



Some thoughts for preemption

Draft



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- **Moving forward...**
- **Preemption options**
- **Above the MAC**
- **MAC layer**
- **Below the MAC**
- **Choices**
- **Questions...**

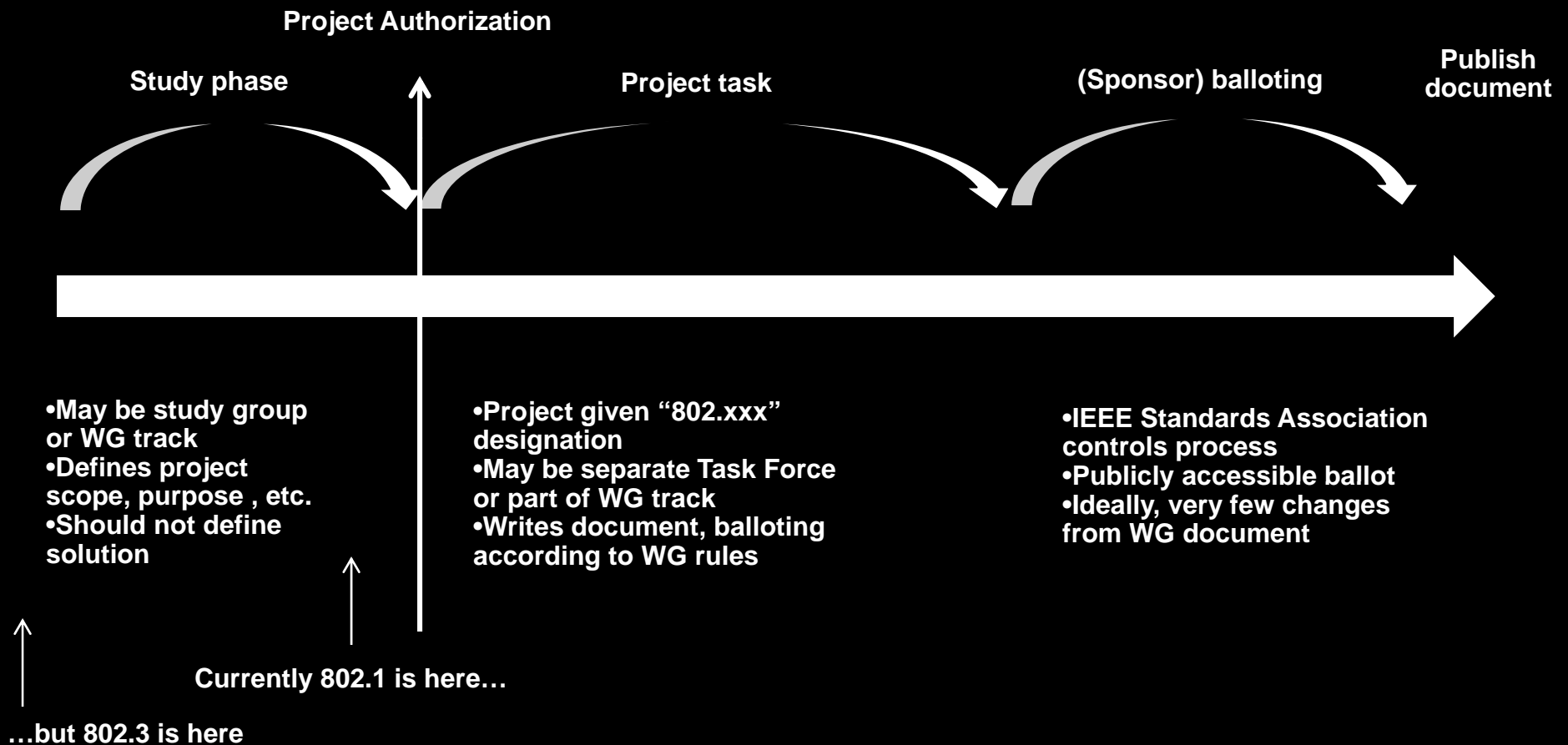
Moving forward with preemption



- **#1 important choice – preemption or not?**
- **#2 (probably no choice) – conjunction with 802.3?**

- **Assuming yes on both – what needs to happen?**
- **Requirements for 802 projects**
- **Typical processes in 802.3**

