

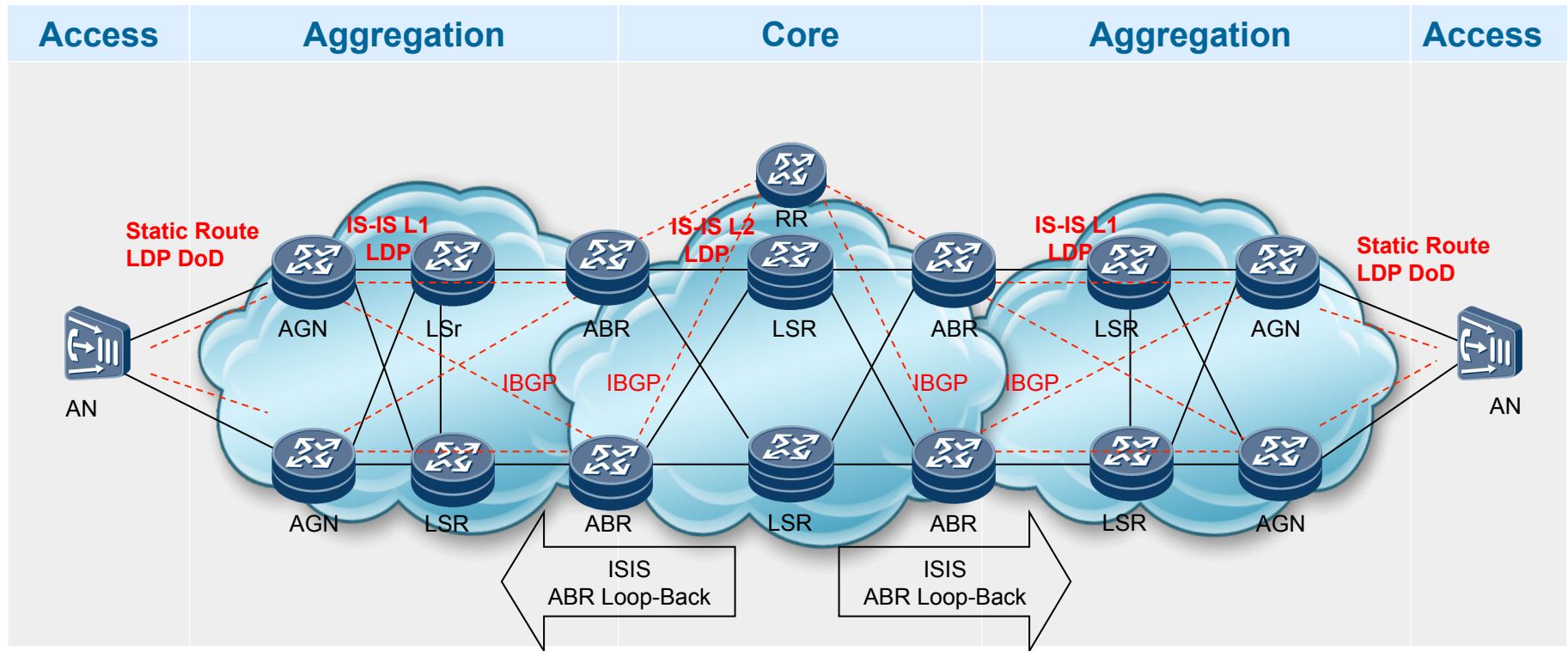
# Seamless MPLS for Mobile Backhaul

## draft-li-mpls-mbb-seamless-mpls-00

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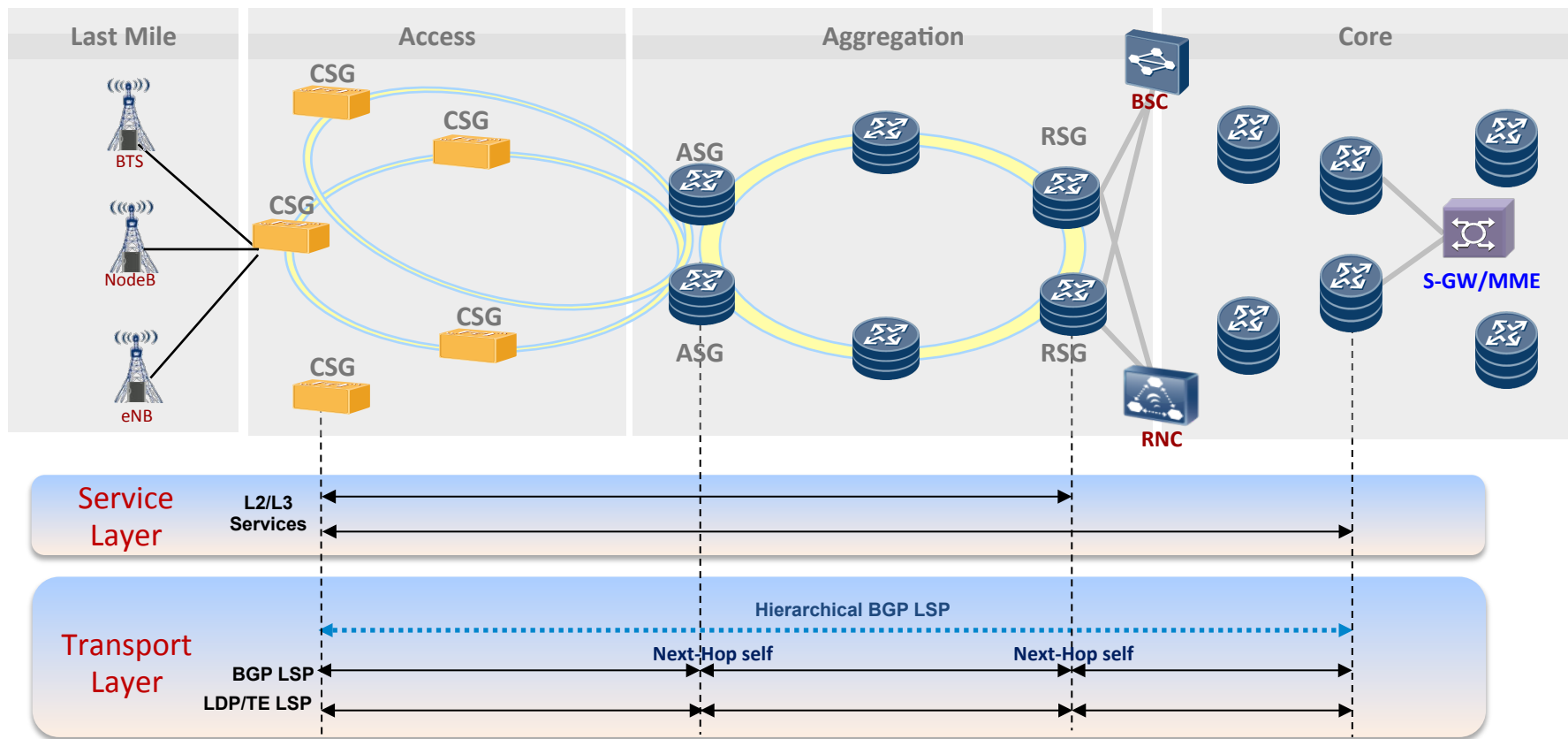
# Seamless MPLS Network Architecture



- The key concepts for Seamless MPLS: Decoupling the transport layer and service layer.
- The network will be divided into multiple IGP areas for access, aggregation and core network
- IBGP run among the Area Boarder Routers (ABRs) to advertize labeled route.
- LDP DoD is introduced to set up LSP on demand between AN and AGN.

# Seamless MPLS for Mobile Backhaul Networks

- Ring topology is adopted in mobile backhaul networks.
- Variable devices with variable capability are deployed in the access ring and aggregation ring.



