目录

简介

常见问题，当曾经开放最短路径优先(OSPF)时是在数据库的路由没出现在路由表里。在大多数情况下OSPF查找在数据库的一个差异，因此在路由表里不安装路由。通常，您能看到ADV意味着的消息(通告LSA的路由器不是可及的通过OSPF)在链路状态广播(LSA)顶部在数据库，当此问题发生时。示例如下：

```
Adv Router is not-reachableLS age: 418Options: (No TOS-capability, DC)LS Type: Router LinksLink State ID: 172.16.32.2Advertising Router: 172.16.32.2LS Seq Number: 80000002Checksum: 0xFA63Length: 60 Number of Links: 3
```

有此问题的几个原因，多数处理配置错误或一残破的拓扑。当更正配置OSPF数据库差异去离开，并且时路由在路由表里出现。本文解释能的数据库导致差异的某些更多常见原因。

某些命令在本文中用于OSPF行为的验证包括show ip ospf interface、ip OSPF数据库路由器、show ip ospf neighbor和show ip ospf database external。如果有的输出任何从您的Cisco设备的这些命令，您能使用 显示潜在问题和修正。要使用输出结果，您必须是注册用户，并且必须进行登录，还要激活JavaScript。

为了使用输出解释器，您必须是注册用户，登录并启用Javascript

先决条件

要求

本文读者应该有这些主题知识

- OSPF基本的了解
- OSPF基本配置

使用的组件

本文档中的信息基于以下软件和硬件版本：

- Cisco IOS软件版本12.3在所有路由器运行。
- 所有Cisco路由器平台支持这。

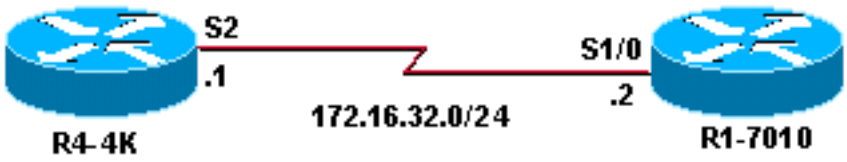
本文档中的信息都是基于特定实验室环境中的设备编写的。本文档中使用的所有设备最初均采用原始（默认）配置。如果您使用的是真实网络，请确保您已经了解所有命令的潜在影响。

规则

有关文档规则的详细信息，请参阅 Cisco 技术提示规则。

原因1 ：网络类型不匹配

请使用以下网络图为例：



R4-4K	R1-7010
interface Loopback0 ip address 172.16.33.1 255.255.255.255interface Serial2 ip address 172.16.32.1 255.255.255.0 **ip ospf network broadcast**router ospf 20 network 172.16.0.0 0.0.255.255 area 0	interface Loopback0 ip address 172.16.33.1 255.255.255.255interface Serial2 ip address 172.16.32.1 255.255.255.0 **ip ospf network broadcast**router ospf 20 network 172.16.0.0 0.0.255.255 area 0

R4-4K(4)# **show ip ospf interface serial 2**Serial2 is up, line protocol is up Internet Address 172.16.32.1/24, Area 0 Process ID 20, Router ID 172.16.33.1, **Network Type BROADCAST**, Cost: 64 Transmit Delay is 1 sec, State DR, Priority 1 Designated Router (ID) 172.16.33.1, Interface address 172.16.32.1 Backup Designated router (ID) 172.16.32.2, Interface address 172.16.32.2 Timer intervals configured, Hello 10, Dead 40, Wait 40, Retransmit 5 Hello due in 00:00:08 Neighbor Count is 1, Adjacent neighbor count is 1 Adjacent with neighbor 172.16.32.2 (Backup Designated Router) Suppress hello for 0 neighbor(s)R1-7010(5)# **show ip ospf interface serial 1/0**Serial1/0 is up, line protocol is up Internet Address 172.16.32.2/24, Area 0 Process ID 20, Router ID 172.16.32.2, **Network Type POINT_TO_POINT**, Cost: 64 Transmit Delay is 1 sec, State POINT_TO_POINT, Timer intervals configured, Hello 10, Dead 40, Wait 40, Retransmit 5 Hello due in 00:00:02 Neighbor Count is 1, Adjacent neighbor count is 1 Adjacent with neighbor 172.16.33.1 Suppress hello for 0 neighbor(s)

正如您上面看到的路由器R4-4K为广播配置，并且路由器R1-7010为点对点配置。这种网络类型不匹配做通告路由器不可达的。

R4-4K(4)# **show ip ospf database router 172.16.32.2 Adv Router is not-reachable** LS age: 418

```
Options: (No TOS-capability, DC)  LS Type: Router Links  Link State ID: 172.16.32.2  Advertising Router: 172.16.32.2  LS Seq Number: 80000002  Checksum: 0xFA63  Length: 60  Number of Links: 3 Link connected to: another Router (point-to-point)  (Link ID) Neighboring Router ID: 172.16.33.1  (Link Data) Router Interface address: 172.16.32.2  Number of TOS metrics: 0 TOS 0 Metrics: 64  Link connected to: a Stub Network  (Link ID) Network/subnet number: 172.16.32.0  (Link Data) Network Mask: 255.255.255.0  Number of TOS metrics: 0  TOS 0 Metrics: 64R1-7010(5)# show ip ospf database router 172.16.33.1  Adv Router is not-reachable  LS age: 357  Options: (No TOS-capability, DC)  LS Type: Router Links  Link State ID: 172.16.33.1 Advertising Router: 172.16.33.1  LS Seq Number: 8000000A  Checksum: 0xD4AA  Length: 48  Number of Links: 2  Link connected to: a Transit Network  (Link ID) Designated Router address: 172.16.32.1  (Link Data) Router Interface address: 172.16.32.1  Number of TOS metrics: 0 TOS 0 Metrics: 64
```

