



Call to Order

General Session and 16th Annual Meeting of Members

www.odva.org

Flake Fatigue



Can It Get Worse?

Yes, It Can. Snowmageddon Is Here Again.



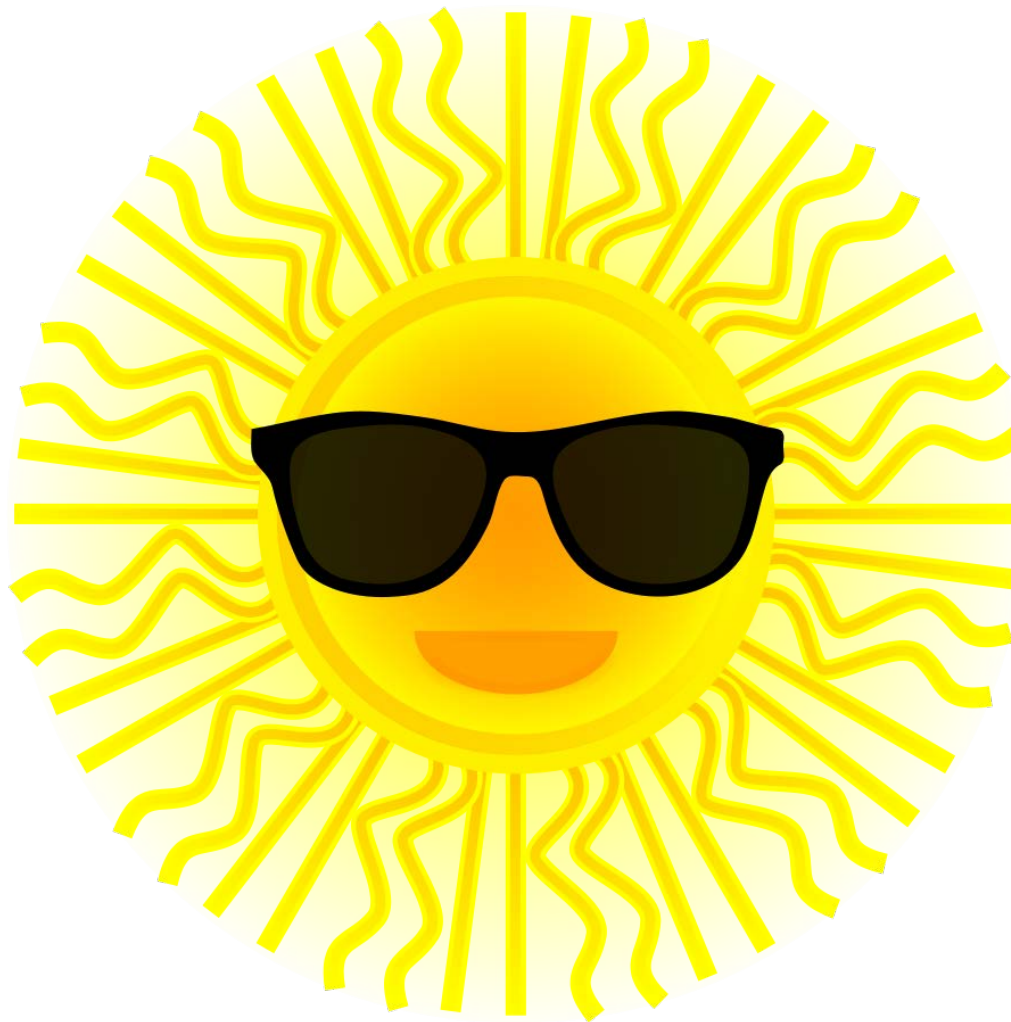
Ann Arbor Forecast for Wednesday, March 12. Snow during the morning will give way to snow showers during the afternoon. Chance of snow 70%. Snow accumulating 3-5 inches(7.5-12.7cm). Cold. Morning high 27F(-3C) with temps falling to near 15F (-9C) and overnight low -3F(-20C). Windy. Winds N at 25 to 35mph(40-56kph). REALLY?

YeeHaa!



We're gonna
go do some
CIPing
in Arizona!

Woo-hoo! Welcome to Phoenix!



Agenda

- **8:15 AM** **16th Term in Review - Report on the Activities of the Association**
- **9:30 AM** **Membership - Presentation of Candidates for Election**
- **9:45 AM** **Election and Break**
- **10:15 AM** **User Perspective from the Field - EtherNet/IP in Packaging**
- **10:45 AM** **Software Defined Networks - Will They be the Next Frontier in Industrial Automation?**
- **11:30 AM** **17th Term - Looking Ahead**
- **12:00 PM** **Adjourn**

Governance Directors



Michael Höing
VP, Electronics Business Unit
Weidmüller Interface



Cyril Perducet
SVP Strategy-Technology-Solutions/CTO
Schneider Electric



Dr. Jürgen Weinhofer
VP, Control Technology & Architecture
Rockwell Automation



Tony Shakib
VP, Business Development
IoT Vertical
Cisco Systems



Dr. Thomas Bürger
VP, Engineering
Automation Systems
Bosch Rexroth



Dr. Raimund Sommer
Managing Director,
Process Solutions
Endress+Hauser



Ikuo Tateishi
Corporate Planning Manager, OEI
Acting CEO, STI
Omron

- ▶ **Cyril Perducat**, Chairman of the Board
- ▶ **Katherine Voss**, President & Executive Director
- ▶ **Rich Harwell**, Chief Technology Officer
- ▶ **Christopher Lynch**, Secretary
- ▶ **Jürgen Weinhofer**, Treasurer



16th Term in Review

Report on Activities of the Association

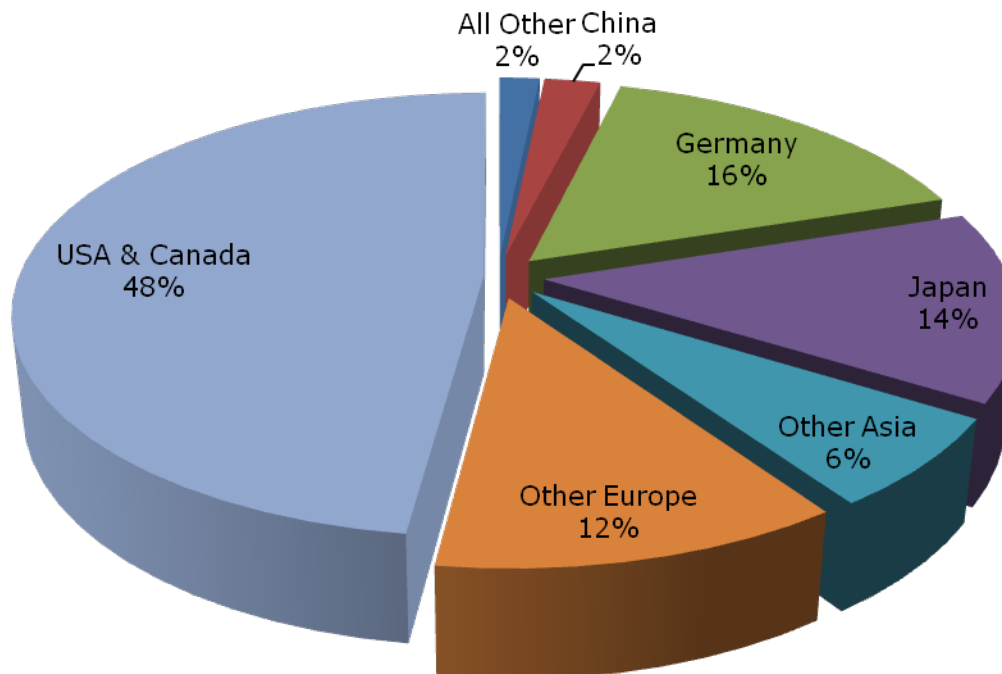
Katherine Voss, president & executive director

