

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

draft-chen-mpls-p2mp-ingress-protection  
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Huaimo Chen ([huaimochen@huawei.com](mailto:huaimochen@huawei.com))

Ning So ([Ning.So@verizonbusiness.com](mailto:Ning.So@verizonbusiness.com))

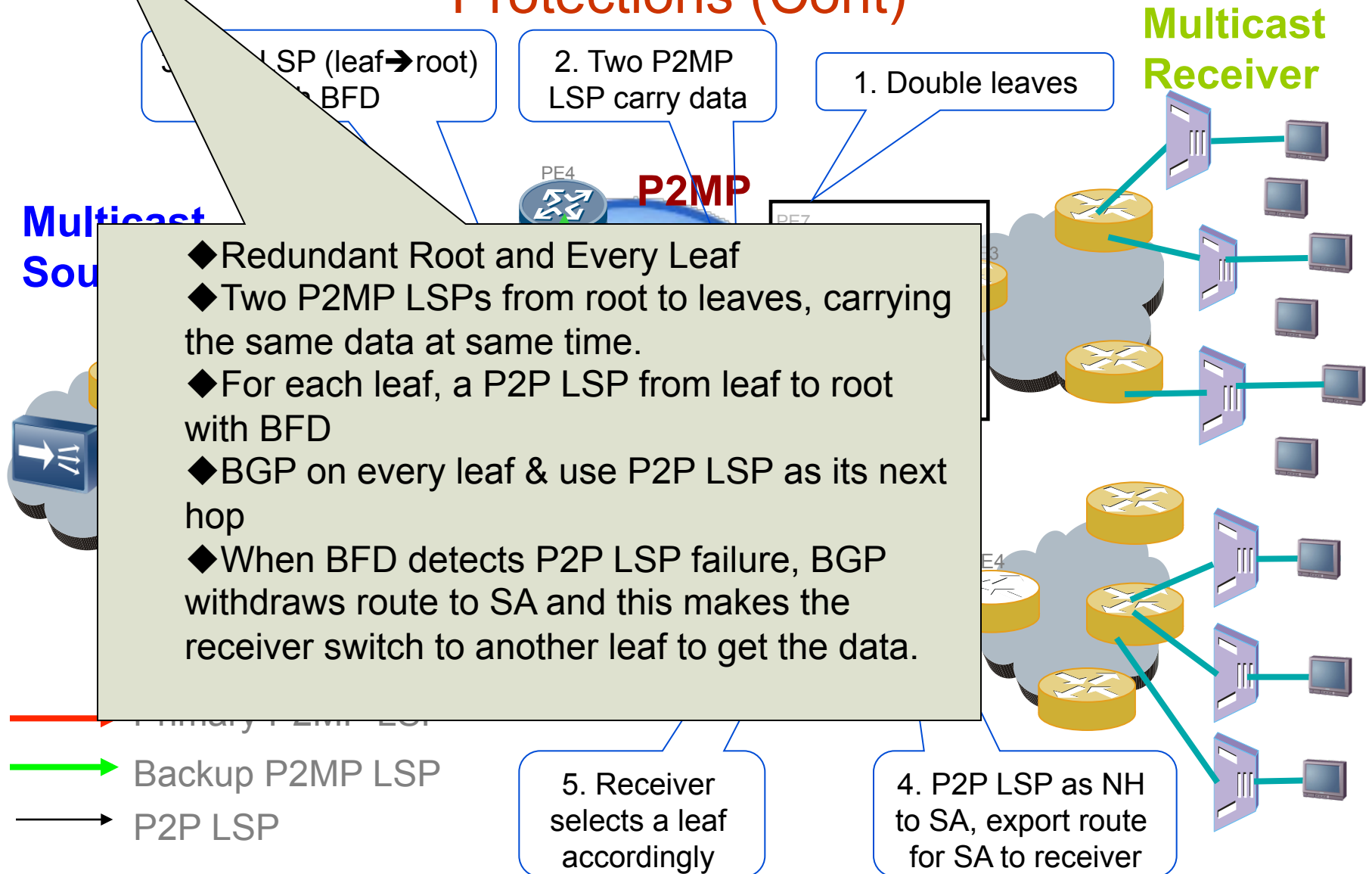
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- **Issues in Existing P2MP LSP Ingress & Egress Protection**
- **Proposed P2MP LSP Ingress & Egress Local Protection**
- **Advantages of P2MP LSP Ingress and Egress Local Protection**
- **It can be used for P2P LSP Ingress/Egress Protection accordingly**

# Details in Existing P2MP LSP Ingress & Egress Protections

- No standards for LSP Ingress/Egress Local Protection
- To provide E2E P2MP LSP protection, a **current way (detail in next page)**
  - ◆ Redundant Root and Every Leaf
  - ◆ Create two P2MP LSPs from root to leaves, carry the same data at same time.
  - ◆ For each leaf, create a P2P LSP from the leaf to root and configure BFD with it
  - ◆ Run iBGP on every leaf node and use P2P LSP as its next hop
  - ◆ When BFD detects P2P LSP failure, BGP withdraws route to root and this makes the receiver switch to another leaf to get the data.

