不最理想的路由，当重新分配在OSPF进程之间时

Contents

Introduction

当在开放最短路径优先(OSPF)之间的重新分发处理并且提供解决方案时，本文展示不最理想的路由问题。

Prerequisites

Requirements

There are no specific requirements for this document.

Components Used

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

The information in this document was created from the devices in a specific lab environment.All of the devices used in this document started with a cleared (default) configuration.If your network is live, make sure that you understand the potential impact of any command.

Conventions

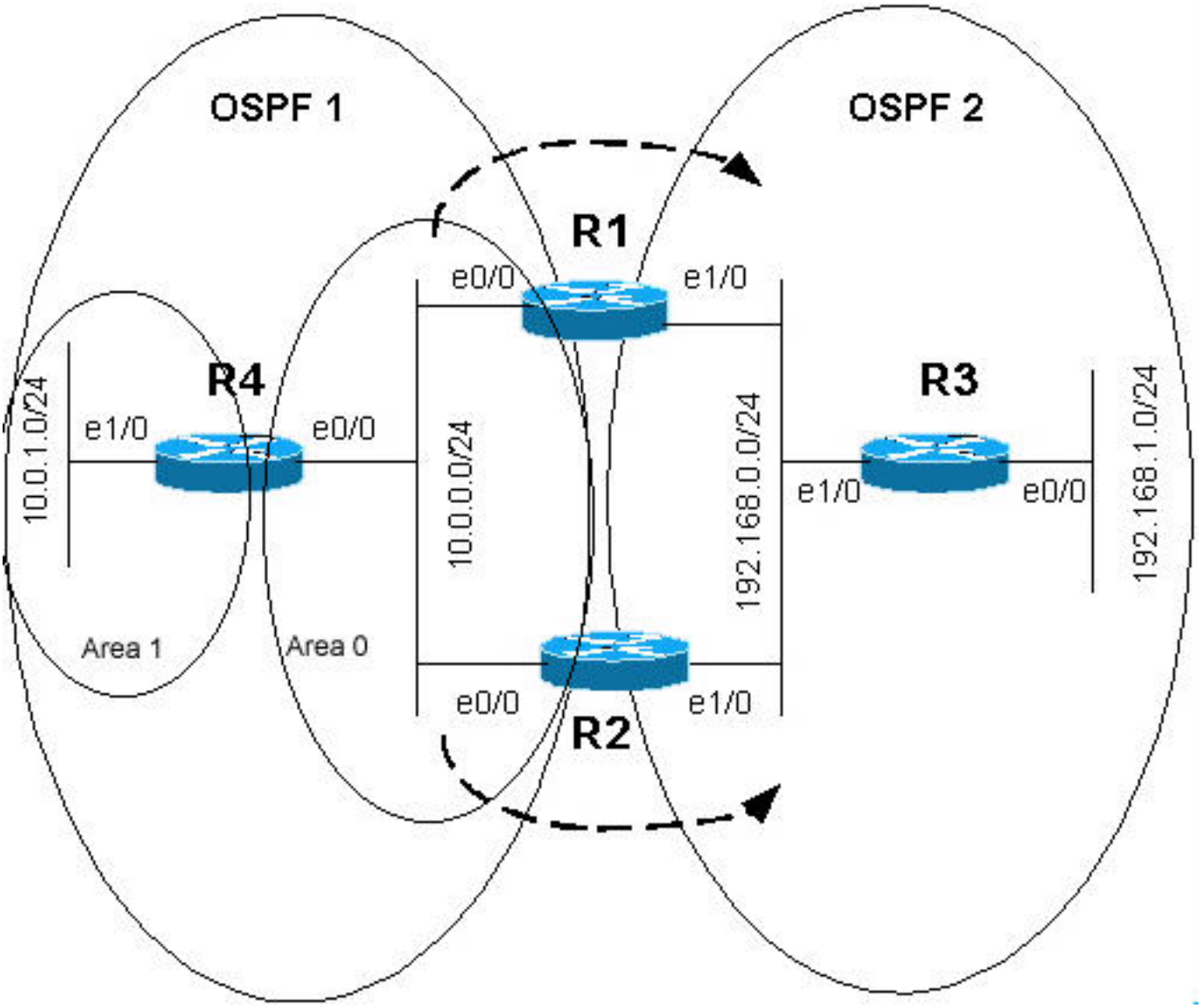
有关文档规则的详细信息，请参阅 Cisco 技术提示规则。

问题

当重新分配在多点的区别OSPF进程之间在网络时，进入subobtimal路由的情况甚至更坏，路由循环

是可能的。

在下面拓扑里我们有进程OSPF1，并且OSPF 2.路由器1 (R1)和路由器2 (R2)从OSPF1再分布到OSPF2。



路由器R1和R2的配置如下所示。

R1

```
hostname r1
!
ip subnet-zero
!
interface Loopback0
 ip address 10.255.255.1 255.255.255.255
!
interface Loopback1
 ip address 192.168.255.1 255.255.255.255
!
interface Ethernet0/0
 ip address 10.0.0.1 255.255.255.0
!
interface Ethernet1/0
 ip address 192.168.0.1 255.255.255.0
```

```
!
router ospf 1
 router-id 10.255.255.1
 log-adjacency-changes
 passive-interface Loopback0
network 10.0.0.0 0.0.0.255 area 0
 network 10.255.255.1 0.0.0.0 area 0
!
router ospf 2
 router-id 192.168.255.1
 log-adjacency-changes
 redistribute ospf 1 subnets match internal
 !--- Redistributing OSPF 1 into OSPF 2. passive-
interface Loopback1 network 192.168.0.0 0.0.0.255 area 0
network 192.168.255.1 0.0.0.0 area 0 ! ip classless !
end
```

R2

```
hostname r2
!
ip subnet-zero
!

interface Loopback0
 ip address 10.255.255.2 255.255.255.255
!
interface Loopback1
 ip address 192.168.255.2 255.255.255.255
!
interface Ethernet0/0
 ip address 10.0.0.2 255.255.255.0
!
interface Ethernet1/0
 ip address 192.168.0.2 255.255.255.0
!
router ospf 1
 router-id 10.255.255.2
