MAC Merge Sublayer to Support Minimum Latency Scheduled Traffic

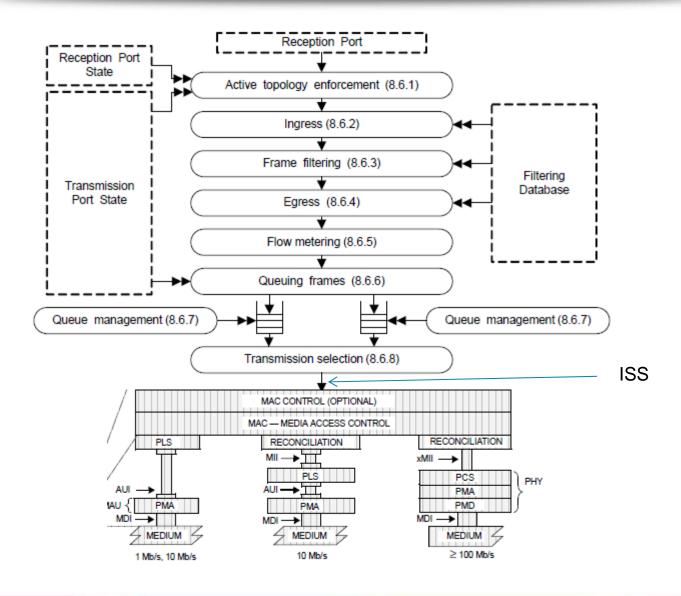


Pat Thaler

Technical Director

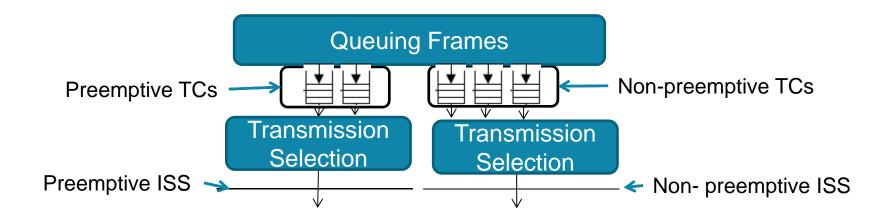
Existing IEEE 802.1 and IEEE 802.3 Models





Interface for supporting Preemptive traffic

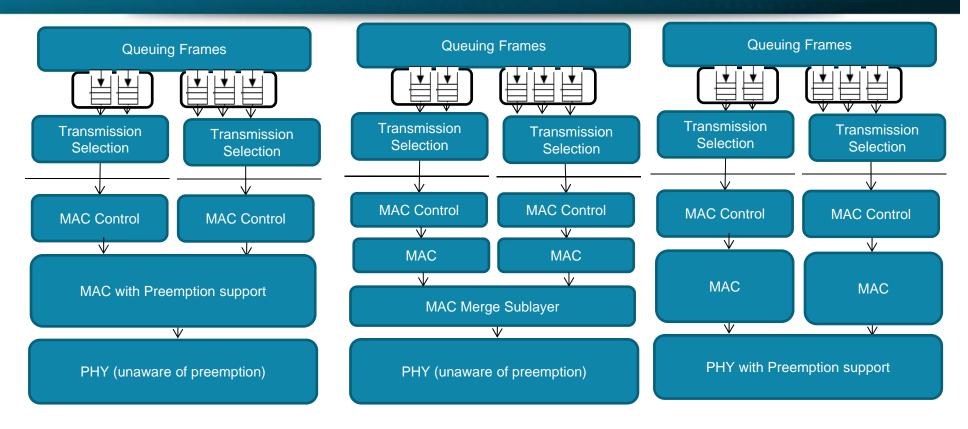




- Allows upper layer to present frames via two paths one ISS for normal traffic and another interface for lowest latency traffic which allows those frames to bypass normal frames
- Defining the interface doesn't determine how to support it below the MAC – there are several feasible alternatives

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.





Pat Thaler

Technical Director