

Segment Routing Use Cases @ DT

Network Complexity, Disjoint Paths, QoS/Service Based Routing.



Reducing Complexity in the Network Architecture

Multi Protocol Label Switching based on RSVP:

- Complex label and path setup protocol (RSVP).
- Physical as well as logical links need to be provisioned, monitored, and maintained.
- Overlay topology.

Multi Protocol Label Switching based on LDP:

- Label distribution protocol (LDP) in addition to IGP.
- LDP needs to be synchronized with IGP.

Segment Routing (with MPLS labels):

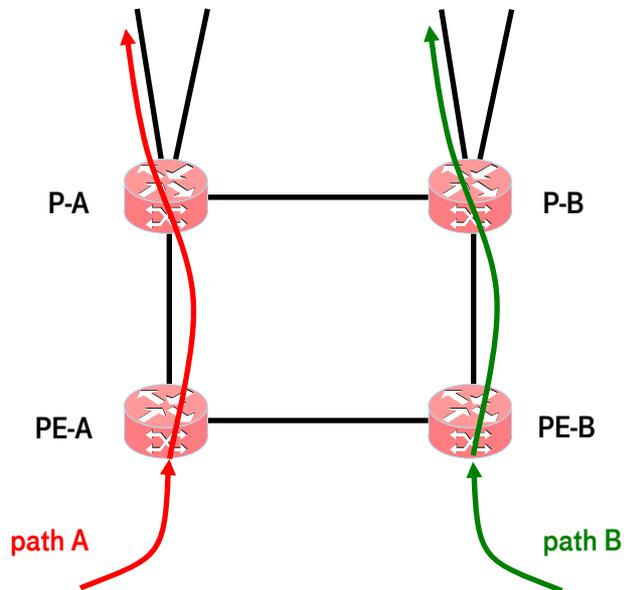
- Label TLV in IGP.
- Additional complexity only where needed for additional functionality.

Disjoint Paths (1/2)

Traditional Solutions

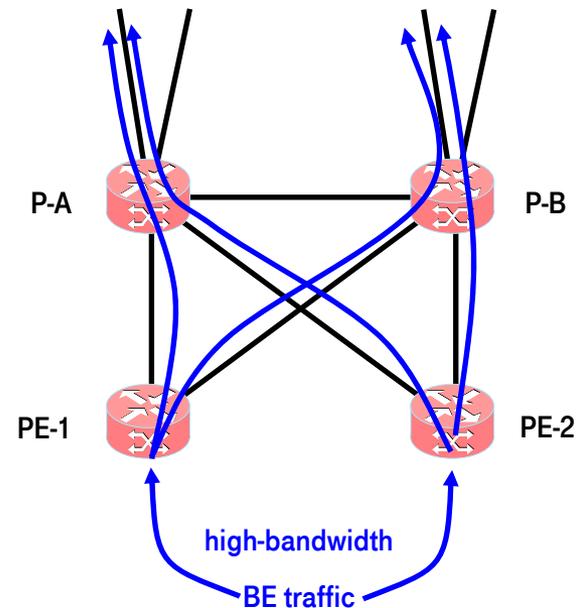
Mobile network:

- Sigtran traffic requires disjoint paths.
- Topology tailored to provide disjoint paths.
- RSVP based MPLS FRR provides fast re-route.



Fixed network:

- No traditional requirement for disjoint paths.
- Topology optimized for high bandwidth demand and efficiency.
- IP FRR where needed.

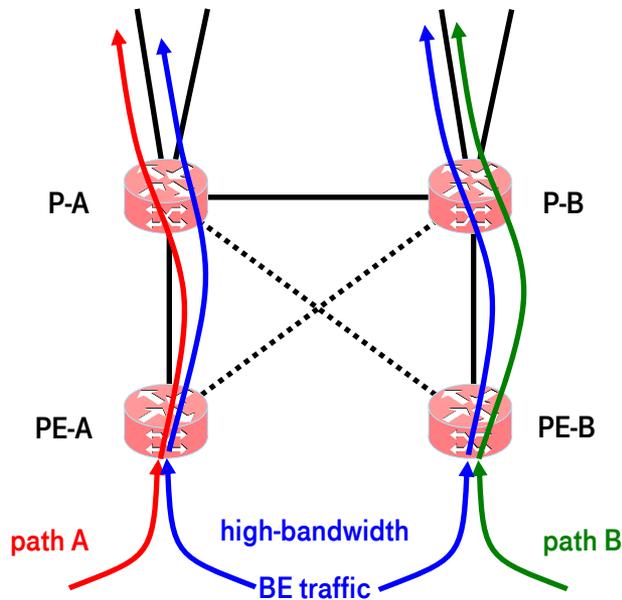


Disjoint Paths (2/2)

Current and Future Solution (?)

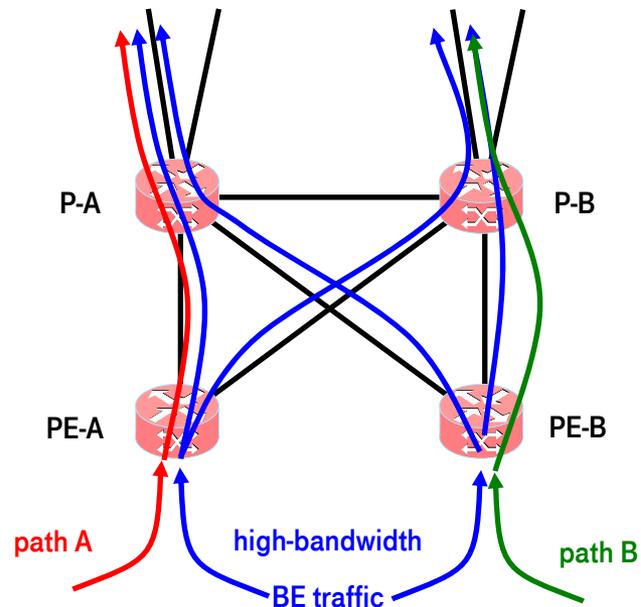
Merged network:

- Topology tailored for both disjoint paths and IP-FRR.
- Limited efficiency.



