配置通過非廣播鏈路的OSPF的初始配置

目錄

簡介

本檔案將介紹非廣播連結上的開放最短路徑優先(OSPF)的初始組態。

背景資訊

在幀中繼、X.25、ATM和交換式多百萬位元資料服務(SMDS)等非廣播媒體上，OSPF可以在兩種模式下執行：

- 非廣播多重存取(NBMA)：通過選擇指定路由器(DR)和備份指定路由器(BDR)來模擬廣播模型。在NBMA網路上模擬廣播模型的方法有兩種：使用**ip ospf network broadcast interface子命令將網路型別定義為廣播，或配置使用router ospf**命令的neighbor語句。
- 點對多點：通過配置[ip ospf network point-to-multipoint](#) 命令，將非廣播網路視為點對點鏈路的集合。

必須定義非廣播網路上的網路型別，以避免配置neighbor語句。本文檔提供了通過非廣播鏈路的OSPF配置示例。使用**show ip ospf interface** 命令檢查運行OSPF的介面的網路型別，並使用**show ip ospf neighbor** 命令瞭解鄰居路由器的狀態。

必要條件

需求

Cisco建議您瞭解OSPF路由協定的[基](#)本配置。

採用元件

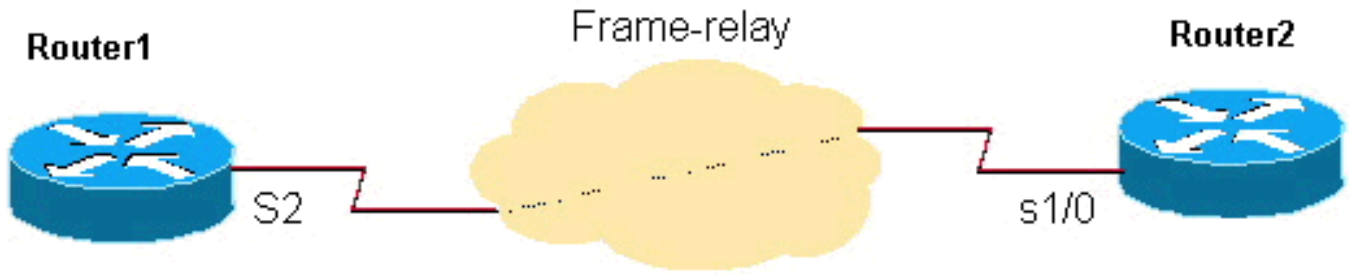
本文中的資訊係根據以下軟體和硬體版本：

- Cisco 2500路由器
- 在路由器上執行的Cisco IOS®軟體版本12.2(24a)

本文中的資訊是根據特定實驗室環境內的裝置所建立。文中使用到的所有裝置皆從已清除（預設）的組態來啟動。如果您的網路運作中，請確保您瞭解任何指令可能造成的影響。

網路圖表

以下是本檔案中的組態範例中使用的網路圖表。



NBMA配置（使用網路型別廣播）

Router1

```
interface Loopback0
 ip address 192.0.2.3 255.255.255.255
!
!
interface Serial2
 ip address 192.0.2.1 255.255.255.0
 encapsulation frame-relay
 ip ospf network broadcast
 no keepalive
 frame-relay map ip 192.0.2.1 16 broadcast
!
!
router ospf 1
 network 192.0.2.0 0.0.0.255 area 0
```

Router2

```
interface Loopback0
 ip address 192.0.2.2 255.255.255.255
!
interface Serial1/0
 ip address 192.0.2.1 255.255.255.0
 encapsulation frame-relay
 ip ospf network broadcast
 no keepalive
 clockrate 2000000
 frame-relay map ip 192.0.2.1 16 broadcast
!
router ospf 1
 network 192.0.2.0 0.0.0.255 area 0
!
```

驗證提示

以下是Router1的**show**命令輸出。

```
Router1# show ip ospf neighbor

     Neighbor ID     Pri   State           Dead Time   Address         Interface
     192.0.2.2         1   FULL/BDR        00:00:37    192.0.2.1         Serial2

Router1# show ip ospf interface s2
     Serial2 is up, line protocol is up
       Internet Address 192.0.2.1/24, Area 0
       Process ID 1, Router ID 192.0.2.3, Network Type BROADCAST, Cost: 64
       Transmit Delay is 1 sec, State DR, Priority 1
       Designated Router (ID) 192.0.2.3, Interface address 192.0.2.1
       Backup Designated router (ID) 192.0.2.2, Interface address 192.0.2.1
       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 192.0.2.2  (Backup Designated Router)
       Suppress hello for 0 neighbor(s)
```

Router2的輸出如下。

```
Router2# show ip ospf neighbor

     Neighbor ID     Pri   State           Dead Time   Address         Interface
     192.0.2.3         1   FULL/DR         00:00:38     192.0.2.1         Serial1/0

Router2# show ip ospf interface s1/0
     Serial1/0 is up, line protocol is up
       Internet Address 192.0.2.1/24, Area 0
       Process ID 1, Router ID 192.0.2.2, Network Type BROADCAST, Cost: 64
       Transmit Delay is 1 sec, State BDR, Priority 1
       Designated Router (ID) 192.0.2.3, Interface address 192.0.2.1
       Backup Designated router (ID) 192.0.2.2, Interface address 192.0.2.1
       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 192.0.2.3  (Designated Router)
       Suppress hello for 0 neighbor(s)
```

