

# Configure OSPFv3 in an NSSA Area to Enable Translation of Type-7 LSA with Zero Forwarding Address

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## Introduction

This document describes a new Open Shortest Path First version 3 (OSPFv3) configuration command on a Cisco IOS<sup>®</sup> XR router which is an OSPFv3 Area Border Router (ABR). This command enables the translation from a Type-7 LSA from a Not-So-Stubby Area (NSSA)

with a forwarding address zero, to a Type-5 LSA.

## Problem

A Cisco IOS XR router which is an OSPFv3 ABR for a NSSA area stops the translation of Type-7 LSAs into Type-5 LSAs when the forwarding address is zero, after a software upgrade to Release 5.3.4, Release 6.2.1 or Release 6.4.1.

The [RFC 3101](#) section 3.2 "Translating Type-7 LSAs into Type-5 LSAs" specifies that the ABR of an NSSA area does not translate Type-7 LSAs into Type-5 LSAs if the forwarding address is zero. This applies to OSPFv2 and OSPFv3.

However the Cisco IOS XR implementation of OSPFv3 allowed the translation of Type-7 LSA with zero forwarding address into Type-5 LSA.

Since the Type-7 to Type-5 LSA translation in that context was not RFC-compliant, this was removed by Cisco bug ID [CSCva64125](#) in Release 5.3.4 and Release 6.2.1.

This change caused some reachability issues in production networks after a software upgrade, so the change was reverted back in Release 5.3.4 Service Pack 3, Release 6.2.2, and Release 6.3.1 by Cisco bug ID [CSCvd81695](#).

## Solution

At that point the Cisco IOS XR OSPFv3 implementation was again not RFC-compliant, so the final change was introduced by Cisco bug ID [CSCvd81715](#) in Release 6.4.1.

- In Cisco IOS XR Release 6.4.1 and later, by default, Cisco IOS XR does not translate Type-7

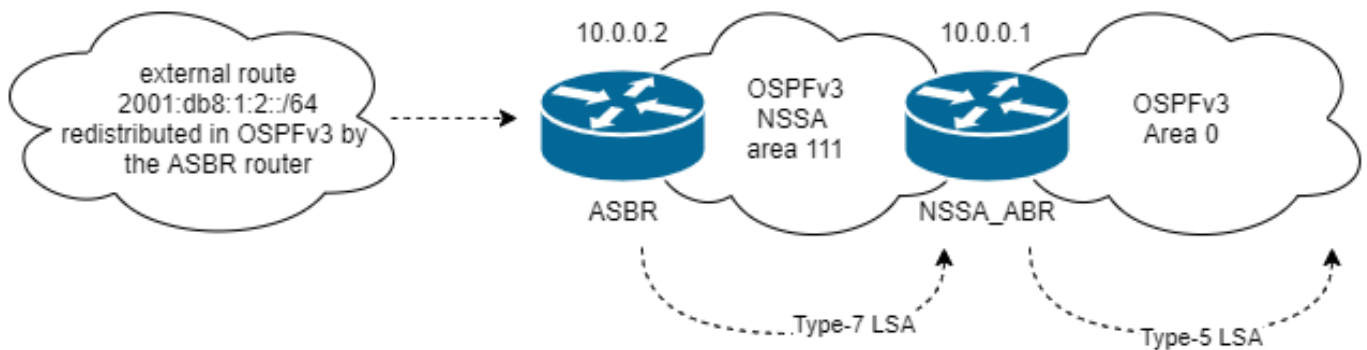
LSAs into Type-5 LSAs when the forwarding address is zero. So Cisco IOS XR is again RFC-compliant by default.

- If you were relying on the non RFC-compliant behavior of old Cisco IOS XR versions, a new configuration command has been introduced in Release 6.4.1 in order to re-enable the translation of Type-7 LSA with a zero forwarding address into Type-5 LSA on the NSSA ABR. You must configure this command when upgrading to Release 6.4.1 or higher if you want to preserve the same non RFC-compliant behavior.

This new configuration command to enable the translation of Type-7 LSA with a zero forwarding address into Type-5 LSA on the NSSA ABR router is:

```
router ospfv3 <process>
  capability type7 translate zero-forward-addr
```

## Example



Before the new capability command is applied, the **routing bit** is not set on the Type-7 LSA, and no Type-5 LSA is originated. Notice that the **Forward Address** is not present:

```
RP/0/RP0/CPU0:NSSA_ABR#show ospfv3 database nssa 2001:db8:1:2::/64
```

```
OSPFv3 Router with ID (10.0.0.1) (Process ID 100)
```

```
Type-7 AS External Link States (Area 111)
```

```
LS age: 639
LS Type: AS External Link
Link State ID: 2
Advertising Router: 10.0.0.2
LS Seq Number: 80007ffa
Checksum: 0x83e3
Length: 36
Prefix Address: 2001:db8:1:2::
Prefix Length: 64, Options: P , Priority: Low
Metric Type: 1 (Comparable directly to link state metric)
Metric: 0
```

After the **capability type7 translate zero-forward-addr** configuration command is committed, the routing bit is set on the Type-7 LSA:

```
RP/0/RP0/CPU0:NSSA_ABR#show ospfv3 database nssa 2001:db8:1:2::/64
```

OSPFv3 Router with ID (10.0.0.1) (Process ID 100)

Type-7 AS External Link States (Area 111)

Routing Bit Set on this LSA

LS age: 125

LS Type: AS External Link

Link State ID: 2

Advertising Router: 10.0.0.2

LS Seq Number: 80007ffc

Checksum: 0x7fe5

Length: 36

Prefix Address: 2001:db8:1:2::

Prefix Length: 64, Options: P , Priority: Low

Metric Type: 1 (Comparable directly to link state metric)

Metric: 0

External Route Tag: 0

**The Type-5 external LSA is now originated:**

RP/0/RP0/CPU0:NSSA\_ABR#show ospfv3 database external 2001:db8:1:2::/64

OSPFv3 Router with ID (10.0.0.1) (Process ID 100)

Type-5 AS External Link States

LS age: 190

LS Type: AS External Link

Link State ID: 0

Advertising Router: 10.0.0.1

LS Seq Number: 80000001

Checksum: 0x9ada

Length: 36

Prefix Address: 2001:db8:1:2::

Prefix Length: 64, Options: None, Priority: Low

Metric Type: 1 (Comparable directly to link state metric)

Metric: 0

External Route Tag: 0