MAC Merge Sublayer to Support Minimum Latency Scheduled Traffic

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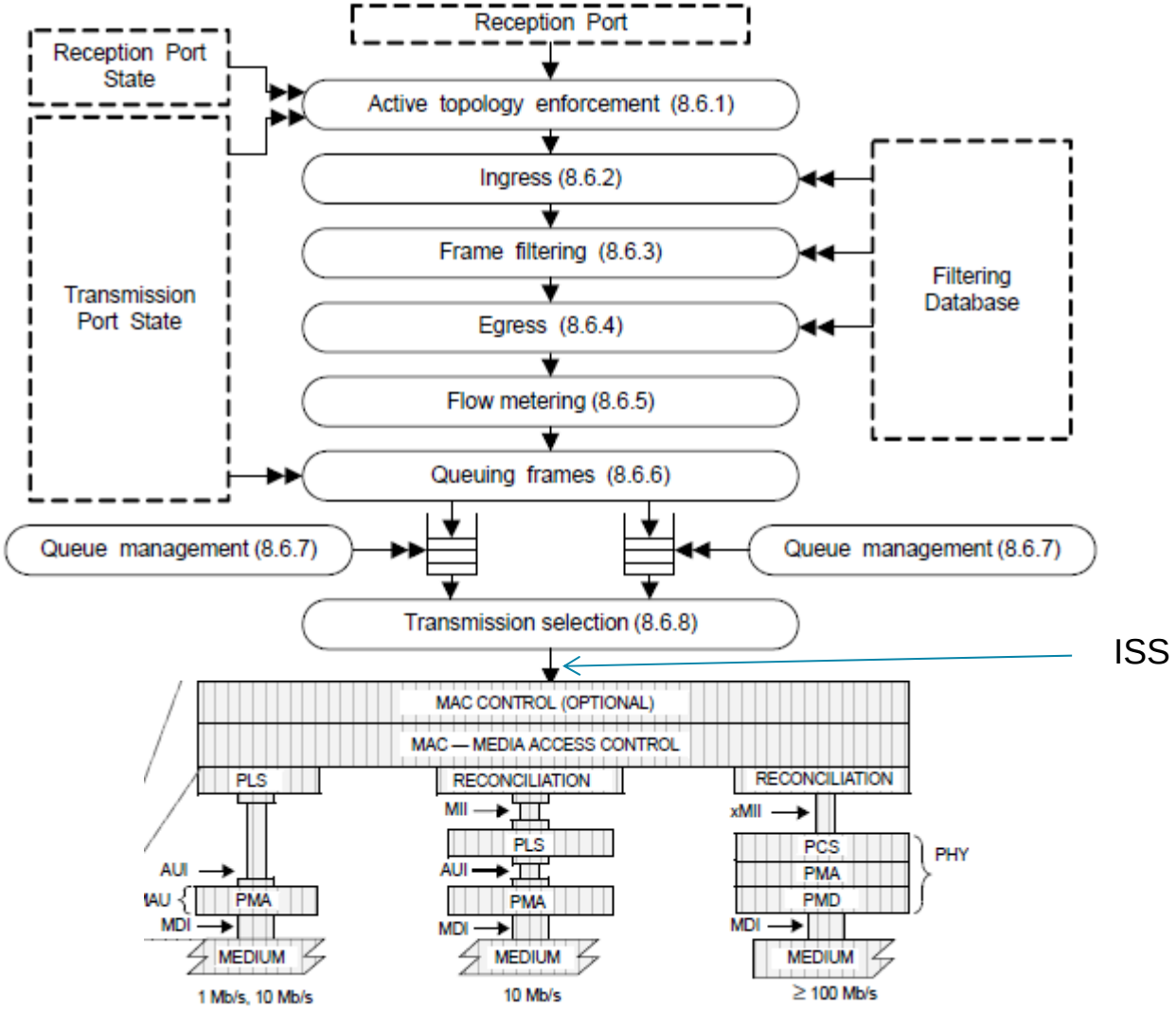
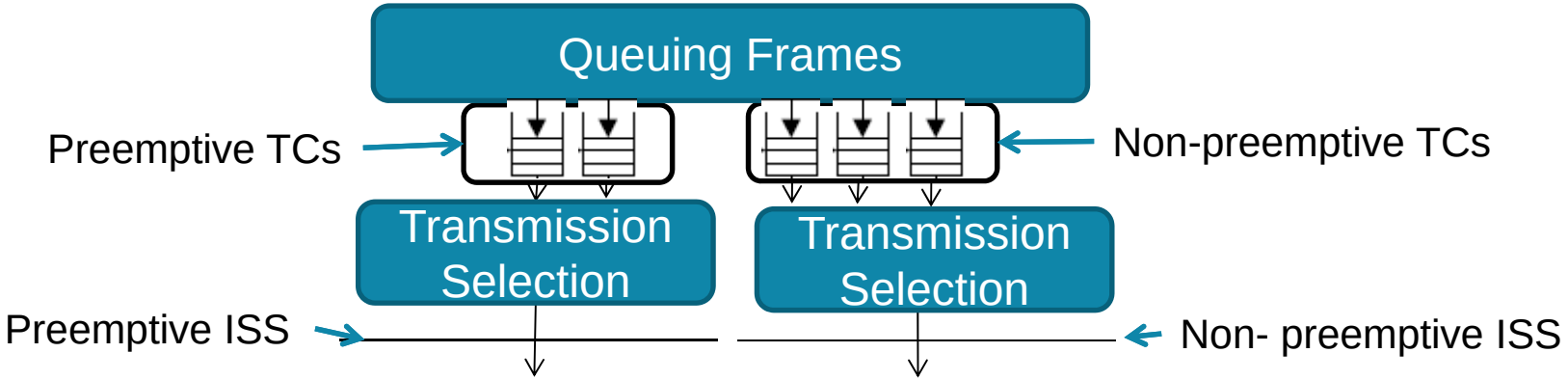
Existing IEEE 802.1 and IEEE 802.3 Models

