

# Extensions to RSVP-TE for P2MP LSP Ingress Local Protection

draft-chen-mpls-p2mp-ingress-protection

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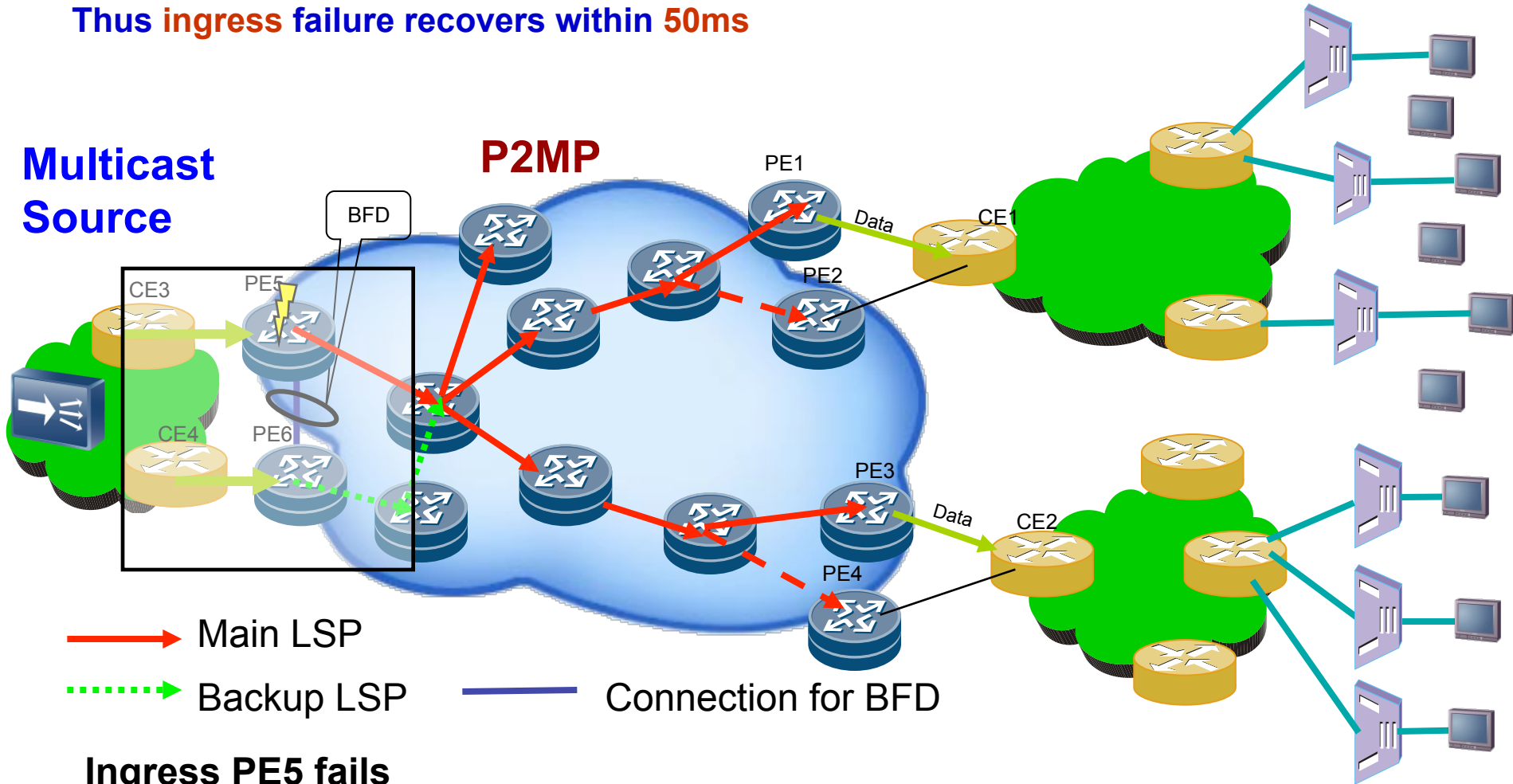
# P2MP LSP Ingress Local Protection (Animated)

