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ISIS Link Overload
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Abstract

Many ISIS deployments run on overlay networks provisioned by means of pseudo-wires or L2-circuits. when the devices in the underlying network go for maintenance, it is useful to divert the traffic away from the specific node(s), to some alternate paths, before the maintenance is actually scheduled. Since the nodes in the underlying network are not visible to ISIS, existing Avoidance of traffic blackhole mechanism described in [RFC3277] cannot be used. It is useful for routers in IS-IS routing domain to be able to advertise a link being in overload state to indicate impending maintenance activity in the underlying network devices.

This document describes the protocol extensions to disseminate link overload information in IS-IS protocol.

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 September 10, 2015.

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1. Introduction

It is useful for routers in IS-IS routing domain to be able to advertise a link being in overload state to indicate impending maintenance activity on the link. This document provides mechanisms to advertise link overload state in the Link attributes TLV as defined in [RFC5029]

2. ISIS Link overload bit

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 ([RFC3784]): 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 following bit represents the Link in overload.

Link Overload: 0x04 When set, this indicates that the link is overloaded.

3. Elements of procedure

The Link attributes sub TLV with link-overload bit set indicates that the Link which carries the sub TLV is overloaded. The node that has the link going for maintenance, sets metric of the link to MAX-METRIC and re-originates the LSP. The metric in the reverse direction also need to change to divert the traffic from reverse direction. The node SHOULD originate Link attributes sub TLV and set the overload bit and originate the LSP and flood it in the respective IS-IS level.

When the originator of the Link attributes sub TLV, purges the LSP or re-originates it without the Link Overload bit set, the metric on the remote node SHOULD be changed back to the original value.

Based on the link type of the overloaded link, actions listed below MAY be taken by the receiver.

3.1. Point-to-point links

When a link attributes sub TLV with link overload bit set is received for a point-to-point link the receiver SHOULD identify the local link which corresponds to the overloaded link and set the metric to MAX-METRIC. Receiver node MUST re-originate the LSP with the changed metric and flood into the ISIS level.

3.2. Broadcast links

Broadcast networks in ISIS are represented by a star topology where the Designated Intermediate System (DIS) is the central point to which all other routers on the broadcast network connect. As a result, routers on the broadcast network advertise only their adjacency to the pseudo-node.As a result, routers on the broadcast network advertise only their adjacency to the pseudo- node. Routers that do not act as DIS do not advertise adjacencies with each other. DIS originates pseudo-node which contains adjacenices with all the neighbors. For the Broadcast links, the MAX-METRIC on the outgoing link cannot be changed since all the adjacencies are on same link. Setting the link cost to MAX- METRIC would impact paths going via all neighbors.

When a link-attributes sub TLV with link-overload bit set is received by the remote end for a broadcast link.

- If it’s non DIS for that link, SHOULD not take any action.

- If receiving node is DIS for the link, it MUST set the metric from the pseudo-node to the originator of the link overload bit to MAX-METRIC and MUST re-originate the pseudo-node LSP and flood into the ISIS Level.

4. Backward compatibility

The mechanism described in the document is fully backward compatible.It is required that the originator and receiver of link-overload bit understand the extensions defined in this document and in case of broadcast links the originator and the DR need to understand the extensions. Other nodes in the network compute based on increased metric and hence the feature is backward compatible.

5. Security Considerations

This document does not introduce any further security issues other than those discussed in [ISO10589] and [RFC1195].

6. IANA Considerations

This specification updates one ISIS registry: ISIS Link attributes Sub TLV

i) 0x04 - Link overload bit

7. Acknowledgements

8. References

8.1. Normative References

[ISO10589] "Intermediate system to Intermediate system intra-domain routeing information exchange protocol for use in conjunction with the protocol for providing the connectionless-mode Network Service (ISO 8473), ISO/IEC 10589:2002, Second Edition.", Nov 2002.

[RFC1195] Callon, R., "Use of OSI IS-IS for routing in TCP/IP and dual environments", RFC 1195, December 1990.

[RFC2119] Bradner, S., "Key words for use in RFCs to Indicate Requirement Levels", BCP 14, RFC 2119, March 1997.

[RFC3277] McPherson, D., "Intermediate System to Intermediate System (IS-IS) Transient Blackhole Avoidance", RFC 3277, April 2002.

[RFC3784] Smit, H. and T. Li, "Intermediate System to Intermediate System (IS-IS) Extensions for Traffic Engineering (TE)", RFC 3784, June 2004.

[RFC5029] Vasseur, JP. and S. Previdi, "Definition of an IS-IS Link Attribute Sub-TLV", RFC 5029, September 2007.

8.2. Informative References

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