

通過廣播介質進行OSPF的初始配置

目錄

[簡介](#)

[必要條件](#)

[需求](#)

[採用元件](#)

[相關產品](#)

[慣例](#)

[設定](#)

[網路圖表](#)

[組態](#)

[驗證](#)

[疑難排解](#)

[疑難排解指令](#)

[相關資訊](#)

簡介

本檔案將說明在廣播媒體（例如乙太網路和權杖環）上進行開放最短路徑優先(OSPF)的組態範例。命令[show ip ospf interface](#)檢驗OSPF是否預設以廣播網路型別在所有廣播媒體上運行。

必要條件

需求

本文檔的讀者應瞭解以下主題：

- [乙太網路技術](#)
- [配置OSPF](#)
- [OSPF鄰居狀態](#)

採用元件

本檔案中的資訊適用於這些軟體和硬體版本。

- 兩台Cisco 2501路由器
- Cisco IOS®軟體版本12.2(27)

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。如果您的網路正在作用，請確保您已瞭解任何指令可能造成的影響。

相關產品

您還可以將此配置用於至少具有一個乙太網、令牌環或FDDI介面的任何兩台路由器。

慣例

如需文件慣例的詳細資訊，請參閱[思科技術提示慣例](#)。

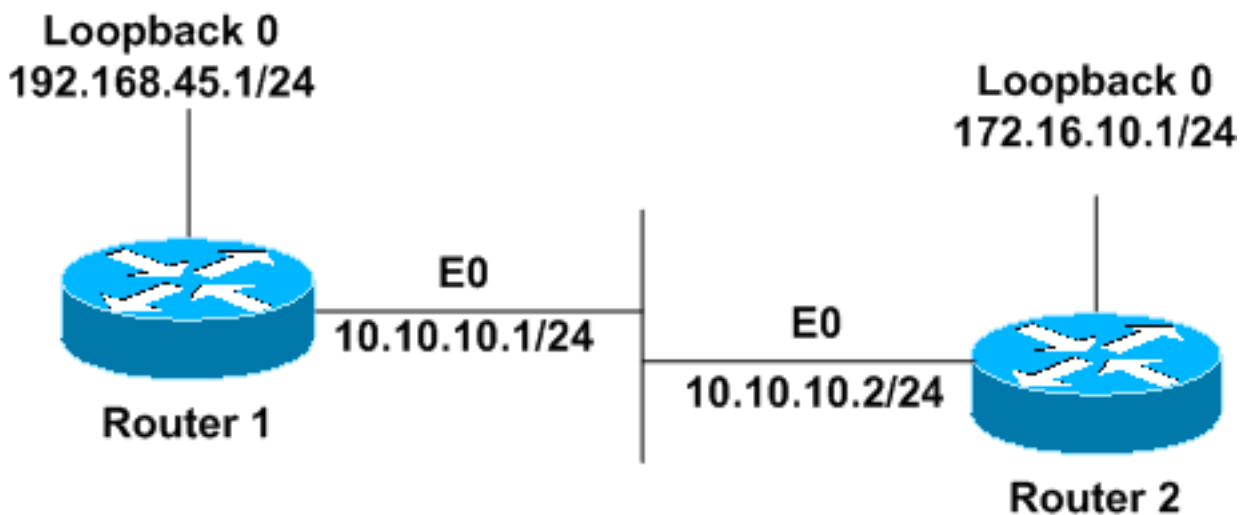
設定

本節提供可用於設定本檔案中所述功能的資訊。

注意：要查詢有關本文檔使用的命令的其他資訊，請參閱[OSPF命令](#)或[使用命令查詢工具](#) (僅限註冊客戶)。

網路圖表

本檔案會使用此網路設定。



組態

本檔案會使用這些設定。

- [Router1](#)
- [Router2](#)

Router1

```
interface Loopback0
 ip address 192.168.45.1 255.255.255.0
!
interface Ethernet0
 ip address 10.10.10.1 255.255.255.0
!
router ospf 1
 network 10.10.10.0 0.0.0.255 area 0
```

```
!--- OSPF is configured to run on the !--- Ethernet
interface with an Area ID of 1. !
```

Router2

```
interface Loopback0
 ip address 172.16.10.1 255.255.255.0
!
interface Ethernet0
 ip address 10.10.10.2 255.255.255.0
!
router ospf 1
 network 10.10.10.0 0.0.0.255 area 0
!--- OSPF is configured to run on the !--- Ethernet
interface with an Area ID of 1. !
```

