

一、环境准备

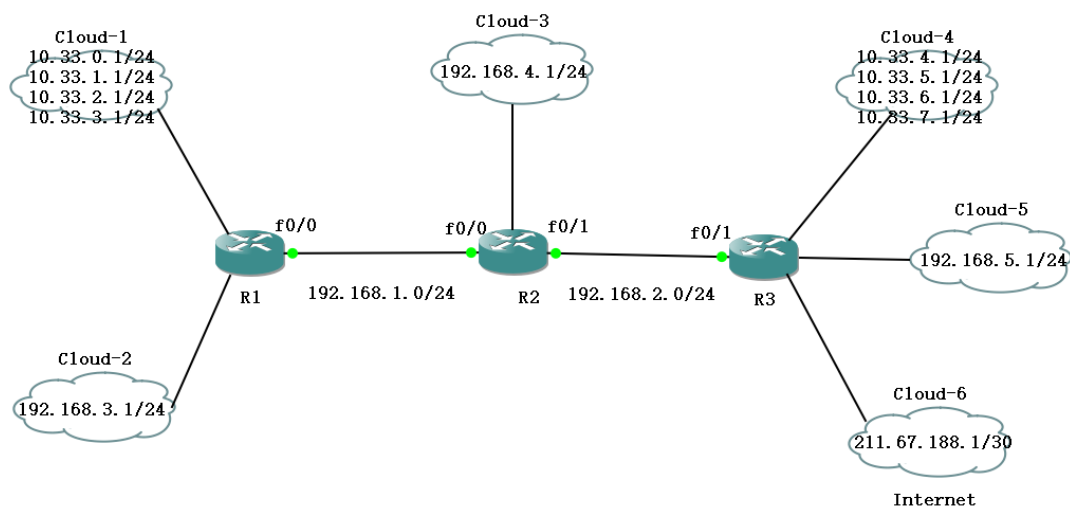
1. 软件：GNS3
2. 路由：c7200

二、实验操作

实验要求：

- 1、掌握 EIGRP 的基本配置
- 2、掌握 EIGRP 的通配符掩配置方法
- 3、掌握 EIGRP 的自动汇总特性，理解 EIGRP 的自动汇总的缺陷以及如何关闭自动汇总
- 4、掌握 EIGRP 的手工汇总
- 5、掌握通过 `ip default-network` 命令配置 EIGRP 默认网络
- 6、掌握 EIGRP 的手工汇总的方法

实验拓扑：



实验过程：

- 1、配置各台路由器的 IP 地址，并且使用 `ping` 命令确认各路由器的直连口的互通性。

参照上一章 (RIP 实验)。

- 2、在三台路由配置 EIGRP 自治系统编号为 33

参考命令：

R1 配置：

```
R1 (config)#router eigrp 33
R1 (config-router)#network 192.168.3.0 0.0.0.255
R1 (config-router)#network 192.168.1.0 0.0.0.255
R1 (config-router)#network 10.0.0.0
```

R2 配置:

```
R2 (config)#router eigrp 33
R2 (config-router)#network 192.168.4.0
R2 (config-router)#network 192.168.2.0
R2 (config-router)#network 192.168.1.0
```

R3 配置:

```
R3 (config)#router eigrp 33
R3 (config-router)#net 10.0.0.0
R3 (config-router)#net 192.168.5.0
R3 (config-router)#net 192.168.2.0
```

问题 1、查看各路由器的路由表，在 R1 上 ping 10.33.4.1，能否 ping 通？

R1 路由表:

```
10.0.0.0/8 is variably subnetted, 9 subnets, 3 masks
D    10.0.0.0/8 is a summary, 01:26:38, Null0
C    10.33.0.0/24 is directly connected, Loopback0
L    10.33.0.1/32 is directly connected, Loopback0
C    10.33.1.0/24 is directly connected, Loopback0
L    10.33.1.1/32 is directly connected, Loopback0
C    10.33.2.0/24 is directly connected, Loopback0
L    10.33.2.1/32 is directly connected, Loopback0
C    10.33.3.0/24 is directly connected, Loopback0
L    10.33.3.1/32 is directly connected, Loopback0
D    192.168.1.0/24 is variably subnetted, 2 subnets, 2 masks
C    192.168.1.0/24 is directly connected, FastEthernet0/0
L    192.168.1.1/32 is directly connected, FastEthernet0/0
D    192.168.2.0/24 [90/30720] via 192.168.1.2, 01:26:38, FastEthernet0/0
D    192.168.3.0/24 is variably subnetted, 2 subnets, 2 masks
C    192.168.3.0/24 is directly connected, Loopback1
L    192.168.3.1/32 is directly connected, Loopback1
D    192.168.4.0/24 [90/156160] via 192.168.1.2, 01:26:38, FastEthernet0/0
D    192.168.5.0/24 [90/158720] via 192.168.1.2, 01:26:38, FastEthernet0/0
R1#
```

