Call to Order

General Session and
17th Annual Meeting of Members

October 15, 2015

Welcome Back

Agenda

8:15 AM 17th TERM IN REVIEW: REPORT ON THE ACTIVITIES OF THE ASSOCIATION

with special report on the
OPTIMIZATION OF INDUSTRIAL CYBERSECURITY: UPDATE ON ODVA'S TECHNICAL APPROACH

9:30 AM MEMBERSHIP: PRESENTATION OF CANDIDATES FOR ELECTION

9:45 AM Election and Break

10:15 AM INTEGRATING ETHERNET/IP™

10:45 AM THE INTELLIGENT FACTORY OF THE FUTURE: INDUSTRIE 4.0 AND THE SMARTFACTORY^{KL} PROJECT

11:30 AM 18TH TERM: LOOKING AHEAD

12:00 PM Adjourn

Member Luncheon immediately following in the Cypress Room.

First, a look back at ODVA…

20 Years Old

March 24, 2015

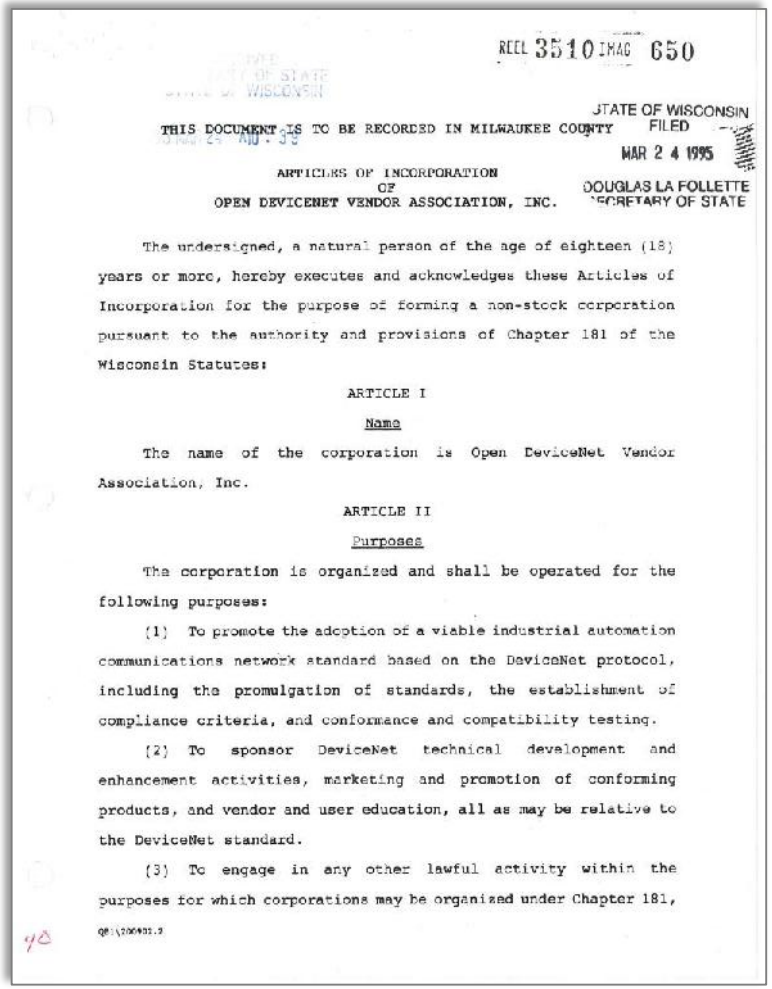
ODVA™

Founded in Wisconsin USA on March 24, 1995

by

OMRON Rockwell Automation

Square D and Westinghouse Cutler-Hammer



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STATE OF WISCONSIN

THIS DOCUMENT IS TO BE RECORDED IN MILWAUKEE COUNTY

FILED

MAR 2 4 1995

DOUGLAS LA FOLLETTE
SECRETARY OF STATE

ARTICLES OF INCORPORATION
OF
OPEN DEVICENET VENDOR ASSOCIATION, INC.

The undersigned, a natural person of the age of eighteen (18) years or more, hereby executes and acknowledges these Articles of Incorporation for the purpose of forming a non-stock corporation pursuant to the authority and provisions of Chapter 181 of the Wisconsin Statutes:

ARTICLE I

Name

The name of the corporation is Open DeviceNet Vendor Association, Inc.

ARTICLE II

Purposes

The corporation is organized and shall be operated for the following purposes:

(1) To promote the adoption of a viable industrial automation communications network standard based on the DeviceNet protocol, including the promulgation of standards, the establishment of compliance criteria, and conformance and compatibility testing.

(2) To sponsor DeviceNet technical development and enhancement activities, marketing and promotion of conforming products, and vendor and user education, all as may be relative to the DeviceNet standard.

(3) To engage in any other lawful activity within the purposes for which corporations may be organized under Chapter 181,

1995

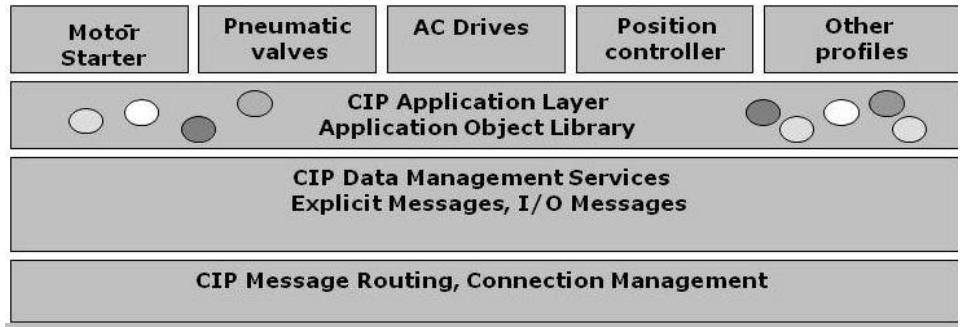
Founded for the purpose of promoting the adoption of DeviceNet including the promulgation of **standards,** establishment of **compliance criteria and conformance testing**.

DeviceNet™

ODVA™

Pioneer in the use of COTS for ICT applied to industrial automation

- adapting CAN to a viable industrial network -

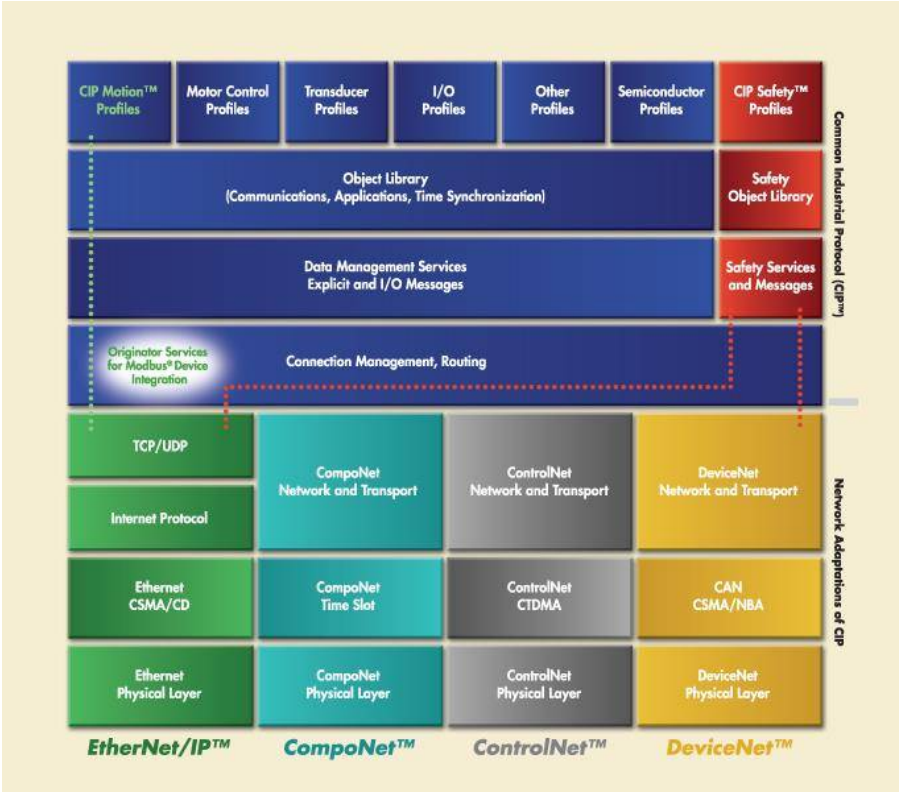


CIP's producer-consumer communication model laid the ground work for the adaptation of TCP/IP to automation

2001

Based on IEEE 802.3 and the TCP/IP Suite, EtherNet/IP proved that COTS can work for industrial automation applications as a result of **standards, compliance criteria and conformance testing.**

EtherNet/IP™



2003-2013

Networks Built on a Common Industrial Protocol

EtherNet/IP™

Its ascent during the same time frame has ideally positioned it for the 4th Industrial Revolution. . . the world of integrated cyber-physical systems.

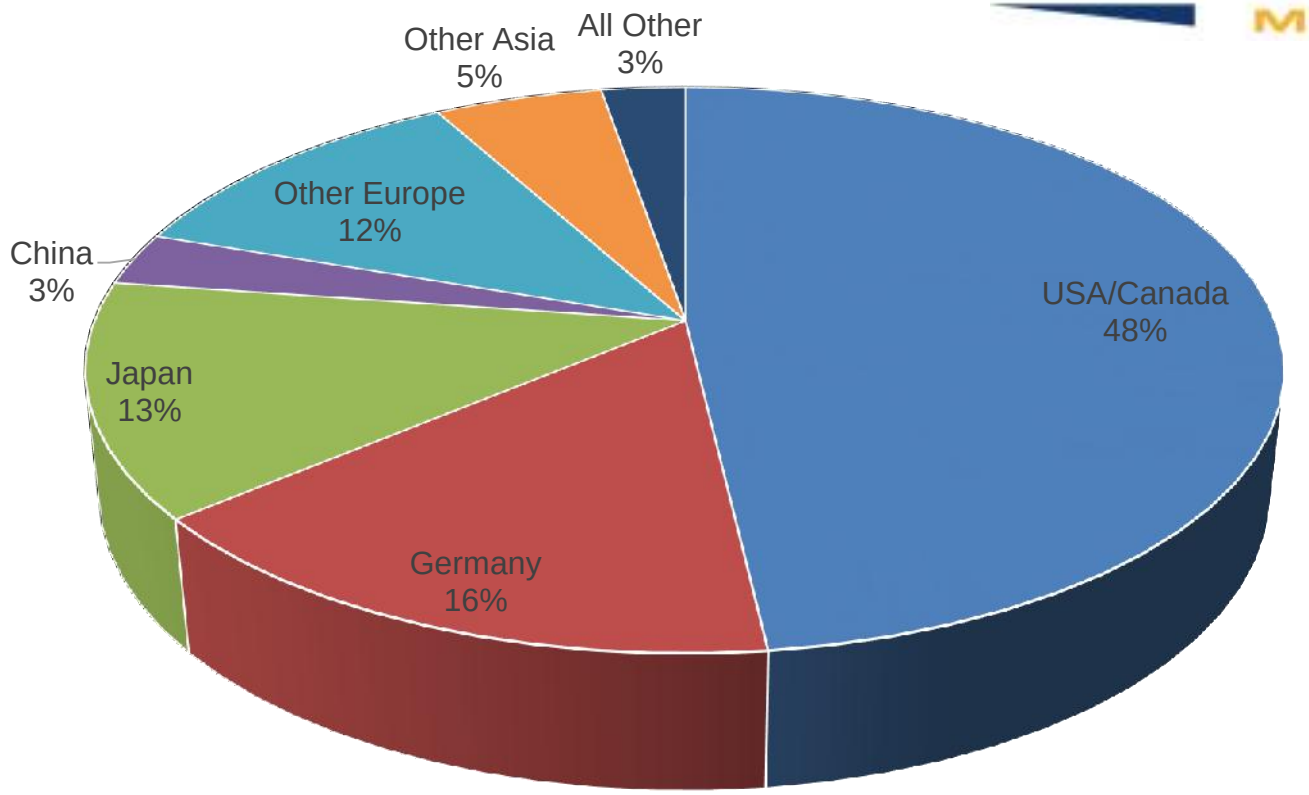
ODVA 2015
INDUSTRY CONFERENCE AND 17TH ANNUAL MEETING
ODVA'S 20TH ANNIVERSARY 1995-2015

REFLECTIONS ON THE ODVA EXPERIENCE

from the "Historians"

AND NOW THE 17TH TERM IN REVIEW

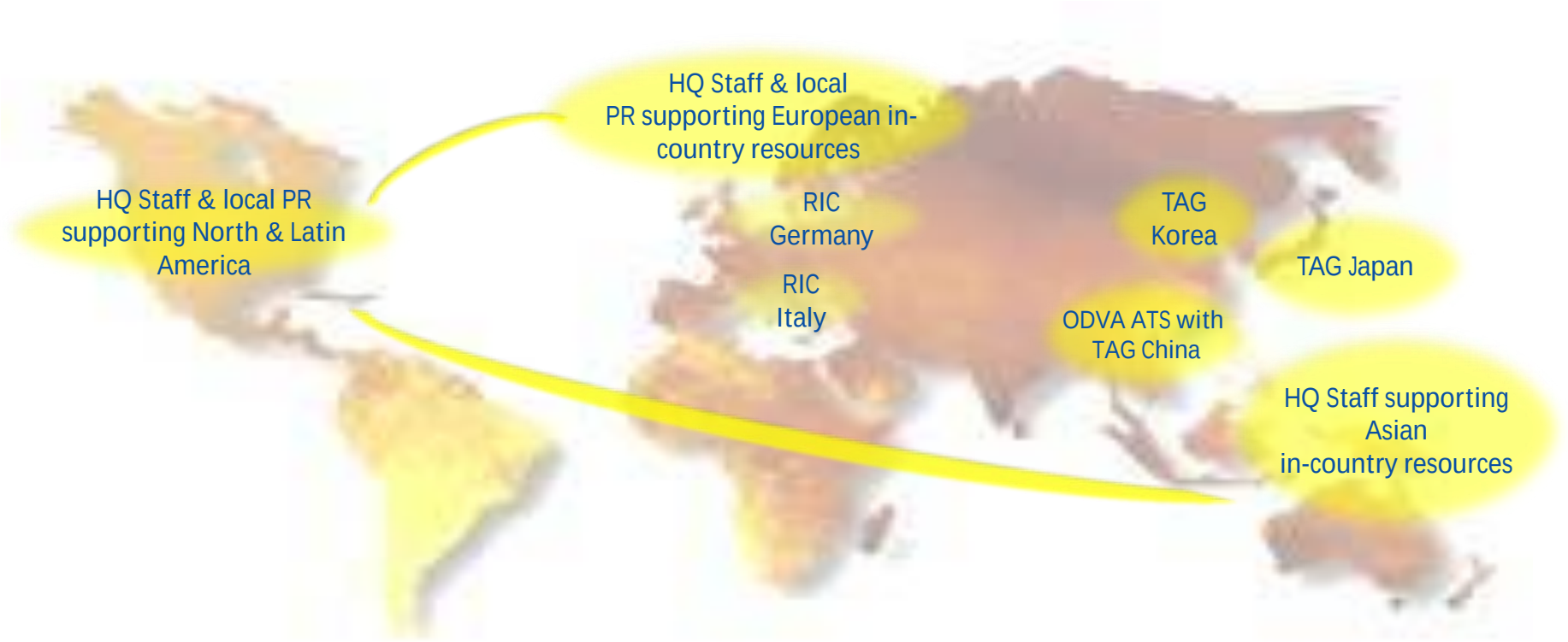
by
Katherine Voss, president & executive director
Rich Harwell, chief technology officer