驗證

本節提供的資訊可用於確認您的組態是否正常運作。

[輸出直譯器工具](#)(僅供註冊客戶使用)支援某些show命令，此工具可讓您檢視show命令輸出的分析。

- [show ip ospf neighbor](#) — 按介面顯示OSPF鄰居資訊。Router1的輸出如下所示：

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

Neighbor ID	Pri	State	Dead Time	Address	Interface
172.16.10.1	1	FULL/BDR	00:00:38	10.10.10.2	Ethernet0

根據此輸出，對於Router2的鄰居ID為172.16.10.1的，Router1的鄰居狀態為「Full」。Router2是此廣播網路中的備份指定路由器(BDR)。要瞭解有關[show ip ospf neighbor](#)命令顯示的詳細資訊，請參閱[show ip ospf neighbor](#)命令顯示什麼內容？

- [show ip ospf interface](#) — 顯示與OSPF相關的介面資訊。乙太網介面上發出的Router1的輸出如下所示：

```
Router1#show ip ospf interface ethernet 0
```

```
Ethernet0 is up, line protocol is up
Internet Address 10.10.10.1/24, Area 0
Process ID 1, Router ID 192.168.45.1, Network Type BROADCAST, Cost: 10
Transmit Delay is 1 sec, State DR, Priority 1
Designated Router (ID) 192.168.45.1, Interface address 10.10.10.1
Backup Designated router (ID) 172.16.10.1, Interface address 10.10.10.2
Timer intervals configured, Hello 10, Dead 40, Wait 40, Retransmit 5
Hello due in 00:00:00
Index 2/2, 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 172.16.10.1 (Backup Designated Router)
Suppress hello for 0 neighbor(s)
```

從該輸出中，您知道Ethernet 0介面的網路型別是廣播的。要瞭解有關[show ip ospf interface](#)命令顯示內容的詳細資訊，請參閱[show ip ospf interface](#)命令顯示什麼？

同樣地，這裡顯示了Router2上show命令的輸出結果。

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

Neighbor ID	Pri	State	Dead Time	Address	Interface
192.168.45.1	1	FULL/DR	00:00:31	10.10.10.1	Ethernet0

從show ip ospf neighbor命令輸出中，您知道Router1是此廣播網路中的指定路由器(DR)。

```
Router2#show ip ospf interface ethernet 0
```

```
Ethernet0 is up, line protocol is up
Internet Address 10.10.10.2/24, Area 0
Process ID 1, Router ID 172.16.10.1, Network Type BROADCAST, Cost: 10
Transmit Delay is 1 sec, State BDR, Priority 1
Designated Router (ID) 192.168.45.1, Interface address 10.10.10.1
Backup Designated router (ID) 172.16.10.1, Interface address 10.10.10.2
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 1
Last flood scan time is 0 msec, maximum is 0 msec
Neighbor Count is 1, Adjacent neighbor count is 1
Adjacent with neighbor 192.168.45.1 (Designated Router)
Suppress hello for 0 neighbor(s)
```

Router2的show ip ospf interface ethernet 0命令輸出還顯示Ethernet 0介面的網路型別為廣播。

疑難排解

本節提供的資訊可用於對組態進行疑難排解。

疑難排解指令

[輸出直譯器工具](#)(僅供註冊客戶使用)支援某些show命令，此工具可讓您檢視show命令輸出的分析。

注意：發出debug指令之前，請參閱[有關Debug指令的重要資訊](#)。

兩個路由器之間形成鄰接關係時存在多種狀態。您可以使用debug ip ospf adj 命令檢視各種狀態，以及廣播OSPF網路中發生的DR和BDR選舉。在早期的Cisco IOS軟體版本中，您可以使用命令debug ip ospf adjacency。建立鄰居關係之前，需要發出此debug命令。

