CFM in TPMR

MAC_Operational control

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Introduction

Two bridges interconnected via one or more TPMRs

❑ Establishes a repeatered line

❑ TPMRs operate in Link (or Section) layer

❑ Two MA always associated with a repeatered line
  - Multiplex Section MA (MEPs in bridges, MIPs in TPMRs)
  - Optional Regenerator Section MA (MEPs in bridges and TPMRs)
    – If not present/activated the Physical Media MA (no CFM support) replaces this RS-MA

❑ Two application cases to consider
  a. Link terminates at both bridges
  b. Link continues at at least one of the bridges (provides port-based interface)

❑ Two ownership cases to consider
  1. Single owner
  2. Multi owner (e.g. customer, provider)
    – Requires support of customer and provider/operator Mas

❑ Two Service/Link layer separation cases
  A. Separate service and link layers (Tagged interface with empty untagged set)
  B. Combined service/link layer (untagged interface, or with non-empty untagged set)

Introduction

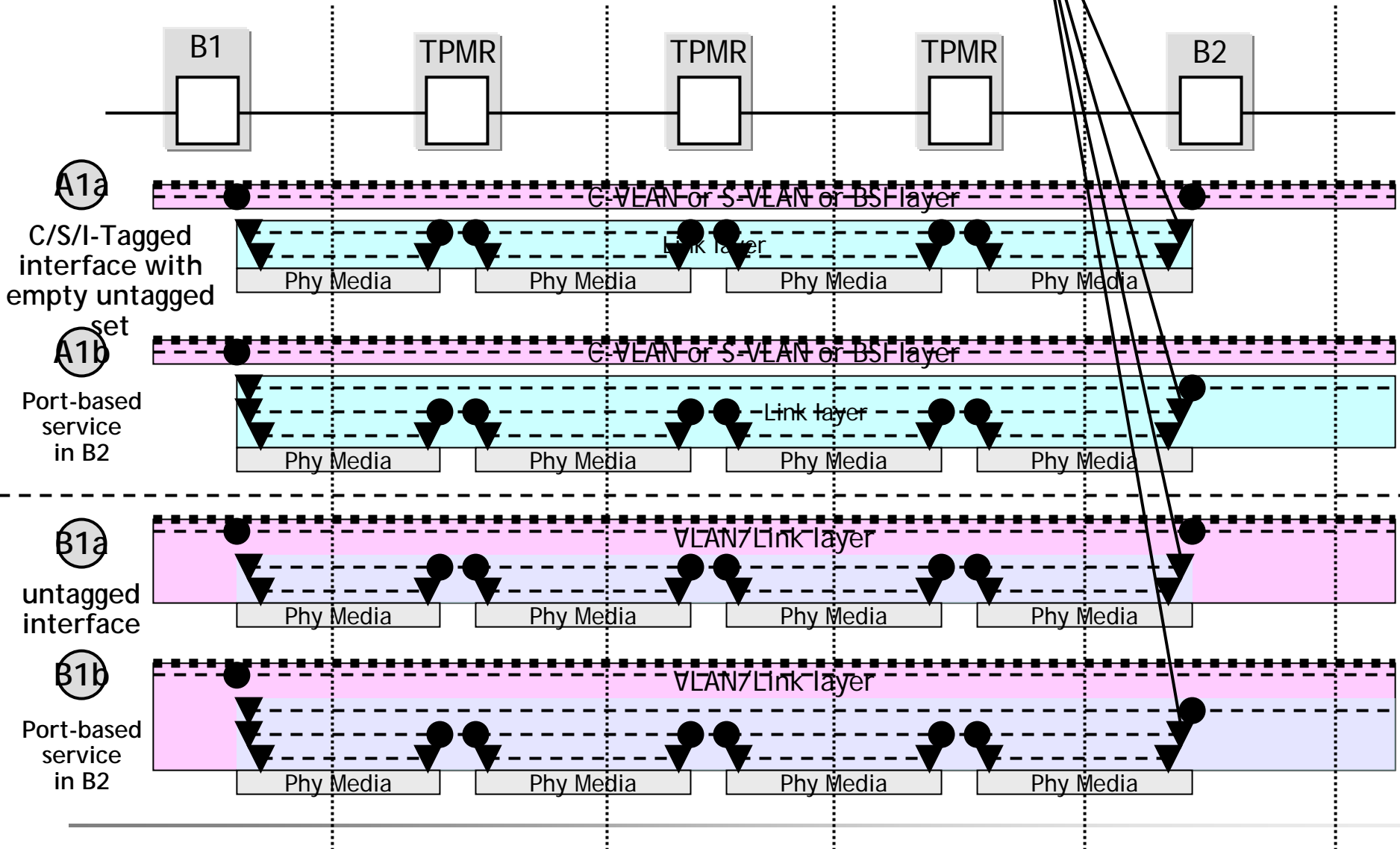Following slides illustrate the layers with their MEPs and MIPs in the different cases

❑ A1a: the most straightforward case

❑ A1b: requires an additional Link CFM MEP in PB CEP and PBB CNP when those must support a TPMR

❑ B1a/B1b: variant on A1a/A1b, no separation between service and link layers

❑ A2a/B2a: note the additional TPMR segment MA, located between MS- and RS-MAs with endpoints in one bridge and one TPMR

❑ A2b/B2b: these two variants have a problem; they essentially require "overlapping MAs". The MS-MA (between the two bridges) overlaps with the Provider MA (starting at TPMR and passing through second bridge). Two alternative MA configurations are illustrated; alternative 1 has the provider MA terminate at the bridge and no monitoring of the TPMR segment, alternative 2 also includes an additional TPMR segment MA.

