

# Conversão de anúncio de estado de enlace OSPF Not So Stubby Area tipo 7 em tipo 5

## Contents

[Introduction](#)

[Prerequisites](#)

[Requirements](#)

[Componentes Utilizados](#)

[Conventions](#)

[Configurar](#)

[Diagrama de Rede](#)

[Configurações](#)

[Verificar](#)

[Examinar o Banco de Dados OSPF](#)

[Troubleshoot](#)

[Informações Relacionadas](#)

## [Introduction](#)

Este documento mostra como o Open Shortest Path First (OSPF) converte um anúncio link state (LSA) Not So Stubby Area (NSSA) do tipo 7 em um LSA do tipo 5.

## [Prerequisites](#)

## [Requirements](#)

Não existem requisitos específicos para este documento.

## [Componentes Utilizados](#)

Este documento não se restringe a versões de software e hardware específicas.

## [Conventions](#)

Consulte as [Convenções de Dicas Técnicas da Cisco para obter mais informações sobre convenções de documentos](#).

## [Configurar](#)

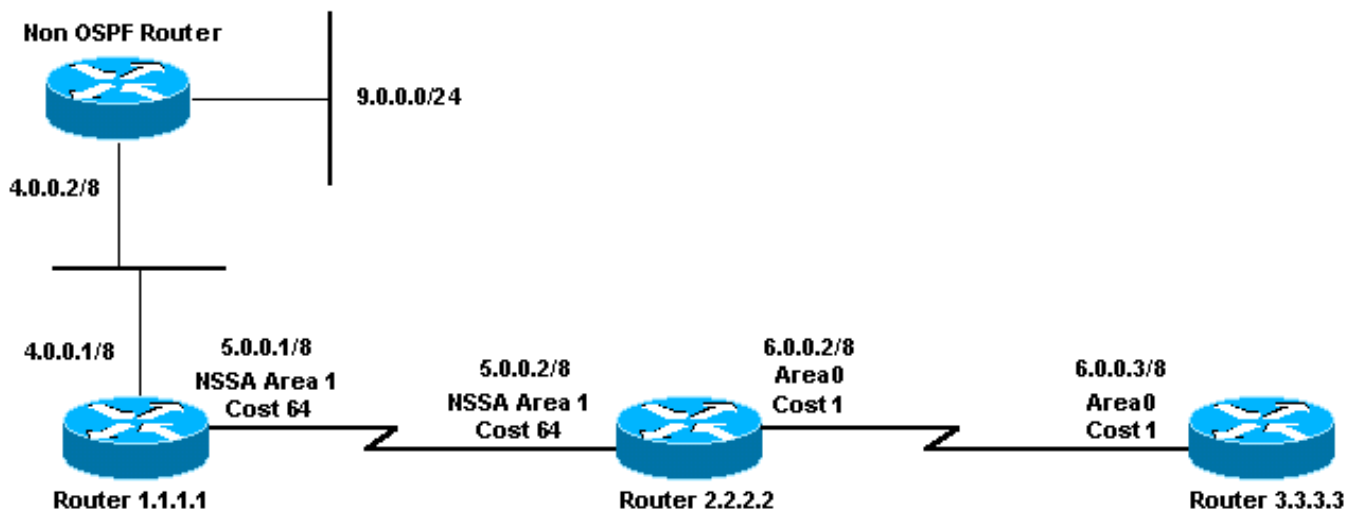
Nesta seção, você encontrará informações para configurar os recursos descritos neste

documento.

**Observação:** para encontrar informações adicionais sobre os comandos usados neste documento, use a [ferramenta Command Lookup Tool](#) (somente clientes [registrados](#)).

## Diagrama de Rede

Este documento utiliza a configuração de rede mostrada neste diagrama.



## Configurações

Este documento utiliza as configurações mostradas aqui.

