



FIREWORKS IN THE ETHER

*Get ready now for emerging
technology and standards that will take
industrial Ethernet to new heights*

About this session

New technologies and standards for Ethernet are emerging that will create fireworks in the industrial automation market. New market opportunities will be created for industrial Ethernet for network convergence, edge devices and accelerating migration from traditional fieldbus to industrial Ethernet. In this session, a panel of EtherNet/IP subject matter experts will share their insights on how new technologies and standards for:

Single-Pair Ethernet • Time Sensitive Networking • Constrained Node Networks

will impact industrial Ethernet and EtherNet/IP in specific.

Panelists

David Brandt, ODVA liaison to IEEE 802.3

Bob Voss, ODVA Chairman of EtherNet/IP Physical Layer SIG

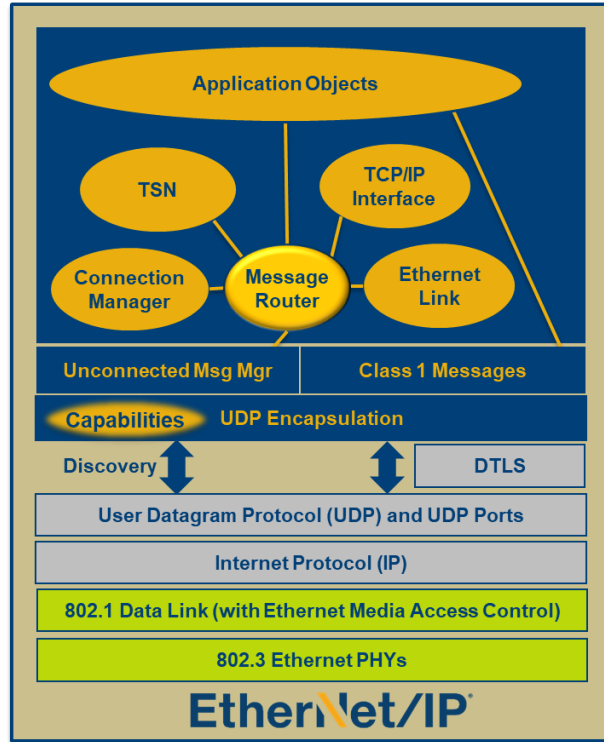
Joakim Wiberg, ODVA CTO

Jordon Woods, ODVA liaison to IEEE 802.1

Harry Forbes, panel moderator and lead technical analyst to ODVA from ARC Advisory Group



Scope of New Technologies and Standards for Industrial Ethernet



CONSTRAINED NETWORK
NODES
(Simplified EtherNet/IP
stack)
+ Single Pair PHYs)

CONVERGED NETWORK TRAFFIC
(Time Sensitive Networking – TSN)
LOW COST, LONG REACH
(Single Pair Ethernet – 10BASE-T..)

Scope of New Technologies and Standards for Industrial Ethernet

Relevant SDOs and Standards

ODVA: The EtherNet/IP Specification

IEEE Standards Association: 802

IETF: RFC 7228 and related

IEC/IEEE: 60802

IEC: 60079, SC48B

TIA: 42.9

Part of Landscape

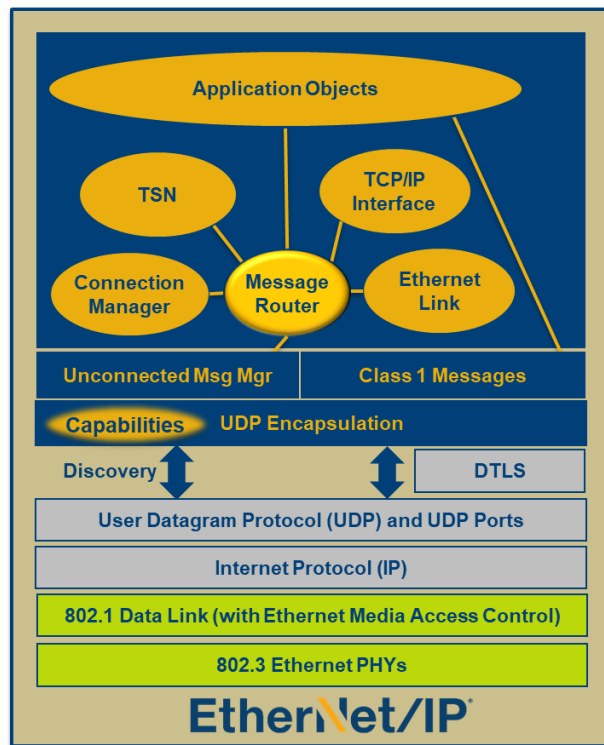
APL Project: Ethernet to the Field
(Cooperation b/t ODVA, Fieldcomm Group and PI)

