

OSPF 中重复路由器 ID 故障排除

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简介

本文描述运行开放最短路径优先(OSPF)的路由器如何选择路由器ID，在什么信息包发送此值以及如何排除报告复制ID的路由器日志消息故障。

先决条件

要求

Cisco 建议您了解以下主题：

- IP路由协议
- OSPF路由协议

使用的组件

本文的信息根据Cisco IOS软件版本12.2。

本文档中的信息都是基于特定实验室环境中的设备编写的。本文档中使用的所有设备最初均采用原始（默认）配置。如果您使用的是真实网络，请确保您已经了解所有命令的潜在影响。

相关产品

此配置也可用于以下硬件和软件版本：

- 所有路由器，例如2500和2600系列
- 第3层交换机

规则

有关文档规则的详细信息，请参阅 [Cisco 技术提示规则](#)。

路由器ID

默认情况下，当OSPF进程初始化时，它选择在路由器的最高的IP地址作为路由器ID为OSPF进程。路由器ID独特识别在OSPF域内的一个路由器。

按照[配置OSPF说明](#)，OSPF使用在接口配置的最大的IP地址作为其路由器ID。如果与此IP地址产生关联的接口被建立下来，或者，如果去除地址，OSPF进程必须重估新的路由器ID和再发出所有其路由信息其接口。

如果环回接口配置有IP地址，Cisco IOS软件使用此IP地址作为其路由器ID，即使其他接口有更大的IP地址。因为环回接口从未断开，更加巨大的稳定性在路由表里达到。

OSPF自动地更喜欢在其他种类的一个环回接口，并且选择在所有环回接口中的最高的IP地址。如果没有当前环回接口，在路由器的最高的IP地址被选择。OSPF不可能处理使用任何特殊接口。一旦路由器ID选择，不更改，除非OSPF process restart或路由器被重新载入。

注意：如果没有与一个有效IP地址的一个接口在UP/UP状态，当开始时，OSPF报告不router-id错误信息到日志。

这些命令用于为了查看路由器ID。

- [show ip ospf](#)
- [show ip ospf interface](#)

```
R2-AGS#show ip ospf interface e0
Ethernet0 is up, line protocol is up
Internet Address 1.1.1.2 255.255.255.0, Area 0
Process ID 1, Router ID 5.5.5.5, Network Type BROADCAST, Cost: 10
Transmit Delay is 1 sec, State BDR, Priority 1
Designated Router (ID) 6.6.6.6, Interface address 1.1.1.1
Backup Designated router (ID) 5.5.5.5, Interface address 1.1.1.2
Timer intervals configured, Hello 10, Dead 40, Wait 40, Retransmit 5
Hello due in 0:00:07
Neighbor Count is 1, Adjacent neighbor count is 1
Adjacent with neighbor 6.6.6.6 (Designated Router)
```

最高的IP地址的选择的默认行为在一个路由器的作为路由器ID可以因在Cisco IOS Software Release 12.0(1)T引入的使用[router-id ospf](#)命令改变。参考Cisco Bug ID [CSCdi38380](#) ([仅限注册用户](#))欲知更多信息。使用[router-id](#)命令的OSPF，OSPF进程的路由器ID是手工所选的那个。在本例中，OSPF进程的路由器ID是10.10.10.10。

```
R2-AGS#show ip ospf interface e0
Ethernet0 is up, line protocol is up
```

```

Internet Address 1.1.1.2 255.255.255.0, Area 0
Process ID 1, Router ID 5.5.5.5, Network Type BROADCAST, Cost: 10
Transmit Delay is 1 sec, State BDR, Priority 1
Designated Router (ID) 6.6.6.6, Interface address 1.1.1.1
Backup Designated router (ID) 5.5.5.5, Interface address 1.1.1.2
Timer intervals configured, Hello 10, Dead 40, Wait 40, Retransmit 5
  Hello due in 0:00:07
Neighbor Count is 1, Adjacent neighbor count is 1
  Adjacent with neighbor 6.6.6.6 (Designated Router)

```

[show ip ospf database命令](#)在此示例可能也使用正如为了检查路由器ID :

```

Router#show ip ospf database
OSPF Router with ID (10.10.10.10) (Process ID 100)

