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Authors: H. Chen M. Toy X. Liu L. Liu
 Futurewei Verizon Alef Edge Fujitsu
 Z. Li Y. Yang
 China Mobile IBM

ISIS Extensions for Broadcast Inter-AS TE Link

Abstract

This document presents extensions to the ISIS protocol for advertising broadcast inter-AS Traffic Engineering (TE) links.

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1. Introduction

Connections among different Autonomous Systems (ASes) may be point-to-point (P2P) links and broadcast links. For a P2P inter-AS TE link, RFC 5316 defines a new TLV, the inter-AS reachability TLV, for advertising the link.

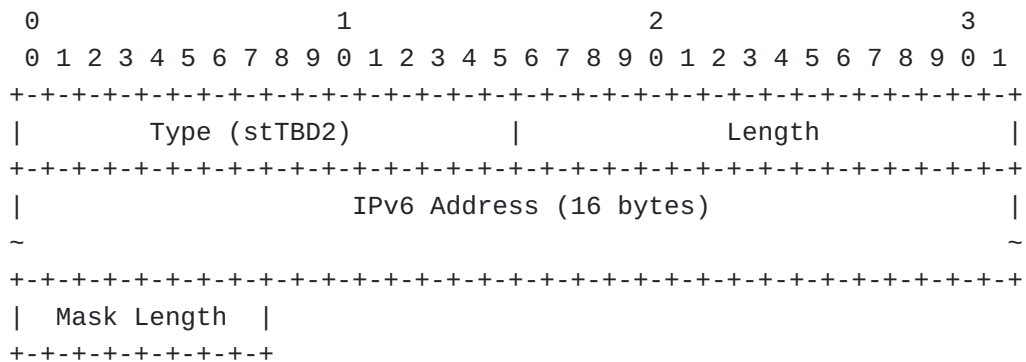
It also defines three new sub-TLVs for inclusion in the inter-AS reachability TLV to carry the information about the neighboring AS number and the remote ASBR ID of an inter-AS link.

For a P2P inter-AS link, the information about its remote ASBR may be configured. For a broadcast inter-AS link, no item configured corresponds to the designated router (DR) of the link in ISIS. Since no ISIS runs over any broadcast inter-AS link, no DR is selected. It is hard to configure an item corresponding to the DR on a broadcast link.

This document presents extensions to ISIS for advertising broadcast inter-AS TE links through defining a new sub-TLV for a broadcast link without configuring any item corresponding to the DR on the link.

2. 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 [[RFC2119](#)].



The IPv6 Address indicates the local IPv6 address of a link. The Mask Length indicates the length of the IPv6 address mask.

4.2. Procedures

4.2.1. ISIS Router Procedure

For a broadcast inter-AS link connecting to multiple ASBRs, each of the ASBRs as an ISIS router advertises an LSP with an inter-AS reachability TLV, which contains sub-TLVs for the information such as 1) 10 8) about the broadcast link described in Section 3. It does not contain any sub-TLVs indicating remote ASBR, instead, it includes a sub-TLV for the local IP address with network mask.

When TE is enabled on an inter-AS link and the link is up, the ASBR SHOULD advertise this link using the normal procedures for ISIS-TE. When either the link is down or TE is disabled on the link, the ASBR SHOULD withdraw the advertisement. When there are changes to the TE parameters for the link (for example, when the available bandwidth changes), the ASBR SHOULD re-advertise the link but MUST take precautions against excessive re-advertisements.

4.2.2. Super Node Procedure

Suppose that there is a super node, which just receives LSPs from each of ASes (or domains) through a passive ISIS adjacency between the super node and an ASBR or a normal router in the AS or domain.

For a new broadcast link connecting multiple routers, when the super node receives an LSP containing the link attached to router X, it stores the link from X into its TED. It finds the link's remote end P using the link's local IP address with network mask. P is a Pseudo node identified by the local IP address of the DR selected from the routers connected to the link. After finding P, it associates the link attached to X with P and the link connected to P with X. If P is not found, a new Pseudo node P is created. The super node associates the link attached to X with P and the link attached to P with X. This creates a bidirectional connection between X and P.

The first router and second router from which the super node receives an LSP containing the link are selected as the DR and BDR respectively. After the DR is down, the BDR becomes the DR and the router other than the DR with the largest (or smallest) local IP address connecting to the link is selected as the BDR.

When the old DR is down and the BDR becomes the new DR, the super node updates its TED through removing the link between each of routers X and old P (the Pseudo node corresponding to the old DR) and adding a link between each of routers X (still connecting to the broadcast link) and new P (the Pseudo node corresponding to the new DR).

5. Security Considerations

The mechanism described in this document does not raise any new security issues for the ISIS protocols.

6. IANA Considerations

This section specifies requests for IANA allocation.

7. Acknowledgement

The authors would like to thank all for their valuable comments on this draft.

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Authors' Addresses

Huaimo Chen
Futurewei
Boston, MA,
United States of America

Email: hchen@futurewei.com

Mehmet Toy
Verizon
United States of America

Email: mehmet.toy@verizon.com

Xufeng Liu
Alef Edge
United States of America

Email: xufeng.liu.ietf@gmail.com

Lei Liu
Fujitsu
United States of America

Email: liulei.kddi@gmail.com

Zhenqiang Li
China Mobile
No.32 Xuanwumenxi Ave., Xicheng District
Beijing
100032
P.R. China

Email: li_zhenqiang@hotmail.com

Yi Yang
IBM
, NC
United States of America

Email: yyang1998@gmail.com