RSVP-TE P2MP Signaling Optimization for RMR

draft-zzhang-mpls-rmr-rsvp-p2mp-01

TEAS WG

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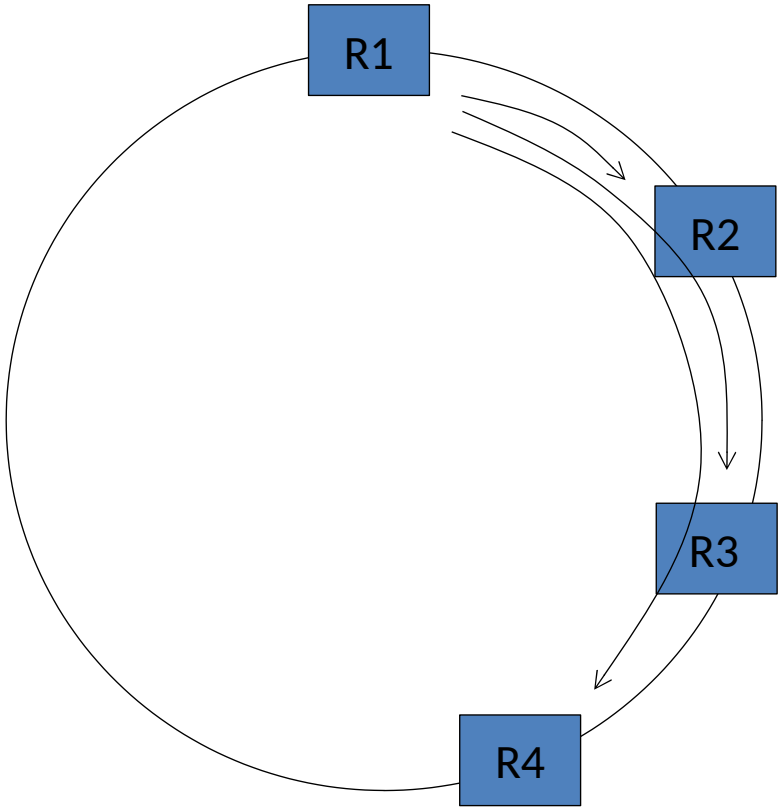
Traditional RSVP-TE P2MP Signaling

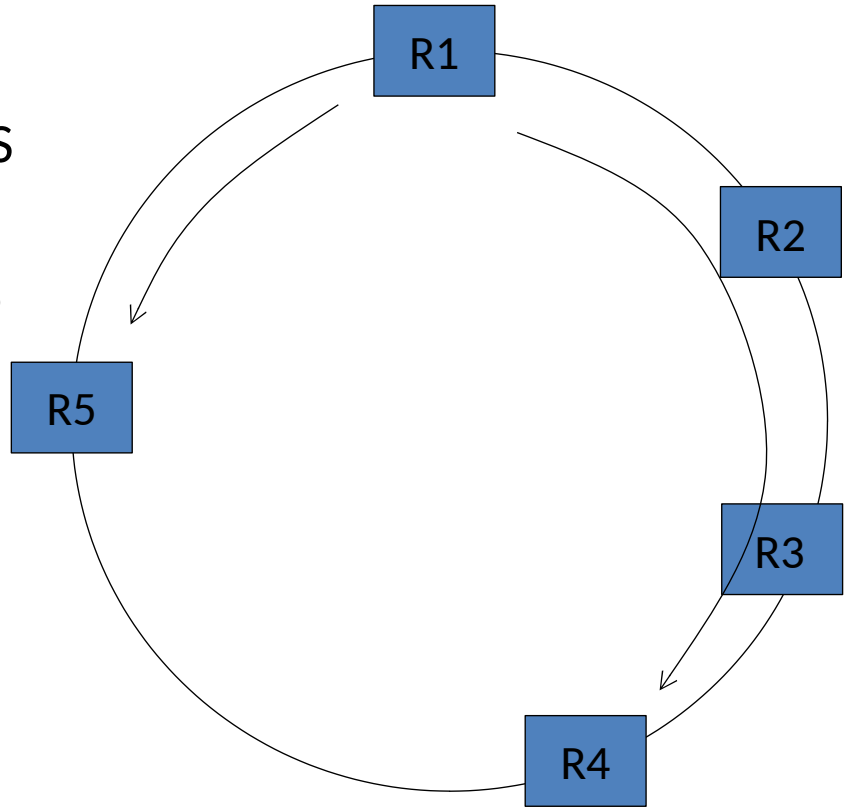
- One sub-LSP for each leaf
  - Lots of redundant PATH/RESV state near the ingress
  - Each leaf is explicitly listed
- Each sub-LSP optionally has its o wn Explicit PATH
- Extra state for tunnel protection