```

值传输

在复制路由器ID的解决方法与OSPF的可以解释前，您需要了解五种OSPF信息包类型。这些是信息包类型：

- Hello
- 数据库描述(DD)
- 链路状态请求
- 链路状态更新
- 链路状态确认

所有OSPF信息包从一个标准的24八位位组报头开始。注意报头包括路由器ID字段，指示产生OSPF信息包的路由唯一的ID。

version 类型 信息包长度
路由器ID
区域ID
校验和 AuType
认证
认证
信息包数据

一般，OSPF信息包运载链路-请陈述广告(LSA)，描述所有链路或路由器接口和链路的状态。当所有LSA从同一个报头时开始，这三个字段识别单个LSA：

- 类型
- 链路状态ID
- 通告路由器

OSPF使用链路状态更新信息包充斥LSA和发送LSA以回应链路状态请求。OSPF邻居负责重新封装在新的更新信息包的适当的LSA进一步充斥的为了传播在他们产生的网络之外的OSPF LSA。因此，复制路由器ID可以发现由和由多个路由器传播。

完成这些步骤为了确定是否有复制路由器ID：

1. 执行**show ip ospf database router x.x.x.x命令**在应该有此ID的路由器。此命令显示路由器LSA (类型1)的内容，通告路由器和所有其直接地连接的接口。了解路由器和指定的IP地址接口列表。
2. 执行**x.x.x.x命令的show ip ospf database router**在汇报重复项的路由器的几次。Shortest Path

First (SPF)算法能一样频繁地运行象一次每10秒。

如果获取这些命令，您应该能捉住更改的信息。此示例是输出的show ip ospf database router命令

```
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: 279
```

```
Options: (No TOS-capability, DC)
```

```
LS Type: Router Links
```

```
Link State ID: 1.1.1.1
```

```
!--- For router links, the 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 which created !--- this LSA. LS Seq Number: 8000001A Checksum: 0xA6FA Length: 48 Number of Links: 2 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: 0.0.0.12 !--- In case of an unnumbered link, use the Management Information !--- Base (MIB) II IfIndex value, which usually starts with 0. Number of TOS metrics: 0 TOS 0 Metrics: 64 !--- This is the OSPF cost of the link that connects the two routers. Link connected to: a Stub Network !--- This entry represents 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 !--- This is the OSPF cost of the Ethernet segment.
```

已知问题

当两路由器在OSPF域时使用同一路由器ID，可能路由不正确地运作。Cisco Bug ID [CSCdr61598](#) (仅限注册用户)和[CSCdu08678](#) (仅限注册用户)提高复制路由器ID检测和报告机制。访问[Bug Toolkit](#) (仅限注册用户)为了查看关于这些Cisco Bug ID的其他信息。有两种复制路由器ID类型：

1. 区域复制路由器ID

```
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: 279
```

```
Options: (No TOS-capability, DC)
```

```
LS Type: Router Links
```

```
Link State ID: 1.1.1.1
```

```
!--- For router links, the 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 which created !--- this LSA. LS Seq Number: 8000001A Checksum: 0xA6FA Length: 48 Number of Links: 2 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: 0.0.0.12 !--- In case of an unnumbered link, use the Management Information !--- Base (MIB) II IfIndex value, which usually starts with 0. Number of TOS metrics: 0 TOS 0 Metrics: 64 !--- This is the OSPF cost of the link that connects the two routers. Link connected to: a Stub Network !--- This entry represents 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 !--- This is the OSPF cost of the Ethernet segment.
```

说明— OSPF发现了有同一路由器ID在区域的一个路由器。**推荐的行为**— OSPF路由器ID应该是唯一。保证所有路由器在区域有独特路由器ID。

2. 类型4 LSA

```
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: 279
```

```
Options: (No TOS-capability, DC)
```

```
LS Type: Router Links
```

```
Link State ID: 1.1.1.1
```

```
!--- For router links, the 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 which created !--- this LSA. LS Seq Number: 8000001A Checksum: 0xA6FA Length: 48 Number of Links: 2 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: 0.0.0.12 !--- In case of an unnumbered link, use the Management Information !--- Base (MIB) II IfIndex value, which usually starts with 0. Number of TOS metrics: 0 TOS 0 Metrics: 64 !--- This is the OSPF cost of the link that connects the two routers. Link connected to: a Stub Network !--- This entry represents 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 !--- This is the OSPF cost of the Ethernet segment.
```

说明— OSPF发现了有同一路由器ID在另一个区域的一个路由器。此路由器在第四类型LSA做通告。**推荐的行为**— OSPF路由器ID应该是唯一。确定所有自治系统边界路由器(ASBRs)远程区域的把独特路由器ID。

