RSVP Setup Protection

draft-shen-mpls-rsvp-setup-protection-02

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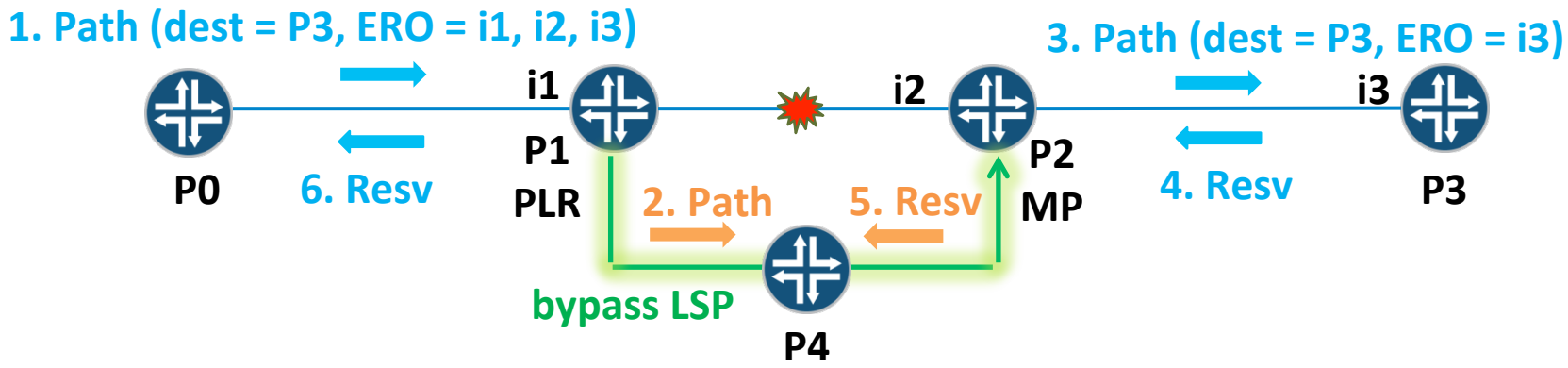
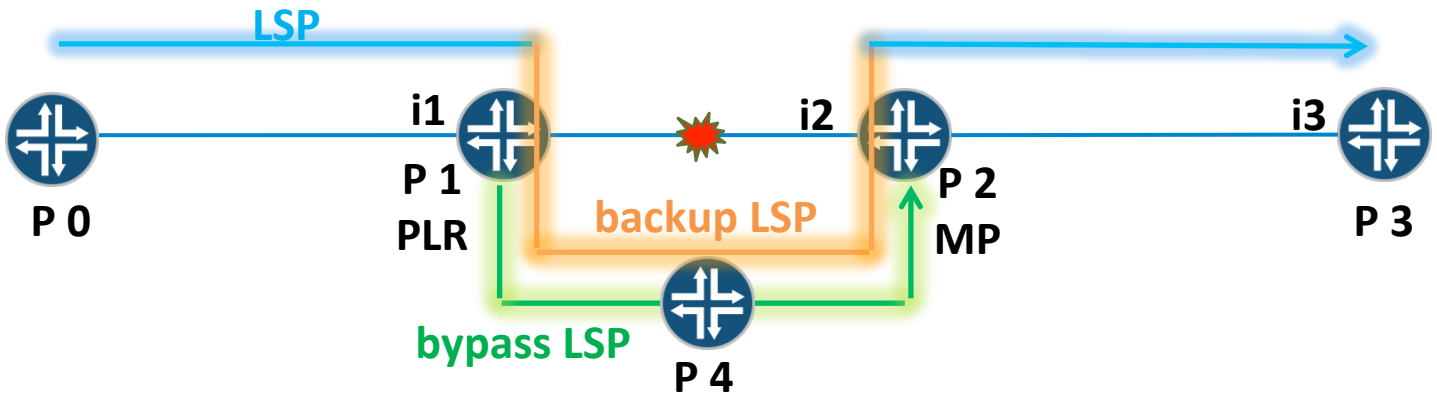
The idea



- An LSP is signaled with an ERO of strict hops.
- If a link/node is in failure state, the router upstream adjacent to the failure (i.e. PLR) can reroute the LSP by signaling a backup LSP through a existing bypass LSP.
  - Detects failure based on the strict ERO.
  - Finds an existing bypass LSP that is protecting the failed link/node.
- Egress of the bypass LSP (i.e. MP) terminates the backup LSP, re-creates the original LSP, and signals it towards destination.
- LSP is protected during setup time, i.e. initial Path message signaling.

The established LSP



- LSP appears as if it was originally set up along the desired path and then failed over to the bypass LSP.
- PLR's notification to ingress:
  - PLR sets "local protection in use" flag in Resv.
  - PLR sends PathErr of "tunnel locally repaired".
- Benefits:
  - The LSP is established with a minimal delay.
  - Path re-computation and re-signaling may follow up at a slower pace, if applicable.

Use Cases

1) LSPs with pre-defined strict EROs that cannot be modified or recomputed by ingress on the fly.
   - Statically configured.
   - Computed offline, based a topology that assumes no network failure.
2) LSPs with a strict requirement for setup time.
   - Cannot tolerate the delay introduced by PathErr propagation, TE info update, path re-computation, re-signaling, etc.
   - Solution: First bring up LSP; Then re-compute and re-signal path, and resolve network failure.
3) Traffic sharing between sibling sub-LSPs of P2MP LSP.
   - If a sibling sub-LSP is already been protected by a bypass LSP, the new sub-LSP being signal shall also use the bypass LSP.

Extension to RSVP

1) A "**setup protection desired**" flag for Attribute Flags TLV of LSP_ATTRIBUTES object.
2) Two new LSP Attribute TLVs for conveying the original source IP address of protected LSP from PLR to MP.
   - **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.

Next Steps

- Comments?
- WG adoption?