 log-adjacency-changes
 passive-interface Loopback0
network 10.0.0.0 0.0.0.255 area 0
 network 10.255.255.2 0.0.0.0 area 0
!
router ospf 2
 router-id 192.168.255.2
 log-adjacency-changes
 redistribute ospf 1 subnets match internal
!--- Redistributing OSPF 1 into OSPF 2. passive-
interface Loopback1 network 192.168.0.0 0.0.0.255 area 0
network 192.168.255.2 0.0.0.0 area 0 ! ip classless end
```

在上述拓扑， R4's E1/0在第1区，并且E0/0在Area 0。所以， R4是区域边界路由器(ABR)通告网络10.0.1.0/24作为域间(IA)路由对R1和R2。R1和R2重新分配此信息到OSPF2。**重新分配**配置命令用R1和R2的上述配置突出显示。所以， R1和R2了解大约10.0.1.0/24作为IA通过OSPF1和作为外部类型2 (E2)通过OSPF2，因为外部Link State Advertisement (LSA)被传播在OSPF2域中。

因为IA路由在E1或E2路由总是被偏好，所需的是看到，在R1和R2里路由表， 10.0.1.0/24是有next-hop R4的一个IA路由。然而，当查看他们的路由表，不同的事被看到时-在R1， 10.0.1.0/24是有next-hop R4的一个IA路由，但是在R2， 10.0.1.0/24是有下一条R1的一个E2路由。

这是命令输出**show ip route命令**R1的。

```
r1#show ip route

Codes: C - connected, S - static, I - IGRP, 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, E - EGP
       i - IS-IS, 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

!--- The gateway of the last resort is not set. 10.0.0.0/8 is variably subnetted, 5 subnets, 2
masks O E2 10.255.255.2/32 [110/1] via 192.168.0.2, 00:24:21, Ethernet1/0 C 10.0.0.0/24 is
directly connected, Ethernet0/0 O IA    10.0.1.0/24 [110/20] via 10.0.0.4, 00:23:49, Ethernet0/0
C       10.255.255.1/32 is directly connected, Loopback0
O IA    10.255.255.4/32 [110/11] via 10.0.0.4, 00:23:49, Ethernet0/0
     192.168.255.0/32 is subnetted, 3 subnets
O       192.168.255.3 [110/11] via 192.168.0.3, 00:26:09, Ethernet1/0
O       192.168.255.2 [110/11] via 192.168.0.2, 00:26:09, Ethernet1/0
C       192.168.255.1 is directly connected, Loopback1
C    192.168.0.0/24 is directly connected, Ethernet1/0
O    192.168.1.0/24 [110/20] via 192.168.0.3, 00:26:09, Ethernet1/0
```