R2 路由表:

```
D    10.0.0.0/8 [90/156160] via 192.168.2.2, 01:26:04, FastEthernet0/1
    [90/156160] via 192.168.1.1, 01:26:04, FastEthernet0/0
D    192.168.1.0/24 is variably subnetted, 2 subnets, 2 masks
C    192.168.1.0/24 is directly connected, FastEthernet0/0
L    192.168.1.2/32 is directly connected, FastEthernet0/0
D    192.168.2.0/24 is variably subnetted, 2 subnets, 2 masks
C    192.168.2.0/24 is directly connected, FastEthernet0/1
L    192.168.2.1/32 is directly connected, FastEthernet0/1
D    192.168.3.0/24 [90/156160] via 192.168.1.1, 01:26:24, FastEthernet0/0
D    192.168.4.0/24 is variably subnetted, 2 subnets, 2 masks
C    192.168.4.0/24 is directly connected, Loopback2
L    192.168.4.1/32 is directly connected, Loopback2
D    192.168.5.0/24 [90/156160] via 192.168.2.2, 01:26:24, FastEthernet0/1
R2#
```

R3 路由表:

```
10.0.0.0/8 is variably subnetted, 9 subnets, 3 masks
D    10.0.0.0/8 is a summary, 00:00:17, Null0
C    10.33.4.0/24 is directly connected, Loopback3
L    10.33.4.1/32 is directly connected, Loopback3
C    10.33.5.0/24 is directly connected, Loopback3
L    10.33.5.1/32 is directly connected, Loopback3
C    10.33.6.0/24 is directly connected, Loopback3
L    10.33.6.1/32 is directly connected, Loopback3
C    10.33.7.0/24 is directly connected, Loopback3
L    10.33.7.1/32 is directly connected, Loopback3
D    192.168.1.0/24 [90/30720] via 192.168.2.1, 00:00:17, FastEthernet0/1
D    192.168.2.0/24 is variably subnetted, 2 subnets, 2 masks
C    192.168.2.0/24 is directly connected, FastEthernet0/1
L    192.168.2.2/32 is directly connected, FastEthernet0/1
D    192.168.3.0/24 [90/158720] via 192.168.2.1, 00:00:17, FastEthernet0/1
D    192.168.4.0/24 [90/156160] via 192.168.2.1, 00:00:17, FastEthernet0/1
D    192.168.5.0/24 is variably subnetted, 2 subnets, 2 masks
C    192.168.5.0/24 is directly connected, Loopback4
L    192.168.5.1/32 is directly connected, Loopback4
C    211.67.188.0/24 is variably subnetted, 2 subnets, 2 masks
C    211.67.188.0/30 is directly connected, Loopback5
L    211.67.188.1/32 is directly connected, Loopback5
R3#
```

答: 在 R1 上 ping 10.33.4.1, 不能 ping 通。因为由于自动汇总, R1 上没有到达 10.33.4.1 的路由条目。

3、在任意一台路由器上观察 EIGRP 的邻居关系

参考命令:

```
R1#show ip eigrp neighbors
```

```
R1#show ip eigrp neighbors
EIGRP-IPv4 Neighbors for AS(33)
H   Address                Interface         Hold Uptime   SRTT   RT0  O  Seq
                               (sec)          (ms)      138    0  Cnt Num
0   192.168.1.2              Fa0/0            14 00:25:11   23
R1#
```

