開放最短路徑優先首碼抑制

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簡介

本檔案將介紹IOS®和IOS® -XE的開放最短路徑優先(OSPF)首碼抑制功能。

背景資訊

OSPF字首抑制是一個有用的功能，用於減少區域內泛洪的鏈路狀態通告(LSA)數量。在主機之間存在多個傳輸鏈路的OSPF區域中，實際通訊是在主機之間。無需向所有路由器通告傳輸鏈路LSA。您只能通告與終端主機相關的LSA。預設情況下，OSPF通告包括傳輸鏈路LSA的所有LSA。

OSPF字首抑制功能有助於克服此行為，並減少通告的第1類（路由器）和第2類（網路）LSA的數量。

此功能可以在路由器上全域性啟用，也可以在每個介面上全域性啟用。

由於資料庫(DB)中的字首數量較少，OSPF字首抑制有助於更快的最短路徑優先(SPF)計算。OSPF第3類、第4類、第5類或第7類LSA不會被抑制。

必要條件

需求

本文件沒有特定需求。

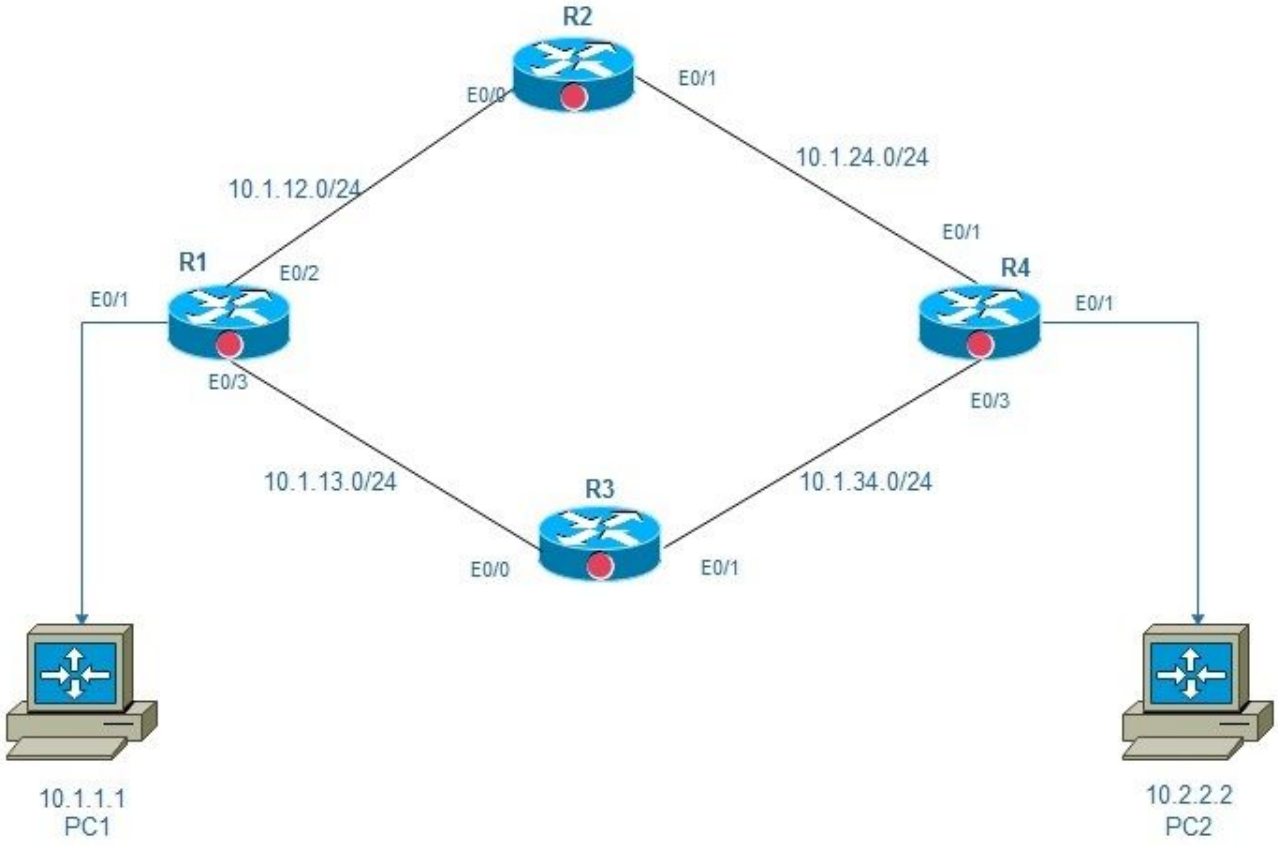
採用元件

本文件所述內容不限於特定軟體和硬體版本。

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。

設定

網路圖表



ospf字首抑制區域0

組態

在此圖中，有2台PC、PC1和PC2通過具有4台路由器R1、R2、R3和R4的網路連線。由於此處的目標是確保端到端可達性，因此您可以在R1、R2、R4和R4的主幹鏈路上啟用OSPF字首抑制，這有助於減少許多LSA。

