Signaling MSD (Maximum SID Depth) using OSPF

draft-tantsura-ospf-segment-routing-msd-00

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For a controller/PCE to know various nodes/links MSD "Maximum SID Depth" of the node or link where SR tunnel exits over – ingress node/node expanding binding SID

A controller/PCE should never use a tunnel with a label depth exceeding that supported by a node/link
  - Ingress node != BGP-LS or PCEP speaker

PCEP SR extensions [I-D.ietf-pce-segment-routing] has defined MSD, to signal in SR PCE Capability TLV, METRIC Object, however requires:
  - PCEP session with the node
  - Signals only node MSD

With MSD values present in LSDB it's advertised through BGP-LS as defined in [I-D.tantsura-idr-bgp-LS-segment-routing-msd]

Similar solution for isis is described in [I-D.tantsura-isis-segment-routing-msd]

Do not confuse with RLD - Readable Label Depth as defined in [I-D.ietf-mpls-spring-entropy-label]
How?

Through new TLV in OSPF (OSPFv2, OSPFv3) RI Opaque LSA [RFC 7770]

- **Node MSD TLV**

```
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
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
|              Type             |             Length            |
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
|                MSD Value                                      |
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
```

- Type: request to IANA to allocate a TLV type code from OSPF Router Information (RI) TLVs Registry defined by [RFC7770]
- Value: 0-254.
  - 0 → Lack of ability to push MSD of any depth
  - Value represented SHOULD be the lowest value that node can support
**Link MSD sub-TLV**

<table>
<thead>
<tr>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>

```
+---------------------------------------------+-----------------+-----------------+
|                                              | Type            | Length          |
|                                              | Type            | Length          |
|                                              | MSD Value       |                 |
```

**Link MSD TLV**

- **Type:** request to IANA to allocate a **optional sub-TLV type code** from
  - OSPFv2 Extended Link TLV Registry as defined in [RFC76804]
  - OSPFv3 Router-Link TLV as defined in [I-D.ietf-ospf-ospfv3-lsa-extend]
- **Value:** 0-254.
  - 0  ≠  Lack of ability to push MSD of any depth
  - This sub-TLV is optional
Next Steps:

- WG Adoption?

Thank you!