您能为子网172.16.32.0/24看到那，路由器R1-7010生成点对点链路，并且路由器R4-4K生成转接链路。这创建在链路状态数据库的一个差异，含义路由在路由表里没有安装。

```
R1-7010(5)# show ip route172.16.0.0/16 is variably subnetted, 3 subnets, 2 masksC 172.16.32.0/24 is directly connected, Serial1/0C  172.16.30.1/32 is directly connected, Loopback0
```

解决方案

要解决此问题，请配置同一种网络类型的两路由器。您能更改路由器R1-7010网络类型广播或者更改路由器R4-4K's serial interfaces到点对点。

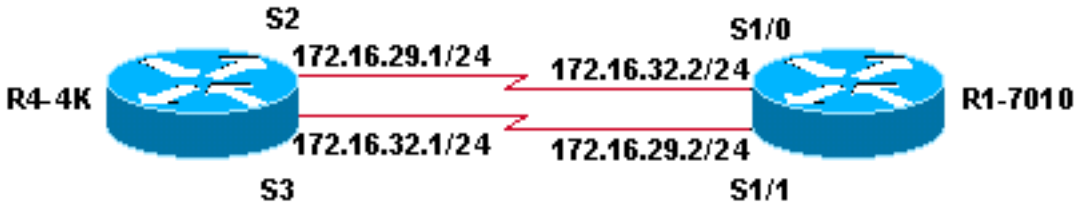
注意： 如果有然后一端是多点接口和的一个情况其他侧是sub-interface更改网络类型广播在两边。

在本例中，因为两边是点到点高级数据链路控制(HDLC)封装的接口，我们删除在R4-4K的“网络类型广播”语句。

```
R4-4K(4)# configure terminal R4-4K(4)(config)# interface serial 2 R4-4K(4)(config-if)# no ip ospf network broadcast R4-4K(4)(config-if)# endR4-4K(4)# show ip ospf interface serial 2 Serial2 is up, line protocol is up  Internet Address 172.16.32.1/24, Area 0  Process ID 20, Router ID 172.16.33.1, Network Type POINT_TO_POINT, Cost: 64  Transmit Delay is 1 sec, State POINT_TO_POINT,  Timer intervals configured, Hello 10, Dead 40, Wait 40, Retransmit 5  Hello due in 00:00:04  Neighbor Count is 1, Adjacent neighbor count is 1  Adjacent with neighbor 172.16.32.2  Suppress hello for 0 neighbor(s)
```

原因2 ：在DUAL串行链路设置的错误地址分配

考虑此网络图为例：



R4-4K	R1-7010
R4-4K(4)# **configure terminal** R4-4K(4)(config)# **interface serial 2** R4-4K(4)(config-if)# **no ip ospf network broadcast** R4-4K(4)(config-if)# **end**R4-4K(4)# **show ip ospf interface serial 2** Serial2	R4-4K(4)# **configure terminal** R4-4K(4)(config)# **interface serial 2** R4-4K(4)(config-if)# **no ip ospf network broadcast** R4-4K(4)(config-if)# **end**R4-4K(4)# **show ip ospf interface serial 2** Serial2

is up, line protocol is up Internet Address 172.16.32.1/24, Area 0 Process ID 20, Router ID 172.16.33.1, **Network Type POINT_TO_POINT**, Cost: 64 Transmit Delay is 1 sec, State POINT_TO_POINT, Timer intervals configured, Hello 10, Dead 40, Wait 40, Retransmit 5 Hello due in 00:00:04 Neighbor Count is 1, Adjacent neighbor count is 1 Adjacent with neighbor 172.16.32.2 Suppress hello for 0 neighbor(s)	is up, line protocol is up Internet Address 172.16.32.1/24, Area 0 Process ID 20, Router ID 172.16.33.1, **Network Type POINT_TO_POINT**, Cost: 64 Transmit Delay is 1 sec, State POINT_TO_POINT, Timer intervals configured, Hello 10, Dead 40, Wait 40, Retransmit 5 Hello due in 00:00:04 Neighbor Count is 1, Adjacent neighbor count is 1 Adjacent with neighbor 172.16.32.2 Suppress hello for 0 neighbor(s)

您能看到IP地址在上述配置里被翻转的OSPF数据库导致一个差异。然而，路由器仍然形成的Cisco IOS版本的邻居早于12.1，因为在点对点链路， OSPF路由器不验证相邻路由器是在相同子网。

```
R4-4K(4)# show ip ospf neighborNeighbor ID     Pri   State           Dead Time   Address
Interface172.16.32.2       1   FULL/  -        00:00:37    172.16.32.2     Serial2172.16.32.2
1   FULL/  -        00:00:31    172.16.29.2     Serial3
```

从上述输出，您能看到Serial2形成有IP地址172.16.32.2的邻居，不是在相同子网。虽然邻居形成，路由在路由表里没有安装：

```
R1-7010(5)# show ip route172.16.0.0/16 is variably subnetted, 3 subnets, 2 masksC
172.16.32.0/24 is directly connected, Serial1/0C       172.16.29.0/24 is directly connected,
Serial1/1C       172.16.30.1/32 is directly connected, Loopback0
```

解决方案

要解决此问题，正确地分配IP地址或交换串行电缆。此处我们更正了IP地址：

R4-4K	R1-7010
R1-7010(5)# **show ip route**172.16.0.0/16 is variably subnetted, 3 subnets, 2 masksC 172.16.32.0/24 is directly connected, Serial1/0C 172.16.29.0/24 is directly connected, Serial1/1C 172.16.30.1/32 is directly connected, Loopback0	R1-7010(5)# **show ip route**172.16.0.0/16 is variably subnetted, 3 subnets, 2 masksC 172.16.32.0/24 is directly connected, Serial1/0C 172.16.29.0/24 is directly connected, Serial1/1C 172.16.30.1/32 is directly connected, Loopback0

