实验七、路由器静态路由配置

一、 实验目的

1. 理解路由表
2. 掌握静态路由的配置

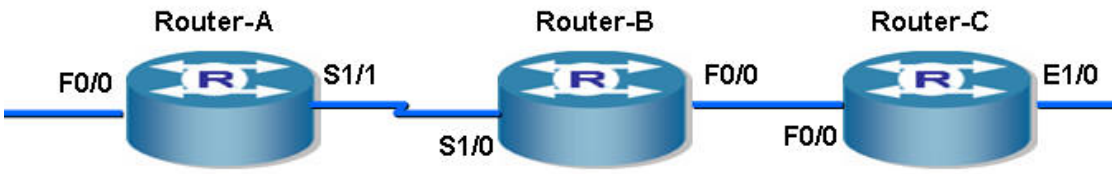
二、 应用环境

1. 在小规模环境里，静态路由是最佳的选择
2. 静态路由开销小，但不灵活，适用于相对稳定的网络

三、 实验设备

1. DCR-1751 三台
2. CR-V35FC 一条
3. CR-V35MT 一条

四、 实验拓扑



五、 实验要求

配置表

Router-A		Router-B		Router-C	
S1/1(DCE)	192.168.1.1	S/1/0(DTE)	192.168.1.2	F0/0	192.168.2.2
F0/0	192.168.0.1	F0/0	192.168.2.1	E1/0	192.168.3.1

六、 实验步骤

第一步：参照实验三，按照上表配置所有接口的 IP 地址，保证所有接口全部是 up 状态，测试连通性

第二步：查看 ROUTER-A 的路由表

Router-A#**show ip route**

Codes: C - connected, S - static, R - RIP, B - BGP, BC - BGP connected
D - DEIGRP, DEX - external DEIGRP, O - OSPF, OIA - OSPF inter area

ON1 - OSPF NSSA external type 1, ON2 - OSPF NSSA external type 2
OE1 - OSPF external type 1, OE2 - OSPF external type 2
DHCP - DHCP type

VRF ID: 0

C 192.168.0.0/24 is directly connected, FastEthernet0/0 ！直连的路由
C 192.168.1.0/24 is directly connected, Serial1/1 ！直连的路由

第三步：查看 ROUTER-B 的路由表
Router-B#show ip route
Codes: C - connected, S - static, R - RIP, B - BGP, BC - BGP connected
D - DEIGRP, DEX - external DEIGRP, O - OSPF, OIA - OSPF inter area
ON1 - OSPF NSSA external type 1, ON2 - OSPF NSSA external type 2
OE1 - OSPF external type 1, OE2 - OSPF external type 2
DHCP - DHCP type

VRF ID: 0

C 192.168.1.0/24 is directly connected, Serial1/0
C 192.168.2.0/24 is directly connected, FastEthernet0/0

第四步：查看 ROUTER-C 的路由表
Router-B#show ip route
Codes: C - connected, S - static, R - RIP, B - BGP, BC - BGP connected
D - DEIGRP, DEX - external DEIGRP, O - OSPF, OIA - OSPF inter area
ON1 - OSPF NSSA external type 1, ON2 - OSPF NSSA external type 2
OE1 - OSPF external type 1, OE2 - OSPF external type 2
DHCP - DHCP type

VRF ID: 0

C 192.168.1.0/24 is directly connected, Serial1/0
C 192.168.2.0/24 is directly connected, FastEthernet0/0

第五步：在 ROUTER-A 上 PING 路由器 C
Router-A#**ping 192.168.2.2**
PING 192.168.2.2 (192.168.2.2): 56 data bytes
.....
--- 192.168.2.2 ping statistics ---
5 packets transmitted, 0 packets received, 100% packet loss **！不通**

第六步：在路由器 A 上配置静态路由
Router-A#**config**

Router-A_config#**ip route 192.168.2.0 255.255.255.0 192.168.1.2** ！配置目标网段和下一跳
Router-A_config#**ip route 192.168.3.0 255.255.255.0 192.168.1.2**

