

基于非广播型链路的 OSPF 的初始配置

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简介

本文为在非广播链路的开放最短路径优先(OSPF)提供初始配置。在非广播介质 (例如，帧中继、X.25、ATM 和交换式多兆位数据服务 (SMDS)) 上，OSPF 可以在两种模式下运行：

- 非广播多路访问(NBMA)：由指定路由器(DR)和备份指定路由器模拟广播模型(BDR)的选择。在 NBMA 网络上模拟广播模型的方式有两种：使用 **ip ospf network broadcast** 接口子命令将网络类型定义为广播，或者使用 **router ospf** 命令配置邻居语句。
- 单点对多点：对待非广播网络作为点对点链路的一集由配置[ip ospf network point-to-multipoint命令](#)。

您必须定义在非广播网络的网络类型为了避免邻居语句的配置。本文为在非广播链路的OSPF提供配置示例。请使用**show ip ospf interface**命令为了检查运行OSPF，并且[show ip ospf neighbor命令](#)用于认识邻接路由器的状态接口的网络类型。

先决条件

要求

思科建议您了解[OSPF路由](#)协议的基本配置。

使用的组件

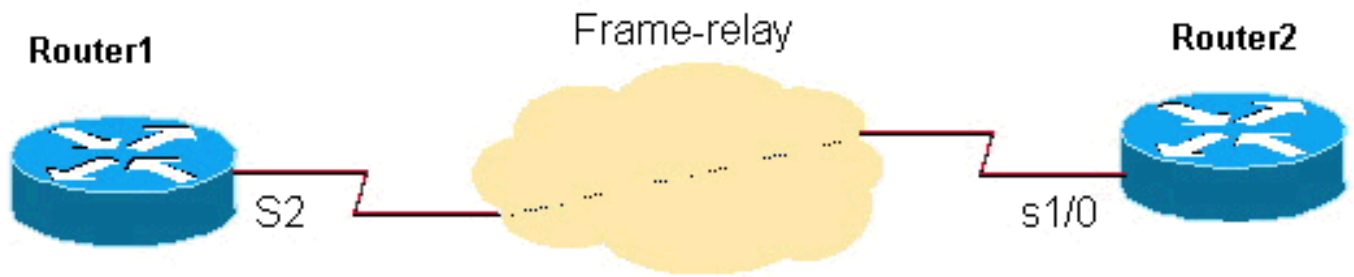
本文档中的信息基于以下软件和硬件版本：

- Cisco 2500 路由器
- 在路由器运行的Cisco IOS软件版本12.2(24a)

本文档中的信息都是基于特定实验室环境中的设备创建的。本文档中使用的所有设备最初均采用原始 (默认) 配置。如果您使用的是真实网络，请确保您已经了解所有命令的潜在影响。

网络图

这是用于在本文的配置示例的网络图。



NBMA的(使用网络类型广播)配置

Router1

```
interface Loopback0
  ip address 3.3.3.3 255.255.255.255
  !
  !
interface Serial2
  ip address 1.1.1.2 255.255.255.0
  encapsulation frame-relay
  ip ospf network broadcast
  no keepalive
  frame-relay map ip 1.1.1.1 16 broadcast
  !
  !
router ospf 1
  network 1.1.1.0 0.0.0.255 area 0
```

Router2

```
interface Loopback0
  ip address 2.2.2.2 255.255.255.255
  !
  !
interface Serial1/0
  ip address 1.1.1.1 255.255.255.0
  encapsulation frame-relay
  ip ospf network broadcast
  no keepalive
  clockrate 2000000
  frame-relay map ip 1.1.1.2 16 broadcast
  !
  !
router ospf 1
  network 1.1.1.0 0.0.0.255 area 0
  !
```