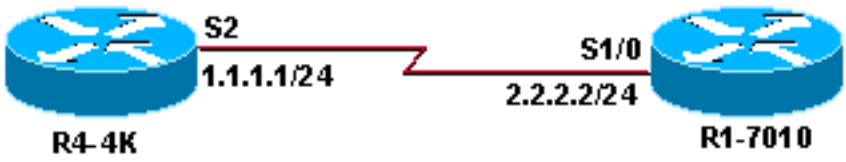
```
R4-4K(4)# show ip ospf neighborNeighbor ID     Pri   State           Dead Time   Address
Interface172.16.32.2       1   FULL/  -        00:00:36    172.16.32.2     Serial2172.16.32.2
1   FULL/  -        00:00:39    172.16.29.2     Serial3
```

现在它显示在Serial2接口的正确邻居地址。路由也在路由表里：

```
R1-7010(5)# show ip route172.16.0.0/16 is variably subnetted, 4 subnets, 2 masksC
172.16.32.0/24 is directly connected, Serial1/0O       172.16.35.1/32 [110/65] via 172.16.32.1,
00:03:12, Serial1/0                    [110/65] via 172.16.29.1, 00:03:12, Serial1/1C
172.16.29.0/24 is directly connected, Serial1/1C       172.16.30.1/32 is directly connected,
Loopback0
```

原因3 ：在错误的Majornet或子网包括的点对点链路的一端

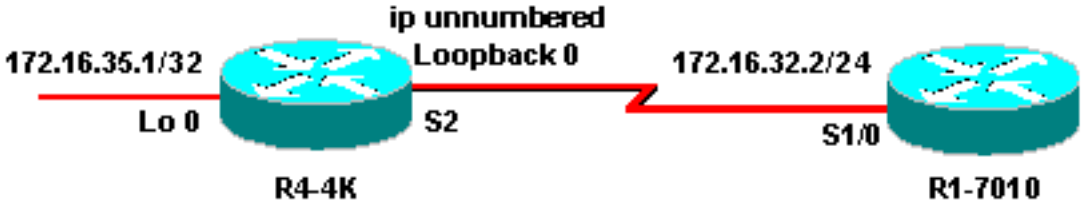
考虑此网络图为例：



此情况创建同一种行为象在DUAL串行链路设置的错误地址分配。要解决问题，请分配在相同子网的IP地址在两路由器。

原因4 ：一端未编号的，并且另一旁拉被编号

考虑以下网络图为例：



R4-4K	R1-7010
interface Loopback0 ip address 172.16.35.1 255.255.255.255interface Serial2 **ip unnumbered Loopback0** router ospf 20 network 172.16.0.0 0.0.255.255 area 0	interface Loopback0 ip address 172.16.35.1 255.255.255.255interface Serial2 **ip unnumbered Loopback0** router ospf 20 network 172.16.0.0 0.0.255.255 area 0

R4-4K(4)# **show interface serial 2**Serial2 is up, line protocol is up Hardware is cxBus Serial **Interface is unnumbered. Using address of Loopback0** (172.16.35.1)R1-7010(5)# **show interface serial 1/0**Serial1/0 is up, line protocol is up Hardware is cxBus Serial **Internet address is 172.16.32.2/24**

以上输出显示R4-4K's Serial2接口是未编号的对Loopback0，而R1-7010's Serial1/0是编号的接口。

R4-4K(4)# **show ip ospf interface serial 2**Serial2 is up, line protocol is up Internet Address **0.0.0.0/24**, Area 0 Process ID 20, Router ID 172.16.35.1, **Network Type** POINT_TO_POINT, Cost: 64 Transmit Delay is 1 sec, State POINT_TO_POINT, Timer intervals configured, Hello 10, Dead 40, Wait 40, Retransmit 5 Hello due in 00:00:02 Neighbor Count is 1, Adjacent neighbor count is 1 Adjacent with neighbor 172.16.32.2 Suppress hello for 0 neighbor(s)R1-7010(5)# **show ip ospf interface serial 1/0**Serial1/0 is up, line protocol is up Internet Address 172.16.32.2/24, Area 0 Process ID 20, Router ID 172.16.32.2, **Network Type** POINT_TO_POINT, Cost: 64 Transmit Delay is 1 sec, State POINT_TO_POINT, Timer intervals configured, Hello 10, Dead 40, Wait 40, Retransmit 5 Hello due in 00:00:02 Neighbor Count is 1, Adjacent neighbor count is 1 Adjacent with neighbor 172.16.33.1 Suppress hello for 0 neighbor(s)

正如您上面看到的网络类型在两种情况下点到点。问题是一端未编号的，并且另一侧不是，创建在数据库的一个差异如下所示。

R4-4K(4)# **show ip ospf database router 172.16.30.1** OSPF Router with ID (172.16.35.1) (Process ID 20) Router Link States (Area 0) LS age: 202 Options: (No TOS-capability, DC) LS Type: Router Links Link State ID: 172.16.30.1 Advertising Router: 172.16.30.1 LS Seq

```
Number: 80000002     Checksum: 0xC899     Length: 60     Number of Links: 3 Link connected to:
another Router (point-to-point)     (Link ID) Neighboring Router ID: 172.16.35.1     (Link Data)
Router Interface address: 172.16.32.2     Number of TOS metrics: 0     TOS 0 Metrics: 64 Link
connected to: a Stub Network     (Link ID) Network/subnet number: 172.16.32.0     (Link Data)
Network Mask: 255.255.255.0     Number of TOS metrics: 0     TOS 0 Metrics: 64 Link connected
to: a Stub Network     (Link ID) Network/subnet number: 172.16.30.1     (Link Data) Network
Mask: 255.255.255.255     Number of TOS metrics: 0     TOS 0 Metrics: 1     R4-4k(4)#    R1-
7010(5)# show ip ospf database router 172.16.35.1OSPF Router with ID (172.16.30.1) (Process ID
20)     Router Link States (Area 0) Adv Router is not-reachable     LS age: 396     Options: (No
TOS-capability, DC)     LS Type: Router Links     Link State ID: 172.16.35.1     Advertising
Router: 172.16.35.1     LS Seq Number: 80000003     Checksum: 0xBEA1     Length: 48     Number
of Links: 2 Link connected to: another Router (point-to-point)     (Link ID) Neighboring Router
ID: 172.16.30.1     (Link Data) Router Interface address: 0.0.0.3          !--- In case of an
unnumbered link we use MIB !--- II IfIndex value which usually starts with 0. Number of TOS
metrics: 0 TOS 0 Metrics: 64 Link connected to: a Stub Network (Link ID) Network/subnet number:
172.16.35.1 (Link Data) Network Mask: 255.255.255.255 Number of TOS metrics: 0 TOS 0 Metrics: 1
R1-7010(5)#
```