当路由器作为区域边界路由器(ABR)和在OSPF域的一个ASBR，如此日志消息示例所显示，复制路由器ID虚假报告能发生。

```
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: 279
```

```
Options: (No TOS-capability, DC)
```

```
LS Type: Router Links
```

```
Link State ID: 1.1.1.1
```

```
!--- For router links, the 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 which created !--- this LSA. LS Seq Number: 8000001A Checksum: 0xA6FA Length: 48 Number of Links: 2 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: 0.0.0.12 !--- In case of an unnumbered link, use the Management Information !--- Base (MIB) II IfIndex value, which usually starts with 0. Number of TOS metrics: 0 TOS 0 Metrics: 64 !--- This is the OSPF cost of the link that connects the two routers. Link connected to: a Stub Network !--- This entry represents 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 !--- This is the OSPF cost of the Ethernet segment.
```

Cisco Bug ID [CSCdu71404](#) (仅限注册用户)解决OSPF域宽检测的此问题。

- 如果路由器接受一种类型4 LSA，并且链路状态ID等于路由器ID，并且路由器不是ABR，则在远程区域的有效路由器ID复制发生，并且应该记录错误信息。
- 如果路由器不是ABR，能接受告诉它关于本身从另一个ABR的类型4 LSA。此情况不表示一个复制路由器ID问题，并且不应该记录错误信息。

亦称类型4 LSA是ASBR汇总LSA。如此示例所显示，发出show ip ospf database asbr-summary命令为了观察这些LSA。

ABR创建(类型4) ASBR汇总LSA为了通知ASBR的可到达性到其他区域。

```
r2.2.2.2#show ip ospf database asbr-summary 1.1.1.1
```

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

```
Summary ASB Link States (Area 0)
```

```
LS age: 266
```

```
Options: (No TOS-capability, DC)
```

```
LS Type: Summary Links(AS Boundary Router)
```

```
Link State ID: 1.1.1.1 (AS Boundary Router address)
```

```
!--- ABR (Router 2.2.2.2) advertises that it knows how !--- to reach the ASBR (Router 1.1.1.1).  
Advertising Router: 2.2.2.2 LS Seq Number: 80000001 Checksum: 0x935C Length: 28 Network Mask: /0  
TOS: 0 Metric: 64 !--- This is the cost of ABR to reach the ASBR.
```

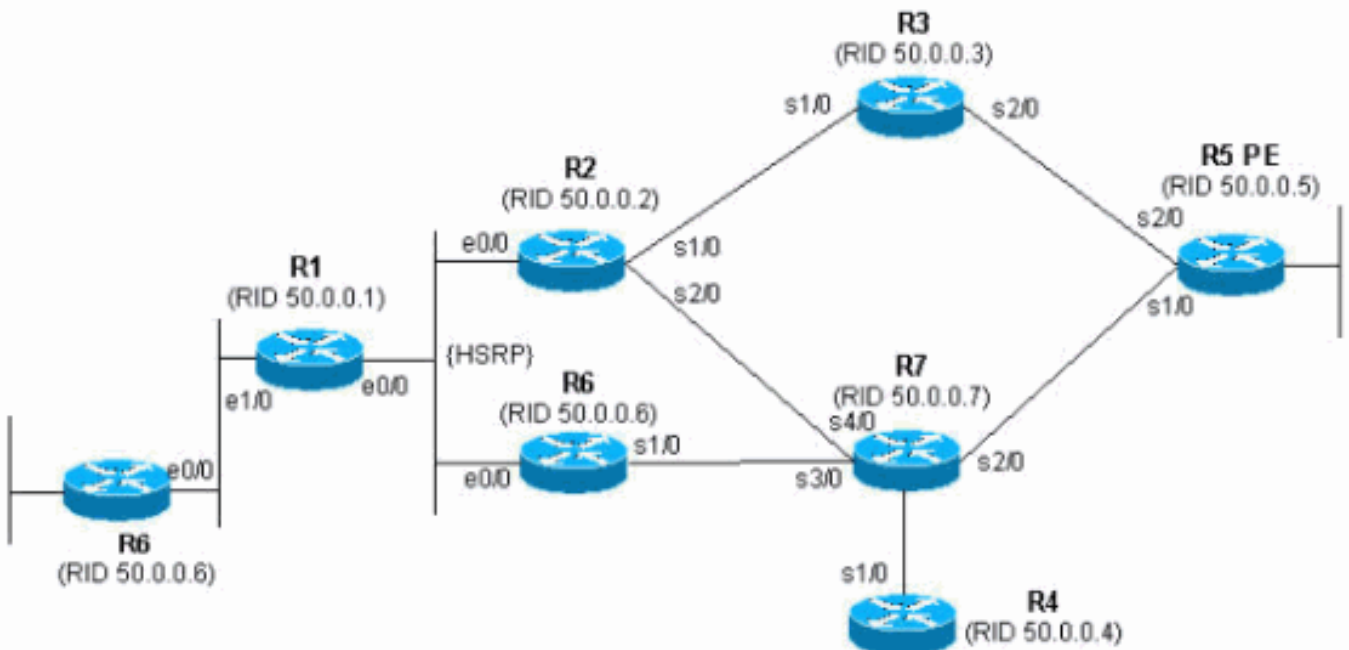
如果LSA是类型4，做通告的链路状态ID是ASBR路由器ID。参考[OSPF如何传播外部路由到多个区域](#)欲知更多信息。