305 and counting

Mix by Principal Place of Business

Membership by Areas of Activity



Leadership in the 17th Term: Board of Directors

Michael Höing
Weidmüller Interface

Fabrice Jadot
Schneider Electric

Dr. Jürgen Weinhofer
Rockwell Automation

Kent Howard
Balluff

Tony Shakib
Cisco Systems

Dr. Thomas Bürger
Bosch Rexroth

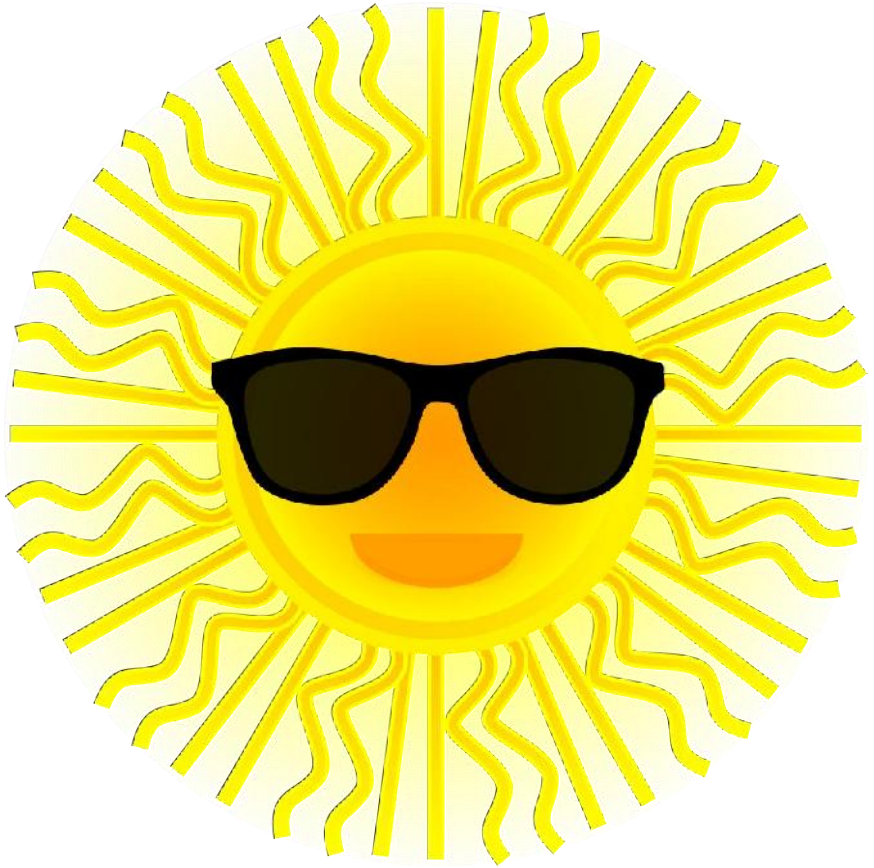
Dr. Rolf Birkhofer
Endress+Hauser

Ikuo Tateishi
Omron

Leadership in the 17th Term: Officers

- **President and Executive Director – Katherine Voss**
- **Chief Technology Officer – Rich Harwell**
- **Secretary – Christopher Lynch**
- **Treasurer – Jürgen Weinhofer**

Since Sunny Phoenix in March 2014 . . .



Deployment of New Brand Architecture

New Brand Assets Launched at Hannover Fair 2014

Deployment of New Brand Architecture

Brand Standards+Identity Guidelines
Published August 2014

Declaration of Conformity
New Template Released Q2 2015

ODVA Community in Action

Including Hannover Fair 2014,
the EtherNet/IP exhibit by ODVA
has appeared at five industry tradeshows:

- Hannover Fair 2014 (Hannover, Germany)
- Industrial Automation Show 2014 (Shanghai)
- SPS IPC Drives Show 2014 (Nuremberg, Germany)
- Hannover Fair 2015 (Hannover, Germany)
- ACHEMA 2015 (Frankfurt, Germany)

At each of these shows, ODVA members participate with products in the Product Gallery, displays in the Member Gallery and a multi-member interoperability demonstration.

ODVA Community in Action

China

Territory Alliance Groups and Regional Interest Communities have driven additional local presence with

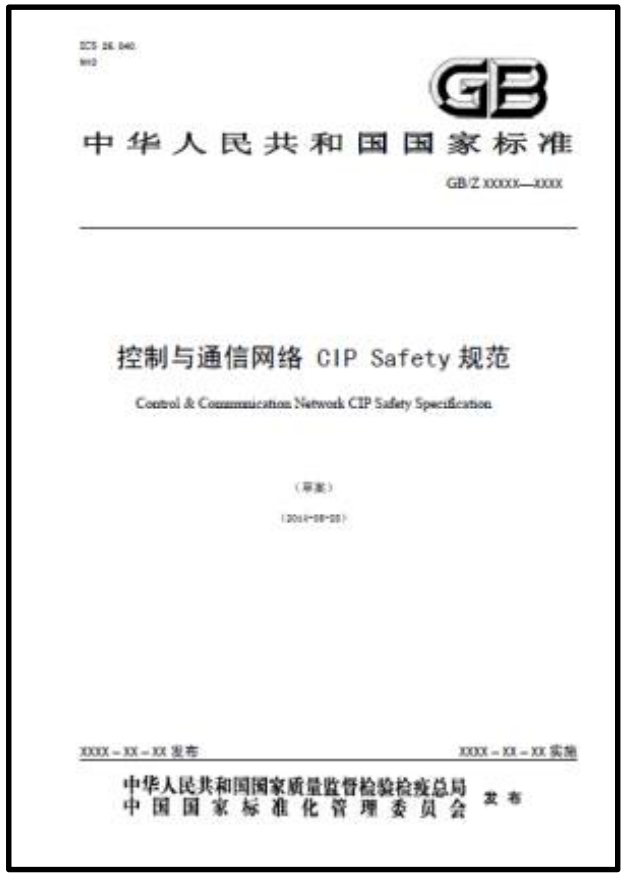
- Seminars
- Webinars
- Tradeshow Support for ODVA Exhibits.

ODVA Community in Action

China

Standardization Administration of China Approved CIP Safety as Chinese National Standard July 2015

Blended effort by staff, members and ODVA's standardization partner in China, ITEI



中华人民共和国国家标准

GB/Z XXXXX—XXXX

控制与通信网络 CIP Safety 规范

Control & Communication Network CIP Safety Specification

XXXX－XX－XX 发布　　XXXX－XX－XX 实施

中华人民共和国国家质量监督检验检疫总局
中国国家标准化管理委员会　发布

ODVA Community in Action

Germany

Territory Alliance Groups and Regional Interest Communities have driven additional local presence with

- Seminars
- Webinars
- Tradeshow Support for ODVA Exhibits.

ODVA Community in Action

Italy

Territory Alliance Groups and Regional Interest Communities have driven additional local presence with

- Seminars
- Webinars
- Tradeshow Support for ODVA Exhibits.

ODVA Community in Action

Japan

Territory Alliance Groups and Regional Interest Communities have driven additional local presence with

- Seminars
- Webinars
- Tradeshow Support for ODVA Exhibits.

ODVA Community in Action

Korea

Territory Alliance Groups and Regional Interest Communities have driven additional local presence with

- Seminars
- Webinars
- Tradeshow Support for ODVA Exhibits.

Other Activities of Note

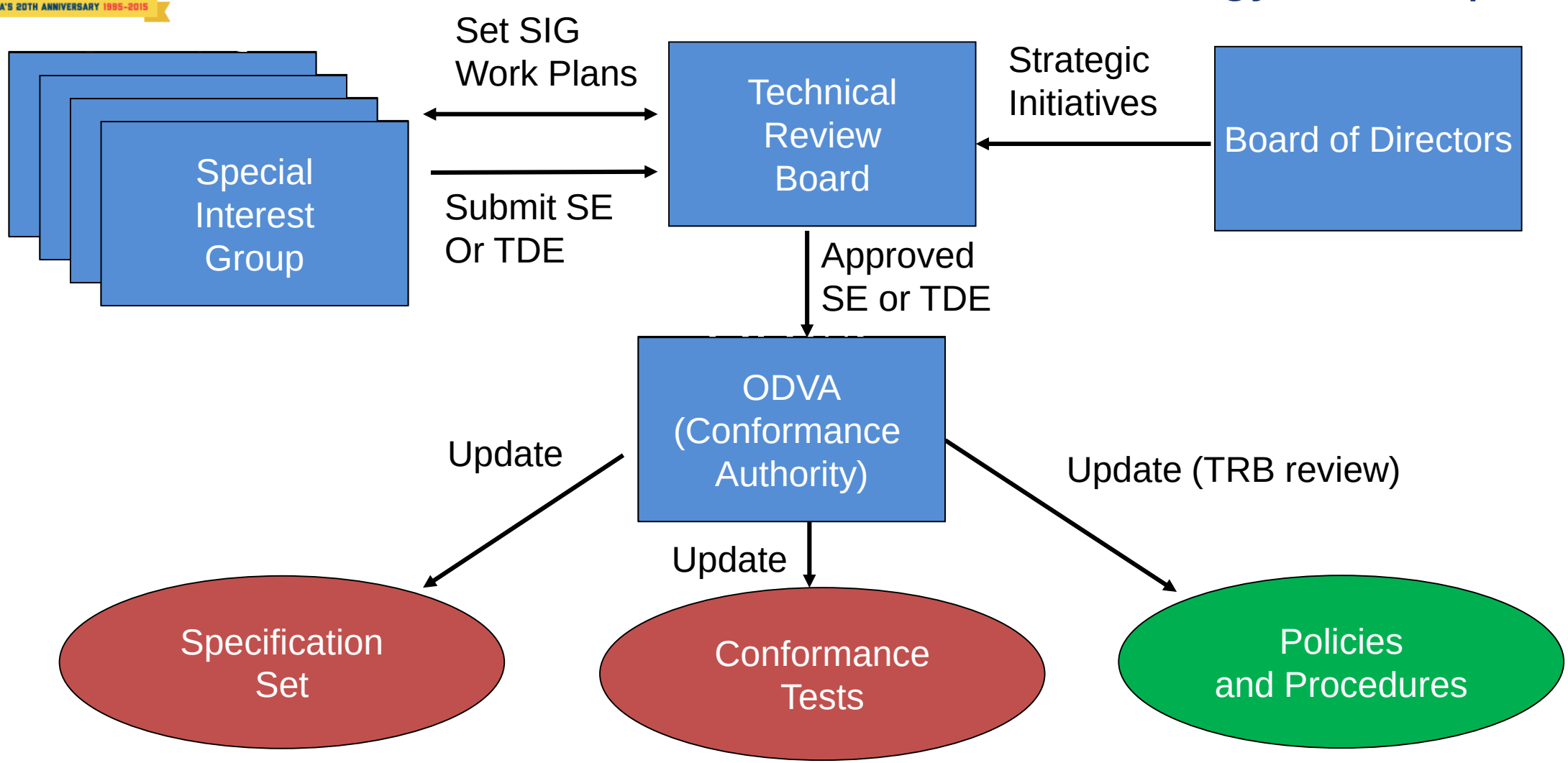
- EtherNet/IP QuickStart
- Functional Safety Week in July 2015

REPORT ON ODVA TECHNICAL ACTIVITIES

Agenda

- **ODVA technology development overview**
- **Technical Review Board (TRB) roster**
- **Special Interest Group (SIG) roster**
- **Key Accomplishments in the 17th Term**
- **Planned Activities in the 18th Term**

ODVA Technology Development



Technical Review Board

1. Rudy Belliardi
2. Paul Didier
3. Dr. Jörg Hähniche
4. Rich Harwell, chairperson
5. Rich Jackson
6. Dr. Ludwig Leurs
7. Eric Scott
8. Dave VanGompel
9. Joakim Wiberg

31

Special Interest Groups

- EtherNet/IP In Process Industries – Mirko Brcic (Endress+Hauser) (new SIG)
- CIP Safety – Bruce Brown (Rockwell) (new chair)
- IO-Link Integration – Frank Moritz (SICK)
- DeviceNet of Things – Thomas Peter (Weidmueller)
- Machinery Information – Rainer Beudert, Steve Zuponcic, Ludwig Leurs
- EtherNet/IP Physical Layer – Bob Lounsbury (Rockwell)
- DeviceNet Physical Layer – Brad Woodman (Molex)
- EtherNet/IP Infrastructure – George Ditzel (Schneider)
- EtherNet/IP System – Brian Batke (Rockwell)
- Distributed Motion – Steve Zuponcic (Rockwell)
- CompoNet – Tianbing Li (Omron)
- Conformance – Qi Zeng (ODVA)
- Modbus Integration – Todd Snide (Schneider)
- Energy Applications – Rick Blair (Schneider)
- CIP System – Dave VanGompel (Rockwell)
- EtherNet/IP Roundtable – Kevin Knake (HMS) in North America, Ulrich Kaemmerer (Schneider) in Europe

Specification Enhancement Summary

Specification Volume	PC 2014-1	PC 2014-2	PC 2015-1	PC 2015-2
CIP Common (V1)	12	11	6	6
EtherNet/IP (V2)	7	4	6	3
DeviceNet (V3)	0	0	0	0
CIP Safety (V5)	1	4	2	4
Modbus Integration (V7)	1	0	1	0
CIP Security (V8)				6

74 specification enhancements over 4 publication cycles with a focus on extending CIP Common features and EtherNet/IP.

Key Accomplishments Since Last Annual Meeting

Topic	SIG	Volume	Summary
CIP Security	EtherNet/IP System : Cybersecurity WG	New CIP Security Volume 8	First Step (Doggett presentation)
Gigabit Ethernet Support	EtherNet/IP system	Vol 2	Supporting Slide
EtherNet/IP CT12 and DeviceNet CT26 released	Conformance	Conformance Test Enhancements	Supporting Slide
CIP Motion Device Axis Object Updates	CIP Motion	Vol 1	Updated Frequency Control, feedback types and start and stop control
Dual Channel Safety Feedback	Safety	Vol 5	Extended safety product support

Gigabit Ethernet Enhancements

- **Benefit of Leveraging Standard Unmodified Ethernet**
- **Related Specification Activity**
  - ESE-001-051: Gigabit Ethernet support in Ethernet Link Object (EtherNet/IP System SIG)
  - 1 Gbit Industrial Ethernet cable study (EtherNet/IP Physical Layer SIG)
- **Positive Impact Across EtherNet/IP applications**
    - CIP Motion
      - Ability to handle many more axes per millisecond
      - Easier to intermix CIP Motion devices with non-CIP Motion devices

Conformance Test Updates

- EtherNet/IP CT12 and DeviceNet CT26 released (December 2014)
  - Significant Enhancements in key object testing
    - Port object, identity object, connection manager object…
  - Improved DLR testing

- Test Plans for Conformance Test extensions:
    - TCP Socket Cleanup Test Plan

      Author: Jamin Wendorf (Real Time Automation)
    - CIP Transport IO Packet Injection Test Plan

      Author: Christoffer Lind, Björn Otterdahl (HMS Industrial Networks)
    - PRP Test plan

      Author: Sunita Patel (Schneider Electric)

Key Future Activities

Topic	SIG	Volume / Revision	Summary
EtherNet/IP for Process enhancements	EtherNet/IP for process	Vol 1 and Vol 2, White Paper	Supporting Slide
Roundtable Diagnostic activities	EtherNet/IP Roundtable/ CIP System/ EtherNet/IP System	Vol 1 and Vol 2	Supporting Slide
CIP Security Parts 1.5 & 2	EtherNet/IP System	Vol 2 and Vol 8	Step 1.5 and Step 2 (Doggett Presentation)
CIP Motion Reorganization	CIP Motion	New CIP Motion volume	Reorganize the material from current volumes

EtherNet/IP in the Process Industries

Plans for next 12-18 months

- Follow-up Reference Architecture for Process Industries
  - Provide implementation examples of the '*X in the cloud*' or '*as a service'* developments, e.g. SCADA implementation in the cloud (either public or private) based on the logical architecture.
- Finalizing Input Assembly structure including device diagnostics
  - Standardized access to process data from EtherNet/IP devices including device diagnostics
  - Definition of device diagnostics for native EtherNet/IP devices that are compliant with NAMUR NE-107
- Finalizing HART mapping on CIP
  - Standardized CIP object structure to get access to HART
- Define PoE adaptation for EtherNet/IP

Roundtable for EtherNet/IP

Change in structure, scope of work and mission of the Roundtable allows much better alignment with ODVA objectives with the TRB directed topics to the group and approval of work products.