OSPF字首抑制可以在全域性模式或介面模式下配置：

```
Global mode configuration:

!
router ospf 1
prefix-suppression
!

Interface mode configuration:

R1:
R1#conf t
Enter configuration commands, one per line. End with CNTL/Z.
```

```
R1(config)#int e0/2
R1(config-if)#ip ospf prefix-suppression
R1(config-if)#int e0/3
R1(config-if)#ip ospf prefix-suppression
R1(config-if)#end
R1#

R2:

R2#
R2#conf t
Enter configuration commands, one per line. End with CNTL/Z.
R2(config)#int e0/0
R2(config-if)#ip ospf prefix-suppression
R2(config-if)#int e0/1
R2(config-if)#ip ospf prefix-suppression
R2(config-if)#end
R2#
R2#

R3:

R3#
R3#conf t
Enter configuration commands, one per line. End with CNTL/Z.
R3(config-if)#int e0/1
R3(config-if)# ip ospf prefix-suppression
R3(config-if)#int e0/0
R3(config-if)# ip ospf prefix-suppression
R3(config-if)#end
R3#
R3#

R4:

R4#conf t
Enter configuration commands, one per line. End with CNTL/Z.
R4(config)#int e0/2
R4(config-if)#ip ospf prefix-suppression
R4(config-if)#int e0/3
R4(config-if)#ip ospf prefix-suppression
R4(config-if)#end
R4#
R4#
```

> **附註**：如果通過OSPF通告管理介面或環回介面，您可能需要將管理介面或環回介面從OSPF字首抑制中排除。

驗證

使用本節內容，確認您的組態是否正常運作。

配置字首抑制之前：

```
R1:

R1#sh ip route
Codes: L - local, 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, H - NHRP, l - LISP
+ - replicated route, % - next hop override

Gateway of last resort is not set

10.0.0.0/8 is variably subnetted, 9 subnets, 2 masks
C 10.1.1.0/24 is directly connected, Ethernet0/1
L 10.1.1.254/32 is directly connected, Ethernet0/1
C 10.1.12.0/24 is directly connected, Ethernet0/2
L 10.1.12.1/32 is directly connected, Ethernet0/2
C 10.1.13.0/24 is directly connected, Ethernet0/3
L 10.1.13.1/32 is directly connected, Ethernet0/3
O 10.1.24.0/24 [110/20] via 10.1.12.2, 00:02:29, Ethernet0/2
O 10.1.34.0/24 [110/20] via 10.1.13.3, 00:02:12, Ethernet0/3
O 10.2.2.0/24 [110/30] via 10.1.13.3, 00:04:22, Ethernet0/3
[110/30] via 10.1.12.2, 00:04:22, Ethernet0/2
R1#


R1#show ip ospf database network | i Mask|Attached Router|State ID
Link State ID: 10.1.12.2 (address of Designated Router)
Network Mask: /24
Attached Router: 10.1.24.2
Attached Router: 10.1.13.1
Link State ID: 10.1.13.3 (address of Designated Router)
Network Mask: /24
Attached Router: 10.1.34.3
Attached Router: 10.1.13.1
Link State ID: 10.1.24.4 (address of Designated Router)
Network Mask: /24
Attached Router: 10.2.2.254
Attached Router: 10.1.24.2
Link State ID: 10.1.34.4 (address of Designated Router)
Network Mask: /24
Attached Router: 10.2.2.254
Attached Router: 10.1.34.3
R1#
```

