RSVP-TE Extensions For Fast Reroute of Bidirectional Co-routed LSPs

draft-tsaad-ccamp-rsvpte-bidir-lsp-fastreroute-00.txt

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Outline

- **Requirements and Scope**

- **Problem Statement**

- **Solution**

- **Next Steps**

Requirements and Scope

- **Scope of Protected LSP:**

  - **Bidirectional**

  - **Co-routed**

  - **Packet Switch Capable (PSC)**

  - **Signaled using GMPLS signaling [RFC3471], [RFC3473].**

- **Requirements:**

  - **Service Providers should be able to share bypass tunnels for various types of services, including unidirectional and bidirectional (G)MPLS tunnels.**

  - **Bypass tunnels can be unidirectional or bidirectional.**

  - **Bidirectional bypass tunnels may be signaled using GMPLS signaling or using associated signaling procedures.**

  - **Bidirectional bypass tunnels may be co-routed or non-corouted.**

  - **PLR should be able to use any (existing) mechanism for failure detection.**

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Terminology
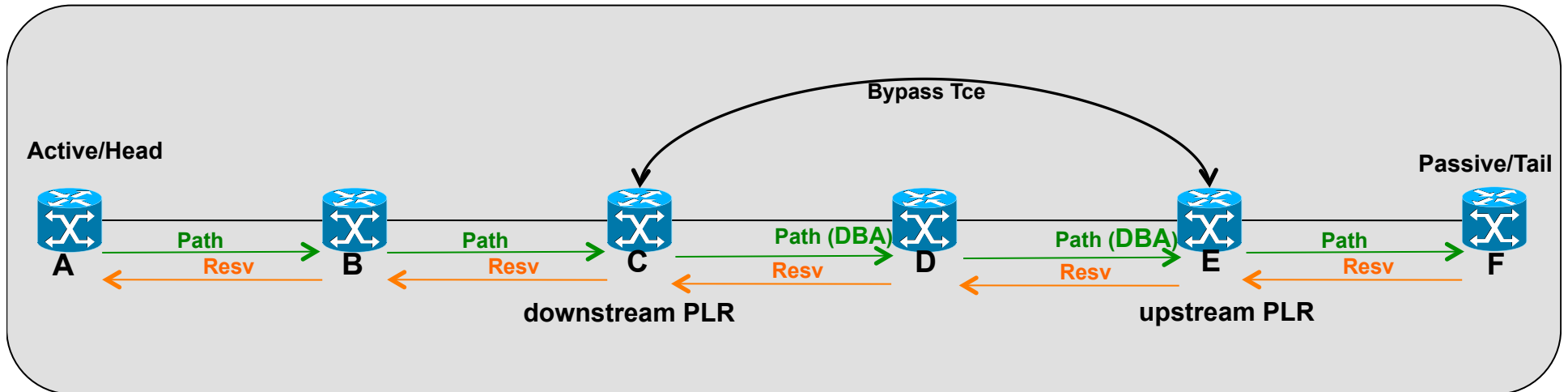
- **Upstream PLR: It detects local failure in upstream direction, and re-routes traffic/RESV when FRR becomes active, e.g., node E.**

- **Downstream PLR: It detects local failure in downstream direction, and re-routes traffic/PATH when FRR becomes active, e.g., node C.**

Problem Statement

1. **The upstream and downstream PLRs may independently assign different bypass tunnels in the forward and reverse direction**

   ➢ **Need means to coordinate the bypass tunnel selection between downstream and upstream PLRs**

2. **After FRR activation data traffic and signaling may flow over asymmetric paths in the forward and reverse direction in the following use cases:**

   ➢ **If upstream and downstream PLRs assign different bypass tunnels.**

   ➢ **Even if we have upstream and downstream PLRs assign same (bidir) bypass tunnel, in case of NNHOP bypass and link failure.**