- Work in progress:
  - **Diagnostics project** – Common diagnostic method and parameters that can be consistently implemented across all EtherNet/IP devices. Complete Diagnostics Scope of Work. CIPSE's drafted and submitted to relevant SIGs.
  - **LLDP investigation –** How LLDP can be applied to EtherNet/IP
  - **Interoperability Conformance Testing** - Assisting Conformance Authority to add interoperability testing to a future Conformance Test offering.
  - **PlugFest** – ACD test improvements, prove out tests for muli-port devices and DLR Performance Profile.
  - **Vendor education** – EtherNet/IP technology tutorials, presenters for Quick Start training
  - **CIP Security –** supporting adoption of these key new capabilities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THANK YOU

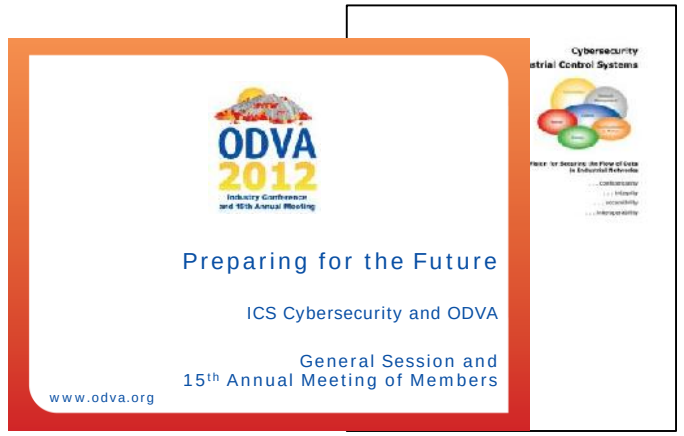
Optimization of Industrial Cybersecurity
Update on ODVA's Technical Approach

David Doggett, Schneider Electric
Cliff Whitehead, Rockwell Automation

October 15, 2015

Increasing need for security is common knowledge …are we delivering?

- Oct 2012 – Presentation to the members and whitepaper.
  - Harden Devices
  - Protect CIP
  - Secure CIP



- Cybersecurity a subgroup of the Systems and Architecture SIG.
  - New Volume 8 of the CIP Networks Library addresses security.

ODVA's Role in Security

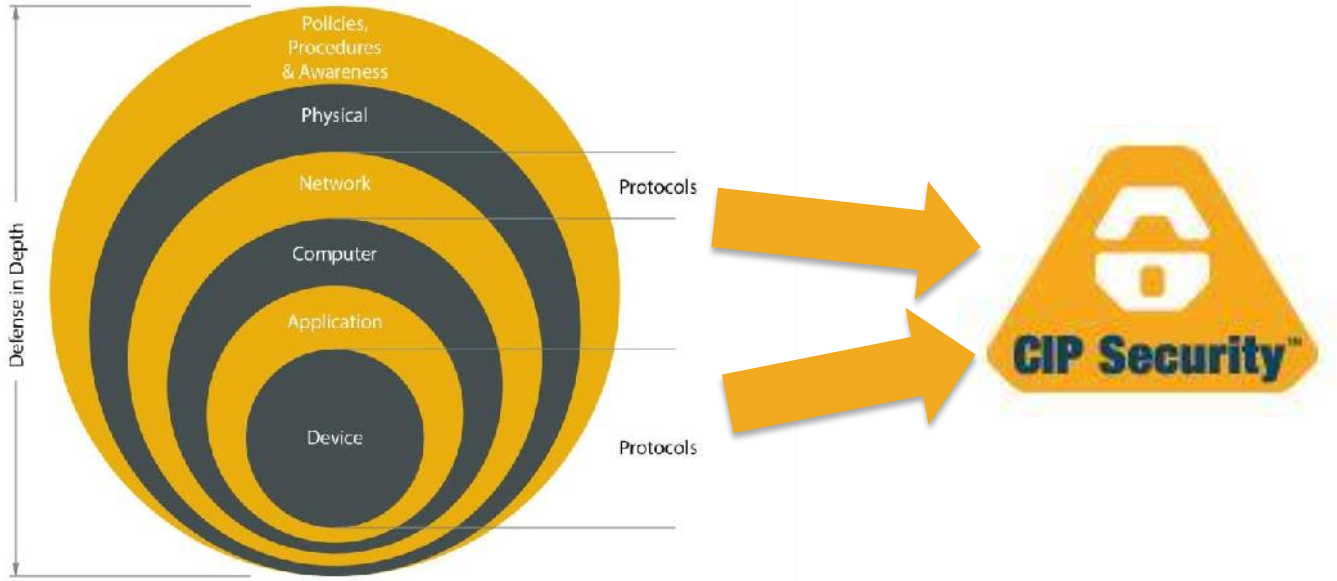
- Environment :
  - Cybersecurity weaknesses will always exist.
  - The future is a convergence of production and other systems.
  - Secure Protocols form a key element of a Defense in Depth strategy.

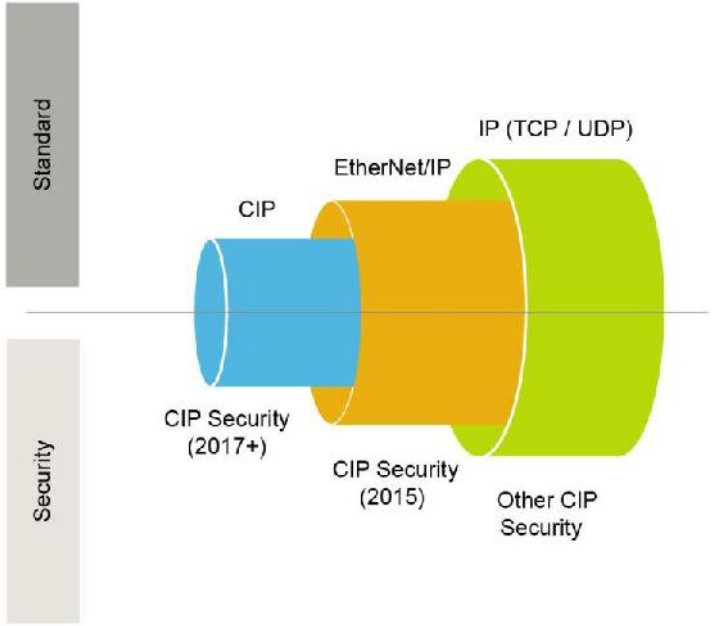
- Assumptions :
  - The networks should be considered to have very limited trust.
  - All entities on the network should be considered untrusted until they can be authenticated
  - Access to a device should not be allowed until authorized by the device itself.
  - Physical access to a device will be limited to only trusted individuals.

- A secure device should :
  - Reject data that has been altered in any way (data integrity)
  - Reject messages sent by unknown/untrusted people or devices (authenticity).
  - Reject messages that request actions that are not allowed (authorization)

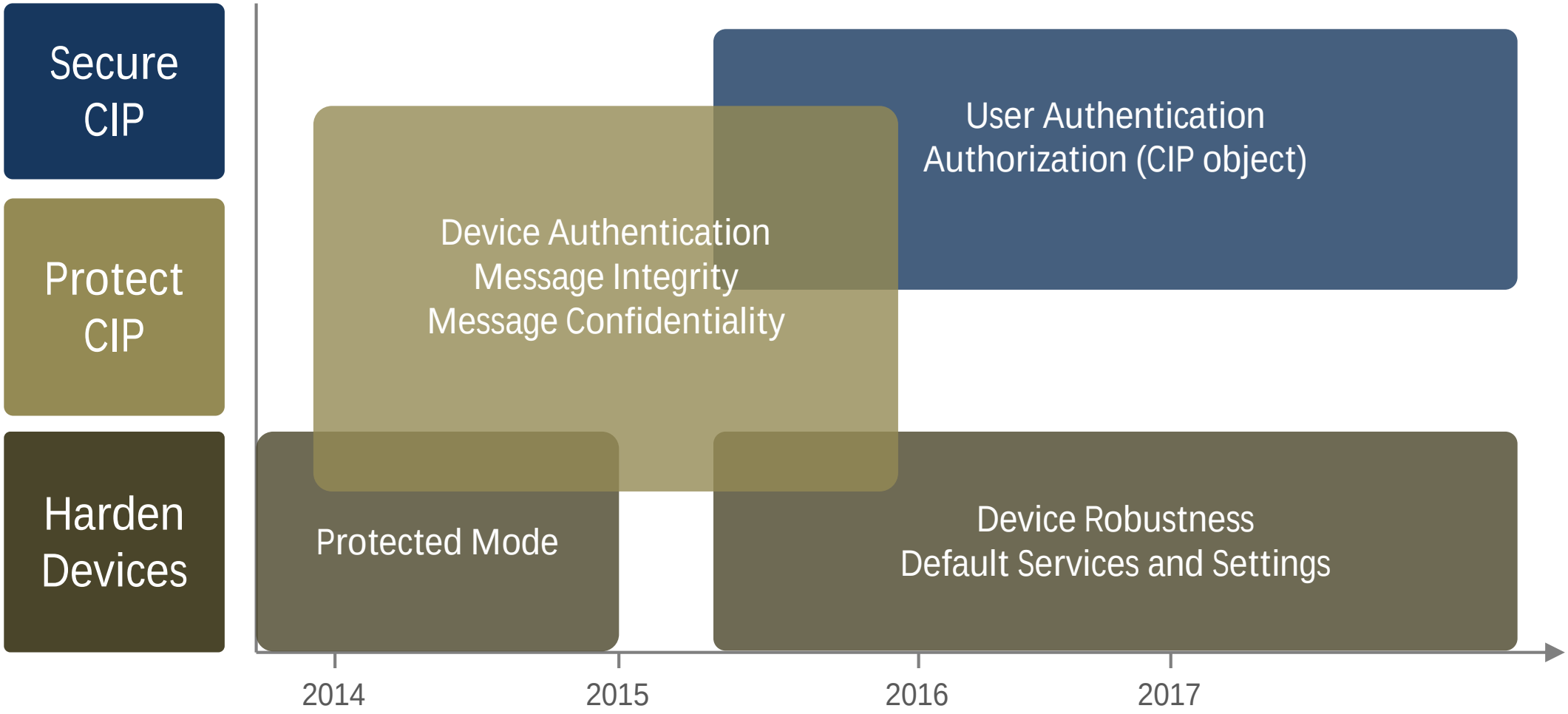
ODVA's Role in Security

- ODVAs Role :
  - Secure protocol on which secure devices and systems can be built.
  - Recommendations for implementation of a secure system.





Elements of CIP Security



Harden Devices

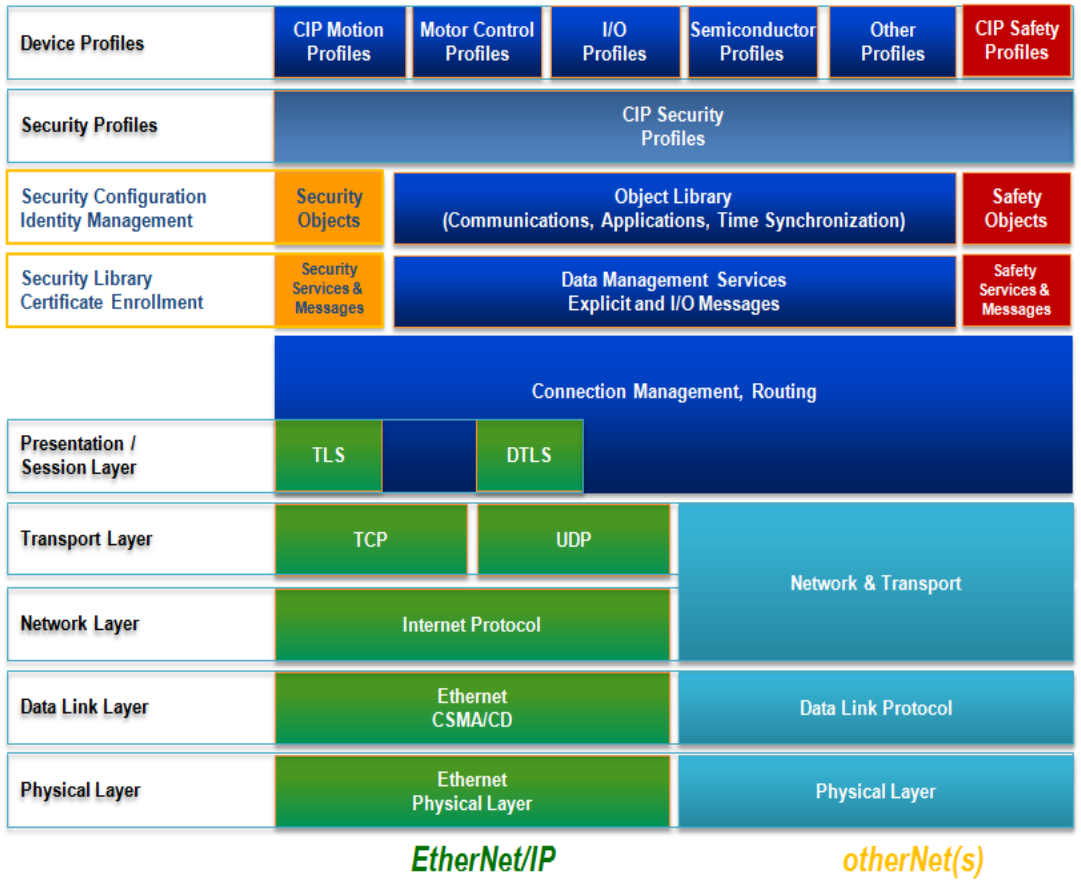
- Protection Mode
  - Attribute of the Identity Object.
  - Rejects disruptive CIP services when attribute is set.
- Network Robustness
  - Further analysis being done of how ODVA will interact with existing standards/certifications.
- Recommended/Required Security Settings
  - More work to be done to ensure a secure by default installation.