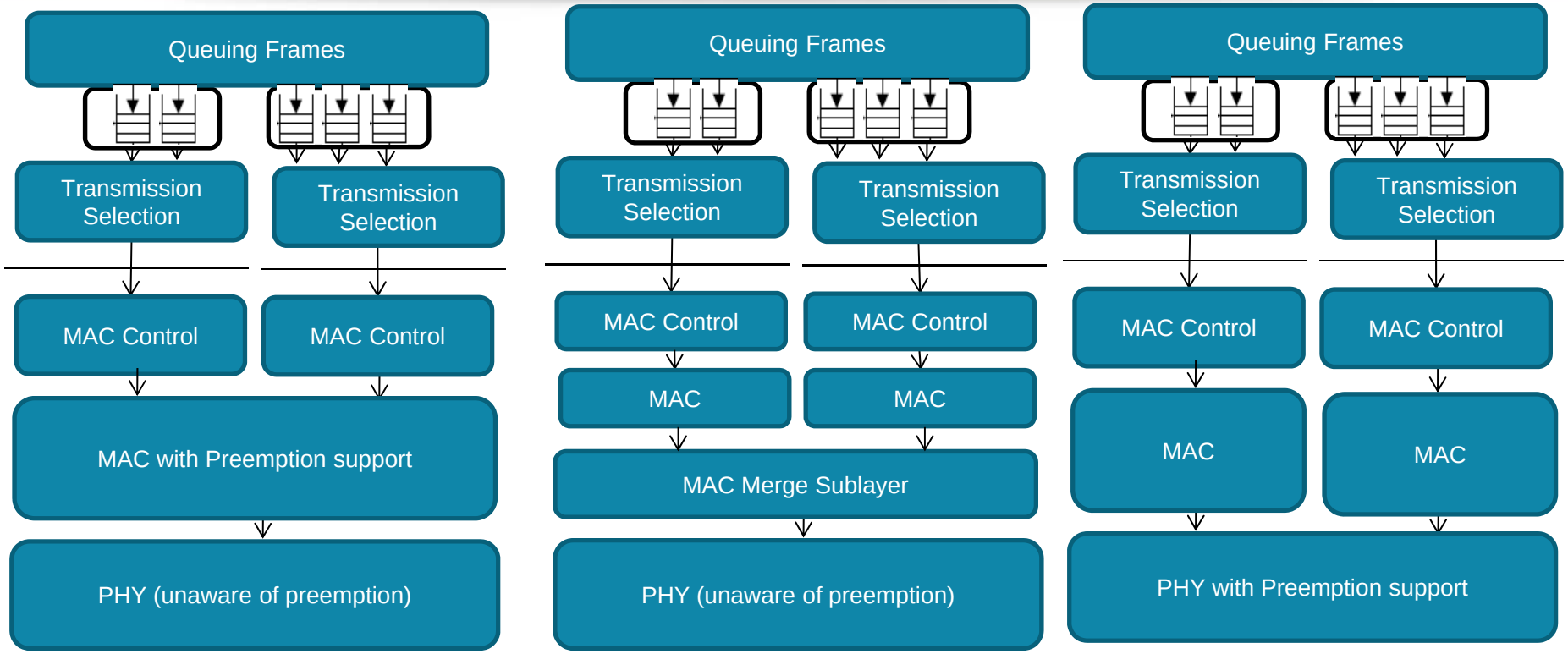


Interface for supporting Preemptive traffic



- Allows upper layer to present frames via two paths – one ISS for normal traffic and another interface for lowest latency traffic which allows those frames to bypass normal frames
- Defining the interface doesn't determine how to support it below the MAC – there are several feasible alternatives

Options for service supporting this interface.



- Preemption could be implemented in the MAC, in the PHY or in a new sublayer.

What is a MAC Merge Sublayer?

- Connects two MACs to a common PHY
- Transmission
  - When an urgent frame is presented on the preemptive ISS, encapsulates fragments adding fragment headers
  - Generates fragment CRC
  - Fragments appear to PHY as normal packets – e.g. no new delimiters or codes.
- Reception
  - Checks fragment CRC
  - Checks for fragment errors (i.e. missing fragments) to protect data integrity (force CRC error to MAC to drop errored frame)
  - Decapsulates fragments

Why a new sublayer?

- A MAC with preemption would need to duplicate most variables – one set for tracking progress of preemptive packet transmission and reception and another set for tracking progress of non-preemptive packet transmission and reception.
- Using two MACs and a MAC Merge sublayer partitions the functionality logically.
  - MAC does the frame specific handling just as it does today
  - MAC Merge handles fragmentation
  - MAC Merge paces bit transmission by accepting bit primitives from the service interface to the MAC
- MAC Merge is above the Media Independent Interface
  - Operates independent of PHY considerations such as encodings
  - PHY sees normally formed frames.

Thank You

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