P2MP Layering Baseline Proposal

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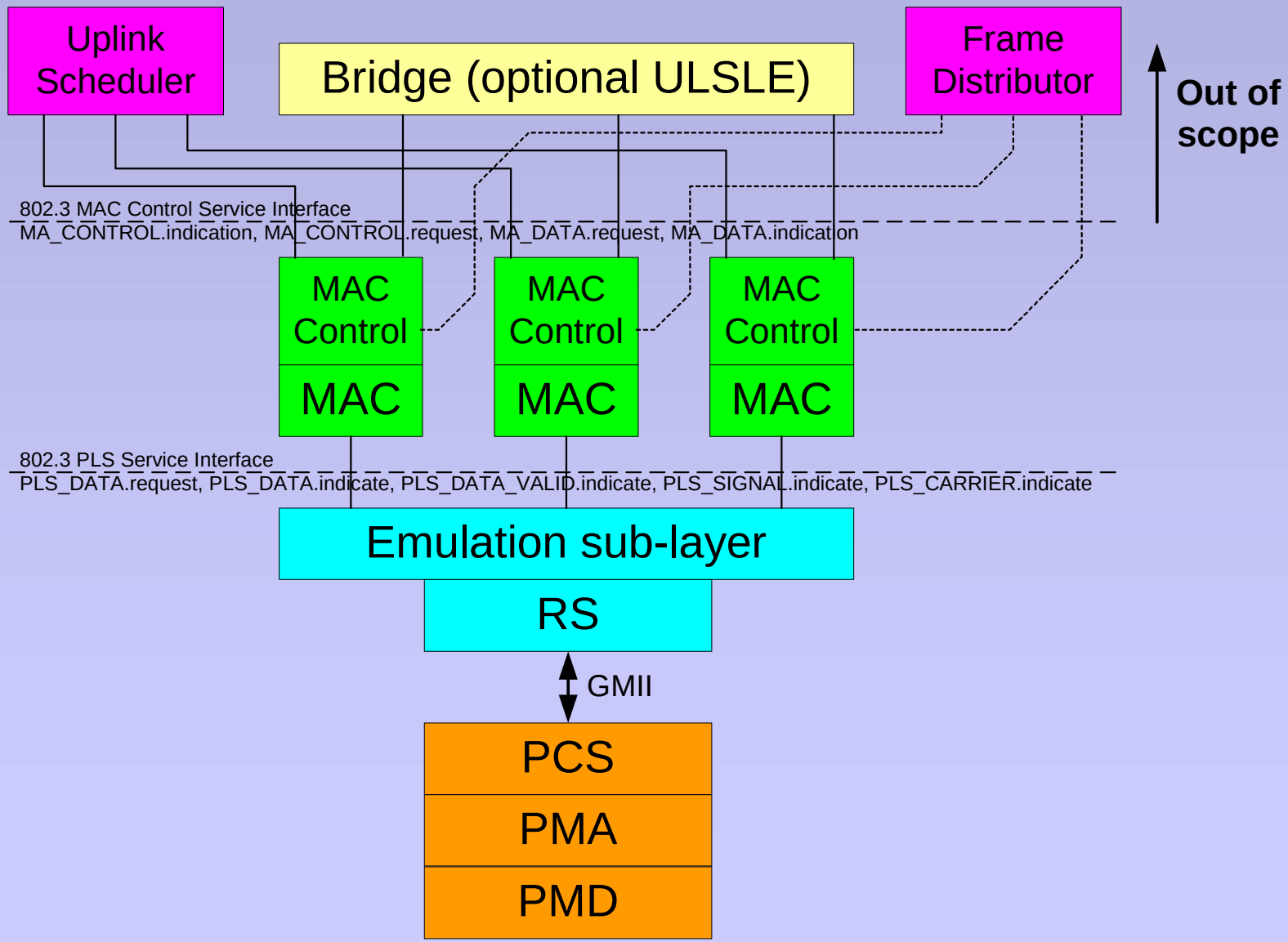
Motivation

- **P2MP should support point-to-point emulation to meet 802.1 compatibility requirement**
- **Project scope requires "minimal augmentation of the MAC operation"**
  - MAC interfaces, frame format and behavior must not be altered (clauses 2,3,4,6)
  - Management (clause 30) should be supported per ONU
  - Existing MAC control functionality (pause) should be supported

Suggested layering
Symmetrical for OLT/ONU



OLT View
Upstream

- **Link management**
  - Counters (usage / corruption) are incremented in only one MAC
  - Global status is the sum of all MACs' counters
- **Demultiplexing**
  - Frames are demultiplexed based on LLID tag and/or granted LLID
  - One MAC is selected to receive incoming frame
  - Tag is stripped
- **MPCP flow**
  - The MAC that received the frame passes it to its MAC control
  - Uplink scheduler identifies source of REPORT message based on the interface it arrived from

OLT View
Downstream

- **Link management**
  - Usage counters are incremented in only one MAC
  - Global status is the sum of all MACs' counters
- **Arbitration**
  - Frame distributor enables transmission of only one entity of MAC control
  - Tag is added based on transmitted MAC entity
- **MPCP flow**
  - MAC control adds time-stamp when frame is passed to MAC
  - Uplink scheduler transmit GATE to a specific LLID using a fixed interface

ONU View
Upstream

- **Link management**
  - Usage counters are incremented in only one MAC
- **Arbitration**
  - MAC control contain registers for transmission enable
  - Only one entity of MAC control is granted at a given moment
    - Among all ONUs
  - Tag is added based on transmitted MAC entity
- **MPCP flow**
  - MAC control adds time-stamp when frame is passed to MAC
  - REPORT messages of a specific LLID will always be transmitted using the same interface

ONU View
Downstream

- **Link management**
  - Counters (usage / corruption) are incremented only in the MAC that should have received the frame
- **Demultiplexing**
  - Frames are demultiplexed based on LLID tag
  - Frame is dropped if LLID doesn't exist in ONU
  - Tag is stripped
- **MPCP flow**
  - The MAC that received the frame passes it to MAC control
  - GATE messages are parsed in a single MAC control entity

Summary

- A simple multiplexing layer is added between RS and MAC
- Several MAC entities exist
- Voted MPCP baseline is not affected
- No other clauses are affected
- Behavior is defined in a single layer

Appendix I – Frame Distributor

- **From Clause 43.2.4 (Link Aggregation)**

  The Frame Distributor is responsible for taking outgoing frames from the MAC Client and transmitting them through the set of links that form the Link Aggregation Group. The Frame Distributor implements a distribution function (algorithm)responsible for choosing the link to be used for the transmission of any given frame or set of frames.

  This standard does not mandate any particular distribution algorithm(s);

A similar mechanism could be defined

Appendix II – Single MAC Layering