4、在任意一台路由器上查看路由器

参考命令:

```
R1#show ip route
```

```
10.0.0.0/8 is variably subnetted, 9 subnets, 3 masks
D    10.0.0.0/8 is a summary, 01:26:38, Null0
C    10.33.0.0/24 is directly connected, Loopback0
L    10.33.0.1/32 is directly connected, Loopback0
C    10.33.1.0/24 is directly connected, Loopback0
L    10.33.1.1/32 is directly connected, Loopback0
C    10.33.2.0/24 is directly connected, Loopback0
L    10.33.2.1/32 is directly connected, Loopback0
C    10.33.3.0/24 is directly connected, Loopback0
L    10.33.3.1/32 is directly connected, Loopback0
D    192.168.1.0/24 is variably subnetted, 2 subnets, 2 masks
C    192.168.1.0/24 is directly connected, FastEthernet0/0
L    192.168.1.1/32 is directly connected, FastEthernet0/0
D    192.168.2.0/24 [90/30720] via 192.168.1.2, 01:26:38, FastEthernet0/0
D    192.168.3.0/24 is variably subnetted, 2 subnets, 2 masks
C    192.168.3.0/24 is directly connected, Loopback1
L    192.168.3.1/32 is directly connected, Loopback1
D    192.168.4.0/24 [90/156160] via 192.168.1.2, 01:26:38, FastEthernet0/0
D    192.168.5.0/24 [90/158720] via 192.168.1.2, 01:26:38, FastEthernet0/0
R1#
```

5、在各路由器上查看 EIGRP 拓扑表

参考命令：

```
R#show ip eigrp topology
```

R1 拓扑表：

```
P 192.168.3.0/24, 1 successors, FD is 128256
  via Connected, Loopback1
P 192.168.2.0/24, 1 successors, FD is 30720
  via 192.168.1.2 (30720/28160), FastEthernet0/0
P 10.33.1.0/24, 1 successors, FD is 128256
  via Connected, Loopback0
P 10.0.0.0/8, 1 successors, FD is 128256
  via Summary (128256/0), Null0
P 192.168.1.0/24, 1 successors, FD is 28160
  via Connected, FastEthernet0/0
P 192.168.4.0/24, 1 successors, FD is 156160
  via 192.168.1.2 (156160/128256), FastEthernet0/0
P 192.168.5.0/24, 1 successors, FD is 158720
  via 192.168.1.2 (158720/156160), FastEthernet0/0
P 10.33.2.0/24, 1 successors, FD is 128256
  via Connected, Loopback0
P 10.33.3.0/24, 1 successors, FD is 128256
  via Connected, Loopback0
P 10.33.0.0/24, 1 successors, FD is 128256
  via Connected, Loopback0
R1#
```

R2 拓扑表：

```
P 192.168.3.0/24, 1 successors, FD is 156160
  via 192.168.1.1 (156160/128256), FastEthernet0/0
P 192.168.2.0/24, 1 successors, FD is 28160
  via Connected, FastEthernet0/1
P 10.0.0.0/8, 2 successors, FD is 156160
  via 192.168.1.1 (156160/128256), FastEthernet0/0
  via 192.168.2.2 (156160/128256), FastEthernet0/1
P 192.168.1.0/24, 1 successors, FD is 28160
  via Connected, FastEthernet0/0
P 192.168.4.0/24, 1 successors, FD is 128256
  via Connected, Loopback2
P 192.168.5.0/24, 1 successors, FD is 156160
  via 192.168.2.2 (156160/128256), FastEthernet0/1
R2#
```

R3 拓扑表：


```

P 192.168.3.0/24, 1 successors, FD is 158720
  via 192.168.2.1 (158720/156160), FastEthernet0/1
P 192.168.2.0/24, 1 successors, FD is 28160
  via Connected, FastEthernet0/1
P 10.0.0.0/8, 1 successors, FD is 128256
  via Summary (128256/0), Null0
P 192.168.1.0/24, 1 successors, FD is 30720
  via 192.168.2.1 (30720/28160), FastEthernet0/1
P 10.33.6.0/24, 1 successors, FD is 128256
  via Connected, Loopback3
P 10.33.5.0/24, 1 successors, FD is 128256
  via Connected, Loopback3
P 10.33.4.0/24, 1 successors, FD is 128256
  via Connected, Loopback3
P 192.168.4.0/24, 1 successors, FD is 156160
  via 192.168.2.1 (156160/128256), FastEthernet0/1
P 192.168.5.0/24, 1 successors, FD is 128256
  via Connected, Loopback4
P 10.33.7.0/24, 1 successors, FD is 128256
  via Connected, Loopback3
R3#

```

问题 2：在拓扑表中包含几条记录？举例说明其中一条记录的 AD 和 FD 值，并写出其 FD 计算过程。

答：R1 包含 10 条记录。

R2 包含 4 条记录。

R3 包含 10 条记录。

记录：R1 >>> 到达 R2 的 192.168.2.0 网络，FD：30720、AD：28160

FD 计算方式：网络入口最小带宽为 100000Kbit，时延=100usec，
 $\text{metric} = [10000000 / 100000 + (100 + 100) / 10] * 256 = 30720$