排除故障

故障排除完成与在Cisco Bug ID [CSCdr61598](#) (仅限注册用户)和Cisco Bug ID [CSCdu08678](#) (仅限注册用户)集成前发布的Cisco IOS软件版本。

单区域网络

此镜像是在这些步骤描述的单区域网络的表示法。



1. 发出show proc cpu|包括ospf命令。这允许您发现使用CPU的OSPF进程。

```
r4#show proc cpu | include OSPF  
3          4704          473          9945  1.38%  0.81%  0.68%  0 OSPF Hello  
71         9956         1012         9837  1.47%  1.62%  1.41%  0 OSPF Router
```

如在前一个示例中看到，有OSPF的高CPU。这表示，必须错误有某事链路稳定性或一复制router-id。

2. 发出show ip ospf statistics命令。这允许您发现SPF算法是否比普通运行更多。

```
r4#show ip ospf statistics
```

```
Area 0: SPF algorithm executed 46 times
```

```
SPF calculation time
```

Delta T	Intra	D-Intra	Summ	D-Summ	Ext	D-Ext	Total	Reason
00:01:36	0	0	0	0	0	0	0	N,
00:01:26	0	0	0	0	0	0	0	R, N,
00:01:16	0	0	0	0	0	0	0	R, N,
00:01:06	0	0	0	0	0	0	0	R, N,
00:00:56	0	0	0	0	0	0	0	R, N,
00:00:46	0	0	0	0	0	0	0	R, N,
00:00:36	0	0	0	0	0	0	0	R, N, kmbgvc
00:00:26	0	0	0	0	0	0	0	R, N,
00:00:16	0	0	0	0	0	0	0	R, N,
00:00:06	0	0	0	0	0	0	0	R, N,

show ip ospf statistics命令如在前一个示例中看到表示，SPF的重新计算执行每10秒。它由路由器和网络LSA触发。有一个问题在区域和当前路由器一样。

3. 发出show ip ospf database命令。

```
r4#show ip ospf database
```

```
OSPF Router with ID (50.0.0.4) (Process ID 1)
```

```
Router Link States (Area 0)
```

Link ID	ADV Router	Age	Seq#	Checksum	Link count
50.0.0.1	50.0.0.1	681	0x80000002	0x7E9D	3
50.0.0.2	50.0.0.2	674	0x80000004	0x2414	5
50.0.0.4	50.0.0.4	705	0x80000003	0x83D	4
50.0.0.5	50.0.0.5	706	0x80000003	0x5C24	6
50.0.0.6	50.0.0.6	16	0x80000095	0xAF63	6
50.0.0.7	50.0.0.7	577	0x80000005	0x86D5	8

```
Net Link States (Area 0)
```

Link ID	ADV Router	Age	Seq#	Checksum
192.168.2.6	50.0.0.6	6	0x8000007A	0xABC7

show ip ospf database命令表示，一个LSA是更新的(使用周期16)，并且其序号更高然后在同一个OSPF数据库的其他LSA。路由器发送此LSA的您需要推测。因为它在同一个区域，通告路由器id知道(50.0.0.6)。是更加可能的此路由器ID被复制。其他路由器有同样router-id的您需要发现。