   For in-band signaling this may cause RSVP soft-state timeout

   ➢ **Need mechanism to "re-coroute" LSPs after FRR activation.**

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Upstream PLRs and MP Label
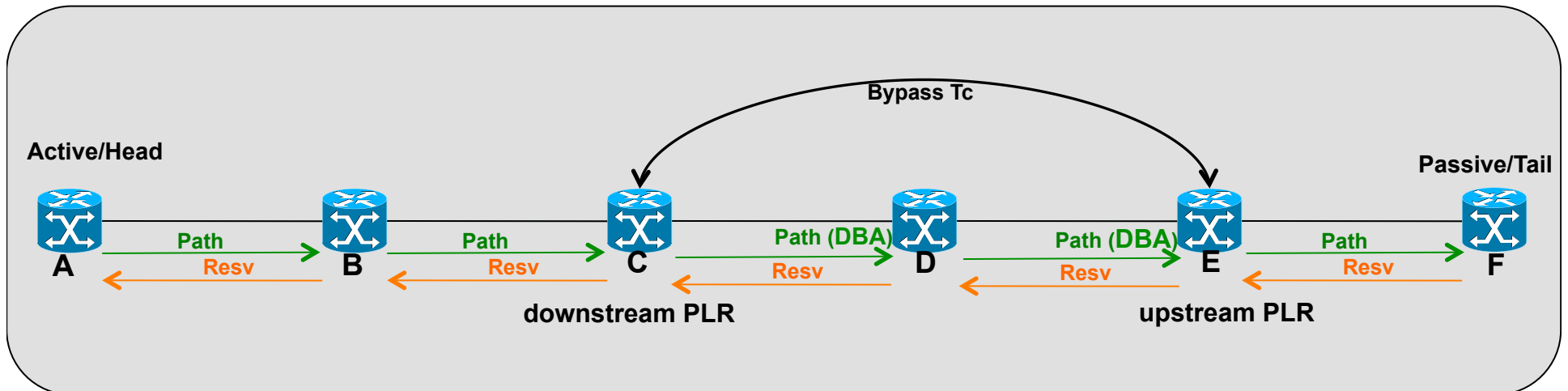
- **Upstream PLR obtains the upstream MP label from the recorded label in the RRO of the received RSVP Path message**

- **Downstream PLR obtains the downstream MP label from the recorded label in the RRO of the received RSVP Resv message [RFC4090]**

Bypass assignment coordination
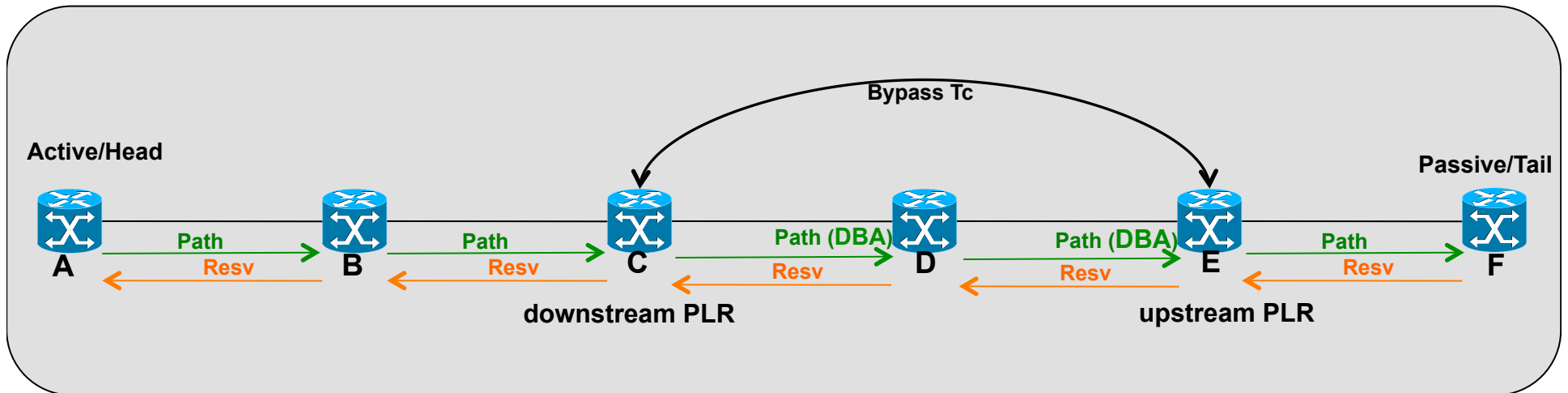
- **Define a new Downstream Bypass Assignment (DBA) object that identifies a bidirectional bypass tunnel assigned by downstream PLR:**