AVnu: conformance test plans for TSN

Industrial Internet Consortium: TSN Testbed

Lab Networks Industrie 4.0

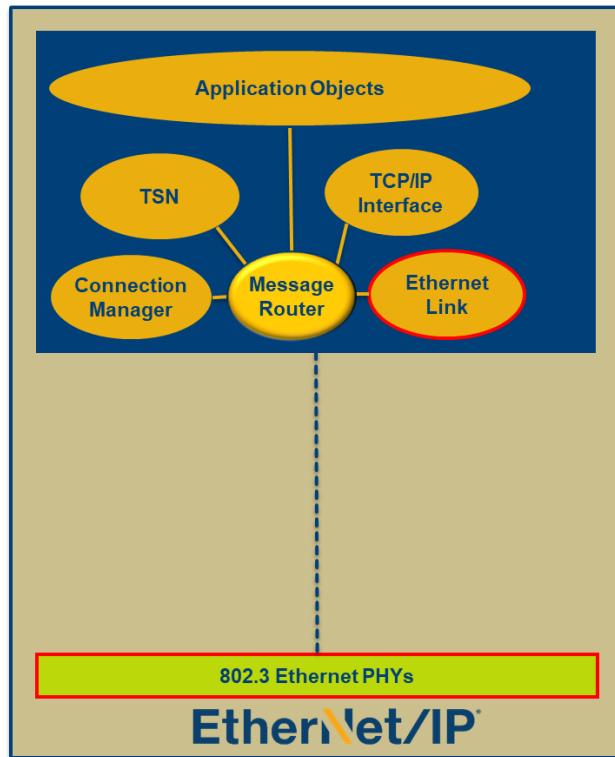
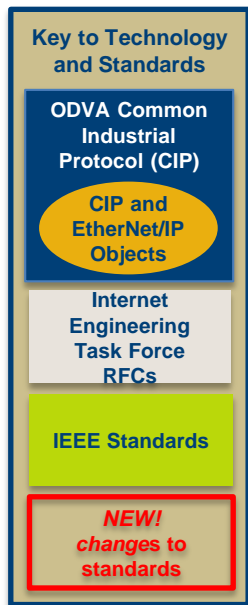
OPC Foundation: data access via OPC UA over TSN-enabled networks



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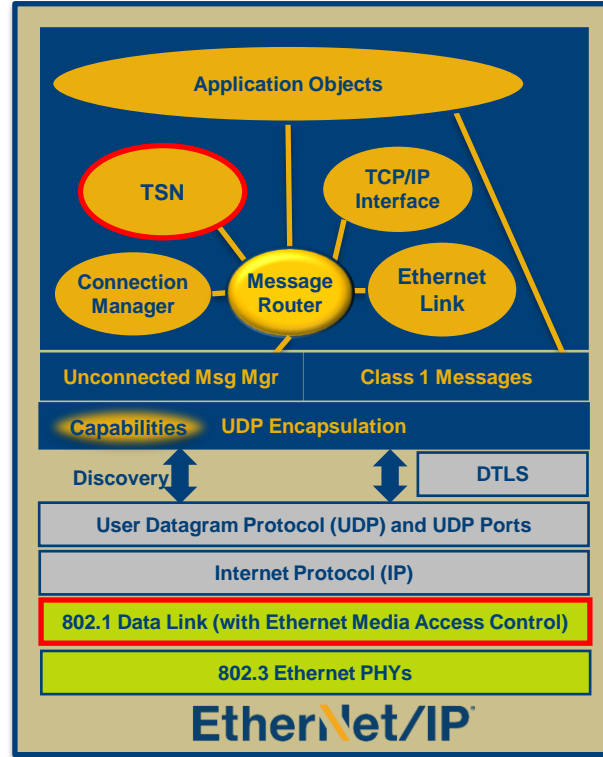
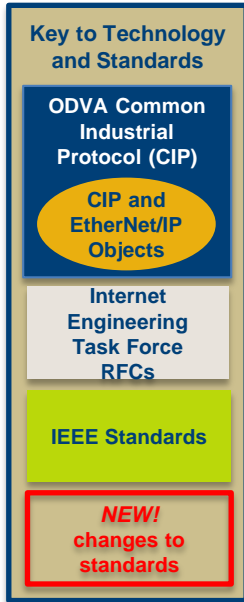
Low Cost, Long Reach



