

Extensions to Resource Reservation Protocol For Fast Reroute of Traffic Engineering GMPLS LSPs

draft-tsaad-ccamp-rsvpte-bidir-lsp-fastreroute-05

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Outline

- **Requirements and Scope**
- **Summary and Update since Previous IETF**
- **Next Steps**

Requirements and Scope

- **Requirements:**
 - 1. Service Providers currently using RSVP-TE signaling would like to deploy packet tunnels using GMPLS signaling for bidirectional tunnels.**
 - 2. Fast reroute [RFC4090] is widely deployed in packet RSVP-TE networks today and hence it is preferred for GMPLS packet tunnels.**
 - 3. Motivation for fast reroute is to leverage the existing mechanisms for failure detection and restoration.**
- **Scope of TE LSP:**
 - 1. Signaled using GMPLS [RFC3473]**
 - 2. Unidirectional or bidirectional**
 - 3. Packet Switch Capable (PSC)**
 - 4. Using FRR procedures [RFC4090]**
- **Note: FRR procedures are not modified for unidirectional GMPLS packet tunnels.**

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Summary for Bidirectional Tunnels

- 1. Need mechanism to obtain upstream merge-point label.**
 - Upstream PLR obtains the upstream MP label from the recorded labels in the RRO of the RSVP Path message.
- 2. The upstream and downstream PLRs may independently assign different (for NHOP/NNHOP) FRR bypass tunnels in the forward and reverse directions.**
 - Coordinate the FRR bypass tunnel selections between downstream and upstream PLRs using new Bypass Assignment RRO subobject.
- 3. After FRR activation (for NHOP/NNHOP bypass), downstream PLR may timeout RSVP soft-state with in-band signaling. Signaling should follow the path of the traffic flow.**
 - Upstream PLR needs to reroute Resv (and traffic) over FRR bypass tunnel in the reverse direction.

Update since IETF-89 London

- 1. Scope is GMPLS signaled packet tunnels**
- 2. Cover both unidirectional and bidirectional tunnels**

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Next Steps

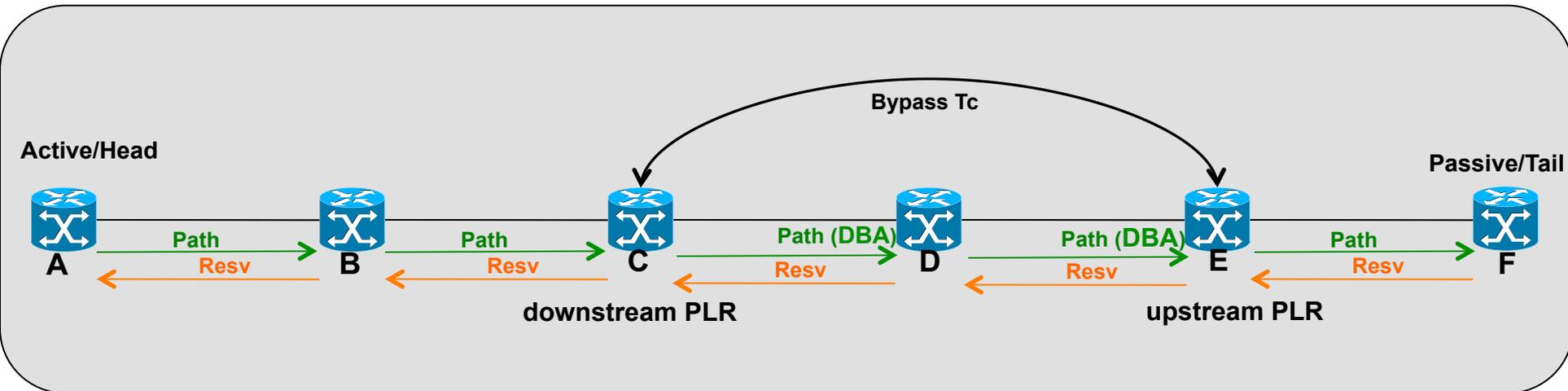
- **Draft has been stable.**
- **Welcome comments from the WG.**
- **Request to make this draft a WG Document.**



Thank You.