4. 此示例显示几个实例show ip ospf database命令。

```
r4#show ip ospf database router adv-router 50.0.0.6
```

```
OSPF Router with ID (50.0.0.4) (Process ID 1)
```

```
Router Link States (Area 0)
```

```
LS age: 11
Options: (No TOS-capability, DC)
LS Type: Router Links
Link State ID: 50.0.0.6
Advertising Router: 50.0.0.6
LS Seq Number: 800000C0
Checksum: 0x6498
Length: 72
Number of Links: 4
```

```
Link connected to: a Transit Network
(Link ID) Designated Router address: 192.168.2.6
(Link Data) Router Interface address: 192.168.2.6
Number of TOS metrics: 0
TOS 0 Metrics: 10
```

```
Link connected to: another Router (point-to-point)
(Link ID) Neighboring Router ID: 50.0.0.7
(Link Data) Router Interface address: 192.168.0.21
Number of TOS metrics: 0
TOS 0 Metrics: 64
```

```
Link connected to: a Stub Network
(Link ID) Network/subnet number: 192.168.0.20
(Link Data) Network Mask: 255.255.255.252
Number of TOS metrics: 0
TOS 0 Metrics: 64
```

```
Link connected to: a Stub Network
(Link ID) Network/subnet number: 50.0.0.6
(Link Data) Network Mask: 255.255.255.255
Number of TOS metrics: 0
TOS 0 Metrics: 1
```

```
r4#show ip ospf database router adv-router 50.0.0.6
```

```
OSPF Router with ID (50.0.0.4) (Process ID 1)
```

```
Router Link States (Area 0)
```

```
LS age: 7
Options: (No TOS-capability, DC)
LS Type: Router Links
Link State ID: 50.0.0.6
Advertising Router: 50.0.0.6
LS Seq Number: 800000C7
```

```
!--- The sequence number has increased. Checksum: 0x4B95 Length: 96 Number of Links: 6
!--- The number of links has increased although the network has been stable. Link connected
to: a Stub Network (Link ID) Network/subnet number: 192.168.3.0 (Link Data) Network Mask:
255.255.255.0 Number of TOS metrics: 0 TOS 0 Metrics: 10 Link connected to: another Router
(point-to-point) (Link ID) Neighboring Router ID: 50.0.0.5 (Link Data) Router Interface
address: 192.168.0.9 Number of TOS metrics: 0 TOS 0 Metrics: 64 Link connected to: a Stub
Network (Link ID) Network/subnet number: 192.168.0.8 (Link Data) Network Mask:
255.255.255.252 Number of TOS metrics: 0 TOS 0 Metrics: 64 Link connected to: another
Router (point-to-point) (Link ID) Neighboring Router ID: 50.0.0.2 (Link Data) Router
Interface address: 192.168.0.2 Number of TOS metrics: 0 TOS 0 Metrics: 64 Link connected
to: a Stub Network (Link ID) Network/subnet number: 192.168.0.0 (Link Data) Network Mask:
255.255.255.252 Number of TOS metrics: 0 TOS 0 Metrics: 64 Link connected to: a Stub
Network (Link ID) Network/subnet number: 50.0.0.6 (Link Data) Network Mask: 255.255.255.255
Number of TOS metrics: 0 TOS 0 Metrics: 1
```

5. 如果认识您的网络，您能找到哪个路由器通告那些链路。第一个早先输出表示，LSA由有OSPF邻居的50.0.0.7一个路由器发送，而第二个输出显示相邻50.0.0.5和50.0.0.6。发出show ip ospf命令为了找到那些路由器和访问他们为了验证他们的OSPF路由器ID。在此示例设置，他们是R6和R3。

```
3>show ip ospf
Routing Process "ospf 1" with ID 50.0.0.6
Supports only single TOS(TOS0) routes
Supports opaque LSA
```

```
r6#show ip ospf
Routing Process "ospf 1" with ID 50.0.0.6
Supports only single TOS(TOS0) routes
```


Supports opaque LSA

6. 发出show run|beg router ospf命令为了检查开始在OSPF配置的配置。

```
R6#show run | include router ospf
router ospf 1
  router-id 50.0.0.6
  log-adjacency-changes
  network 50.0.0.0 0.0.0.255 area 0
  network 192.168.0.0 0.0.0.255 area 0
  network 192.168.2.0 0.0.0.255 area 0
```

```
r3#show run | begin router ospf
router ospf 1
  log-adjacency-changes
  network 50.0.0.0 0.0.0.255 area 0
  network 192.168.0.0 0.0.0.255 area 0
  network 192.168.3.0 0.0.0.255 area 0
```

