RSVP Setup Protection

draft-shen-mpls-rsvp-setup-protection-00

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Overview

What is setup protection?

- A mechanism that protects LSPs during initial Path message signaling time.
- Based on RSVP facility-backup fast reroute.

Why setup protection?

- To improve the chances of establishment for LSPs whose explicit paths (EROs) are:
  - Pre-computed;
  - Statically configured;
  - Computed based on a topology that may not reflect the state of every link/node in the network.

RSVP Fast Reroute

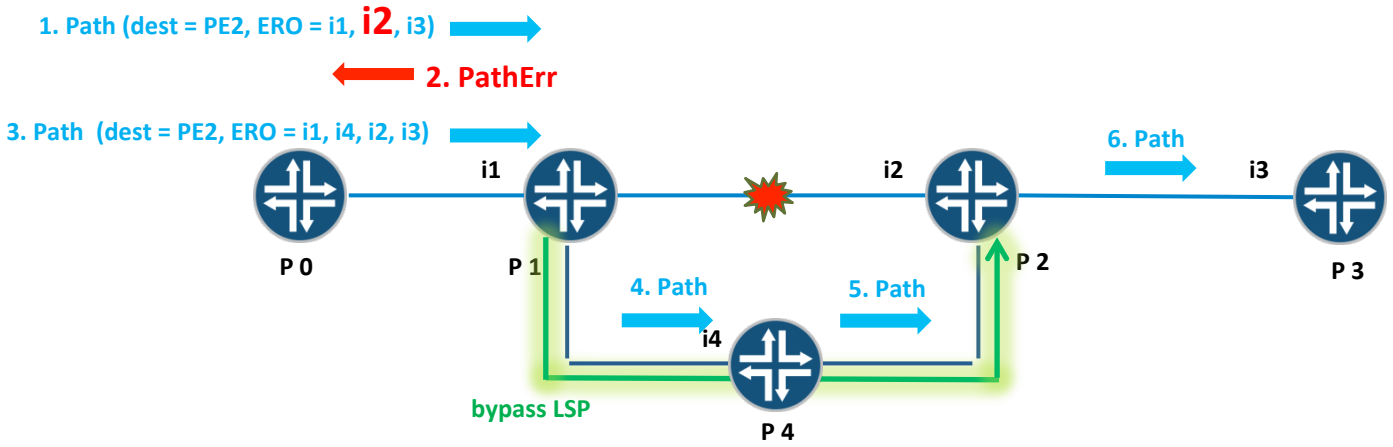
Establishment:

1. Signaling of protected LSP
   - Path message signals the desired path (ERO).
   - Resv message distributes labels and records route (RRO).
2. Setting up of local protection on each router
   - Next-hop address and label (Resv RRO).
   - Next-next-hop address and label (Resv RRO).

Observation:

- Local protection can only be established after the protected LSP has been set up.

Problem Description



What will happen, if there is a link/node failure along the path when the initial Path message is being signaled?

Typical behavior today:

