

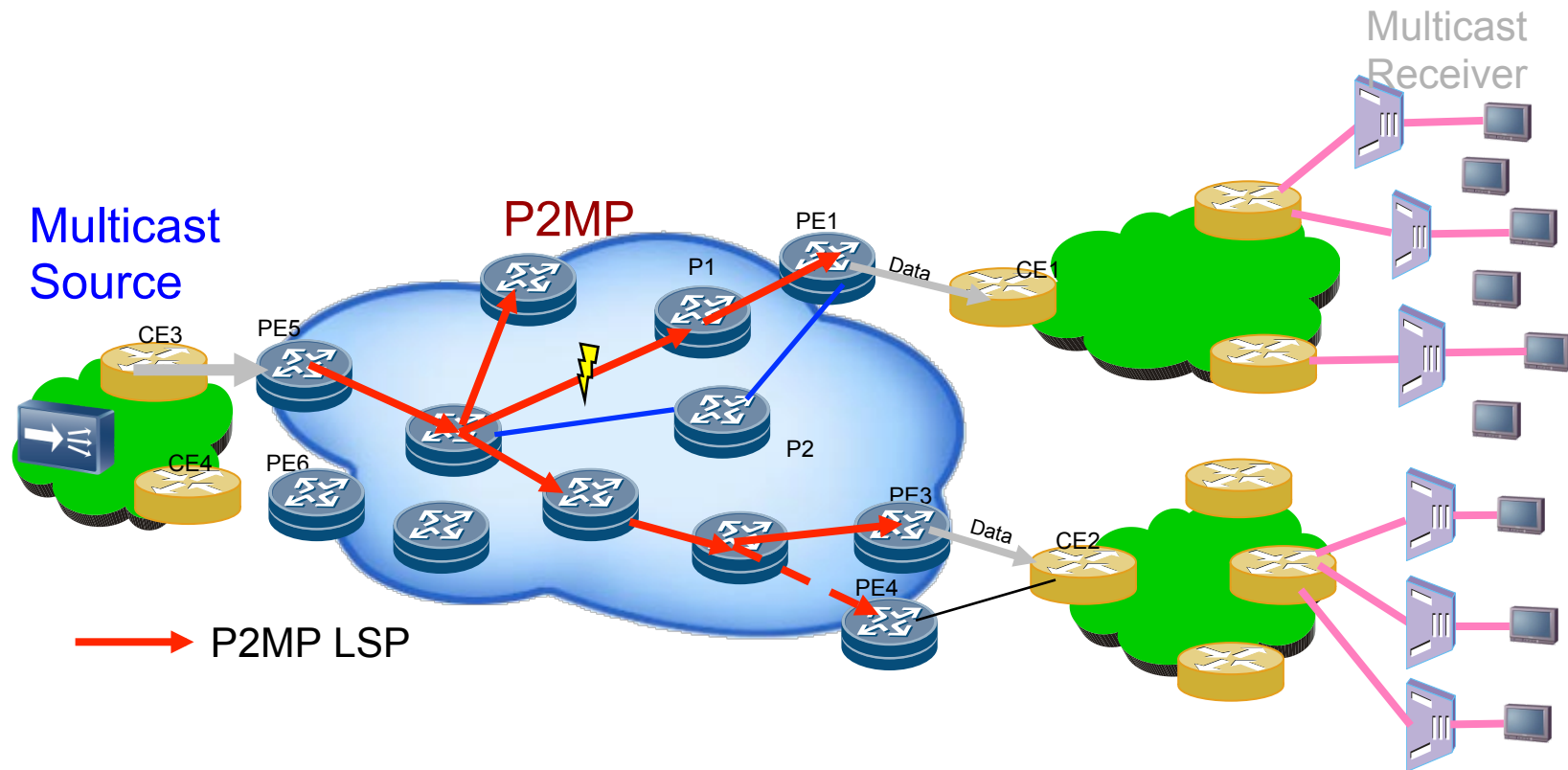
# Alternative Constraints for Point-to-Multipoint Traffic-Engineered MPLS Label Switched Paths(LSPs)