在前一个示例中，删除了router-id命令，并且OSPF进程未被重新启动。同一个问题能也起因于消除并且被配置得其他地方的环回接口。

7. 发出clear ip ospf 1 process命令和show ip ospf命令为了清除进程。

```
r3#clear ip ospf 1 process
Reset OSPF process? [no]: y
```

```
r3#show ip ospf
Routing Process "ospf 1" with ID 50.0.0.6
Supports only single TOS(TOS0) routes
Supports opaque LSA
```

如前一个示例所显示，错误IP地址仍然出现。

8. 发出show ip int brie命令为了检查接口。

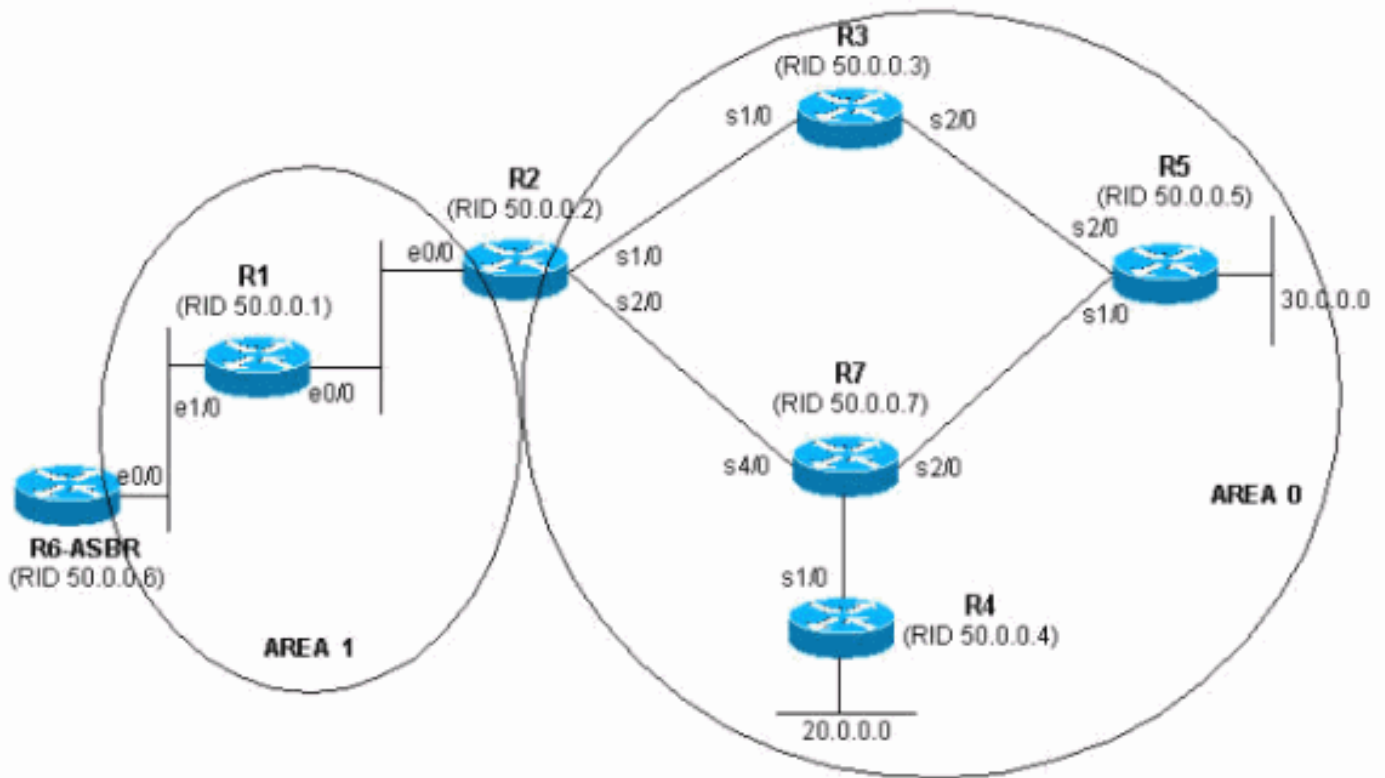
```
r3#show ip int brie
Interface                IP-Address      OK? Method Status          Protocol
Ethernet0/0              192.168.3.1    YES NVRAM  up              up
Serial1/0                 192.168.0.2    YES NVRAM  up              up
Serial2/0                 192.168.0.9    YES NVRAM  up              up
Loopback0                 unassigned     YES NVRAM  up              up
Loopback1                 50.0.0.6       YES NVRAM  up              up
```

!--- The highest Loopback IP address

为了更正问题，请切记在路由器配置的最高的环回是唯一在您的OSPF网络或者用router-id < IP地址>命令静态配置router-id在OSPF路由器配置模式下。