6、在各路由器上查看 EIGRP 接口

```
R#show ip eigrp interfaces
```

R1 EIGRP 接口：

```

R1#show ip eigrp interfaces
EIGRP-IPv4 Interfaces for AS(33)

```

Interface	Peers	Xmit Queue Un/Reliable	PeerQ Un/Reliable	Mean SRTT	Pacing Time Un/Reliable	Multicast Flow Timer	Pending Routes
Lo1	0	0/0	0/0	0	0/0	0	0
Fa0/0	1	0/0	0/0	29	0/0	92	0
Lo0	0	0/0	0/0	0	0/0	0	0

```

R1#

```

R2 EIGRP 接口：

```
R2#show ip eigrp interfaces
EIGRP-IPv4 Interfaces for AS(33)
```

Interface	Peers	Xmit Queue Un/Reliable	PeerQ Un/Reliable	Mean SRTT	Pacing Time Un/Reliable	Multicast Flow Timer	Pending Routes
Lo2	0	0/0	0/0	0	0/0	0	0
Fa0/0	1	0/0	0/0	23	0/0	96	0
Fa0/1	1	0/0	0/0	40	0/0	164	0

```
R2#
```

R3 EIGRP 接口:

```
R3#show ip eigrp interfaces
EIGRP-IPv4 Interfaces for AS(33)
```

Interface	Peers	Xmit Queue Un/Reliable	PeerQ Un/Reliable	Mean SRTT	Pacing Time Un/Reliable	Multicast Flow Timer	Pending Routes
Lo4	0	0/0	0/0	0	0/0	0	0
Fa0/1	1	0/0	0/0	291	0/0	2156	0
Lo3	0	0/0	0/0	0	0/0	0	0

```
R3#
```

7、查看协议信息

参考命令:

```
R#show ip protocols
```

R1 协议信息:

```
R1#show ip protocols
*** IP Routing is NSF aware ***

Routing Protocol is "eigrp 33"
  Outgoing update filter list for all interfaces is not set
  Incoming update filter list for all interfaces is not set
  Default networks flagged in outgoing updates
  Default networks accepted from incoming updates
  EIGRP-IPv4 Protocol for AS(33)
    Metric weight K1=1, K2=0, K3=1, K4=0, K5=0
    NSF-aware route hold timer is 240
    Router-ID: 192.168.3.1
    Topology : 0 (base)
    Active Timer: 3 min
    Distance: internal 90 external 170
    Maximum path: 4
    Maximum hopcount 100
    Maximum metric variance 1

  Automatic Summarization: enabled
    192.168.3.0/24 for Fa0/0, Lo0
    192.168.1.0/24 for Lo1, Lo0
    10.0.0.0/8 for Lo1, Fa0/0
    Summarizing 4 components with metric 128256
  Maximum path: 4
  Routing for Networks:
    10.0.0.0
    192.168.1.0
    192.168.3.0
  Routing Information Sources:
    Gateway         Distance         Last Update
    192.168.1.2      90               02:46:10
  Distance: internal 90 external 170

R1#
```

R2 协议信息:

```

R2#show ip protocols
*** IP Routing is NSF aware ***

Routing Protocol is "eigrp 33"
  Outgoing update filter list for all interfaces is not set
  Incoming update filter list for all interfaces is not set
  Default networks flagged in outgoing updates
  Default networks accepted from incoming updates
  EIGRP-IPv4 Protocol for AS(33)
    Metric weight K1=1, K2=0, K3=1, K4=0, K5=0
    NSF-aware route hold timer is 240
    Router-ID: 192.168.4.1
    Topology : 0 (base)
      Active Timer: 3 min
      Distance: internal 90 external 170
      Maximum path: 4
      Maximum hopcount 100
      Maximum metric variance 1

  Automatic Summarization: enabled
    192.168.4.0/24 for Fa0/0, Fa0/1
    192.168.2.0/24 for Lo2, Fa0/0
    192.168.1.0/24 for Lo2, Fa0/1
  Maximum path: 4
  Routing for Networks:
    192.168.1.0
    192.168.2.0
    192.168.4.0
  Routing Information Sources:
    Gateway         Distance      Last Update
    192.168.2.2         90          02:47:42
    192.168.1.1         90          02:47:43
  Distance: internal 90 external 170

R2#

