Support for DMLT Guard Band

A Technical Feasibility Presentation

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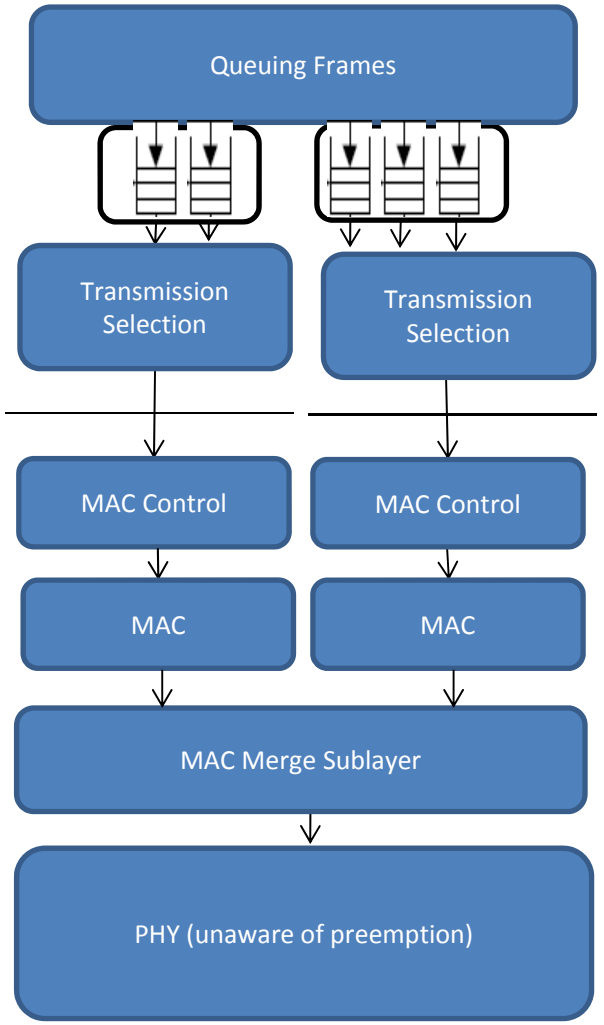
Ethernet stack with MAC Merge

- MAC Merge sublayer
  - Provides lower latency for scheduled traffic
  - Preserves frame integrity
  - Minimizes impact on throughput
  - Is transparent to existing non-deprecated PHYs above 10 Mb/s



Providing minimum latency for scheduled traffic

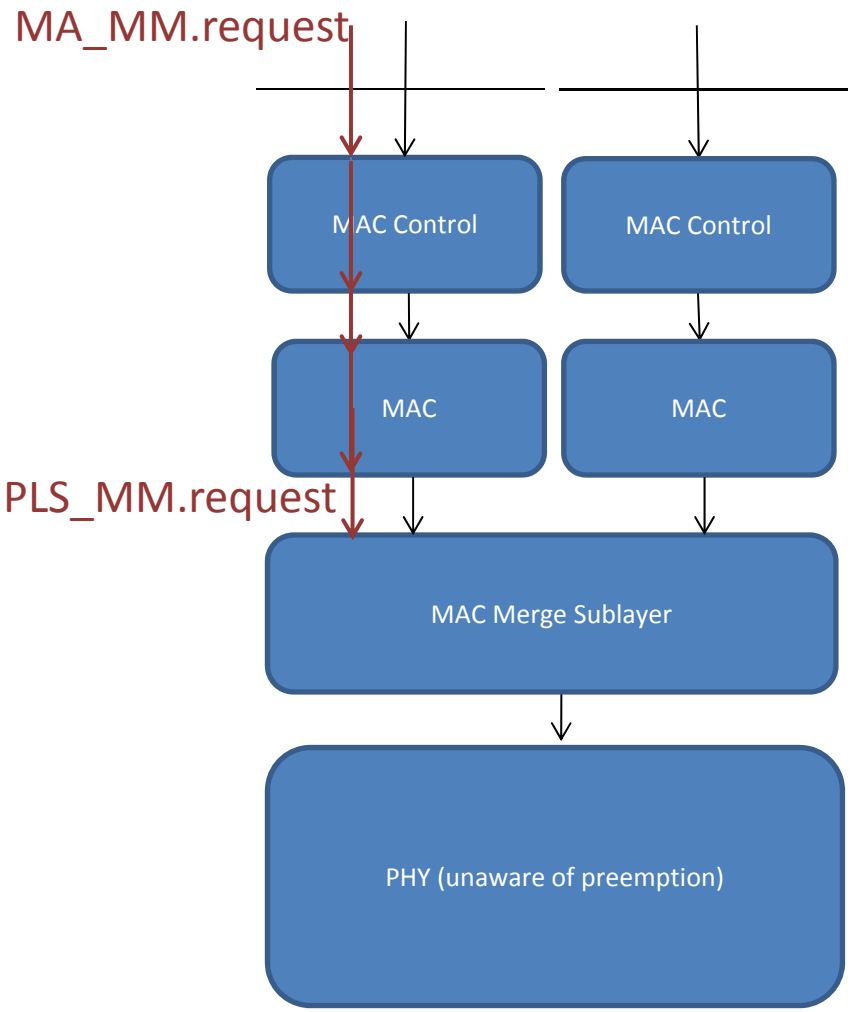
- Preemption may be triggered by the DMLT MAC presenting the first bit of a DMLT frame
- Start of transmission of the DMLT frame must then wait for the MAC Merge layer to preempt any preemptable frame in progress
  - Up to minimum fragment size plus IPG
- Can we do better for scheduled traffic?