与ASBR的多个区域

这些问题的症状是外部路由，通过从静态的再分配是获知到OSPF进程由R6，ASBR路由器从在所有路由器的路由表拍动在OSPF Area 0内。外部路由是120.0.0.0/16，并且问题在Area 0。开始的路由器5被注意从那里排除故障。



1. 发出show ip route命令几次为了连续发现症状。

```
r5#show ip route 120.0.0.0
Routing entry for 120.0.0.0/16, 1 known subnets

O E2    120.0.0.0 [110/20] via 192.168.0.9, 00:00:03, Serial2/0
```

```
r5#show ip route 120.0.0.0
% Network not in table
r5#
```

2. 看一看在OSPF数据库为了证实LSA是否被接受。如果连续发出show ip ospf database命令几次，您注意LSA由两路由器、50.0.0.6和50.0.0.7接受。若有，如果在第二个条目岁查找您注意其值大量地更改。

```
r5#show ip ospf database | begin Type-5
Type-5 AS External Link States

Link ID      ADV Router   Age          Seq#         Checksum Tag
120.0.0.0    50.0.0.6    2598        0x80000001  0xE10E    0
120.0.0.0    50.0.0.7    13          0x80000105  0xD019    0
```

```
r5#show ip ospf database | begin Type-5
Type-5 AS External Link States

Link ID      ADV Router   Age          Seq#         Checksum Tag
120.0.0.0    50.0.0.6    2599        0x80000001  0xE10E    0
120.0.0.0    50.0.0.7    14          0x80000105  0xD019    0
```

```
r5#show ip ospf database | begin Type-5
Type-5 AS External Link States

Link ID      ADV Router   Age          Seq#         Checksum Tag
120.0.0.0    50.0.0.6    2600        0x80000001  0xE10E    0
120.0.0.0    50.0.0.7    3601        0x80000106  0x6F6     0
```

```
r5#show ip ospf database | begin Type-5
Type-5 AS External Link States

Link ID      ADV Router   Age          Seq#         Checksum Tag
120.0.0.0    50.0.0.6    2602        0x80000001  0xE10E    0
```

```
r5#show ip ospf database | begin Type-5
Type-5 AS External Link States
```

```

Link ID          ADV Router      Age           Seq#           Checksum Tag
120.0.0.0       50.0.0.6       2603         0x80000001   0xE10E 0
r5#

```

3. 您也注意奇怪的工作情况，如果查看序号为从50.0.0.7被接受，是通告路由器的LSA。查看什么其他LSA从50.0.0.7被接受。如果连续发出show ip ospf database adv路由器50.0.0.7命令几次，如此示例所显示，条目迅速变化。

```

r5#show ip ospf database adv-router 50.0.0.7

OSPF Router with ID (50.0.0.5) (Process ID 1)

Router Link States (Area 0)

Link ID          ADV Router      Age           Seq#           Checksum Link count
50.0.0.7        50.0.0.7       307          0x8000000D   0xDF45 6

Type-5 AS External Link States

Link ID          ADV Router      Age           Seq#           Checksum Tag
120.0.0.0       50.0.0.7       9            0x8000011B   0xA42F 0

```

```
r5#show ip ospf database network adv-router 50.0.0.7
```

```
OSPF Router with ID (50.0.0.5) (Process ID 1)
```

```
r5#show ip ospf database network adv-router 50.0.0.7
```

```
OSPF Router with ID (50.0.0.5) (Process ID 1)
```

最后输出不显示什么。或者路由拍动或很可能有另一个种类的问题，在OSPF域内的复制路由器ID。

4. 发出show ip ospf database命令为了查看50.0.0.7做通告的外部LSA。

```

r5#show ip ospf database external adv-router 50.0.0.7

OSPF Router with ID (50.0.0.5) (Process ID 1)

Type-5 AS External Link States

Delete flag is set for this LSA
LS age: MAXAGE(3600)
Options: (No TOS-capability, DC)
LS Type: AS External Link
Link State ID: 120.0.0.0 (External Network Number )
Advertising Router: 50.0.0.7
LS Seq Number: 80000136
Checksum: 0xA527
Length: 36
Network Mask: /16
Metric Type: 2 (Larger than any link state path)
TOS: 0
Metric: 16777215
Forward Address: 0.0.0.0
External Route Tag: 0

```

```
r5#show ip ospf database external adv-router 50.0.0.7
```

```
OSPF Router with ID (50.0.0.5) (Process ID 1)
```

```
r5#
```

