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OSPF LLS Extensions for Local Interface ID Advertisement
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Abstract

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

Requirements Language

The key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT", "SHOULD", "SHOULD NOT", "RECOMMENDED", "MAY", and "OPTIONAL" in this document are to be interpreted as described in RFC 2119 [RFC2119].

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 November 24, 2017.

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1. Introduction

Every 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 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 signaling (LLS) [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. Implementation 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 Remote Interface Identifier is known at the time the link is advertised.

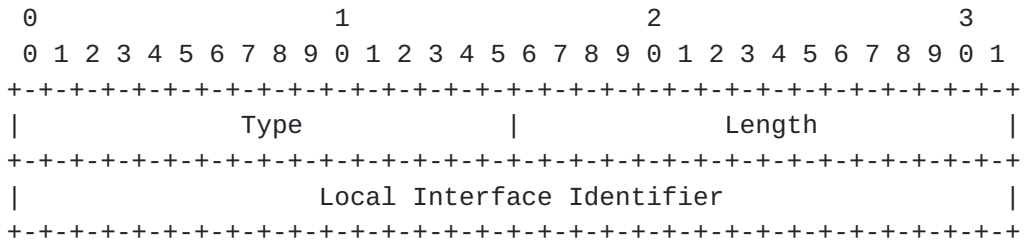
TE Opaque LSA is defined for MPLS Traffic Engineering, but the knowledge of the Remote Interface Identifier is useful for other cases where MPLS TE is not used. One example is the lack of valid 2-way connectivity check for remote parallel point-to-point links in OSPF. In such case, TE Opaque LSAs are not exchanged solely for 2-way connectivity correctness.

3. Interface ID Exchange using OSPF LLS

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

3.1. Local Interface Identifier TLV

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



where:

Type: TBD, suggested value 18

Length: 4 octet

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

Local Interface Identifier TLV MUST be present in all Hello packets on all link types, except packets that are sent to the remote end of the virtual-link.

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 the Link Local TE Opaque LSAs.

Implementations which also support the Local Interface ID signalling via Link Local TE Opaque LSA MAY continue to do so to ensure backward compatibility and they MUST 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 updates Link Local Signalling TLV Identifiers registry.

Following values is allocated:

o 18 - Local Interface Identifier TLV

6. Security Considerations

Implementations must assure that malformed LLS TLV and Sub-TLV 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. Normative References

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