Milestones in 802 projects



What is needed for next step



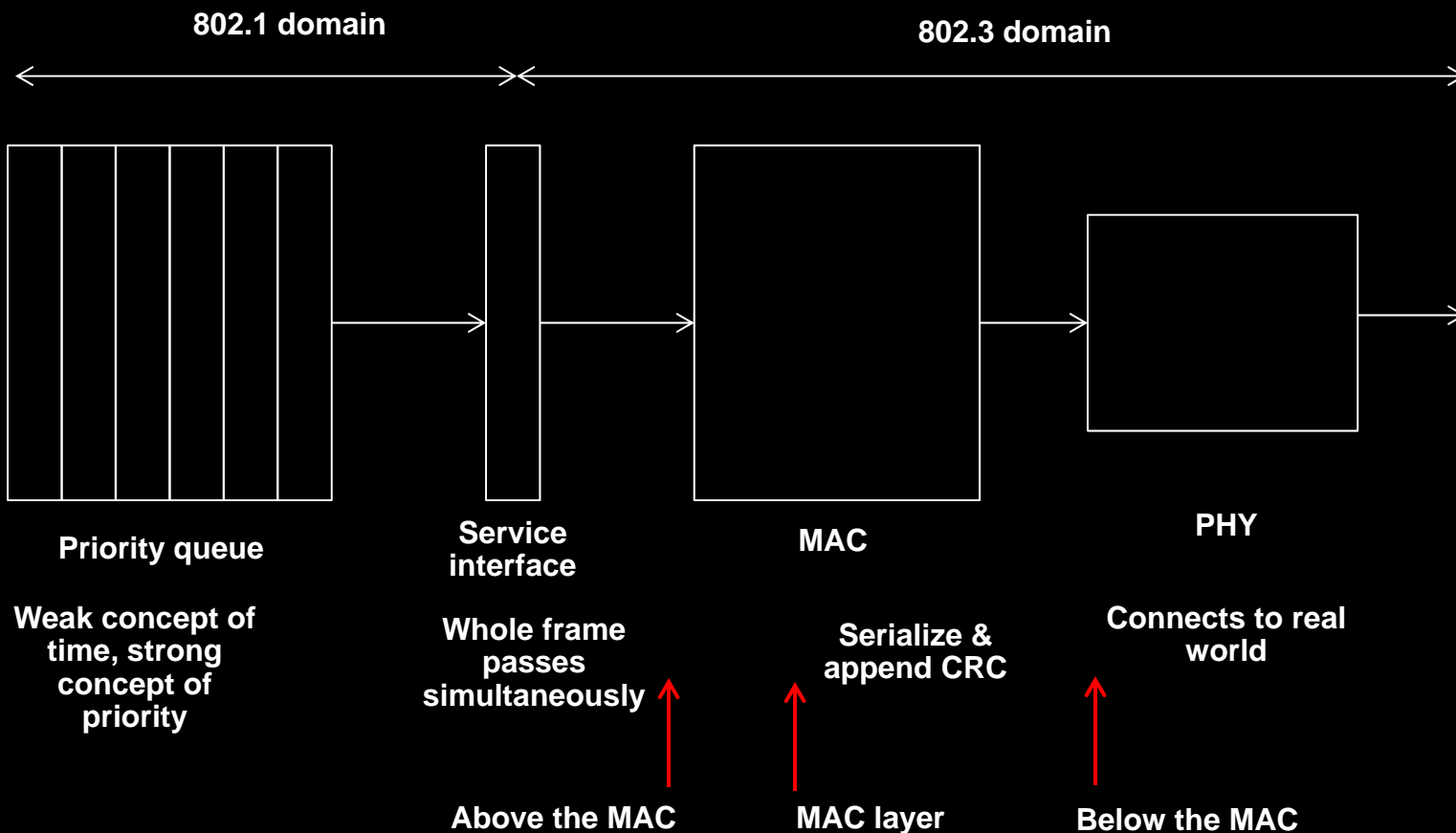
- In order to start **real** work – needs PAR
- 802.1 mostly ready – 802.3 part still needs definition
- First step is Call For Interest (CFI)
 - (ideally March 2012, needs 30 day notice)
 - Permission from WG to develop PAR etc.
- In 802.3 SG (assuming CFI) – define project
 - PAR (purpose, scope, etc.) same as for 802.1
 - Also, specific project objectives
 - Need to understand the nature of changes required

