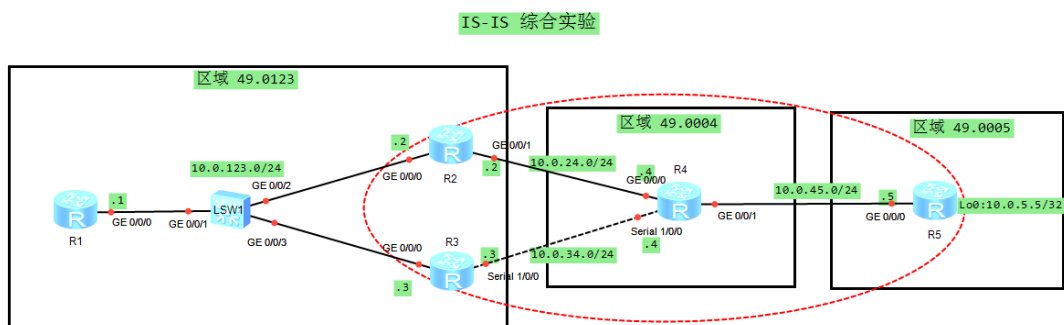


## 【HCIP 实验 08】IS-IS 综合实验

### 一、实验拓扑



### 二、实验需求及解法

本实验模拟IS-IS综合网络，完成以下需求：

1. 如图所示，配置所有路由器的接口IP地址。

R1:

```
interface GigabitEthernet0/0/0
 ip address 10.0.123.1 255.255.255.0
#
```

R2:

```
interface GigabitEthernet0/0/0
 ip address 10.0.123.2 255.255.255.0
interface GigabitEthernet0/0/1
 ip address 10.0.24.2 255.255.255.0
#
```

R3:

```
interface GigabitEthernet0/0/0
 ip address 10.0.123.3 255.255.255.0
interface Serial1/0/0
 ip address 10.0.34.3 255.255.255.0
#
```

R4:

```
interface GigabitEthernet0/0/0
 ip address 10.0.24.4 255.255.255.0
interface Serial1/0/0
 ip address 10.0.34.4 255.255.255.0
interface GigabitEthernet0/0/1
 ip address 10.0.45.4 255.255.255.0
#
```

R5:

```
interface GigabitEthernet0/0/0
 ip address 10.0.45.5 255.255.255.0
interface LoopBack0
 ip address 10.0.5.5 255.255.255.255
#
```

2. 运行IS-IS，进程号1，完成以下需求：

2.1 R1/2/3属于区域49.0123，R4属于区域49.0004，R5属于区域49.0005

2.2 系统ID如下：

R1: 0000.0000.0001

R2: 0000.0000.0002

R3: 0000.0000.0003

R4: 0000.0000.0004

R5: 0000.0000.0005

2.3 R1为Level-1路由器，R4为Level-2路由器，R5为Level-2路由器。

R2和R3为Level1-2路由器。

2.4 将各路由器的is-name修改为各自的设备名称。

2.5 确保R1可以ping通10.0.5.5

R1:

```
isis 1
 is-level level-1
 network-entity 49.0123.0000.0000.0001.00
 is-name R1
interface GigabitEthernet0/0/0
 isis enable 1
```

#

R2

```
isis 1
 network-entity 49.0123.0000.0000.0002.00
 is-name R2
interface GigabitEthernet0/0/0
 isis enable 1
interface GigabitEthernet0/0/1
```

```
isis enable 1
#
R3:
isis 1
network-entity 49.0123.0000.0000.0003.00
is-name R3
interface GigabitEthernet0/0/0
isis enable 1
interface Serial1/0/0
isis enable 1
#
R4:
isis 1
is-level level-2
network-entity 49.0004.0000.0000.0004.00
is-name R4
interface GigabitEthernet0/0/0
isis enable 1
interface GigabitEthernet0/0/1
isis enable 1
interface Serial1/0/0
isis enable 1
#
R5:
isis 1
is-level level-2
network-entity 49.0005.0000.0000.0005.00
is-name R5
interface GigabitEthernet0/0/0
isis enable 1
interface LoopBack0
isis enable 1
```

### 3. IS-IS优化

3.1 在R1/2/3之间选择R1成为DIS，优先级为120。

```
R1:
interface GigabitEthernet0/0/0
isis dis-priority 120
#
```

3.2 在R2/3上修改circuit-level，使得R2/3向R1只发送Level-1的IIH，向R4只发送Level-2的IIH。（IIH：ISIS Hello）查看R2/3的ISIS邻居，确认R2与R3只有L1的邻居关系。

```

R2:
interface GigabitEthernet0/0/0
    isis circuit-level level-1
interface GigabitEthernet0/0/1
    isis circuit-level level-2
#

```

```

R3:
interface GigabitEthernet0/0/0
    isis circuit-level level-1
interface Serial1/0/0
    isis circuit-level level-2

```

3.3 修改R4和R5之间的网络类型为P2P，不选择DIS加快收敛速度。

```

R4:
interface GigabitEthernet0/0/1
    isis circuit-type p2p
#

```

```

R5:
interface GigabitEthernet0/0/0
    isis circuit-type p2p

```

#### 4. 路径优化

4.1 R1去往10.0.5.5有R2和R3两个可用的路径，查看R1的路由表确认此点。

```

[R1]dis ip routing-table 10.0.5.5
Route Flags: R - relay, D - download to fib
-----
Routing Table : Public
Summary Count : 2
Destination/Mask    Proto   Pre  Cost   Flags NextHop         Interface
-----
0/0/0               ISIS-L1 15    10      D    10.0.123.2         GigabitEthernet
0/0/0               ISIS-L1 15    10      D    10.0.123.3         GigabitEthernet

```

R1从R2/3收到默认路由，cost均为10。

4.2 在R2和R3上使用路由渗透，查看R1路由表，确认R1获得10.0.5.5的明细路由。

```

R2/3:
isis 1
import-route isis level-2 into level-1

```

```

[R1]dis ip routing-table 10.0.5.5
Destination/Mask    Proto   Pre  Cost   Flags NextHop         Interface
-----
10.0.5.5/32        ISIS-L1 15    30      D    10.0.123.2         GigabitEthernet
0/0/0              ISIS-L1 15    30      D    10.0.123.3         GigabitEthernet
0/0/0

```

4.3 在R2和R3上开启自动计算cost功能，使得R1可以正确选择去往10.0.5.5的最佳路径。

查看R1路由表，确认R1选择R2作为最佳下一跳。

R2/3:

isis 1

auto-cost enable

[R1]dis ip routing-table 10.0.5.5

Destination/Mask	Proto	Pre	Cost	Flags	NextHop	Interface
10.0.5.5/32	ISIS-L1	15	40	D	10.0.123.2	GigabitEthernet