

802.3 Technical Activities

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George Zimmerman
CME Consulting/self

IEEE 802.3: The (Now Current) Standard

- Revision IEEE 802.3-2022 was published 29 July 2022
- As of the Sept 2022 SASB meeting 5 amendments have been approved:
 - IEEE 802.3dd – Maintenance on Clause 104, single-pair powering
 - Corrections to specifications related to single-pair powering, no new features
 - IEEE 802.3cs – Super-PON, pt-to-multipoint over WDM
 - RS, PCS, PMA, and PMD for up to 50km/1024 nodes, 10Gb/s down, 10 or 2.5Gb/s up
 - IEEE 802.3db – 100, 200 and 400 Gb/s PHY over multimode fiber
 - IEEE 802.3ck – 100, 200, 400 Gb/s electrical interfaces based on 100 Gb/s signaling
 - IEEE 802.3de – Adds 10 Mb/s Single-Pair Ethernet PHYs to PHYs supporting MAC Merge (preemption) and Time Synchronization Service Interface

IEEE 802.3 – Areas of Development

- Expanding the speed of Ethernet
 - Greater than 400 Gb/s Ethernet (.3df)
 - 400 Gb/s Ethernet over DWDM (.3cw)
- Filling out Automotive Ethernet
 - Greater than 10 Gb/s automotive electrical (.3cy)
 - Greater than 1 Gb/s automotive optical glass (.3cz) & plastic (.3dh)
- Progressing Single Pair Ethernet for Building/Industrial automation
 - 10 Mb/s Multidrop Segments Enhancement (.3da) – (power, data, PLCA features)
 - 100 Mb/s Long-Reach Single-Pair Ethernet PHY (.3dg)
- Improving Ethernet's Time Synchronization capability (.3cx)
- Progressing Access Ethernet
 - > 50 Gb/s Bidirectional Optical Access PHYs Study Group

Automotive Ethernet Projects in Progress

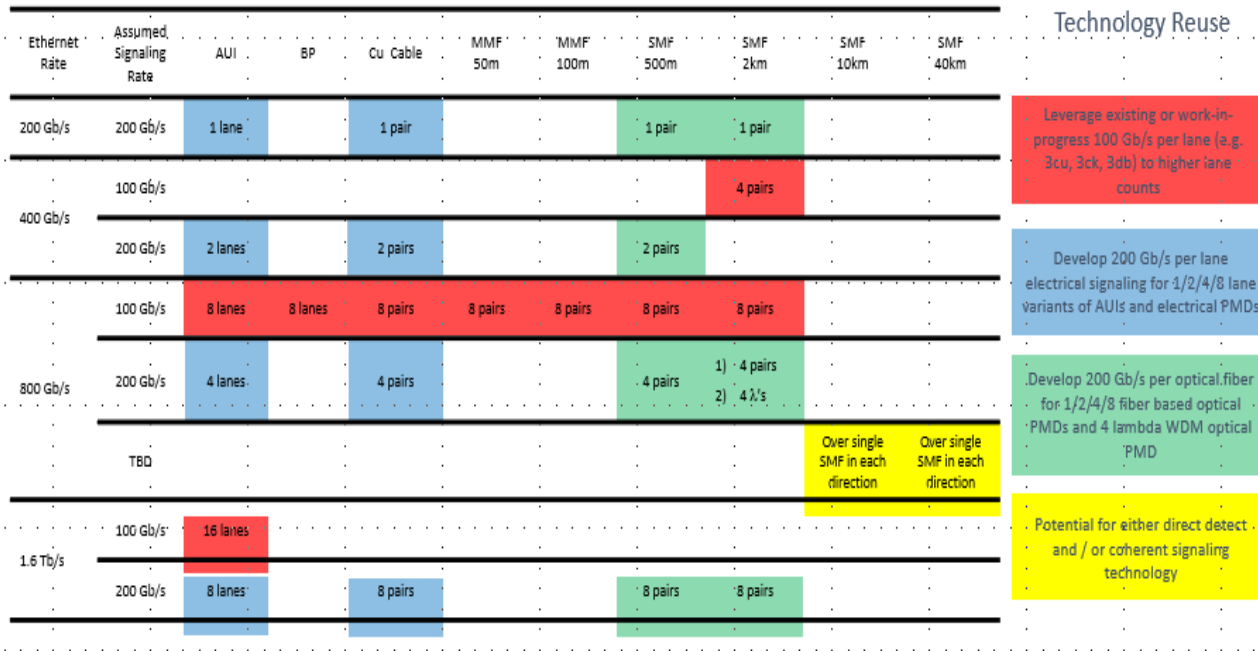
- Focusing of filling out the high-speed variants
 - 802.3-2022 includes automotive PHYs to 10Gb/s electrical and an optical (POF) PHY at 1Gb/s
- Characterized by impulsive noise, environmental constraints, short reaches, special-purpose use cases
 - 802.3cy: >10 Gb/s Electrical Automotive PHY
 - 25Gb/s, 11 m electrical PHY, entering initial SA ballot
 - 802.3cz: Multi-Gigabit Optical (glass) Automotive PHY
 - 2.5, 5, 10, 25, 50 Gb/s, 40 m, Recirculating SA ballot
 - 802.3dh: Multi-Gigabit Optical (plastic) Automotive PHY