**General Session and
16th Annual Meeting of Members**

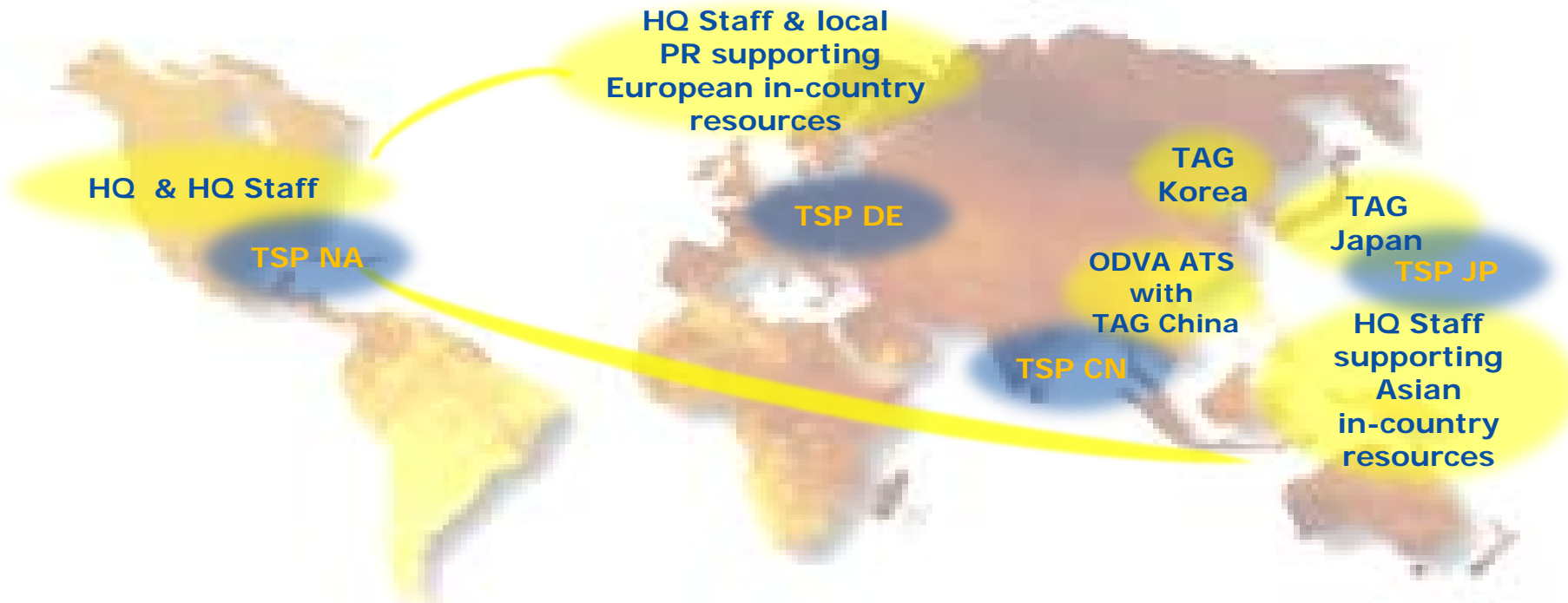
www.odva.org

Global Presence

Mix of Membership by Principal Place of Business



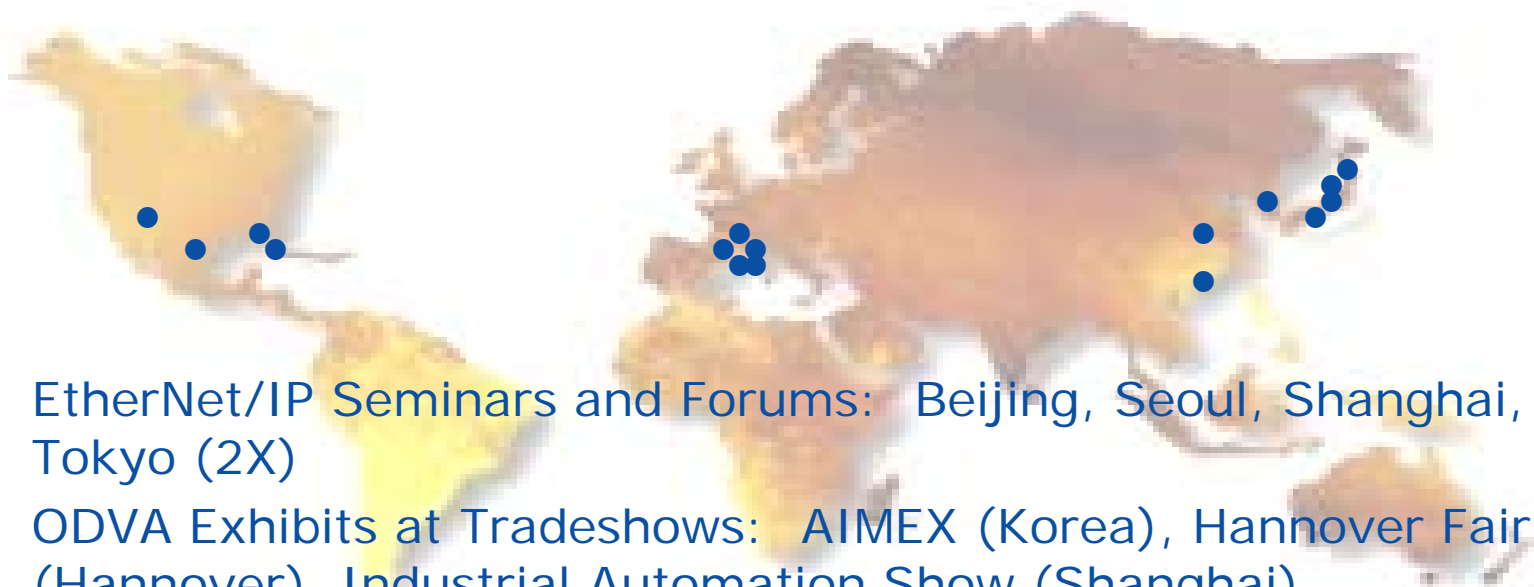
Global Presence



Focused Areas of Operation

Global Presence

Industry Awareness Face-to-Face Activities



- ▶ EtherNet/IP Seminars and Forums: Beijing, Seoul, Shanghai, Tokyo (2X)
- ▶ ODVA Exhibits at Tradeshows: AIMEX (Korea), Hannover Fair (Hannover), Industrial Automation Show (Shanghai), PackExpo (Las Vegas), SPS/IPC/Drives Show (Nuremberg, 2X), System Controls Fair (Tokyo)
- ▶ ODVA Media Briefing: Hannover, Nuremberg(2X)
- ▶ ODVA Participation at Industry Events: ARC Forum (Orlando, 2X), Automation Fair (Houston), Industrial Open Network Fair (Osaka, Tokyo)

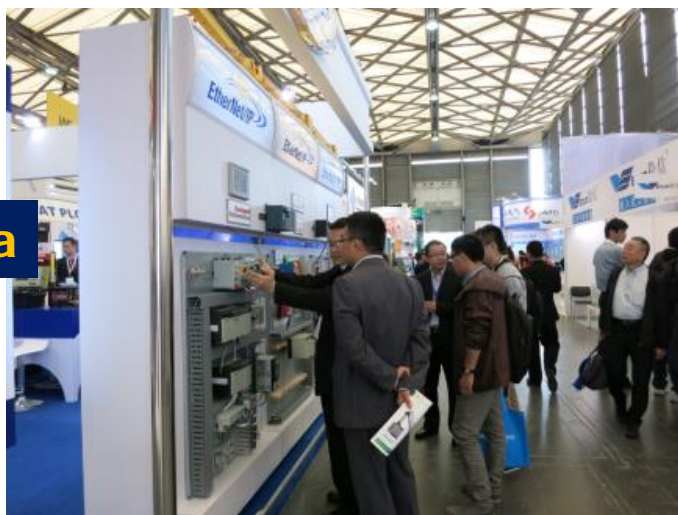
Global Presence Industry Awareness Face-to-Face Activities