5. 查看SPF计算原因为了验证此。x意味着SPF运行每10秒由于外部LSA (类型5)飘荡和的确，您看到SPF运行。

```
r5#show ip ospf statistic
```

Area 0: SPF algorithm executed 2 times

SPF calculation time

Delta T	Intra	D-Intra	Summ	D-Summ	Ext	D-Ext	Total	Reason
00:47:23	0	0	0	0	0	0	0	X
00:46:33	0	0	0	0	0	0	0	X
00:33:21	0	0	0	0	0	0	0	X
00:32:05	0	0	0	0	0	0	0	X
00:10:13	0	0	0	0	0	0	0	R, SN, X
00:10:03	0	0	0	0	0	0	0	R, SN, X
00:09:53	0	0	0	0	0	0	0	R,
00:09:43	0	0	0	0	0	0	0	R, SN, X
00:09:33	0	0	0	0	0	0	0	X
00:09:23	0	0	0	0	0	0	0	X

6. 知道问题是当前区域的外部。启用您的在ABR的重点。比OSPF area 0远程登录到ABR路由器2为了安排在其他区域的更多公开性。发出[show ip ospf border-routers](#)和[show ip ospf database network adv-router](#)命令。

```
r2#show ip ospf border-routers
```

```
OSPF Process 1 internal Routing Table
```

```
Codes: i - Intra-area route, I - Inter-area route
```

```
i 50.0.0.7 [20] via 192.168.2.1, Ethernet0/0, ASBR, Area 1, SPF 25
```

```
r2#show ip ospf database network adv-router 50.0.0.7
```

```
OSPF Router with ID (50.0.0.2) (Process ID 1)
```

```
Net Link States (Area 1)
```

```
Routing Bit Set on this LSA
```

```
LS age: 701
```

```
Options: (No TOS-capability, DC)
```

```
LS Type: Network Links
```

```
Link State ID: 192.168.1.2 (address of Designated Router)
```

```
Advertising Router: 50.0.0.7
```

```
LS Seq Number: 80000001
```

```
Checksum: 0xBC6B
```

```
Length: 32
```

```
Network Mask: /24
```

```
Attached Router: 50.0.0.7
```

```
Attached Router: 50.0.0.1
```

7. 有故障的路由器在LAN和50.0.0.1一样。它必须是路由器6.发出[show ip ospf](#)命令。

```
r6#show ip ospf
```

```
Routing Process "ospf 1" with ID 50.0.0.7
```

```
Supports only single TOS(TOS0) routes
```

```
Supports opaque LSA
```

```
It is an autonomous system boundary router.
```

8. 一旦找到有故障的路由器，请参见本文的[Single Area Network部分](#)更正问题。

[错误信息：%OSPF-4-FLOOD_WAR：进程60500冲洗LSA ID 10.x.x.0第五类型副词rtr 10.40.x.x在区域10.40.0.0](#)

%OSPF-4-FLOOD_WAR 60500LSA ID 10.35.70.410.40.0.0错误信息的rtr 10.40.0.105被接受。

此错误信息阐明，路由器产生或以高速率冲洗LSA。在网络的一典型方案可能是在网络的一个路由器产生LSA和LSA的第二路由器冲洗的地方。提供得此错误信息的一个详细规格说明这里：

- 60500 -报告错误的OSPF进程。在本例中，进程ID是**60500**。
- 或(关键字) -指示路由器是否产生LSA或冲洗。在此错误信息，路由器冲洗LSA。
- LSA ID 10.35.70.4 -连接溢出战争被发现的状态ID。在本例中，它是**10.35.70.4**。
- - LSA类型。此示例有一**种类5** LSA。**注意**：溢出战争有每个LSA的一个不同的根本原因。
- rtr -即产生LSA的路由器(**10.40.0.105**)。
- - LSA属于的区域。在本例中，LSA属于**10.40.0.0**。

[解决方案](#)

注释此错误的**种类**特定;在本例中，第五类型。此指定意味着有在位于不同的区域的两路由器的复制路由器ID。结果，更改在其中一的路由器ID路由器是必要的。

[相关信息](#)

- [如何配置OSPF](#)
- [OSPF数据库说明指南](#)
- [解释的OSPF相邻问题](#)
- [什么show ip ospf interface命令显示？](#)
- [开放最短路径优先\(OSPF\)支持页面](#)
- [技术支持和文档 - Cisco Systems](#)