

OSPF实验:基本的OSPF配置思科认证 PDF转换可能丢失图片或格式，建议阅读原文

[https://www.100test.com/kao\\_ti2020/590/2021\\_2022\\_OSPF\\_E5\\_AE\\_9E\\_E9\\_AA\\_8C\\_c101\\_590388.htm](https://www.100test.com/kao_ti2020/590/2021_2022_OSPF_E5_AE_9E_E9_AA_8C_c101_590388.htm) 实验级别：Assistant 实验步骤：

1.首先在3台路由器上配置物理接口，并且使用ping命令确保物理链路的畅通。 2.在路由器上配置loopback接口：

```
R1(config)#int loopback 0 R1(config-if)#ip add 1.1.1.1
```

```
255.255.255.0 R2(config)#int loopback 0 R2(config-if)#ip add
```

```
2.2.2.2 255.255.255.0 R3(config)#int loopback 0 R3(config-if)#ip
```

```
add 3.3.3.3 255.255.255.0 路由器的RID是路由器接口的最高的IP
```

地址，当有环回口存在是，路由器将使用环回口的最高IP地址作为起RID，从而保证RID的稳定。

3. 在3台路由器上分别启动ospf进程，并且宣告直连接口的网络。

```
R1(config)#router ospf 10 R1(config-router)#network 192.168.1.0
```

```
0.0.0.255 area 0 R1(config-router)#network 1.1.1.0 0.0.0.255 area 0
```

```
R1(config-router)#network 192.168.3.0.0.255 area 0 ospf的进程
```

号只有本地意义，既在不同路由器上的进程号可以不相同。

但是为了日后维护的方便，一般启用相同的进程号。 ospf使用反向掩码。

Area 0表示骨干区域，在设计ospf网络时，所有的非骨干区域都需要和骨干区域直连！ R2，R3的配置和R1类似，这里省略。

不同的是我们在R2和R3上不宣告各自的环回口。

```
*Aug 13 17:58:51.411: %OSPF-5-ADJCHG: Process 10, Nbr
```

```
2.2.2.2 on Serial1/0 from LOADING to FULL, Loading Done 配置
```

