

802.11 Layering for 802.1AS [Work in Progress]

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Agenda

- Time sync goals for 802.11
- Protocol options for 802.11
- 802.1AS Layering for 802.11

.11 Time Synchronization Goals

- Wireless mobility, fast clock-master selection/handover, low power
- Single time reference across LANs
- Consistent application-interface at stations
- Straight-forward bridging of time between media types
- 10us end-to-end accuracy over seven hops
 - Clocks possess appropriate jitter and wander
- Cost consistent with CE devices

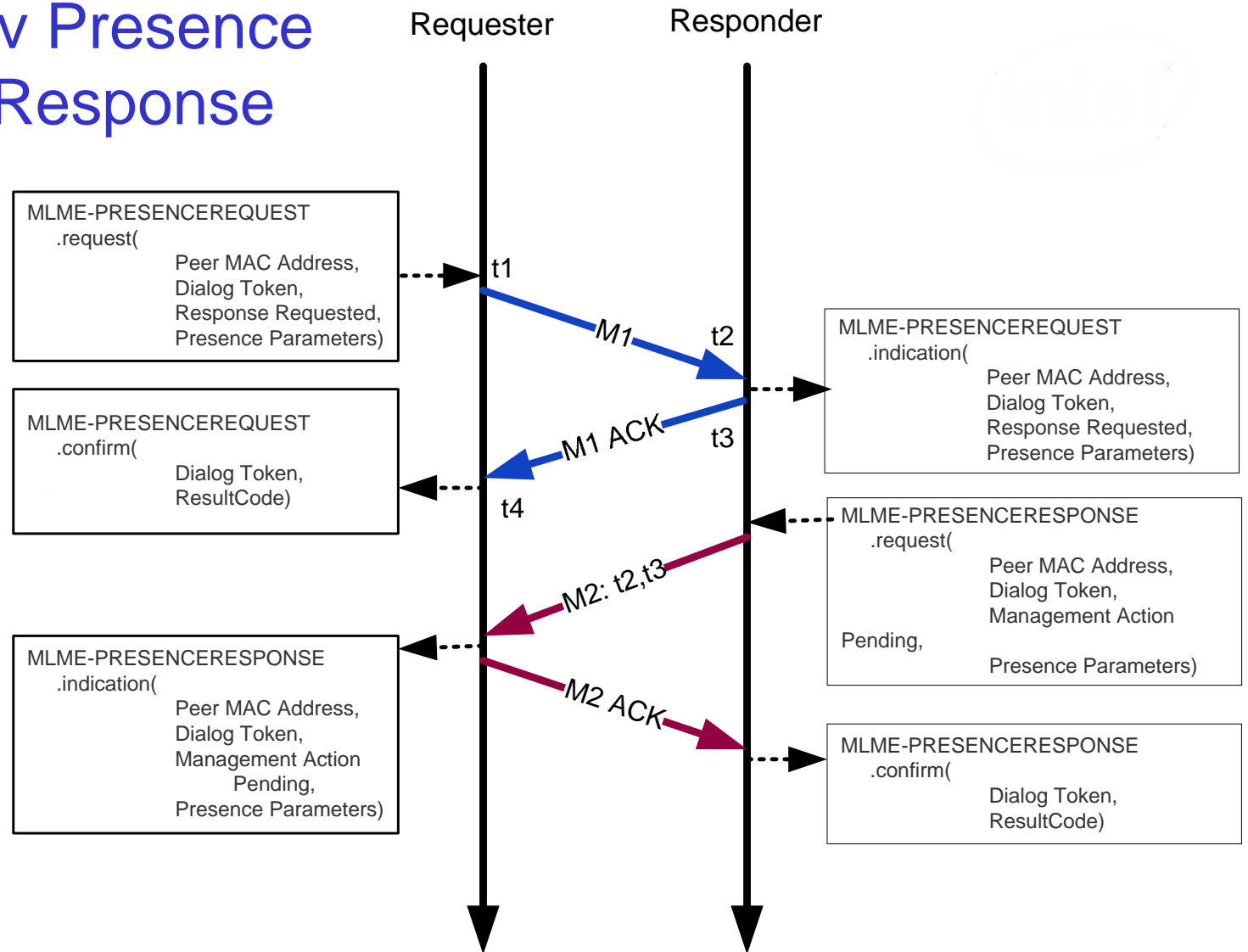
Non Goals:

- Fixed-latency delivery of content
- Wide-area network time synchronization

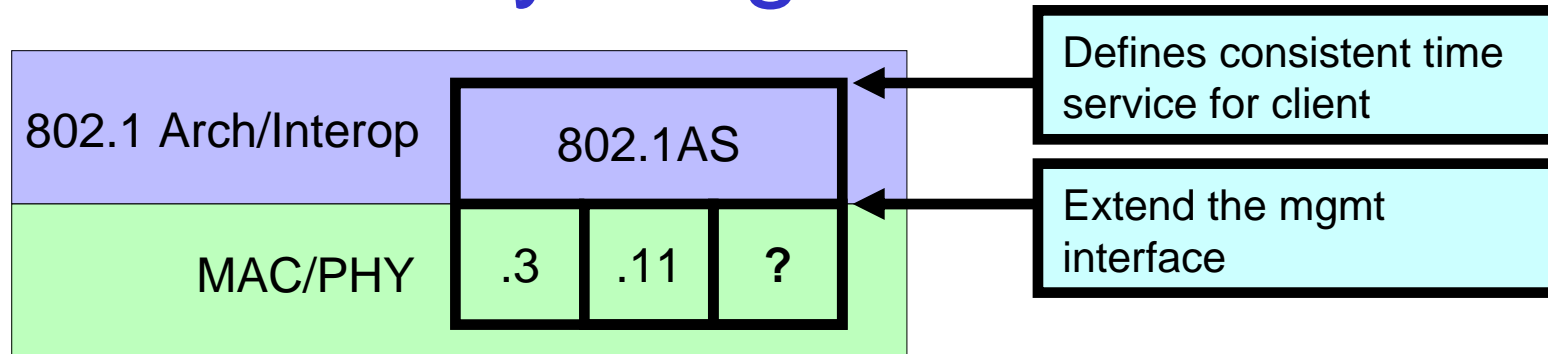
Protocol options for 802.11

1. Apply 1588 messages directly to 802.11
 - The brute force method
2. Use modified TGv location estimation and either:
 - A. Send t_3 and t_2 instead of $(t_3 - t_2)$
 - Define timestamp point
 - Permit Presence Response to go either direction
 - B. Supplement link delay measurement with 1588-like SYNC message timestamp in HW
 - C. Ignore link delay – only send t_2 back, don't measure t_3, t_4
3. Use TSF time to communicate time to stations
 - Accuracy may be too low
 - Requires separate message to communicate time offset

802.11 TGv Presence Request/Response



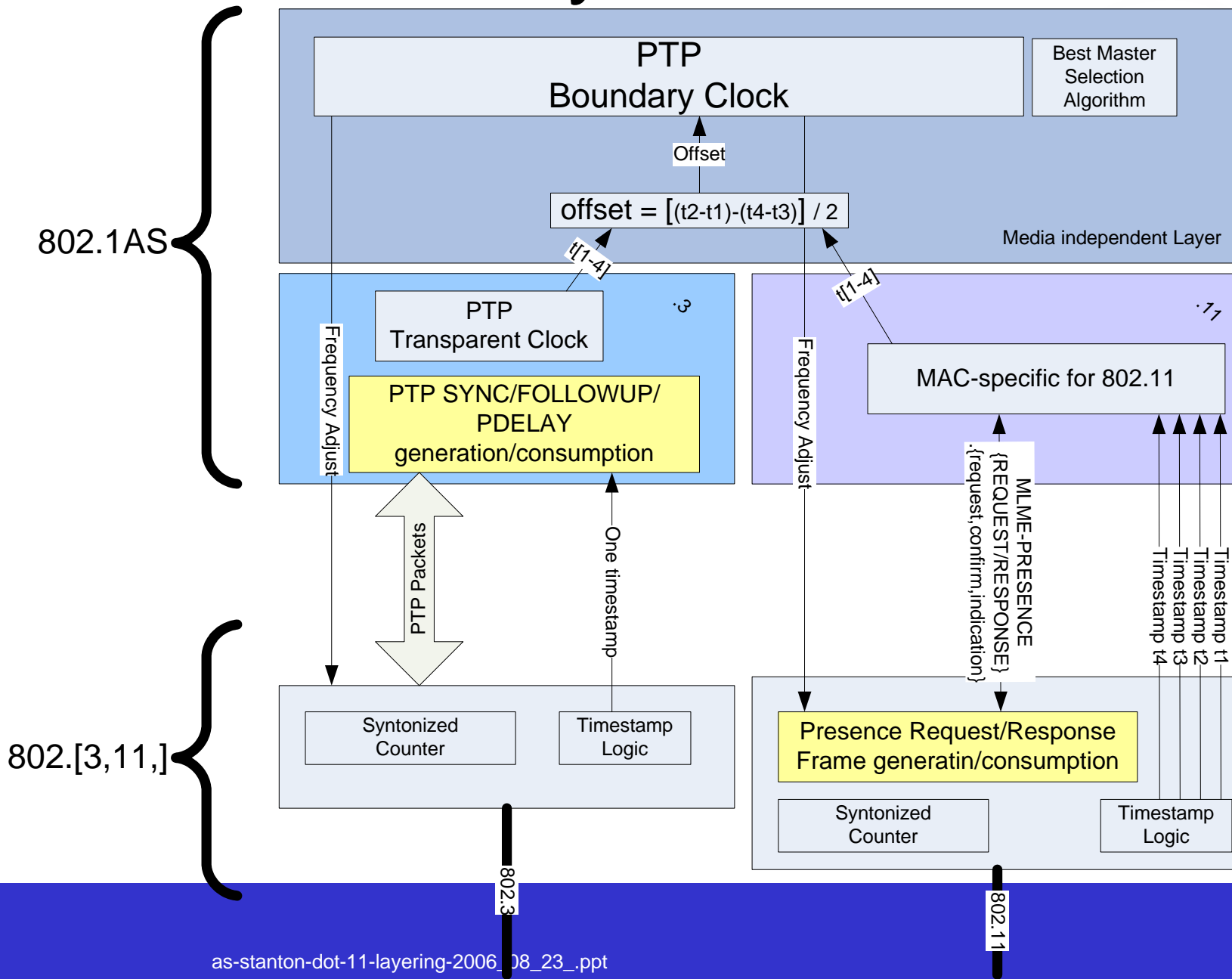
Layering for 802.1AS



- Interoperability, client time service
- Protocol:
 - “Generic Messages Protocol” recommendation
 - Media may use the “Generic Messages” or define their own
- Measurement:
 - Define extension to MAC Service Interface to get timestamp information
 - Define measurement accuracy options, as appropriate for application

.3+.11 Sync Architecture

(VERY) PRELIMINARY



Possible tree hierarchy