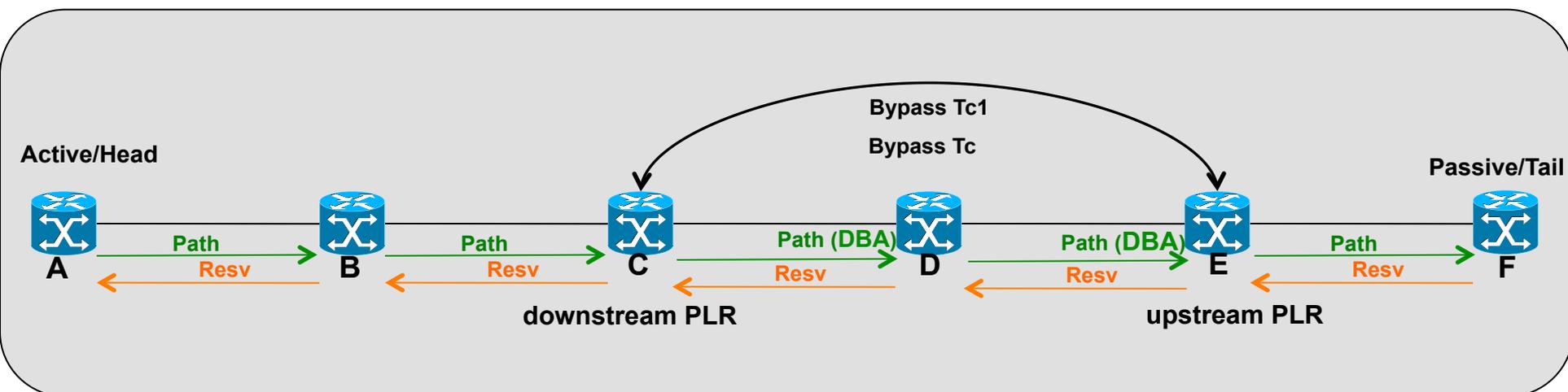
Backup Slides

Upstream PLR and Upstream MP Label



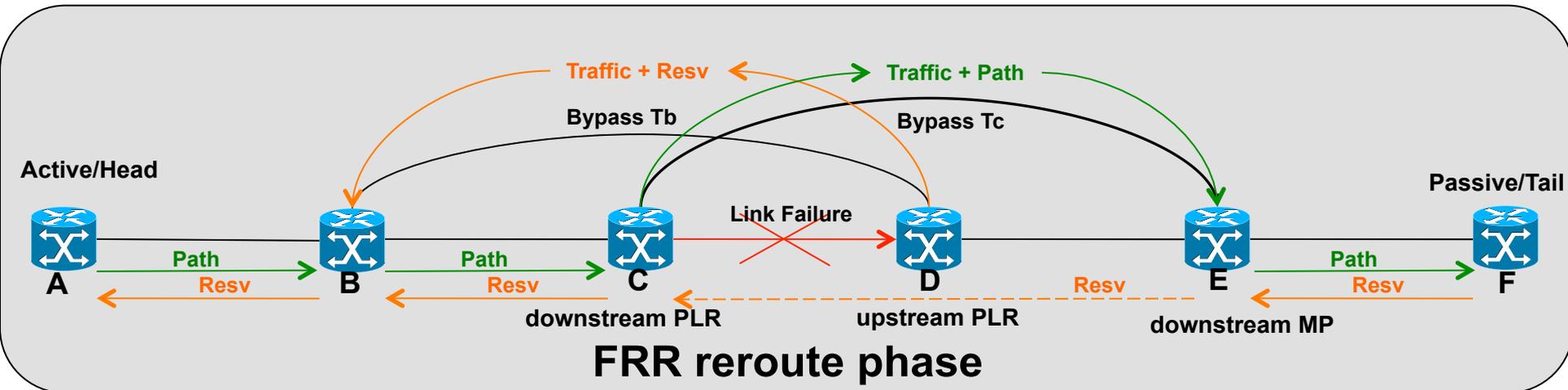
1. Upstream PLR obtains the upstream MP label from the recorded labels in the **RRO of the RSVP Path** message.
2. Downstream PLR obtains the downstream MP label from the recorded labels in the RRO of the RSVP Resv message [RFC4090].