您能看到R1-7010生成此点对点链路的LSA与包含其接口地址的Link Data字段，而R4-4K生成同一条链路的LSA与包含MIBII IfIndex值的Link Data字段。这创建在链路状态数据库的一个差异，含义路由在路由表里没有安装。

```
R1-7010(5)# show ip route172.16.0.0/16 is variably subnetted, 3 subnets, 2 masksC
172.16.32.0/24 is directly connected, Serial1/0C       172.16.30.1/32 is directly connected,
Loopback0
```

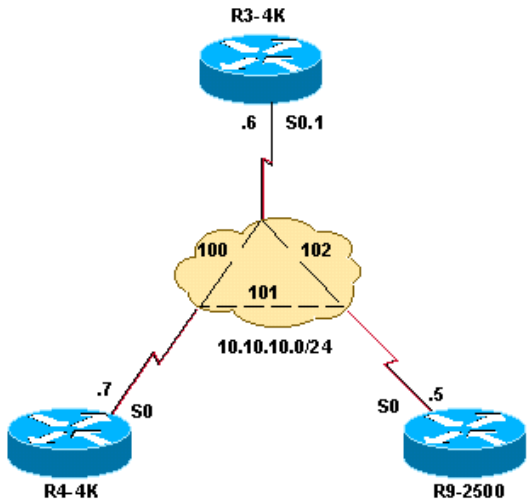
解决方案

要解决此问题，请配置路由器的serial interfaces如或者编号或未编号的。在本例中我们编号了路由器R4-4K序列2接口。

```
R4-4K(4)# configure terminal R4-4K(4)(config)# interface serial 2R4-4K(4)(config-if)# no ip
unnumbered loopback 0 R4-4K(4)(config-if)# ip address 172.16.32.1 255.255.255.0R4-4K(4))# show
ip ospf interface serial 2Serial2 is up, line protocol is up   Internet Address 172.16.32.1/24,
Area 0   Process ID 20, Router ID 172.16.33.1, Network Type POINT_TO_POINT, Cost: 64   Transmit
Delay is 1 sec, State POINT_TO_POINT,  Timer intervals configured, Hello 10, Dead 40, Wait 40,
Retransmit 5    Hello due in 00:00:02  Neighbor Count is 1, Adjacent neighbor count is 1
Adjacent with neighbor 172.16.32.2  Suppress hello for 0 neighbor(s)R1-7010(5)# show ip
route172.16.0.0/16 is variably subnetted, 3 subnets, 2 masksC       172.16.32.0/24 is directly
connected, Serial1/0O       172.16.33.1/32 [110/65] via 172.16.32.1, 00:03:08, Serial1/0C
172.16.30.1/32 is directly connected, Loopback0
```

原因5 ：在全网状帧中继环境的中断的PVC

考虑此网络图为例：



R9-2500

```
R4-4K(4)# configure terminal R4-4K(4)(config)# interface
serial 2R4-4K(4)(config-if)# no ip unnumbered loopback 0
R4-4K(4)(config-if)# ip address 172.16.32.1
255.255.255.0R4-4K(4))# show ip ospf interface serial
2Serial2 is up, line protocol is up   Internet Address
172.16.32.1/24, Area 0   Process ID 20, Router ID
172.16.33.1, Network Type POINT_TO_POINT, Cost: 64
Transmit Delay is 1 sec, State POINT_TO_POINT,  Timer
intervals configured, Hello 10, Dead 40, Wait 40,
Retransmit 5    Hello due in 00:00:02  Neighbor Count is
1, Adjacent neighbor count is 1     Adjacent with
neighbor 172.16.32.2  Suppress hello for 0
neighbor(s)R1-7010(5)# show ip route172.16.0.0/16 is
variably subnetted, 3 subnets, 2 masksC
172.16.32.0/24 is directly connected, Serial1/0O
172.16.33.1/32 [110/65] via 172.16.32.1, 00:03:08,
Serial1/0C       172.16.30.1/32 is directly connected,
Loopback0
```

R4-4K

```
R4-4K(4)# configure terminal R4-4K(4)(config)# interface
serial 2R4-4K(4)(config-if)# no ip unnumbered loopback 0
R4-4K(4)(config-if)# ip address 172.16.32.1
255.255.255.0R4-4K(4))# show ip ospf interface serial
2Serial2 is up, line protocol is up   Internet Address
172.16.32.1/24, Area 0   Process ID 20, Router ID
172.16.33.1, Network Type POINT_TO_POINT, Cost: 64
Transmit Delay is 1 sec, State POINT_TO_POINT,  Timer
intervals configured, Hello 10, Dead 40, Wait 40,
Retransmit 5    Hello due in 00:00:02  Neighbor Count is
1, Adjacent neighbor count is 1     Adjacent with
neighbor 172.16.32.2  Suppress hello for 0
neighbor(s)R1-7010(5)# show ip route172.16.0.0/16 is
variably subnetted, 3 subnets, 2 masksC
172.16.32.0/24 is directly connected, Serial1/0O
172.16.33.1/32 [110/65] via 172.16.32.1, 00:03:08,
Serial1/0C       172.16.30.1/32 is directly connected,
Loopback0
```