这是命令输出show ip route命令R2的。

```
r2#show ip route

Codes: C - connected, S - static, I - IGRP, 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, E - EGP
       i - IS-IS, 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

!--- The gateway of last resort is not set. 10.0.0.0/8 is variably subnetted, 5 subnets, 2 masks
C 10.255.255.2/32 is directly connected, Loopback0 C 10.0.0.0/24 is directly connected,
Ethernet0/0 O E2    10.0.1.0/24 [110/20] via 192.168.0.1, 00:25:34, Ethernet1/0
O E2    10.255.255.1/32 [110/1] via 192.168.0.1, 00:25:34, Ethernet1/0
O E2    10.255.255.4/32 [110/11] via 192.168.0.1, 00:25:34, Ethernet1/0
     192.168.255.0/32 is subnetted, 3 subnets
O       192.168.255.3 [110/11] via 192.168.0.3, 00:26:45, Ethernet1/0
C       192.168.255.2 is directly connected, Loopback1
O       192.168.255.1 [110/11] via 192.168.0.1, 00:26:45, Ethernet1/0
C    192.168.0.0/24 is directly connected, Ethernet1/0
O    192.168.1.0/24 [110/20] via 192.168.0.3, 00:26:45, Ethernet1/0
```

此问题为什么发生？

当启用在一个路由器的多个OSPF进程，从软件中的时，进程独立。OSPF协议，在一个OSPF进程里面，总是偏好在外部路由的内部路由。然而， OSPF不执行在进程之间的任何OSPF路由选择(例如， OSPF度量和路由类型没有被考虑到，当决定进程应该安装到路由表)的路由时。

没有不同的OSPF进程之间的交互作用，并且同分决赛是管理距离。因此，因为两个OSPF进程有默认管理距离110，设法第一个的进程安装路由做它成路由表。所以，必须配置路由的管理距离从不同的OSPF进程，因此某些OSPF进程路由在另一个进程路由被偏好由人的目的，和不作为机会问题。

关于管理距离的更多信息，请参见什么是管理距离。关于在路由表里发送安置的Cisco路由器如何的更多信息选择，请参见在Cisco路由器的路由选择。

解决方案

解决方案 1

因为我们知道上述情况，路由器选择根据管理距离的最佳路由，逻辑方法防止此工作情况将增加外部路由的管理距离在OSPF2的。这样，获知的路由通过OSPF1在外部路由永远将更喜欢重新分配从OSPF1到OSPF2。这执行使用sub-router configuration命令**距离ospf外部*<value>***如下面配置所显示。

R1

```
hostname r1
!
ip subnet-zero
!
interface Loopback0
 ip address 10.255.255.1 255.255.255.255
!
interface Loopback1
 ip address 192.168.255.1 255.255.255.255
!
interface Ethernet0/0
 ip address 10.0.0.1 255.255.255.0
!
interface Ethernet1/0
 ip address 192.168.0.1 255.255.255.0
!
router ospf 1
 router-id 10.255.255.1
 log-adjacency-changes
 passive-interface Loopback0
 network 10.0.0.0 0.0.0.255 area 0
 network 10.255.255.1 0.0.0.0 area 0
!
router ospf 2
 router-id 192.168.255.1
 log-adjacency-changes
 redistribute ospf 1 subnets match internal
 passive-interface Loopback1
 network 192.168.0.0 0.0.0.255 area 0
 network 192.168.255.1 0.0.0.0 area 0
 distance ospf external 115
!--- Increases the administrative distance of external
!--- routes to 115. ! ip classless ! end
```