   <Downstream Bypass Assignment> ::=

   <Bypass Tunnel ID><Bypass Source Address><Bypass Destination Address>

- **DBA object is sent in the RSVP Path message every time the downstream PLR assigns or updates the bypass tunnel assignment so the upstream PLR may reflect the assignment too**

Bypass assignment coordination (Cont.)
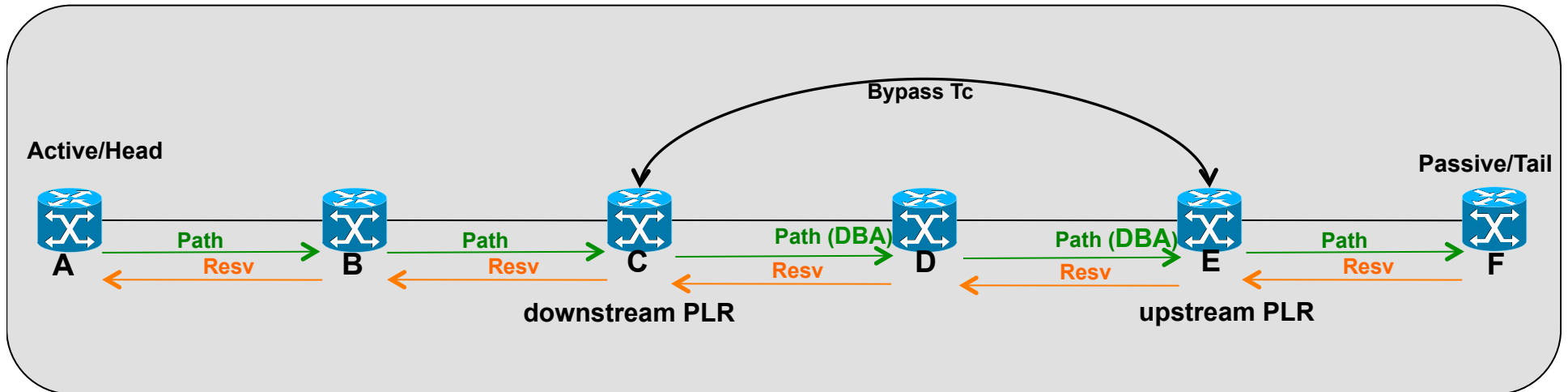
- **Upstream PLR assigns the matching bidirectional bypass tunnel (from DBA) in the reverse direction and removes the object before forwarding message downstream**

- **In absence of DBA object, a upstream PLR can independently assign a bypass tunnel in the reverse direction**

