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Definition of an IS-IS Link Attribute sub-TLV

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Abstract

This document defines a sub-TLV called "Link-attributes" carried within the TLV 22 and used to flood some link characteristics.

Conventions used in this document

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 [i].

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1. Introduction

[IS-IS] specifies the IS-IS protocol (ISO 10589) with extensions to support IPv4 in [IS-IS-IP]. A router advertises one or several Link State Protocol data units which are composed of variable length tuples called TLVs (Type-Length-Value).

[IS-IS-TE] defines a set of new TLVs whose aims are to add more information about links characteristics, increase the range of IS-IS metrics and optimize the encoding of IS-IS prefixes.

This document defines a new sub-TLV named "Link-attributes" carried within the extended IS reachability TLV (type 22) specified in [IS-IS-TE].

2. Link-attributes sub-TLV format

The link-attribute sub-TLV is carried within the TLV 22 and has a format identical to the sub-TLV format used by the Traffic Engineering Extensions for IS-IS [IS-IS-TE]: 1 octet of sub-type, 1 octet of length of the value field of the sub-TLV followed by the value field in this case, a 16 bit flags field.

The Link-attribute sub-type is 19 (to be assigned by IANA) and has a length of 2 octets.

This sub-TLV is OPTIONAL and MAY appear at most once for a single IS neighbor.

The following bits are defined:

Local Protection Available (0x01). When set, this indicates that the link is protected by means of some local protection mechanism (e.g [FRR]).

Link excluded from local protection path (0x02). When set, this link SHOULD not be included in any computation of a repair path by any other router in the routing area. The triggers for setting up this bit are out of the scope of this document.

Such link characteristics has several applications such as constrained shortest path computation for a Traffic Engineering Label Switched (TE LSP) path or the triggering of specific actions in the context of IS-IS SPF computation.

Local maintenance required (0x04). When set, this indicates that the link will be put out of service and will consequently be shortly unavailable. The set of actions triggered by other nodes is out of the scope of this document. An example of the usage of this bit is provided in [GR-SHUT].

3. Interoperability with routers non supporting this capability

A router not supporting the link-attribute sub-TLV MUST just silently ignore this sub-TLV.

Where the information in the link attributes sub-TLV is used to affect the IS-IS SPF calculation, additional information indicating which routers are using this information is required to insure such usage does not result in loops or black holes. How this additional information is conveyed is outside the scope of this document.

4. Security considerations

No new security issues are raised in this document.

5. IANA considerations

IANA will assign a new codepoint for the link-attribute sub-TLV defined in this document and carried within TLV 22. Suggested value is 19 (to be assigned by IANA).

6. Intellectual Property Considerations

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7. Acknowledgments

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8. References

8.1 Normative references

[RFC] Bradner, S., "Key words for use in RFCs to Indicate Requirement Levels," RFC 2119.

[IS-IS] "Intermediate System to Intermediate System Intra-Domain Routeing Exchange Protocol for use in Conjunction with the Protocol for Providing the Connectionless-mode Network Service (ISO 8473)", ISO 10589.

[IS-IS-IP] Callon, R., RFC 1195, "Use of OSI IS-IS for routing in TCP/IP and dual environments", RFC 1195, December 1990.

[IS-IS-TE] H. Smit, T. Li, "IS-IS extensions for traffic engineering", RFC 3784.

8.2 Informative references

[FRR] Ping Pan, et al, "Fast Reroute Extensions to RSVP-TE for LSP Tunnels", draft-ietf-mpls-rsvp-lsp-fastreroute-07.txt. Work in progress.

[GR-SHUT], Z. Ali et al, "Graceful Shutdown in MPLS Traffic Engineering Networks", draft-ali-ccamp-mpls-graceful-shutdown-01.txt. Work in progress.

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