```

R3 协议信息:

```

R3#show ip protocols
*** IP Routing is NSF aware ***

Routing Protocol is "eigrp 33"
  Outgoing update filter list for all interfaces is not set
  Incoming update filter list for all interfaces is not set
  Default networks flagged in outgoing updates
  Default networks accepted from incoming updates
  EIGRP-IPv4 Protocol for AS(33)
    Metric weight K1=1, K2=0, K3=1, K4=0, K5=0
    NSF-aware route hold timer is 240
    Router-ID: 211.67.188.1
    Topology : 0 (base)
      Active Timer: 3 min
      Distance: internal 90 external 170
      Maximum path: 4
      Maximum hopcount 100
      Maximum metric variance 1

  Automatic Summarization: enabled
    192.168.5.0/24 for Fa0/1, Lo3
    192.168.2.0/24 for Lo4, Lo3
    10.0.0.0/8 for Lo4, Fa0/1
      Summarizing 4 components with metric 128256
  Maximum path: 4
  Routing for Networks:
    10.0.0.0
    192.168.2.0
    192.168.5.0
  Routing Information Sources:
    Gateway         Distance      Last Update
    192.168.2.1      90           01:21:55
  Distance: internal 90 external 170

R3#

```

8、关闭各路由器自动汇总，清空路由表

参考命令：

```

R1(config)#router eigrp 33

R1(config-router)#no auto-summary

R1#clear ip route *

```

此时查看每个路由器路由表，有什么变化

R1 路由表：


```

10.0.0.0/8 is variably subnetted, 12 subnets, 2 masks
C   10.33.0.0/24 is directly connected, Loopback0
L   10.33.0.1/32 is directly connected, Loopback0
C   10.33.1.0/24 is directly connected, Loopback0
L   10.33.1.1/32 is directly connected, Loopback0
C   10.33.2.0/24 is directly connected, Loopback0
L   10.33.2.1/32 is directly connected, Loopback0
C   10.33.3.0/24 is directly connected, Loopback0
L   10.33.3.1/32 is directly connected, Loopback0
D   10.33.4.0/24 [90/158720] via 192.168.1.2, 00:06:58, FastEthernet0/0
D   10.33.5.0/24 [90/158720] via 192.168.1.2, 00:06:58, FastEthernet0/0
D   10.33.6.0/24 [90/158720] via 192.168.1.2, 00:06:58, FastEthernet0/0
D   10.33.7.0/24 [90/158720] via 192.168.1.2, 00:06:58, FastEthernet0/0
192.168.1.0/24 is variably subnetted, 2 subnets, 2 masks
C   192.168.1.0/24 is directly connected, FastEthernet0/0
L   192.168.1.1/32 is directly connected, FastEthernet0/0
D   192.168.2.0/24 [90/30720] via 192.168.1.2, 00:06:58, FastEthernet0/0
192.168.3.0/24 is variably subnetted, 2 subnets, 2 masks
C   192.168.3.0/24 is directly connected, Loopback1
L   192.168.3.1/32 is directly connected, Loopback1
D   192.168.4.0/24 [90/156160] via 192.168.1.2, 00:06:58, FastEthernet0/0
D   192.168.5.0/24 [90/158720] via 192.168.1.2, 00:06:58, FastEthernet0/0
R1#

```

R2 路由表:

```

10.0.0.0/24 is subnetted, 8 subnets
D   10.33.0.0 [90/156160] via 192.168.1.1, 00:07:33, FastEthernet0/0
D   10.33.1.0 [90/156160] via 192.168.1.1, 00:07:33, FastEthernet0/0
D   10.33.2.0 [90/156160] via 192.168.1.1, 00:07:33, FastEthernet0/0
D   10.33.3.0 [90/156160] via 192.168.1.1, 00:07:33, FastEthernet0/0
D   10.33.4.0 [90/156160] via 192.168.2.2, 00:07:33, FastEthernet0/1
D   10.33.5.0 [90/156160] via 192.168.2.2, 00:07:33, FastEthernet0/1
D   10.33.6.0 [90/156160] via 192.168.2.2, 00:07:33, FastEthernet0/1
D   10.33.7.0 [90/156160] via 192.168.2.2, 00:07:33, FastEthernet0/1
192.168.1.0/24 is variably subnetted, 2 subnets, 2 masks
C   192.168.1.0/24 is directly connected, FastEthernet0/0
L   192.168.1.2/32 is directly connected, FastEthernet0/0
192.168.2.0/24 is variably subnetted, 2 subnets, 2 masks
C   192.168.2.0/24 is directly connected, FastEthernet0/1
L   192.168.2.1/32 is directly connected, FastEthernet0/1
D   192.168.3.0/24 [90/156160] via 192.168.1.1, 00:07:33, FastEthernet0/0
192.168.4.0/24 is variably subnetted, 2 subnets, 2 masks
C   192.168.4.0/24 is directly connected, Loopback2
L   192.168.4.1/32 is directly connected, Loopback2
D   192.168.5.0/24 [90/156160] via 192.168.2.2, 00:07:33, FastEthernet0/1
R2#

