

在帧中继的NBMA和广播模式中运行OSPF的问题

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[Introduction](#)

此技术说明在一个充分地网状连接的帧中继环境里解释OSPF路由的问题出现于链路状态数据库，但是不在路由表里的。关于更多方案，请参阅[为什么是一些OSPF路由在数据库，但是不是路由表里？](#)

[Prerequisites](#)

[Requirements](#)

本文档的读者应掌握以下这些主题的相关知识：

- OSPF
- 帧中继

[Components Used](#)

This document is not restricted to specific software and hardware versions.然而，在本文的配置利用这些软件和硬件版本测试并且更新：

- Cisco 2500 Series Router
- Cisco IOS版本12.2(24a)

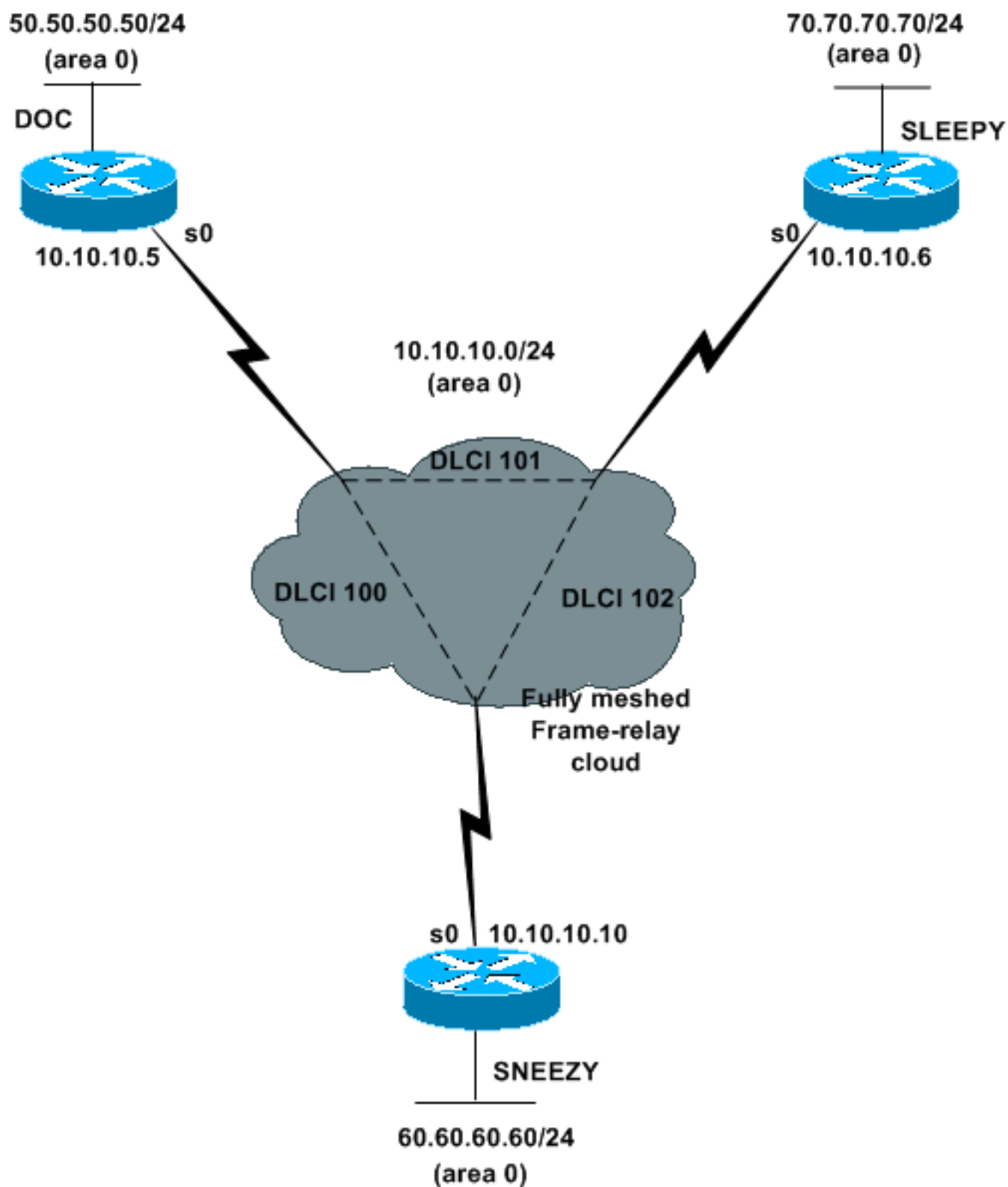
The information in this document was created from the devices in a specific lab environment.All of the devices used in this document started with a cleared (default) configuration.If your network is live, make sure that you understand the potential impact of any command.