# Details in Existing P2MP LSP Ingress & Egress Protections (Cont)



# Issues in Existing P2MP LSP Ingress & Egress Protections

- Not Scalable
- Consume lots of resource
  - Reserve/use double bandwidth
- Not reliable
  - The failure of reverse P2P LSP from leaf to root does not mean the failure of its corresponding P2MP sub-LSP from root to leaf
- Speed of Global Recovery
  - Depends on convergence of IGP and BGP
- Difficult to configure and maintain
  - For each P2MP LSP branch/sub-LSP,
    - need configure a reverse P2P LSP from leaf to root with BFD
    - P2P LSP with BFD is used to detect failure of its corresponding P2MP sub-LSP

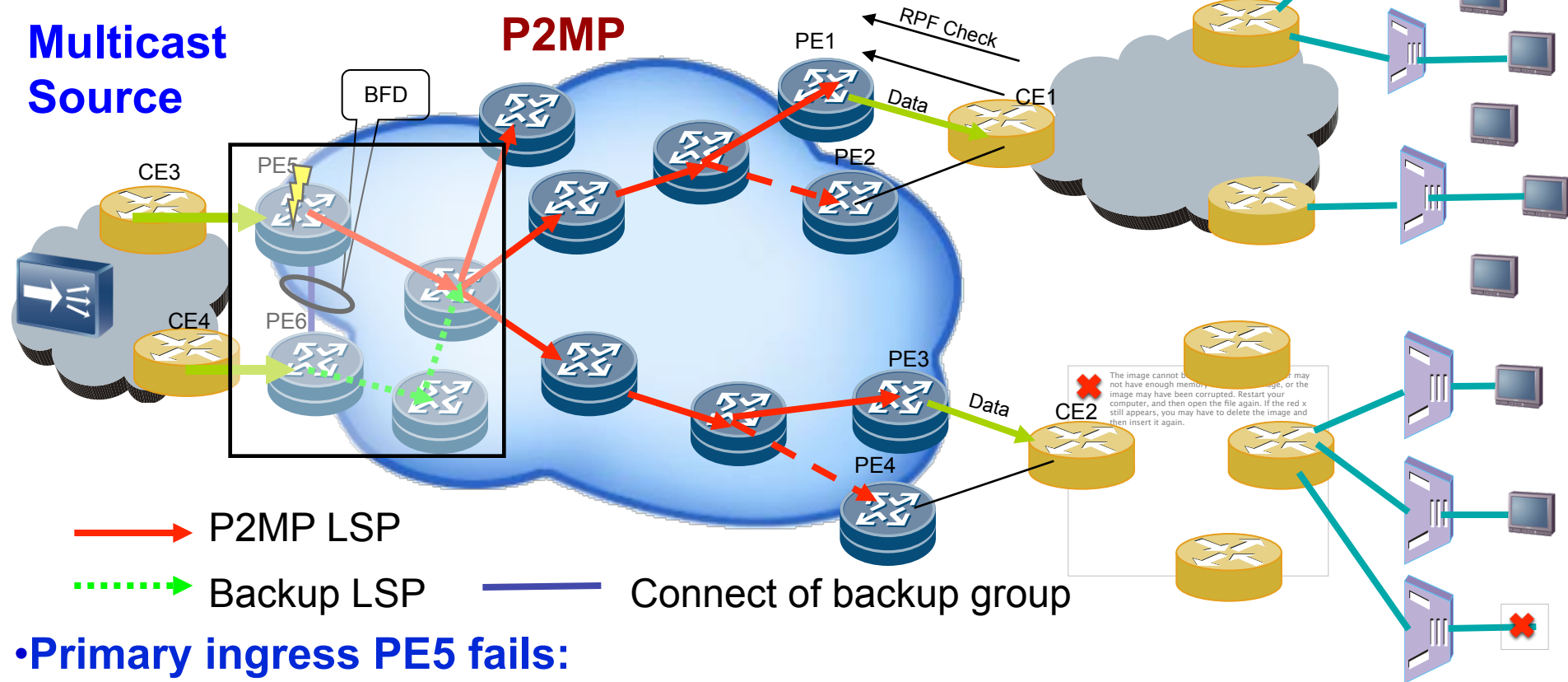
# P2MP LSP Ingress Local Protection (Animated)

