

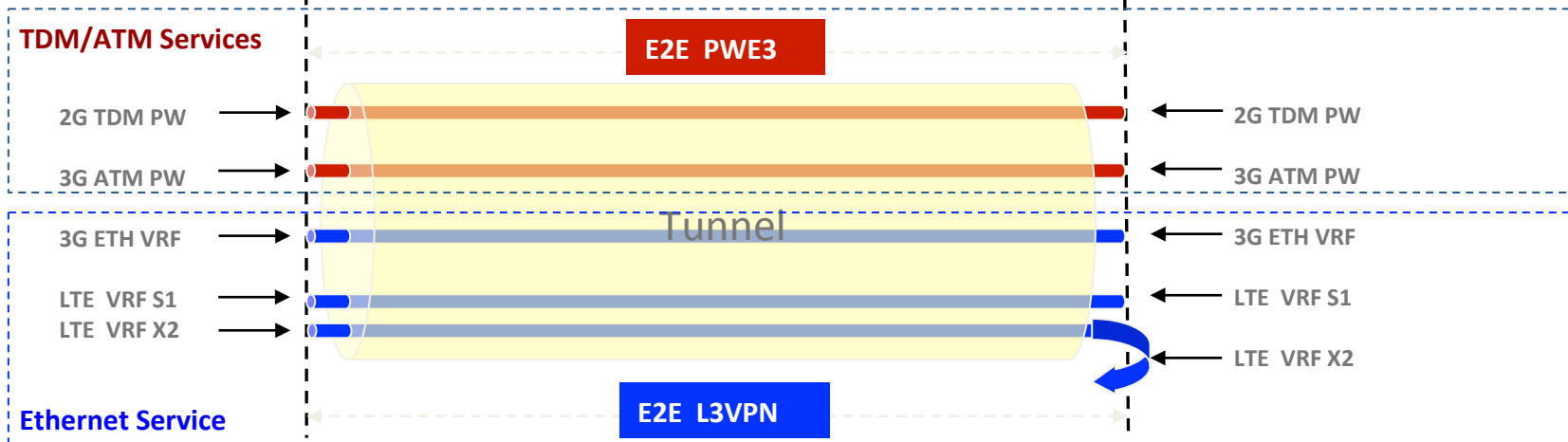
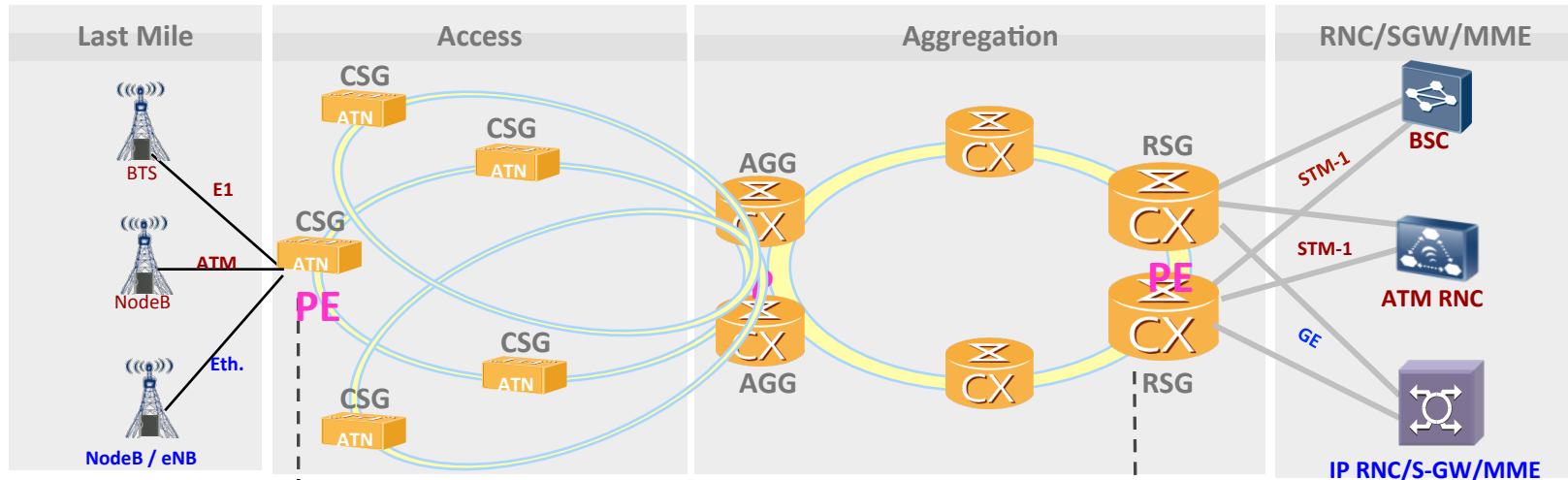
OSPF Extensions for Automatic Computation of MPLS Traffic Engineering Path Using Traffic Engineering Layers and Areas