# Link Failure With Node-protection Bypass Tunnels (Reroute Phase)

FRR ready state
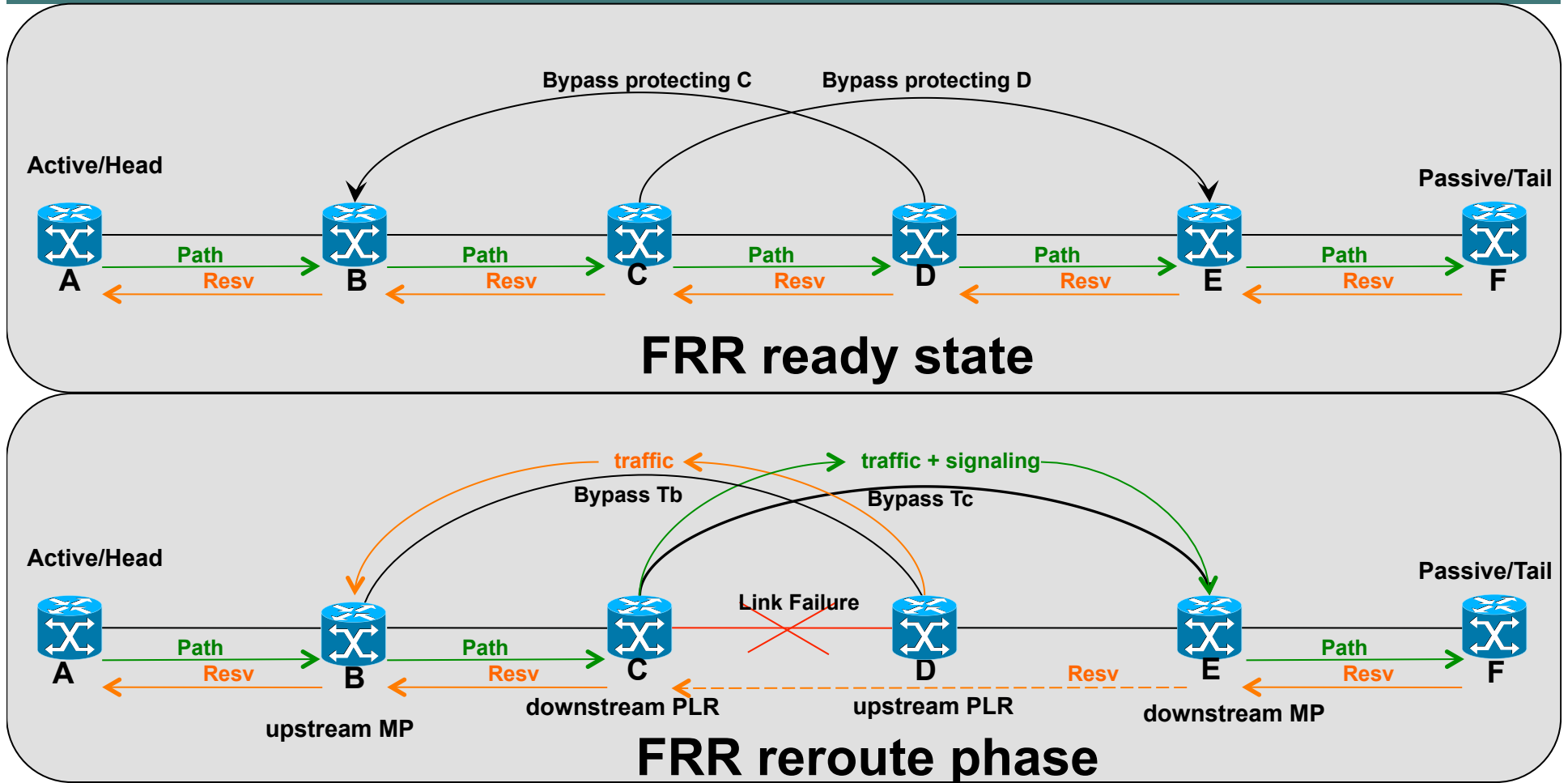
FRR reroute phase

The downstream PLR C and upstream PLR D independently trigger fast reroute procedures to redirect traffic onto respective bypass tunnels

Reroute Phase – cont.