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Critical choice for Study Group



- **Where (in architecture) to preempt?**
 - Will govern scope of work and reasonable objectives

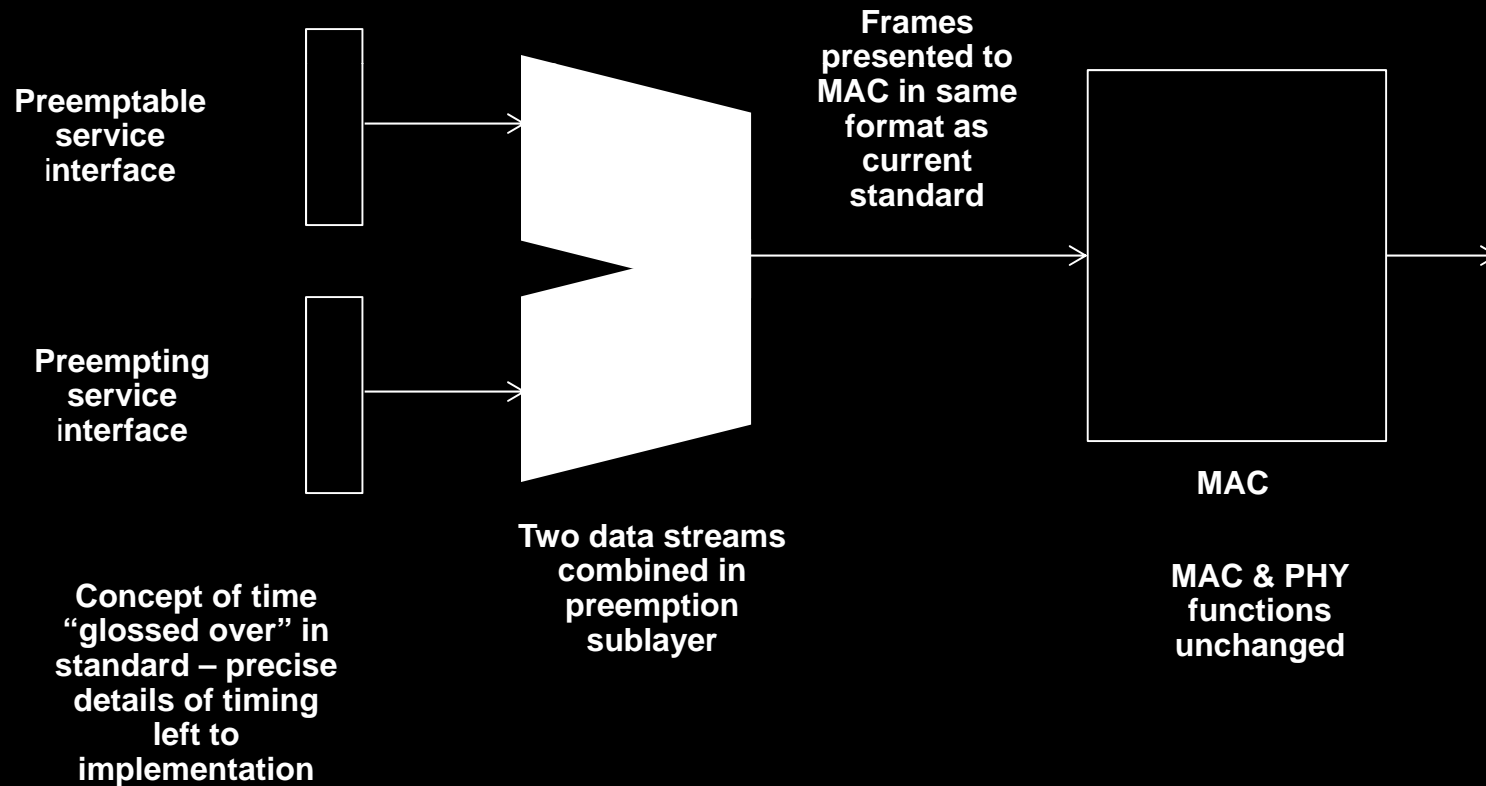


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Above the MAC



- **Preemption above the MAC, with MAC & PHY unchanged**
 - Preemption sublayer (could also be considered in 802.1)



