Support Shared Mesh Protection in MPLS-TP

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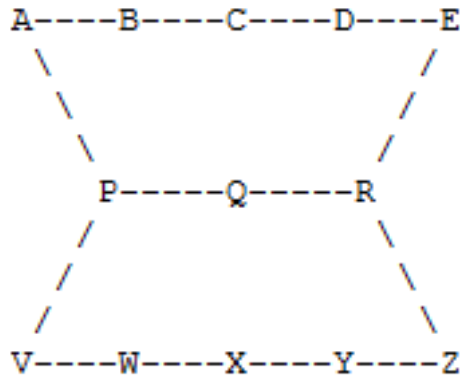Luyuan Fang (Cisco)
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(Required per MPLS-TP Requirements (Req 68, 69, RFC5654))

```
A----B----C----D----E
      \              /
       \            /
        \          /
     P-----Q-----R
        /          \
       /            \
      /              \
V----W----X----Y----Z

A Shared Mesh Protection Topology
```

The resources on P-Q-R is shared by multiple working LSP's

- Key properties:
  1. Protecting LSP's are pre-established
  2. Upon failure, a working LSP needs to activate the protection
  3. And, it may preempt/notify other connections
  4. If the resources are taken, it needs to try another protecting LSP (1:N)

Protocol Operation Overview

Working LSP

B   C

3. Failure

A   2. Setup HW   2. Setup HW   D

1. Setup a protecting connection

4. Activation   4. Activation

E   F   G

2. Setup HW   2. Setup HW   2. Setup HW

4. Activation   4. Activation

```
 0                   1                   2                   3
 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
|Ver|Request|Rsv|R|    Reserved     |     Status     |     Seq     |
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
```

Request: SF/SD/FS/EXER/...   **R**: Revertive   **Status**: OK/failure   **Seq**: reliable messaging

Key Function and Major Changes since Last IETF

- **<u>Operation in Summary</u>**
  - Activation
  - De-activation
  - Query
  - Pre-emption
- **<u>Major Changes</u>**
  - Adapted the PSC Logic from RFC 6378 (Linear Protection)
  - Simplified the protocol message format
  - Consolidated with G.SMP work in ITU (same protocol procedure can apply in both packet and circuit networks)

- **<u>Collaboration Status</u>**
  - Consolidated with all outstanding proposals, except one
  - The only remaining issue: the need for reliable message delivery

- **<u>Next Step</u>**
  - Ready to advance to Working Group document