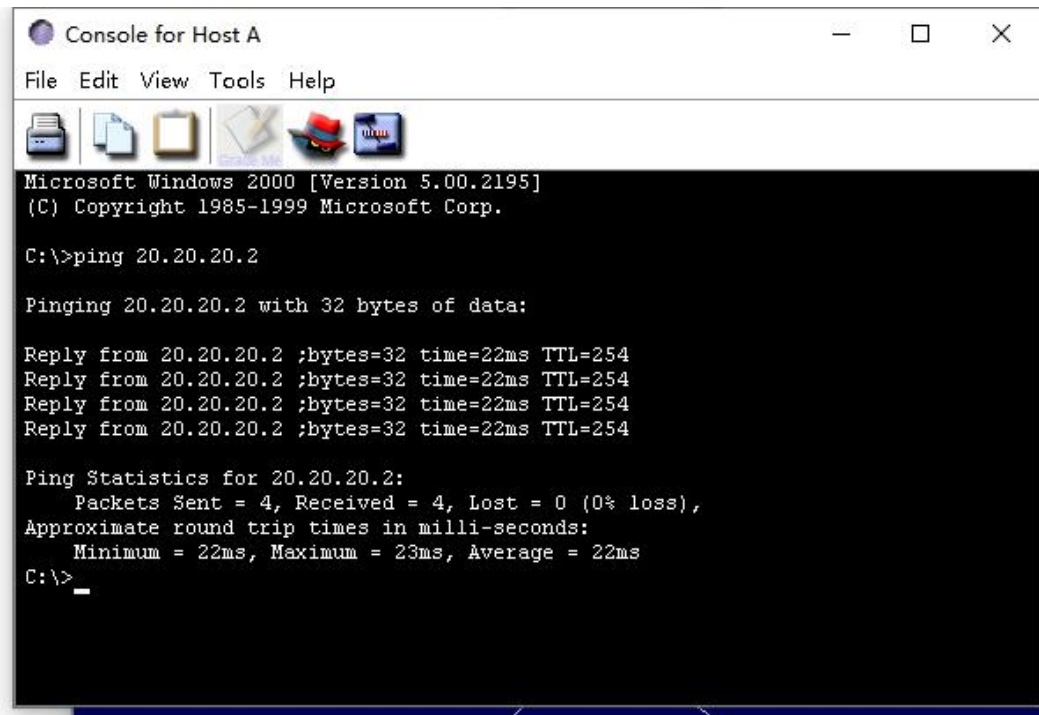
Press RETURN to get started!

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#
```

主机 A ping 主机 B:



```
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C:\>ping 20.20.20.2

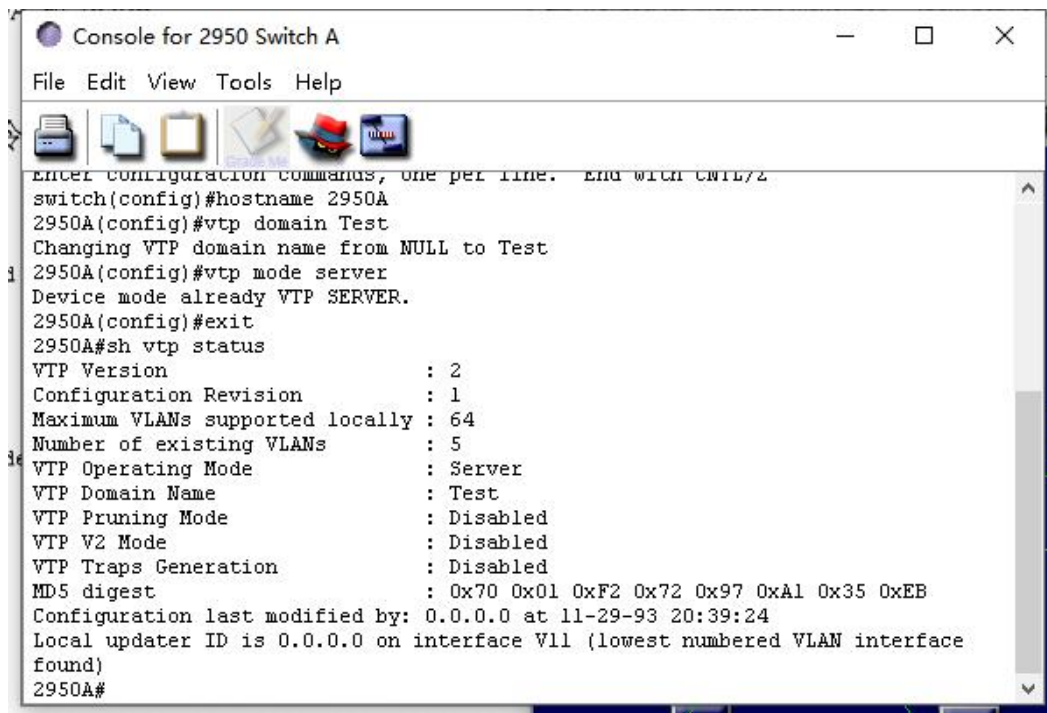
Pinging 20.20.20.2 with 32 bytes of data:

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:\>
```

实现 VLAN 跨越多个交换机及不同 VLAN 之间的通信:

配置 VTP 并验证:

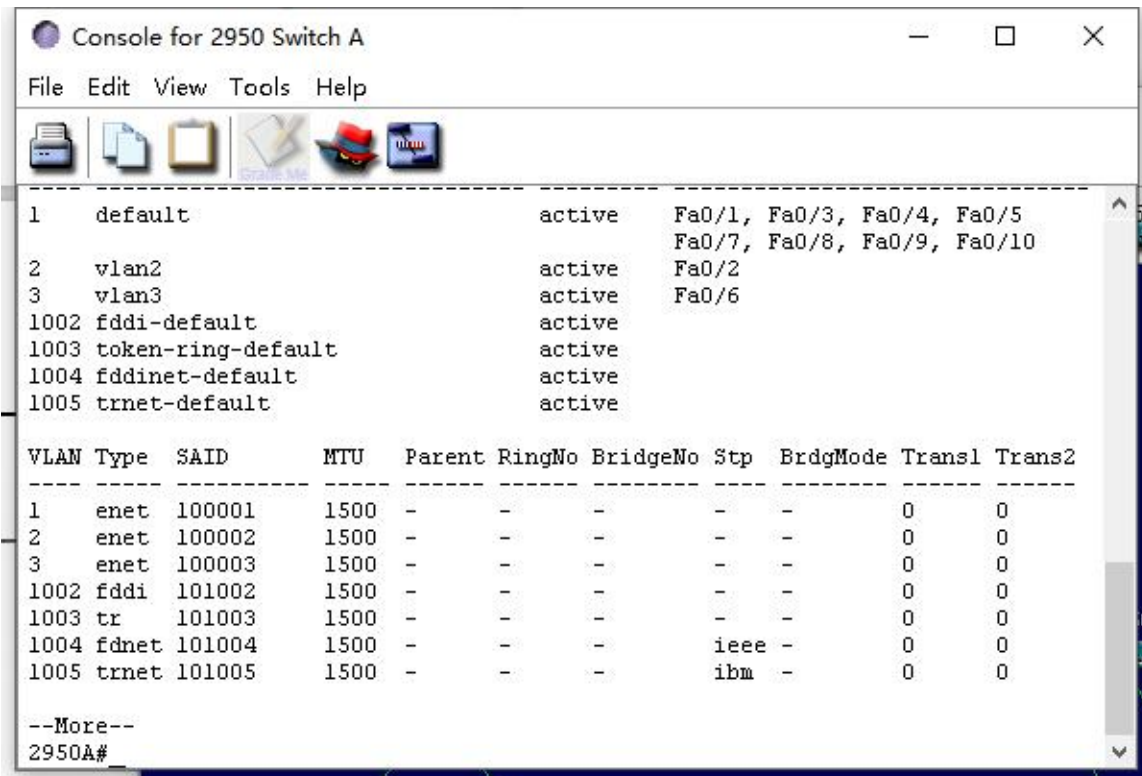