Germany



Japan



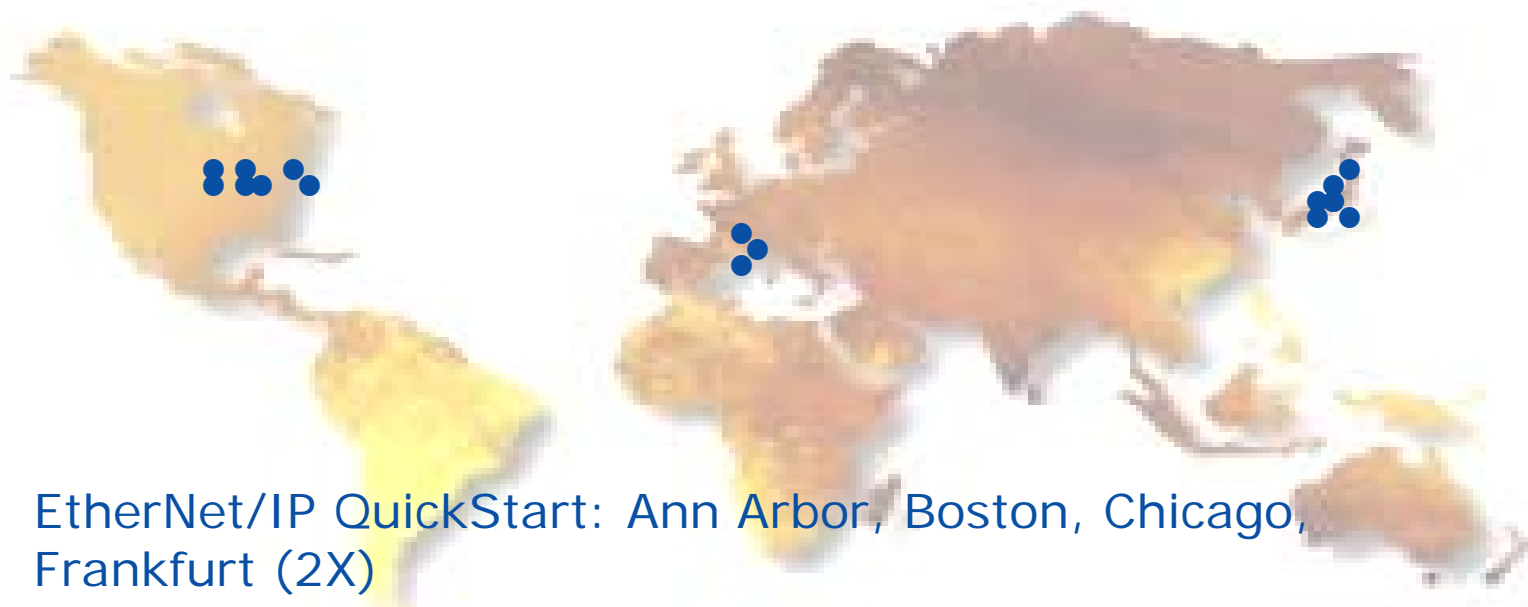
China



Korea

Global Presence

Vendor Adoption Face-to-Face Activities



- ▶ EtherNet/IP QuickStart: Ann Arbor, Boston, Chicago, Frankfurt (2X)
- ▶ EtherNet/IP Implementor Seminar: Tokyo (3X)
- ▶ EtherNet/IP Implementor Workshop: Ann Arbor (2X), Boston, Chicago, Frankfurt (2X)
- ▶ EtherNet/IP PlugFest: Ann Arbor, Seligenstadt
- ▶ ODVA College: Kanazawa, Nagoya, Osaka, Tokyo

Global Presence Vendor Adoption Face-to-Face Activities

China



Japan



Europe



North America



Global Presence ODVA in China



Investment started in 2007

Global Presence

ODVA in China



Office
New Hualian Mansion
755 Middle Huai Hai Road
Shanghai

Global Presence

Chinese “GB” Standardization

Established

- ▶ EtherNet/IP ▶ DeviceNet ▶ ControlNet

In-Process

- ▶ CIP Safety ▶ CompoNet



Working Committee for the Chinese Standardization of CIP Safety

ODVA on Weibo



The screenshot shows the ODVA Weibo profile page. The profile header includes the ODVA logo, name, and location (Shanghai). Below the header, there are tabs for '全部广播' (All Broadcasts), '相册' (Album), '关于他' (About Him), and '收听/听众' (Followers/Following). The main content area displays a tweet from ODVA dated October 29, 2013, at 13:43, with 99 reads. The tweet text is: 'ODVA 将参加2013工博会，展台号：W1D107，欢迎大家前来参观。' (ODVA will participate in the 2013 World Internet Conference, booth number: W1D107, welcome everyone to come and visit.). Below the tweet, there is a comment section showing two comments from users '李青山' and 'Fisher', both dated August 6, 2013, at 15:01. The comments are: '李青山: 已经收听了，但是还是没明白呵呵!' (Li Qingshan: I have listened, but I still don't understand haha!) and 'Fisher: 正在收听' (Fisher: Listening now). The bottom of the screenshot shows a search bar and a '转 播' (Retweet) button.

Global Presence TAG China



1. Cisco Systems
2. Deutschmann
3. Hilscher
4. Panduit
5. Renesas
6. Rockwell Automation
7. Schneider Electric
8. Wago



Meet Shirley Li, managing deputy director of ODVA ATS, who is helping to build this team. . .



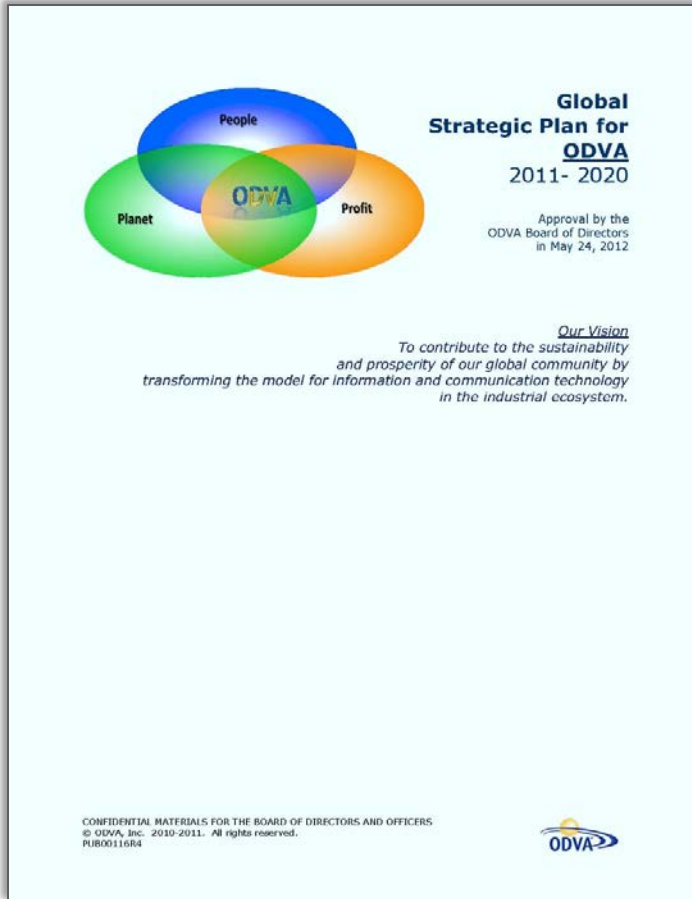
. . . including joint marketing with the Chinese Association of Automation.

Governance Strategic Plan 2011-2020

Living Initiatives are a Central Aspect

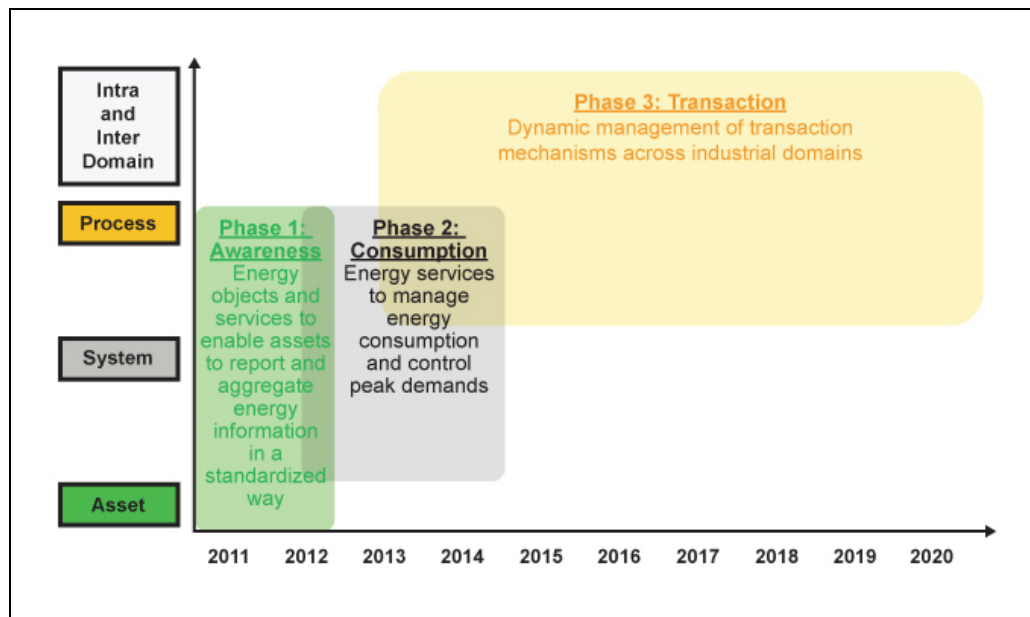
- ▶ 2010: Growth
- ▶ 2010: Energy
- ▶ 2011: Machinery
- ▶ 2012: Process

In the 16th term, the Growth Initiative for the 17th Term and beyond has been a key work activity of the Board and ODVA staff. Working groups have made significant progress on the others. Together these initiatives reinforce one another.



