MPLS Multipath Usage

Current Name:
Use of Multipath with MPLS-TP and MPLS
draft-villamizar-mpls-tp-multipath-03

Will be Renamed to:
Use of Multipath with MPLS and Strict Packet Ordering
draft-villamizar-mpls-multipath-use-00

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The two MPLS Multipath drafts will be renamed shortly, removing TP from the draft name. Emphasis will be placed on carrying LSP with strict packet ordering requirements (of which MPLS-TP is an example). The Infinera IPR no longer applies since Entropy Label is used rather than Infinera's forwarding method and the IPR will not be carried over to the new drafts.

MPLS Multipath Usage - Changes

- Draft is much shorter
  - reduced from 25 pages to 9 pages.

  1. Downselected from four alternatives to Entropy Label as the means to support LSP with strict packet ordering (eg MPLS-TP) over MPLS over multipath.
  2. Lengthy statement of multipath requirements are gone.
  3. Lengthy discussion of requirements tradeoffs and scalability considerations are gone.

- No new forwarding is proposed. The document becomes a usage document, describing a use of Entropy Label.

MPLS Multipath Usage - Highlights

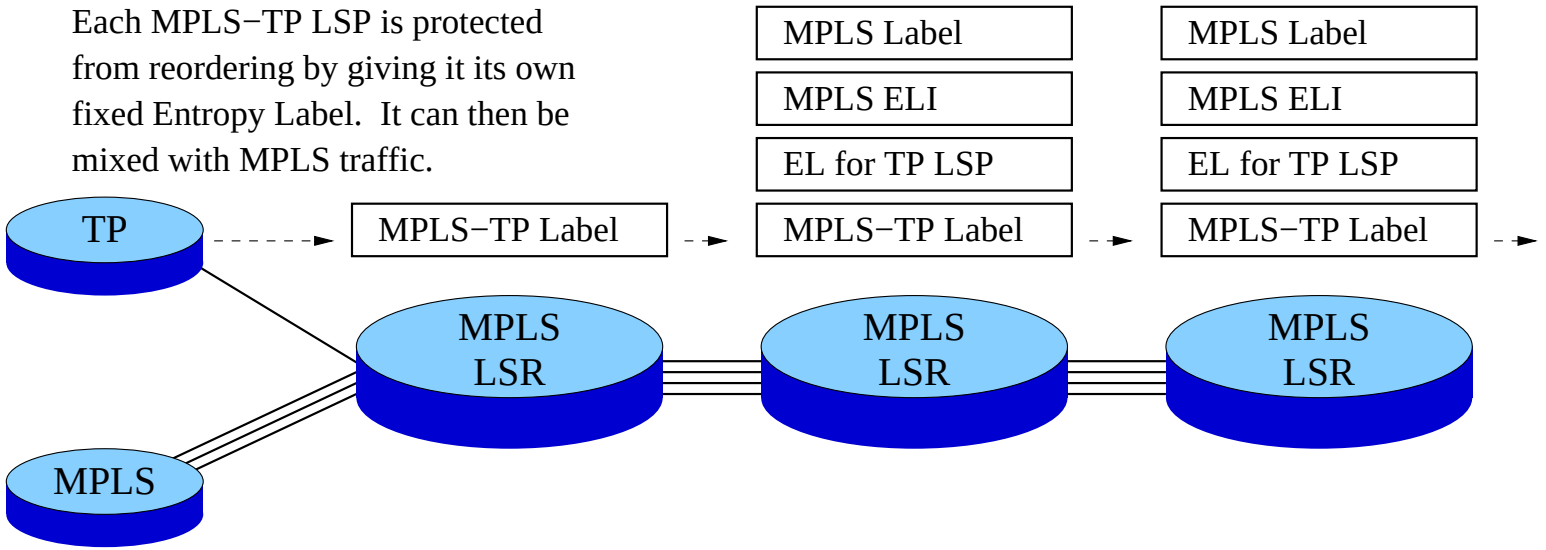
- Document makes a few simple points:

  1. MPLS-TP in MPLS and MPLS in MPLS-TP are called for as requirements in RFC 5654 requirement 33.
  2. Entropy Label provides a means of carrying LSP with strict packet ordering requirements (eg MPLS-TP) over MPLS server layer using multipath.
     - This provides a fully MPLS-TP compliant server layer.
  3. MPLS client LSP can be carried within MPLS-TP server layer LSP with limitations described in the draft.