# Scenarios for Network Architecture

## ■ Network Architecture 1: Network separated by Ases

- Scenario 1: ASes connected by different ASBRs
- Scenario 2: ASes connected by integrated ASBRs

## ■ Different network integrated in one AS but separated by different IGP areas

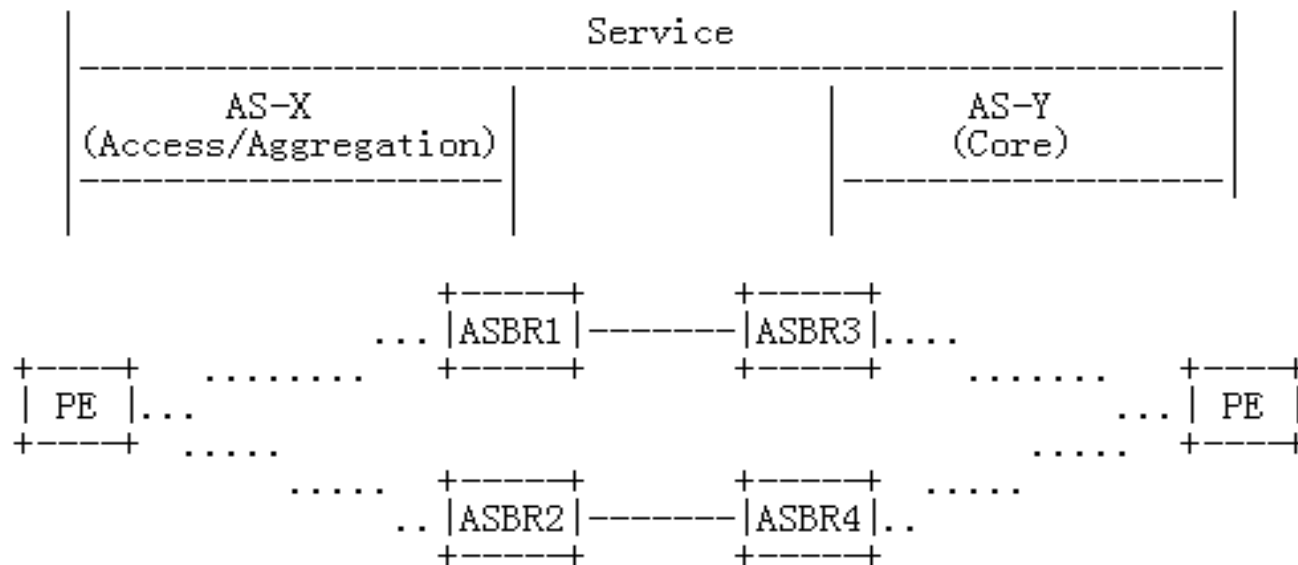
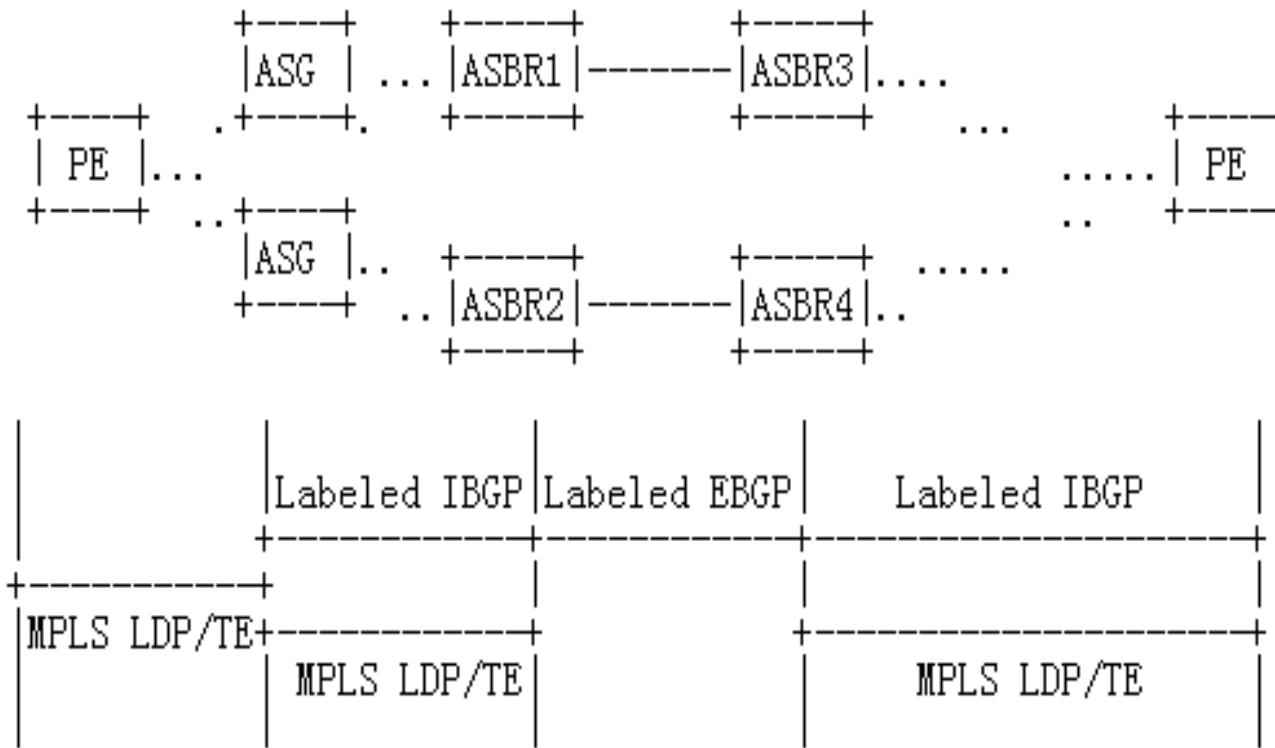


