MPLS Egress Protection Framework
draft-shen-mpls-egress-protection-framework-04

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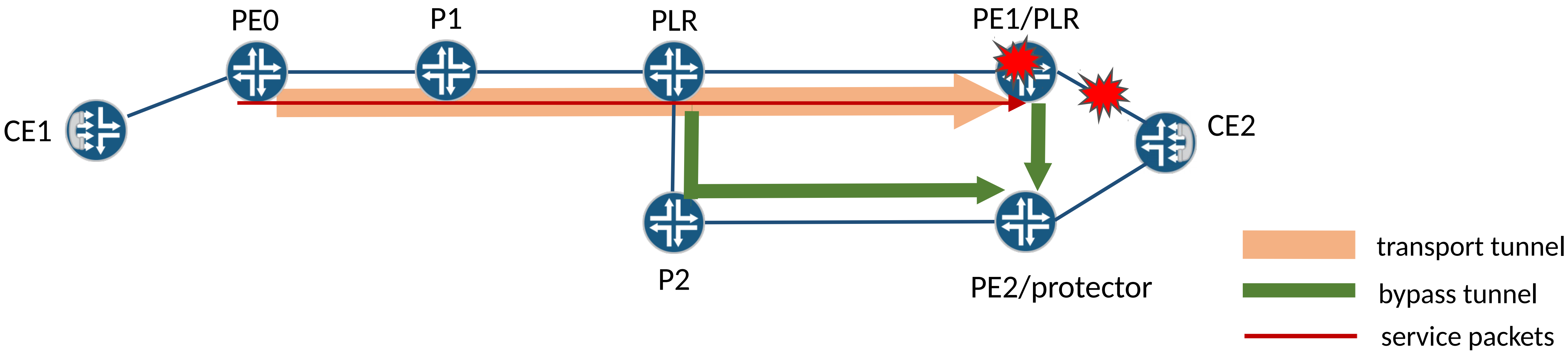
Egress Protection

- Egress failures - egress node and egress link (aka. PE-CE link, AC).
- Egress protection – FRR for protecting MPLS tunnels and services against egress failures.
  - Equivalent to FRR for transit link/node failures, e.g. RSVP, LDP, LFA.
  - Driven by local failure detection and local repair.
  - Complements global repair and topology convergence.



Protection at Service and Transport Levels

- Egress link failure is a service-level failure.
  - Service packets are unable to reach the service destination.
- Egress node failure is a two-level failure.
  - Transport tunnel - MPLS packets are unable to reach the egress router.
  - Each service carried by the tunnel - Service packets are unable to reach the service instance.
- Egress protection must be provided at both levels.
  - Transport level – PLR redirects packets to a “protector”.
  - Service level – Protector hosts “protection service instances” to forward service packets towards service destinations.

Goals

- Provide a generic and unified solution for egress protection.
  - Multi-transport and multi-service
  - Minimized complexity
- Provide a framework and guidelines towards services.
  - Service protocol extensions, if needed, should be addressed by separate drafts on a per-service-type basis.
    - ✓ PWE3 – RFC 8401
    - ✓ Layer-3 VPNs – section 8 of the draft

Goals (cont.)

- Must support P2P tunnels, as well as P2MP and MP2P tunnels by treating sub-LSPs as P2P.
- PLR must be agnostic with services and service labels, and maintain protection state on a per-tunnel basis, rather than per-service-label basis.
- PLR must be able to use local routing/TE info to resolve bypass tunnel.
- Protector must be able to perform context-based IP forwarding or label switching for rerouted service packets.
- Must work seamlessly with transit link/node protection mechanisms.

Building Blocks

- Router at PLR (point of local repair)
  - Penultimate hop router in egress node protection.
  - Egress router in egress link protection.
  - Pre-establishes a bypass tunnel to protector.
- Protector
  - Points bypass tunnel to special label table and IP forwarding table, corresponding to the label space and IP address space of protected egress router, respectively.
- Bypass tunnel
  - PLR reroutes packets to protector via a bypass tunnel, with service label intact.
  - UHP tunnel
- Context ID and context-based forwarding
  - Protector forwards service packets to ultimate service destinations, by using a label table and IP forwarding table indicated by a context ID.

