Update to IEEE P802.3cg on ODVA Liaison Activities

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Activity overview

- Attended “ODVA 2017 Industry Conference” (every 18 months)
  - Proceedings:https://www.odva.org/Happenings/Industry-Conference-and-Annual-Meeting-Library
    - Papers on: Single-pair Ethernet and liaisons, 3cg, E2E links
- Presented IEEE update to the ODVA BOD
- Discussed 3cg use cases with select SIG chairs (SIG is like a TF)
- Process Automation is a key initiative
  - SIG meetings, papers, and the Keynote speech

Use cases discussed

- Process Automation: “Long Reach Ethernet for Process Instruments”
- Factory Automation: “Long Reach Ethernet for Discrete Field Devices”
- Factory Automation: “Ethernet for In-cabinet Components”
- Extending OT Network Infrastructure

Process Automation
"Long Reach Ethernet for Process Instruments"

- Replacement of 4-20mA, HART, Profibus PA, and Foundation Fieldbus with Ethernet
  - NAMUR request of complete Ethernet solutions (EtherNet/IP and PROFINET)
- Objectives:
  - 10 Mb/s (upgrade from 31.25 kb/s or less)
  - 1000 m (covers majority of applications)
  - Compatible with IEC 60079 (explosive environment) design techniques
    - 1000 m for Ex e, 200 m for Ex i
  - Operates over legacy installed cables (IEC 61158-2 type A, "fieldbus cable" and similar)
    - 100 ohm STP, long life installations, certified
  - Optional power (probably rules for simple DC power)
- Devices: Instruments, Field switches, I/O, operator interfaces, SIS

Factory Automation
“Long Reach Ethernet for Discrete Field Devices”

- Replacement of fieldbuses (CANopen, Modbus RTU, CC-Link, DeviceNet, ControlNet, INTERBUS, and Profibus DP) and serial links (RS-232) with Ethernet
- Objectives:
  - 10 Mb/s
  - 1000 m (links > 100 m, conveyors, mining, etc.)
  - Optional power (probably rules for simple DC power)
  - New cable and connector system seen as beneficial
    - Preserve the application and convert it to Ethernet
    - Opportunistic cable reuse (too many differences, shorter life installations, not certified), channel specification is common denominator

Factory Automation
“Ethernet for In-cabinet Components”

- Replacement of sensor and device networks (AS-i, DeviceNet, SmartWire-DT, etc.) and direct wiring with Ethernet
  - Foster new and growing market on the trend for smarter devices
- Likely to be separate from long reach PHY
- Objectives:
  - Automotive driven need for half of the relative cost of 100BASE-T1 cost in order to replace MOST, FlexRay, CAN-FD, etc.
  - Multi-drop is under consideration (half as many interfaces per node as a linear topology)
  - Optional power
- Devices: Contactors, breakers, overload relays, pushbuttons, indicators

Extending OT Network Infrastructure

- Backhaul > 100m
- Daisy-chain loop
- Eventually 100M