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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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

win10, Router eSIM v1.0，CCNA Network Visualizer 6.0

3 实验结果

利用 Router eSIM v1.0 模拟路由器配置。

Lab_A	Completed
Hostname	Done
Enable Secret	Done
Line Console Login	Done
Line Console Password	Done
Line vty Login	Done
Line vty Password	Done
E0 IP	Done
E0 Shutdown	Done
E1 IP	Done
E1 Shutdown	Done
S0 IP	Done
S0 Clock Rate	Done
S0 Shutdown	Done
Routing Protocol	Done
Network 1	Done
Network 2	Done
Network 3	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	Completed
Hostname	Done
Enable Secret	Done
Line Console Login	Done
Line Console Password	Done
Line vty Login	Done
Line vty Password	Done
E0 IP	Done
E0 Shutdown	Done
S0 IP	Done
S0 Clock Rate	Done
S0 Shutdown	Done
S1 IP	Done
S1 Shutdown	Done
Routing Protocol	Done
Network 1	Done
Network 2	Done
Network 3	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	Completed
Hostname	Done
Enable Secret	Done
Line Console Login	Done
Line Console Password	Done
Line vty Login	Done
Line vty Password	Done
E0 IP	Done
E0 Shutdown	Done
S0 IP	Done
S0 Clock Rate	Done
S0 Shutdown	Done
S1 IP	Done
S1 Shutdown	Done
Routing Protocol	Done
Network 1	Done
Network 2	Done
Network 3	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	Completed
Hostname	Done
Enable Secret	Done
Line Console Login	Done
Line Console Password	Done
Line vty Login	Done
Line vty Password	Done
E0 IP	Done
E0 Shutdown	Done
S1 IP	Done
S1 Shutdown	Done
Routing Protocol	Done
Network 1	Done
Network 2	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	Completed
Hostname	Done
Enable Secret	Done
Line Console Login	Done
Line Console Password	Done
Line vty Login	Done
Line vty Password	Done
E0 IP	Done
E0 Shutdown	Done
Routing Protocol	Done
Network 1	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

二、（1）使用 CCNA Network Visualizer 6.0 配置静态路由

路由 A：

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

```
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#
```

路由 B：

```
RouterB#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
S     192.5.5.0 [1/0] via 201.100.11.1
C     199.6.13.0/24 is directly connected, FastEthernet0/0
S     205.7.5.0 [1/0] via 201.100.11.1


RouterB#ping 192.5.5.1

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
```

```
RouterB#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
RouterB#
```

(2)配置动态路由

路由 A：

```
Routing Protocol is "rip"
  Sending updates every 30 seconds, next due in 19 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
    FastEthernet0/0       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       00:00:11
  Distance: <default is 120>
```

路由 B：

```
Routing Protocol is "rip"
  Sending updates every 30 seconds, next due in 18 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
    Serial0/1             1     1 2
    Serial0/0             1     1 2
  Automatic network summarization is in effect
  Maximum path: 4
  Routing for networks:
    10.0.0.0
  Routing information sources:
    Gateway         Distance      Last Update
    10.2.2.3          120       00:00:12
    10.1.1.1          120       00:00:12
  Distance: <default is 120>

RouterB#
```

路由 C：

```
RouterC#sh ip protocols
Routing Protocol is "rip"
  Sending updates every 30 seconds, next due in 1 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
    Serial0/1             1     1 2
    FastEthernet0/0       1     1 2
  Automatic network summarization is in effect
  Maximum path: 4
  Routing for networks:
    10.0.0.0
    192.168.1.0
  Routing information sources:
    Gateway         Distance      Last Update
    10.2.2.2          120       00:00:29
  Distance: <default is 120>
```