**More on energy, machinery and process now...stay tuned
for an update on growth after the break.**

Strategic Plan Initiative Energy

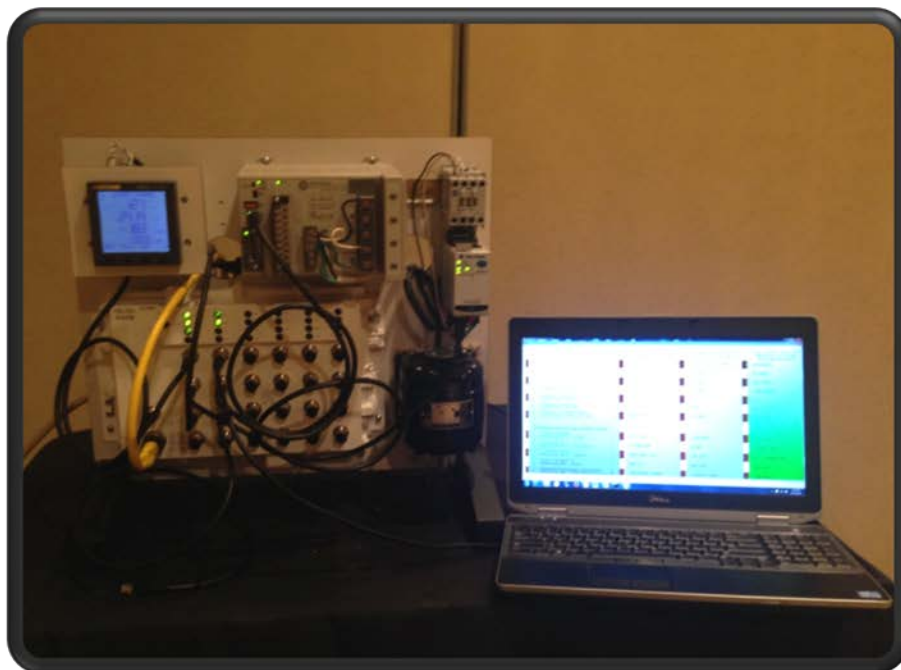


Key Milestones

Release of Phase 2a, and significant progress on Phase 2b in anticipation of submittal in the next publication cycle.

On Track!

Strategic Plan Initiative Energy



LIVE MARCH 12, 2014!

Multi-vendor interoperability demonstration of OEU.
(Base Energy Object and the Electrical Energy Object)

Strategic Plan Initiative Process

White paper
published in
February 2014
completed
ODVA's series of
"optimization"
white papers
resulting from
the formation of
ODVA's
initiatives.



3. Optimization of Process Integration (OPI)

Strategic Plan Initiative Process

White paper
published in
February 2014
completed
ODVA's series of
"optimization"
white papers
resulting from
the formation of
ODVA's
initiatives.

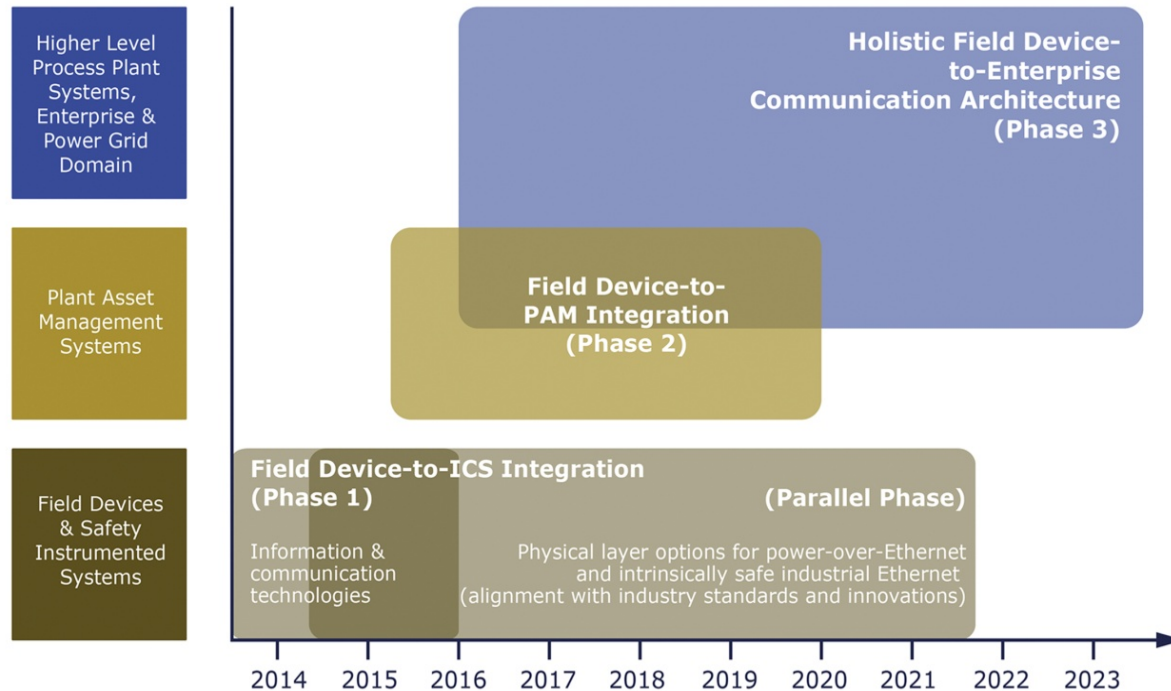


**1. Optimization
of Energy
Usage
(OEU)**

**3. Optimization
of Process
Integration
(OPI)**

**2. Optimization
of Machine
Integration
(OMI)**

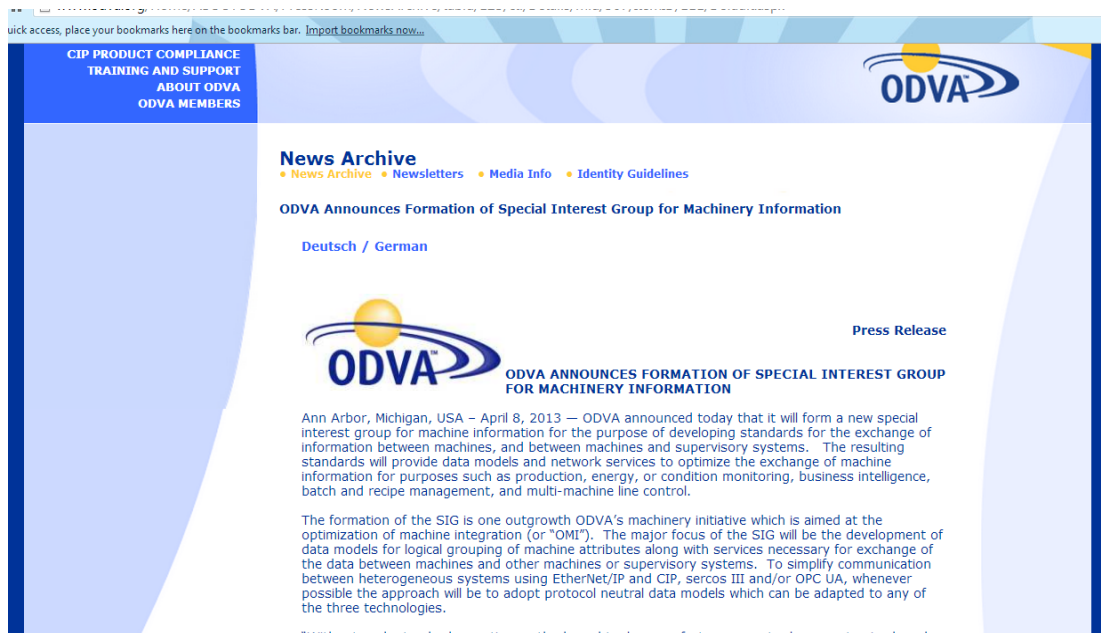
Strategic Plan Initiative Process



ODVA Expects to Announce Formation of a SIG for Process Applications in 2014

Strategic Plan Initiative Machinery

SIG for Machinery Information Formed: Phase 1 Work is Machine-to-Supervisory Communications




quick access, place your bookmarks here on the bookmarks bar. [Import bookmarks now...](#)

