Splicing TE-LSPs in Inter-AS/ Hierarchical CsC scenarios

draft-balaji-mpls-csc-te-lsp-splice-01

Balaji Venkat Venkataswami
Bhargav Bhikkaji
Sam Aldrin
Shankar Raman
Gaurav Raina

Problem Statement

- Disparate ISPs or Same ISP could have multiple Tier-2 sites spread across geographies, inter-corrected through Tier-1 ISP.

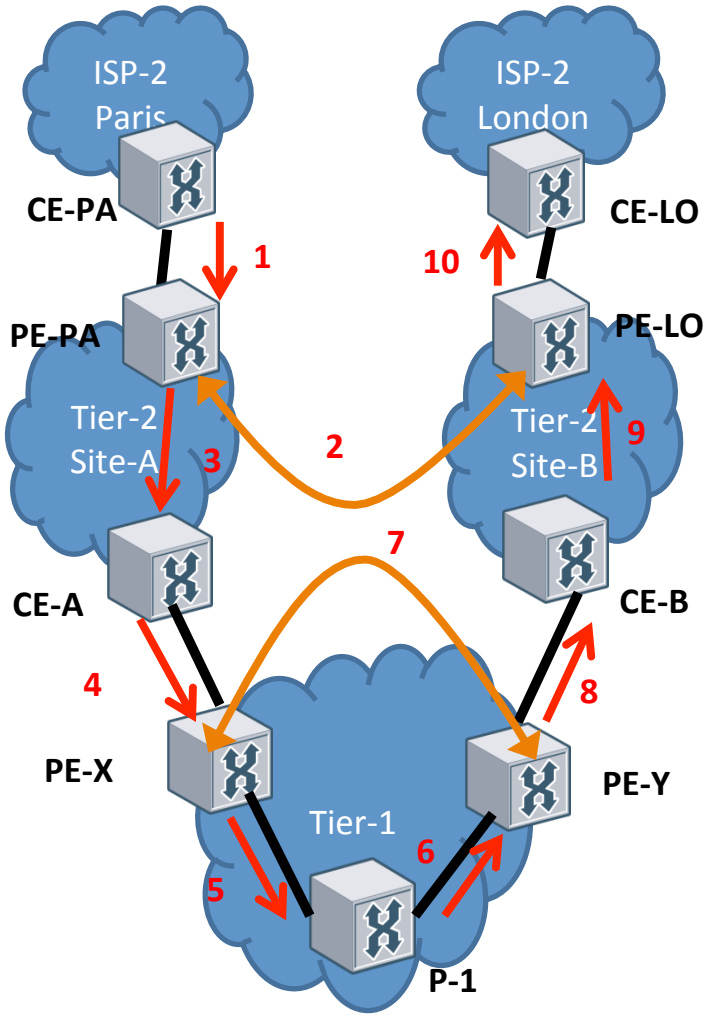
- Each Tier-2 site could have pre-build TE-LSP having different characteristics such as
  - Using under-utilized links
  - Delay bound characteristics.

- Tier-2 sites does not have capability to choose TE-tunnel in respective remote site based on certain characteristics such as unused tunnels, link utilization, delay and jitter etc

- Similar need exists for Inter-AS as well.

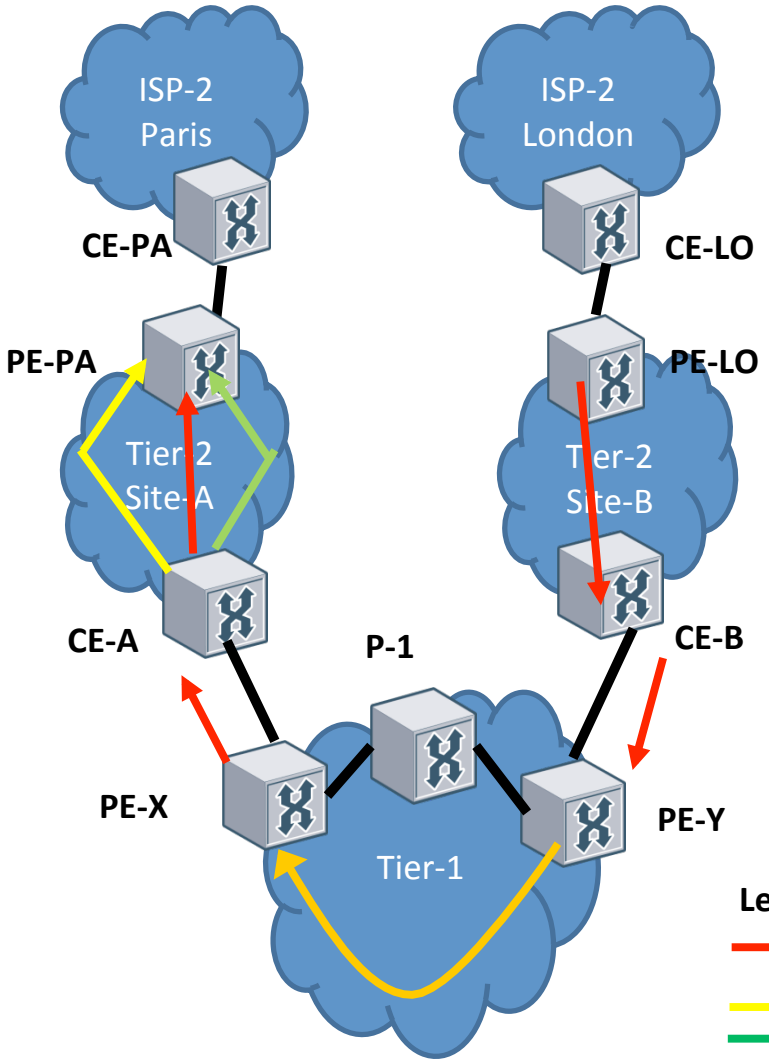
- RSVP-TE tunnels mechanisms are available at Inter-AS level
  - These tunnels are setup end-to-end
  - Requires administrative permissions across AS'es