Protect and Secure CIP – Based on Threats, using Proven Technologies

Threat Type	Threat Description	Security Property	Volume 8: CIP Security™	Future enhancement
Spoofing identity	E.g. illegally accessing and then using another user's or devices authentication information, such as username and password.	Device authorization	x	
		User authorization		x
Tampering with data	The malicious modification of data, including unauthorized changes made to persistent data, such as that held in a database, and the alteration of data as it flows between two computers over an open network, such as the Internet.	Message integrity	x (Ethernet)	x (CIP)
		Data integrity (at rest)		x
Repudiation	Threats associated with users or devices who deny performing an action without other parties having any way to prove otherwise. Nonrepudiation refers to the ability of a system to counter repudiation threats. E.g, a user who purchases an item might have to sign for the item upon receipt. The vendor can then use the signed receipt as evidence that the user did receive the package.	Non-repudiation (audit of events)		x
Information disclosure	IExposure of information to individuals who are not supposed to have access to it—e.g, the ability of users to read a file that they were not granted access to, or the ability of an intruder to read data in transit between two computers.	Message confidentiality	x	
		Message integrity	x	
Denial of service	Denying service to valid users—for example, by making a Web server temporarily unavailable or unusable. Certain types of DoS threats must be protected against to improve system availability and reliability.	Availability		x
Elevation of privilege	An unprivileged user gaining privileged, and thereby sufficient, access to compromise or destroy the entire system. Elevation of privilege threats include those situations in which an attacker has effectively penetrated all system defenses and become part of the trusted system itself, a dangerous situation indeed.	Authorization		x

CIP Security

- Device Authorization
  - Preshared Keys.
  - Device Certificates.
  - TLS/DTLS with Mutual Authentication.
- Message Integrity/Confidentiality
  - TLS/DTLS (with encryption).
  - Null Cipher for speed / HMAC
- Performance, will vary but initial test is
  - 400ms connection times (from 100ms)
  - Minimal impact on data exchange (Null Cipher).



Device Authentication

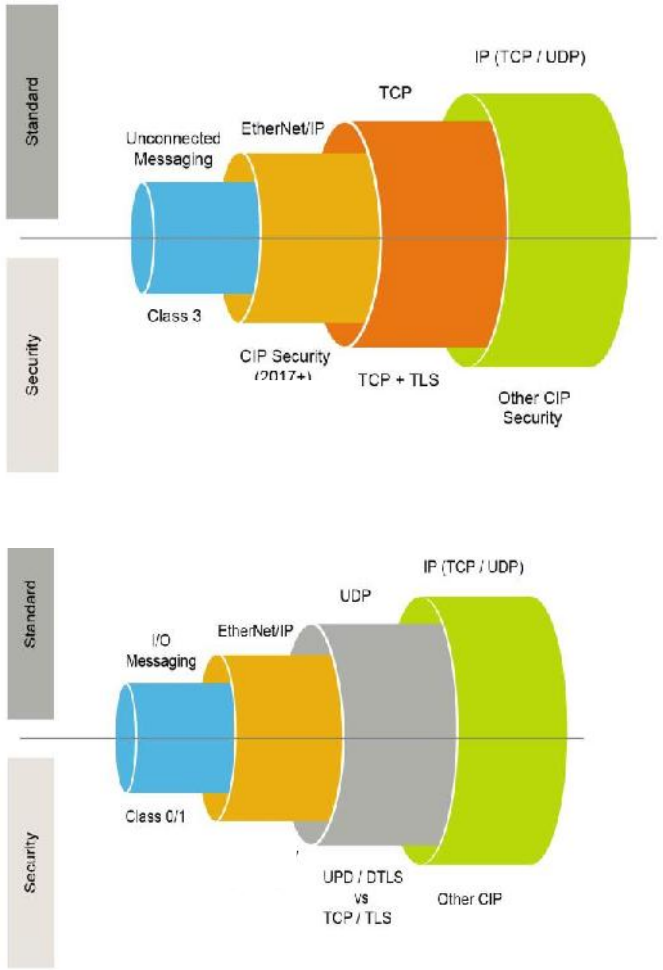
- Group of trusted devices (IEC62443 security zone) based on sharing common keys or Certificates signed by a trusted end user CA.

- Pre shared key
  - Simple implementation for users of smaller systems.

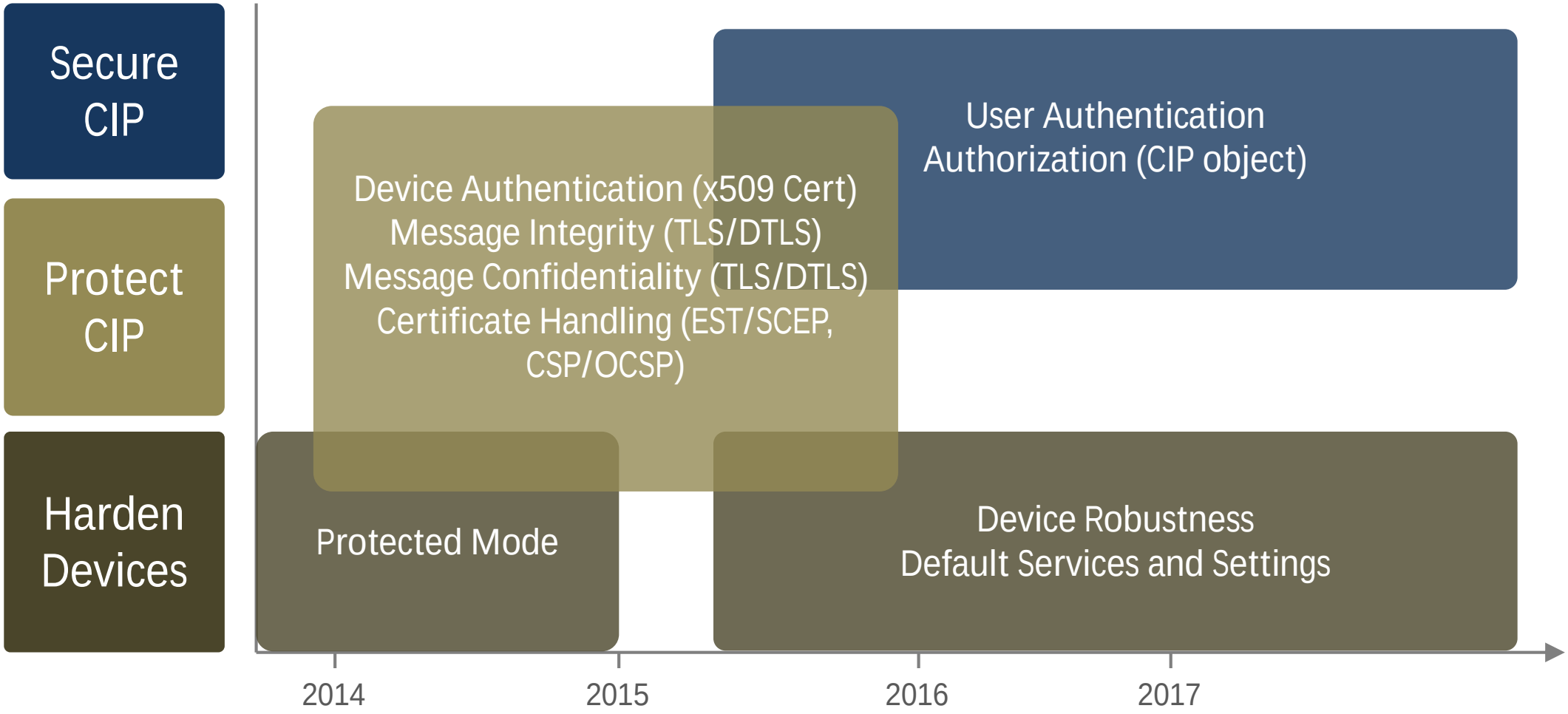
- Certificate Based
  - Proven cryptographic identity per device (X509 Cert)
  - More robust and secure for large systems.
  - Certificate Handling covered as part of specification.
    - Default certificate (vendor installed or device self signed) available on startup.
    - Local PKI support for installing end user certificates to ensure uniqueness of devices at a end user site.
      - Push mode for end user device certificates defined in 2015 specification.
      - Pull mode (EST/SCEP) to be defined later but can be implemented now.

EtherNet/IP Secure

- UCMM and Class 3 - EtherNet/IP over TLS (Port 2221/tcp)
- Class 0/1 – EtherNet/IP over DTLS (Port 2221/udp)
  - Forward_Open and Forward_Close moved to DTLS/UDP.
- Identity and Integrity of communications in all use cases.
  - Confidentiality of communications optional.
- Authorization based on possession of preshared key or trusted certificate.
  - CIP object security to be covered in 2017+



Elements of CIP Security

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THANK YOU

INTEGRATING WITH ETHERNET/IP™

Gary A. Hida
Applied Control Engineering, Inc. (ACE)
October 15, 2015

"Great minds discuss ideas, average minds discuss events, small minds discuss people."

-- Eleanor Roosevelt

ACE Overview

APPLIED CONTROL ENGINEERING

THE RIGHT SOLUTION. ON-TIME. ON-BUDGET.

- Independent Systems Integrator
- Established in 1991
- Genesis based in:
  - Chemical
  - Specialty Chemical
  - Air Separations
- 100+ Fulltime employees
- Privately Owned
- Internally Financed

Engineering Offices

- Delaware Valley
- Chesapeake Region
- Greater Boston
- Gulf Coast
- Lehigh Valley
- New England
- Ohio Valley

Automation Services

- Projects from $500-$2M
- Greenfield, Brownfield, Legacy migration
- New systems
- 24/7 Service Support

Integration Opportunities

- $65B worth of existing process control systems nearing end of useful life
- Migration opportunities

"If you must have motivation, think of your paycheck on Friday."

--Noel Coward

The World Before EtherNet/IP

- Closed networks
- Everything “owned” by hardware vendors
- Severe limits on integrating pieces
- Playground for integrators
- Views on Ethernet evolved in the ‘90’s

- EtherNet/IP eliminates these issues
- Less work for integrators but higher value

“The future ain't what it used to be.”

--Yogi Berra

Networks and Project Execution

- Hopefully this idea is now history…

  "That new process equipment is arriving next month. Send out the drawings to five integrators and let's get quotes…"

- Process control project execution – networks are no longer predetermined
  - Control Platform
  - Instrumentation
  - Valves
  - Electrical Distribution Equipment
  - VFD Vendors
  - Regulatory Equipment and Interfaces
- EtherNet/IP enables and simplifies these communications

System Life Cycle

Networking has impacts throughout the system life cycle

- Requirements Definition
- **Architecture**
- **Vendor Selections**
- Detailed Design
- Implementation and Testing
- Infrastructure
- Installation and Commissioning
- Operation and Maintenance

Network Requirements

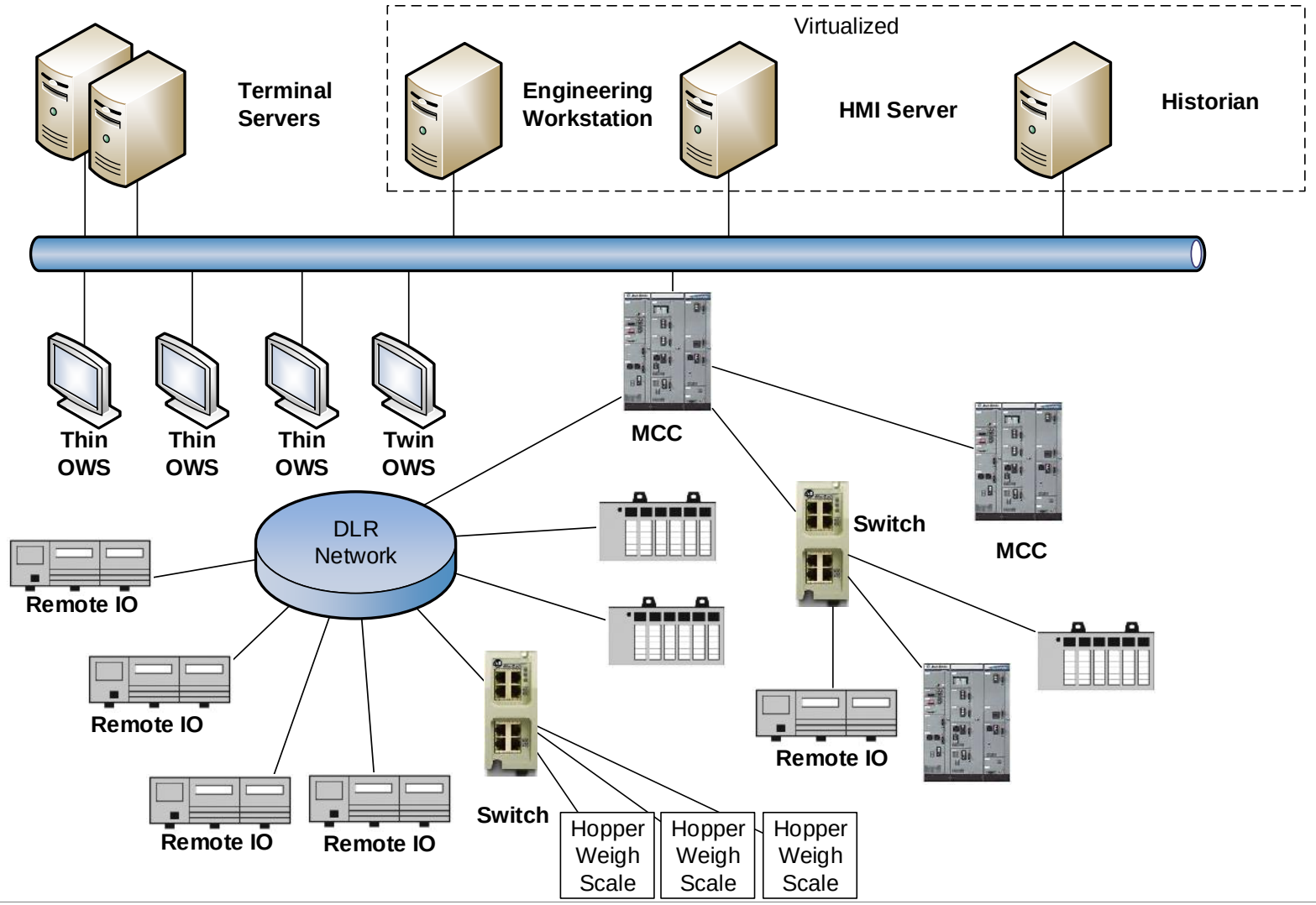
- Interoperability and support
- Data availability
- Reliability
- Compliance to standards
  - Conformance testing
- Secure
- Ease of use