Optimized future network with SR:

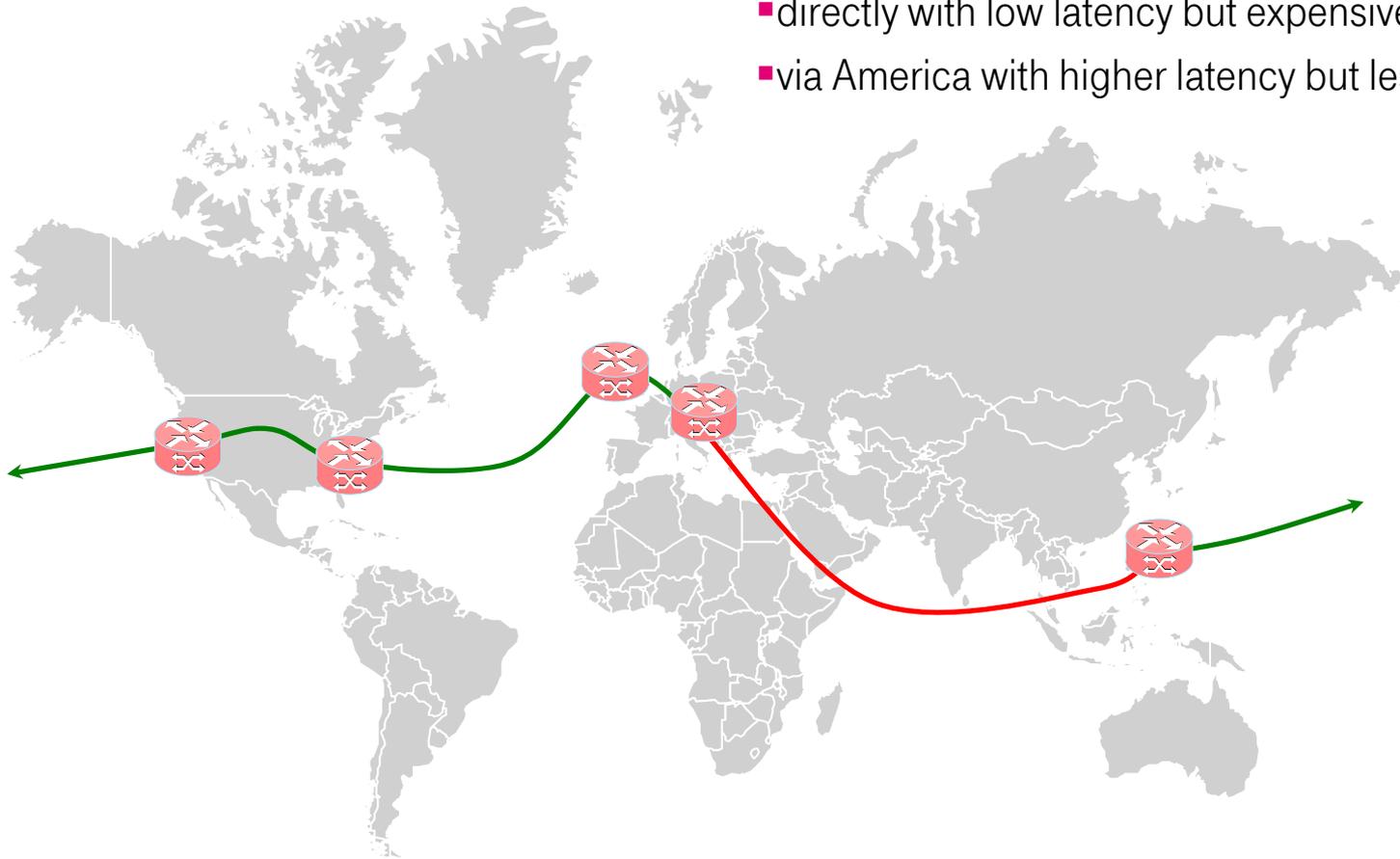
- Basic topology optimized for IP-FRR and efficiency.
- Sigtran traffic constrained with A/B anycast segment to provide disjoint paths.



QoS/Service Based Routing (1/2)

Routing of Asia-Europe traffic

- directly with low latency but expensive
- via America with higher latency but less cost



QoS/Service Based Routing (2/2)

Routing of Asia-Europe traffic

Traditional approach:

- Set up full mesh of RSVP tunnels.
- Optimize RSVP for latency.
- Optimize IGP/LDP for capacity (alternatively a second full mesh of RSVP tunnels).
- Route delay-sensitive traffic on RSVP, other on IGP (or second set of tunnels).

➔ Adds all complexity and operational efforts (configuration, monitoring, maintenance) of a full mesh of RSVP tunnels and overlay topology.

With Segment Routing:

- Optimize IGP for capacity and cost-efficiency.
- Set up anycast segment for direct links between Asia and Europe.
- Add special segment to delay-sensitive Asia/Europe traffic only (QoS or service based).

➔ Little extra efforts once segment routing is rolled out.

References

Simplicity, MPLS label in IGP:

- [draft-filsfils-rtgwg-segment-routing-use-cases-01](#), section 2

Disjoint Paths:

- [draft-filsfils-rtgwg-segment-routing-use-cases-01](#), section 4.1.1

QoS Based Routing:

- [draft-filsfils-rtgwg-segment-routing-use-cases-01](#), section 4.1.2