System / Application and PHY requirements

IEEE 802.3dm

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Conrad Zerna (Aviva Links Inc.)

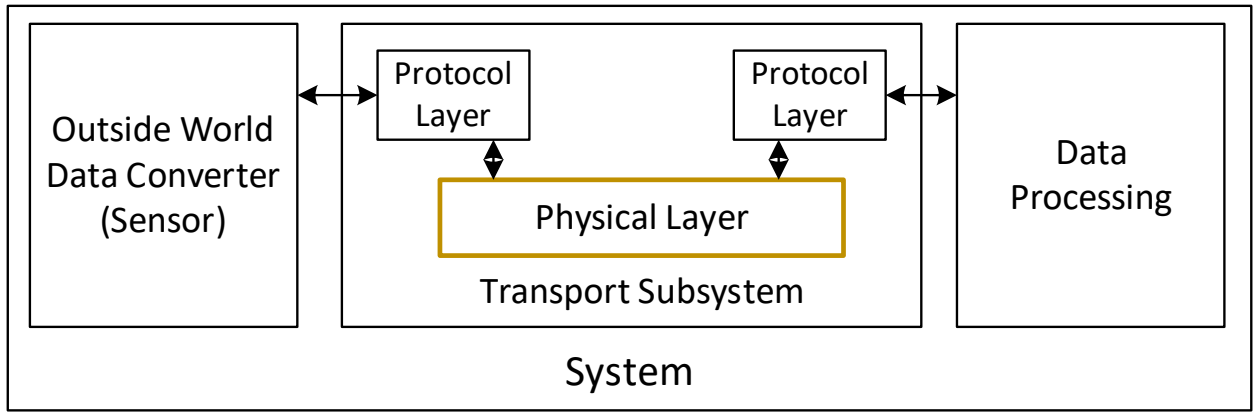
Supporters

- Steve Gorshe, Microchip
- Claude Gauthier, NXP

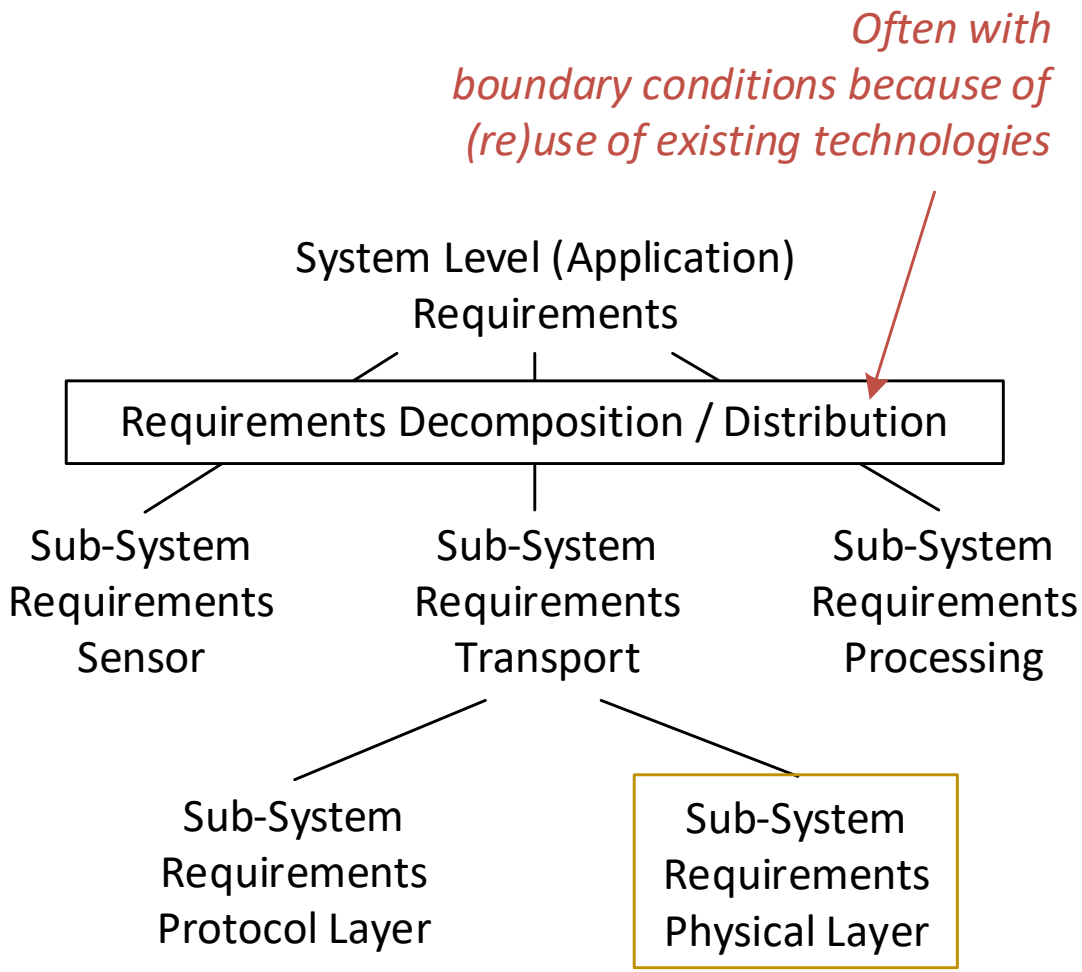
Motivation

- Several presentations in 802.3dm have stated requirements “on 802.3dm from the application”