draft-li-ospf-auto-mbb-te-path-00

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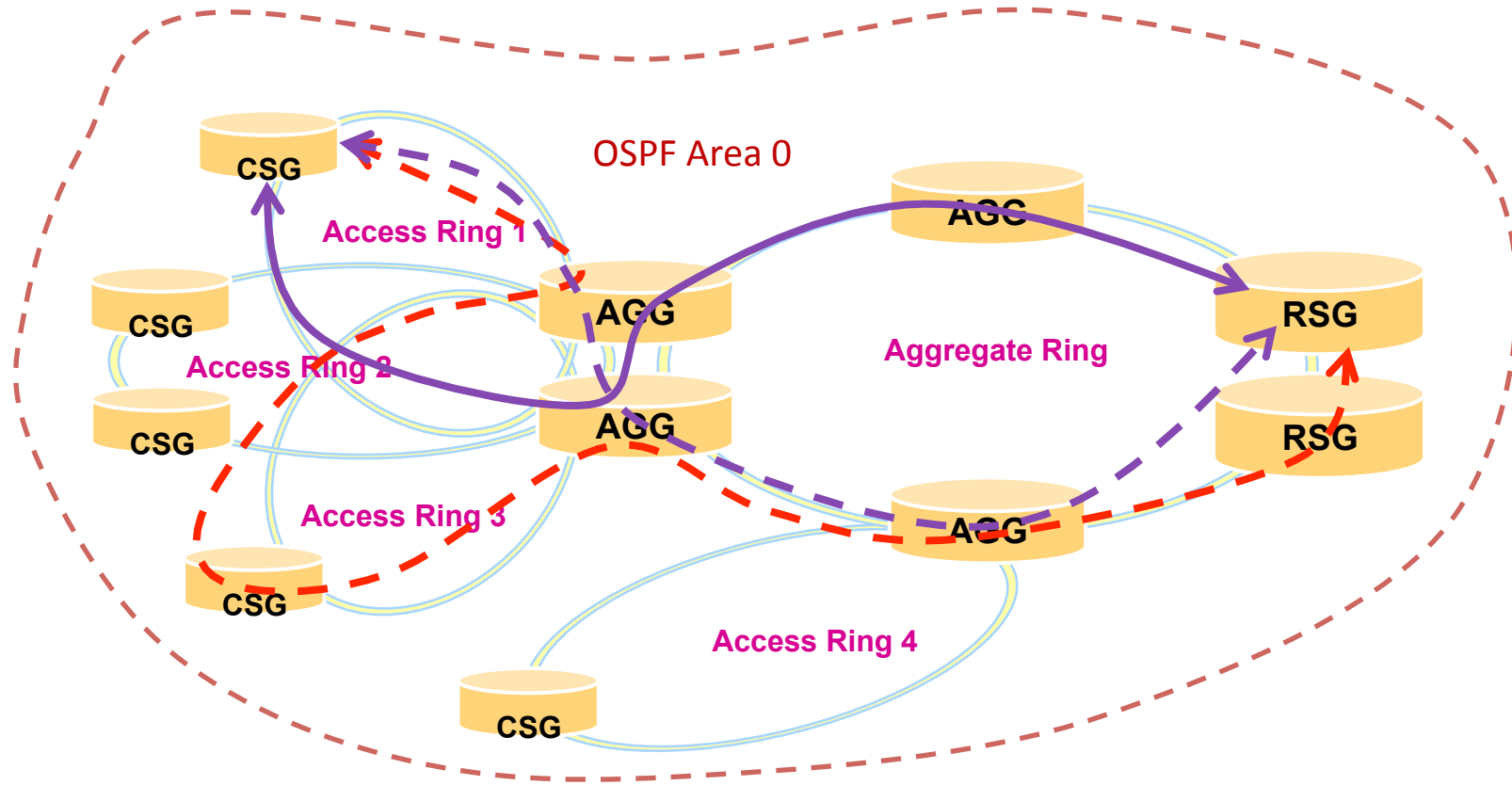
IETF 86, Orlando, FL, USA