從Router1的角度來看此輸出。輸出中粗體字的部分是鄰接過程經歷的各種狀態。

```
Router1#debug ip ospf adj
```

```
OSPF adjacency events debugging is on
```

```
*Mar 1 01:41:23.319: OSPF: Rcv DBD from 172.16.10.1 on Ethernet0 seq 0x1F6C opt
0x42 flag 0x7 len 32 mtu 1500 state INIT
*Mar 1 01:41:23.323: OSPF: 2 Way Communication to 172.16.10.1
on Ethernet0, state 2WAY
*Mar 1 01:41:23.327: OSPF: Neighbor change Event on interface Ethernet0
*Mar 1 01:41:23.327: OSPF: DR/BDR election on Ethernet0
*Mar 1 01:41:23.331: OSPF: Elect BDR 172.16.10.1
*Mar 1 01:41:23.331: OSPF: Elect DR 192.168.45.1
*Mar 1 01:41:23.335: DR: 192.168.45.1 (Id) BDR: 172.16.10.1 (Id)
*Mar 1 01:41:23.339: OSPF: Send DBD to 172.16.10.1 on Ethernet0 seq 0x2552 opt
0x42 flag 0x7 len 32
```

```

*Mar 1 01:41:23.343: OSPF: First DBD and we are not SLAVE
*Mar 1 01:41:23.359: OSPF: Rcv DBD from 172.16.10.1 on Ethernet0 seq 0x2552 opt
  0x42 flag 0x2 len 52  mtu 1500  state EXSTART
*Mar 1 01:41:23.363: OSPF: NBR Negotiation Done. We are the MASTER
*Mar 1 01:41:23.367: OSPF: Send DBD to 172.16.10.1 on Ethernet0 seq 0x2553 opt
  0x42 flag 0x3 len 72
*Mar 1 01:41:23.387: OSPF: Rcv DBD from 172.16.10.1 on Ethernet0 seq 0x2553 opt
  0x42 flag 0x0 len 32  mtu 1500  state EXCHANGE
*Mar 1 01:41:23.391: OSPF: Send DBD to 172.16.10.1 on Ethernet0 seq 0x2554 opt
  0x42 flag 0x1 len 32
*Mar 1 01:41:23.411: OSPF: Rcv DBD from 172.16.10.1 on Ethernet0 seq 0x2554 opt
  0x42 flag 0x0 len 32  mtu 1500  state EXCHANGE
*Mar 1 01:41:23.415: OSPF: Exchange Done with 172.16.10.1 on Ethernet0
*Mar 1 01:41:23.419: OSPF: Synchronized with 172.16.10.1 on Ethernet0, state FULL
01:41:23: %OSPF-5-ADJCHG: Process 1, Nbr 172.16.10.1 on Ethernet0
  from LOADING to FULL, Loading Done
*Mar 1 01:41:23.879: OSPF: Build router LSA for area 0, router ID 192.168.45.1,
  seq 0x80000004
*Mar 1 01:41:23.923: OSPF: Build network LSA for Ethernet0, router ID 192.168.45.1
*Mar 1 01:41:25.503: OSPF: Neighbor change Event on interface Ethernet0
*Mar 1 01:41:25.507: OSPF: DR/BDR election on Ethernet0
*Mar 1 01:41:25.507: OSPF: Elect BDR 172.16.10.1
*Mar 1 01:41:25.511: OSPF: Elect DR 192.168.45.1
*Mar 1 01:41:25.511:          DR: 192.168.45.1 (Id)   BDR: 172.16.10.1 (Id)

```

發出[debug ip ospf events](#) 命令以驗證hello計時器值，如以下示例輸出所示。

```

Router1#debug ip ospf events
OSPF events debugging is on
Router1#
*Mar 1 04:04:11.926: OSPF: Rcv hello from 172.16.10.1 area 0 from
  Ethernet0 10.10.10.2
*Mar 1 04:04:11.930: OSPF: End of hello processing
*Mar 1 04:04:21.926: OSPF: Rcv hello from 172.16.10.1
  area 0 from Ethernet0 10.10.10.2
*Mar 1 04:04:21.930: OSPF: End of hello processing
*Mar 1 04:04:31.926: OSPF: Rcv hello from 172.16.10.1 area 0 from
  Ethernet0 10.10.10.2
*Mar 1 04:04:31.930: OSPF: End of hello processing
*Mar 1 04:04:41.926: OSPF: Rcv hello from 172.16.10.1 area 0 from
  Ethernet0 10.10.10.2
*Mar 1 04:04:41.930: OSPF: End of hello processing
*Mar 1 04:04:51.926: OSPF: Rcv hello from 172.16.10.1 area 0 from
  Ethernet0 10.10.10.2
*Mar 1 04:04:51.930: OSPF: End of hello processing
*Mar 1 04:05:01.926: OSPF: Rcv hello from 172.16.10.1 area 0 from
  Ethernet0 10.10.10.2
*Mar 1 04:05:01.930: OSPF: End of hello processing
*Mar 1 04:05:11.926: OSPF: Rcv hello from 172.16.10.1 area 0 from
  Ethernet0 10.10.10.2
*Mar 1 04:05:11.930: OSPF: End of hello processing
*Mar 1 04:05:21.926: OSPF: Rcv hello from 172.16.10.1 area 0 from
  Ethernet0 10.10.10.2
*Mar 1 04:05:21.930: OSPF: End of hello processing

```

此輸出顯示hello資料包每10秒交換一次。

[相關資訊](#)

- [通過多路訪問網路連線的OSPF路由器](#)
- [非廣播鏈路上的OSPF初始配置](#)

- [排除OSPF故障](#)
- [OSPF支援頁](#)
- [IP路由技術支援頁面](#)
- [技術支援與文件 - Cisco Systems](#)