```

R3 路由表:

```

10.0.0.0/8 is variably subnetted, 12 subnets, 2 masks
D   10.33.0.0/24 [90/158720] via 192.168.2.1, 00:06:14, FastEthernet0/1
D   10.33.1.0/24 [90/158720] via 192.168.2.1, 00:06:14, FastEthernet0/1
D   10.33.2.0/24 [90/158720] via 192.168.2.1, 00:06:14, FastEthernet0/1
D   10.33.3.0/24 [90/158720] via 192.168.2.1, 00:06:14, FastEthernet0/1
C   10.33.4.0/24 is directly connected, Loopback3
L   10.33.4.1/32 is directly connected, Loopback3
C   10.33.5.0/24 is directly connected, Loopback3
L   10.33.5.1/32 is directly connected, Loopback3
C   10.33.6.0/24 is directly connected, Loopback3
L   10.33.6.1/32 is directly connected, Loopback3
C   10.33.7.0/24 is directly connected, Loopback3
L   10.33.7.1/32 is directly connected, Loopback3
D   192.168.1.0/24 [90/30720] via 192.168.2.1, 00:06:14, FastEthernet0/1
192.168.2.0/24 is variably subnetted, 2 subnets, 2 masks
C   192.168.2.0/24 is directly connected, FastEthernet0/1
L   192.168.2.2/32 is directly connected, FastEthernet0/1
D   192.168.3.0/24 [90/158720] via 192.168.2.1, 00:06:14, FastEthernet0/1
D   192.168.4.0/24 [90/156160] via 192.168.2.1, 00:06:14, FastEthernet0/1
192.168.5.0/24 is variably subnetted, 2 subnets, 2 masks
C   192.168.5.0/24 is directly connected, Loopback4
L   192.168.5.1/32 is directly connected, Loopback4
211.67.188.0/24 is variably subnetted, 2 subnets, 2 masks
C   211.67.188.0/30 is directly connected, Loopback5
L   211.67.188.1/32 is directly connected, Loopback5
R3#

```

问题 3: 如果此时在 R1 上 ping 10.33.4.1 能否 ping 通?

答: 在 R1 上 ping 10.33.4.1 能 ping 通。因为关闭自动汇总之后, R1 上有到达 10.33.4.1 的路由条目。

9、在路由器 R1 和 R3 上配置手动汇总

参考命令:

```
R1(config)#int f0/0

R1(config-if)#ip summary-address eigrp 33 10.33.0.0 255.255.252.0

R3(config)#int f0/1

R3(config-if)#ip summary-address eigrp 33 10.33.4.0 255.255.252.0
```

问题 4: 查看各路由器路由表, 有什么不同

R1 路由表:

```
10.0.0.0/8 is variably subnetted, 10 subnets, 3 masks
D    10.33.0.0/22 is a summary, 00:01:39, Null0
C    10.33.0.0/24 is directly connected, Loopback0
L    10.33.0.1/32 is directly connected, Loopback0
C    10.33.1.0/24 is directly connected, Loopback0
L    10.33.1.1/32 is directly connected, Loopback0
C    10.33.2.0/24 is directly connected, Loopback0
L    10.33.2.1/32 is directly connected, Loopback0
C    10.33.3.0/24 is directly connected, Loopback0
L    10.33.3.1/32 is directly connected, Loopback0
D    10.33.4.0/22 [90/158720] via 192.168.1.2, 00:00:59, FastEthernet0/0
D    192.168.1.0/24 is variably subnetted, 2 subnets, 2 masks
C    192.168.1.0/24 is directly connected, FastEthernet0/0
L    192.168.1.1/32 is directly connected, FastEthernet0/0
D    192.168.2.0/24 [90/30720] via 192.168.1.2, 00:22:30, FastEthernet0/0
D    192.168.3.0/24 is variably subnetted, 2 subnets, 2 masks
C    192.168.3.0/24 is directly connected, Loopback1
L    192.168.3.1/32 is directly connected, Loopback1
D    192.168.4.0/24 [90/156160] via 192.168.1.2, 00:22:30, FastEthernet0/0
D    192.168.5.0/24 [90/158720] via 192.168.1.2, 00:22:30, FastEthernet0/0
R1#
```