## Multicast Receiver

local protection for ingress failure

Multicast Source

P2MP



- Primary ingress PE5 fails:
  - Traffic to backup tunnel
  - Traffic merged into P2MP LSP

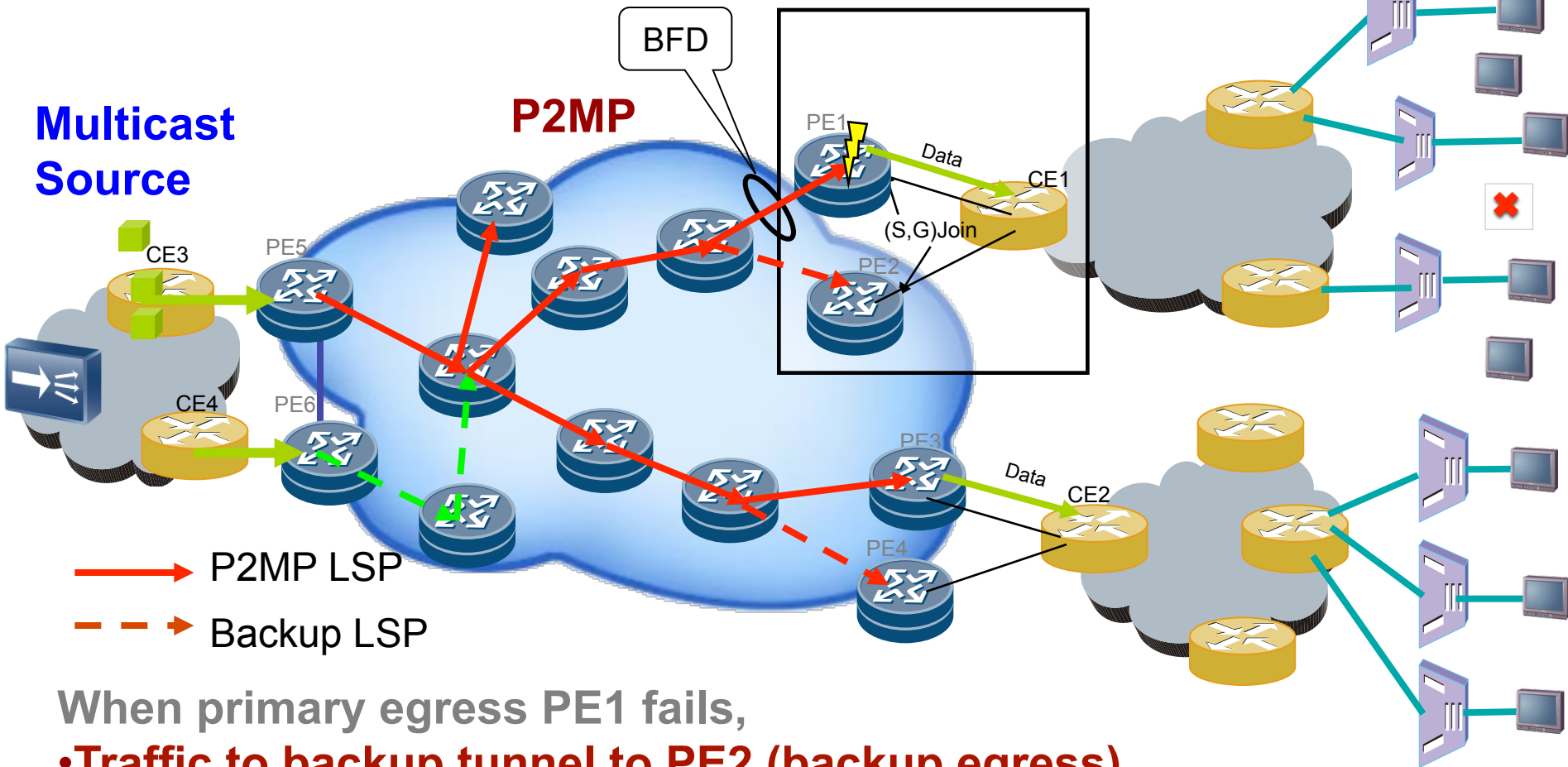
# P2MP LSP Egress Local Protection<sub>(Animated)</sub>