验证提示

这是Router1的show命令输出。

```
Router1# show ip ospf neighbor
```

Neighbor ID	Pri	State	Dead Time	Address	Interface
2.2.2.2	1	FULL/BDR	00:00:37	1.1.1.1	Serial2

```
Router1# show ip ospf interface s2
```

```

Serial2 is up, line protocol is up
Internet Address 1.1.1.2/24, Area 0
Process ID 1, Router ID 3.3.3.3, Network Type BROADCAST, Cost: 64
Transmit Delay is 1 sec, State DR, Priority 1
Designated Router (ID) 3.3.3.3, Interface address 1.1.1.2
Backup Designated router (ID) 2.2.2.2, Interface address 1.1.1.1
Timer intervals configured, Hello 10, Dead 40, Wait 40, Retransmit 5
  Hello due in 00:00:00
Index 1/1, flood queue length 0
Next 0x0(0)/0x0(0)
Last flood scan length is 1, maximum is 2
Last flood scan time is 0 msec, maximum is 4 msec
Neighbor Count is 1, Adjacent neighbor count is 1
  Adjacent with neighbor 2.2.2.2 (Backup Designated Router)
Suppress hello for 0 neighbor(s)

```

Router2 的输出如下所示。

```
Router2# show ip ospf neighbor
```

Neighbor ID	Pri	State	Dead Time	Address	Interface
3.3.3.3	1	FULL/DR	00:00:38	1.1.1.2	Serial1/0

```
Router2# show ip ospf interface s1/0
```

```

Serial1/0 is up, line protocol is up
Internet Address 1.1.1.1/24, Area 0
Process ID 1, Router ID 2.2.2.2, Network Type BROADCAST, Cost: 64
Transmit Delay is 1 sec, State BDR, Priority 1
Designated Router (ID) 3.3.3.3, Interface address 1.1.1.2
Backup Designated router (ID) 2.2.2.2, Interface address 1.1.1.1
Timer intervals configured, Hello 10, Dead 40, Wait 40, Retransmit 5
  Hello due in 00:00:03
Index 1/1, flood queue length 0
Next 0x0(0)/0x0(0)
Last flood scan length is 1, maximum is 2
Last flood scan time is 0 msec, maximum is 4 msec
Neighbor Count is 1, Adjacent neighbor count is 1
  Adjacent with neighbor 3.3.3.3 (Designated Router)
Suppress hello for 0 neighbor(s)

```

NBMA的(使用邻居语句)配置

Router1

```

interface Loopback0
  ip address 3.3.3.3 255.255.255.255
!
interface Serial2
  ip address 1.1.1.2 255.255.255.0
  encapsulation frame-relay
  ip ospf priority 2
  no keepalive
  frame-relay map ip 1.1.1.1 16
!
router ospf 1
  network 1.1.1.0 0.0.0.255 area 0
  neighbor 1.1.1.1
!

```

Router2

```

interface Loopback0
  ip address 2.2.2.2 255.255.255.255
!
interface Serial1/0
  ip address 1.1.1.1 255.255.255.0

```

```

encapsulation frame-relay
no keepalive
clockrate 2000000
frame-relay map ip 1.1.1.2 16
!
router ospf 1
network 1.1.1.0 0.0.0.255 area 0
neighbor 1.1.1.2
!

```

注意：在显示的配置中，[ip ospf priority 2命令](#)在Router1比默认优先级值设置一个接口优先级为1，做它DR和Router2 NBMA网络的BDR。若需要，您不能设置优先级值为0为了配置路由器变为DR/BDR。这在星型网络中是必要的，在该网络中应该将集线器配置为DR，分支既不应该是DR也不应该是BDR。虽则邻居语句的配置在一端的是满足形成邻接，它是良好的做法安排它配置在两个末端如显示。并且，因为OSPF数据包是使用neighbor语句进行单播的，所以frame-relay map命令不需要包含broadcast参数。

验证提示

这是Router1的show命令输出。

```
Router1# show ip ospf neighbors
```

Neighbor ID	Pri	State	Dead Time	Address	Interface
2.2.2.2	1	FULL/BDR	00:01:39	1.1.1.1	Serial2

```
Router1# show ip ospf interface s2
```

```

Serial2 is up, line protocol is up
Internet Address 1.1.1.2/24, Area 0
Process ID 1, Router ID 3.3.3.3, Network Type NON_BROADCAST, Cost: 64
Transmit Delay is 1 sec, State DR, Priority 1
Designated Router (ID) 3.3.3.3, Interface address 1.1.1.2
Backup Designated router (ID) 2.2.2.2, Interface address 1.1.1.1
Timer intervals configured, Hello 30, Dead 120, Wait 120, Retransmit 5
Hello due in 00:00:19
Index 1/1, flood queue length 0
Next 0x0(0)/0x0(0)
Last flood scan length is 2, maximum is 2
Last flood scan time is 0 msec, maximum is 0 msec
Neighbor Count is 1, Adjacent neighbor count is 1
Adjacent with neighbor 2.2.2.2 (Backup Designated Router)
Suppress hello for 0 neighbor(s)