R2 路由表:

```
10.0.0.0/22 is subnetted, 2 subnets
D    10.33.0.0 [90/156160] via 192.168.1.1, 00:02:59, FastEthernet0/0
D    10.33.4.0 [90/156160] via 192.168.2.2, 00:02:20, FastEthernet0/1
D    192.168.1.0/24 is variably subnetted, 2 subnets, 2 masks
C    192.168.1.0/24 is directly connected, FastEthernet0/0
L    192.168.1.2/32 is directly connected, FastEthernet0/0
D    192.168.2.0/24 is variably subnetted, 2 subnets, 2 masks
C    192.168.2.0/24 is directly connected, FastEthernet0/1
L    192.168.2.1/32 is directly connected, FastEthernet0/1
D    192.168.3.0/24 [90/156160] via 192.168.1.1, 00:24:57, FastEthernet0/0
D    192.168.4.0/24 is variably subnetted, 2 subnets, 2 masks
C    192.168.4.0/24 is directly connected, Loopback2
L    192.168.4.1/32 is directly connected, Loopback2
D    192.168.5.0/24 [90/156160] via 192.168.2.2, 00:24:57, FastEthernet0/1
R2#
```

R3 路由表:

```

10.0.0.0/8 is variably subnetted, 10 subnets, 3 masks
D 10.33.0.0/22 [90/158720] via 192.168.2.1, 00:03:55, FastEthernet0/1
O 10.33.4.0/22 is a summary, 00:03:10, Null0
C 10.33.4.0/24 is directly connected, Loopback3
L 10.33.4.1/32 is directly connected, Loopback3
C 10.33.5.0/24 is directly connected, Loopback3
L 10.33.5.1/32 is directly connected, Loopback3
C 10.33.6.0/24 is directly connected, Loopback3
L 10.33.6.1/32 is directly connected, Loopback3
C 10.33.7.0/24 is directly connected, Loopback3
L 10.33.7.1/32 is directly connected, Loopback3
D 192.168.1.0/24 [90/30720] via 192.168.2.1, 00:25:17, FastEthernet0/1
O 192.168.2.0/24 is variably subnetted, 2 subnets, 2 masks
C 192.168.2.0/24 is directly connected, FastEthernet0/1
L 192.168.2.2/32 is directly connected, FastEthernet0/1
D 192.168.3.0/24 [90/158720] via 192.168.2.1, 00:25:17, FastEthernet0/1
O 192.168.4.0/24 [90/156160] via 192.168.2.1, 00:25:17, FastEthernet0/1
O 192.168.5.0/24 is variably subnetted, 2 subnets, 2 masks
C 192.168.5.0/24 is directly connected, Loopback4
L 192.168.5.1/32 is directly connected, Loopback4
C 211.67.188.0/24 is variably subnetted, 2 subnets, 2 masks
L 211.67.188.0/30 is directly connected, Loopback5
L 211.67.188.1/32 is directly connected, Loopback5
R3#

```

答：各个路由器的路由表中添加了手动汇总的路由条目，解决了连续子网划分问题。

10、配置默认网络

在 R3 上配置静态路由

```
R3(config)#ip route 0.0.0.0 0.0.0.0 211.67.188.2
```

在 R3 上声明默认网络

```
R3(config)#router eigrp 33
```

```
R3(config-router)#network 211.67.188.0
```

```
R3(config)#ip default-network 211.67.188.0
```

问题 5：在各路由器上查看路由表，看有什么变化？

R1 路由表：


```

10.0.0.0/8 is variably subnetted, 10 subnets, 3 masks
D   10.33.0.0/22 is a summary, 00:14:19, Null0
C   10.33.0.0/24 is directly connected, Loopback0
L   10.33.0.1/32 is directly connected, Loopback0
C   10.33.1.0/24 is directly connected, Loopback0
L   10.33.1.1/32 is directly connected, Loopback0
C   10.33.2.0/24 is directly connected, Loopback0
L   10.33.2.1/32 is directly connected, Loopback0
C   10.33.3.0/24 is directly connected, Loopback0
L   10.33.3.1/32 is directly connected, Loopback0
D   10.33.4.0/22 [90/158720] via 192.168.1.2, 00:13:39, FastEthernet0/0
192.168.1.0/24 is variably subnetted, 2 subnets, 2 masks
C   192.168.1.0/24 is directly connected, FastEthernet0/0
L   192.168.1.1/32 is directly connected, FastEthernet0/0
D   192.168.2.0/24 [90/30720] via 192.168.1.2, 00:35:10, FastEthernet0/0
192.168.3.0/24 is variably subnetted, 2 subnets, 2 masks
C   192.168.3.0/24 is directly connected, Loopback1
L   192.168.3.1/32 is directly connected, Loopback1
D   192.168.4.0/24 [90/156160] via 192.168.1.2, 00:35:11, FastEthernet0/0
D   192.168.5.0/24 [90/158720] via 192.168.1.2, 00:35:11, FastEthernet0/0
211.67.188.0/30 is subnetted, 1 subnets
D   211.67.188.0 [90/158720] via 192.168.1.2, 00:00:54, FastEthernet0/0
R1#