R3-4K

```
R4-4K(4)# configure terminal R4-4K(4)(config)# interface
serial 2R4-4K(4)(config-if)# no ip unnumbered loopback 0
R4-4K(4)(config-if)# ip address 172.16.32.1
255.255.255.0R4-4K(4))# show ip ospf interface serial
2Serial2 is up, line protocol is up   Internet Address
172.16.32.1/24, Area 0   Process ID 20, Router ID
172.16.33.1, Network Type POINT_TO_POINT, Cost: 64
Transmit Delay is 1 sec, State POINT_TO_POINT,  Timer
intervals configured, Hello 10, Dead 40, Wait 40,
Retransmit 5    Hello due in 00:00:02  Neighbor Count is
1, Adjacent neighbor count is 1     Adjacent with
neighbor 172.16.32.2  Suppress hello for 0
neighbor(s)R1-7010(5)# show ip route172.16.0.0/16 is
variably subnetted, 3 subnets, 2 masksC
172.16.32.0/24 is directly connected, Serial1/0O
172.16.33.1/32 [110/65] via 172.16.32.1, 00:03:08,
Serial1/0C       172.16.30.1/32 is directly connected,
Loopback0
```

只要帧中继网云充分地网状连接，在帧中继的广播模型正常运转。如果任何永久虚电路(PVC)是残破的，它能制造在OSPF数据库的问题，反过来生成ADV消息。

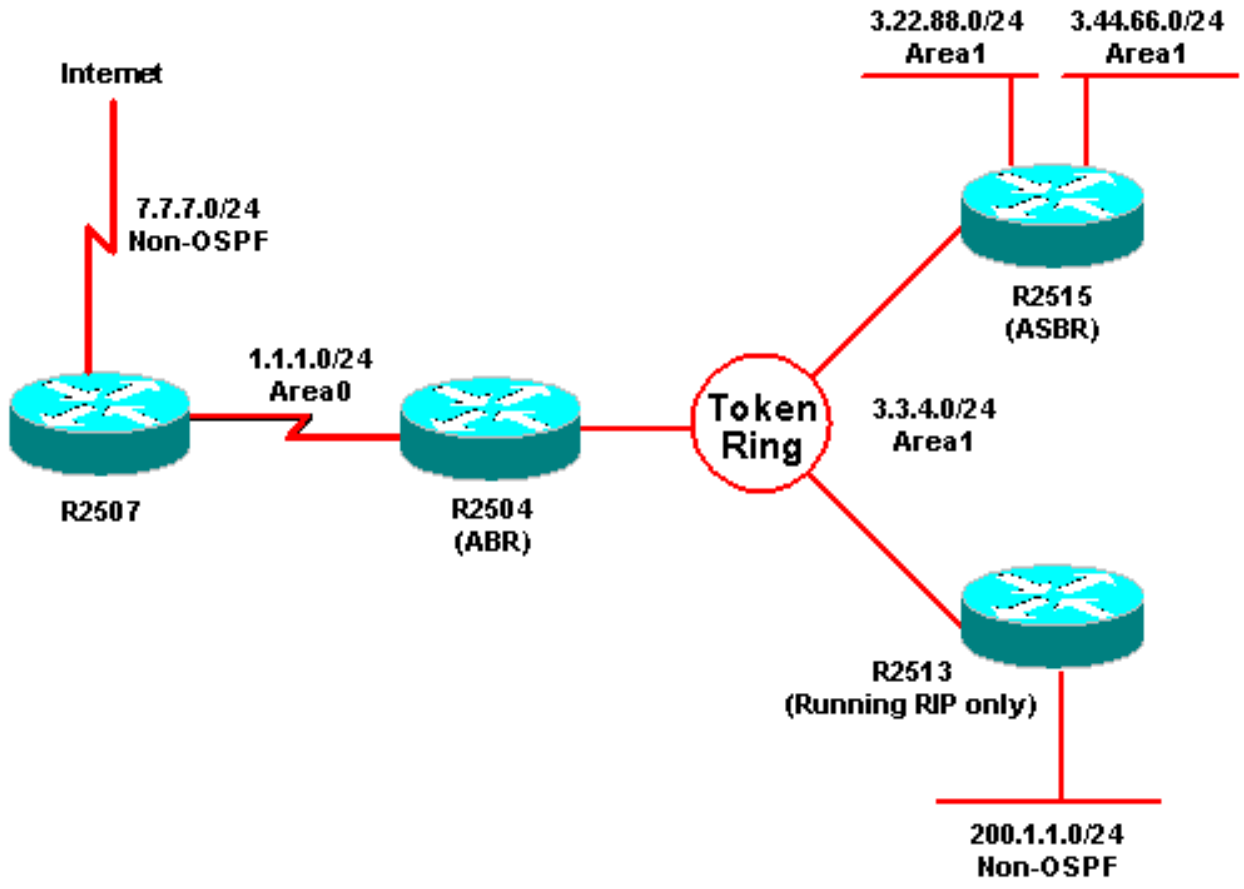
在本例中，在R9-2500之间的PVC和R4-4K是残破的，并且对指定路由器(DR)的R9-2500链路是残破的。结果， R9-2500宣称从(的所有LSA不是DR)的R3-4K，作为不可达的。正如你看到的R9-2500不生成serial interfaces的转接链路附加对R3-4K;它生成残余部分链路，因为，就R9-2500而言没有在此链路的DR。

```
R9-2500(3)# show ip ospf database router        OSPF Router with ID (50.50.50.50) (Process ID 10)
Router Link States (Area 0)  LS age: 148  Options: (No TOS-capability, DC)  LS Type: Router
Links  Link State ID: 50.50.50.50  Advertising Router: 50.50.50.50  LS Seq Number: 8000000B
Checksum: 0x55A  Length: 48   Number of Links: 2    Link connected to: a Stub Network    (Link
ID) Network/subnet number: 10.10.10.0    (Link Data) Network Mask: 255.255.255.0    Number of
TOS metrics: 0    TOS 0 Metrics: 64    Link connected to: a Stub Network    (Link ID)
Network/subnet number: 50.50.50.50    (Link Data) Network Mask: 255.255.255.255    Number of TOS
metrics: 0    TOS 0 Metrics: 1  Adv Router is not-reachable  LS age: 1081  Options: (No TOS-
capability, DC)  LS Type: Router Links  Link State ID: 60.60.60.60  Advertising Router:
60.60.60.60  LS Seq Number: 80000006  Checksum: 0x4F72  Length: 48   Number of Links: 2    Link
connected to: a Stub Network    (Link ID) Network/subnet number: 60.60.60.60    (Link Data)
Network Mask: 255.255.255.255    Number of TOS metrics: 0    TOS 0 Metrics: 1    Link connected
to: a Transit Network    (Link ID) Designated Router address: 10.10.10.7    (Link Data) Router
Interface address: 10.10.10.6    Number of TOS metrics: 0    TOS 0 Metrics: 64           Adv
Router is not-reachable  LS age: 306  Options: (No TOS-capability, DC)  LS Type: Router Links
Link State ID: 70.70.70.70  Advertising Router: 70.70.70.70  LS Seq Number: 80000007  Checksum:
0xC185  Length: 48   Number of Links: 2    Link connected to: a Stub Network    (Link ID)
Network/subnet number: 70.70.70.70    (Link Data) Network Mask: 255.255.255.255    Number of TOS
metrics: 0    TOS 0 Metrics: 1    Link connected to: a Transit Network    (Link ID) Designated
Router address: 10.10.10.7    (Link Data) Router Interface address: 10.10.10.7    Number of TOS
metrics: 0    TOS 0 Metrics: 64
```

