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IGP Extensions for Advertising Node Index
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Abstract

This document describes OSPF and IS-IS extensions for distributing the node index configured on a node.

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 [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 30 September 2025.

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1. Introduction

When the nodes in a network are numbered or indexed from 1 to the number of the nodes, an efficient stateless multicast along the shortest paths to the egresses of a P2MP tree can be achieved using the node indices of the egresses.

This document proposes OSPF and IS-IS extensions for distributing the node index configured on a node to support the best effort stateless multicast. When a controller such as PCE as a controller has the node indexes, it can send the P2MP tree encoded in the node indexes to the ingress of the tree.

1.1. Terminology

LSA: Link State Advertisement.

OSPF: Open Shortest Path First.

LSP: Link State Protocol data unit.

IS-IS: Intermediate System to Intermediate System.

2. Extensions to OSPF

This section describes extensions to OSPF for distributing the node index configured on a node. The node index of a node MUST be unique in a network. This is like the identifier (ID) of the node.

[RFC7770] defines the Router Information (RI) Link state Advertisement (LSA). The RI LSA is used to advertise Optional Router Information using Router Information LSA TLVs. A new Router Information LSA TLV, called Node Index TLV, is defined to carry the Node Index configured on the node originating the RI LSA. The Node Index TLV has the following format:

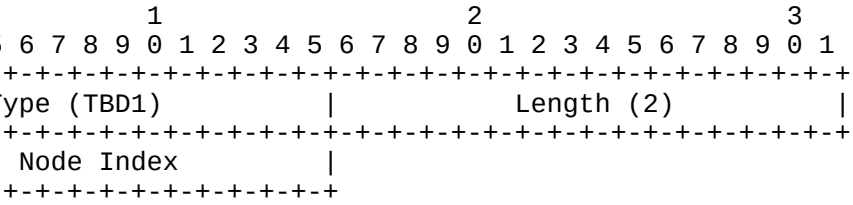

Figure 1: Node Index TLV

Type: TBD1.

Length: 2.

Node Index: The node index configured on a node.

This TLV is optional. It is applicable to both OSPFv2 and OSPFv3. For advertising a node index, the area-scoped RI LSA including a Node Index TLV is used.

3. Extension to IS-IS

This section describes an extension to IS-IS for distributing the Node Index configured on a node.

[RFC7981] defines the IS-IS Router CAPABILITY TLV to advertise Router Information. The TLV includes multiple sub-TLVs. A new Node Index sub-TLV to be included in the TLV, is defined to carry the Node Index configured on the node originating the TLV in its LSP. This sub-TLV has the following format:

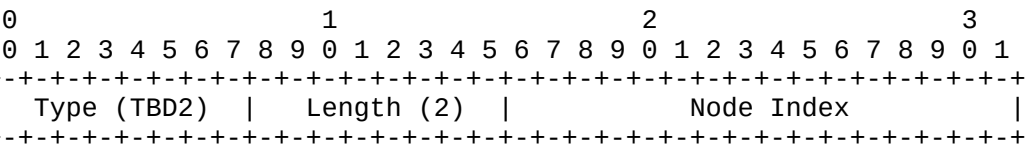

Figure 2: Node Index sub-TLV

Type: TBD2.

Length: 2.

Node Index: The Node Index configured on a node.

This sub-TLV is optional. For advertising a node index, the area-scoped LSP including a Node Index sub-TLV in an IS-IS Router CAPABILITY TLV is used.

4. Security Considerations

TBD.

5. IANA Considerations

5.1. OSPF RI TLVs Registry

Under "OSPF Router Information (RI) TLVs registry" as defined in [RFC7770], IANA is requested to assign a new type as follows:

Value	Description	reference
TBD1	Node Index	This document

5.2. IS-IS Sub-TLVs for TLV 242 Registry

Under "Sub-TLVs for TLV 242 (IS-IS Router CAPABILITY TLV) registry" as defined in [RFC7981], IANA is requested to assign a new sub-TLV as follows:

Value	Description	reference
TBD2	Node Index	This document

6. Acknowledgements

The authors would like to thank people for their comments on this work.

7. Normative References

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[RFC7981] Ginsberg, L., Previdi, S., and M. Chen, "IS-IS Extensions for Advertising Router Information", RFC 7981, DOI 10.17487/RFC7981, October 2016, <https://www.rfc-editor.org/info/rfc7981>.

[RFC8174] Leiba, B., "Ambiguity of Uppercase vs Lowercase in RFC 2119 Key Words", BCP 14, RFC 8174, DOI 10.17487/RFC8174, May 2017, <https://www.rfc-editor.org/info/rfc8174>.

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