- This presentation aims to clarify system requirements and the position of the 802.3dm subsystem within these system / application requirements

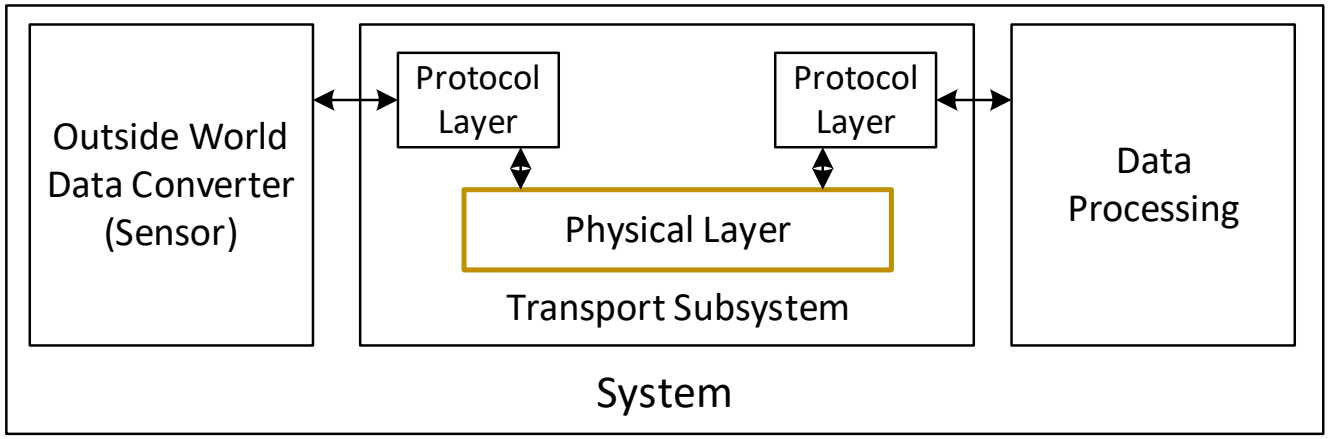
System, Sub-System, Requirements Decomposition



- Boundary conditions: one of the subsystems targets reuse / leveraging of an existing technology, which cannot change (or only minor change)
  → System requirements are adjusted on other subsystems to compensate