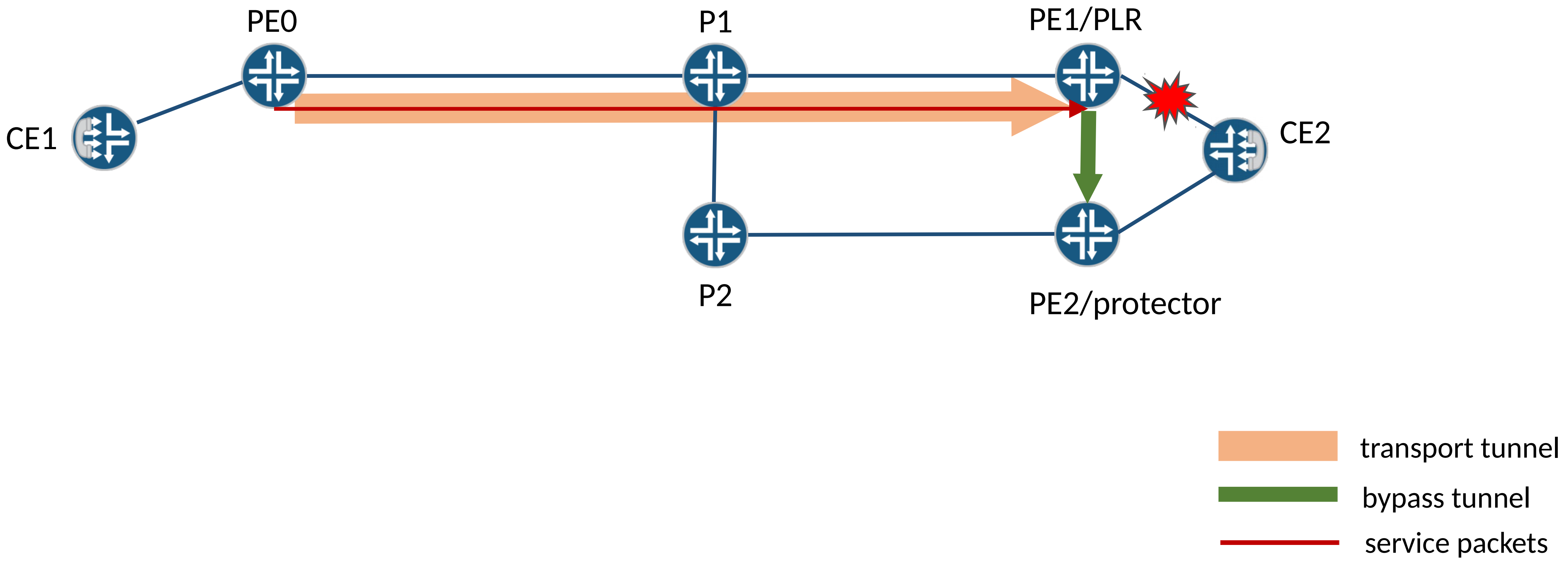
Update 1 - New Co-authors

- Hannes Gredler (hannes@rtbrick.com)
- Carsten Michel (c.michel@telekom.de)

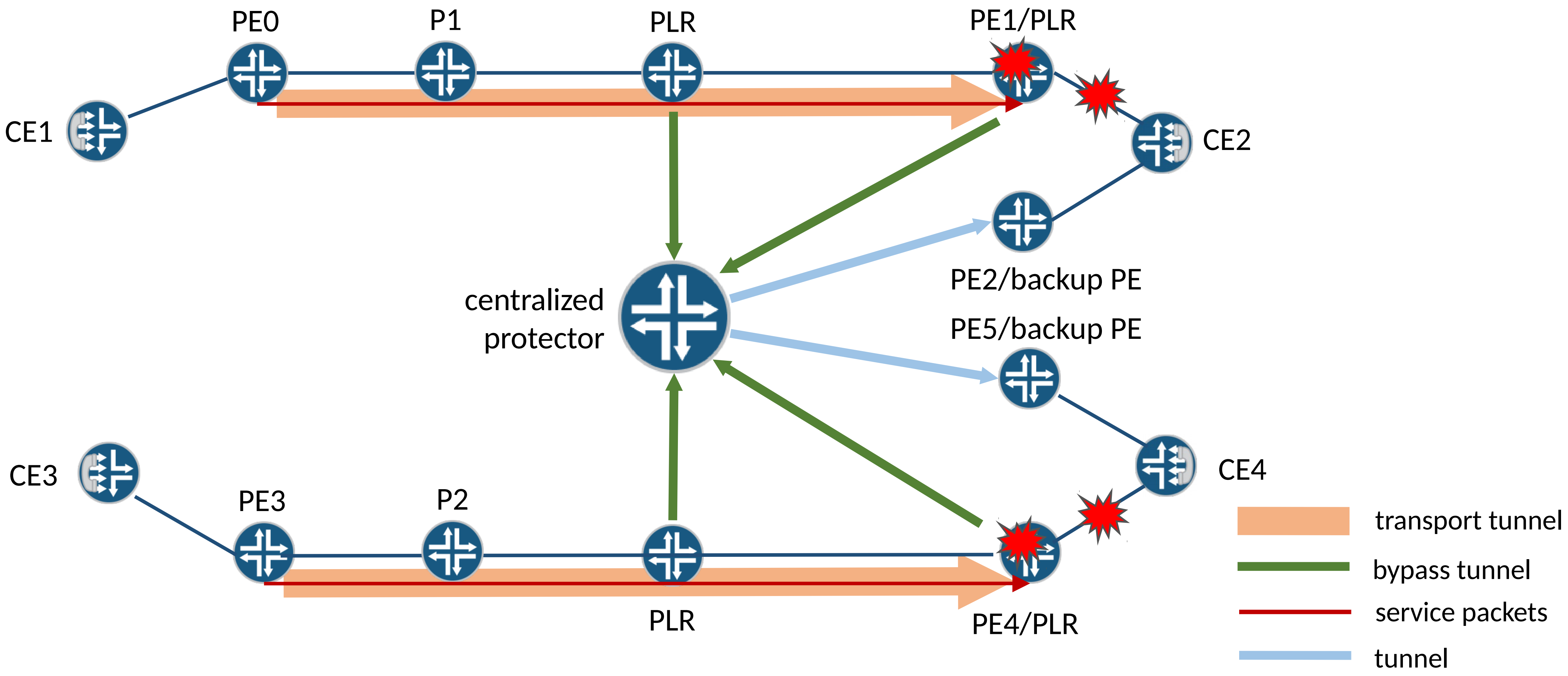
Update 2 – Allow Tunnel Protocol Extensions

- The draft should work with existing tunnel protocols.
- Tunnel protocol extensions are not precluded, if they can facilitate egress protection establishment.
    - Example: *draft-ietf-teas-rsvp-egress-protection*

Update 3 – Egress Link Protection



Update 4 – Centralized Protector Model



Next Steps

- Welcome comments.
- As the draft is mature, we’d like to request for WG adoption.