A possible “above the MAC” mechanism



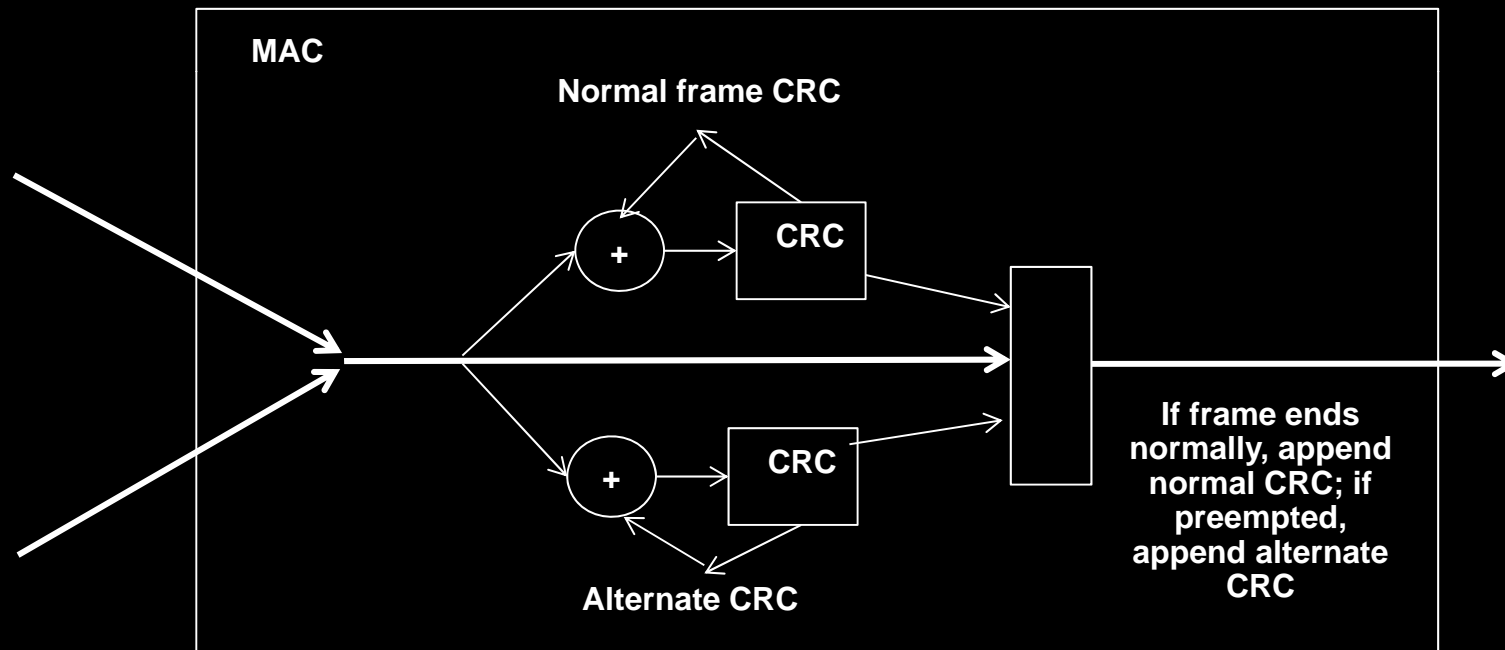
- **TAG preemptable frames (outermost TAG)**
 - Remove TAG at link partner
- **Add termination character at end of preemptable frame**
 - Also removed at link partner
- **CRCs added to all frames as normal**
- **If preemption required, cut frame short & use different termination character**
 - Then allow preempting frame(s) to go through
 - After preempting frame, send continuation of preempted frame
 - Use different start tag to protect against lost fragments

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MAC Layer



- Possible MAC layer implementation using dual CRC
 - Requires compatible alternate CRC for preempted frames