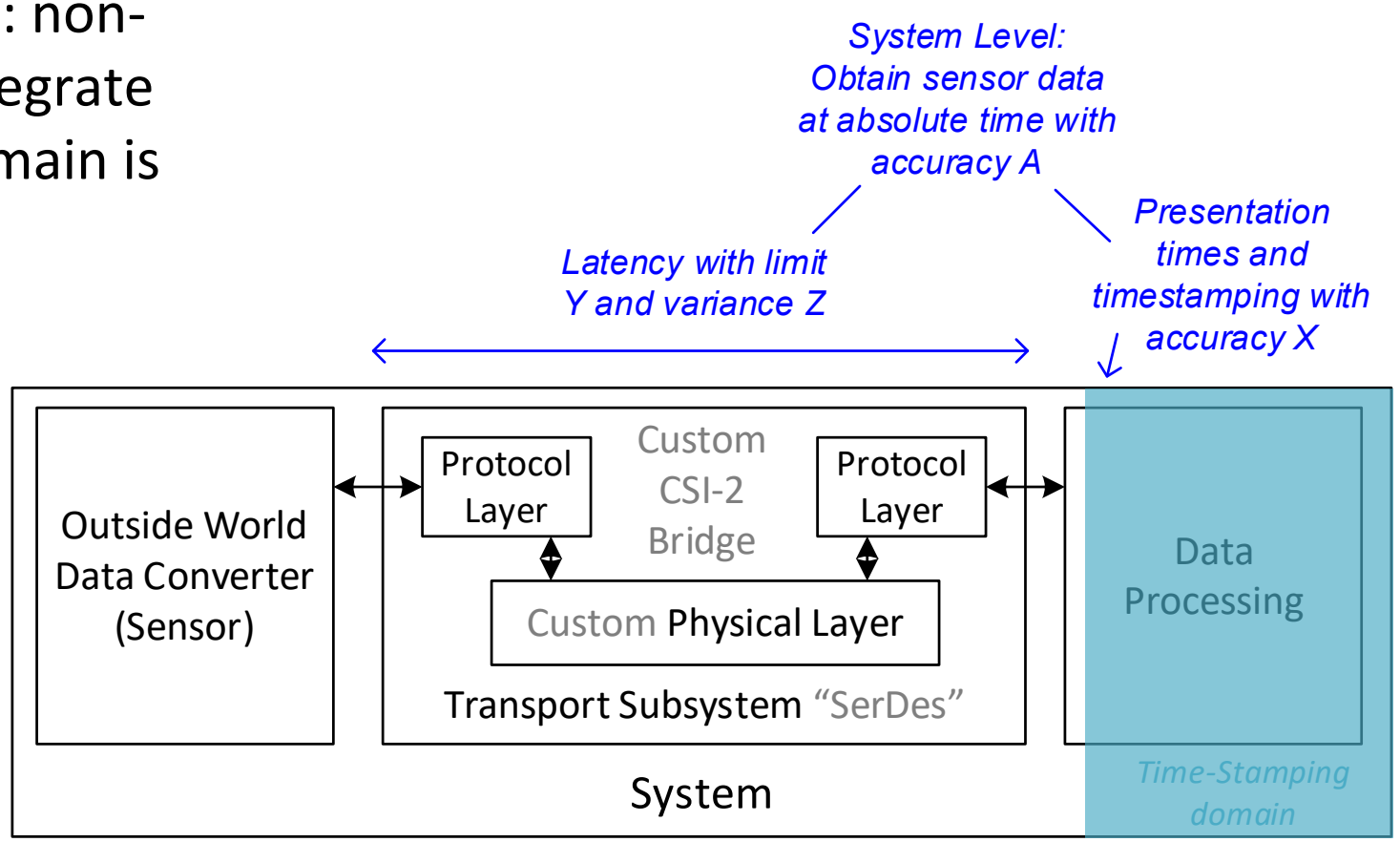
System Requirements



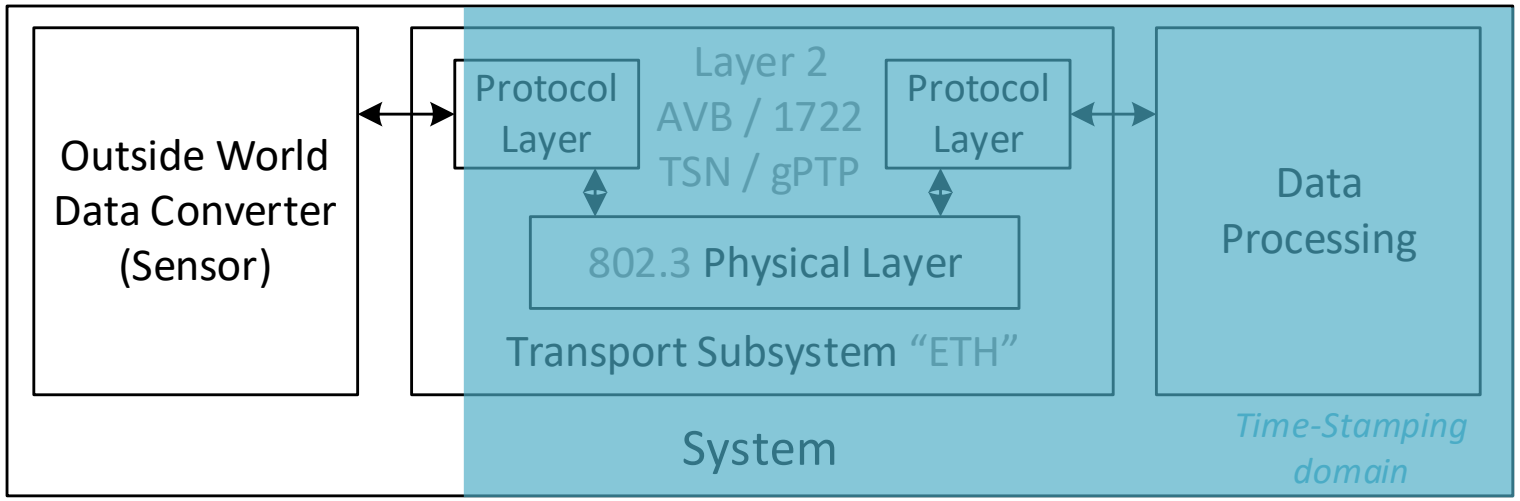
- System requirements presented so far
- https://ieee802.org/3/dm/public/0924/Gollob_dm_03c_System_View_20240918.pdf, Slide 5
  - Time stamping requirement: “very good time synchronization of all sensors to create all data at synchronized regular time slices and timestamp it.”
  - Latency of transport as a non-requirement
- https://ieee802.org/3/dm/public/0724/matheus_dm_02b_latency_07152024.pdf, Slide 8
  - Sensor dynamic parameter adjustment latency requirement

Technology Reuse “SerDes”

- Example of boundary conditions: non-capability of the transport to integrate or extend the time stamping domain is decomposed into
  - Time stamping requirement for data processing sub-system
  - Latency requirement on transport sub-system
    → this is NOT a true system requirement, it is the result of a limitation of the transport sub-system



Ethernet 802.3dm Based System



- Protocol Layer on top of 802.3dm PHY will be significantly different
  - Ethernet Layer 2 packetizes data, 1722 is a sub-packet in protocol layer
  - gPTP enables extension of synchronization / time stamping domain
  - TSN to control concurrent video and control data
- System requirements decomposition and thus transport / physical layer parameters will be different

Summary

- This presentation has clarified the actually stated system requirements and the position of the 802.3dm subsystem within these system / application requirements
  - Copying requirements from other subsystems contained in other systems is a false equivalency
  - 802.3dm requirements have to be derived top down
- Individuals affiliated with OEMs should present subsystem requirement based on technology reuse of protocol layer
  “Ethernet Packets, AVB/1722, TSN/gPTP”

Thank You!