Figure 1 Redundant ASBRs connected Back to Back

# Scenarios for Different Edge of Labeled BGP

- Scenario 1: Cell Site/User PE devices as the edge
- Scenario 2: ASG nodes as the edge
- Scenario 3: RSG(ASBR) devices as the edge



# Overall New Requirements of Seamless MPLS for MBB

## ■ Requirements on MPLS TE

- Proxy Egress LSP and BGP LSP Stitching
- Unified OAM: end-to-end OAM for mobile service
- Protection: end-to-end convergence in 50 ms
- Scalability: improve scalability of MPLS TE

## ■ Requirements on Ring Network

- LDP DoD: Multiple hops for provision of LDP DoD
- LDP FRR: 100% network coverage

## ■ Requirements on L3VPN

- Policy control: Reduce complexity on control route distribution
- L3VPN OAM: SDH-like OAM requirement for mobile service

# Requirements and Solutions of Seamless MPLS for MBB(1)

## ■ Scalability

- Auto Mesh and Enhancement:
  - Auto Mesh: [RFC4972]
  - Role-based Auto Mesh: [I-D.li-ccamp-role-based-automesh]
- Service-Driven Tunnel:
  - [I-D.li-mpls-serv-driven-co-lsp-fmwk]
- Auto Path Computation
  - [I-D.li-ospf-auto-mbb-te-path]

# Requirements and Solutions of Seamless MPLS for MBB(2)

## ■ Access Stitching

### ➤ Transport Layer Stitching

- Proxy TE: [I-D.li-mpls-proxy-te-lsp]
- Proxy LDP DoD: proposed later

### ➤ Service Layer Stitching

- L3 Service Stitching: Hierarchy of VPN (HoVPN)
- L2VPN Service stitching: Multi-Segment PW



# Requirements and Solutions of Seamless MPLS for MBB(3)

## ■ Reliability

- MPLS TE

- MPLS LDP

  - MRT FRR based on LDP MT: [I-D.li-rtgwg-ldp-mt-mrt-frr]

## ■ Policy Control: Improve Intelligence of IBGP

- AIGP

  - [I-D.ietf-idr-aigp]

- NEXTHOP\_PATH ATTRIBUTE

  - [I-D.zhang-idr-next-hop-path-attr-00]

# Requirements and Solutions of Seamless MPLS for MBB(4)

## ■ OAM

### ➤ L2VPN

- VPN Layer: MPLS TP for PW
- Service Layer: Y.1731 for MAC

### ➤ L3VPN

- VPN Layer - L3VPN PM: [I-D.zheng-l3vpn-pm-analysis]/ [I-D.dong-l3vpn-pm-framework]
- VPN Layer - IPFPM: [I-D.chen-coloring-based-ipfpm-framework]

### ➤ Service Path Visualization

- Trace the whole path in one operation

# Next Steps

- Solicit more comments and feedback
- Incorporate more requirements and solutions
- Revise the draft