- [Router 1.1.1.1](#)
- [Router 2.2.2.2](#)
- [Router 3.3.3.3](#)

### Router 1.1.1.1

Current configuration:

```
hostname r1.1.1.1

interface Loopback0
 ip address 1.1.1.1 255.0.0.0

interface Serial2/1/0
 ip address 5.0.0.1 255.0.0.0

interface Ethernet2/0/0
 ip address 4.0.0.1 255.0.0.0

router ospf 4
 redistribute static metric 5 metric-type 1
 network 5.0.0.0 0.255.255.255 area 1
 network 4.0.0.0 0.255.255.255 area 1
 area 1 nssa

ip route 9.0.0.0 255.0.0.0 4.0.0.2
```

end
<b>Router 2.2.2.2</b>
Current configuration:  hostname r2.2.2.2  interface Loopback0 ip address 2.2.2.2 255.0.0.0  interface Serial0/1/0 ip address 5.0.0.2 255.0.0.0  interface ATM1/0.20 ip address 6.0.0.2 255.0.0.0  router ospf 2 network 5.0.0.0 0.255.255.255 area 1 network 6.0.0.0 0.255.255.255 area 0 area 1 nssa  end
<b>Router 3.3.3.3</b>
Current configuration:  hostname r3.3.3.3  interface Loopback0 ip address 3.3.3.3 255.0.0.0  interface ATM2/0.20 point-to-point ip address 6.0.0.3 255.0.0.0  router ospf 2 network 6.0.0.0 0.255.255.255 area 0  end

## Verificar

Esta seção fornece informações que você pode usar para confirmar se sua configuração está funcionando adequadamente.

A [Output Interpreter Tool \(somente clientes registrados\) oferece suporte a determinados comandos show, o que permite exibir uma análise da saída do comando show.](#)

- [show ip ospf database](#) — Exibe uma lista dos LSAs e os digita em um banco de dados de estado de link. Esta lista mostra apenas as informações no cabeçalho LSA.
- [show ip ospf database nssa-external](#) — Exibe informações somente sobre os LSAs externos de NSSA.
- [show ip ospf database external](#) — Exibe informações somente sobre os LSAs externos.
- [show ip ospf database \[router\] \[link-state-id\]](#) — Exibe uma lista de todos os LSAs de um roteador no banco de dados. Os LSAs são produzidos por cada roteador, e esses LSAs fundamentais listam todos os links, ou interfaces dos roteadores, juntamente com os estados

e os custos de saída dos links. Eles são inundados apenas na área de origem.

- **show ip ospf database summary <link-state id>** — Exibe os links de resumo do roteador de borda de área (ABR).
- **show ip route** — Exibe o status atual da tabela de roteamento.

## Examinar o Banco de Dados OSPF

Para ver como o banco de dados do OSPF parece, considerando esse ambiente de rede, use o comando **show ip ospf database**.

```
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
2.2.2.2	2.2.2.2	1235	0x8000001D	0xD9FF	2
3.3.3.3	3.3.3.3	1100	0x8000000B	0x9455	2

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

Link ID	ADV Router	Age	Seq#	Checksum
4.0.0.0	2.2.2.2	1979	0x80000002	0xFDE7
5.0.0.0	2.2.2.2	1483	0x80000004	0x8864

```
Router Link States (Area 1)
```

Link ID	ADV Router	Age	Seq#	Checksum	Link count
1.1.1.1	1.1.1.1	319	0x8000000C	0xAFA8	3
2.2.2.2	2.2.2.2	220	0x8000002F	0xD478	2

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

Link ID	ADV Router	Age	Seq#	Checksum
6.0.0.0	2.2.2.2	1483	0x8000001C	0x7894

```
Type-7 AS External Link States (Area 1)
```

Link ID	ADV Router	Age	Seq#	Checksum	Tag
9.0.0.0	1.1.1.1	334	0x80000005	0xD738	0

```
Type-5 AS External Link States
```

Link ID	ADV Router	Age	Seq#	Checksum	Tag
9.0.0.0	2.2.2.2	1725	0x80000004	0x50C6	0

Para anunciar rotas externas para um NSSA, o Roteador de Limite de Sistema Autônomo (ASBR) cria LSAs externos à NSSA (tipo 7).