参考关于运行OSPF的问题在帧中继的NBMA模式关于此问题的更详细信息。

原因6 ：通过外部路由已知的转发地址

考虑此网络图为例：



R2507

```
R9-2500(3)# show ip ospf database router        OSPF
Router with ID (50.50.50.50) (Process ID 10)
Router Link States (Area 0)  LS age: 148  Options: (No
TOS-capability, DC)  LS Type: Router Links  Link State
ID: 50.50.50.50  Advertising Router: 50.50.50.50  LS Seq
Number: 8000000B  Checksum: 0x55A  Length: 48   Number
of Links: 2    Link connected to: a Stub Network
(Link ID) Network/subnet number: 10.10.10.0    (Link
Data) Network Mask: 255.255.255.0    Number of TOS
metrics: 0    TOS 0 Metrics: 64    Link connected to: a
Stub Network    (Link ID) Network/subnet number:
50.50.50.50    (Link Data) Network Mask: 255.255.255.255
Number of TOS metrics: 0    TOS 0 Metrics: 1  Adv Router
is not-reachable  LS age: 1081  Options: (No TOS-
capability, DC)  LS Type: Router Links  Link State ID:
60.60.60.60  Advertising Router: 60.60.60.60  LS Seq
Number: 80000006  Checksum: 0x4F72  Length: 48   Number
of Links: 2    Link connected to: a Stub Network
(Link ID) Network/subnet number: 60.60.60.60    (Link
Data) Network Mask: 255.255.255.255    Number of TOS
metrics: 0    TOS 0 Metrics: 1    Link connected to: a
Transit Network    (Link ID) Designated Router address:
10.10.10.7    (Link Data) Router Interface address:
10.10.10.6    Number of TOS metrics: 0    TOS 0 Metrics:
64            Adv Router is not-reachable  LS age: 306
Options: (No TOS-capability, DC)  LS Type: Router Links
Link State ID: 70.70.70.70  Advertising Router:
70.70.70.70  LS Seq Number: 80000007  Checksum: 0xC185
Length: 48   Number of Links: 2    Link connected to: a
Stub Network    (Link ID) Network/subnet number:
70.70.70.70    (Link Data) Network Mask: 255.255.255.255
Number of TOS metrics: 0    TOS 0 Metrics: 1    Link
connected to: a Transit Network    (Link ID) Designated
Router address: 10.10.10.7    (Link Data) Router
Interface address: 10.10.10.7    Number of TOS metrics:
0    TOS 0 Metrics: 64
```

R2504

```
R9-2500(3)# show ip ospf database router        OSPF
Router with ID (50.50.50.50) (Process ID 10)
Router Link States (Area 0)  LS age: 148  Options: (No
TOS-capability, DC)  LS Type: Router Links  Link State
ID: 50.50.50.50  Advertising Router: 50.50.50.50  LS Seq
Number: 8000000B  Checksum: 0x55A  Length: 48   Number
of Links: 2    Link connected to: a Stub Network
(Link ID) Network/subnet number: 10.10.10.0    (Link
Data) Network Mask: 255.255.255.0    Number of TOS
metrics: 0    TOS 0 Metrics: 64    Link connected to: a
Stub Network    (Link ID) Network/subnet number:
50.50.50.50    (Link Data) Network Mask: 255.255.255.255
Number of TOS metrics: 0    TOS 0 Metrics: 1  Adv Router
is not-reachable  LS age: 1081  Options: (No TOS-
capability, DC)  LS Type: Router Links  Link State ID:
60.60.60.60  Advertising Router: 60.60.60.60  LS Seq
Number: 80000006  Checksum: 0x4F72  Length: 48   Number
of Links: 2    Link connected to: a Stub Network
(Link ID) Network/subnet number: 60.60.60.60    (Link
Data) Network Mask: 255.255.255.255    Number of TOS
metrics: 0    TOS 0 Metrics: 1    Link connected to: a
Transit Network    (Link ID) Designated Router address:
10.10.10.7    (Link Data) Router Interface address:
10.10.10.6    Number of TOS metrics: 0    TOS 0 Metrics:
```

```
64            Adv Router is not-reachable  LS age: 306
Options: (No TOS-capability, DC)  LS Type: Router Links
Link State ID: 70.70.70.70  Advertising Router:
70.70.70.70  LS Seq Number: 80000007  Checksum: 0xC185
Length: 48   Number of Links: 2    Link connected to: a
Stub Network    (Link ID) Network/subnet number:
70.70.70.70    (Link Data) Network Mask: 255.255.255.255
Number of TOS metrics: 0    TOS 0 Metrics: 1    Link
connected to: a Transit Network    (Link ID) Designated
Router address: 10.10.10.7    (Link Data) Router
Interface address: 10.10.10.7    Number of TOS metrics:
0    TOS 0 Metrics: 64
```