All these could be optimized away in case of RMR



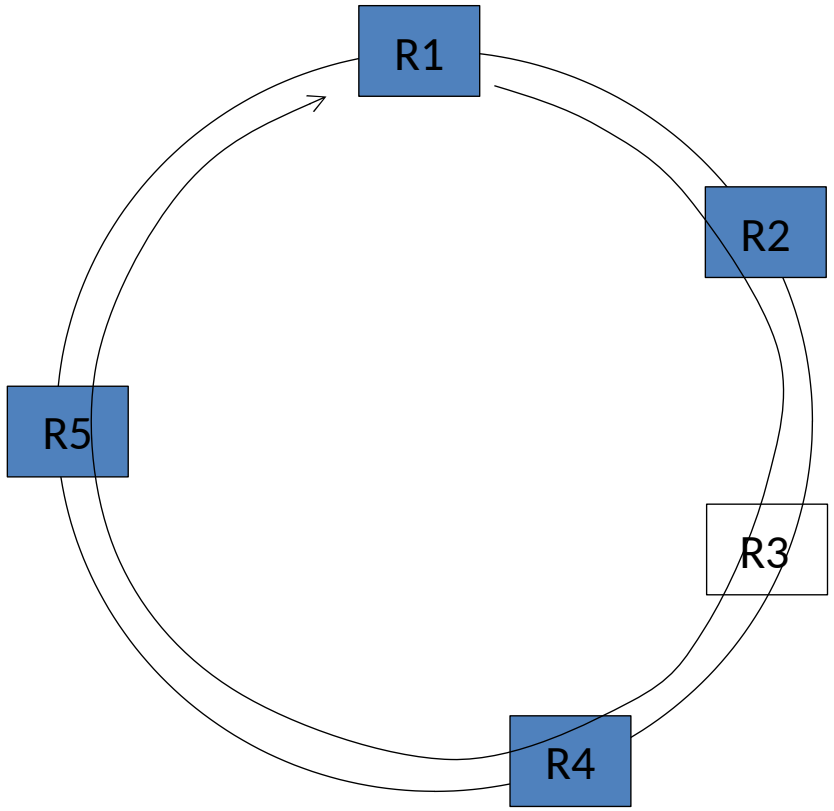
Optimizations for RMR

- A single LSP
  - A single pair of PATH/RESV state on e ach node of the tunnel
  - Ingress could decide to use a single LS P in one direction for all leaves
- Or optionally two sub-LSPs in oppo site directions
  - To reach different set of leaves
  - Not for protection purposes
- No explicit path needed
  - Just send along the ring in the specifi ed direction



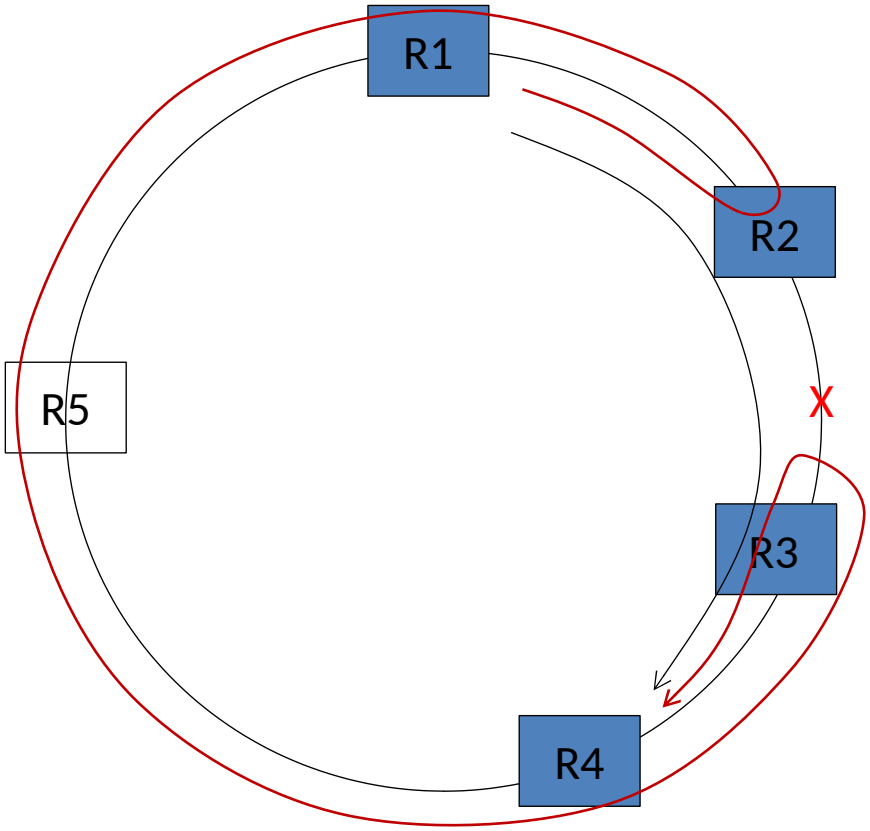
Optimizations for RMR

- Implicitly allowed leaves
  - PATH messages sent along the rin g back to ingress
    - Ingress itself listed as a leaf
  - Leaves decide by themselves
    - Send RESV to PHOP
- Both explicitly listed leaves and implicitly allowed leaves are all owed
- Traffic stops at the last leaf
  - The last leaf does not have RESV state from downstream



Optimizations for RMR

- No additional signaling or state for protection
- Before global repair finishes aft er a failure:
  - Don’t send RESV tear on failure
  - On link failure, PLR tunnels traffic to next node via a unicast ring LSP in the other direction
  - On node failure, PLR tunnel traffic s traffic to next next node
  - Traffic then continues from there on



Live-live Protection

- Live-live protection not needed in most situations
  - Traffic tunneled via Ring LSP upon failure
- Live-live protection can be easily achieved for missio n-critical scenarios
  - If duplication removal is done by application
  - Just set up two opposite-direction sub-LSPs to reach all lea ves and send traffic in both directions
  - Each leaf will deliver duplicate traffic (received in two direc tions) to application
  - No switchover upon failure detection; just global repair

MP2MP with RMR

- PATH message could carry a label used for downstrea m nodes to send traffic upstream
- Ingress node sends received upstream traffic downstr eam in the other direction
  - If two sub-LSPs in different directions are used

Related RSVP Objects

- RMR Object in PATH messages indicating RMR optimi zation is used:
  - Ring ID
  - Ring direction
- <S2L Sub-LSP Descriptor List> lists:
  - Explicit leaves
  - Ingress itself in case of implicit leaves
- PATH messages could carry a label object for MP2MP tunnels

The Plan

- Seek comments
- Request WG adoption