Single-Pair Ethernet Projects in Progress

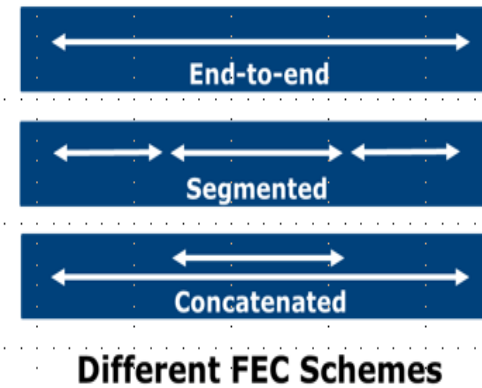
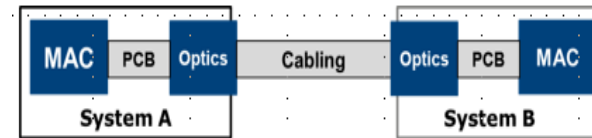
- Longer-reach, industrial & building automation PHYs
- Focused on needs, practices, and environment of the “Operational Technology” space
 - Challenges of simple deployments, existing practices, and impulsive noise
 - 802.3da: Single-Pair Multidrop Segments Enhancement
 - Selecting baseline proposals for:
 - Refining medium specification and refinements based on the 10BASE-T1S PHY for 10 Mb/s at up to at least 50m reach, increased node count
 - Adding new features: dynamic node assignment for PLCA, powering for multidrop,
 - 802.3dg: 100 Mb/s Long-Reach Single-Pair PHY
 - (Early stages of) selecting baseline proposals for a new 100 Mb/s PHY operating up to 500m with associated powering for industrial & automation environments

The Next Speed of Ethernet (.3df): Many PHYs, Unified by Architecture

IEEE P802.3df Physical Layer Objectives



Revisiting the FEC Debate



- Architecture can support all of these FEC schemes
- More than one FEC scheme is anticipated to be leveraged for different PMDs
- Multi-generation support

Slides courtesy of John D'Ambrosia, Chair IEEE P802.3df Task Force

Additional IEEE 802.3 Activities in Progress

- 802.3cx: Improved PTP Timestamping Accuracy
- 802.3cw: 400 Gb/s over DWDM systems
- Study Groups:
 - Greater than 50 Gb/s Bidirectional Optical Access PHYs
- Ad Hoc:
 - Power Delivery Coordinating Committee
 - Coordinating with IEC, ISO/IEC, and NFPA groups on powering
 - New Ethernet Applications
 - Industry connections - where new activities are born!

QUESTIONS?

THANK YOU!