How OSPF Injects a Default Route into a Not So Stubby Area

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Contents

Introduction

This document shows how Open Shortest Path First (OSPF) injects a default route into a not so stubby area (NSSA). The area border router (ABR) for the NSSA does not, by default, originate a default route into the NSSA. You must use the **area <x> nssa default−information originate** command.

Prerequisites

Requirements

There are no specific requirements for this document.

Components Used

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

Conventions

For more information on document conventions, see the Cisco Technical Tips Conventions.
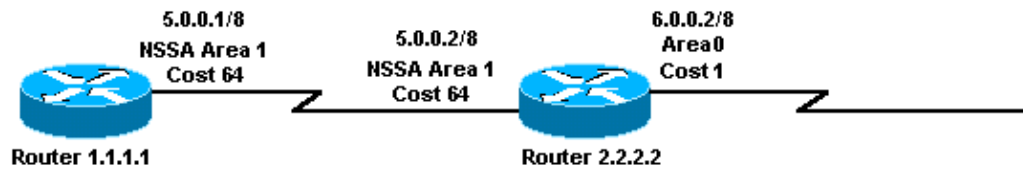
Configure

In this section, you are presented with the information to configure the features described in this document.

Note: To find additional information on the commands used in this document, use the Command Lookup Tool (registered customers only) .

Network Diagram

This document uses the network setup shown in this diagram.

Configurations

This document uses the configurations shown here.

- Router 1.1.1.1
- Router 2.2.2.2

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

router ospf 2
 network 5.0.0.0 0.255.255.255 area 1
 area 1 nssa

end
```

Router 2.2.2.2

```
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 default-information originate

end
```

Verify

This section provides information you can use to confirm your configuration is working properly.

Certain **show** commands are supported by the Output Interpreter Tool (registered customers only) , which allows you to view an analysis of **show** command output.

- **show ip ospf database** Displays a list of the Link State Advertisements (LSAs) and types them into a link state database. This list shows only the information in the LSA header.
- **show ip ospf database** *nssa−external* Displays information only about the NSSA external LSAs.
- **show ip route** Displays the current status of the routing table.

Examine the OSPF Database in a Not So Stubby Area

To see how the OSPF Database looks, use the **show ip ospf database** command.

```
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         600      0x80000001     0x9583         1

            Summary Net Link States (Area 0)

Link ID     ADV Router      Age      Seq#           Checksum
5.0.0.0      2.2.2.2        600      0x80000001     0x8E61

            Router Link States (Area 1)

Link ID     ADV Router      Age      Seq#           Checksum   Link count
1.1.1.1     1.1.1.1         864      0x8000005E     0xD350         2
2.2.2.2     2.2.2.2         584      0x8000001E     0xF667         2

            Summary Net Link States (Area 1)

Link ID     ADV Router      Age      Seq#           Checksum
6.0.0.0     2.2.2.2         585      0x80000004     0xA87C

            Type-7 AS External Link States (Area 1)

Link ID     ADV Router      Age      Seq#           Checksum   Tag
0.0.0.0     2.2.2.2         601      0x80000001     0xD0D8       0
```

The ABR for the NSSA originates a type 7 and an LSA with a link ID of 0.0.0.0. This is a result of the **area 1 nssa default−information−originate** command in its OSPF configuration.

```
r2.2.2.2#show ip ospf database nssa-external 0.0.0.0

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

                Type-7 AS External Link States (Area 1)

    LS age: 650
    Options: (No TOS-capability, No Type 7/5 translation, DC)
    LS Type: AS External Link
    Link State ID: 0.0.0.0 (External Network Number )
    Advertising Router: 2.2.2.2
    LS Seq Number: 80000001
```

```
          Checksum: 0xD0D8
          Length: 36
          Network Mask: /0
                Metric Type: 2 (Larger than any link state path)
                TOS: 0
                Metric: 1
                Forward Address: 0.0.0.0
                External Route Tag: 0
```

The ABR originates the 0.0.0.0 type 7 LSA, even though it does not have a default route.

```
     r2.2.2.2#show ip route 0.0.0.0
     % Network not in table

     r1.1.1.1#show ip route ospf
     O IA 6.0.0.0/8 [110/65] via 5.0.0.2, 00:00:18, Serial2/1/0
     O*N2 0.0.0.0/0 [110/1] via 5.0.0.2, 00:00:18, Serial2/1/0
```

Troubleshoot

There is currently no specific troubleshooting information available for this configuration.

Related Information

- **OSPF Database Explanation Guide**
- **OSPF Support Page**
- **IP Routing Support Page**
- **Technical Support & Documentation – Cisco Systems**

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