Project Examples

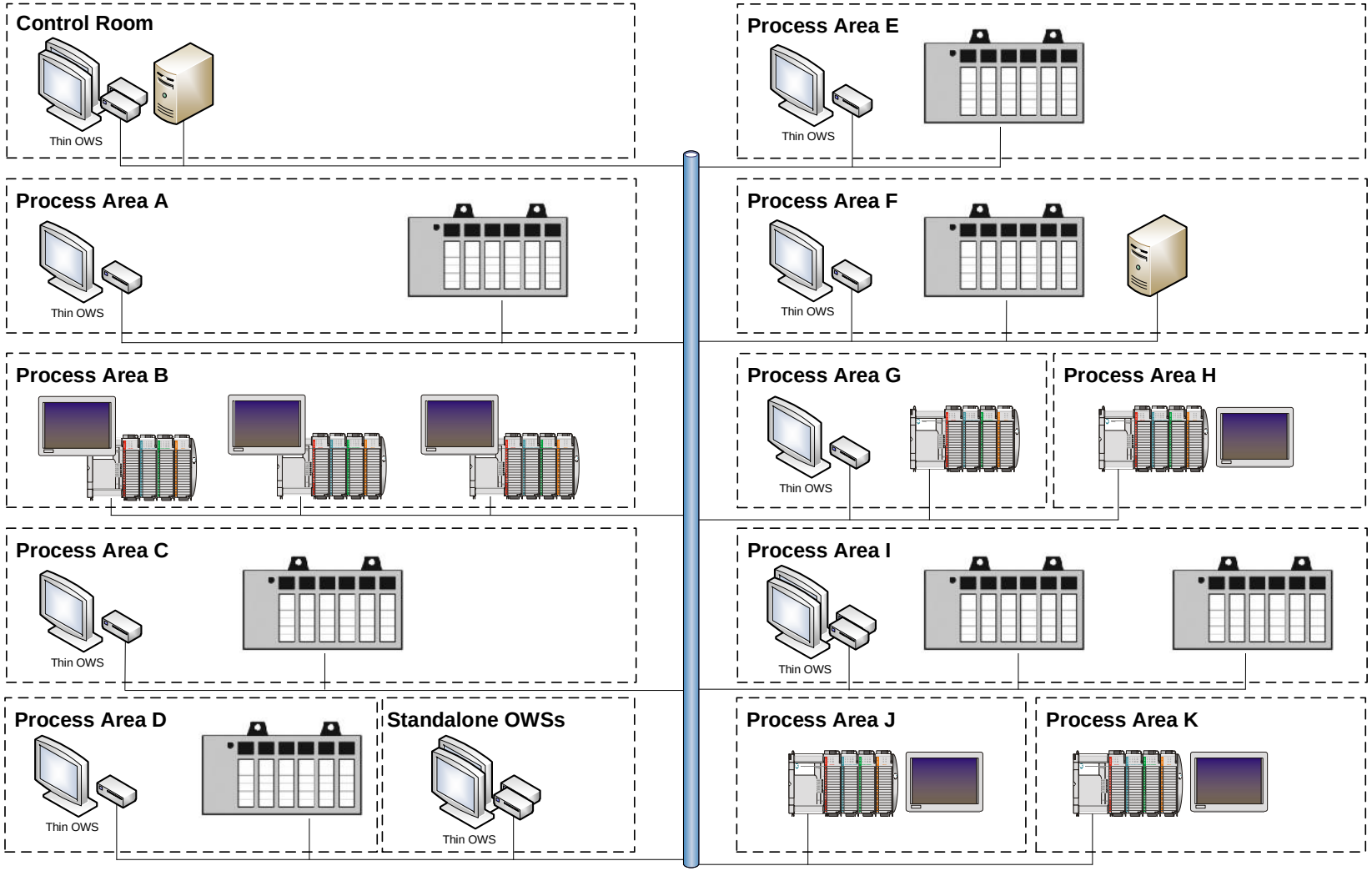
Chemical Process Industry Application

- Migration from legacy DCS
- Existing system:
  - Proprietary I/O bus and controller bus networks
  - No other devices were networked
- Migrated System:
  - All VFD's and soft starters connected via EtherNet/IP and ring architecture
  - All I/O on EtherNet/IP
  - All data available to Historian and enterprise

Chemical Process Industry Application



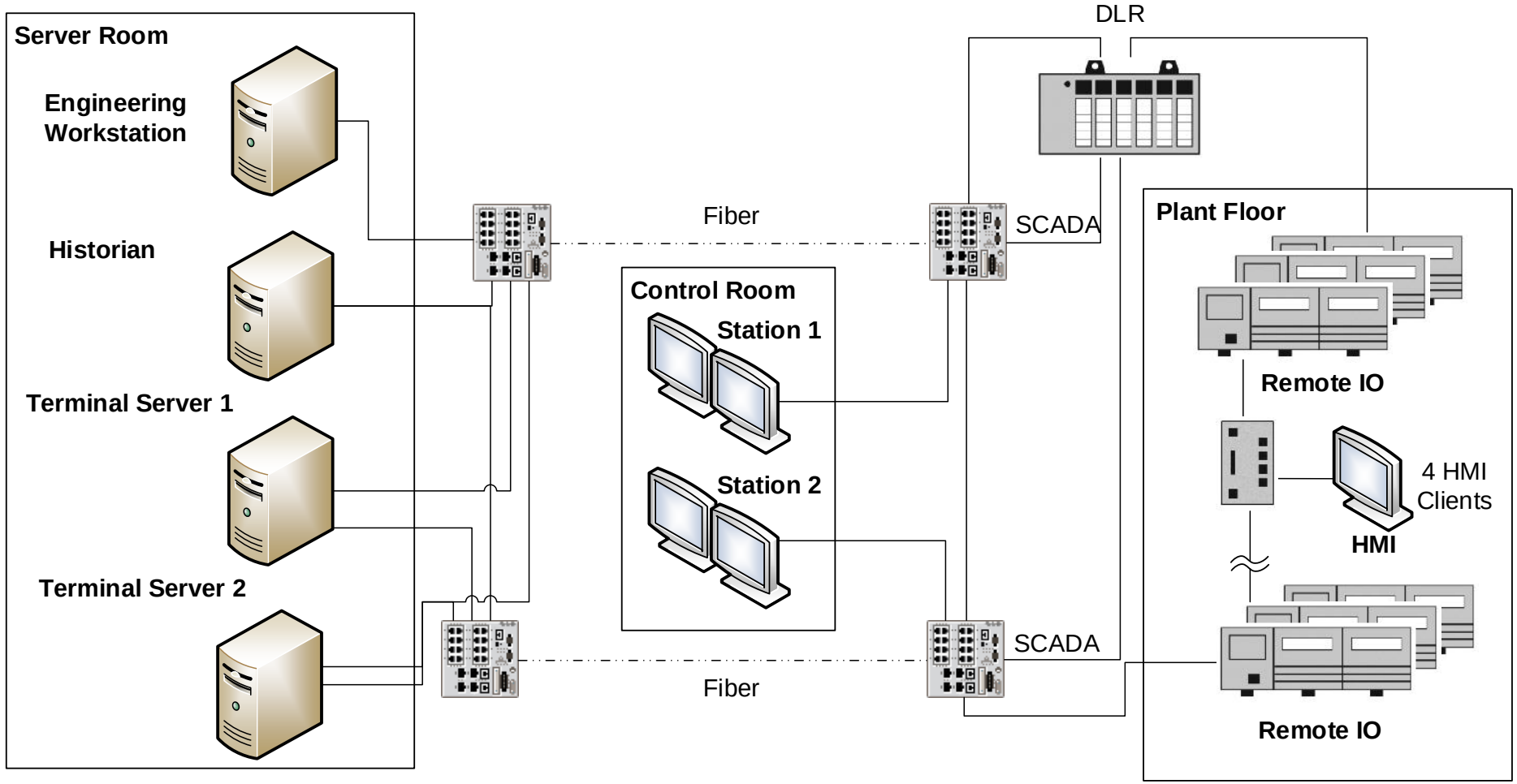
Chemical Process Industry Application



Consumer Products / Process Application

- Upgrade from legacy hardware
- Mixed vendor and vintage hardware
- Two HMI platforms
- Multiple remote I/O networks
- Gateway linking device to serial MODBUS devices
- Some obsolete hardware
- Limited documentation
- Migrated System:
  - Customer received multiple proposals; some with multiple networks
  - Final design moved to EtherNet/IP with resilient and redundant networks

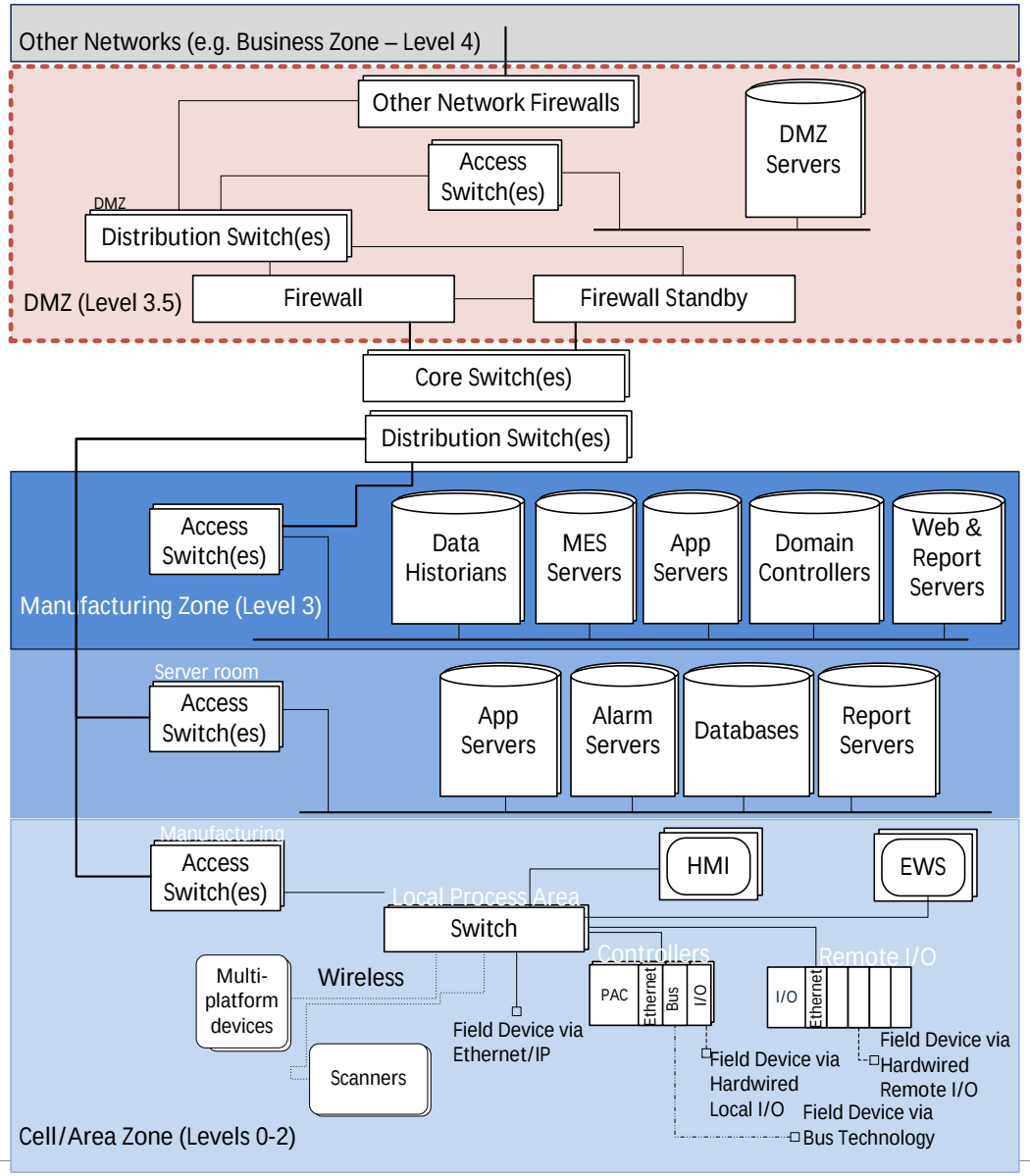
Consumer Products / Process Application



Life Science Application

- Converged Network
  - Core switches used to connect entire campus
  - Distribution switches used to connect to the Core
  - Access switches
  - Local access switches
- Server rooms host resources for the DMZ and Level 3 networks
- PCN allows for Process Control elements to communicated across campus
- Having all devices on network allows for OT functions

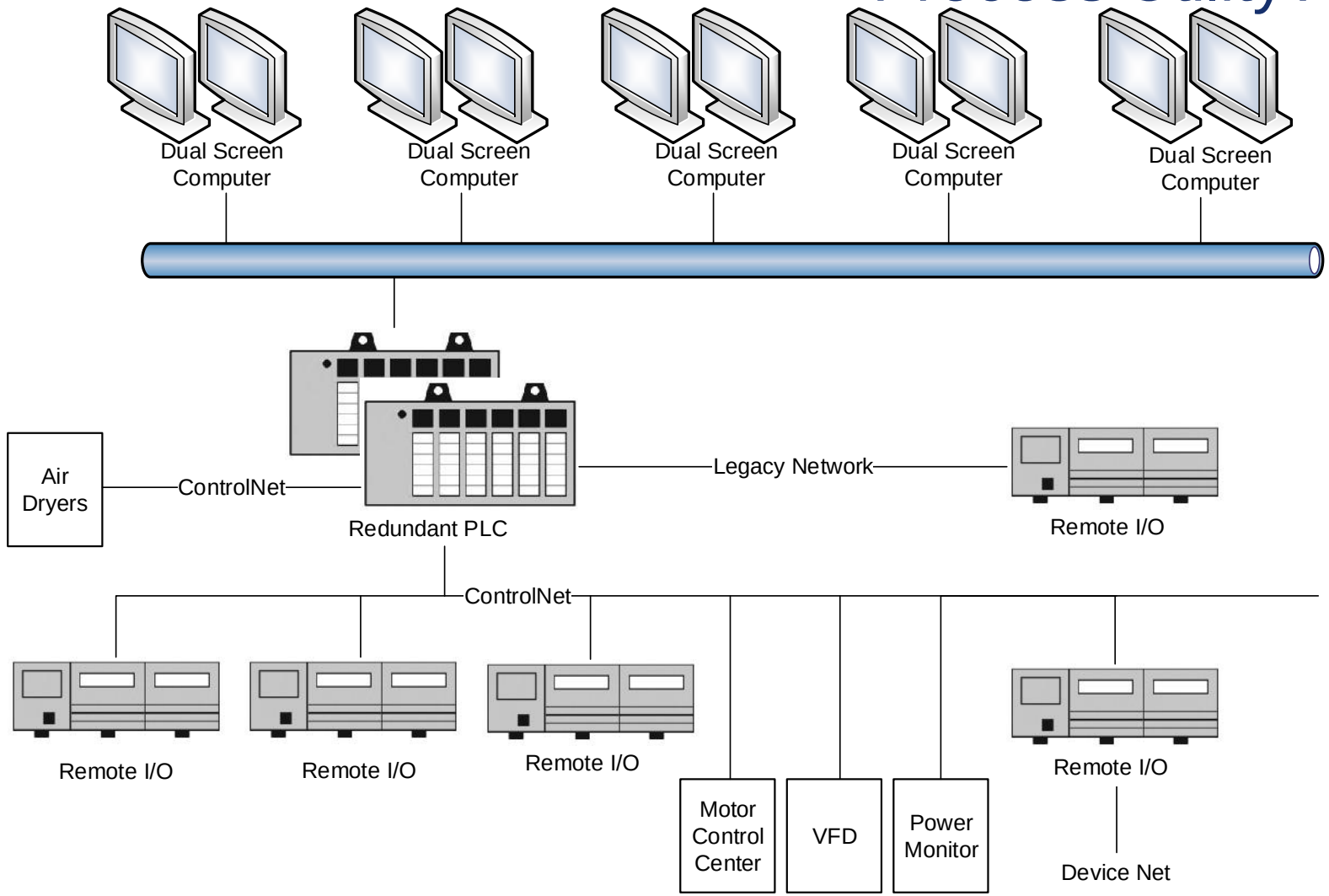
Life Science Application



Process Utility Application

- Mission critical application – one customer is data center
- System has lived >25 years
- Redundant controllers
- ControlNet™ I/O network providing segregation from controlled Ethernet network
- Dual EtherNet/IP networks for HMI and data collection
- OEM package equipment on ControlNet
- MCC included DeviceNet™, VFD's, power monitors

Process Utility Application



Future from Integrators Perspective

- Physical
- Wireless
- Security (IEC 62351, IEC62443)
- Scalable Redundancy Options
- Network Set-Up
- Reduce the IT component
- Quantity of field devices
- Diagnostics


ODVA
2015
INDUSTRY CONFERENCE
AND 17TH ANNUAL MEETING
ODVA'S 20TH ANNIVERSARY 1995-2015

THANK YOU

THE INTELLIGENT FACTORY OF THE FUTURE: INDUSTRIE 4.0 AND THE SMARTFACTORY^{KL} PROJECT

Prof. Dr.-Ing. Dr. h.c. Detlef Zuehlke

Director Innovative Factory Systems Dept. IFS
German Research Centre for Artificial Intelligence
DFKI Kaiserslautern
and
Executive Chairman, SmartFactory^{KL} e.V.