Single Pair Ethernet

Incorporated in IEEE 802.3 Ethernet standard as 10BASE-T1S and 10BASE-T1L (currently known as IEEE 802.3cg)

+ amends IEEE 802.3bu for optional Power)



Time Sensitive Networking

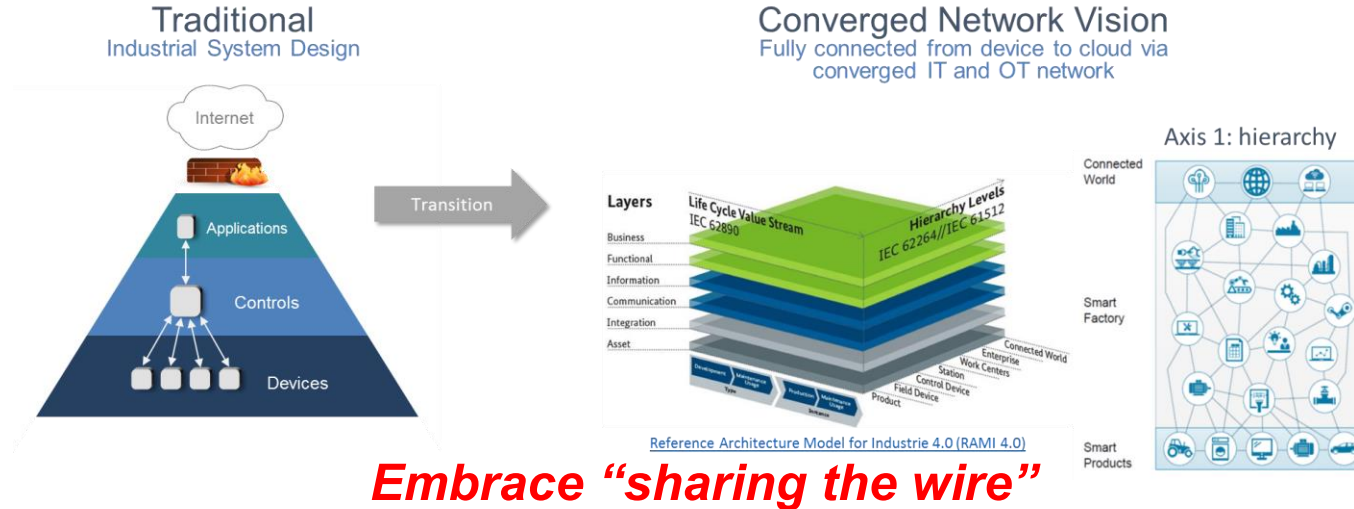
Incorporated in IEEE 802.1

Pillars of TSN=

1. Time synchronization
2. Bounded low latency
3. Ultra-reliability
4. Resource management

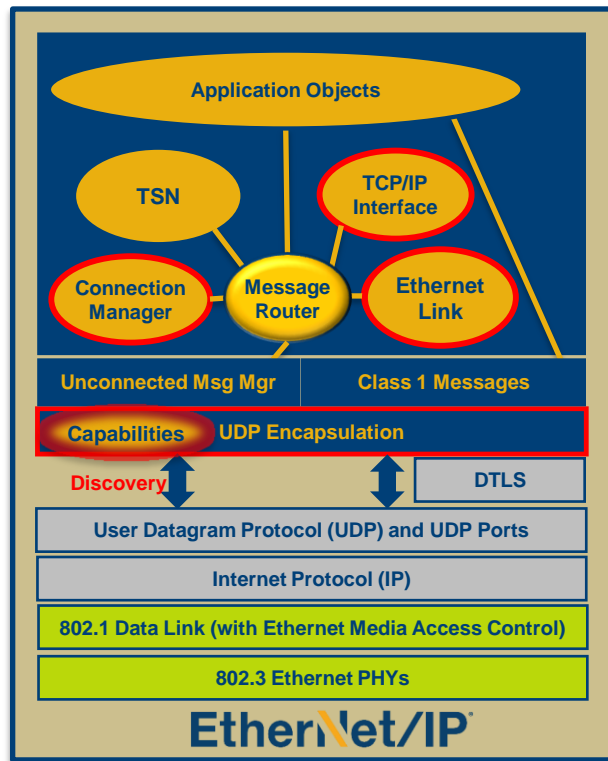
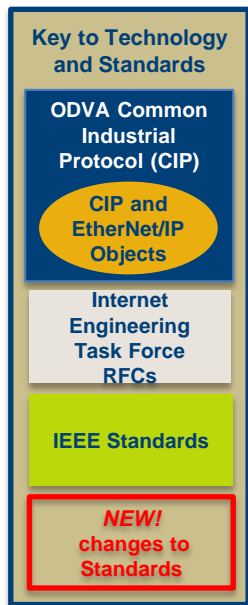
Network Convergence