draft-li-mpls-p2mp-te-alt-path-00

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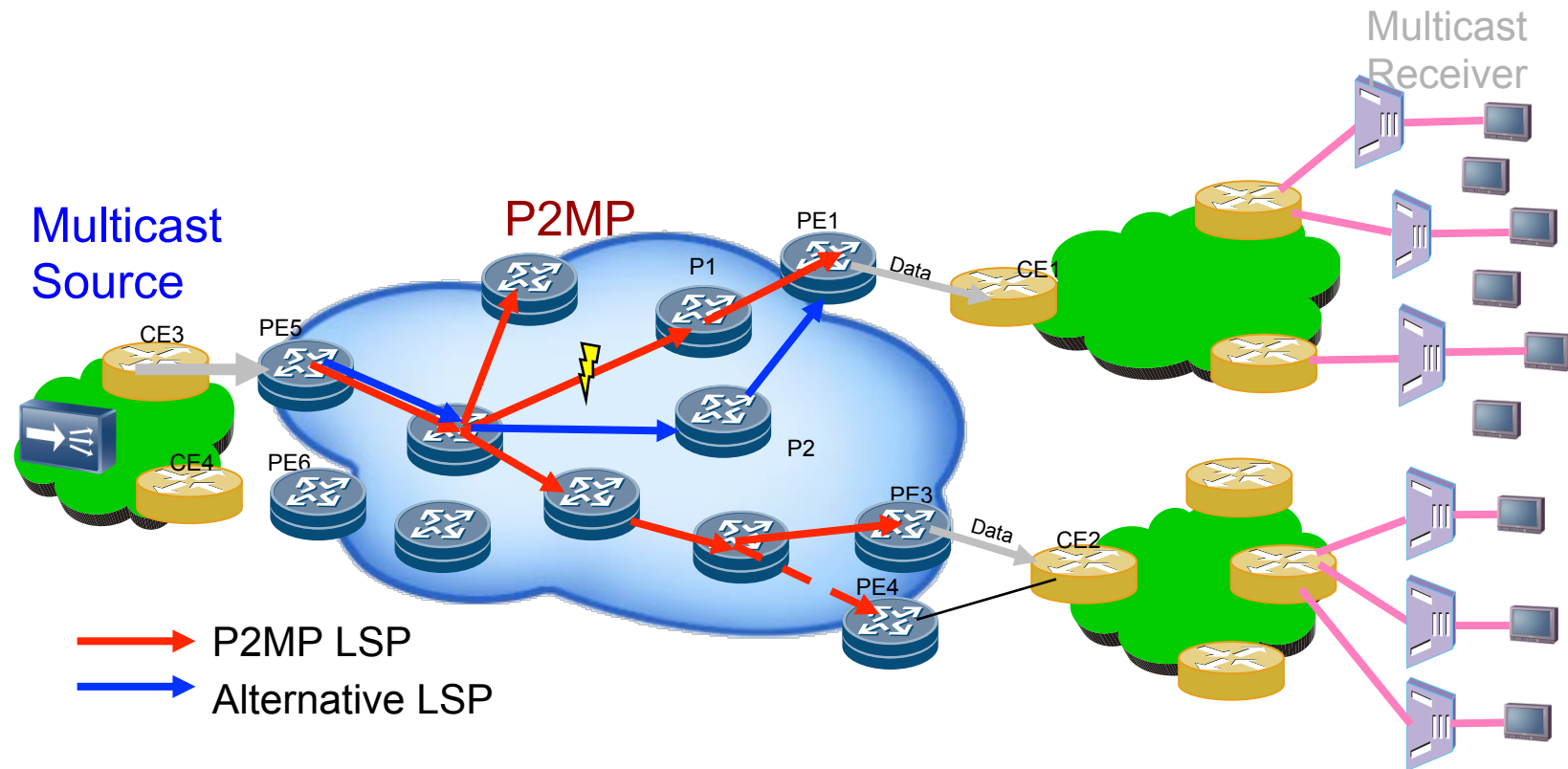
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# Problem Statement of P2MP TE LSP



- Traffic engineering constraints are applied to all S2L sub-LSPs. This may cause the issue that some S2L sub-LSPs can be set up while others can not according to the constraints.
- There will be a worse case that some S2L sub-LSPs can not be restored after link failure according to the constraints. It will cause continuous traffic loss.
- Comparing with mLDP, P2MP TE lacks the capability to provide a best-effort path.

# Alternative Path for P2MP TE



- **Alternative constraints:** Alternative constraints can be specified for the P2MP TE LSP to calculate paths to specific leaf nodes if the path with the primary constraints is not available. The P2MP TE LSP is set up with some S2L sub-LSPs using the primary constraints while the other S2L sub-LSPs using the alternative constraints.

# Mechanisms for Alternative Path of P2MP TE

- **Path Computation in Root Node:**
  - ◆ Primary constraints **MUST** be used at first.
  - ◆ If the primary path is not available, alternative constraints **SHOULD** be used for specific leaf nodes.
  - ◆ Re-optimization will be started if alternative constraints are used.
- **Alternative Constraints Propagation**
  - ◆ Extensions of RSVP-TE is necessary to propagate alternative constraints.
- **Resource Reservation**
  - ◆ Choice of different traffic parameters for resource reservation

# Protocol Extensions for Alternative Path of P2MP TE

```
<Path Message> ::=
    <Common Header> [ <INTEGRITY> ]
    [ [<MESSAGE_ID_ACK> | <MESSAGE_ID_NACK>] ...]
    [ <MESSAGE_ID> ]
    <SESSION> <RSVP_HOP>
    <TIME_VALUES>
    [ <EXPLICIT_ROUTE> ]
    <LABEL_REQUEST>
    [ <PROTECTION> ]
    [ <LABEL_SET> ... ]
    [ <SESSION_ATTRIBUTE> ]
    [ <NOTIFY_REQUEST> ]
    [ <ADMIN_STATUS> ]
    [ <POLICY_DATA> ... ]
    <sender descriptor>
    [<S2L sub-LSP descriptor list>]
```

The following is the format of the S2L sub-LSP descriptor list.

```
<S2L sub-LSP descriptor list> ::= <S2L sub-LSP descriptor>
    [ <S2L sub-LSP descriptor list> ]
```

```
<S2L sub-LSP descriptor> ::= <S2L_SUB_LSP>
    [ <P2MP_SECONDARY_EXPLICIT_ROUTE> ]
    [ <P2MP_SECONDARY_SESSION_ATTRIBUTE> ]
    [ <P2MP_SECONDARY_SENDER_TSPEC> ]
```

# Next Steps

- Get feedback on Mechanisms and Protocol (on mailing list)