结束后，我们可以看到邻居关系已经到达FULL状态。

4. 在R1上查看路由表，可以看到以下信息：

```
R1#show ip route Codes:
```

```
C - connected, S - static, 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 i - IS-IS, su - IS-IS  
summary, L1 - IS-IS level-1, L2 - IS-IS level-2 ia - IS-IS inter area, \* -  
candidate default, U - per-user static route o - ODR, P - periodic  
downloaded static route Gateway of last resort is not set 1.0.0.0/24 is  
subnetted, 1 subnets C 1.1.1.0 is directly connected, Loopback0 C  
192.168.1.0/24 is directly connected, Serial1/0 O 192.168.2.0/24  
[110/65] via 192.168.1.2, 00:03:42, Serial1/0 C 192.168.3.0/24 is  
directly connected, FastEthernet0/ 我们看到R1学到  
了192.168.2.0/24这个网段的路由。后面的数字[110/65]，分别  
表示OSPF的管理距离（AD）和路由的Metric值 OSPF的Metric  
值是由cost值逐跳累加的。Cost=100Mb/带宽值。 5. 在R1  
上show ip ospf neighbor、 show ip ospf interface R1#show ip ospf  
neighbor Neighbor ID Pri State Dead Time Address Interface 3.3.3.3  
1 FULL/BDR 00:00:34 192.168.3.3 FastEthernet0/0 2.2.2.2 0 FULL/  
00:00:32 192.168.1.2 Serial1/0 我们看到R1和R3选取了DR和BDR  
，而R1和R2没有选取。 在ospf的五种网络类型中  
。 Point-to-Point,Point-to-Multipoint(广播与非广播)这三种网  
络类型不选取DR与BDR. Broadcast,NBMA选取DR与BDR。  
R1#show ip ospf interface FastEthernet0/0 is up, line protocol is up  
Internet Address 192.168.3.1/24, Area 0 Process ID 10, Router ID  
1.1.1.1, Network Type BROADCAST, Cost: 1 Transmit Delay is 1  
sec, State DR, Priority 1 Designated Router (ID) 1.1.1.1, Interface  
address 192.168.3.1 Backup Designated router (ID) 3.3.3.3, Interface  
address 192.168.3.3 Timer intervals configured, Hello 10, Dead 40,

Wait 40, Retransmit 5 oob-resync timeout 40 Hello due in 00:00:03  
Index 3/3, flood queue length 0 Next 0x0(0)/0x0(0) Last flood scan  
length is 1, maximum is 1 Last flood scan time is 0 msec, maximum is  
0 msec Neighbor Count is 1, Adjacent neighbor count is 1 Adjacent  
with neighbor 3.3.3.3 (Backup Designated Router) Suppress hello for  
0 neighbor(s) Serial1/0 is up, line protocol is up Internet Address  
192.168.1.1/24, Area 0 Process ID 10, Router ID 1.1.1.1, Network  
Type POINT\_TO\_POINT, Cost: 64 Transmit Delay is 1 sec, State  
POINT\_TO\_POINT, Timer intervals configured, Hello 10, Dead  
40, Wait 40, Retransmit 5 oob-resync timeout 40 Hello due in  
00:00:02 Index 1/1, flood queue length 0 Next 0x0(0)/0x0(0) Last  
flood scan length is 1, maximum is 1 Last flood scan time is 4 msec,  
maximum is 4 msec Neighbor Count is 1, Adjacent neighbor count  
is 1 Adjacent with neighbor 2.2.2.2 Suppress hello for 0 neighbor(s)  
Loopback0 is up, line protocol is up Internet Address 1.1.1.1/24,  
Area 0 Process ID 10, Router ID 1.1.1.1, Network Type  
LOOPBACK, Cost: 1 Loopback interface is treated as a stub Host 在  
这里我们看到环回口的网络网络类型是Loopback，这是一种  
特殊的网络类型，只针对环回口存在。我们到R2上看看路由  
表：R2#show ip route Codes: C - connected, S - static, 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 i  
- IS-IS, su - IS-IS summary, L1 - IS-IS level-1, L2 - IS-IS level-2 ia -  
IS-IS inter area, \* - candidate default, U - per-user static route o -  
ODR, P - periodic downloaded static route Gateway of last resort is

not set 1.0.0.0/32 is subnetted, 1 subnets O 1.1.1.1 [110/65] via 192.168.1.1, 00:12:34, Serial1/0 2.0.0.0/24 is subnetted, 1 subnets C 2.2.2.0 is directly connected, Loopback0 C 192.168.1.0/24 is directly connected, Serial1/0 C 192.168.2.0/24 is directly connected, Serial1/1 O 192.168.3.0/24 [110/65] via 192.168.1.1, 00:12:34, Serial1/0 [110/65] via 192.168.2.3, 00:12:34, Serial1/1 R2的路由表显示来自环回口的路由，掩码为/32，既我们所说的“主机路由”。在实际应用中，环回口以32位的居多，用作ospf的管理接口。但是如果你想让环回口模拟一个网段，我们可以通过以下配置来消除。 R1(config)#int loopback 0 R1(config-if)#ip ospf network point-to-point 环回口只能配置成point-to-point这种类型，不可以配置成其它的类型。 回到R2查看路由表： R2#show ip route Codes: C - connected, S - static, 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 i - IS-IS, su - IS-IS summary, L1 - IS-IS level-1, L2 - IS-IS level-2 ia - IS-IS inter area, \* - candidate default, U - per-user static route o - ODR, P - periodic downloaded static route Gateway of last resort is not set 1.0.0.0/24 is subnetted, 1 subnets O 1.1.1.0 [110/65] via 192.168.1.1, 00:00:24, Serial1/0 2.0.0.0/24 is subnetted, 1 subnets C 2.2.2.0 is directly connected, Loopback0 C 192.168.1.0/24 is directly connected, Serial1/0 C 192.168.2.0/24 is directly connected, Serial1/1 O 192.168.3.0/24 [110/65] via 192.168.1.1, 00:00:24, Serial1/0 [110/65] via 192.168.2.3, 00:00:24, Serial1/1 我们看到主机路由没有了，取而代之的是一个/24的网段。 更多优质资料尽在百考

试题论坛 百考试题在线题库 思科认证更多详细资料 100Test  
下载频道开通，各类考试题目直接下载。详细请访问  
[www.100test.com](http://www.100test.com)