MAC Status (MAC_operational) is determined by the MEPs as specified in clause 19.2.8/802.1ag. The MS-MA MEP in the bridges controls the MAC_Operational of the interface; any interruption of the chain results in a loss of CCMs and consequently a MAC_operation set to false. MAC Status propagation from TPMR to Bridge is as such not necessary; this is an implicit feature of CFM.

TPMR layers
Single owner

this MEP controls MAC_Operational @ B2 as per clause 19.2.8/802.1ag

B1   TPMR   TPMR   TPMR   B2

A1a

C/S/I-Tagged interface with empty untagged set

C-VLAN or S-VLAN or BSI layer

Link layer

Phy Media   Phy Media   Phy Media   Phy Media

A1b

Port-based service in B2

C-VLAN or S-VLAN or BSI layer

Link layer

Phy Media   Phy Media   Phy Media   Phy Media

B1a

untagged interface

VLAN/Link layer

Phy Media   Phy Media   Phy Media   Phy Media

B1b

Port-based service in B2

VLAN/Link layer

Phy Media   Phy Media   Phy Media   Phy Media

TPMR layers
Multiple owners, Tagged interface
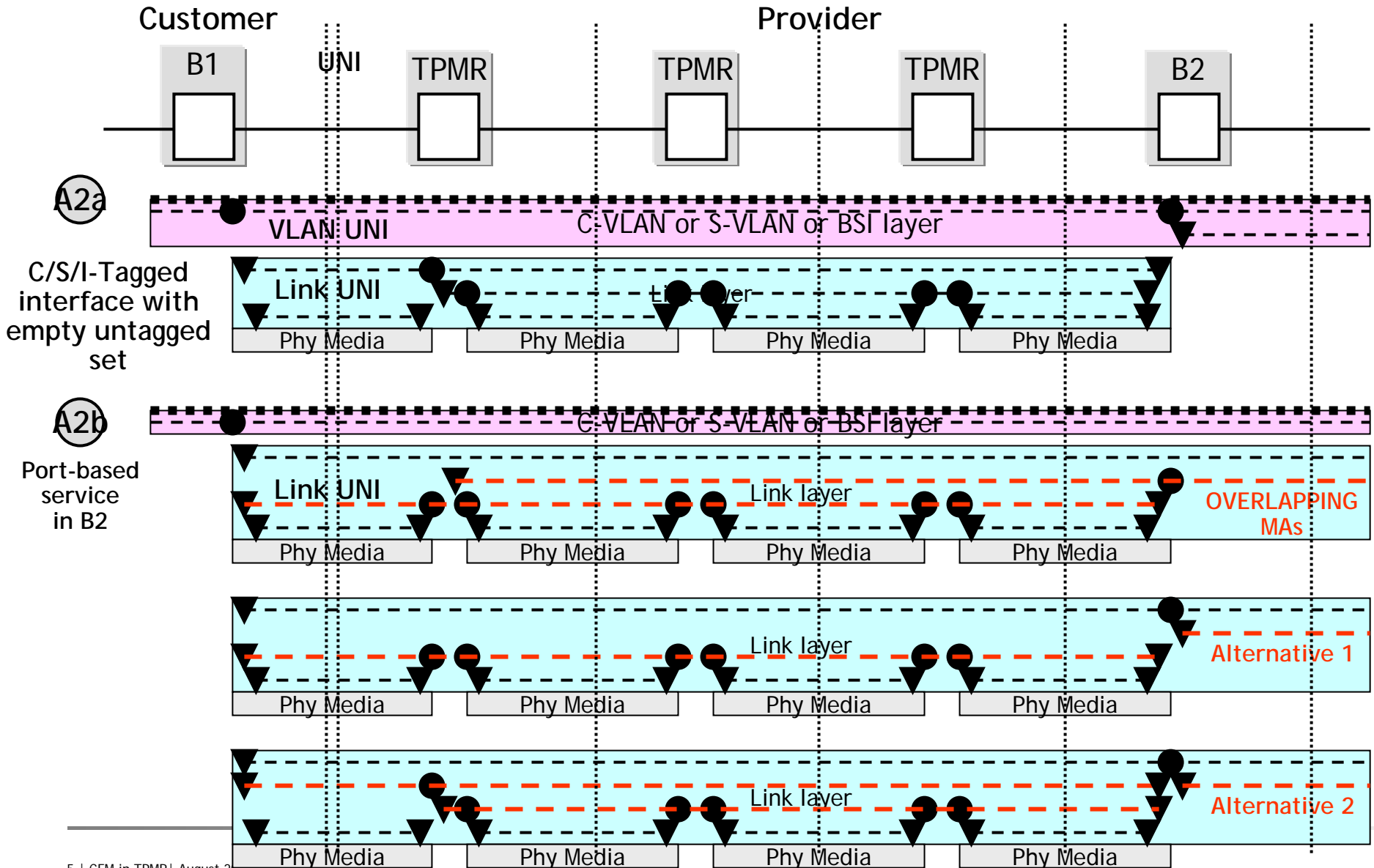
TPMR layers
Multiple owners, untagged interface

Customer

Provider

B1 TPMR TPMR TPMR B2

B2a untagged interface

VLAN UNI — VLAN/Link layer
Link UNI
Phy Media Phy Media Phy Media Phy Media

B2b Port-based service in B2

VLAN/Link layer
Link UNI Link layer
Phy Media Phy Media Phy Media Phy Media
OVERLAPPING MAs

VLAN/Link layer
Link layer
Phy Media Phy Media Phy Media Phy Media
Alternative 1

VLAN/Link layer
Link layer
Phy Media Phy Media Phy Media Phy Media
Alternative 2