October 15, 2015

German Research Center for Artificial Intelligence (DFKI)

Since 07/1988 — Kaiserslautern
- Augmented Reality
- Embedded Intelligence
- Knowledge Management
- Innovative Factory Systems

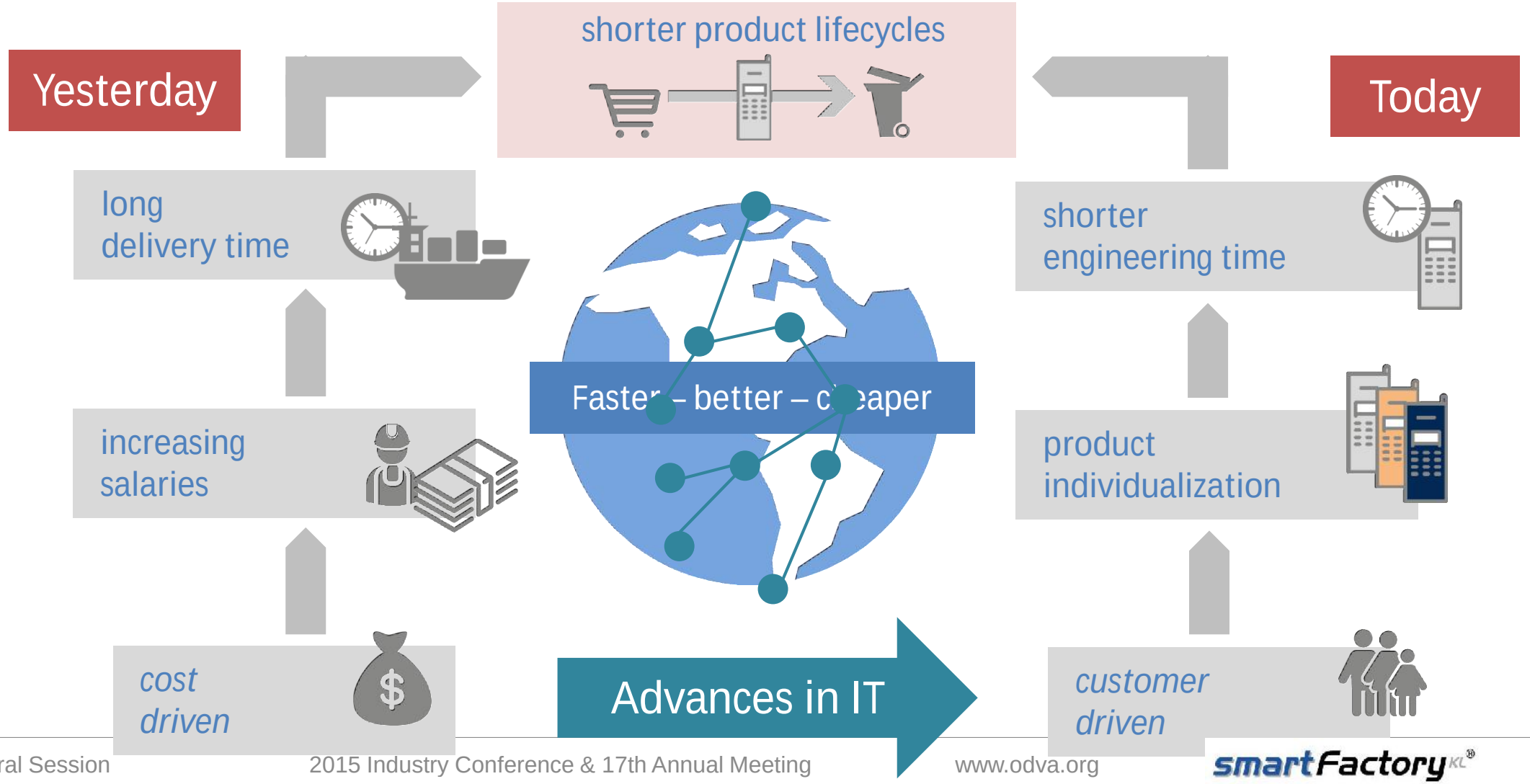
Since 07/1988 — Saarbrücken

Since 11/2005 — Bremen

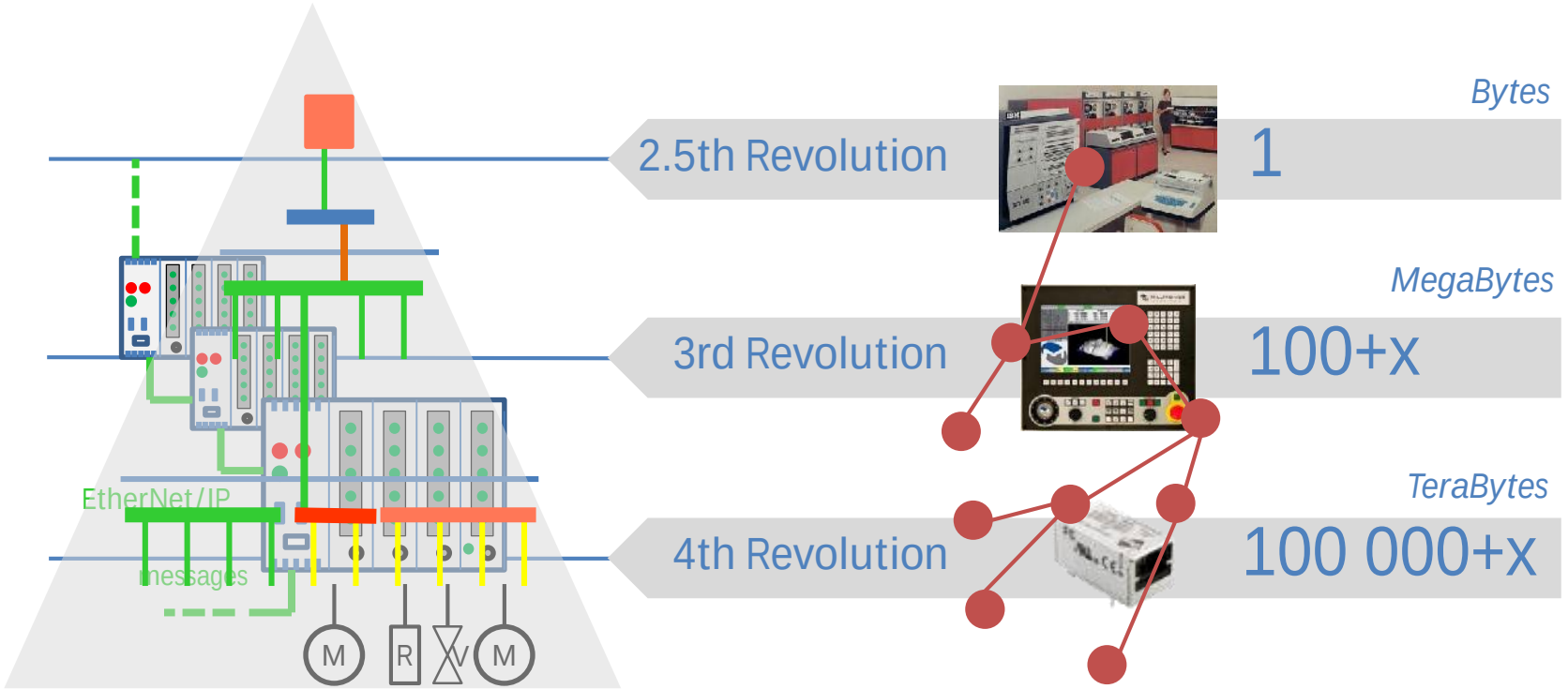
Since 05/2007 — **Berlin**

Lab Osnabrück

Innovation Drivers



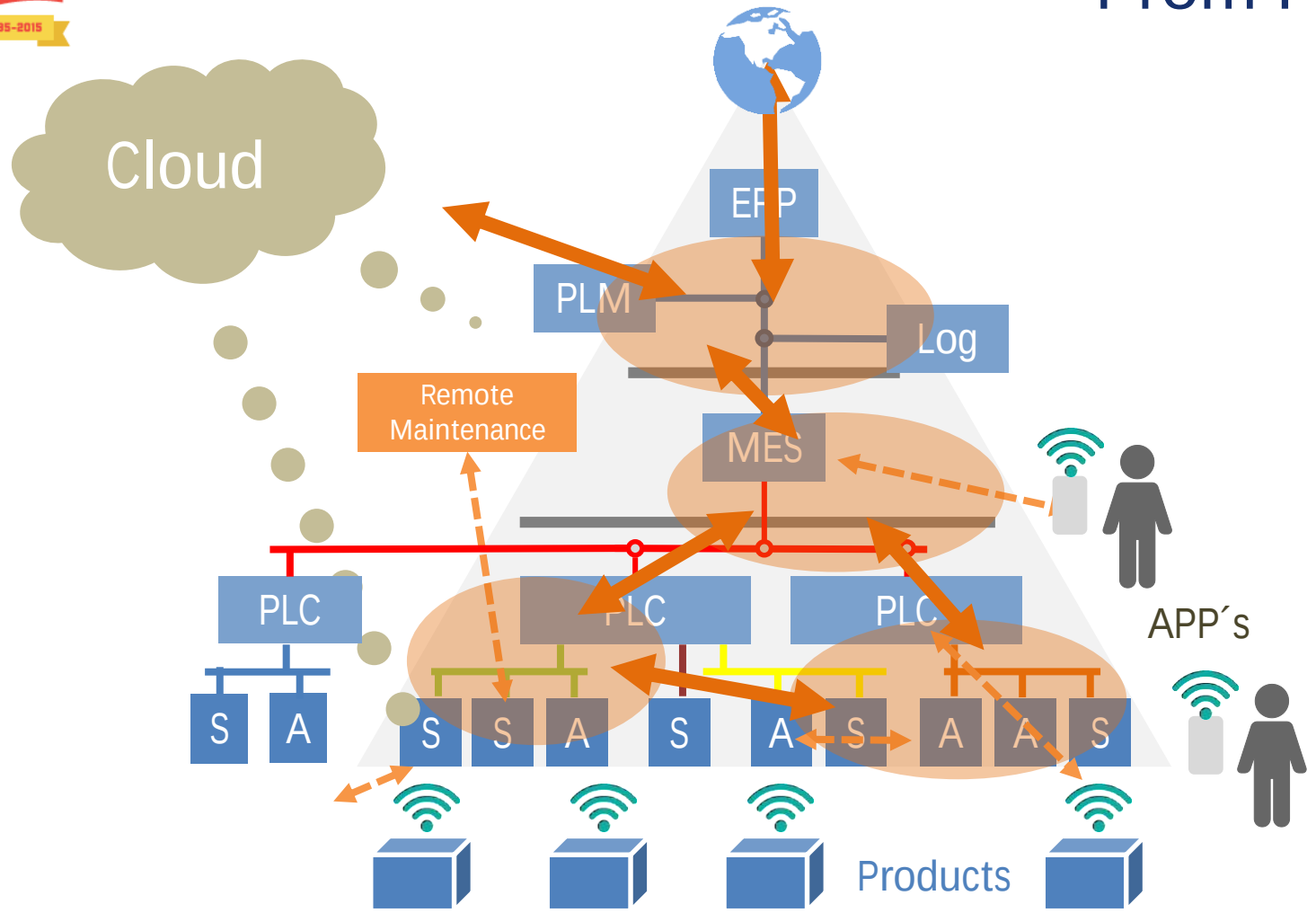
Digitalization of the Industry

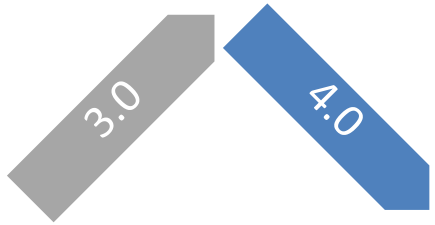


Automation structure

Digitalization

From Pyramid to Network



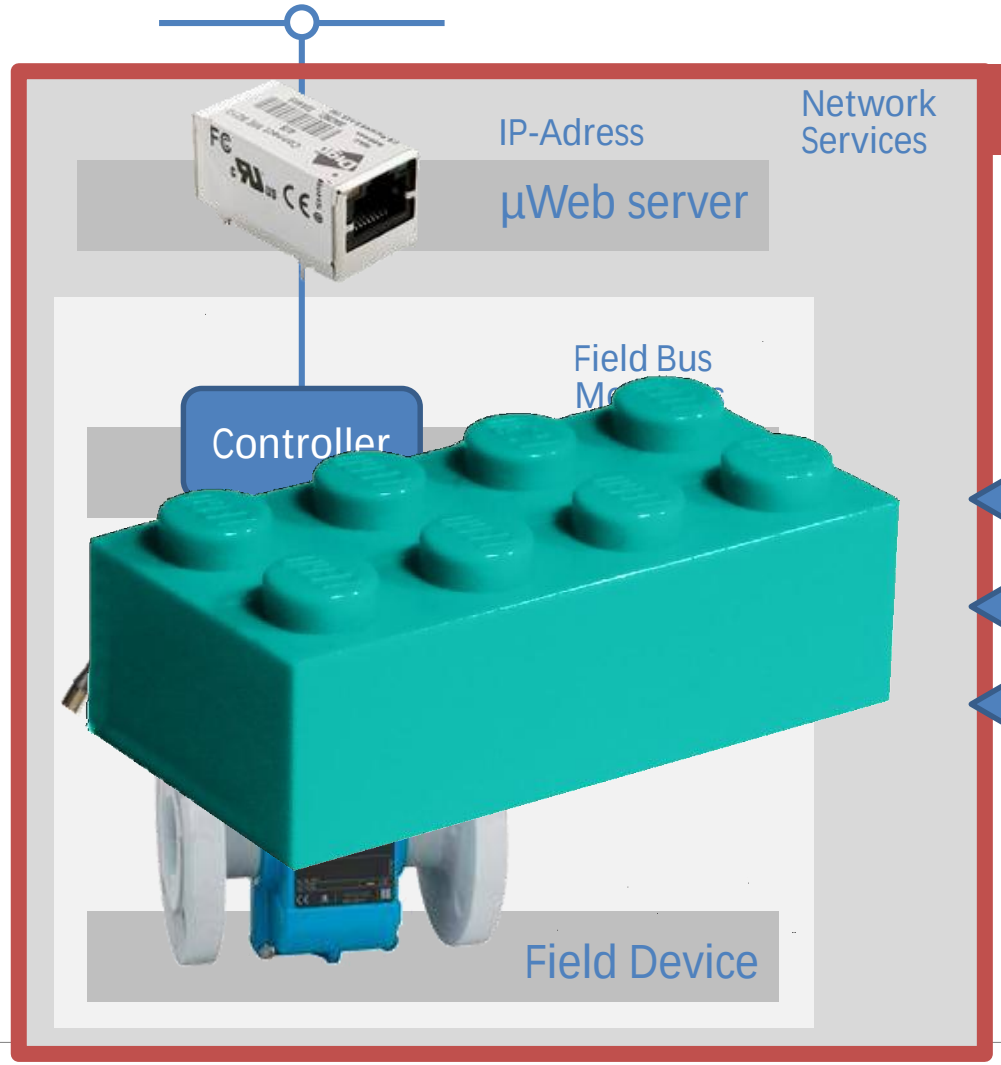


Complexity

Object orientation
Modularization
Standardization
Lean Thinking

IND 4.0 World - dynamic

Towards smart modules

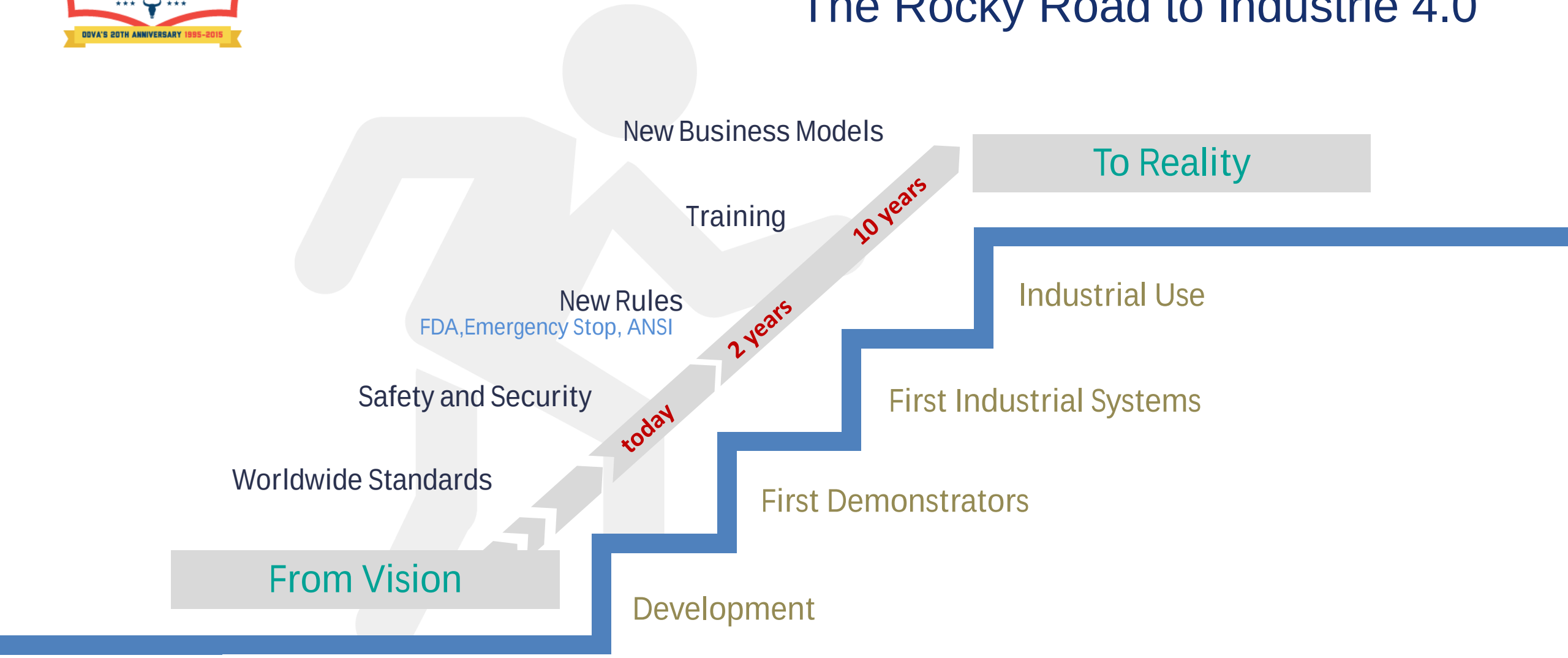


Cyber-Physical System

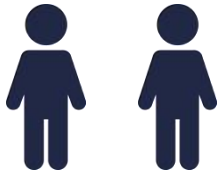
Fundamental Principles

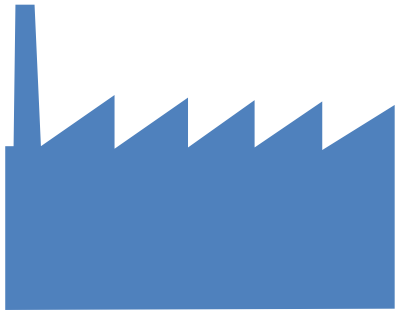
- **Self Identification**
  (who am I?)