Application of MPLS TE in MBB



- MPLS TE is used in the network to carry L2VPN/L3VPN services, providing traffic engineering, OAM, etc.
- As the network scale expands, more MPLS TE tunnels have to be deployed.
- It is important to deploy MPLS TE tunnel easily.

Problem Statement of MPLS TE Auto Path Computation



- Requirement 1: Completely disjoint primary and backup LSP
- Requirement 2: Avoid passing through different access rings

Existing Solutions and Challenge

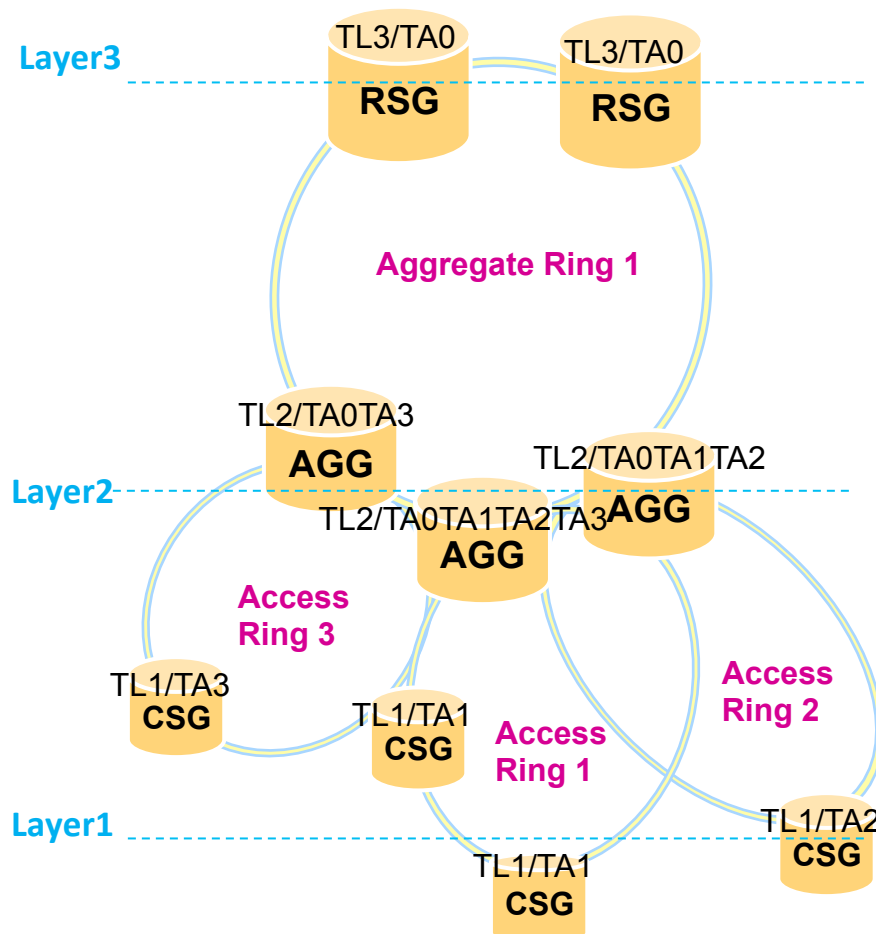
■ Existing Solutions

- Solution 1: To set reasonable link cost
- Solution 2: To use explicit-path or affinity property(Color)

■ Challenge

- It will be very complex and time-consuming to adjust the cost for a large scale network or change explicit path or affinity property for a great deal of MPLS TE tunnels.