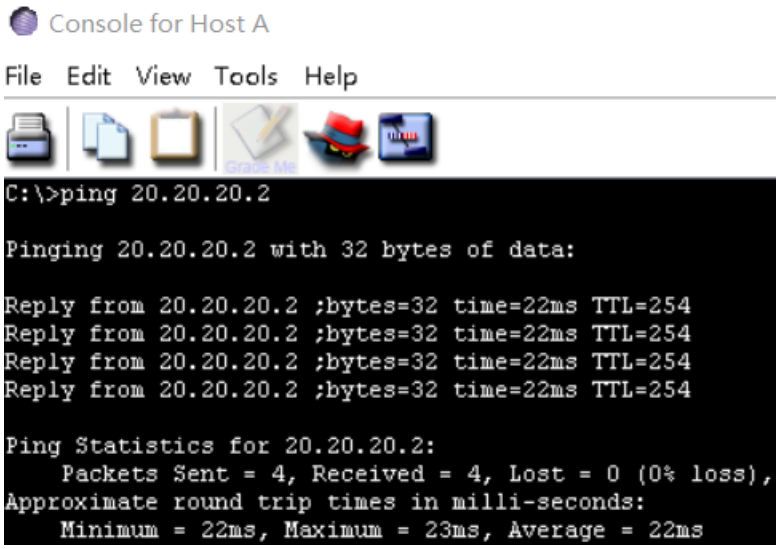
（3）配置交换机端口

实例 1：在典型快速以太局域网中实现 VLAN

```
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
```

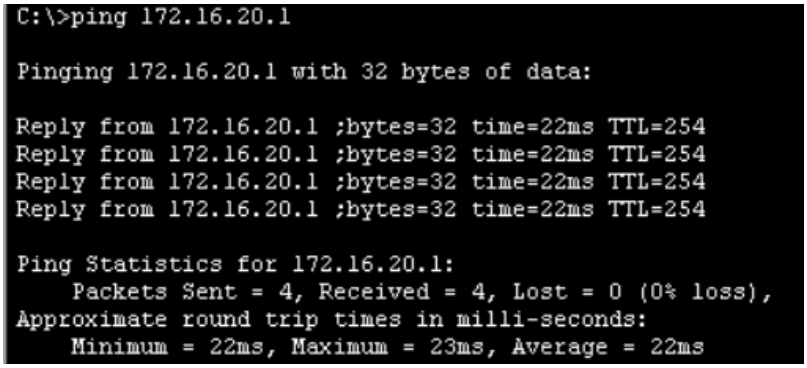
```
3550A#ping 192.168.10.3

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#
```

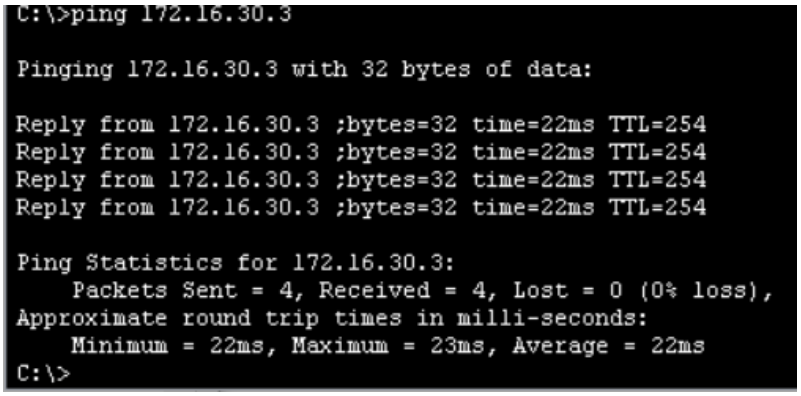
在主机 Host A ping 主机 Host B



实例二：VLAN 跨越多个交换机及不同 VLAN 之间的通信

Host A：





Host B:

```
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:\>
```

4 实验总结

熟悉 CISCO IOS 的基本操作、路由器的常规配置、静态路配置、动态路由协议 RIP 的配置、CISCO 路由器访问列表配置、基于交换机端口的 VLAN 的配置。更加了解了路由器的工作方式。