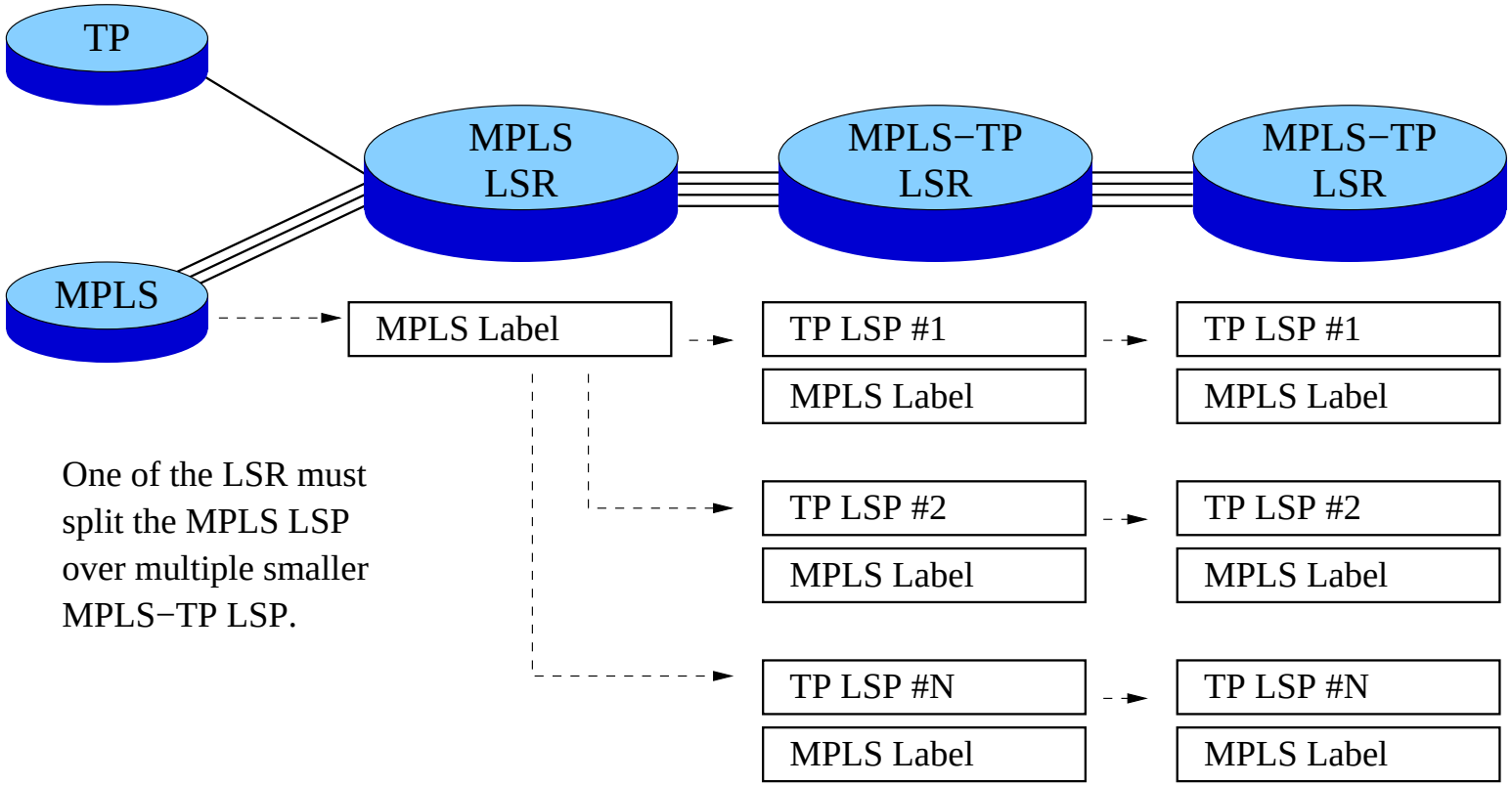
- Without any change in forwarding or protocol extensions MPLS-TP in MPLS and MPLS in MPLS-TP can be supported with limitations described in the document.

MPLS Multipath Usage - MPLS-TP in MPLS

Each MPLS−TP LSP is protected from reordering by giving it its own fixed Entropy Label. It can then be mixed with MPLS traffic.



MPLS Multipath Usage - MPLS in MPLS-TP



MPLS-TP in MPLS - Limitations

- An MPLS LSR must know which LSP require strict packet ordering.
  1. If the MPLS-TP ingress and MPLS ingress are the same LSR, this can be accomplished by configuration.
  2. If the MPLS ingress is a midpoint LSR for the MPLS-TP LSP, then without signaling extensions this is more difficult. Feasible with overload of administrative attributes for example.
- There is no means to know whether limitations on large microflow in LSR multipath with cause problems.

MPLS in MPLS-TP - Limitations

- MPLS-TP LSP must be able to carry peak load of the MPLS LSP.

  1. If the MPLS-TP LSP capacity must be increased, the MPLS-TP LSP may have to be rerouted to different component links.
  2. If the MPLS-TP LSP capacity is set to a worst case capacity, then capacity is wasted if MPLS LSP tend not to all peak at the same time.

- Fixing the path of large chunks of capacity (MPLS-TP LSP) tends to create bin packing problems, for example on traditional MPLS Link Bundling.

MPLS Multipath Usage - Conclusion

- Please **Read the draft and comment on it on the MPLS WG mailing list**
- draft-villamizar-mpls-tp-multipath-03 is now a short read.
- After downselecting to use Entropy Label the content should be non-controversial (or much less controversial).