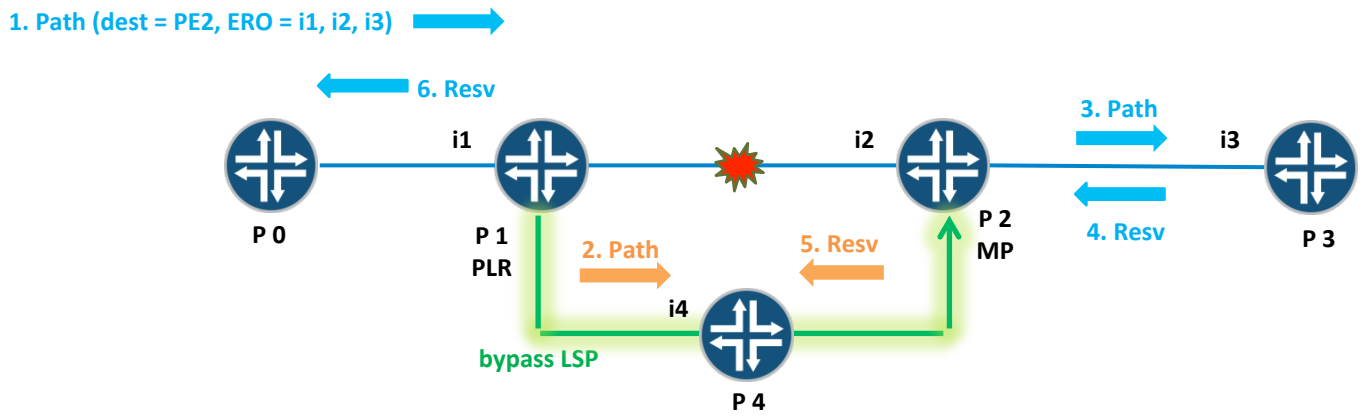
- RSVP sends PathErr.
- IGP floods update-to-date TE info.
- Ingress router computes a new path around the failure, and signals the new path.
- Existing bypass LSP is ignored.

Problem Description (cont.)

Issues:

- If the desired path is pre-computed or fixed, an alternative path may not be possible.
- Control plane convergence and path re-computation may introduce a significant delay, which can impact LSP signaling performance.
- Existing bypass LSP will not be used, even if it is the preferred alternative path.

Setup Protection



PLR (point of local repair) reroutes LSP through an existing bypass LSP.

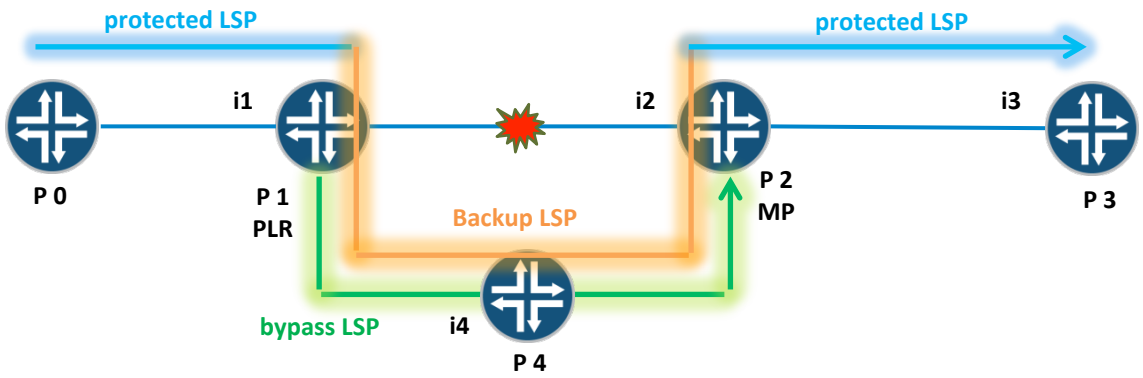
- Detects downstream link/node failure based on strict ERO.
- Searches for an existing bypass LSP that is protecting the failed link/node.
- Signals a backup LSP through the bypass LSP, using “sender template specific” method.

MP (merge point) terminates the backup LSP, and re-creates the protected LSP.

Two new LSP Attribute TLVs are defined:

- Protected LSP Sender IPv4 Address TLV.
- Protected LSP Sender IPv6 Address TLV.
- Carried by the LSP_REQUIRED_ATTRIBUTES of Path message of the backup LSP.
- Used by MP for recreating the protected LSP.

Setup Protection (cont.)



The LSP appears as if it was originally set up along the desired path and failed over to the bypass LSP.

- PLR sends Resv with “local protection available” and “local protection in use” in RRO.
- PLR sends PathErr of “tunnel locally repaired”.

PLR may perform local reversion after the failed link/node is restored.

Next Steps

- Questions and comments?
- WG adoption?