CIP PRODUCT COMPLIANCE
TRAINING AND SUPPORT
ABOUT ODVA
ODVA MEMBERS

News Archive
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ODVA Announces Formation of Special Interest Group for Machinery Information

[Deutsch / German](#)

 **ODVA ANNOUNCES FORMATION OF SPECIAL INTEREST GROUP FOR MACHINERY INFORMATION**

Ann Arbor, Michigan, USA – April 8, 2013 — ODVA announced today that it will form a new special interest group for machine information for the purpose of developing standards for the exchange of information between machines, and between machines and supervisory systems. The resulting standards will provide data models and network services to optimize the exchange of machine information for purposes such as production, energy, or condition monitoring, business intelligence, batch and recipe management, and multi-machine line control.

The formation of the SIG is one outgrowth ODVA's machinery initiative which is aimed at the optimization of machine integration (or "OMI"). The major focus of the SIG will be the development of data models for logical grouping of machine attributes along with services necessary for exchange of the data between machines and other machines or supervisory systems. To simplify communication between heterogeneous systems using EtherNet/IP and CIP, sercos III and/or OPC UA, whenever possible the approach will be to adopt protocol neutral data models which can be adapted to any of the three technologies.

*Without such standard reporting methods and tools, manufacturers must rely on customized, and

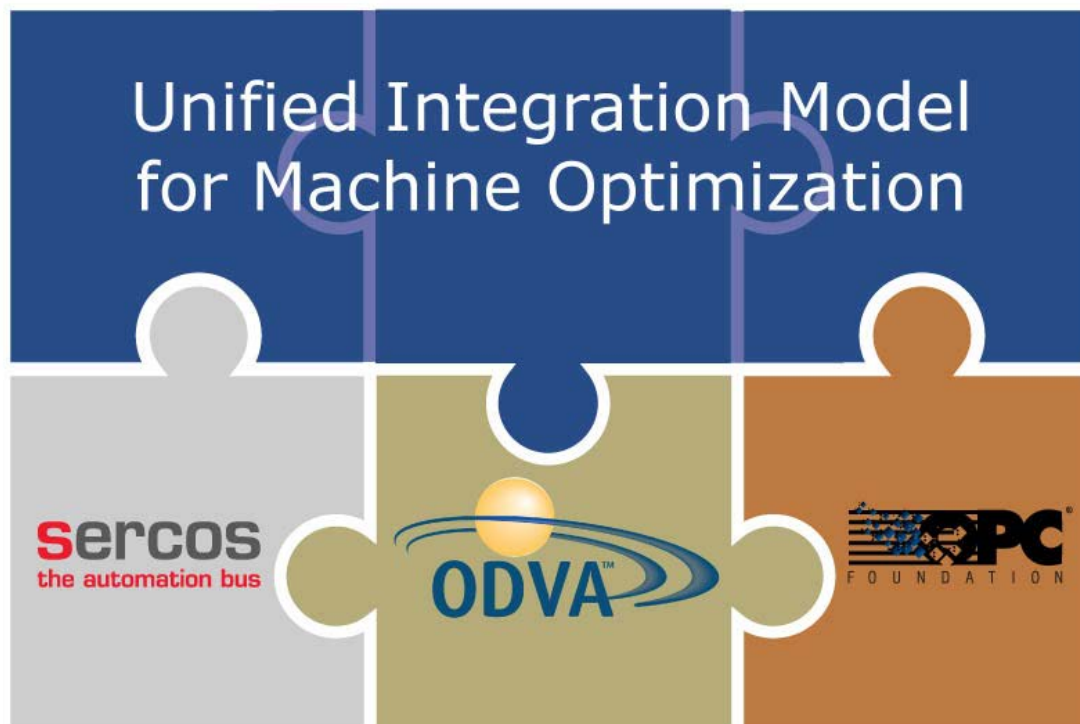
SIG Participants from Members

- Bosch Rexroth
- Cisco Systems
- Omron
- Rockwell Automation
- Schneider Electric

SIG Participants as Invited Experts

- Tom Burke, OPC Foundation •
- Peter Lutz, Sercos International •

Strategic Plan Initiative Machinery



Alliance Partnerships

Technology Milestone CIP Safety

10th
Anniversary!

Technology Milestone CIP Safety

**10th
Anniversary!**

2003

Established
Special Interest Group

Technology Milestone CIP Safety

**10th
Anniversary!**

2003

Established
Special Interest Group

2005

Published
The CIP Safety™ Specification



Technology Milestone

CIP Safety

**10th
Anniversary!**

2005

Issued First
Declaration of Conformity
for DeviceNet™

2005

Published
The CIP Safety™ Specification

2003

Established
Special Interest Group

**Declaration of Conformity
to the CIP Safety™ Specification**



Networks Built on a
Common Industrial Protocol

ODVA hereby issues this Declaration of Conformity to the CIP Safety™ Specification for the product(s) described below. The Vendor listed below (the "Vendor") has holds a valid the Terms of Usage Agreement for the DeviceNet Safety™ Technology from ODVA, which is incorporated herein by reference, thereby agreeing that it is the Vendor's ultimate responsibility to assure that its DeviceNet Safety Compliant Products conform to the CIP Safety Specifications and that the CIP Safety Specifications are provided by ODVA to the vendor on an AS IS basis without warranty. NO WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING WITHOUT LIMITATION ANY WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, ARE BEING PROVIDED BY ODVA.

In recognition of the below DeviceNet Safety Compliant Product(s) having been DeviceNet Safety CONFORMANCE TESTED™ at ODVA-authorized Test Service Provider and having received a passing result from ODVA at the Composite Test Revision Level specified below, this Declaration of Conformity authorizes the Vendor to use the DeviceNet Safety name, the DeviceNet Safety logo and the Device Safety Certification Logo and Word Marks in conjunction with the specific DeviceNet Safety Compliant Product(s) described below, for so long as the Vendor's Terms of Usage Agreement for the DeviceNet Safety Technology remains valid.



Certification Logo Mark

DeviceNet Safety CONFORMANCE TESTED™

Certification Word Mark

This Declaration of Conformity is issued on **31 JANUARY 2005** on behalf of ODVA by:

Katherine Voss
Katherine Voss
Executive Director

Vendor Information	
Vendor Name	Rockwell Automation
Vendor Address	1 Allen-Bradley Drive Mayfield Heights, OH 44124 USA

Test Information	
Test Date	31 January 2005
Composite Test Revision	1
ODVA File Number	10208

Product Information	
Identity Object Instance 1	
Device(s) Under Test	Value
Vendor ID (Identity Object Attribute 1)	1
Device Type (Identity Object Attribute 2)	035
Device Profile Name	Safety Discrete I/O
Product Revision (Identity Object Attribute 4)	1.001

Products Covered Under This Declaration of Conformity		
No.	Product Code (Identity Object Attribute 3)	Product Name (Identity Object Attribute 7)
1	1791DS-1B12	SOC File Name 1B12.stc

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Technology Milestone

CIP Safety

**10th
Anniversary!**

2006 Adoption by
Sercos Int'l

2005 Issued First
Declaration of Conformity
for DeviceNet™

2005 Published 1st Edition of
The CIP Safety™ Specification

2003 Established
Special Interest Group



Select Language: English (United States) | Contact | Order | Calendar | Search | Web | Site

ODVA

News Archive
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SERCOS International Announces Adoption of CIP Safety™ on SERCOS

SERCOS International (SI) and ODVA announced today that SI will adopt CIP Safety™ as its functional safety protocol for SERCOS.