R2

```
hostname r2
!
ip subnet-zero
!
interface Loopback0
 ip address 10.255.255.2 255.255.255.255
!
interface Loopback1
 ip address 192.168.255.2 255.255.255.255
!
interface Ethernet0/0
 ip address 10.0.0.2 255.255.255.0
```

```
!
interface Ethernet1/0
 ip address 192.168.0.2 255.255.255.0
!
router ospf 1
 router-id 10.255.255.2
 log-adjacency-changes
 passive-interface Loopback0
 network 10.0.0.0 0.0.0.255 area 0
 network 10.255.255.2 0.0.0.0 area 0
!
router ospf 2
 router-id 192.168.255.2
 log-adjacency-changes
 redistribute ospf 1 subnets match internal
 passive-interface Loopback1
 network 192.168.0.0 0.0.0.255 area 0
 network 192.168.255.2 0.0.0.0 area 0
 distance ospf external 115
!--- Increases the administrative distance of !---
external routes to 115. ! ip classless ! end
```

发生的路由表，当更改外部路由的管理距离在OSPF2的如下所示。

这是命令输出**show ip route命令**R1的。

```
r1#show ip route
Codes: C - connected, S - static, I - IGRP, 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, E - EGP
       i - IS-IS, 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

!--- The gateway of the last resort is not set. 10.0.0.0/8 is variably subnetted, 5 subnets, 2
masks O 10.255.255.2/32 [110/11] via 10.0.0.2, 00:00:35, Ethernet0/0 C 10.0.0.0/24 is directly
connected, Ethernet0/0 O IA    10.0.1.0/24 [110/20] via 10.0.0.4, 00:00:35, Ethernet0/0
C       10.255.255.1/32 is directly connected, Loopback0
O       10.255.255.4/32 [110/11] via 10.0.0.4, 00:00:35, Ethernet0/0
     192.168.255.0/32 is subnetted, 3 subnets
O       192.168.255.3 [110/11] via 192.168.0.3, 00:00:35, Ethernet1/0
O       192.168.255.2 [110/11] via 192.168.0.2, 00:00:35, Ethernet1/0
C       192.168.255.1 is directly connected, Loopback1
C    192.168.0.0/24 is directly connected, Ethernet1/0
O    192.168.1.0/24 [110/20] via 192.168.0.3, 00:00:35, Ethernet1/0
```

这是命令输出**show ip route命令**R2的。

```
r2#show ip route
Codes: C - connected, S - static, I - IGRP, 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, E - EGP
       i - IS-IS, 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

!--- The gateway of the last resort is not set. 10.0.0.0/8 is variably subnetted, 5 subnets, 2
masks C 10.255.255.2/32 is directly connected, Loopback0 C 10.0.0.0/24 is directly connected,
Ethernet0/0 O 10.255.255.1/32 [110/11] via 10.0.0.1, 00:01:28, Ethernet0/0 O IA    10.0.1.0/24
```

```
[110/20] via 10.0.0.4, 00:01:28, Ethernet0/0
O       10.255.255.4/32 [110/11] via 10.0.0.4, 00:01:28, Ethernet0/0
     192.168.255.0/32 is subnetted, 3 subnets
O       192.168.255.3 [110/11] via 192.168.0.3, 00:01:28, Ethernet1/0
C       192.168.255.2 is directly connected, Loopback1
O       192.168.255.1 [110/11] via 192.168.0.1, 00:01:28, Ethernet1/0
C    192.168.0.0/24 is directly connected, Ethernet1/0
O    192.168.1.0/24 [110/20] via 192.168.0.3, 00:01:28, Ethernet1/0
```

在某些情况下注释该，当也有从OSPF2的再分配到OSPF1时是重要的，并且有重新分配到OSPF2(路由信息协议[RIP]，增强的内部网关路由选择协议(EIGRP)静态的其他路由协议，等等)，这可能导致在OSPF2的subobtimal路由那些外部路由的。

解决方案 2

如果最终原因实现两个不同的OSPF进程是过滤某些路由，有允许您执行在ABR的路由过滤在称为SPF ABR类型3 LSA过滤的Cisco IOS软件版本12.2(4)T的一个新功能。

而不是配置秒钟OSPF进程，是OSPF2的一部分，在的上面的例子的链路，可能被配置作为另一个区域在OSPF1里面。然后，您能实现在R1和R2的必需的路由过滤与此新功能。关于此功能的更多信息，请参见SPF ABR类型3 LSA过滤。

Related Information

- OSPF 支持页
- IP 路由协议支持页
- IP 路由支持页
- Technical Support - Cisco Systems