Guard band

- The MAC Client is responsible the schedule
  - knows when scheduled traffic should arrive
- Guard band is provided by preempting traffic before the scheduled traffic arrives
- When scheduled frame arrives, it can be transmitted immediately
- How can guard band start be signaled from MAC Client to MAC Merge sublayer

MA_MM.request and PLS_MM.request

- MA_MM.request: Additional primitive on DMLT MAC client service interface
- PLS_MM.request: Additional primitive on interface between DMLT MAC and MAC Merge sublayer



MA_MM.request(hold_req) and PLS_MM.request(hold_req)

- DMLT MAC Control and MAC operation is not affected by this primitive except to send the primitive on the lower layer interface
- hold_req parameter takes one of two values:
  - hold – asserts hold variable in MAC Merge sublayer
  - release – clears hold value in MAC Merge sublayer
- MAC Merge preempts whenever hold = TRUE or DMLT MAC PLS_DATA.request has a bit to transmit.

Example of primitives in 802.3 that tunnel through sublayers:

In Clause 65, Figure 65-4,

- PMD_signal.request goes from the PCS through the PMA to the PMD
- Signal_detect goes from the PMD through the PMA to the PCS

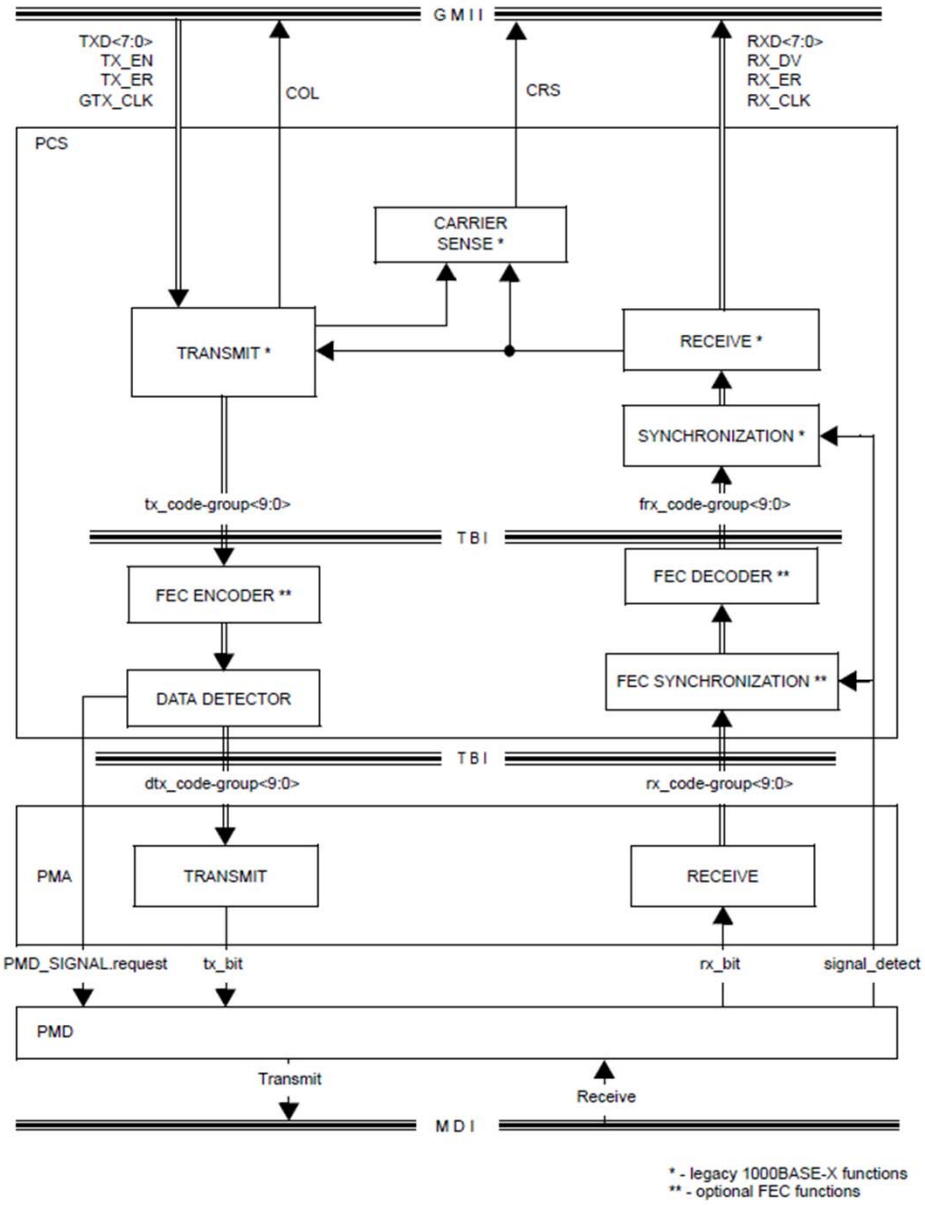


Figure 65–4—PCS Extension functional block diagram

Conclusion

- It is feasible for DMLT in a MAC Merge sublayer below the MAC to minimize latency by supporting a hold request that preempts normal traffic before urgent traffic is ready for transmit.
  - The hold request would be passed through the DMLT MAC Control and MAC sublayers without affecting the operation of those sublayers.

Thank you!
Questions?