通过点到多点链路连接的OSPF路由器

Contents

Introduction

本文档说明通过点对多点链路相连的两个开放最短路径优先 (OSPF) 路由器。

Prerequisites

Requirements

There are no specific requirements for this document.

Components Used

This document is not restricted to specific software and hardware versions.

Conventions

Refer to Cisco Technical Tips Conventions for more information on document conventions.

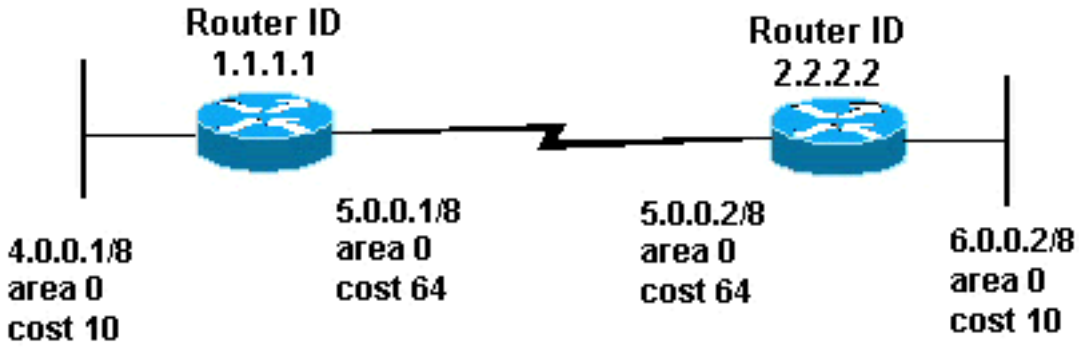
Configure

本部分提供有关如何配置本文档所述功能的信息。

Note: 有关本文档所用命令的详细信息，请使用命令查找工具（仅限注册用户）。

Network Diagram

本文档使用以下网络设置：



配置

本文档使用以下配置：

- 路由器1.1.1.1
- 路由器2.2.2.2

Router1.1.1.1

```
Current configuration:

hostname r1.1.1.1

interface Loopback0
 ip address 1.1.1.1 255.0.0.0

interface Ethernet2/0/0
 ip address 4.0.0.1 255.0.0.0

interface Serial2/1/0
 ip address 5.0.0.1 255.0.0.0
 ip ospf network point-to-multipoint

router ospf 1
 network 4.0.0.0 0.255.255.255 area 0
 network 5.0.0.0 0.255.255.255 area 0

end
```

路由器2.2.2.2

```
Current configuration:

hostname r2.2.2.2

interface Loopback0
 ip address 2.2.2.2 255.0.0.0

interface Ethernet0/0/4
 ip address 6.0.0.2 255.0.0.0

interface Serial2/1/0
```

```
 ip address 5.0.0.2 255.0.0.0
 ip ospf network point-to-multipoint

router ospf 2
 network 6.0.0.0 0.255.255.255 area 0
 network 5.0.0.0 0.255.255.255 area 0

end
```

Verify

本部分所提供的信息可用于确认您的配置是否正常工作。

命令输出解释程序（仅限注册用户）(OIT) 支持某些 **show** 命令。使用 OIT 可查看对 show 命令输出的分析。

- **show ip ospf database** —显示Link State Advertisement (LSA)列表并且键入他们到链路状态数据库。此列表在LSA报头显示仅信息。
- **show ip ospf database [router] [link-state-id]** —显示所有列表在数据库的路由器LSA。LSA是由每个路由器生产的。这些根本LSA与状态和链路流出开销一起列出所有路由器链路或接口。他们在他们产生的区域内仅被充斥。