Nuremberg, Germany – November 28, 2006 – SERCOS International (SI) and ODVA announced today that SI will adopt CIP Safety™ as its functional safety protocol for SERCOS. ODVA, for its part, will extend *The CIP Safety Specification* to include safety profiles for SERCOS devices. SI, for its part, will develop the SERCOS III network adaptation to utilize CIP Safety. SI and ODVA, jointly, will develop and establish conformance testing for devices implementing CIP Safety on SERCOS to help ensure compliance with the collective body of specifications and enable interoperability of these devices in multi-vendor systems.

This action is consistent with the desires of industry to have a single, worldwide network protocol for safety applications. Further, the joint support of CIP Safety by ODVA and SI will facilitate technical and market synergies for users and vendors of functional safety networks.

"SERCOS interface is the world-leading digital drive interface with more than 20 years history and worldwide acceptance in all servo-driven motion applications," states Peter Lutz, managing director of SERCOS International. "Using CIP Safety as the functional safety protocol on SERCOS III, SI's new generation industrial Ethernet network, opens up completely new possibilities and leads to a greater versatility for applications with safety requirements. This provides significant benefits not only to the SERCOS users and vendors but for the worldwide safety community."

"CIP Safety stands alone as the world's only media-independent, truly open network protocol for functional safety," states Katherine Voss, executive director of ODVA. "Adoption of CIP Safety by SERCOS International will provide users of SERCOS technology with a functional safety solution that meets industry's growing requirement for seamless integration of safety networks with the overall network architecture."

The responsible technical working group within SI has already started to extend and adapt its initial "SERCOS safety" concept - published and approved by TUV Rheinland in November 2005 - to CIP Safety. SI and ODVA expect that the enhancements to their respective specifications to encompass the adaptation of SERCOS to CIP Safety will be published during 2007. They also expect that first

Technology Milestone CIP Safety

**10th
Anniversary!**

2003 Established
Special Interest Group

2005 Published 1st Edition of
The CIP Safety™ Specification

2005 Issued First
Declaration of Conformity
for DeviceNet™

2006 Adoption by
Sercos Int'l

2007 Issued First
Declaration
of Conformity
for EtherNet/IP™

ODVA
Sincerely yours,
Common Industrial Protocol

**Declaration of Conformity
to the CIP Safety™ Specification**

ODVA hereby issues this Declaration of Conformity to the CIP Safety™ Specification for the product(s) described below. The Vendor listed below (the "Vendor") has signed a valid Terms of Usage Agreement for the CIP Safety on EtherNet/IP™ Technology from ODVA, which is incorporated herein by reference, thereby agreeing that it is the Vendor's ultimate responsibility to ensure that its CIP Safety on EtherNet/IP Compliant Products conform to the CIP Safety Specifications and that the CIP Safety Specifications are provided by ODVA to the vendor on an AS IS basis without warranty. NO WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING WITHOUT LIMITATION ANY WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, ARE BEING PROVIDED BY ODVA.

In recognition of the below CIP Safety on EtherNet/IP Compliant Product(s) having been CIP Safety on EtherNet/IP CONFORMANCE TESTED™ at ODVA-authorized Test Service Provider and having received a passing result from ODVA at the Composite Test Revision Level specified below, this Declaration of Conformity authorizes the Vendor to use the CIP Safety on EtherNet/IP name, the CIP Safety logo and the appropriate Certification Logo and Word Marks as outlined in the ODVA Identity Guidelines in conjunction with the specific CIP Safety on EtherNet/IP Compliant Product(s) described below, for as long as the Vendor's Terms of Usage Agreement for the CIP Safety on EtherNet/IP Technology remains valid.

CIP Safety™
on EtherNet/IP™
Certification Logo Mark

CIP Safety on EtherNet/IP CONFORMANCE TESTED™
Certification Word Mark

This Declaration of Conformity is issued on **08 October 2007** on behalf of ODVA by:

Katherine Voss
Katherine Voss
Executive Director

Vendor Information	
Vendor Name	Rockwell Automation
Vendor Address	One Allen Bradley Drive Mayfield Heights, OH 44124 USA
Test Information	
Test Date	08 October 2007
Composite Test Revision	3
ODVA File Number	10950
Product Information	
Identify Object Instance 1	
Device(s) Under Test	Value
Vendor ID (Identity Object Attribute 1)	1
Device Type (Identity Object Attribute 2)	0x23
Device Profile Name	Safety Discrete I/O Device
Product Revision (Identity Object Attribute 4)	1.000
Products Covered Under This Declaration of Conformity	
No. Product Code (Identity Object Attribute 3) Product Name (Identity Object Attribute 7) SOC File Name	
1 11 A-0 1791ES-1B0XBV4 IP20 S/4 1791ESCOMBO.etc	

CIP Safety and the CIP Safety on EtherNet/IP CONFORMANCE TESTED are trademarks of Open DeviceNet Vendor Association, Inc. (ODVA)
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Technology Milestone CIP Safety