```
r2.2.2.2#show ip ospf database nssa-external 9.0.0.0
```

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

```
Type-7 AS External Link States (Area 1)
```

```
Routing Bit Set on this LSA  
LS age: 381
```

Options: (No TOS-capability, Type 7/5 translation, DC)  
*!--- This can be translated into a type 5 LSA by !--- an ABR. LS Type: AS External Link Link State ID: 9.0.0.0 (External Network Number ) !--- The ASBR (Router 1.1.1.1) advertises !--- 9.0.0.0/8. Advertising Router: 1.1.1.1 !--- Router ID of the ASBR. LS Seq Number: 80000005 Checksum: 0xD738 Length: 36 Network Mask: /8 Metric Type: 1 (Comparable directly to link state metric) TOS: 0 Metric: 5 Forward Address: 4.0.0.1 !--- Forwarding address is incorrectly specified !--- as an interface on the ASBR.*

O ABR converte LSAs tipo 7 em LSAs tipo 5 e propaga os LSAs tipo 5 em áreas normais.

```
r2.2.2.2#show ip ospf database external 9.0.0.0
```

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

```
Type-5 AS External Link States
```

```
LS age: 1782
Options: (No TOS-capability, DC)
LS Type: AS External Link
Link State ID: 9.0.0.0 (External Network Number )
!--- Router 2.2.2.2 advertises 9.0.0.0/8. Advertising Router: 2.2.2.2 !--- When the conversion is complete, the advertising !--- router ID becomes the ABR router ID !--- because the ABR originates this type 5 LSA. LS Seq Number: 80000004 Checksum: 0x50C6 Length: 36 Network Mask: /8 Metric Type: 1 (Comparable directly to link state metric) TOS: 0 Metric: 5 Forward Address: 4.0.0.1 External Route Tag: 0 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 1)
```

```
Routing Bit Set on this LSA
LS age: 426
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 LS Seq Number: 8000000C Checksum: 0xAFA8 Length: 60 AS Boundary Router !--- Bit E in the router LSA indicates that this router !--- originates from external LSAs. Number of Links: 3 !--- There are three links in area 1. Link connected to: a Stub Network !--- This 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 !--- The OSPF cost of the Ethernet segment. Link connected to: another Router (point-to-point) !--- Shows that Router 1.1.1.1 is a neighbor with !--- Router 2.2.2.2. (Link ID) Neighboring Router ID: 2.2.2.2 (Link Data) Router Interface address: 5.0.0.1 !--- The interface address that connects to Router !--- 2.2.2.2 is 5.0.0.1. Number of TOS metrics: 0 TOS 0 Metrics: 64 !--- The OSPF cost of the link that connects !--- the two routers. Link connected to: a Stub Network !--- This represents the serial link 5.0.0.0/8. (Link ID) Network/subnet number: 5.0.0.0 (Link Data) Network Mask: 255.0.0.0 Number of TOS metrics: 0 TOS 0 Metrics: 64 !--- The OSPF cost of the serial link.
```

Você pode ver na saída **em negrito** aqui que, embora o Roteador 2.2.2.2 não tenha nenhuma instrução **redistribute** em sua configuração, ele ainda é um ASBR porque converte LSAs tipo 7 em LSAs tipo 5.

```
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: 1361
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: 8000001D
Checksum: 0xD9FF
Length: 48
Area Border Router
```

```
!--- Bit B is set in the router LSA to indicate !--- that this router is an ABR. AS Boundary
Router
```

```
!--- Bit E in the router LSA indicates that this router !--- originates from external LSAs.
Number of Links: 2 !--- There are two links in area 0. Link connected to: another Router (point-
to-point) (Link ID) Neighboring Router ID: 3.3.3.3 (Link Data) Router Interface address: 6.0.0.2
Number of TOS metrics: 0 TOS 0 Metrics: 1 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: 1 Router Link States (Area 1) LS age: 346 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: 8000002F
Checksum: 0xD478 Length: 48 Area Border Router AS Boundary Router Number of Links: 2 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: 5.0.0.0 (Link Data) Network Mask:
255.0.0.0 Number of TOS metrics: 0 TOS 0 Metrics: 64 r2.2.2.2#show ip ospf database router
3.3.3.3
```

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

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

```
LS age: 1245
Options: (No TOS-capability, DC)
LS Type: Router Links
Link State ID: 3.3.3.3
Advertising Router: 3.3.3.3
LS Seq Number: 8000000B
Checksum: 0x9455
Length: 48
Number of Links: 2
```

```
Link connected to: another Router (point-to-point)
(Link ID) Neighboring Router ID: 2.2.2.2
(Link Data) Router Interface address: 6.0.0.3
Number of TOS metrics: 0
TOS 0 Metrics: 1
```

```
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: 1
```

Para anunciar rotas de uma área para outra, o ABR cria LSAs de resumo (tipo 3).

