Data Sheet Model for TSN

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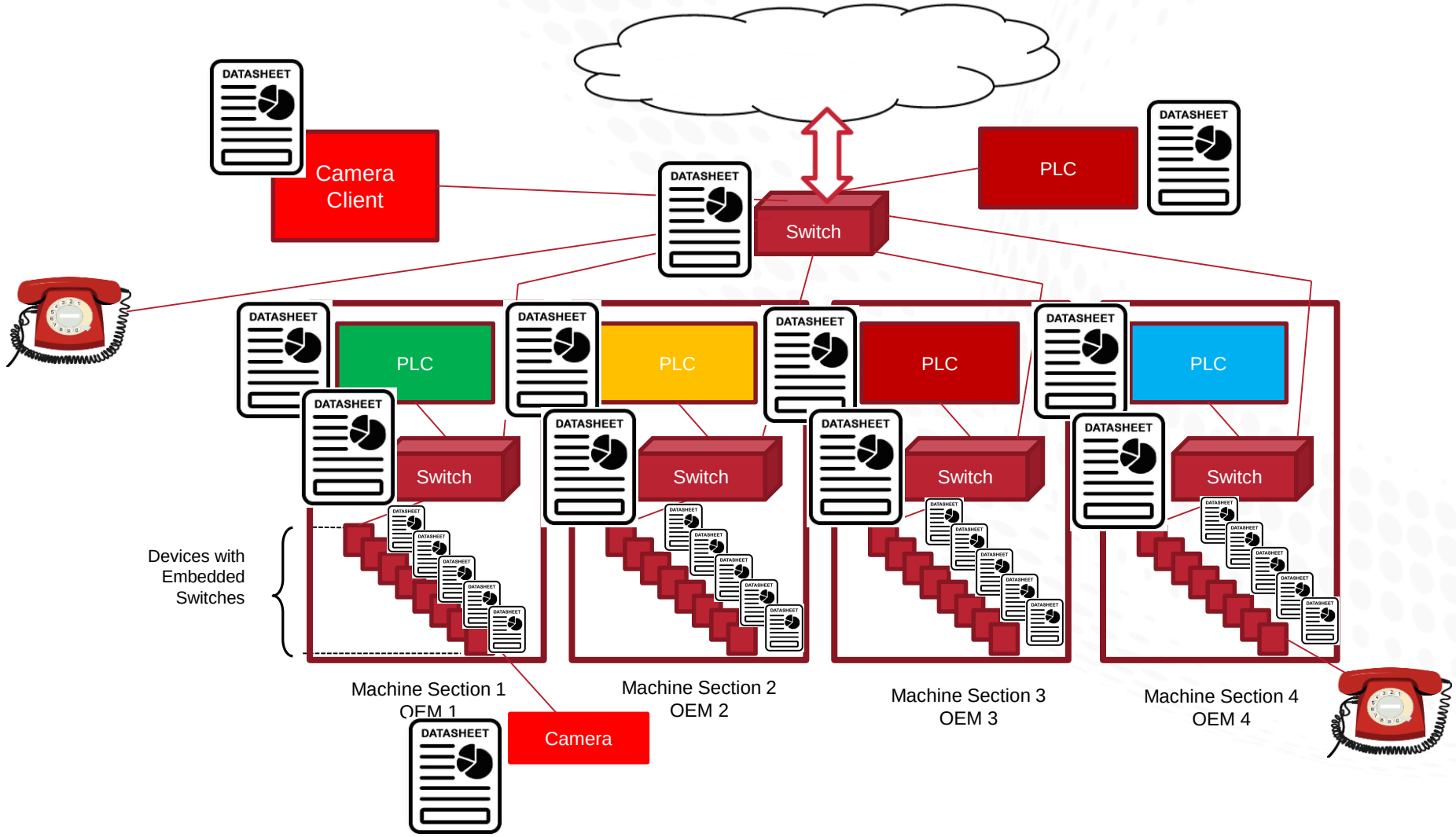
Presented by: Mark Hantel

