BGP-LS Extensions for Advertising Path MTU

draft-zhu-idr-bgp-ls-path-mtu-03

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Motivation

• In traditional MPLS, the Path MTU can be signaled via signaling protocols like RSVP-TE[3209] and LDP[RFC3988].

• However, there is no additional signaling to establish Segment Routing(SR) paths, so the SR tunnel cannot currently support the negotiation mechanism of the Path MTU.
  • SR information is reported by BGP-LS, and the SDN can calculate the SR Paths based on this info.

• When SIDs (Label or IPv6 address) are pushed in a packet, the packet will be dropped (in IPv6) or fragmented in forwarding since the packet size may exceed the Path MTU.

• From Operator:
  • When using leased line over multi-domains, MTU should be learned to avoid dropping packets.

• This draft is to specify the extensions to BGP Link State (BGP-LS) to carry link MTU messages.
Deployment Scenario

- RFC7752 specifies the collection of link-state and TE information and its distribution to consumers.
  - Concretely, a router maintains one or more databases for storing link-state information about nodes and links in any given area.
  - The router's BGP process can retrieve topology from these LSDBs and distribute it to a consumer, either directly or via a peer BGP speaker (typically a dedicated Route Reflector).

- The **link MTU** information is acquired through the process of collecting link state and TE information by BGP-LS.

- RFC7176 specifies the IS-IS mechanism and extensions for **link MTU Sub-TLV**.
Sub-TLV for link MTU

- [RFC7752] defines the TLVs that map link-state information to BGP-LS NLRI and the BGP-LS attribute.

- In this document, a new sub-TLV for **link MTU** is added to the Link Attribute TLV.

```
x   TYPE    - TBD
x   LENGTH - Total length of the value field, it should be 2
x   VALUE   - 2-byte MTU value of the link
```

<table>
<thead>
<tr>
<th>No. of Octets</th>
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<tbody>
<tr>
<td>+--------------</td>
</tr>
<tr>
<td>MTU value</td>
</tr>
<tr>
<td>+--------------</td>
</tr>
</tbody>
</table>

Figure 2. Sub-TLV Format for MTU

- Whenever there is a change in MTU value represented by Link Attribute TLV, BGP-LS should re-originate the respective TLV with the new MTU value. Then, the controller can calculate the Path MTU.
Changes

• Be more specific on the IGP/IS-IS extensions for link MTU.

  • “As for how IGP collects link MTU information and stores it in LSDB, which is beyond the scope of this article.” is changed to

  • “[RFC7176] specifies the IS-IS mechanism and extensions for link MTU Sub-TLV.”
Next Step

- **draft-ietf-idr-sr-policy-path-mtu-01** has been progressed and become a WG draft.
  - It defines extensions to BGP to distribute **path MTU** information within SR policies.

- **draft-zhu-idr-bgp-ls-path-mtu-03** would need to be progressed as well.
  - It specifies the extensions to BGP-LS to carry **link MTU** messages.

- We would like to call for adoption for this draft.
Thank you for your attention!