R2515

```
R9-2500(3)# show ip ospf database router        OSPF
Router with ID (50.50.50.50) (Process ID 10)
Router Link States (Area 0)  LS age: 148  Options: (No
TOS-capability, DC)  LS Type: Router Links  Link State
ID: 50.50.50.50  Advertising Router: 50.50.50.50  LS Seq
Number: 8000000B  Checksum: 0x55A  Length: 48   Number
of Links: 2    Link connected to: a Stub Network
(Link ID) Network/subnet number: 10.10.10.0    (Link
Data) Network Mask: 255.255.255.0    Number of TOS
metrics: 0    TOS 0 Metrics: 64    Link connected to: a
Stub Network    (Link ID) Network/subnet number:
50.50.50.50    (Link Data) Network Mask: 255.255.255.255
Number of TOS metrics: 0    TOS 0 Metrics: 1  Adv Router
is not-reachable  LS age: 1081  Options: (No TOS-
capability, DC)  LS Type: Router Links  Link State ID:
60.60.60.60  Advertising Router: 60.60.60.60  LS Seq
Number: 80000006  Checksum: 0x4F72  Length: 48   Number
of Links: 2    Link connected to: a Stub Network
(Link ID) Network/subnet number: 60.60.60.60    (Link
Data) Network Mask: 255.255.255.255    Number of TOS
metrics: 0    TOS 0 Metrics: 1    Link connected to: a
Transit Network    (Link ID) Designated Router address:
10.10.10.7    (Link Data) Router Interface address:
10.10.10.6    Number of TOS metrics: 0    TOS 0 Metrics:
64            Adv Router is not-reachable  LS age: 306
Options: (No TOS-capability, DC)  LS Type: Router Links
Link State ID: 70.70.70.70  Advertising Router:
70.70.70.70  LS Seq Number: 80000007  Checksum: 0xC185
Length: 48   Number of Links: 2    Link connected to: a
Stub Network    (Link ID) Network/subnet number:
70.70.70.70    (Link Data) Network Mask: 255.255.255.255
Number of TOS metrics: 0    TOS 0 Metrics: 1    Link
connected to: a Transit Network    (Link ID) Designated
Router address: 10.10.10.7    (Link Data) Router
Interface address: 10.10.10.7    Number of TOS metrics:
0    TOS 0 Metrics: 64
```

R2513

```
R9-2500(3)# show ip ospf database router        OSPF
Router with ID (50.50.50.50) (Process ID 10)
Router Link States (Area 0)  LS age: 148  Options: (No
TOS-capability, DC)  LS Type: Router Links  Link State
ID: 50.50.50.50  Advertising Router: 50.50.50.50  LS Seq
Number: 8000000B  Checksum: 0x55A  Length: 48   Number
of Links: 2    Link connected to: a Stub Network
(Link ID) Network/subnet number: 10.10.10.0    (Link
Data) Network Mask: 255.255.255.0    Number of TOS
metrics: 0    TOS 0 Metrics: 64    Link connected to: a
Stub Network    (Link ID) Network/subnet number:
```

```
50.50.50.50    (Link Data) Network Mask: 255.255.255.255
Number of TOS metrics: 0    TOS 0 Metrics: 1  Adv Router
is not-reachable  LS age: 1081  Options: (No TOS-
capability, DC)  LS Type: Router Links  Link State ID:
60.60.60.60  Advertising Router: 60.60.60.60  LS Seq
Number: 80000006  Checksum: 0x4F72  Length: 48   Number
of Links: 2    Link connected to: a Stub Network
(Link ID) Network/subnet number: 60.60.60.60    (Link
Data) Network Mask: 255.255.255.255    Number of TOS
metrics: 0    TOS 0 Metrics: 1    Link connected to: a
Transit Network    (Link ID) Designated Router address:
10.10.10.7    (Link Data) Router Interface address:
10.10.10.6    Number of TOS metrics: 0    TOS 0 Metrics:
64            Adv Router is not-reachable  LS age: 306
Options: (No TOS-capability, DC)  LS Type: Router Links
Link State ID: 70.70.70.70  Advertising Router:
70.70.70.70  LS Seq Number: 80000007  Checksum: 0xC185
Length: 48   Number of Links: 2    Link connected to: a
Stub Network    (Link ID) Network/subnet number:
70.70.70.70    (Link Data) Network Mask: 255.255.255.255
Number of TOS metrics: 0    TOS 0 Metrics: 1    Link
connected to: a Transit Network    (Link ID) Designated
Router address: 10.10.10.7    (Link Data) Router
Interface address: 10.10.10.7    Number of TOS metrics:
0    TOS 0 Metrics: 64
```

```
R2507# show ip ospf data external 200.1.1.0       OSPF Router with ID (7.7.7.1) (Process ID 1)
Type- 5 AS External Link States       LS age: 72       Options: (No TOS- capability, DC)
LS Type: AS External Link       Link State ID: 200.1.1.0 (External Network Number )
Advertising Router: 3.44.66.3       LS Seq Number: 80000001       Checksum: 0xF161       Length:
36       Network Mask: /24                    Metric Type: 2 (Larger than any link state path)
TOS: 0                   Metric: 20                    Forward Address: 3.3.4.4
External Route Tag: 0
```

R2507有200.1.1.0/24在其数据库，但是在路由表里未安装它，因为3.3.4.4通过OSPF外部路由了解。

```
R2507# show ip route 3.3.4.4       Routing entry for 3.3.4.0/ 24       Known via "ospf 1",
distance 110, metric 20,type extern 2, forward metric 70       Redistributing via ospf 1
Last update from 1.1.1.2 on Serial0, 00: 00: 40 ago       Routing Descriptor Blocks:       *
1.1.1.2, from 3.44.66.3, 00: 00: 40 ago, via Serial0          Route metric is 20, traffic share
count is 1
```