Authored by: Steve Zuponcic & Mark Hantel

Background

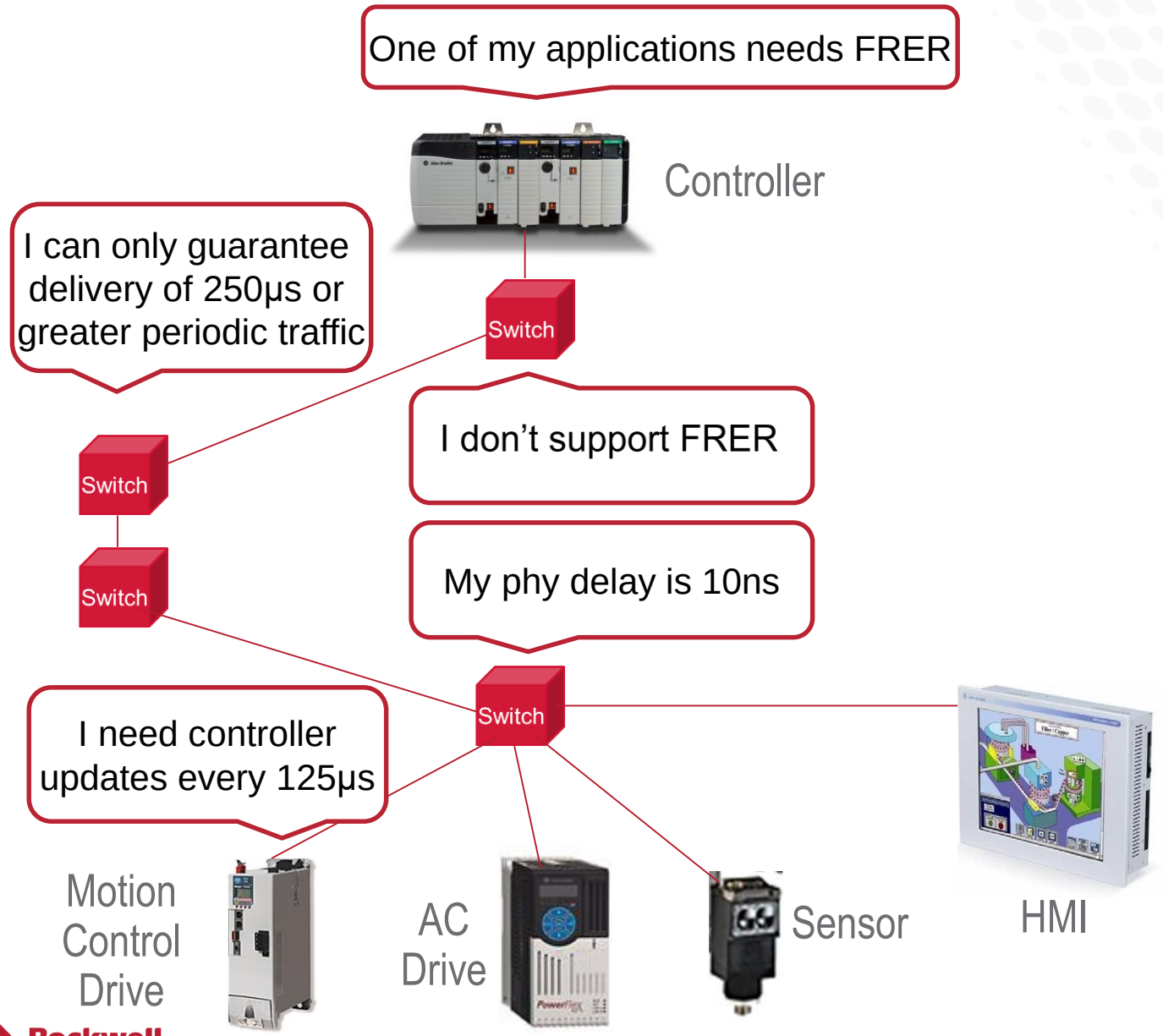
- At the last plenary in Bangkok the concept of a data sheet was introduced by Steve Zuponcic
- The purpose of a data sheet is a method to alleviate concerns around including hard numbers in the 60802 profile and as a method to allow offline configuration.
- The concept is that each TSN device (bridge and end station) in a TSN based industrial network would implement said data sheet.



Overview

- A data sheet is meant to be a **precursor** and not a replacement or an alternate for Qcc or a distributed protocol.
- One goal of the data sheet model is to provide a place for **performance indicators** that are not specified in the 60802 profile.
- Another goal is to enable system **configuration** and **modeling** by providing device capabilities offline well in advance of hardware acquisition.
- Finally, it allows for system **validation** during the design process.

Performance Indicators



- One way or another, compatibility of a network and end stations will need to be assured.
- One method for this is to provide hard numbers in the 60802 profile that each device must meet to be considered TSN conformant. This is essentially overprovisioning to meet the most demanding use case.
- Another method is to not include numbers at all, and allow each vendor to decide what meets the needs of their applications.
- A compromise would be to include a mandatory minimal subset of performance indicators that everyone must meet, then publish a full set of performance indicators in the data sheet

Bridge - Traffic Management Capabilities

What mechanisms (TSN & Other) are implemented in this bridge

- How many queues are implemented
- How deep are the queues
- Does the bridge support Scheduling?
- Does the bridge support Preemption?
- Does the bridge support Ingresss Policing?
- Does the bridge support Qav Stream Reservation?
- Does the bridge support MSRP?
- Does the bridge support RAP?
- Does the bridge support FRER CB?
- Include "General required bridge features" from profile contribution
- Does the bridge support AS-REV? (Is this something we need to assume every device has?)

This slide and subsequent slides propose hypothetical questions that would be answered by a data sheet for the type of device shown.

Bridge – Control Plane Capabilities

How can this bridge be managed?

- Management Model
  - Does the bridge support a centralized Qcc based management model?
  - Does the bridge support a hybrid management model?
  - Does the bridge support a fully distributed management model?
- Management Protocol
  - Does the bridge support LLDP?
  - Does the bridge support SNMP for management?
  - Does the bridge implement YANG?
    - Can RESTCONF be used to access the YANG models?
    - Can NETCONF be used to access the YANG models?

Bridge - Characteristics

- Is cut-through supported?
- Is cut-through enabled?
- What is the PHY delay of each port?
- What is the MAC delay of each port?
- What is the maximum queue delay of each port?

- Future Consideration: Can we envelope the communications timing, or do we need exact answers for each parameter?

Application Requirements (Manufacturer)

- What traffic classes will be supported?
- Is the device time aware?
- Does the device support stream based scheduling?
- Does the device support stream class scheduling?
- Does the device support ingress policing?
- Does the device support application-to-application FRER?
- Does the device support preemption?
- Does the device support Centralized/Fully Distributed and/or Hybrid Management?
- What is the PHY Delay of the device?
- What is the MAC Delay of the device?

Application Requirements (User)

- What traffic class(es) does the application require?
- What is the publishing interval per traffic class?
- What is the traffic deadline per class?

Questions & Next Steps

- Do we need to support all legacy 802.1 techniques for traffic management compatibility with other markets? (I.E. MSRP/MVRP/MMRP)

- The data sheet model needs to be aligned with the Qcc information model

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Thank you

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