[Conventions](#)

有关文档规则的详细信息，请参阅 [Cisco 技术提示规则](#)。

背景理论

下面的示例使用一个充分地网状连接的帧中继环境。网络图和配置如下所示：



文档

```
interface Ethernet0
ip address 50.50.50.50 255.255.255.0
```

```
interface Serial0
  encapsulation frame-relay
  !--- Enables Frame Relay encapsulation on the interface.
interface Serial0.1 multipoint !--- The subinterface is
configured as a multipoint link. ip address 10.10.10.5
255.255.255.0 ip ospf network broadcast !--- This
command is used to define the network type as broadcast.
!--- The network type is defined on nonbroadcast
networks to !--- avoid configuring the neighbors
explicitly. frame-relay map ip 10.10.10.6 101 broadcast
frame-relay map ip 10.10.10.10 100 broadcast !--- To
define the mapping between a destination protocol
address !--- and the data-link connection identifier
(DLCI) used to !--- connect to the destination address.
!--- The broadcast keyword is used to forward broadcasts
to !--- this address when broadcast/multicast is !---
disabled because of non-broadcast medium. router ospf 1
network 0.0.0.0 255.255.255.255 area 0
```

Sleepy

```
interface Ethernet0
  ip address 70.70.70.70 255.255.255.0

interface Serial0
  encapsulation frame-relay
  !--- Enables Frame Relay encapsulation on the interface.
interface Serial0.1 multipoint !--- The subinterface is
configured as a multipoint link. ip address 10.10.10.6
255.255.255.0 ip ospf network broadcast !--- This
command is used to define the network type as broadcast.
!--- The network type is defined on nonbroadcast
networks to !--- avoid configuring the neighbors
explicitly. frame-relay map ip 10.10.10.5 101 broadcast
frame-relay map ip 10.10.10.10 102 broadcast !--- To
define the mapping between a destination protocol
address !--- and the DLCI used to connect to the
destination address. !--- The broadcast keyword is used
to forward broadcasts to !--- this address when
broadcast/multicast is !--- disabled because of non-
broadcast medium. router ospf 1 network 0.0.0.0
255.255.255.255 area 0
```

Sneezy

```
interface Ethernet0
  ip address 60.60.60.60 255.255.255.0

interface Serial0
  encapsulation frame-relay
  !--- Enables Frame Relay encapsulation on the interface.
interface Serial0.1 multipoint !--- The subinterface is
configured as a multipoint link. ip address 10.10.10.10
255.255.255.0 ip ospf network broadcast !--- This
command is used to define the network type as broadcast.
!--- The network type is defined on nonbroadcast
networks to !--- avoid configuring the neighbors
explicitly. frame-relay map ip 10.10.10.5 100 broadcast
frame-relay map ip 10.10.10.6 102 broadcast !--- To
define the mapping between a destination protocol
address !--- and the DLCI used to connect to the
destination address. !--- The broadcast keyword is used
```

```
to forward broadcasts to !--- this address when
broadcast/multicast is !--- disabled because of non-
broadcast medium. router ospf 1 network 0.0.0.0
255.255.255.255 area 0
```

问题

最初，所有路由器有所有路由在他们的邻接表里。事件发生原因文档和Sleepy从他们的各自的邻居表互相下降。从在此部分产生的邻接表，我们能看到文档邻接表没有条目70.70.70.70，并且Sleepy邻接表没有条目50.50.50.50。

文档邻接表

```
doc#
show ip ospf neighbor

Neighbor ID Pri State          Dead Time Address
Interface
60.60.60.60 1    FULL/DR      00:00:33 10.10.10.10
Serial0.1
```

Sleepy邻接表

```
sleepy# show ip ospf neighbor

Neighbor ID Pri State          Dead Time Address
Interface
60.60.60.60 1    FULL/BDR     00:00:32 10.10.10.10
Serial0.1
```

Sneezy邻接表

```
sneezy# show ip ospf neighbor

Neighbor ID Pri State          Dead Time Address
Interface
50.50.50.50 1    FULL/DROTHER 00:00:36 10.10.10.5
Serial0.1
70.70.70.70 1    FULL/DR      00:00:31 10.10.10.6
Serial0.1
```

另外，文档丢失从其路由表的所有OSPF路由，并且Sleepy和Sneezy不再请有50.50.50.0 (Doc的LAN子网)在他们的路由表里。

文档路由表

```
doc#
show ip route

Gateway of last resort is not set
10.0.0.0 255.255.255.0 is subnetted, 1 subnets
C      10.10.10.0 is directly connected, Serial0.1
50.0.0.0 255.255.255.0 is subnetted, 1 subnets
C      50.50.50.0 is directly connected, Ethernet0
```