- Locally detect and repair **ingress** failure
- Thus **ingress** failure recovers within **50ms**

**Multicast Source**

**Multicast Receiver**

**P2MP**

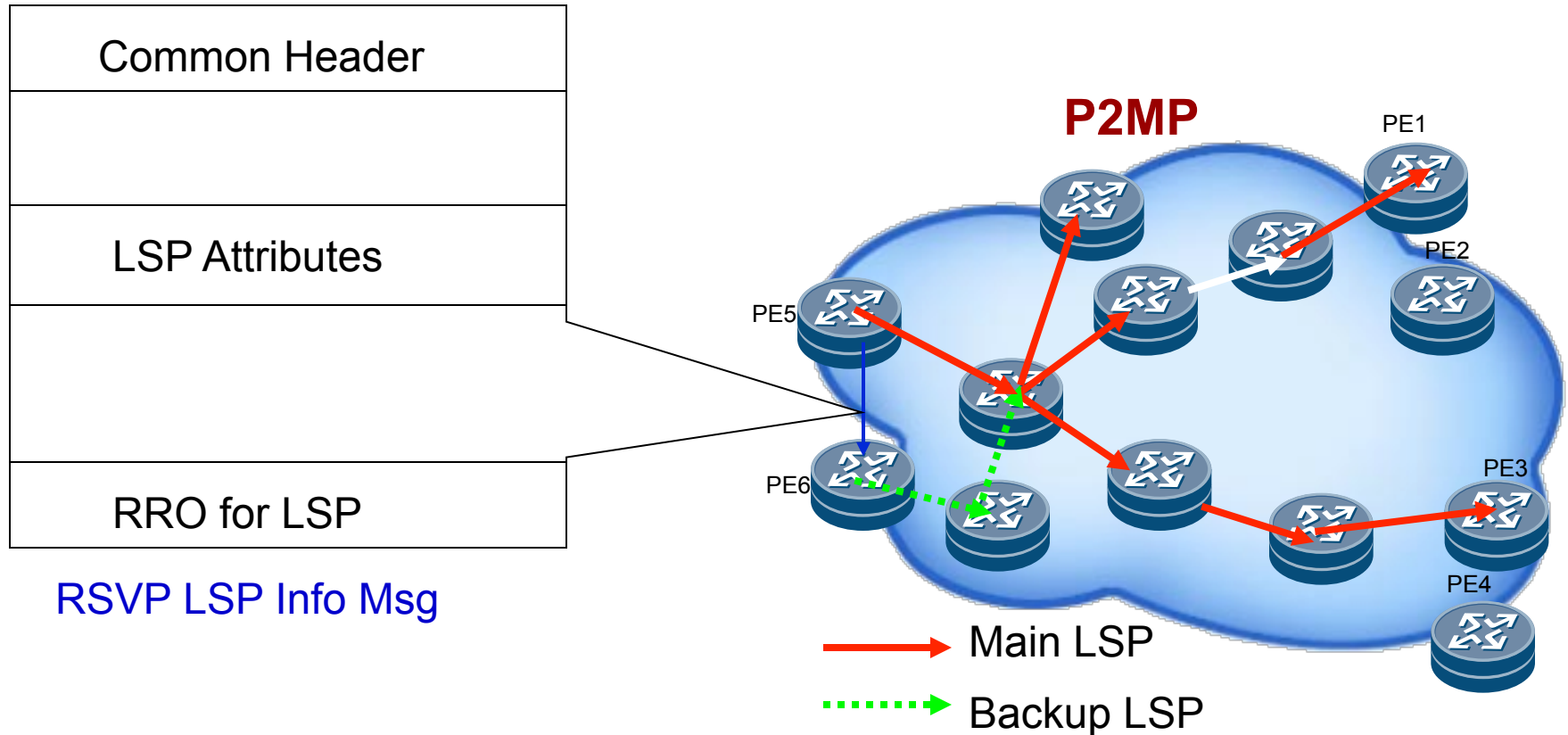


**Ingress PE5 fails**

- Traffic to backup LSP (from PE6 to NH of Ingress PE5)
- Traffic merged into main LSP at NH of ingress