Local protection for egress failure

**Multicast Source**

**P2MP**

**Multicast Receiver**



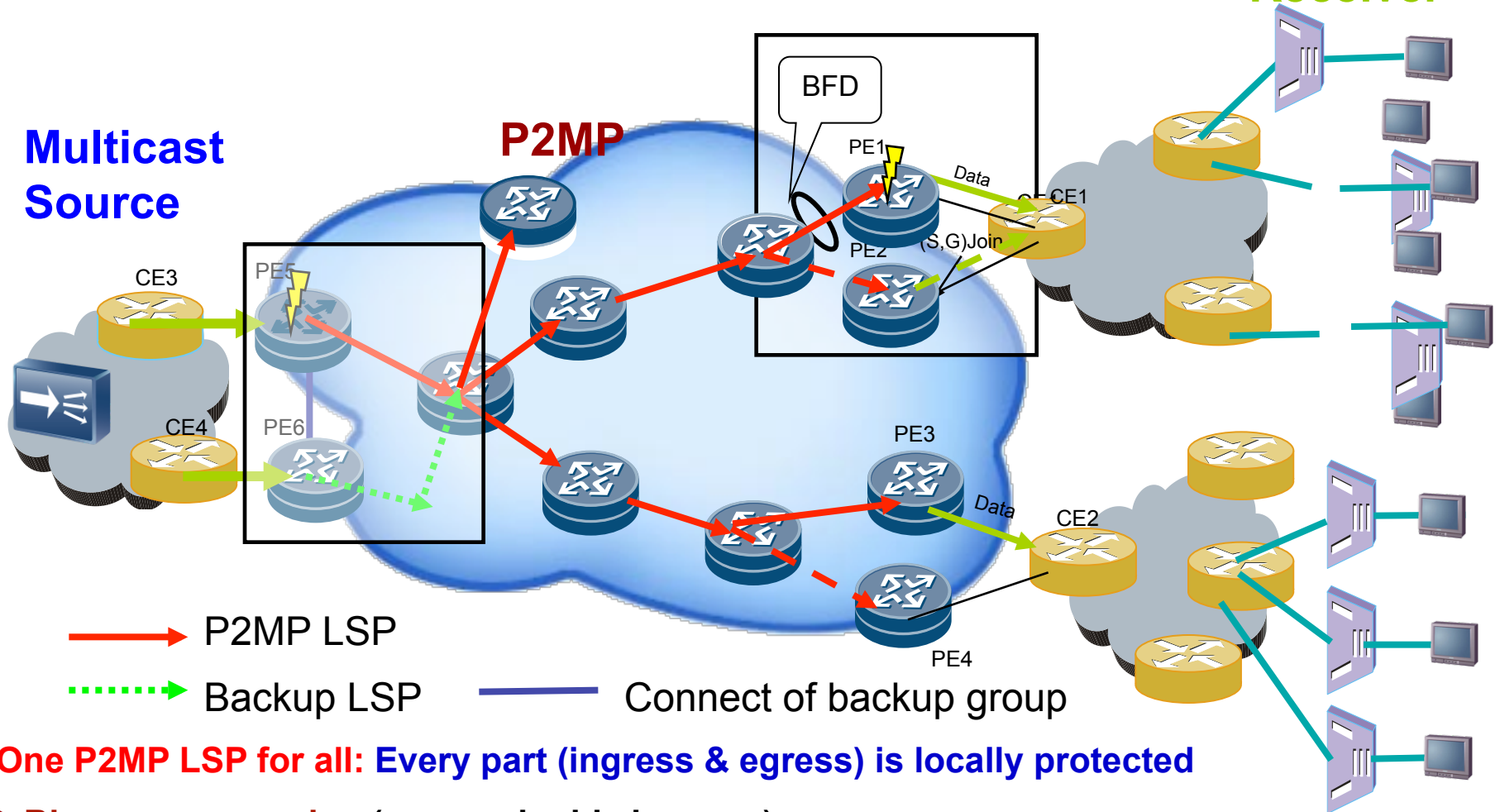
When primary egress PE1 fails,

- Traffic to backup tunnel to PE2 (backup egress)
- Traffic delivered to CE1 from PE2

# P2MP LSP Ingress & Egress Local Protection (Animated)

**Existing scenario:** double root and every leaf

Create two global P2MP LSP from each root to leaves, carrying data at same time



➤ **Big resource saving** (e.g, no double bw resv)

➤ **Faster failure recovery:** local protection speed



# Advantages of P2MP LSP Ingress and Egress Local Protection

- 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
  - ◆ Flow recovery within 50ms when a failure happens
- Easier to operate

# Next Step

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