FRR reroute phase
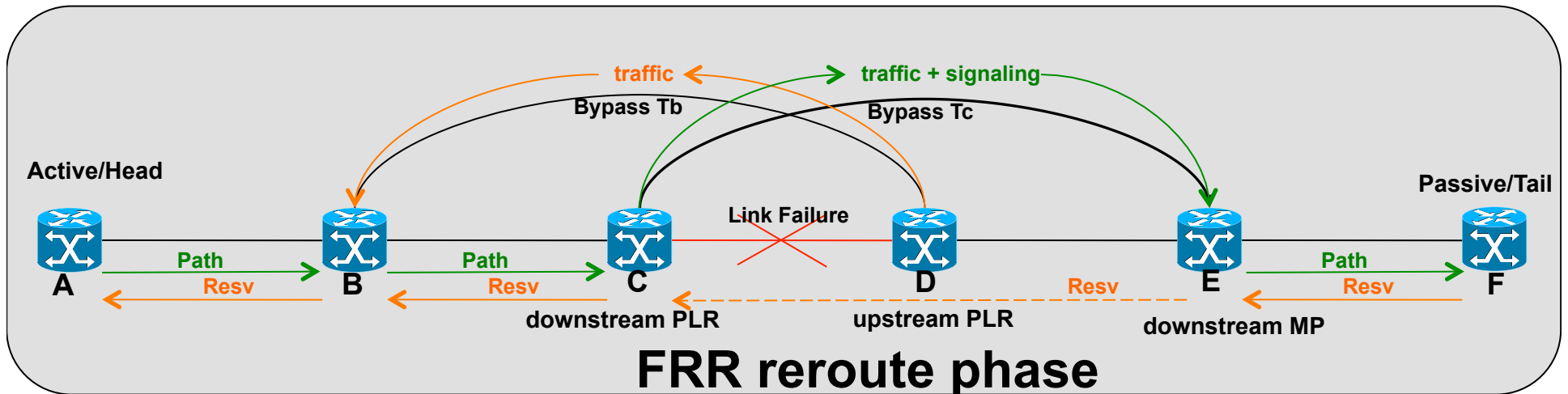
- **The downstream PLR C also reroutes RSVP Path state onto the bypass tunnel Tc [RFC4090].**
- **At this point, router D stops receiving RSVP Path refreshes for the protected bidirectional LSP.**
- **This eventually lead to state timeouts for the protected LSP.**

Re-coroute phase

FRR active state – Re-coroute Phase
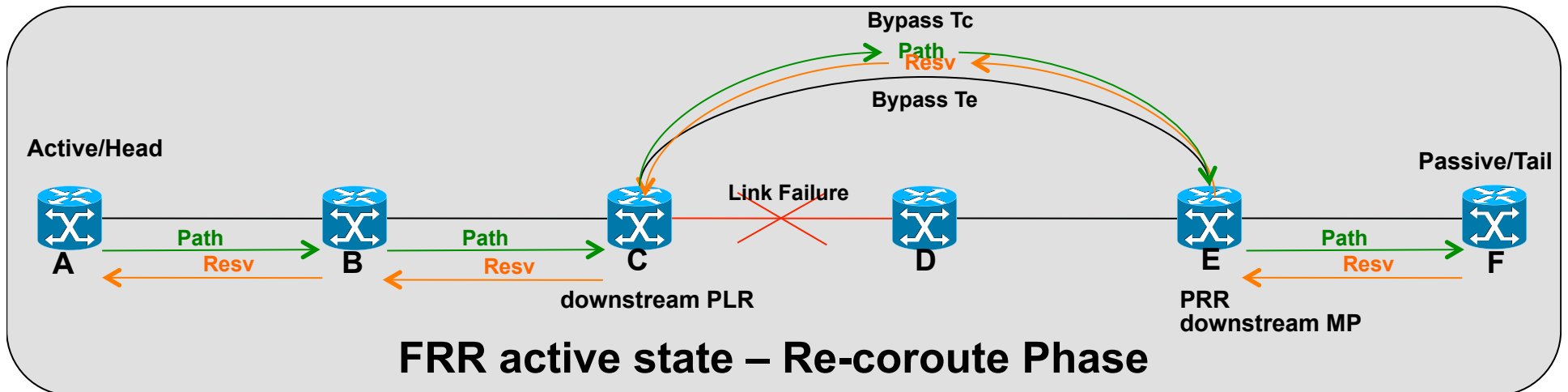
- Once the traffic is protected (fast FRR switched), now need a way to get the primary LSP symmetrical in both directions.

- Node E assumes the role of Point of Remote Repair (PRR).

- Finds or provisions a reverse tunnels (Te) that terminates on downstream PLR, C.

- Moves the traffic in reverse direction to Te.

- Node D is now completely out of the LSP path (bypassed)

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Next Steps

- **Authors of this draft and http://tools.ietf.org/html/draft-bhatia-mpls-rsvp-te-bidirectional-lsp-01 has have intention to merge the drafts.**

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

Thank You.