# RSVP-TE Extensions for Ingress Local Protection

## LSP Info sent from Ingress to Backup Ingress



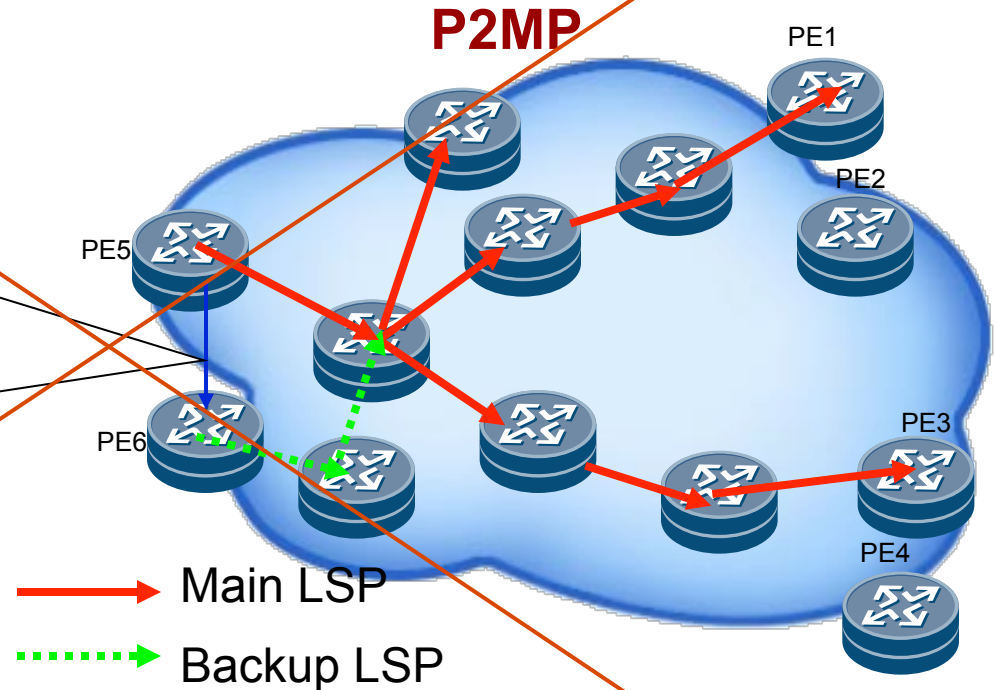
- Ingress PE5 sends **LSP Info Msg** to backup ingress PE6
- PE6 constructs **PATH msg** for creating backup LSP
- PE6 creates FIB entry (inactive) after receiving RESV msg

# OSPF Extensions for Ingress Local Protection

## LSP Info sent from Ingress to Backup Ingress in LSA

|                    |  |            |
|--------------------|--|------------|
| LS Age             |  | LS Type =9 |
| Link State ID      |  |            |
| LSP Attributes TLV |  |            |
| RRO for LSP TLV    |  |            |

OSPF Opaque LSA



- **OSPF** in PE5 sends **LSP Info in LSA** to **OSPF** in PE6
- **RSVP-TE** in PE6 constructs **PATH msg** for backup LSP
- PE6 creates **FIB entry (inactive)** after receiving **RESV msg**