Architecture of MPLS TE Auto Path Computation: Concept of TA/TL



Concept of TA/TL

- TL (TE Layer): It indicates the physical layer of the node in the network.
- TA (TE Area): It indicates the physical ring of the node.

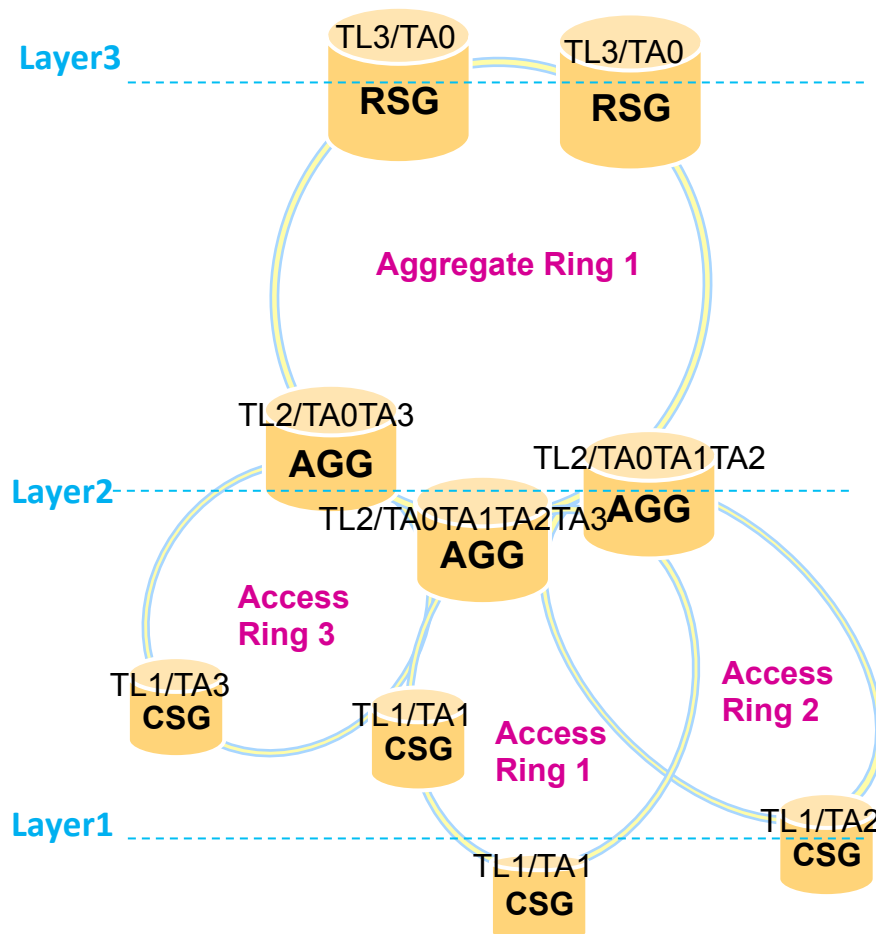
TL and TA are defined for MPLS TE path

computation according to the natural topology of the mobile network.

IGP Flooding TA/TL Info

- TL and TA information are flooded and installed into TEDB.

