RSVP-TE Extensions in Support of Proactive Protection

TEAS & CCAMP WG, IETF106, Singapore

draft-lin-ccamp-gmpls-proactive-protection-00

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Overview of This Draft

➢ Background:
  • There could be some indications before a physical failure happens in a network
  • Predicting a physical failure is possible

➢ Main ideas of this draft:
  • Proposing a new protection method called **Proactive Protection**, i.e., creating protection LSP when predicting a failure on the working LSP will happen (before real failure happens)
    – RSVP-TE protocol extensions **for Proactive Protection**
    – RSVP-TE protocol extensions **for notification of a predicted failure**

(Note: Not sure whether this draft will end up in CCAMP or TEAS, will be presented in both WGs)
Overview of Predicted Failure & Proactive Protection

Predicted failure notification

Proactive protection path created

Real failure happened

Protection switch

(Optional) Protection path deleted if no failure happened

Benefits

- Protection switch is as fast as traditional 1+1 or 1:1
- Much higher resource usage than 1+1 or 1:1 (protection LSP created only when potential failure is predicted)
Protocol Extension 1: E2E Proactive Protection

**PROTECTION Object**

- **T** (Triggered E2E Proactive Protection):
  - **T = 1**: E2E Proactive Protection is required
  - When **T = 1**, LSP Flags SHOULD be 1+1 or 1:N

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**Path Message**

- **A = 1 (E2E Proactive Protection)**
- **P = 0** (Working / Protected LSP)
- LSP Flags = 1+1 or 1:N

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**Initial stage:**

- **W**
- **A**
- **B**
- **C**
- **D**

**When receiving “predicted failure” notification:**

- **T = 1 (E2E Proactive Protection)**
- **P = 1** (Protecting LSP)
- LSP Flags = 1+1 or 1:N

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Start failure prediction, triggered by “T=1”
**Protocol Extension 2: Proactive Segment Protection**

<table>
<thead>
<tr>
<th>PROTECTION Object</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>A</strong> (proActive Segment Protection):</td>
</tr>
<tr>
<td>• <strong>A = 1</strong>: Proactive Segment Protection is required</td>
</tr>
<tr>
<td>• When <strong>A = 1</strong>, Seg. Flags SHOULD be 1+1 or 1:N</td>
</tr>
</tbody>
</table>

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**Initial stage:**
- **A = 1 (Proactive Segment Protection)**
- **P = 0** (Working / Protected LSP)
- Seg. Flags = 1+1 or 1:N

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**When receiving “predicted failure” notification:**
- **A = 1 (Proactive Segment Protection)**
- **P = 1** (Protecting LSP Segment)
- Seg. Flags = 1+1 or 1:N

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![Diagram of proactive segment protection](image-url)
Protocol Extension 3: Predicted Failure Notification

- Error Code = 25: "Notify Error" (RFC3209)
  - New Error Sub-code = TBA: "Notify Error/LSP Local Predicted Failure"
- New TLV in ERROR_SPEC Object

**Notify message:**
- Error Code = 25
- Error Sub-code = “predicted failure”
- Time = t6 (will probably happen before t6)

- The source node MAY delete the protection LSP after t6 if no real failure happens
- Whether & when to delete the protection LSP is based on local policies
Next Steps

- Need to decide whether to continue this work in CCAMP or TEAS: Chairs to give us advice
- Get feedbacks from the WG level and move forward
Thank you