**This Option is killed.**

# Next Step

- Welcome comments
- Request to make it into a working group document

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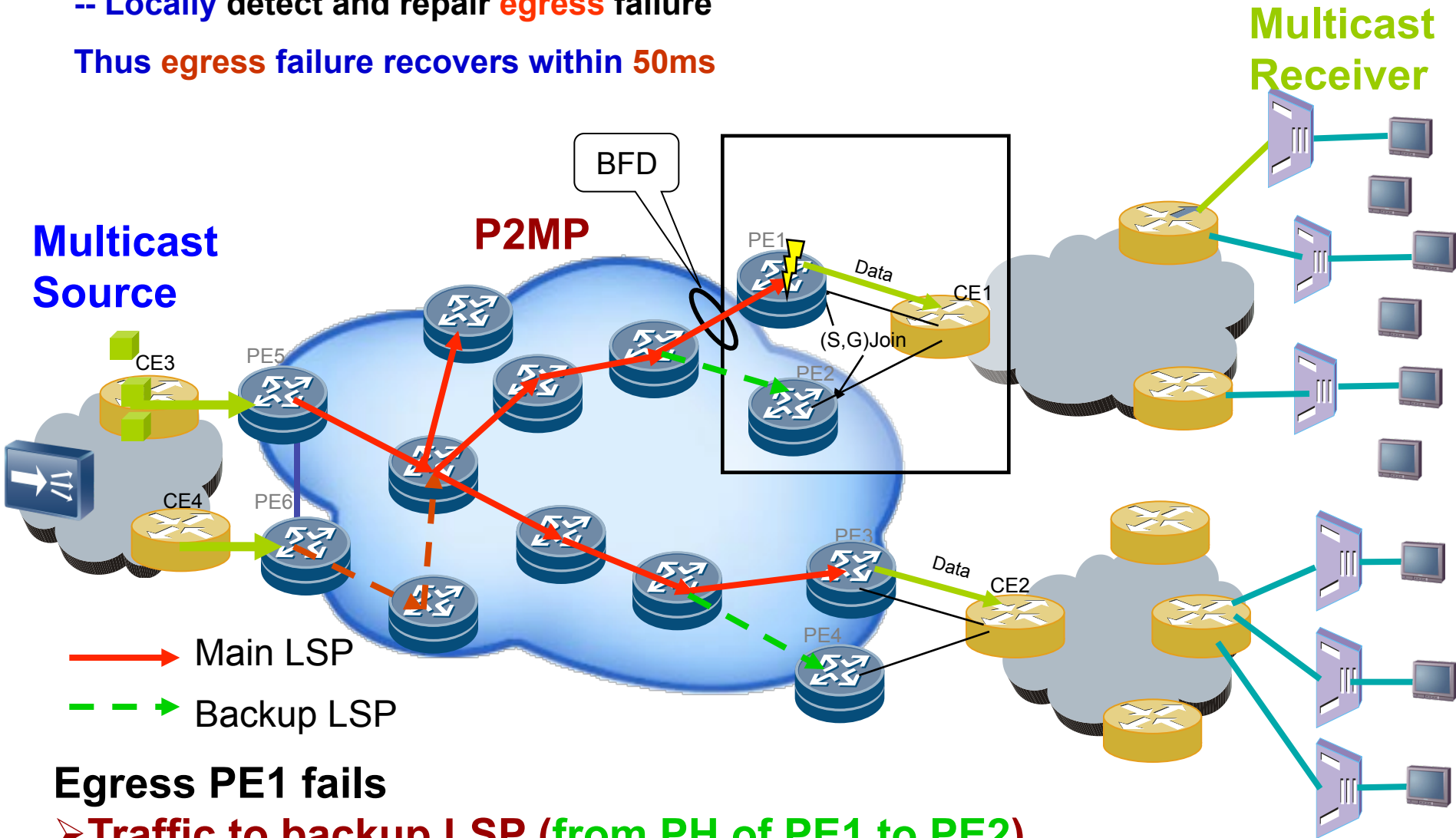
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# P2MP LSP Egress Local Protection (Animated)