```

R2 路由表:

```

10.0.0.0/22 is subnetted, 2 subnets
D   10.33.0.0 [90/156160] via 192.168.1.1, 00:15:03, FastEthernet0/0
D   10.33.4.0 [90/156160] via 192.168.2.2, 00:14:24, FastEthernet0/1
192.168.1.0/24 is variably subnetted, 2 subnets, 2 masks
C   192.168.1.0/24 is directly connected, FastEthernet0/0
L   192.168.1.2/32 is directly connected, FastEthernet0/0
192.168.2.0/24 is variably subnetted, 2 subnets, 2 masks
C   192.168.2.0/24 is directly connected, FastEthernet0/1
L   192.168.2.1/32 is directly connected, FastEthernet0/1
D   192.168.3.0/24 [90/156160] via 192.168.1.1, 00:37:01, FastEthernet0/0
192.168.4.0/24 is variably subnetted, 2 subnets, 2 masks
C   192.168.4.0/24 is directly connected, Loopback2
L   192.168.4.1/32 is directly connected, Loopback2
D   192.168.5.0/24 [90/156160] via 192.168.2.2, 00:37:01, FastEthernet0/1
211.67.188.0/30 is subnetted, 1 subnets
D   211.67.188.0 [90/156160] via 192.168.2.2, 00:01:38, FastEthernet0/1
R2#

```

R3 路由表:

```

S* 0.0.0.0/0 [1/0] via 211.67.188.2
10.0.0.0/8 is variably subnetted, 10 subnets, 3 masks
D   10.33.0.0/22 [90/158720] via 192.168.2.1, 00:16:58, FastEthernet0/1
D   10.33.4.0/22 is a summary, 00:16:19, Null0
C   10.33.4.0/24 is directly connected, Loopback3
L   10.33.4.1/32 is directly connected, Loopback3
C   10.33.5.0/24 is directly connected, Loopback3
L   10.33.5.1/32 is directly connected, Loopback3
C   10.33.6.0/24 is directly connected, Loopback3
L   10.33.6.1/32 is directly connected, Loopback3
C   10.33.7.0/24 is directly connected, Loopback3
L   10.33.7.1/32 is directly connected, Loopback3
D   192.168.1.0/24 [90/30720] via 192.168.2.1, 00:38:20, FastEthernet0/1
192.168.2.0/24 is variably subnetted, 2 subnets, 2 masks
C   192.168.2.0/24 is directly connected, FastEthernet0/1
L   192.168.2.2/32 is directly connected, FastEthernet0/1
D   192.168.3.0/24 [90/158720] via 192.168.2.1, 00:38:20, FastEthernet0/1
D   192.168.4.0/24 [90/156160] via 192.168.2.1, 00:38:20, FastEthernet0/1
192.168.5.0/24 is variably subnetted, 2 subnets, 2 masks
C   192.168.5.0/24 is directly connected, Loopback4
L   192.168.5.1/32 is directly connected, Loopback4
211.67.188.0/24 is variably subnetted, 2 subnets, 2 masks
C   211.67.188.0/30 is directly connected, Loopback5
L   211.67.188.1/32 is directly connected, Loopback5
R3#

```


答：变化，各个路由器上有到达 211.67.188.0 网段的路由条目。

11、修改 R1 的 f0/0 接口的 K 值为 k1=1, k2=1, k3=1, k4=0, k5=1

参考命令：

```
R1(config)#router eigrp 33  
  
R1(config-router)# metric weights 0 1 1 1 0 1
```

问题 6：修改后查看路由器 R1 和 R2 的邻居关系是否存在？这说明了什么？

```
R1#show ip eigrp neighbors  
EIGRP-IPv4 Neighbors for AS(33)  
R1#
```

答：路由器 R1 和 R2 的邻居关系不存在，因为邻居关系需要满足的条件之一是 K 值相同。