- **Services Exploration**
  (what do I offer?)
- **Autonomous Networking**
  (who are my partners?)

The Rocky Road to Industrie 4.0



Industrie 4.0 in the Lifecycle





Design → Engineering → Start-Up → Operation → Recycling

Information Backbone — OPC UA

PLM
(Design)

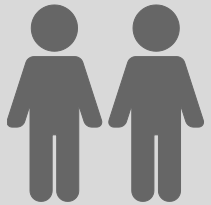
Maintenance
(Repair)

ERP
(Planning)

MES
(Control)

Resource Control
(Optimization)

Change-Management
(Rebuild)



Customer
(Information)

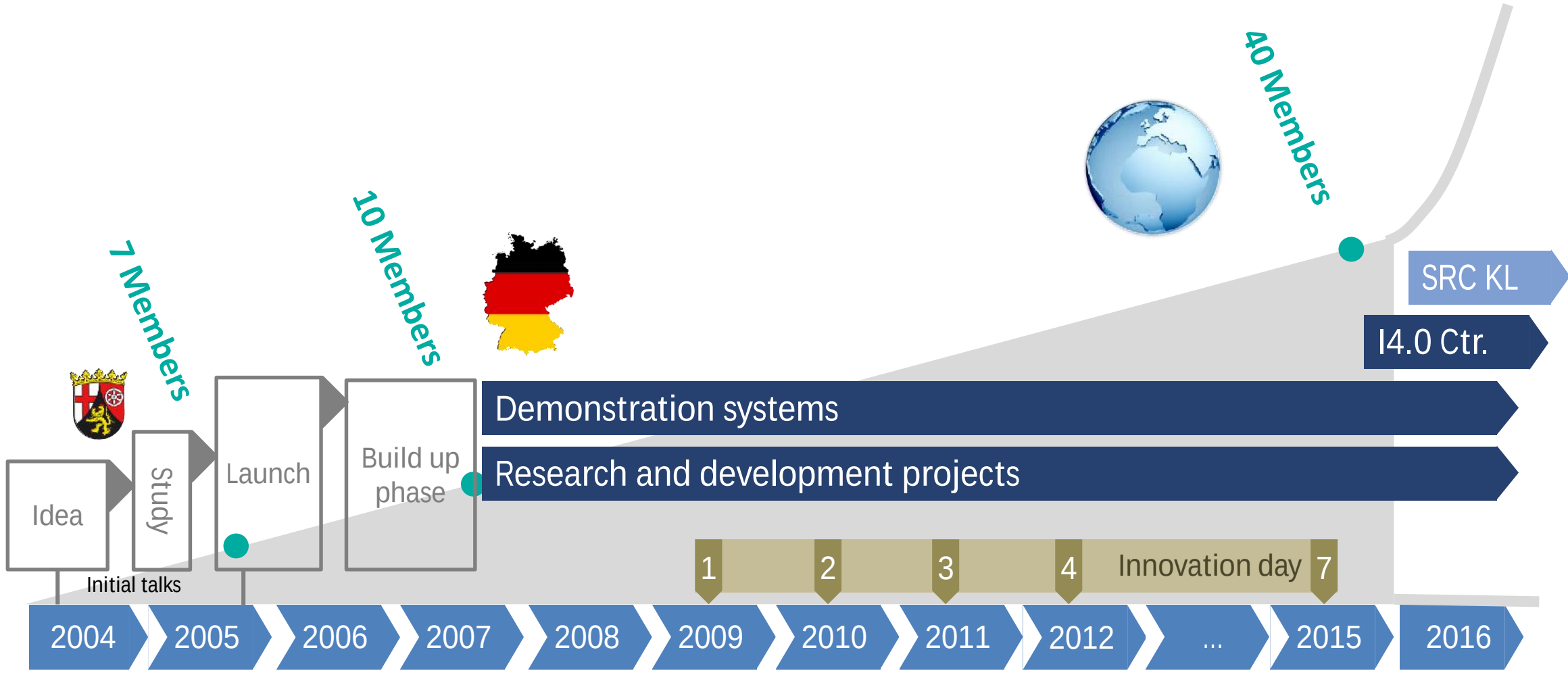
Logistics
(Delivery)

From vision to reality – the SmartFactory^{KL}

Launch:	June 2005
Legal form:	registered non-profit association
Members:	institutions only
Governance:	general assembly, executive board
Fees:	12.000 / 3.000 € annual fee
Financing:	fees, donations, projects
Employees:	currently 16
Revenue:	1 Mio €

The *SmartFactory*^{KL} is the worldwide biggest and most popular manufacturer independent research and demonstration center for INDUSTRIE 4.0 technologies.