第七步：查看路由表
Router-A#**show ip route**
Codes: C - connected, S - static, R - RIP, B - BGP, BC - BGP connected
D - DEIGRP, DEX - external DEIGRP, O - OSPF, OIA - OSPF inter area
ON1 - OSPF NSSA external type 1, ON2 - OSPF NSSA external type 2
OE1 - OSPF external type 1, OE2 - OSPF external type 2
DHCP - DHCP type

VRF ID: 0

C 192.168.0.0/24 is directly connected, FastEthernet0/0
C 192.168.1.0/24 is directly connected, Serial1/1
S 192.168.2.0/24 [1,0] via 192.168.1.2 **！注意静态路由的管理距离是 1**
S 192.168.3.0/24 [1,0] via 192.168.1.2

第八步：配置路由器 B 的静态路由并查看路由表
Router-B#**config**
Router-B_config#**ip route 192.168.0.0 255.255.255.0 192.168.1.1**
Router-B_config#**ip route 192.168.3.0 255.255.255.0 192.168.2.2**
Router-B_config#^**Z**
Router-B#**show ip route**
Codes: C - connected, S - static, R - RIP, B - BGP, BC - BGP connected
D - DEIGRP, DEX - external DEIGRP, O - OSPF, OIA - OSPF inter area
ON1 - OSPF NSSA external type 1, ON2 - OSPF NSSA external type 2
OE1 - OSPF external type 1, OE2 - OSPF external type 2
DHCP - DHCP type

VRF ID: 0

S 192.168.0.0/24 [1,0] via 192.168.1.1
C 192.168.1.0/24 is directly connected, Serial1/0
C 192.168.2.0/24 is directly connected, FastEthernet0/0
S 192.168.3.0/24 [1,0] via 192.168.2.2

第九步：配置路由器 C 的静态路由并查看路由表
Router-C#**config**
Router-C_config#**ip route 192.168.0.0 255.255.0.0 192.168.2.1** ！采用超网的方法
Router-C_config#^**Z**
Router-C#**show ip route**
Codes: C - connected, S - static, R - RIP, B - BGP
D - DEIGRP, DEX - external DEIGRP, O - OSPF, OIA - OSPF inter area

ON1 - OSPF NSSA external type 1, ON2 - OSPF NSSA external type 2
OE1 - OSPF external type 1, OE2 - OSPF external type 2

S 192.168.0.0/16 [1,0] via 192.168.2.1 ！注意掩码是 16 位
C 192.168.2.0/24 is directly connected, FastEthernet0/0
C 192.168.3.0/24 is directly connected, Ethernet1/0

第十步：测试
Router-C**#ping 192.168.0.1**
PING 192.168.0.1 (192.168.0.1): 56 data bytes
!!!!! **！成功**
--- 192.168.0.1 ping statistics ---
5 packets transmitted, 5 packets received, 0% packet loss
round-trip min/avg/max = 30/32/40 ms

七、 注意事项和排错

1. 非直连的网段都要配置路由
2. 以太网接口要接主机或交换机才能 up
3. 串口注意 DCE 和 DTE 的问题

八、 配置序列

路由器 B 的序列
Router-B#show running-config
Building configuration...

Current configuration:
!
!version 1.3.2E
service timestamps log date
service timestamps debug date
no service password-encryption
!
hostname Router-B
!
interface FastEthernet0/0
 ip address 192.168.2.1 255.255.255.0
 no ip directed-broadcast
!
interface Serial1/0
 ip address 192.168.1.2 255.255.255.0
 no ip directed-broadcast
!
interface Async0/0

```
 no ip address
 no ip directed-broadcast
!
!
!
!
ip route 192.168.0.0 255.255.255.0 192.168.1.1
ip route 192.168.3.0 255.255.255.0 192.168.2.2
!
!
```

九、 共同思考

1. 什么情况下可以采用路由器 C 的超网配置方法？
2. 为什么只有当所有路由器都配置了路由以后才能通？
3. 静态路由有什么优势？什么情况下使用？

十、 课后练习

1. 请将路由器 A 采用缺省路由的方式配置
2. 将地址改为 10.0.0.0/24 这个网段重复以上实验