-- Locally detect and repair egress failure

Thus egress failure recovers within 50ms



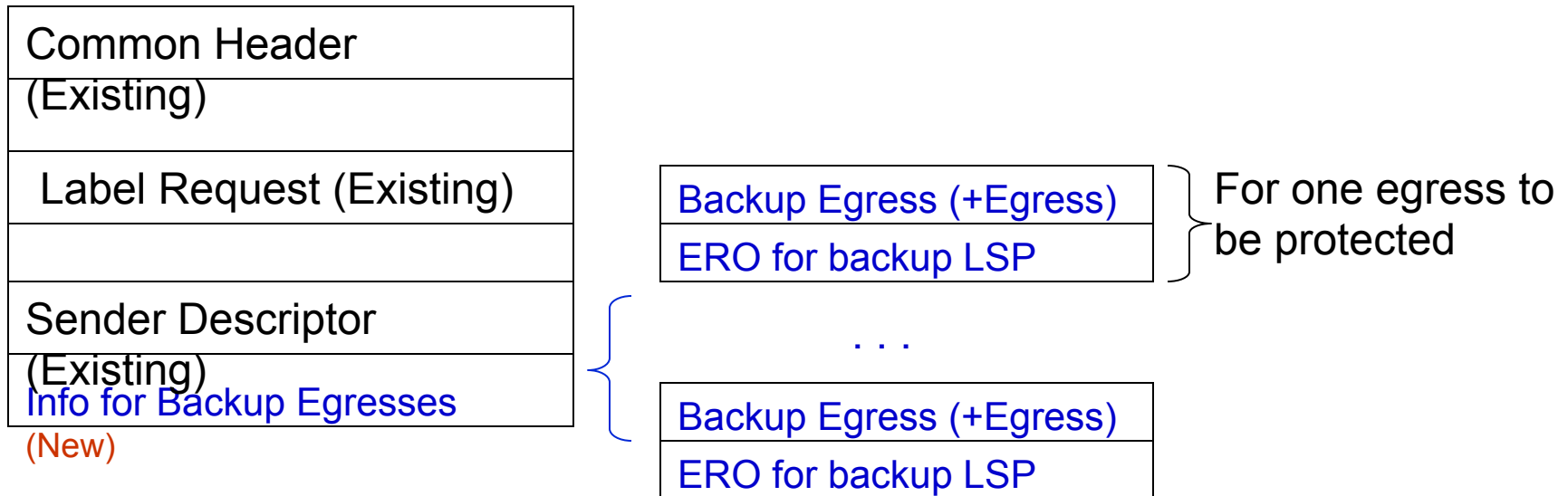
**Egress PE1 fails**

➤ Traffic to backup LSP (from PH of PE1 to PE2)

➤ Traffic delivered to CE1 from PE2

# RSVP-TE Extensions for Egress Local Protection

## PATH Message



Previous Hop (PH) of Egress:

- Generates PATH msg based on Info and sends along backup LSP path
- Creates FIB entry (inactive) for backup LSP after receiving RESV msg



# Next Step

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# New P2MP LSP E2E Protection

- Ingress of P2MP LSP is locally protected (New)
- Every egress of P2MP LSP is locally protected (New)
- Every link and intermediate node of P2MP LSP is locally protected using FRR (Existing)

Thus

- All parts of P2MP LSP are locally protected

# Advantages of P2MP LSP Ingress and Egress Local Protection + FRR

- All parts of P2MP LSP are locally protected
- Only one P2MP LSP is used to implement an E2E protection
  - ◆ Normally two P2MP LSPs are used
- Big saving on resource : 50% bandwidth saving
  - ◆ No need to reserve/use double bandwidth
- Faster recovery
  - ◆ Speed of local protection recovery
  - ◆ Traffic recovery within 50ms when a failure happens
- Easier to operate

# Next Step

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