Reoptimization of Point-to-Multipoint Traffic Engineering Loosely Routed LSPs
draft-tsaad-mpls-p2mp-loose-path-reopt-00

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Outline

- **Scope and Requirements**

- **Problem Statement**

- **Signaling Extension**

- **IETF Update and Next Steps**

Scope

- **P2MP-TE LSP [RFC4875]**

- **Signaled with Loose Hop ERO or no ERO [RFC3209]**

- **Inter-domain LSP reoptimization [RFC4736]**

- **The ingress node does not have visibility of the transit/ egress area topology**

- **PCE is not used**

Requirements

- **As per P2MP-TE [RFC4875], an ingress node may:**

1. **Reoptimize the entire P2MP-TE LSP by resignaling all its S2L sub-LSP(s), i.e. all destinations, OR,**

2. **Reoptimize individual S2L sub-LSP, i.e. individual destination.**

- **[RFC4875] does not define mechanisms to reoptimize loosely routed (inter-domain) P2MP-TE LSPs.**

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RFC4736 For P2P LSP Reoptimization

- [RFC4736] defines following query/notify messages for loosely routed (inter-domain) **P2P** LSP reoptimization.

1. An ingress node sends "Path Re-evaluation Request" to query a border node.

    ➢ Ingress node sets a flag (0x20) in SESSION_ATTRIBUTES object in the Path message.

2. A border node sends "Preferable Path Exists" to notify the ingress node to trigger reoptimization (which may be solicited or unsolicited).

    ➢ Border node sends a PathErr code 25 (notify error defined in [RFC3209]) with sub-code 6.

- **[RFC4736] does not define mechanism for P2MP-TE LSP Reoptimization.**

RFC4736 For P2MP-TE LSP Reoptimization

- [RFC4736] mechanisms can be used for loosely routed (inter-domain) P2MP-TE for **individual** S2L sub-LSP (i.e. individual destination) reoptimization as follows:

  ➢ Send "Path Re-evaluation Request" query and "Preferable Path Exists" notify messages on each individual S2L sub-LSP, i.e. destination.

- However, to reoptimize the entire P2MP-TE LSP Tree, node will have to send query and notify messages on all (typically 100s of) S2L sub-LSPs.

- Such requirement can force ad-hoc methods of implementation that may produce undesired results especially when **inter-operating**. Please see the next slide for the specific issues.

- This can be avoided by extending the query/notify messages for P2MP-TE LSP **Tree** reoptimization.

RFC4736 For P2MP-TE LSP Tree Reoptimization: Issues

- Specific issues that may arise when [RFC4736] query/notify messages are used for loosely routed (inter-domain) P2MP-TE LSP Tree reoptimization:

1. A border node has to accumulate received queries on all S2L sub-LSPs (using a wait timer) and interpret them as a reoptimization request for the P2MP-TE LSP Tree.

   ➢ A border node may prematurely notify "Preferable Path Exists" for a sub-set of S2L sub-LSPs.

2. Similarly, the ingress node has to accumulate received notifications on all S2L sub-LSPs (using a delay timer) to determine to perform P2MP-TE LSP Tree reoptimization or per S2L sub-LSP reoptimization (especially for the unsolicited notifications).

   ➢ Ingress node may prematurely start reoptimization of sub-set of S2L sub-LSPs, which may result in data traffic duplication [RFC4875] [Section 14.2].

3. This method may produce undesired results when inter-operating due to timing related issues and different implementations.

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Signaling Extension For Loosely Routed P2MP-TE LSP Tree Reoptimization

- New RSVP query and notify messages are defined for loosely routed (inter-domain) P2MP-TE LSP Tree reoptimization.

1. An ingress node sends "P2MP-TE Tree Re-evaluation Request" to query a border node for a preferable P2MP-TE LSP tree.

   ➢ A new "P2MP-TE Tree Re-evaluation Request" flag is defined in Attributes Flags TLV of the LSP_ATTRIBUTES object [RFC5420] that is carried in a Path message.

2. A border node notifies "Preferable P2MP-TE Tree Exists" to the ingress node to trigger reoptimization (which may be solicited or unsolicited).

   ➢ Border node sends a PathErr code 25 (notify error defined in [RFC3209]) with new sub-code "Preferable P2MP-TE Tree Exists".

3. Any S2L sub-LSP of the LSP Tree transiting through the border node can be selected to send the query to that border node. Notification should be sent back on the S2L sub-LSP on which the query was received.

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IETF Update

- **Proposed signaling extension was originally part of the following IETF draft:**

  draft-ietf-mpls-inter-domain-p2mp-rsvp-te-lsp

- **WG chairs suggested to submit a new individual draft for this work to avoid feature creep and with simplified procedure.**

  Email snippets from Loa and Ross:

  On 2013-07-24 8:45 AM, "Loa Andersson" <loa@pi.nu> wrote:

  <snip> We don't want to feature creep our wg docs, starting with a brand new individual draft would have much better chances to succeed.

  We see it as a much better path to give the re-optimization aspects a fresh start.

  /Loa

  On 2013-07-23 11:03 PM, "Ross Callon" <rcallon@juniper.net> wrote:

  If resubmitted as an individual draft, we are free to put it in front of the WG again for consideration to be adopted as a WG draft.

  Ross

Next Steps

- **We like to make this draft a WG Document.**

- Currently this draft is published with Intended status: Informational.

- We like to get input from the WG if this document should be:

  - ➤ **Informational** and updates [RFC4736] which is Informational and was developed by MPLS WG or

  - ➤ **Standards Track** and updates [RFC4875] which is Standards Track and was developed by the CCAMP WG.

Thank You.