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**ISIS Extensions for Broadcast Inter-AS TE Link  
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**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 [\[RFC2119\]](#).

## 3. Information on Inter-AS TE Link

For a broadcast link connecting multiple ASBRs in a number of ASes, on each of the ASBRs X, the following information about the link may be obtained:

- 1) Link Type: Multi-access
- 2) Local IP address with mask length
- 3) Traffic engineering metric
- 4) Maximum bandwidth
- 5) Maximum reservable bandwidth
- 6) Unreserved bandwidth
- 7) Administrative group
- 8) SRLG

No remote IP address or item corresponding to the DR (i.e., DR's interface address) may be obtained.

## 4. Extensions to ISIS

### 4.1. sub-TLVs

Two new sub-TLVs are defined. One is for local IPv4 address with mask length; and the other is for local IPv6 address with mask length.

The format of the sub-TLV for a local IPv4 address with mask length is shown as follows.

```

      0               1               2               3
      0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1
+---+---+---+---+---+---+---+---+---+---+---+---+---+---+---+---+
|               Type (stTBD1)               |               Length               |
+---+---+---+---+---+---+---+---+---+---+---+---+---+---+---+---+
|               IPv4 Address (4 bytes)               |
+---+---+---+---+---+---+---+---+---+---+---+---+---+---+---+---+
|   Mask Length   |
+---+---+---+---+---+

```



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.

## **8. References**

### **8.1. Normative References**

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## **8.2. Informative References**

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