Development of SmartFactory^{KL}



The Members of SmartFactory^{KL}

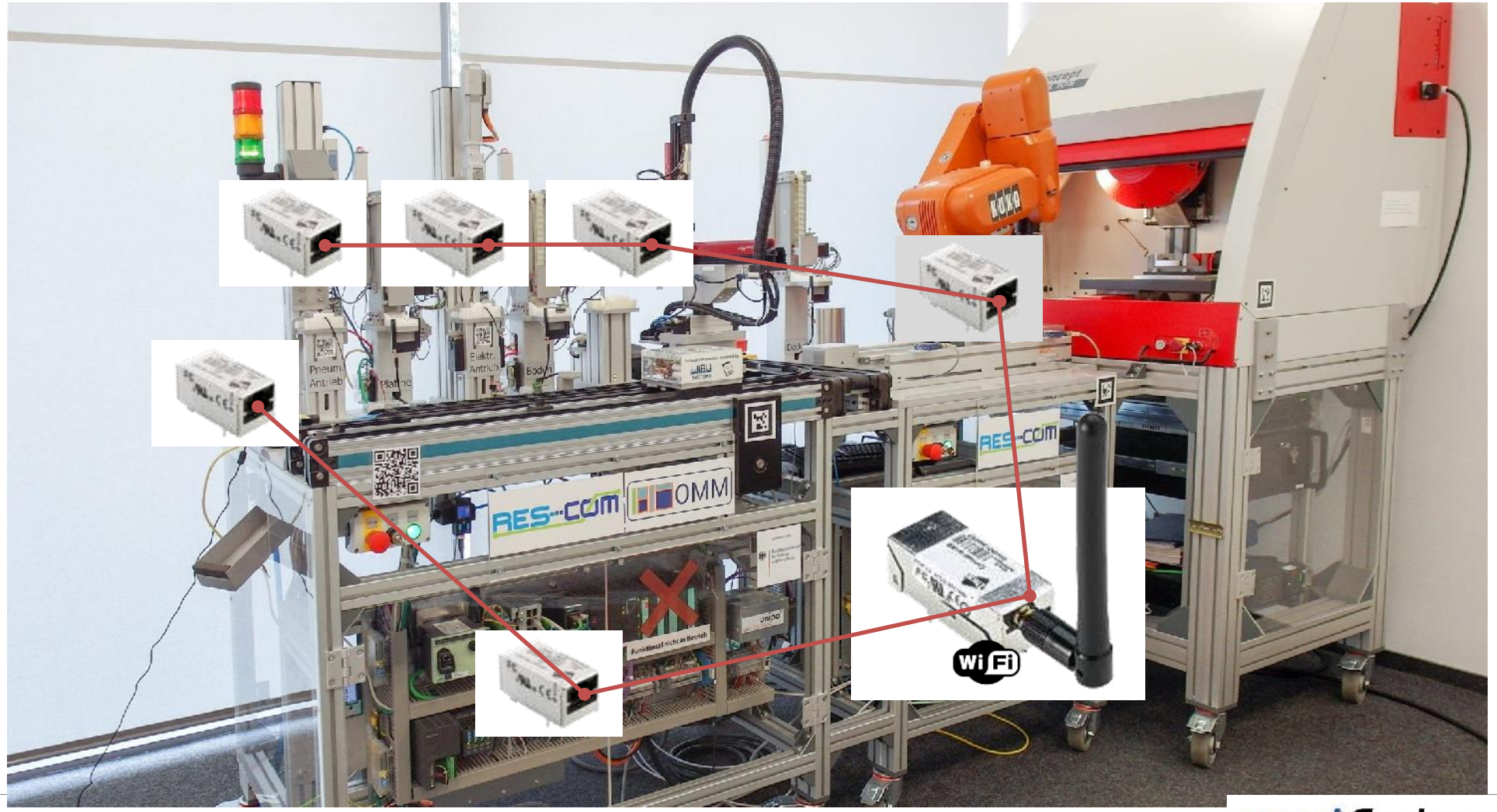
* ODVA members

Industry

Science

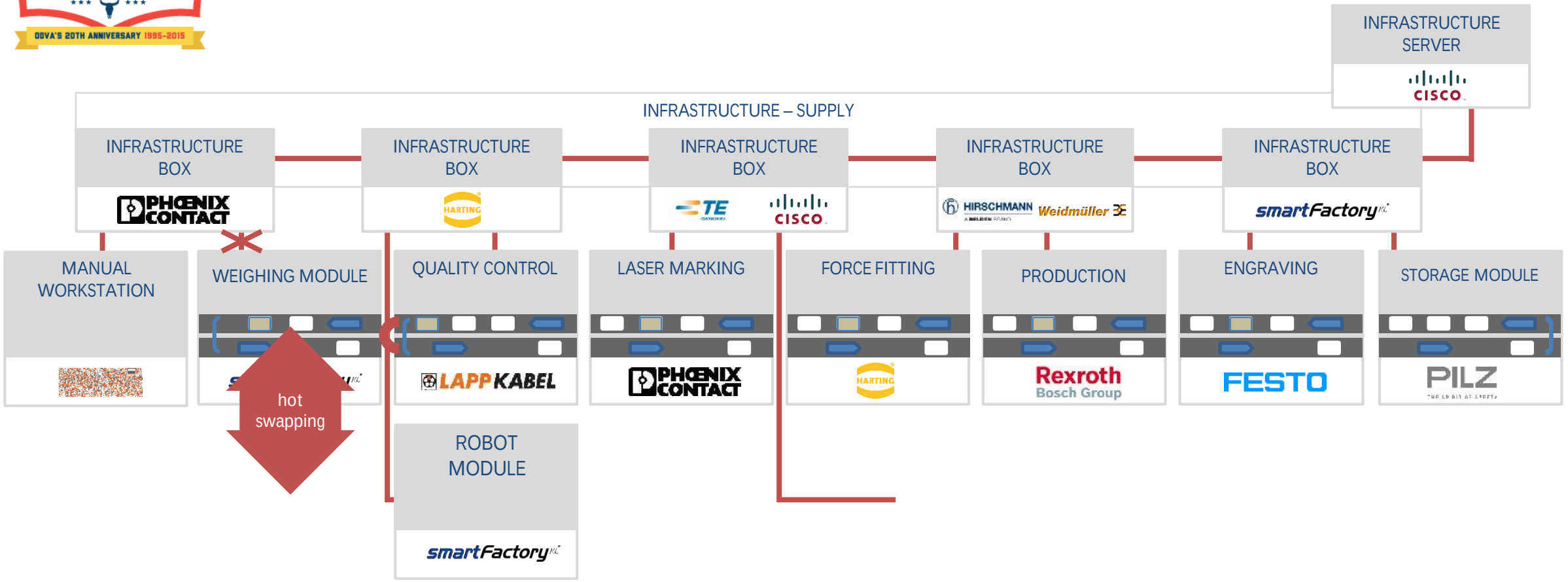
SmartFactory^{KL} Lab

ResCom-CPS-Demonstrator – 2012



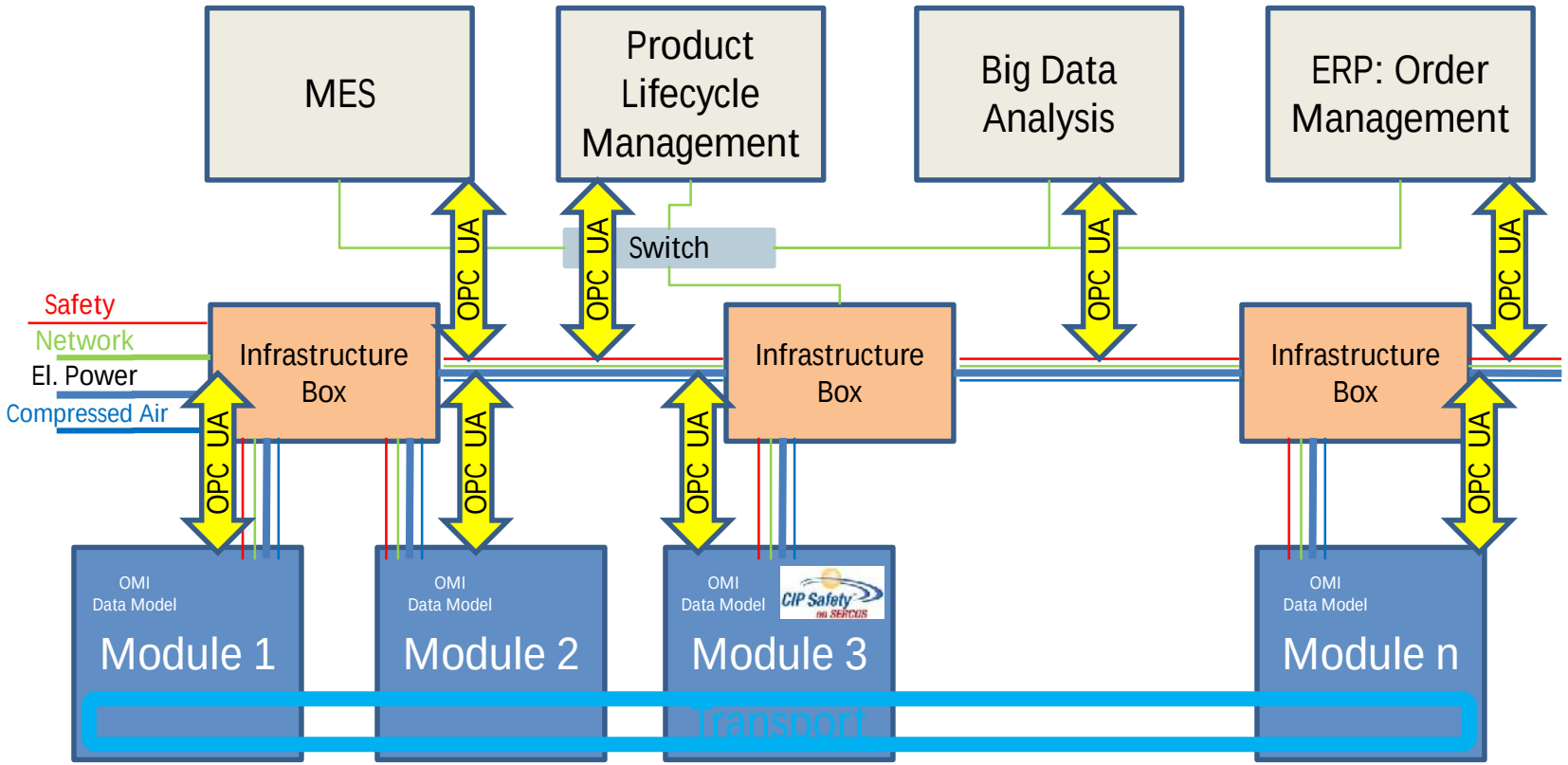
Industrie 4.0 Demonstrator Line – 2015

Industrie 4.0 Demonstrator Structure 2015



Structure of Demo Line

Modules are connected via transport system
Modules recognize neighbor modules
Infrastructure Boxes supply power, compressed air, network connection and safety (emergency stop)
Data connection to supervisory systems via OPC UA



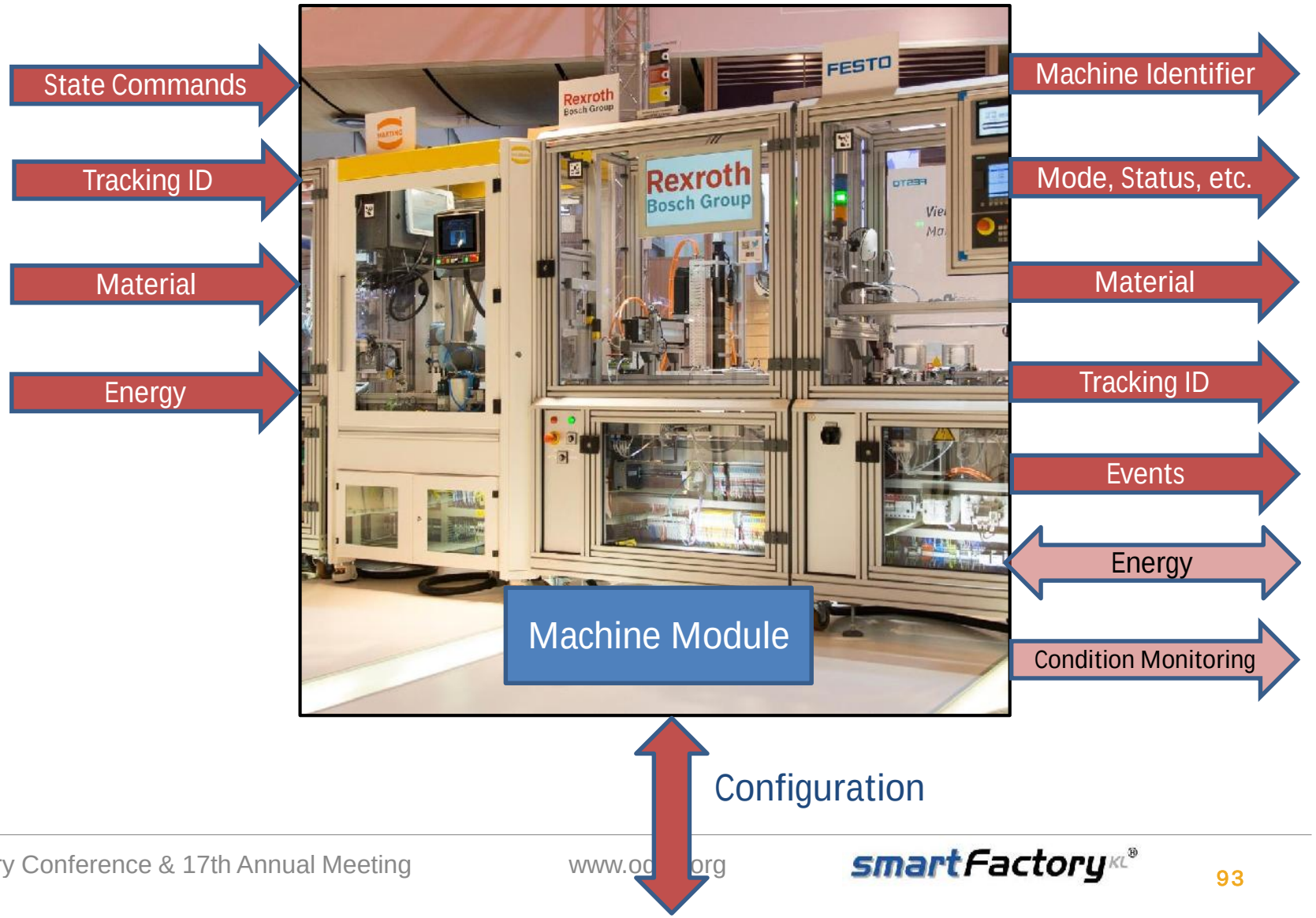
ODVA Machine Data Model

Bosch Rexroth wants to evaluate the ODVA machine data model in the SmartFactory demo line at Hannover Fair 2016

The MES / ERP system providers are very interested

Next steps

- Publication of data model, 10/14/2015
- Application to demo line



The Industrie 4.0 Demonstrator – in Detail

Energy Control, Firewall, Power Distribution

Infrastructure Box

Product Memory

Module Localization

"Machine-USB" Connector

SoA-PLC

Flexible Conveyor Lock

Standards Used

Interoperability

Communication

Electromechanical

SEMANTIC SERVICE DESCRIPTION
OWL OWL-S SAWSDL ...
WSDL EDDL Device Class Profiles ...

ISO-OSI

7 ? SoA-Services
6
5 OPC-UA
4
3 IP
2
1 Ethernet

Modular connector

SoA

OPC-UA

TCP/IP

RJ45, WiFi, ...

3x400V
24V
RJ45 Network
Emergency Stop
Compressed Air

Industrie 4.0 worldwide

320 Mio$/5 yrs DMDII
160 Mio$/5 yrs UILabs

USA

DMDII

- IT-driven
- Low production
- Few skilled workers

PLATTFORM INDUSTRIE 4.0

470 Mio € / 5 J.
BKZ 28 Mio € / 3 J.

Germany

EU

CH

AUT

- Production driven
- High production
- Many skilled workers
- SME-structures

??

China

- Government driven
- High production
- No skilled workers

??

- Industry driven
- High production
- Many skilled workers

Detlef Zuehlke
Director Innovative Factory Systems IFS
German Research Centre for Artificial Intelligence
DFKI Kaiserslautern
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Executive Chairman SmartFactory KL e.V.
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67663 Kaiserslautern / Germany
zuehlke@dfki.de

THANK YOU

ODVA 2015
INDUSTRY CONFERENCE AND 17TH ANNUAL MEETING
ODVA'S 20TH ANNIVERSARY 1995-2015

THE FUTURE OF INDUSTRIAL AUTOMATION

Looking Ahead to ODVA's18th Term

18th Term at a Glance

Key Pacing Internal Activities	2015Q4	2016Q1	2016Q2	2016Q3	2016Q4	2017Q1	2017Q2
17th Annual Meeting of the ODVA Board of Directors							
2015 Industry Conference & 17th Annual Meeting of Members							
ODVA Specifications: 2015PC2							
ODVA Specifications: 2016PC1							
ODVA Specifications: 2016PC2							
18th Annual Meeting of the Board of Directors							
2017 Industry Conference & 18th Annual Meeting of Members							
ODVA Specifications: 2017PC1							
Remarks: Schedule for Regular Meeting of the Board TBD							

Leadership in the 18th Term: Board of Directors

Michael Höing
Weidmüller Interface

Dr. Jürgen Weinhofer
Rockwell Automation

Dr. Thomas Bürger
Bosch Rexroth

Fabrice Jadot
Schneider Electric

Dr. Rolf Birkhofer
Endress+Hauser

Masuru Takeuchi
Omron

Tony Shakib
Cisco Systems

Leadership in the 18th Term: Officers

- **President and Executive Director – Katherine Voss**
- **Chief Technology Officer – Joakim Wiberg**
- **Secretary – Christopher Lynch**
- **Treasurer – Jürgen Weinhofer**

Leadership in the 18th Term: Technical Review Board

1. Rudy Belliardi – returning for a successive term
2. Paul Didier – returning for a successive term
3. Dr. Jörg Hähniche – returning for a successive term
4. Dr. Ludwig Leurs – returning for a successive term
5. Shinji Murayama – joining for an initial term
6. Eric Scott – returning for a successive term
7. Dave VanGompel – returning for a successive term
8. Joakim Wiberg, Chairperson – returning for a successive term

Leadership: Gone but Not Forgotten

- Ikuo Tateishi
- Kent Howard
- Rich Jackson

. . . and a special thanks to. . .

Leadership

Returning to his full-time day job as . .

. . .Manager of Connectivity Technology
Eaton Electrical

Rich Harwell

Leadership: Gone but Not Forgotten

Rich Harwell
extraordinary commitment
2005-2015 (CTO 2007-2015)

Refresher from 16th Annual Meeting of Members

Announcements

Refresher from 16th Annual Meeting of Members

Announcements

Refresher from 16th Annual Meeting of Members

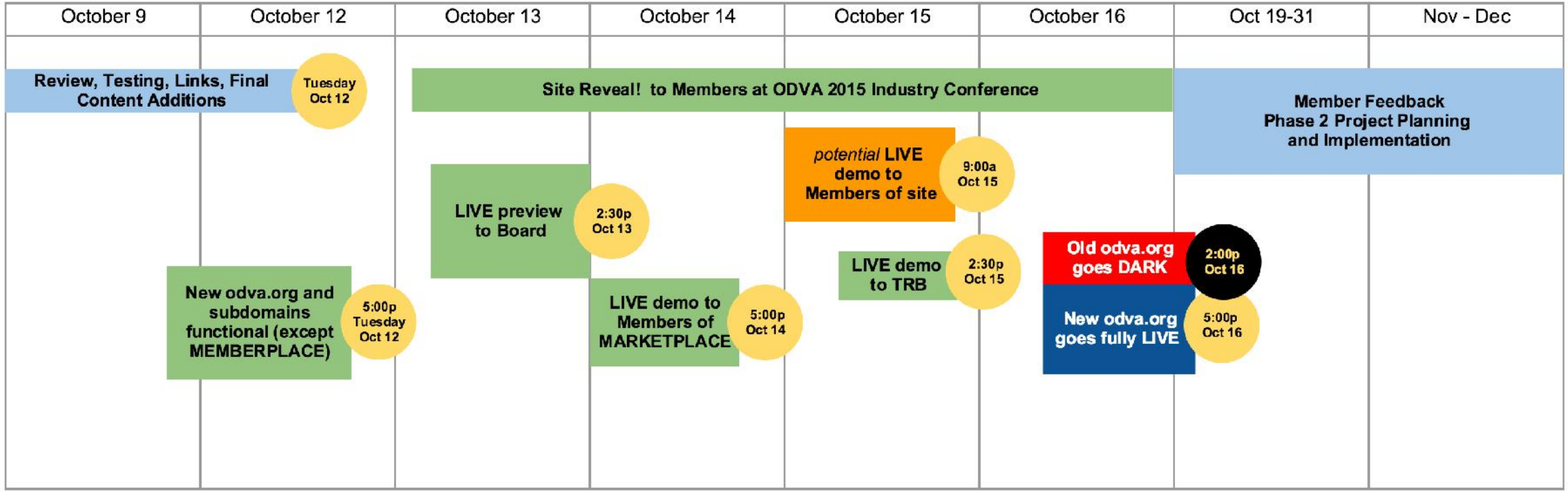
Announcements

Web Presence in the 18th Term

Ending October 16, 2015 at 14:00 Eastern Daylight Savings Time

Web Presence in the 18th Term

Timeline



Countdown to October 16, 2015 at 17:00 Eastern Daylight Savings Time

Web Presence in the 18th Term

Objectives

- Refresh the look and messaging
- Project a voice that speaks to industry engagement and adoption first and talks about ODVA second
- Update the technology used to develop and manage the website
- Make the information easier to find
- Group information in areas that speak to different persona (e.g., users, developers)

Web Presence in the 18th Term

Grouping of Content to Speak to Persona Groups

- Technology and Standards
- MARKETPLACE
- Optimization 4.0
- Happenings
- KNOW-HOW HUB
- Contact ODVA

Omnipresent

- About ODVA
- Submit Order
- Publication Download
- Join ODVA
- MEMBERPLACE

Web Presence in the 18th Term

Grouping of Content to Speak to Persona Groups

- Technology and Standards
- MARKETPLACE
- Optimization 4.0
- Happenings
- KNOW-HOW HUB
- Contact ODVA

Selective localization
In these areas

Omnipresent

- About ODVA
- Submit Order
- Publication Download
- Join ODVA
- MEMBERPLACE

Optimization 4.0™

The message platform in the 18th Term to bring together ODVA's Optimization Initiatives under a unified framework

Industrial Cybersecurity ● Energy Usage ● Machine Integration ● Process Integration

20 years in the making,

ODVA™

is now

THE FUTURE OF INDUSTRIAL AUTOMATION