Today CsC case



1) CE-Pa sends update for 146.22.15.0/24 to PE-Pa
2) An MP-iBGP update for Net=146.22.15.0/24 with next hop as PE-Pa and label assignment as 99 is sent to PE-Lo from PE-Pa
3) An IGP + LDP update for Net=PE-Pa with label as pop action is sent to CE-A from PE-Pa
4) The CE-A device sends an update with Net=PE-Pa with NH=CE-A and a label assignment of 1 to PE-X.
5) An LDP update goes from PE-X with Net as PE-X and Label as pop action to P1.
6) An LDP update goes from P1 with Net=PE-X and label as 2 to PE-Y
7) An MP-iBGP update is sent from PE-X to PE-Y with Net=PE-Pa NH=PE-X and Label as 4.
8) An LDP update with Net=PE-Pa and NH=PE-Y with label as 3 from PE-Y to CE-B.
9) An IGP update goes from CE-B with Net=PE-Pa with NH as PE-Y to PE-Lo
10) An LDP Update goes from CE-B to PE-Lo with Net=PE-Pa and label as 5.

Today CsC case…



1) There are various tunnels in Tier-2 Site-A, Including LDP tunnel as part of CsC or Inter-AS case

2) For all kinds of flow from PE-LO to PE-PA, Only LDP tunnel on Tier-2 Site-A is used.

3) Currently there exists is no mechanism to splice under utilized tunnels in Tier-2 Site-A by Tier-2 Site-B based on load/application.

4) The solution should be transparent to Tunnel

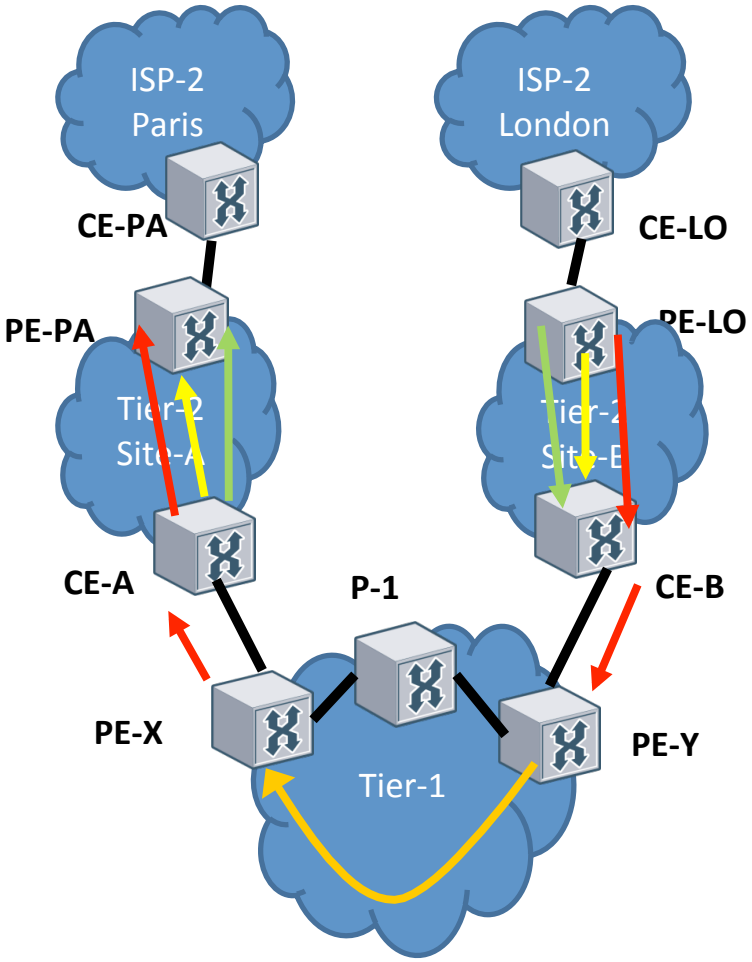
Legends:

LDP tunnel Set as part of CsC or Inter-AS case

Unused/Under utilized pre-configured tunnels (RSVP)

Tunnel in Tier-1 transparent to Tier-2

Matching PIPES.



Legends:

LDP tunnel Set as part of CsC

RSVP tunnels now utilized.

Tunnel in Tier-1 transparent to Tier-2

1) Mechanism to splice tunnel from Tier-2 Site-B to Tier-2 Site A through a transparent Tier-1 tunnel that could aggregate multiple such splices Tier-2 tunnels through it.
2) Solution not restrictive to Tier-2 but should be extended to Tier-3 and Inter-AS cases as well.
3) In the example considered, Tier-2 Site-A administrator has control over type of tunnels to be advertised without sharing sensitive information on topology.

Advantages:

1) TE-LSPs can be constructed to give specific QoS for select FEC's/Prefix.
2) Having such a splicing model gives the traffic complete QoS from start to finish
3) Better usage of under utilized links.

Next Steps…

- More Inputs From WG.
- More data from Carriers and Service providers.
- Based on Feedbacks/Comments, Publish next version of draft.