**10th
Anniversary!**

2008

Published
The CIP Safety™ Specification
with **CIP Safety on Sercos**

2007

Issued First
**Declaration
Of Conformity
for EtherNet/IP™**

2006

Adoption by
Sercos Int'l

2005

Issued First
**Declaration of Conformity
for DeviceNet™**

2005

Published First Edition of
The CIP Safety™ Specification

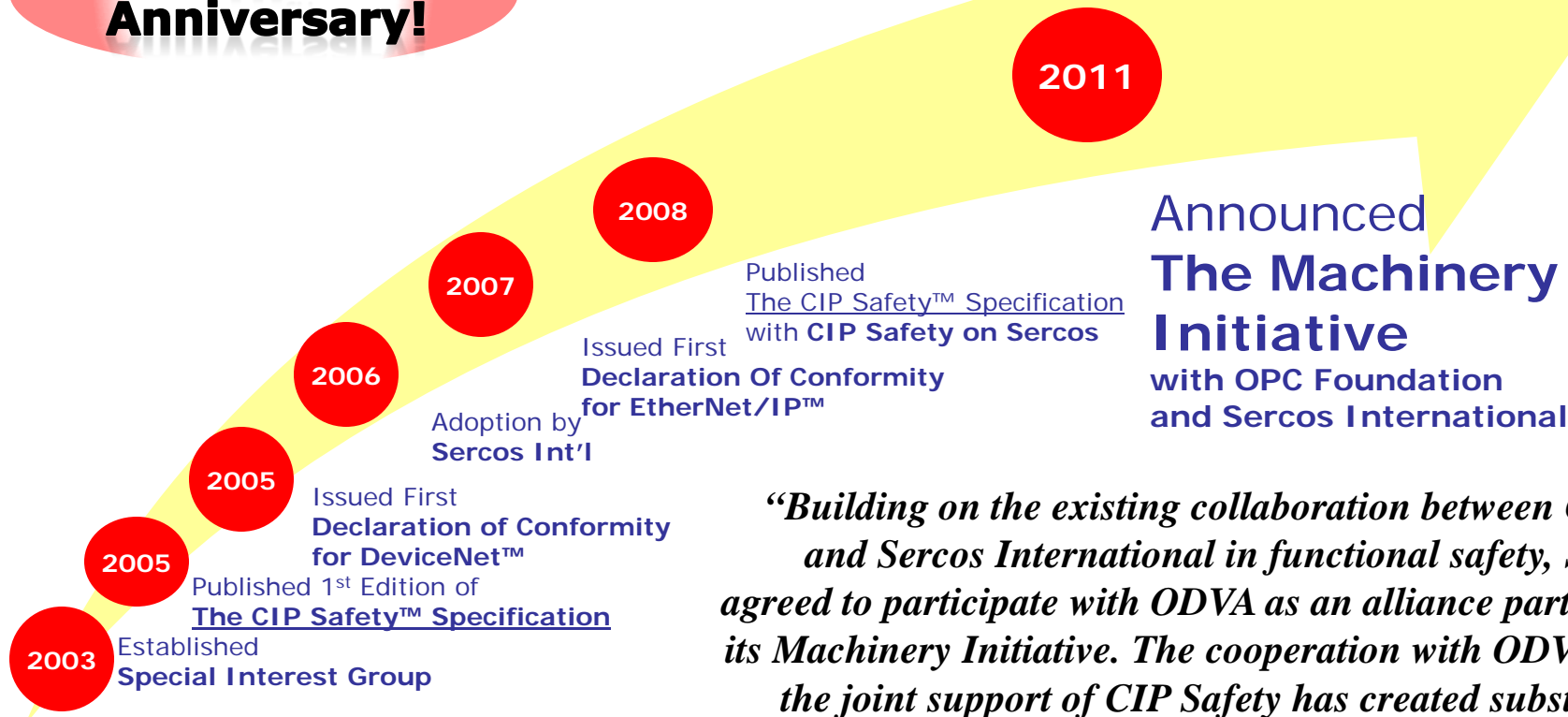
2003

Established
Special Interest Group



Technology Milestone CIP Safety

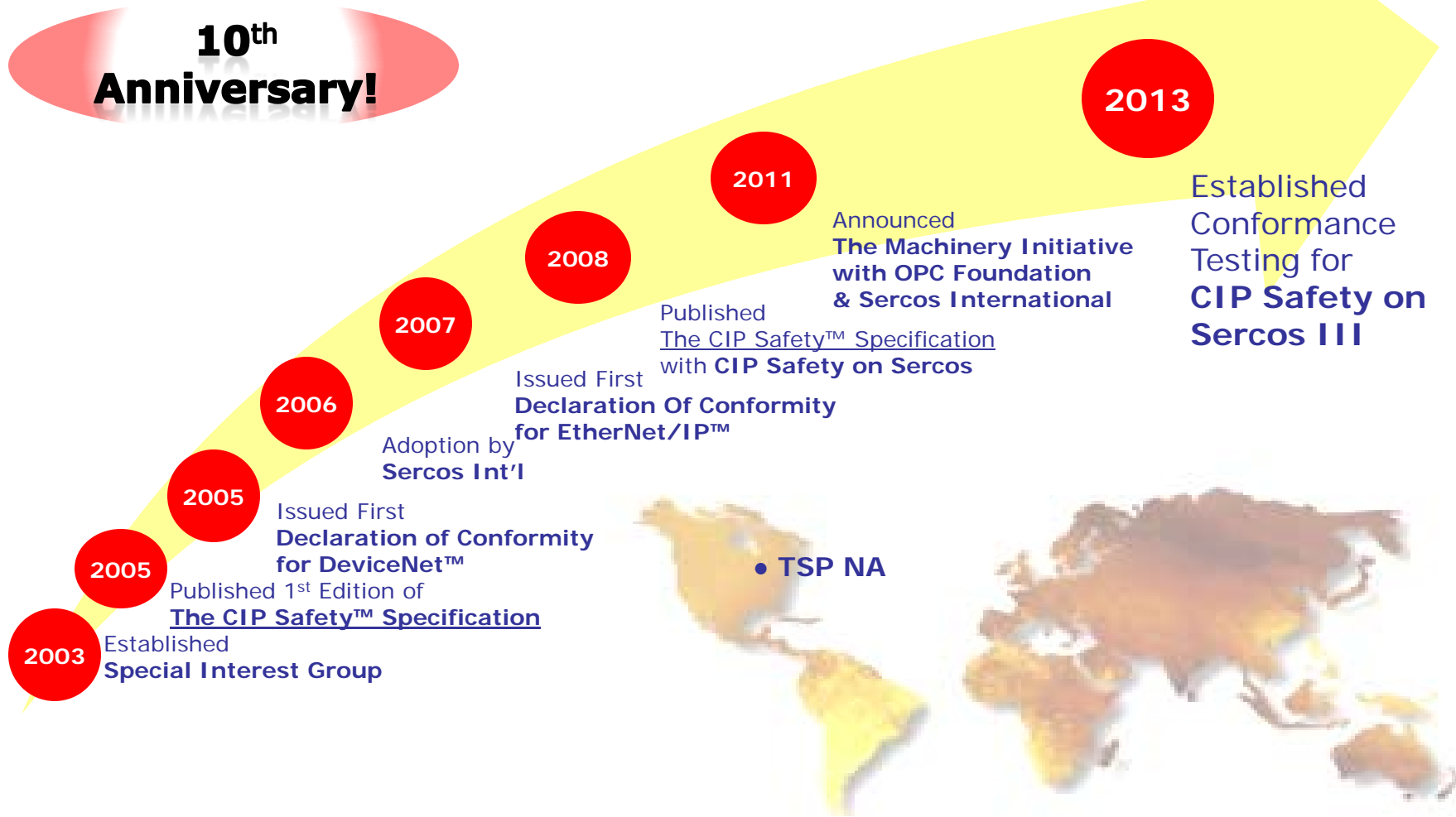
**10th
Anniversary!**



“Building on the existing collaboration between ODVA and Sercos International in functional safety, SI has agreed to participate with ODVA as an alliance partner in its Machinery Initiative. The cooperation with ODVA and the joint support of CIP Safety has created substantial technical and market synergies for the safety network community.” Peter Lutz, Managing Director of SI

Technology Milestone CIP Safety

**10th
Anniversary!**



Technology Milestone

CIP Safety

**10th
Anniversary!**

2003 Established
Special Interest Group

2005

2005

2006

Adoption by
Sercos Int'l

Issued First
Declaration of Conformity
for DeviceNet™

Published 1st Edition of
The CIP Safety™ Specification

Issued First
Declaration Of Conformity
for EtherNet/IP™

2007

2008

Published
The CIP Safety™ Specification
with CIP Safety on Sercos

2011

Announced
The Machinery Initiative
with OPC Foundation
& Sercos International

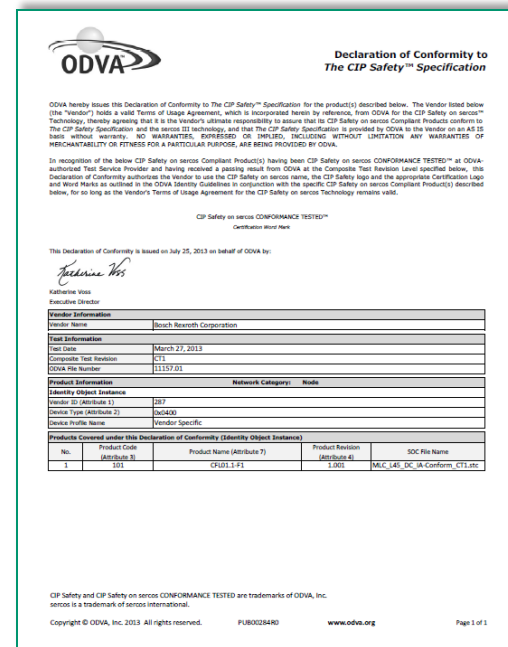
2013

Established Conformance Testing
for CIP Safety on Sercos III

2013

Issued First
Declaration
of Conformity
for Sercos III

*In total,
77 Declarations of Conformity
have been issued for CIP Safety.*



ODVA

**Declaration of Conformity to
The CIP Safety™ Specification**

ODVA hereby issues this Declaration of Conformity to The CIP Safety™ Specification for the product(s) described below. The Vendor listed below (the "Vendor") holds a valid Terms of Usage Agreement, which is incorporated herein by reference, from ODVA for the CIP Safety on Sercos™ Technology, thereby agreeing that it is the Vendor's ultimate responsibility to ensure that its CIP Safety on Sercos Compliant Product(s) conform to the CIP Safety Specification and the Sercos III technology, and that The CIP Safety Specification is provided by ODVA to the Vendor on an AS IS basis, without warranty, NO WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING WITHOUT LIMITATION ANY WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, ARE BEING PROVIDED BY ODVA.

In recognition of the below CIP Safety on Sercos Compliant Product(s) having been CIP Safety on Sercos CONFORMANCE TESTED™ at ODVA, authorized Test Service Provider and having received a passing result from ODVA at the Conformance Test Revision Level specified below, this Declaration of Conformity authorizes the Vendor to use the CIP Safety on Sercos name, the CIP Safety logo and the appropriate Certification Logo and Word Marks as outlined in the ODVA Identity Guidelines in conjunction with the specific CIP Safety on Sercos Compliant Product(s) described below, for so long as the Vendor's Terms of Usage Agreement for the CIP Safety on Sercos Technology remains valid.