Data has become a commodity, flexible data access is a must



Source: “An Interoperable Ecosystem Through Common Standards and Testing – TSN/A Conference 2018

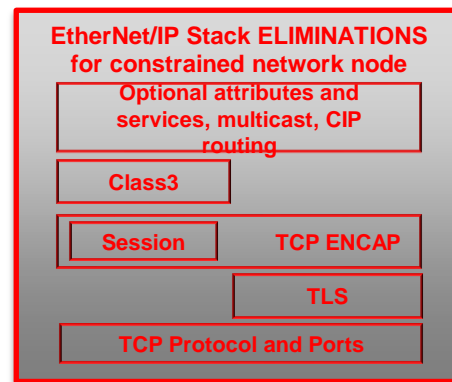
Constrained Node Networks



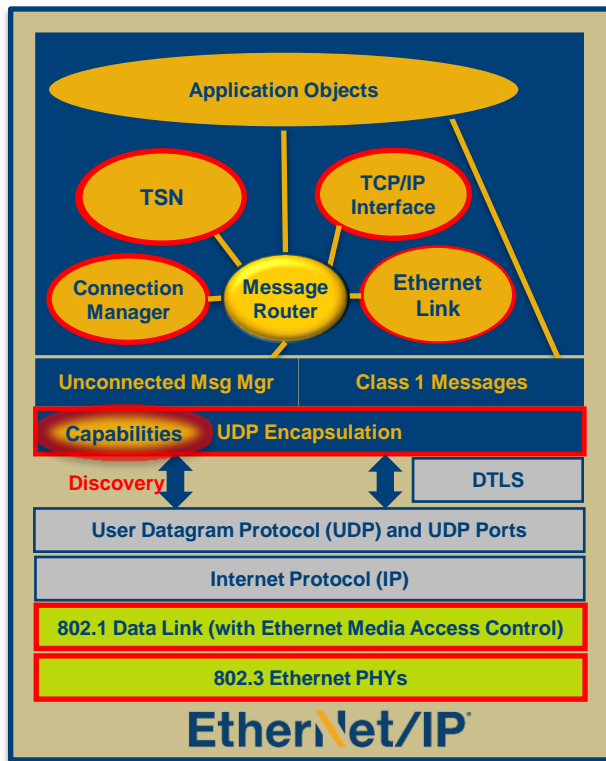
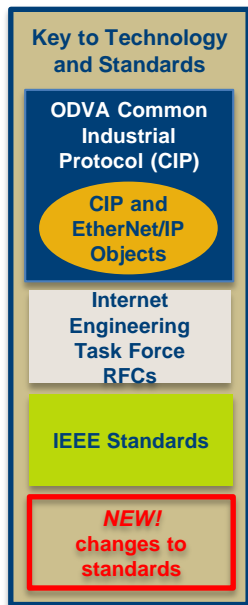
New EtherNet/IP options

- Reduced firmware
- Reduced hardware
- Optimized cabling/connectors
- Building blocks for low power wireless

CONSTRAINED NETWORK NODES
(Simplified EtherNet/IP stack
+ Single Pair PHYs)

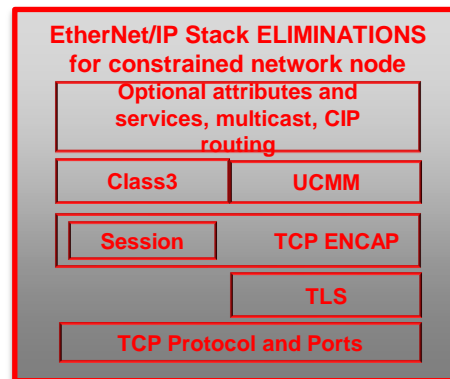


Impact to EtherNet/IP Developers



Design Considerations

- Think about integrating a generic application interface between TCP and UDP
- Segment TSN functionality so that it's only included in devices where it's needed – not likely to be needed in constrained node devices.



What OPPORTUNITIES will Single Pair Ethernet, TSN and Constrained Node Networks create?