```

Router2 的输出如下所示。

```
Router2# show ip ospf neighbor
```

Neighbor ID	Pri	State	Dead Time	Address	Interface
3.3.3.3	1	FULL/DR	00:01:49	1.1.1.2	Serial1/0

```
Router2# show ip ospf interface s1/0
```

```

Serial1/0 is up, line protocol is up
Internet Address 1.1.1.1/24, Area 0
Process ID 1, Router ID 2.2.2.2, Network Type NON_BROADCAST, Cost: 64
Transmit Delay is 1 sec, State BDR, Priority 1
Designated Router (ID) 3.3.3.3, Interface address 1.1.1.2
Backup Designated router (ID) 2.2.2.2, Interface address 1.1.1.1
Timer intervals configured, Hello 30, Dead 120, Wait 120, Retransmit 5
Hello due in 00:00:01
Index 1/1, flood queue length 0

```

```
Next 0x0(0)/0x0(0)
Last flood scan length is 2, maximum is 2
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 (Designated Router)
Suppress hello for 0 neighbor(s)
```

点对多点的配置

Router1

```
interface Loopback0
  ip address 3.3.3.3 255.255.255.255
!
interface Serial2
  ip address 1.1.1.2 255.255.255.0
  encapsulation frame-relay
  ip ospf network point-to-multipoint
  no keepalive
  frame-relay map ip 1.1.1.1 16 broadcast
!
router ospf 1
  network 1.1.1.0 0.0.0.255 area 0
!
```

Router2

```
interface Loopback0
  ip address 2.2.2.2 255.255.255.255
!
interface Serial1/0
  ip address 1.1.1.1 255.255.255.0
  encapsulation frame-relay
  ip ospf network point-to-multipoint
  no keepalive
  clockrate 2000000
  frame-relay map ip 1.1.1.2 16 broadcast
!
router ospf 1
  network 1.1.1.0 0.0.0.255 area 0
```

验证提示

这是Router1的show命令输出。

```
Router1# show ip ospf neighbors
```

Neighbor ID	Pri	State	Dead Time	Address	Interface
2.2.2.2	1	FULL/ -	00:01:53	1.1.1.1	Serial2

```
Router1# show ip ospf interface s2
```

```
Serial2 is up, line protocol is up
Internet Address 1.1.1.2/24, Area 0
Process ID 1, Router ID 3.3.3.3, Network Type POINT_TO_MULTIPOINT, Cost: 64
Transmit Delay is 1 sec, State POINT_TO_MULTIPOINT,
Timer intervals configured, Hello 30, Dead 120, Wait 120, Retransmit 5
  Hello due in 00:00:18
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 0 msec, maximum is 0 msec
Neighbor Count is 1, Adjacent neighbor count is 1
  Adjacent with neighbor 2.2.2.2
Suppress hello for 0 neighbor(s)
```

Router2 的输出如下所示。

```
Router2# show ip ospf neighbor
```

Neighbor ID	Pri	State	Dead Time	Address	Interface
3.3.3.3	1	FULL/ -	00:01:58	1.1.1.2	Serial1/0

```
Router2# show ip ospf interface s1/0
```

```
Serial1/0 is up, line protocol is up
Internet Address 1.1.1.1/24, Area 0
Process ID 1, Router ID 2.2.2.2, Network Type POINT_TO_MULTIPOINT, Cost: 64
Transmit Delay is 1 sec, State POINT_TO_MULTIPOINT,
Timer intervals configured, Hello 30, Dead 120, Wait 120, Retransmit 5
Hello due in 00:00:18
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 0 msec, maximum is 0 msec
Neighbor Count is 1, Adjacent neighbor count is 1
Adjacent with neighbor 3.3.3.3
Suppress hello for 0 neighbor(s)
```

注意：如输出所示，将 NBMA 网络配置为单点对多点时，没有选择任何 DR 和 BDR，因为会将该网络视为点对点链路的集合。

欲知更多信息，请参阅[配置 OSPF](#)。

相关信息

- [OSPF 支持页](#)
- [IP 路由协议支持页](#)
- [技术支持和文档 - Cisco Systems](#)