NBMA的配置（使用Neighbor語句）

Router1

```
interface Loopback0
      ip address 192.0.2.3 255.255.255.255
     !
     interface Serial2
      ip address 192.0.2.1 255.255.255.0
      encapsulation frame-relay
```

```
 ip ospf priority 2
 no keepalive
 frame-relay map ip 192.0.2.1 16
!
router ospf 1
 network 192.0.2.0 0.0.0.255 area 0
 neighbor 192.0.2.1
!
```

Router2

```
interface Loopback0
 ip address 192.0.2.2 255.255.255.255
!
interface Serial1/0
 ip address 192.0.2.1 255.255.255.0
 encapsulation frame-relay
 no keepalive
 clockrate 2000000
 frame-relay map ip 192.0.2.1 16
!
router ospf 1
 network 192.0.2.0 0.0.0.255 area 0
 neighbor 192.0.2.1
!
```

註：在剛才顯示的配置中，Router1上的**ip ospf priority 2命令將介面優先順序設定為比預設優先順序值1更高的優先順序，這使它成為NBMA網路的DR，而Router2成為BDR。**如果需要，您可以將優先順序值設定為0，以便將路由器配置為永不成為DR/BDR。在必須配置中心以成為DR的集中星型網路中，這是必需的，其中as輻條既不能是DR也不能是BDR。雖然在一端上設定**neighbor**語句足以形成鄰接關係，但最好在兩端都設定該語句，如圖所示。此外，**frame-relay map**命令不需要具有**broadcast**引數，因為OSPF資料包使用**neighbor**語句進行單播。

驗證提示

以下是Router1的**show**命令輸出。

```
Router1# show ip ospf neighbors

     Neighbor ID     Pri   State           Dead Time   Address         Interface
     192.0.2.2         1   FULL/BDR        00:01:39    192.0.2.1         Serial2

Router1# show ip ospf interface s2
     Serial2 is up, line protocol is up
       Internet Address 192.0.2.1/24, Area 0
       Process ID 1, Router ID 192.0.2.3, Network Type NON_BROADCAST, Cost: 64
       Transmit Delay is 1 sec, State DR, Priority 1
       Designated Router (ID) 192.0.2.3, Interface address 192.0.2.1
       Backup Designated router (ID) 192.0.2.2, Interface address 192.0.2.1
       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 192.0.2.2  (Backup Designated Router)
       Suppress hello for 0 neighbor(s)
```

Router2的輸出如下。

```
Router2# show ip ospf neighbor

     Neighbor ID     Pri   State           Dead Time   Address         Interface
     192.0.2.3         1   FULL/DR         00:01:49     192.0.2.1         Serial1/0

Router2# show ip ospf interface s1/0
     Serial1/0 is up, line protocol is up
       Internet Address 192.0.2.1/24, Area 0
       Process ID 1, Router ID 192.0.2.2, Network Type NON_BROADCAST, Cost: 64
       Transmit Delay is 1 sec, State BDR, Priority 1
       Designated Router (ID) 192.0.2.3, Interface address 192.0.2.1
       Backup Designated router (ID) 192.0.2.2, Interface address 192.0.2.1
       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 192.0.2.3  (Designated Router)
       Suppress hello for 0 neighbor(s)
```

點對多點配置

Router1

```
interface Loopback0
      ip address 192.0.2.3 255.255.255.255
     !
     interface Serial2
      ip address 192.0.2.1 255.255.255.0
      encapsulation frame-relay
      ip ospf network point-to-multipoint
      no keepalive
      frame-relay map ip 192.0.2.1 16 broadcast
     !
     router ospf 1
      network 192.0.2.0 0.0.0.255 area 0
     !
```

Router2

```
interface Loopback0
      ip address 192.0.2.2 255.255.255.255
     !
     interface Serial1/0
      ip address 192.0.2.1 255.255.255.0
      encapsulation frame-relay
      ip ospf network point-to-multipoint
      no keepalive
      clockrate 2000000
      frame-relay map ip 192.0.2.1 16 broadcast
     !
     router ospf 1
      network 192.0.2.0 0.0.0.255 area 0
```

驗證提示

以下是Router1的**show**命令輸出。

```
Router1# show ip ospf neighbors

     Neighbor ID     Pri   State           Dead Time   Address         Interface
     192.0.2.2         1   FULL/  -        00:01:53    192.0.2.1         Serial2

Router1# show ip ospf interface s2
     Serial2 is up, line protocol is up
       Internet Address 192.0.2.1/24, Area 0
       Process ID 1, Router ID 192.0.2.3, 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 192.0.2.2
       Suppress hello for 0 neighbor(s)
```

Router2的輸出如下。

```
Router2# show ip ospf neighbor

     Neighbor ID     Pri   State           Dead Time   Address         Interface
     192.0.2.3         1   FULL/  -        00:01:58     192.0.2.1         Serial1/0

Router2# show ip ospf interface s1/0
     Serial1/0 is up, line protocol is up
       Internet Address 192.0.2.1/24, Area 0
       Process ID 1, Router ID 192.0.2.2, 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 192.0.2.3
       Suppress hello for 0 neighbor(s)
```

註：如輸出所示，當NBMA網路配置為點對多點時，沒有選擇DR和BDR，因為它被視為點對點鏈路的集合。

有關詳細資訊，請參閱配置OSPF。

相關資訊

- OSPF支援頁
- IP路由通訊協定支援頁面
- 技術支援與文件 - Cisco Systems

關於此翻譯

思科已使用電腦和人工技術翻譯本文件，讓全世界的使用者能夠以自己的語言理解支援內容。請注意，即使是最佳機器翻譯，也不如專業譯者翻譯的內容準確。Cisco Systems, Inc. 對這些翻譯的準確度概不負責，並建議一律查看原始英文文件（提供連結）。