Sleepy路由表

```
sleepy# show ip route

Gateway of last resort is not set
10.0.0.0/ 24 is subnetted, 1 subnets
```



```

LS Type: Network Links
Link State ID: 10.10.10.6 (address of Designated
Router)
Advertising Router: 70.70.70.70

Network Mask: 255.255.255.0
Attached Router: 70.70.70.70
Attached Router: 60.60.60.60

```

另一个方式查看此是文档宣称Sneezy作为DR并且盼望Sneezy生成网络连接状态。然而，因为Sneezy不是DR，它不生成网络连接状态，在其路由表里反过来不允许文档安装任何路由。

文档邻接表

```

doc# show ip ospf neighbor

Neighbor ID      Pri   State             Dead Time
Address          Interface
60.60.60.60     1    FULL/DR           00:00:29
10.10.10.10     Serial0.1

```

原因

根据数据库，帧中继网云的DR是Sleepy。然而，Sleepy看不到文档作为OSPF邻居。如在此示例中看到，从Sleepy的ping到文档发生故障：

```

sleepy# ping 10.10.10.5

Type escape sequence to abort.
Sending 5, 100- byte ICMP Echos to 10.10.10.5, timeout is 2 seconds:
.....
Success rate is 0 percent (0/ 5)

```

从输出的show frame-relay map命令在Sleepy，我们能看到去文档的DLCI是非激活的。那解释Sleepy为什么不能连接文档，并且他们为什么互相看不到作为相邻。这是触发问题的事件：

```

sleepy# show frame-relay map
Serial0.1 (up): ip 10.10.10.5 dlci 101( 0x65,0x1850), static,
                broadcast,
                CISCO, status defined, inactive

Serial0.1 (up): ip 10.10.10.10 dlci 102( 0x66,0x1860), static,
                broadcast,
                CISCO, status defined, active

```

由于在文档和Sleepy之间的PVC是残破的，并且指定路由器(DR)的Doc的链路是残破的，文档宣称从的所有LSA不是DR)的Sneezy (如不可得到。如果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。如果任何永久虚拟电路(PVC)是残破的，它能制造在OSPF数据库的问题，从如下所示的show ip ospf database router命令输出是明显的—哪些显示ADV消息。

文档邻接表

```

doc#
show ip ospf database router
OSPF Router with ID (50.50.50.50) (Process
ID 1)

```

Router Link States (Area 0)

LS age: 57
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: 800000D4
Checksum: 0x355D
Length: 48
Number of Links: 2

Link connected to: a Transit Network
(Link ID) Designated Router address: 10.10.10.10
(Link Data) Router Interface address: 10.10.10.5
Number of TOS metrics: 0
TOS 0 Metrics: 64

Link connected to: a Stub Network
(Link ID) Network/subnet number: 50.50.50.0
(Link Data) Network Mask: 255.255.255.0
Number of TOS metrics: 0
TOS 0 Metrics: 10

Adv Router is not-reachable

LS age: 367
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: 800000C9
Checksum: 0xC865
Length: 48
Number of Links: 2

Link connected to: a Transit Network
(Link ID) Designated Router address: 10.10.10.6
(Link Data) Router Interface address: 10.10.10.10
Number of TOS metrics: 0
TOS 0 Metrics: 64

Link connected to: a Stub Network
(Link ID) Network/subnet number: 60.60.60.0
(Link Data) Network Mask: 255.255.255.0
Number of TOS metrics: 0
TOS 0 Metrics: 10

Adv Router is not-reachable

LS age: 53
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: 800000CA
Checksum: 0xEDD4
Length: 48
Number of Links: 2

Link connected to: a Transit Network
(Link ID) Designated Router address: 10.10.10.6
(Link Data) Router Interface address: 10.10.10.6
Number of TOS metrics: 0

```
TOS 0 Metrics: 64
```

```
Link connected to: a Stub Network  
(Link ID) Network/subnet number: 70.70.70.0  
(Link Data) Network Mask: 255.255.255.0  
Number of TOS metrics: 0  
TOS 0 Metrics: 10
```

[解决方案](#)

当您配置OSPF运行一个支持广播的或非广播，多路访问网络时，所有设备一定能直接地与(在最小数量)指定路由器连通。广播和NBMA型号依靠充分地网状连接的帧中继网云。如果一个永久虚拟电路(PVC)断开，网云充分地不再网状连接，并且OSPF未正确地起作用。

在一个帧中继环境里，如果第2层是不稳定的，正如在我们的示例，我们不推荐OSPF广播网络类型。请使用点对多点的OSPF。

[Related Information](#)

- [排除OSPF故障](#)
- [OSPF设计指南](#)
- [解释的OSPF相邻问题](#)
- [OSPF的初始配置在非广播连接](#)
- [帧中继上的OSPF子接口的初始配置](#)
- [IP 路由支持页](#)
- [OSPF 支持页](#)
- [Technical Support & Documentation - Cisco Systems](#)