```
r2.2.2.2#show ip ospf database summary 4.0.0.0
```

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

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

```
LS age: 172
Options: (No TOS-capability, DC)
LS Type: Summary Links(Network)
Link State ID: 4.0.0.0 (summary Network Number)
```

```
!--- The ABR (Router 2.2.2.2) advertises !--- 4.0.0.0/8 into area 0. Advertising Router:
2.2.2.2 LS Seq Number: 80000003 Checksum: 0xFBE8 Length: 28 Network Mask: /8 TOS: 0 Metric: 74
```

```
r2.2.2.2#show ip ospf database summary 5.0.0.0
```

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

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

```
LS age: 1687
```

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

```
LS Type: Summary Links(Network)
```

```
Link State ID: 5.0.0.0 (summary Network Number)
```

```
!--- The ABR (Router 2.2.2.2) advertises !--- 5.0.0.0/8 into area 0. Advertising Router:  
2.2.2.2 LS Seq Number: 80000004 Checksum: 0x8864 Length: 28 Network Mask: /8 TOS: 0 Metric: 64
```

```
r2.2.2.2#show ip ospf database summary 6.0.0.0
```

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

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

```
LS age: 1697
```

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

```
LS Type: Summary Links(Network)
```

```
Link State ID: 6.0.0.0 (summary Network Number)
```

```
!--- The ABR (Router 2.2.2.2) advertises !--- 6.0.0.0/8 into area 1. Advertising Router:  
2.2.2.2 LS Seq Number: 8000001C Checksum: 0x7894 Length: 28 Network Mask: /8 TOS: 0 Metric: 1
```

Os LSAs de resumo do ASBR não são necessários nesse caso porque o ABR origina o LSA externo e o ABR pode ser alcançado na área 0. Compare esse exemplo com um cenário no qual a NSSA era uma área normal, observando o exemplo de banco de dados [How OSPF Propagates External Routes into Multiple Areas \(Como o OSPF propaga as rotas externas em múltiplas áreas\)](#).

Esta saída da tabela de roteamento mostra os diferentes tipos de rotas OSPF que a 9.0.0.0 é conhecida por cada roteador.

```
r1.1.1.1#show ip route 9.0.0.0
```

```
Routing entry for 9.0.0.0/8
```

```
Known via "static", distance 1, metric 0
```

```
Redistributing via ospf 4
```

```
Advertised by ospf 4 metric 5 metric-type 1
```

```
Routing Descriptor Blocks:
```

```
* 4.0.0.2
```

```
Route metric is 0, traffic share count is 1
```

```
r2.2.2.2#show ip route ospf
```

```
O 4.0.0.0/8 [110/74] via 5.0.0.1, 01:10:13, Serial0/1/0
```

```
O N1 9.0.0.0/8 [110/79] via 5.0.0.1, 01:07:20, Serial0/1/0
```

```
R3.3.3.3#show ip route ospf
```

```
O IA 4.0.0.0/8 [110/75] via 6.0.0.2, 02:11:14, ATM2/0.20
```

```
O IA 5.0.0.0/8 [110/65] via 6.0.0.2, 03:10:41, ATM2/0.20
```

```
O E1 9.0.0.0/8 [110/80] via 6.0.0.2, 02:08:11, ATM2/0.20
```

## [Troubleshoot](#)

Atualmente, não existem informações disponíveis específicas sobre Troubleshooting para esta configuração.

## [Informações Relacionadas](#)

- [Como o OSPF propaga as rotas externas em áreas múltiplas](#)
- [Manual de explicações do banco de dados OSPF](#)
- [Suporte à tecnologia OSPF](#)
- [Página de Suporte do IP Routing](#)
- [Suporte Técnico e Documentação - Cisco Systems](#)