注意： 采用Cisco bug ID CSCdp72526 (仅限于注册用户)进行修复时，OSPF不会生成重叠外部网络的第5类链路状态广播(LSA)。因此， R2507只将有概略的区域内路由3.0.0.0/8。然后，R2507将安装200.1.1.0/24作为转发地址，它将可通过区域内路由3.0.0.0/8到达，从而与RFC 2328保持一致。

在上述的bug修正，输出将看起来象以下后：

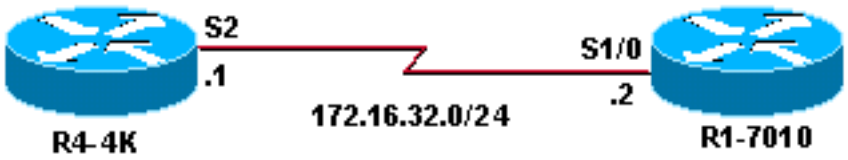
```
R2507# show ip route 3.3.4.4       Routing entry for 3.0.0.0/8       Known via "ospf 1", distance
110, metric 74, type inter area       Last update from 1.1.1.2 on Serial0, 00:19:20 ago
Routing Descriptor Blocks:       * 1.1.1.2, from 3.3.4.2, 00:19:20 ago, via Serial0R2507# show ip
route         Codes: 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
routeGateway of last resort is not set1.0.0.0/24 is subnetted, 1 subnets     C 1.1.1.0 is
directly connected, Serial0     O IA 3.0.0.0/8 [110/74] via 1.1.1.2, 00:30:18, Serial0     O E2
200.1.1.0/24 [110/20] via 1.1.1.2, 00:22:58, Serial0     Route metric is 74, traffic share count
is 1R2507#
```

如果转发地址通过外部路由也知道， OSPF在路由表里不安装该路由。关于此问题的更详细信息

，请参阅与OSPF转发地址有关的常见路由问题。

原因7 ：分配列表阻塞路由

请使用以下网络图为例：



R4-4K	R1-7010
R2507# **show ip route 3.3.4.4** Routing entry for 3.0.0.0/8 Known via "ospf 1", distance 110, metric 74, type inter area Last update from 1.1.1.2 on Serial0, 00:19:20 ago Routing Descriptor Blocks: * 1.1.1.2, from 3.3.4.2, 00:19:20 ago, via Serial0R2507# **show ip route** Codes: 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 routeGateway of last resort is not set1.0.0.0/24 is subnetted, 1 subnets C 1.1.1.0 is directly connected, Serial0 O IA 3.0.0.0/8 [110/74] via 1.1.1.2, 00:30:18, Serial0 O E2 200.1.1.0/24 [110/20] via 1.1.1.2, 00:22:58, Serial0 Route metric is 74, traffic share count is 1R2507#	R2507# **show ip route 3.3.4.4** Routing entry for 3.0.0.0/8 Known via "ospf 1", distance 110, metric 74, type inter area Last update from 1.1.1.2 on Serial0, 00:19:20 ago Routing Descriptor Blocks: * 1.1.1.2, from 3.3.4.2, 00:19:20 ago, via Serial0R2507# **show ip route** Codes: 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 routeGateway of last resort is not set1.0.0.0/24 is subnetted, 1 subnets C 1.1.1.0 is directly connected, Serial0 O IA 3.0.0.0/8 [110/74] via 1.1.1.2, 00:30:18, Serial0 O E2 200.1.1.0/24 [110/20] via 1.1.1.2, 00:22:58, Serial0 Route metric is 74, traffic share count is 1R2507#

正如您上面看到的R1-7010有**distribute-list命令**已配置的，并且只提供172.16.32.0/24在路由表里将安装的地址范围。在链路状态协议您不能确实过滤LSA用**distribute-list命令**。LSA在数据库;然而

LSA在路由表里不会安装。

```
R1-7010(5)# show ip ospf database router 172.16.33.1  LS age: 357  Options: (No TOS-capability, DC)  LS Type: Router Links  Link State ID: 172.16.33.1  Advertising Router: 172.16.33.1  LS Seq Number: 8000000A  Checksum: 0xD4AA  Length: 48  Number of Links: 3 Link connected to: another Router (point-to-point)  (Link ID) Neighboring Router ID: 172.16.32.2  (Link Data) Router Interface address: 172.16.32.1  Number of TOS metrics: 0  TOS 0 Metrics: 64
```

distribute-list configuration命令在R1-7010在路由表里过滤从安装的172.16.33.1/32网络。

```
R1-7010(5)# show ip route172.16.0.0/16 is variably subnetted, 3 subnets, 2 masksC 172.16.32.0/24 is directly connected, Serial1/0C  172.16.30.1/32 is directly connected, Loopback0
```

解决方案

要解决此问题，配置R1-7010和允许172.16.33.0/24在访问控制表(ACL)，因此此网络在路由表里被安装。

```
R1-7010(5)# configure terminal R1-7010(5)(config)# access-list 1 permit 172.16.33.0 0.0.0.255 R1-7010(5)(config)# endR1-7010(5)# show ip access-list 1Standard IP access list 1  permit 172.16.32.0, wildcard bits 0.0.0.255  permit 172.16.33.0, wildcard bits 0.0.0.255R1-7010(5)# show ip route172.16.0.0/16 is variably subnetted, 3 subnets, 2 masksC  172.16.32.0/24 is directly connected, Serial1/0O  172.16.33.1/32 [110/65] via 172.16.32.1, 00:00:08, Serial1/0C  172.16.30.1/32 is directly connected, Loopback0
```

相关信息

- OSPF 支持页
- OSPF:常见问题
- 技术支持 - Cisco Systems