Open Shortest Path First IGP
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OSPF LLS Extensions for Local Interface ID Advertisement
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Abstract

Every OSPF interface is assigned an identifier, Interface ID, which uniquely identifies the interface on the router. In some cases it is useful to know the Interface ID assigned by the adjacent router on its side of the adjacency (Remote Interface ID).

This draft describes the extensions to OSPF link-local signalling to advertise the Local Interface Identifier.

Requirements Language

The key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT", "SHOULD", "SHOULD NOT", "RECOMMENDED", "NOT RECOMMENDED", "MAY", and "OPTIONAL" in this document are to be interpreted as described in BCP14 [RFC2119] [RFC8174] when, and only when, they appear in all capitals, as shown here.

Status of This Memo

This Internet-Draft is submitted in full conformance with the provisions of BCP 78 and BCP 79.

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This Internet-Draft will expire on January 19, 2019.

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1. Introduction

Every OSPF interface is assigned an Interface ID, which uniquely identifies the interface on the router. For example, some implementations MAY be able to use the MIB-II IfIndex [RFC2863] as the Interface ID.

Local/Remote Interface Identifiers MAY be flooded by OSPF [RFC2328] as defined in [RFC4203]. From the perspective of the advertising router, the Local Interface Identifier is a known value, however the Remote Interface Identifier needs to be learnt before it can be advertised. [RFC4203] suggests to use TE Link Local LSA [RFC3630] to communicate the Local Interface Identifier to neighbors on the link. Though such mechanism works, it has some drawbacks.

This draft proposes an extension to OSPF link-local signalling [RFC5613] to advertise the Local Interface Identifier.

2. Interface ID Exchange using TE Opaque LSA

Usage of the Link Local TE Opaque LSA to propagate the Local Interface Identifier to the neighbors on the link is described in [RFC4203]. This mechanism has following problems:

LSAs can only be flooded over an existing adjacency that is in Exchange state or greater. The adjacency state machine progresses independently on each side of the adjacency and, as such, may reach the Full state on one side before the TE Link Opaque LSA arrives. The consequence is that link can be initially advertised without the Remote Interface Identifier. Later, when the TE Link Opaque LSA arrives, the link must be advertised again, this time with the valid Remote Interface Identifier. Implementations may choose to wait before advertising the link, but there is no guarantee that the neighbor will ever advertise the TE Link Opaque LSA with the Interface Identifier. In summary, the existing mechanism does not guarantee that the Remote Interface Identifier is known at the time the link is advertised.

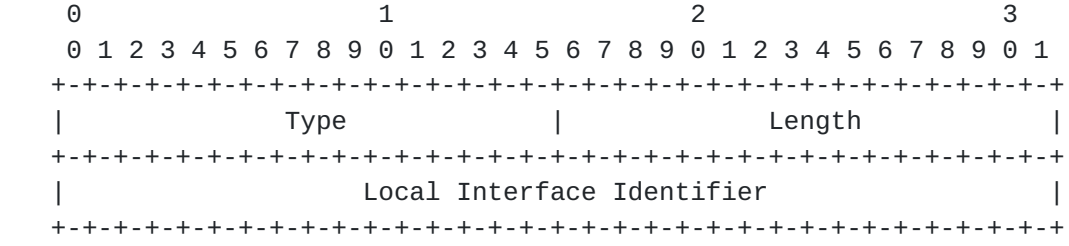
The TE Opaque LSA is defined for MPLS Traffic Engineering, but the knowledge of the Remote Interface Identifier is useful also for cases where MPLS TE is not used. One example is the lack of a valid 2-way connectivity check for parallel point-to-point links between OSPF routers.

3. Interface ID Exchange using OSPF LLS

To address the problems described earlier and to allow the Interface Identifier exchange to be part of the neighbor discovery process, we propose to extend OSPF link-local signalling to advertise the Local Interface Identifier in OSPF Hello packets.

3.1. Local Interface Identifier TLV

The Local Interface Identifier TLV is a LLS TLV. It has following format:



where:

Type: 18

Length: 4 octets

Local Interface Identifier: The value of the local Interface Identifier.

Local Interface Identifier TLV signalling using LLS is applicable to all OSPF interface types other than virtual links.

4. Backward Compatibility with RFC 4203

Implementations which support Local Interface ID signalling using LLS MUST prefer the Local Interface ID value received through LLS over the value received through Link Local TE Opaque LSA if both are received from the same OSPF router.

Implementations which support Local Interface ID signalling via Link Local TE Opaque LSA MAY continue to do so to ensure backward compatibility. If they also support Local Interface ID signalling using LLS as described herein, they SHOULD signal the same Local Interface ID via both mechanisms.

During the rare conditions, when the Local Interface ID changes, a timing interval may exist, where the received values of the Local Interface ID advertised through LLS and Link Local TE Opaque LSA may differ. Such situation is temporary and received values via both mechanisms should become equal as soon as the next Hello and/or Link Local TE Opaque LSA is re-generated by the originator.

5. IANA Considerations

This specification allocates a single code point from the "Open Shortest Path First (OSPF) Link Local Signalling (LLS) - Type/Length/ Value Identifiers (TLV)" registry.

Following values is allocated:

o 18 - Local Interface Identifier TLV

6. Security Considerations

The security considerations for "OSPF Link-Local Signaling" [RFC5613] also apply to the Local Interface Identifier TLV described herein. The current usage of a neighbor's Local Interface Identifier is to disambiguate parallel links between OSPF routers. Hence, modification of the advertised Local Interface Identifier TLV may result in the wrong neighbor interface identifier being advertised in

the OSPFv2 Extended Link LSA [RFC8379] and could prevent the link from being used. If authentication is being used in the OSPF routing domain [RFC5709], then the Cryptographic Authentication TLV [RFC5613] SHOULD also be used to protect that contents of the Link-Local Signaling (LLS) block.

Implementations must assure that malformed LLS TLVs and Sub-TLVs permutations do not result in errors which cause hard OSPF failures.

7. Contributors

8. Acknowledgements

Thanks to Tony Przygienda for his extensive review and useful comments.

9. References

9.1. Normative References

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