OSPF Extensions for Broadcast Inter-AS TE Link

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### Introduction

**Inter-AS Link (no OSPF running over it):**

- OSPF-TE (RFC 5392) for P2P inter-AS TE links
  1. Configure remote AS number
  2. Configure remote router ID
     - On C, configure D's AS and ID
     - On D, configure C's AS and ID
  3. A TE link is advertised in Inter-AS-TE LSA with link TLV containing sub-TLVs for
     1). Link-Type: P2P
     2). Link-ID Remote AS and ASBR ID
     3). Local IP Address
     4). Remote IP Address
     5). TE Metric
        
- No extensions for broadcast inter-AS TE links
Information on a Broadcast Inter-AS TE Link:

1). Link-Type: Multi-access
2). Link-ID DR’s Interface IP
3). Local IP Address with Network Mask, Local AS
4). Remote IP Address
5). TE Metric

.....

i.e.,
1). Link-Type: Multi-access
2). Local IP Address with Network Mask, Local AS
3). TE Metric
4). Maximum bandwidth
5). Maximum reservable bandwidth
6). Unreserved bandwidth
7). Administrative group
8). SRLG
Extensions to OSPF: New sub-TLVs (1/2)

- **sub-TLV** for local IPv4 address with mask

  - **IPv4 Address**: Local IPv4 address of connection to broadcast link
  - **Mask Length**: Length of the IPv4 address mask

- **sub-TLV** for local IPv6 address with mask

  - **IPv6 Address**: Local IPv6 address of connection to broadcast link
  - **Mask Length**: Length of the IPv6 address mask
Extensions to OSPF: New sub-TLVs (2/2)

- **sub-TLV** for local AS

```
+-------------------+-------------------+-------------------+-------------------+
| 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 (stTBD3)   |   Length          |                   |                   |
+-------------------+-------------------+-------------------+-------------------+
|                   |                   |                   |                   |
+-------------------+-------------------+-------------------+-------------------+
|                   |                   |                   |                   |
+-------------------+-------------------+-------------------+-------------------+
|                   |                   |                   |                   |
+-------------------+-------------------+-------------------+-------------------+
|                   |                   |                   |                   |
+-------------------+-------------------+-------------------+-------------------+
| o AS Number: AS number of ASBR originating Inter-AS-TE LSA |
+-------------------+-------------------+-------------------+-------------------+
```
Procedures

- **OSPF Router (as ASBR attached to broadcast link)**
  
  Originates/advertises Inter-AS TE LSA containing
  
  1. Link-Type: Multi-access
  2. Local IP Address with Network Mask, Local AS
  3. TE Metric

- **Super Node (as PCE/SDN)**
  
  1. Receives Inter-AS TE LSAs from ASes
  2. Figures out ASBRs attached to a broadcast link through 2)
  3. Selects DR/BDR, creates Pseudo node P for DR, and connects ASBRs to P
  4. Promotes BDR to DR when DR is down
Summary

Presented

✓ Information on Broadcast Inter-AS TE Link
✓ Extensions to OSPF: 3 New sub-TLVs
✓ Procedures
  ❖ OSPF Router
  ❖ Super Node
Next Step

• Request for comments and suggestions