Architecture of MPLS TE Auto Path Computation: Enhanced CSPF Algorithm



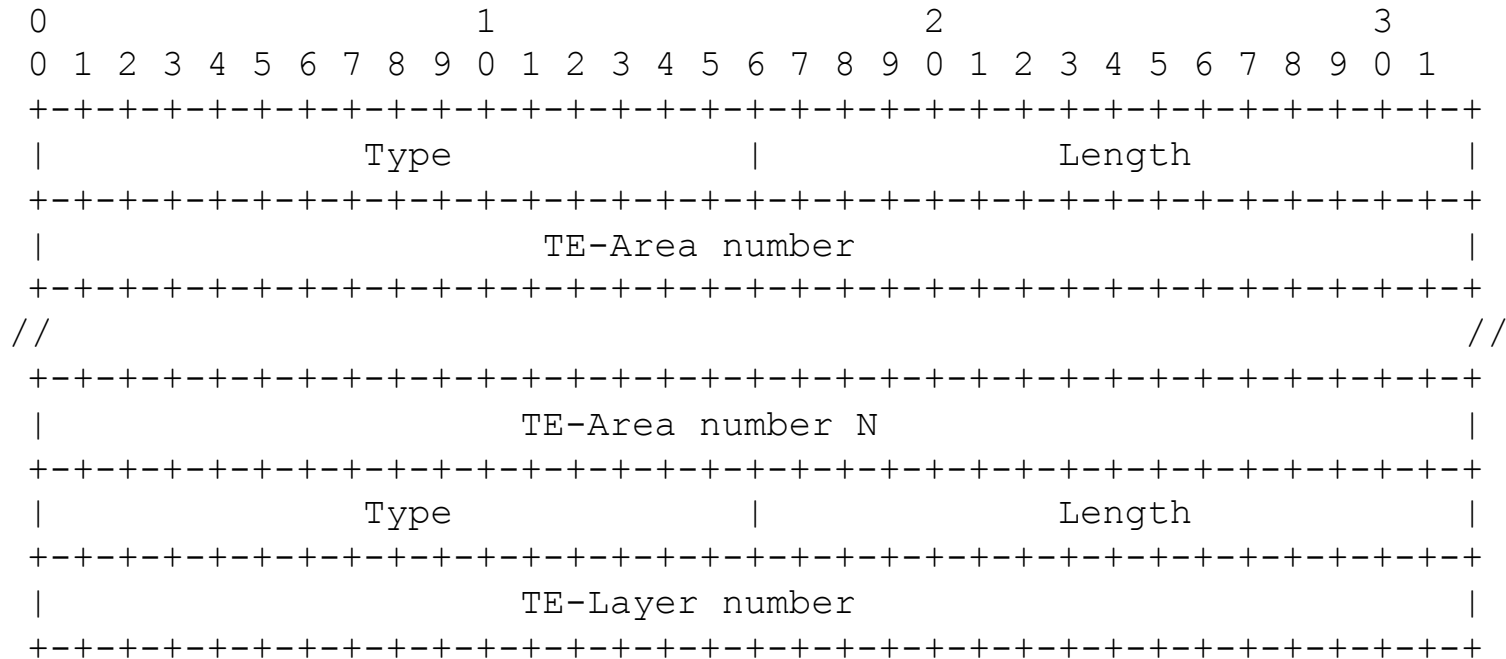
Rules for Enhanced CSPF Algorithm

- Rule1: If the destination node of the LSP is not in the same TA as the source node or the passed node, the node in the different layer will be the potential next-hop.
- Rule2: One LSP's TL track can not include TLh->TLi->TLh, this means that the LSP cannot pass through the low layer twice.
- Rule3: If the LSP reach a node that in the same TA as the destination node, the LSP must be calculated in this TA only.
- Rule 4: If the LSP reach a node that among more than one TAs, the node in different TA should be prior to be the next hop.

Rules for Determining Primary/Secondary LSP

- Rule 5: The LSP which passes fewer TAs will be the primary LSP.
- Rule 6: If the two LSPs passes the same TAs, the one with shorter metric in every layer from high to low will be the main LSP

OSPF Extensions: TA TLV and TL TLV



Elements of Procedure

- The OSPF TA and TL TLV is carried within the OSPF Routing Information LSA.
- The TA TLV and TL TLV may be advertised within an Area-local or Routing-domain scope Router Information LSA, depending on the MPLS TE profile.

Next Steps

- Get feedback on the architecture and OSPF extensions (on mailing list)