R4:

```
R4#sh ip route
Codes: L - local, 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, H - NHRP, l - LISP
+ - replicated route, % - next hop override

Gateway of last resort is not set

10.0.0.0/8 is variably subnetted, 9 subnets, 2 masks
O 10.1.1.0/24 [110/30] via 10.1.34.3, 00:04:59, Ethernet0/3
  [110/30] via 10.1.24.2, 00:04:59, Ethernet0/2
O 10.1.12.0/24 [110/20] via 10.1.24.2, 00:04:59, Ethernet0/2
O 10.1.13.0/24 [110/20] via 10.1.34.3, 00:04:59, Ethernet0/3
C 10.1.24.0/24 is directly connected, Ethernet0/2
L 10.1.24.4/32 is directly connected, Ethernet0/2
```

```
C 10.1.34.0/24 is directly connected, Ethernet0/3
L 10.1.34.4/32 is directly connected, Ethernet0/3
C 10.2.2.0/24 is directly connected, Ethernet0/1
L 10.2.2.254/32 is directly connected, Ethernet0/1
R4#



R4#show ip ospf database network | i Mask|Attached Router|State ID
Link State ID: 10.1.12.2 (address of Designated Router)
Network Mask: /24
Attached Router: 10.1.24.2
Attached Router: 10.1.13.1
Link State ID: 10.1.13.3 (address of Designated Router)
Network Mask: /24
Attached Router: 10.1.34.3
Attached Router: 10.1.13.1
Link State ID: 10.1.24.4 (address of Designated Router)
Network Mask: /24
Attached Router: 10.2.2.254
Attached Router: 10.1.24.2
Link State ID: 10.1.34.4 (address of Designated Router)
Network Mask: /24
Attached Router: 10.2.2.254
Attached Router: 10.1.34.3
R4#
```

設定首碼抑制後：

```
Please note that now we see only one OSPF route on Router1 and Router4.

R1:

[110/30] via 10.1.12.2, 00:04:22, Ethernet0/2
R1#sh ip route
Codes: L - local, 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, H - NHRP, l - LISP
+ - replicated route, % - next hop override

Gateway of last resort is not set

10.0.0.0/8 is variably subnetted, 7 subnets, 2 masks
C 10.1.1.0/24 is directly connected, Ethernet0/1
L 10.1.1.254/32 is directly connected, Ethernet0/1
C 10.1.12.0/24 is directly connected, Ethernet0/2
L 10.1.12.1/32 is directly connected, Ethernet0/2
C 10.1.13.0/24 is directly connected, Ethernet0/3
L 10.1.13.1/32 is directly connected, Ethernet0/3
O 10.2.2.0/24 [110/30] via 10.1.13.3, 00:07:38, Ethernet0/3
[110/30] via 10.1.12.2, 00:07:38, Ethernet0/2
R1#



R1#show ip ospf database network | i Mask|Attached Router|State ID
Link State ID: 10.1.12.1 (address of Designated Router)
Network Mask: /32
Attached Router: 10.1.13.1
```

```
Attached Router: 10.1.24.2
Link State ID: 10.1.13.1 (address of Designated Router)
Network Mask: /32
Attached Router: 10.1.13.1
Attached Router: 10.1.34.3
Link State ID: 10.1.24.2 (address of Designated Router)
Network Mask: /32
Attached Router: 10.1.24.2
Attached Router: 10.2.2.254
Link State ID: 10.1.34.4 (address of Designated Router)
Network Mask: /32
Attached Router: 10.2.2.254
Attached Router: 10.1.34.3
R1#
```

R4:

```
R4#sh ip route
Codes: L - local, 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, H - NHRP, l - LISP
+ - replicated route, % - next hop override

Gateway of last resort is not set

10.0.0.0/8 is variably subnetted, 7 subnets, 2 masks
O 10.1.1.0/24 [110/30] via 10.1.34.3, 01:15:37, Ethernet0/3
  [110/30] via 10.1.24.2, 01:15:47, Ethernet0/2
C 10.1.24.0/24 is directly connected, Ethernet0/2
L 10.1.24.4/32 is directly connected, Ethernet0/2
C 10.1.34.0/24 is directly connected, Ethernet0/3
L 10.1.34.4/32 is directly connected, Ethernet0/3
C 10.2.2.0/24 is directly connected, Ethernet0/1
L 10.2.2.254/32 is directly connected, Ethernet0/1
R4#
```

```
R4#show ip ospf database network | i Mask|Attached Router|State ID
Link State ID: 10.1.12.1 (address of Designated Router)
Network Mask: /32
Attached Router: 10.1.13.1
Attached Router: 10.1.24.2
Link State ID: 10.1.13.1 (address of Designated Router)
Network Mask: /32
Attached Router: 10.1.13.1
Attached Router: 10.1.34.3
Link State ID: 10.1.24.2 (address of Designated Router)
Network Mask: /32
Attached Router: 10.1.24.2
Attached Router: 10.2.2.254
Link State ID: 10.1.34.4 (address of Designated Router)
Network Mask: /32
Attached Router: 10.2.2.254
Attached Router: 10.1.34.3
R4#
```

疑難排解

目前尚無適用於此組態的具體疑難排解資訊。