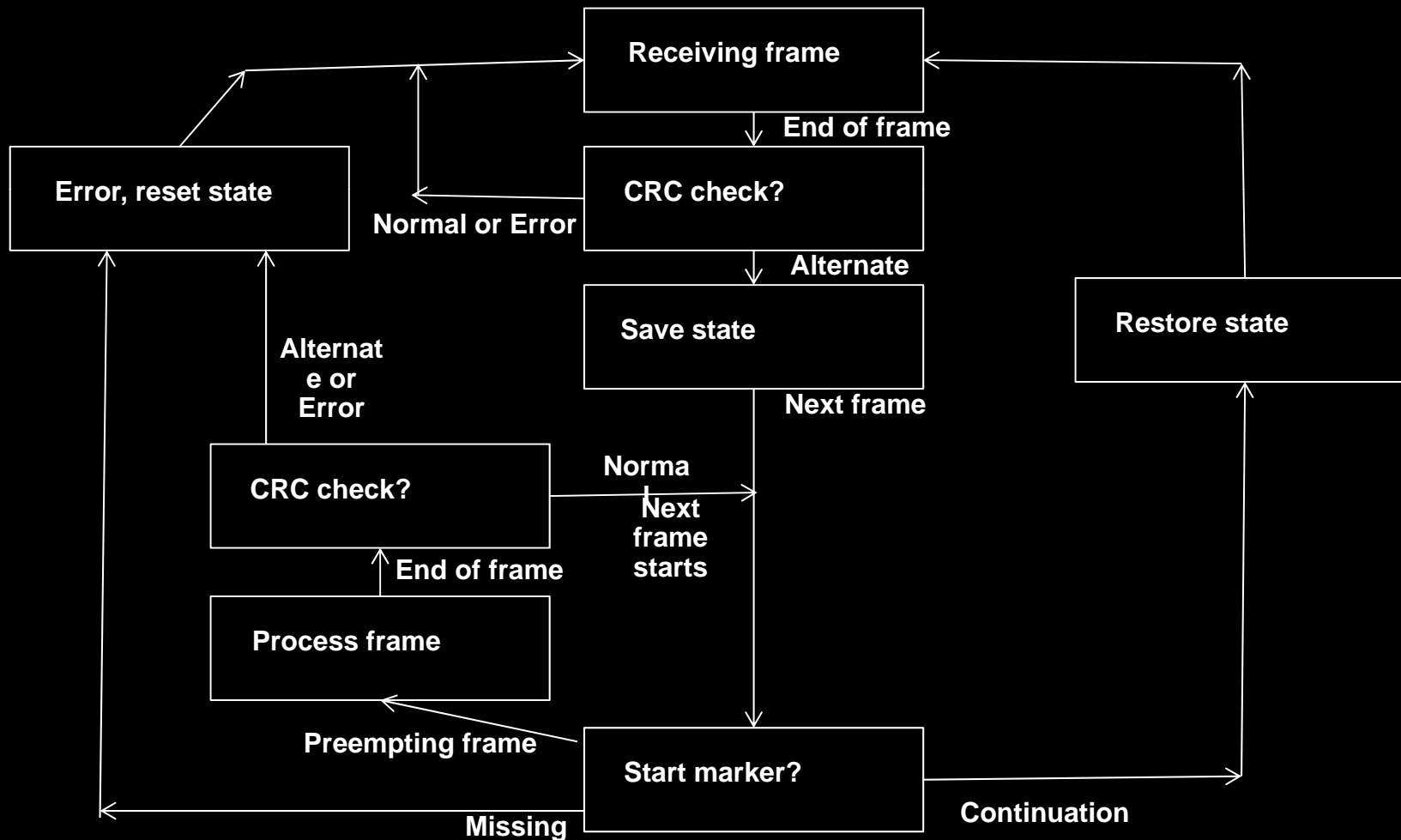


Save state of normal CRC for preempted frame; mark start of preempting frame(s); use normal CRC for preempting frames; mark start of continuation of preempted frame; continue normal frame CRC using saved state.

Receive state machine



Requires dual CRC checkers & buffer for preempted frame



Notes regarding dual CRC



Needs change for higher layer interface

I.e. 2 channels (normal & preemptive)