Bypass Assignment Coordination (NHOP/NNHOP bypass)



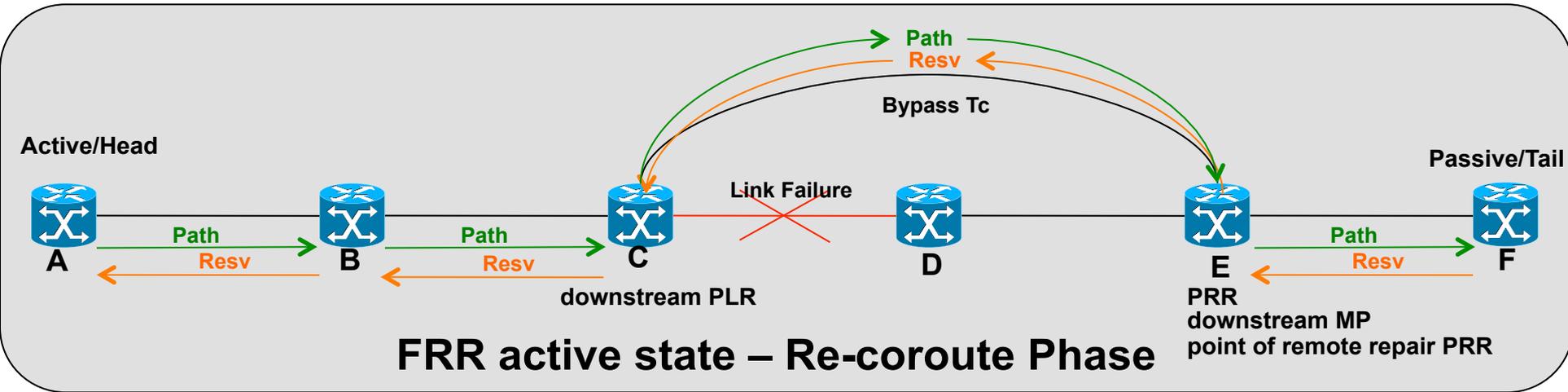
1. Define a new **Bypass Assignment (BA) subobject in RRO** that identifies a bidirectional bypass tunnel assigned by downstream PLRs:
 $\langle \text{Bypass Assignment subobject} \rangle ::= \langle \text{Bypass Tunnel ID} \rangle$
2. Source address for bypass is derived from node-id subobject in RRO [RFC4561].
3. BA subobject is added in the **RRO of the Path** message every time downstream PLR assigns or updates the bypass tunnel.
4. Upstream PLR uses the recorded bypass tunnel to match the assignment.

FRR Reroute Phase (NNHOP bypass)



1. The downstream PLR C and upstream PLR D independently trigger fast reroute procedures to redirect traffic onto respective bypass tunnels.
2. The downstream PLR C reroutes RSVP Path state onto the bypass tunnel Tc [RFC4090]. The upstream PLR D reroutes RSVP Resv state onto bypass tunnel Tb.
3. At this point, **node D stops receiving RSVP Path** and **node C stops receiving RSVP Resv** refreshes for the protected bidirectional tunnel.
4. This eventually leads to Path and Resv state timeouts for the protected bidirectional tunnel.

FRR Re-coroute Phase (NNHOP bypass)



1. Once the traffic is protected (fast FRR switched), now need a way to get the primary LSP co-routed in both directions to avoid timeouts.
2. Downstream MP node E assumes the role of **Point of Remote Repair (PRR)** (upon receiving Path message over bypass tunnel Tc).
3. Node E finds the reverse bypass tunnels (Tc) that terminates on downstream PLR, node C.
4. Node E moves traffic in the reverse direction and Resv to bypass tunnel Tc.
5. Node D is now completely out of the primary tunnel path (bypassed).



Thank You.