检查OSPF数据库

为了看到产生的OSPF数据库看起来此网络环境，如何查看输出的**show ip ospf database命令**。

```
r2.2.2.2#show ip ospf database

       OSPF Router with ID (2.2.2.2) (Process ID 2)

                Router Link States (Area 0)

Link ID    ADV Router    Age    Seq#           Checksum    Link count
1.1.1.1   1.1.1.1       206    0x8000000A     0x158C        3
2.2.2.2   2.2.2.2       206    0x8000000B     0x791         3

r2.2.2.2#show ip ospf database router 1.1.1.1

       OSPF Router with ID (2.2.2.2) (Process ID 2)

                Router Link States (Area 0)

  LS age: 224
  Options: (No TOS-capability, DC)
  LS Type: Router Links
  Link State ID: 1.1.1.1
  !--- For router links, Link State Id is always the same !--- as the Advertising Router (next
line). Advertising Router: 1.1.1.1 !--- This is the router ID of the router that created !---
this LSA. LS Seq Number: 8000000A Checksum: 0x158C Length: 60 Number of Links: 3 Link connected
to: another Router (point-to-point) !--- This line shows that this router(1.1.1.1) is a !---
neighbor with 2.2.2.2. (Link ID) Neighboring Router ID: 2.2.2.2 (Link Data) Router Interface
address: 5.0.0.1 !--- This line shows the interface on this router !--- (1.1.1.1) that connects
the neighbor (2.2.2.2). Number of TOS metrics: 0 TOS 0 Metrics: 64 !--- The OSPF cost of the
link is 64. Link connected to: a Stub Network !--- This router's (1.1.1.1) interface on the !---
point-to-multipoint network. (Link ID) Network/subnet number: 5.0.0.1 (Link Data) Network Mask:
255.255.255.255 !--- Notice the mask. Only the interface is advertised, !--- not the whole
```

```
subnet. Number of TOS metrics: 0 TOS 0 Metrics: 0 !--- The OSPF cost for this router to reach
its !--- own interface is zero. Link connected to: a Stub Network !--- Represents the subnet of
the Ethernet segment 4.0.0.0/8. (Link ID) Network/subnet number: 4.0.0.0 (Link Data) Network
Mask: 255.0.0.0 Number of TOS metrics: 0 TOS 0 Metrics: 10 !--- The cost of the link is 10.
r2.2.2.2#show ip ospf database router 2.2.2.2

       OSPF Router with ID (2.2.2.2) (Process ID 2)

                Router Link States (Area 0)

  LS age: 253
  Options: (No TOS-capability, DC)
  LS Type: Router Links
  Link State ID: 2.2.2.2
  Advertising Router: 2.2.2.2
  LS Seq Number: 8000000B
  Checksum: 0x791
  Length: 60
   Number of Links: 3

    Link connected to: another Router (point-to-point)
     (Link ID) Neighboring Router ID: 1.1.1.1
     (Link Data) Router Interface address: 5.0.0.2
      Number of TOS metrics: 0
       TOS 0 Metrics: 64

    Link connected to: a Stub Network
     (Link ID) Network/subnet number: 5.0.0.2
     (Link Data) Network Mask: 255.255.255.255
      Number of TOS metrics: 0
       TOS 0 Metrics: 0

    Link connected to: a Stub Network
     (Link ID) Network/subnet number: 6.0.0.0
     (Link Data) Network Mask: 255.0.0.0
      Number of TOS metrics: 0
       TOS 0 Metrics: 10
```

计算最短路径

此部分从路由器2.2.2.2的角度计算最短路径树。

路由器2.2.2.2在其自己的LSA看起来并且看到路由器1.1.1.1是相邻。路由器2.2.2.2查看1.1.1.1's路由器LSA验证1.1.1.1看到2.2.2.2作为相邻。如果两路由器互相看到作为相邻，则他们认为可达到。

每个路由器也检查其本地邻接表(您能检查它使用**show ip ospf neighbor命令**)验证其接口和邻居的接口在一个普通的IP子网。如果他们是，所有末端网络的路由器安装路由在他们的相邻的路由器LSA列出了。

在本例中，因为路由器1.1.1.1列出了4.0.0.0/8作为在其自己的路由器LSA的一个stub网络路由器2.2.2.2在其路由表里安装4.0.0.0/8的一个路由。路由器1.1.1.1也列出了5.0.0.1/32作为残余部分，是其在点到多点网络的接口。所以，路由器2.2.2.2在其路由表里安装5.0.0.1/32的OSPF路由。

```
Router 2.2.2.2#show ip route ospf
O    4.0.0.0/8 [110/74] via 5.0.0.1, 00:09:26, Serial0/1/0
O    5.0.0.1/32 [110/64] via 5.0.0.1, 00:09:26, Serial0/1/0

Router 1.1.1.1#show ip route ospf
O    6.0.0.0/8 [110/74] via 5.0.0.2, 00:00:49, Serial2/1/0
O    5.0.0.2/32 [110/64] via 5.0.0.2, 00:00:49, Serial2/1/0
```

Troubleshoot

目前没有针对此配置的故障排除信息。

Related Information

- OSPF数据库说明指南
- OSPF支持
- IP路由技术支持
- Technical Support & Documentation - Cisco Systems