Alternate CRC must choose polynomials

Account for other layer assumptions

Some fears regarding robustness

One change will apply to all PHYs

**Simple marker applied at start of preempting
frame and at continuation of fragment**

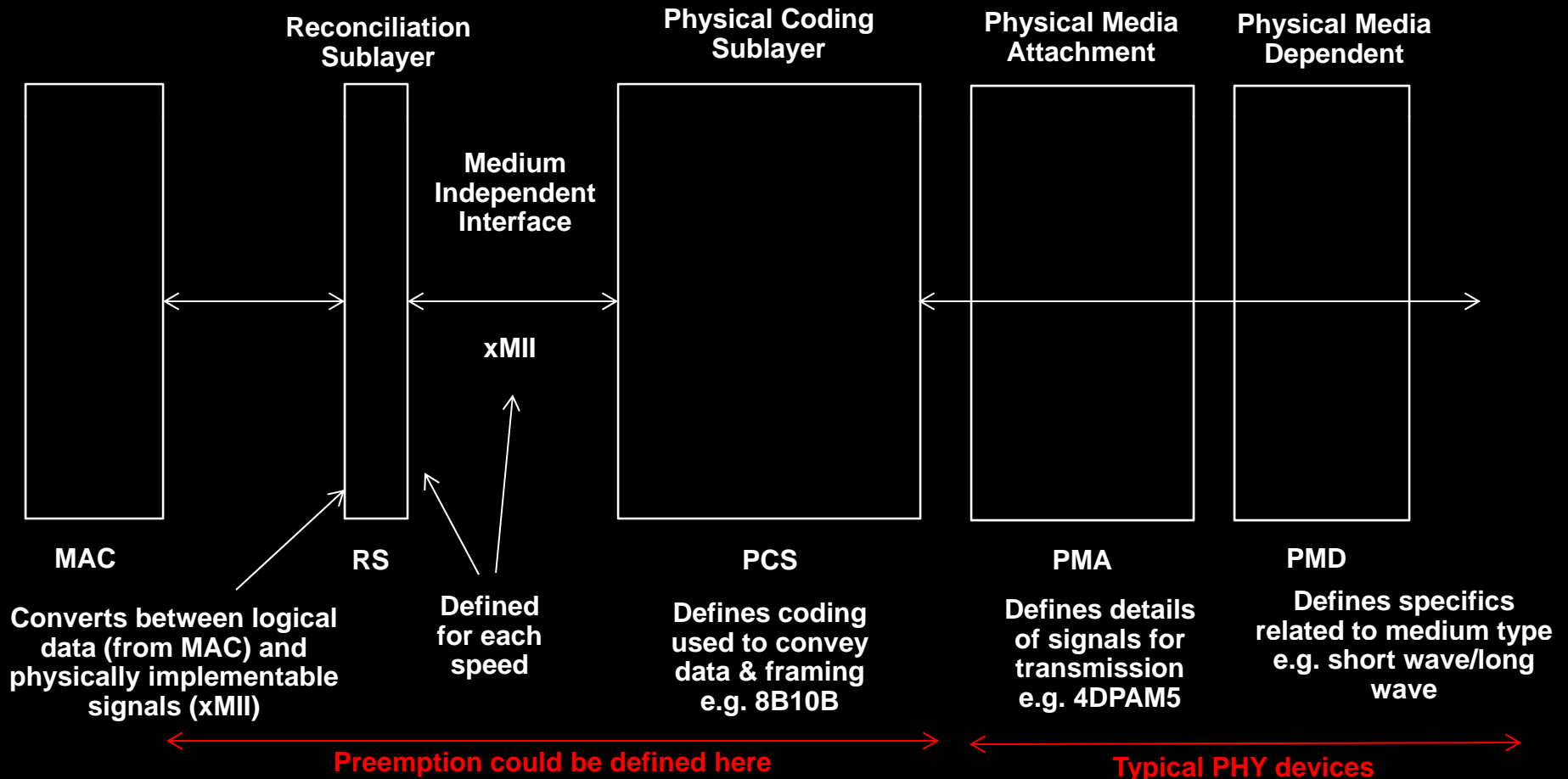
Must be stripped before forwarding

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Elements of the PHY



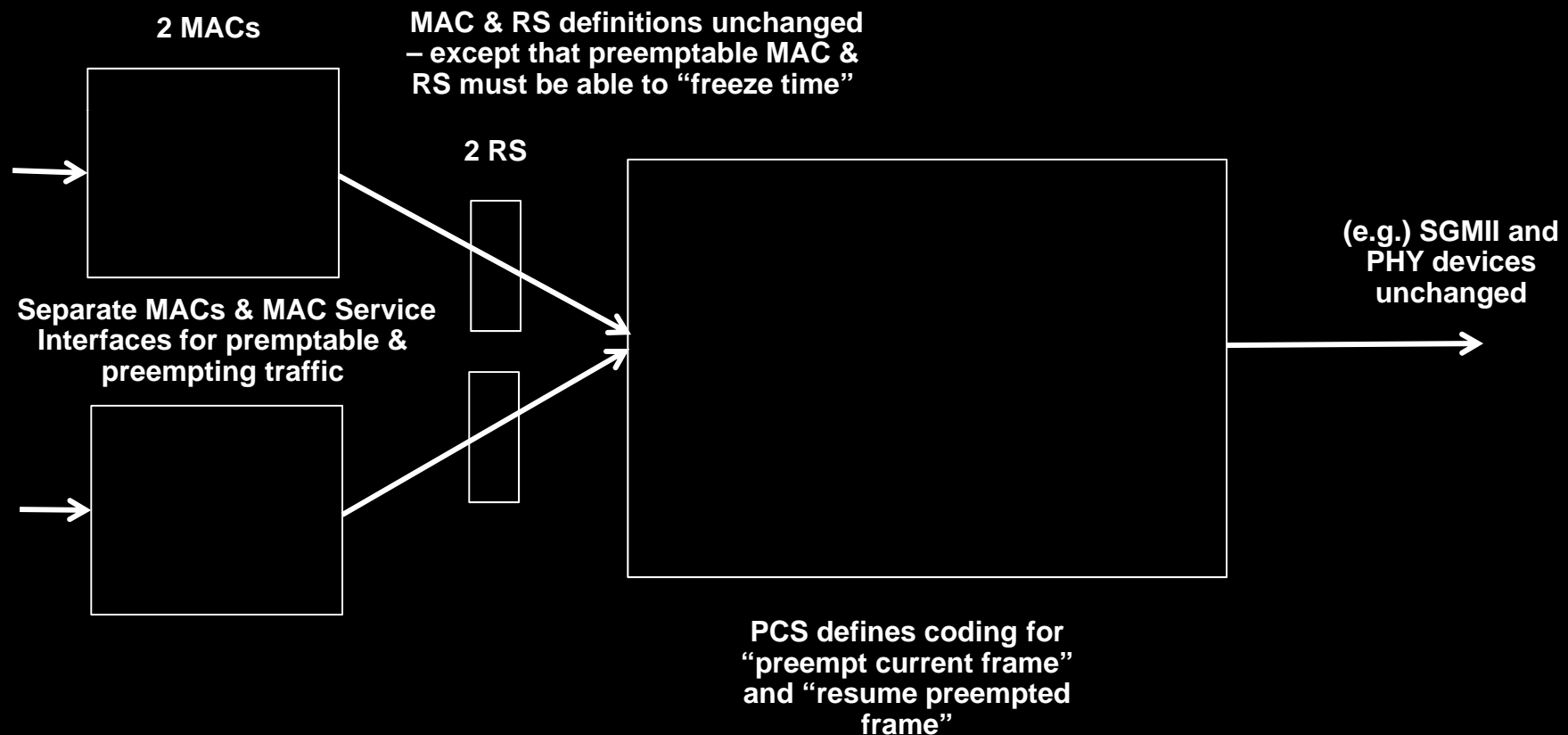
- Note that “PHY” encompasses all sublayers below MAC
 - Does not necessarily correspond to devices sold as “PHYs”



PHY Layer Preemption



- Possible PHY layer implementation
 - Details would need to be defined for each speed



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Before PAR can proceed

Which documents will need change (.1/.3)?

What will be the scope, etc. & compatibility issues

Assuming that 802.3 changes will be made

What are the objectives – i.e. define success

Above, below or in the MAC? ...

It may be difficult to define without forcing choice

Scope of change to MAC service interface

How much “hand waving” is acceptable?

Should MAC service interface change to reflect time?

Can function be described logically without time?

Assuming that 802.3 changes will be made

What are the objectives – i.e. define success

Above, below or in the MAC? ...

It may be difficult to define without forcing choice

For 802.3, what sort of objectives are needed?

No change to the MAC? / Specific MAC change?

Change to maximum packet size for PHY?

Specific robustness requirements (e.g. MTTFPA)?

Also need to be considered

How much overhead in preemptable traffic?

Worst case preemption delay?

Provability / testability for solutions?

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