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   Signaling Maximum SID Depth using Border Gateway Protocol Link-State
           draft-tantsura-idr-bgp-ls-segment-routing-msd-02

Abstract

   This document discusses use of BGP-LS to expose node and/or link on a
   node MSD "Maximum SID Depth" to a centralized controller (PCE/SDN).

Status of This Memo

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1. Introduction

When Segment Routing tunnels are computed by a centralized
controller, it is crucial that the controller knows MSD "Maximum SID
Depth" of the node or link SR tunnel exits over, so it doesn't
download a path with SID (label stack) of a depth more than the node
or link configured is capable of imposing.This document describes how
to use BGP-LS to expose the MSD of the node or link configured to a
centralized controller.

1.1. Conventions used in this document

1.1.1. Terminology

BGP-LS: Distribution of Link-State and TE Information using Border
Gateway Protocol

MSD: Maximum SID Depth

PCC: Path Computation Client

PCE: Path Computation Element

PCEP: Path Computation Element Protocol

SID: Segment Identifier

SR: Segment routing

1.1.2. Requirements Language

   The key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT",
   "SHOULD", "SHOULD NOT", "RECOMMENDED", "NOT RECOMMENDED", "MAY", and
   "OPTIONAL" in this document are to be interpreted as described in
   [RFC2119].

2. Problem Statement

   In existing technology only PCEP has extension to signal the MSD (SR
   PCE Capability TLV/ METRIC Object as defined in
   [I-D.ietf-pce-segment-routing],If PCEP is not supported by the node
   (head-end of the SR tunnel) controller has no way to learn the MSD of
   the node/link configured. OSPF and IS-IS extensions are defined in:

   [I-D.ietf-ospf-segment-routing-msd]

   [I-D.ietf-isis-segment-routing-msd]

3. MSD supported by a node

   Node MSD is encoded in a new Node Attribute TLV, as defined in
   [RFC7752]

```
     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              |            Length             |
    +-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
    |     MSD       |
    +-+-+-+-+-+-+-+-+
```

                       Figure 1: Node attribute format

   Type : A 2-octet field specifiying code-point of the new TLV type.
   Code-point: TBA (suggested 1050) from BGP-LS Node Descriptor, Link
   Descriptor, Prefix Descriptor, and Attribute TLVs registry

   Length: A 2-octet field that indicates the length of the value
   portion

   MSD: Node MSD is a number in the range of 0-254. The vaule of 0
   represents lack of ability to push MSD of any depth, any other value
   represents that of the node.

4. MSD supported on a link

Link MSD is encoded in a New Link Attribute TLV, as defined in
[RFC7752]

```
  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            |             Length            |
  +-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
  |     MSD       |
  +-+-+-+-+-+-+-+-+
```
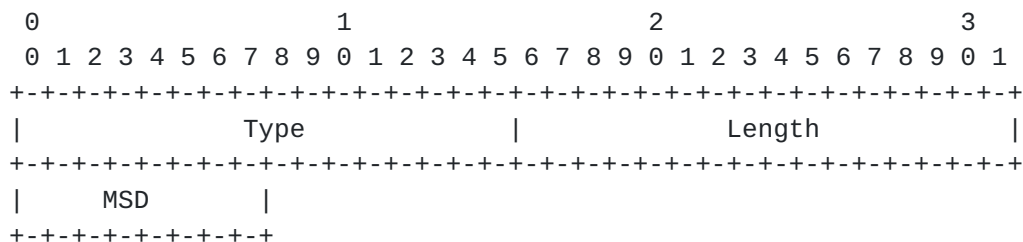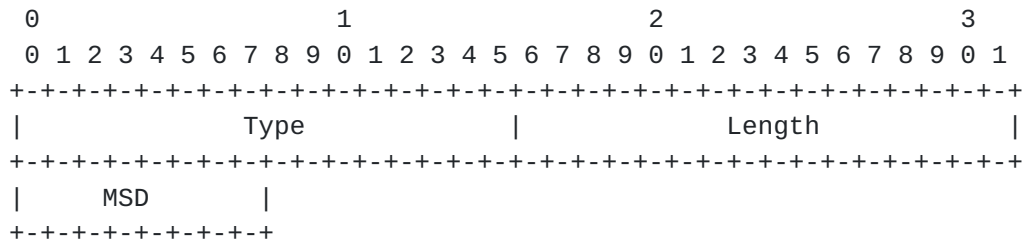
Figure 2: Link attribute format

Type : A 2-octet field specifiying code-point of the new TLV type.
Code-point: TBA (suggested 1110) from BGP-LS Node Descriptor, Link
Descriptor, Prefix Descriptor, and Attribute TLVs registry

Length: A 2-octet field that indicates the length of the value
portion

MSD: Link MSD is a number in the range of 0-254. The vaule of 0
represents lack of ability to push MSD of any depth, any other value
represents that of the link.

5. IANA Considerations

This document requests assigning 2 new code-points from the BGP-LS
Node Descriptor, Link Descriptor, Prefix Descriptor, and Attribute
TLVs registry as specified in sections 3 and 4.

6. Security Considerations

This document does not introduce security issues beyond those
discussed in [RFC7752]

7. Acknowledgements

We like to thank Nikos Triantafillis for the valuable comments.

8. References

8.1. Normative References

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