```
Console for 2950 Switch A
File Edit View Tools Help

Enter configuration commands, one per line. End with CNTL/Z
switch(config)#hostname 2950A
2950A(config)#vtp domain Test
Changing VTP domain name from NULL to Test
2950A(config)#vtp mode server
Device mode already VTP SERVER.
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          : 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 V11 (lowest numbered VLAN interface found)
2950A#
```

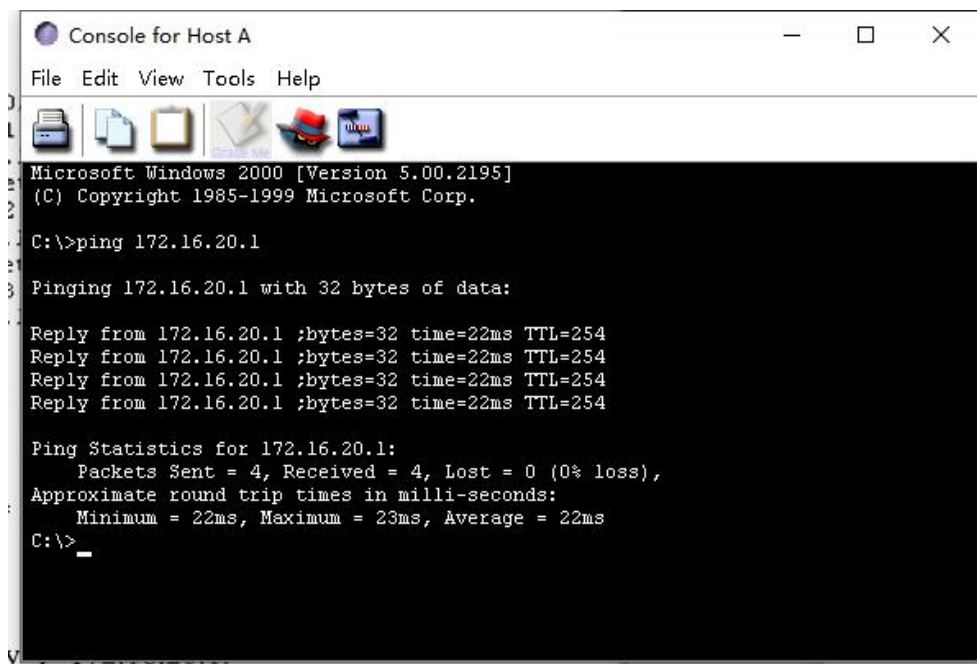


分配端口并验证：

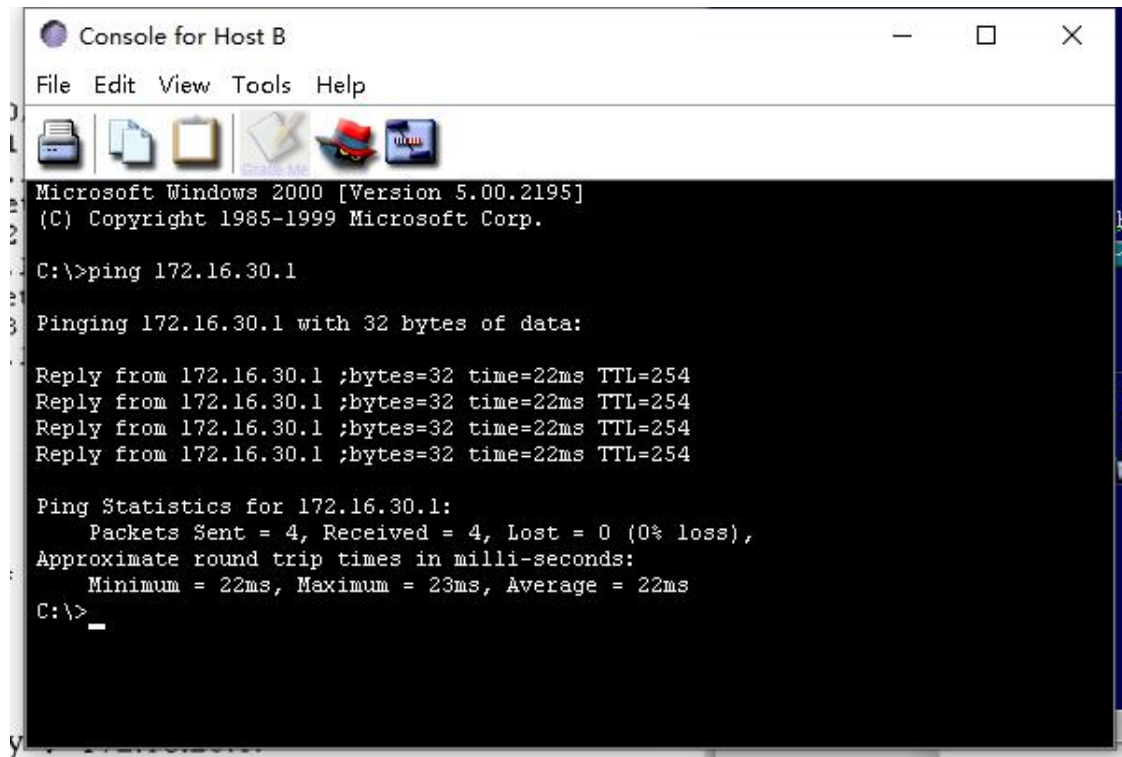


验证连通性：

Host A ping 172.16.20.1:



Host B ping 172.16.30.1:



```
Microsoft Windows 2000 [Version 5.00.2195]
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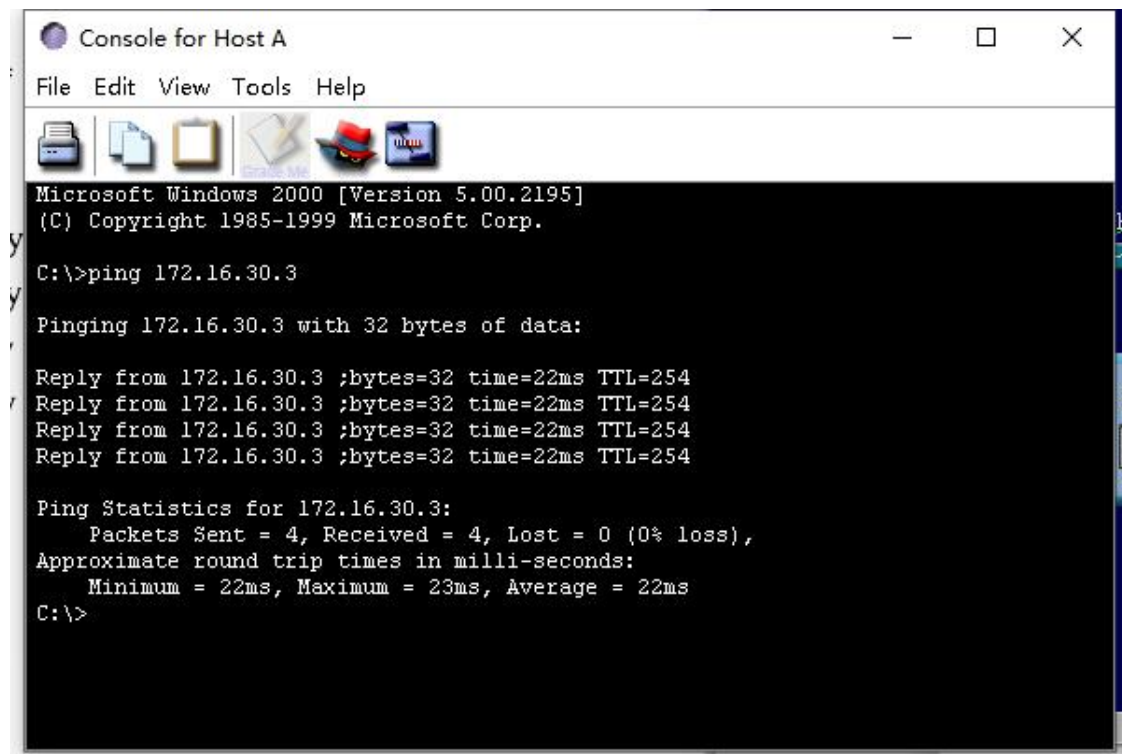
C:\>ping 172.16.30.1

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:\>
```

Host A ping Host B:



```
Microsoft Windows 2000 [Version 5.00.2195]
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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:\>
```

## 4 实验总结

动手实现了路由器的配置，熟悉了路由器的有关知识，更加熟悉路由器、交换机的工作机制。