CIP Safety on Sercos CONFORMANCE TESTED™
Certification Word Mark

This Declaration of Conformity is issued on July 25, 2013 on behalf of ODVA by:

Katherine Voss
Katherine Voss
Executive Director

Product Information				
Vendor Name	Bosch Rexroth Corporation			
Test Information				
Test Date	March 27, 2013			
Conformance Test Revision	CT1			
ODVA File Number	11157/01			
Product Information				
Network Category: Node				
Identity Object Instance				
Vendor ID (Attribute 1)	207			
Device Type (Attribute 2)	20400			
Device Profile Name	Vendor Specific			
Products Covered under this Declaration of Conformity (Identity Object Instance)				
No.	Product Code (Attribute 3)	Product Name (Attribute 7)	Product Revision (Attribute 8)	SOC File Name
1	203	CR01-1-F1	1.003	M.C. L45 DC-VA Conform CT1.doc

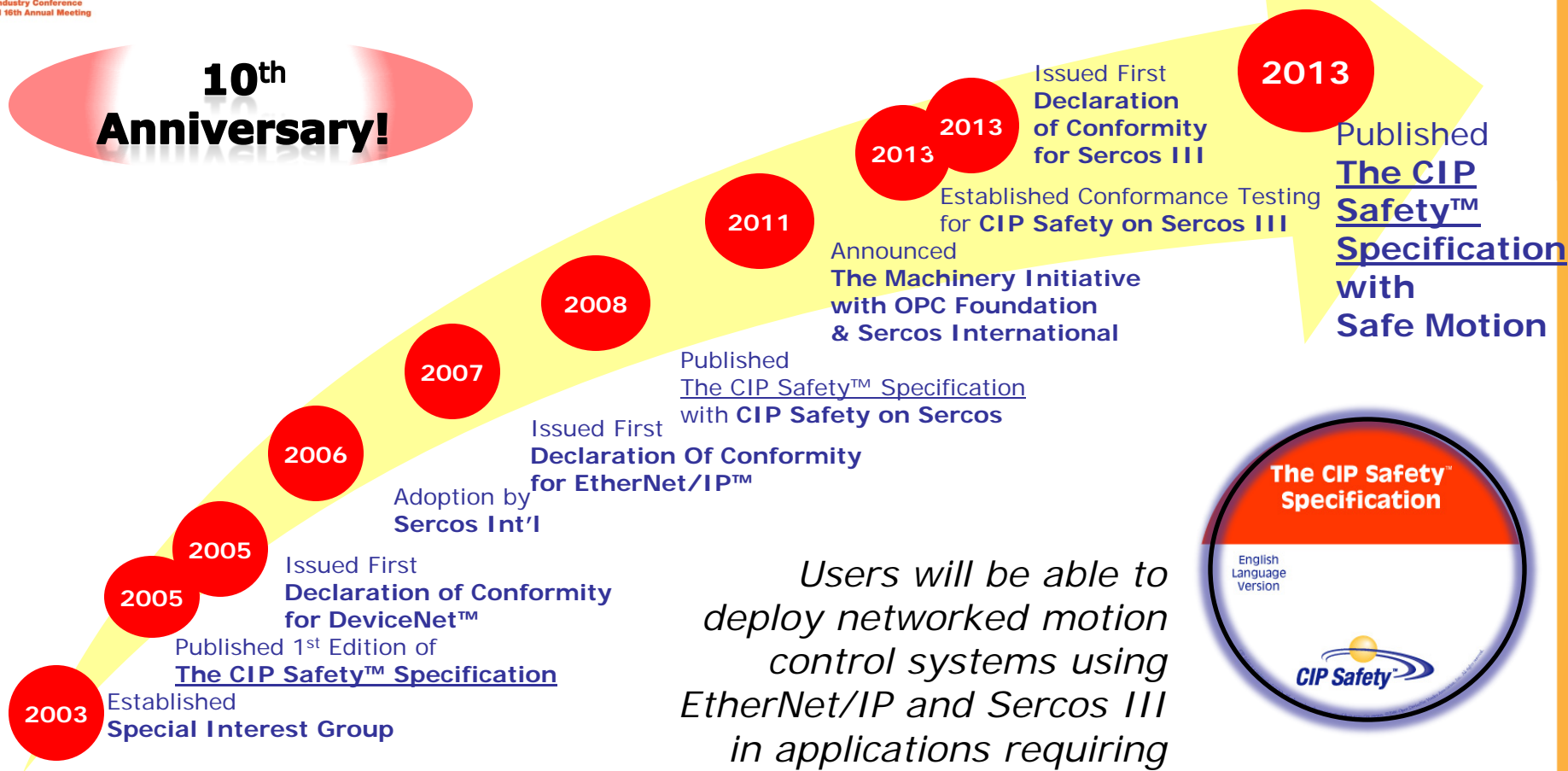
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Technology Milestone

CIP Safety

**10th
Anniversary!**



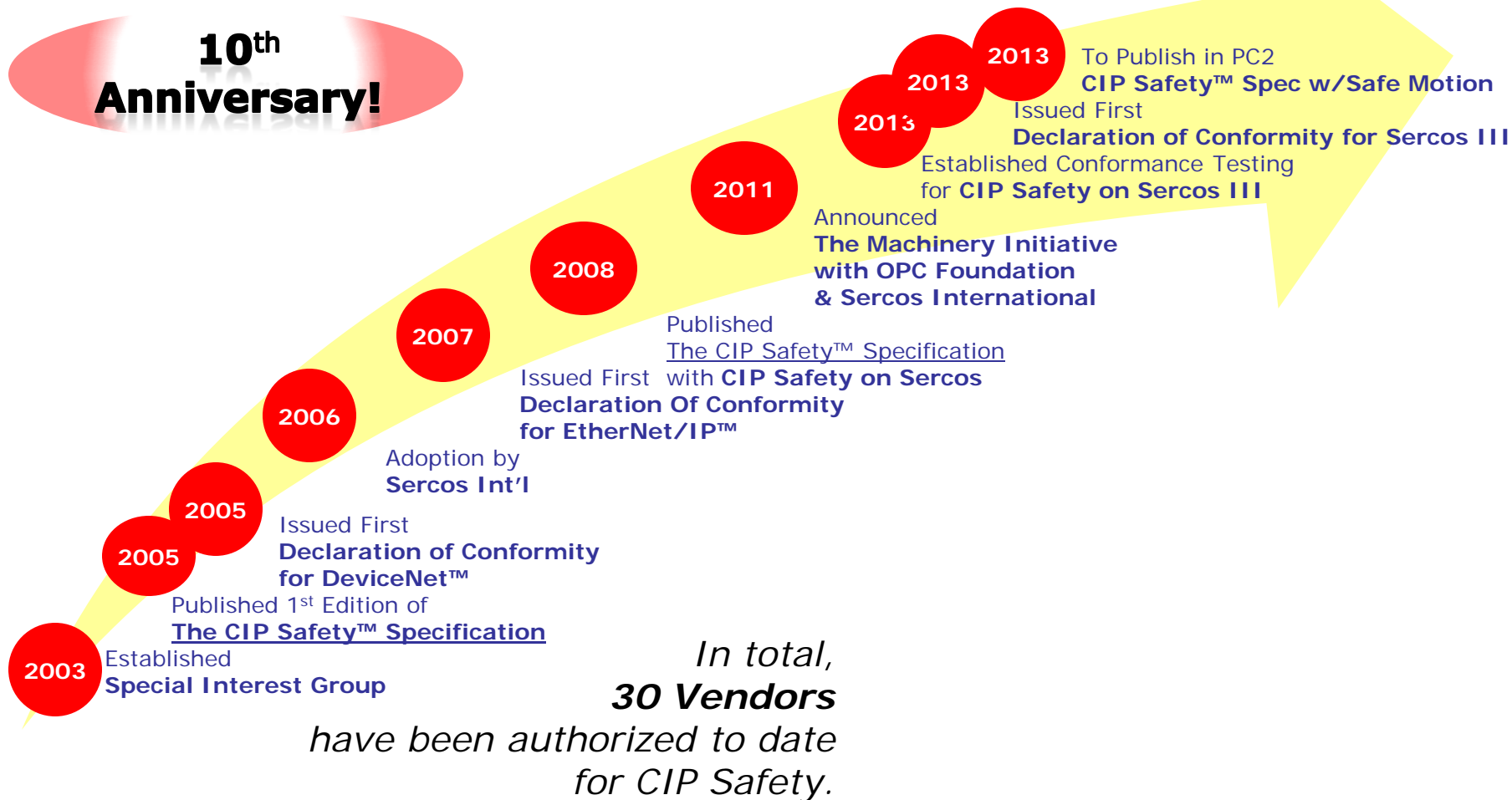
*Users will be able to
deploy networked motion
control systems using
EtherNet/IP and Sercos III
in applications requiring
safe motion functions such
as safe torque off and
safety limited positions.*



Technology Milestone

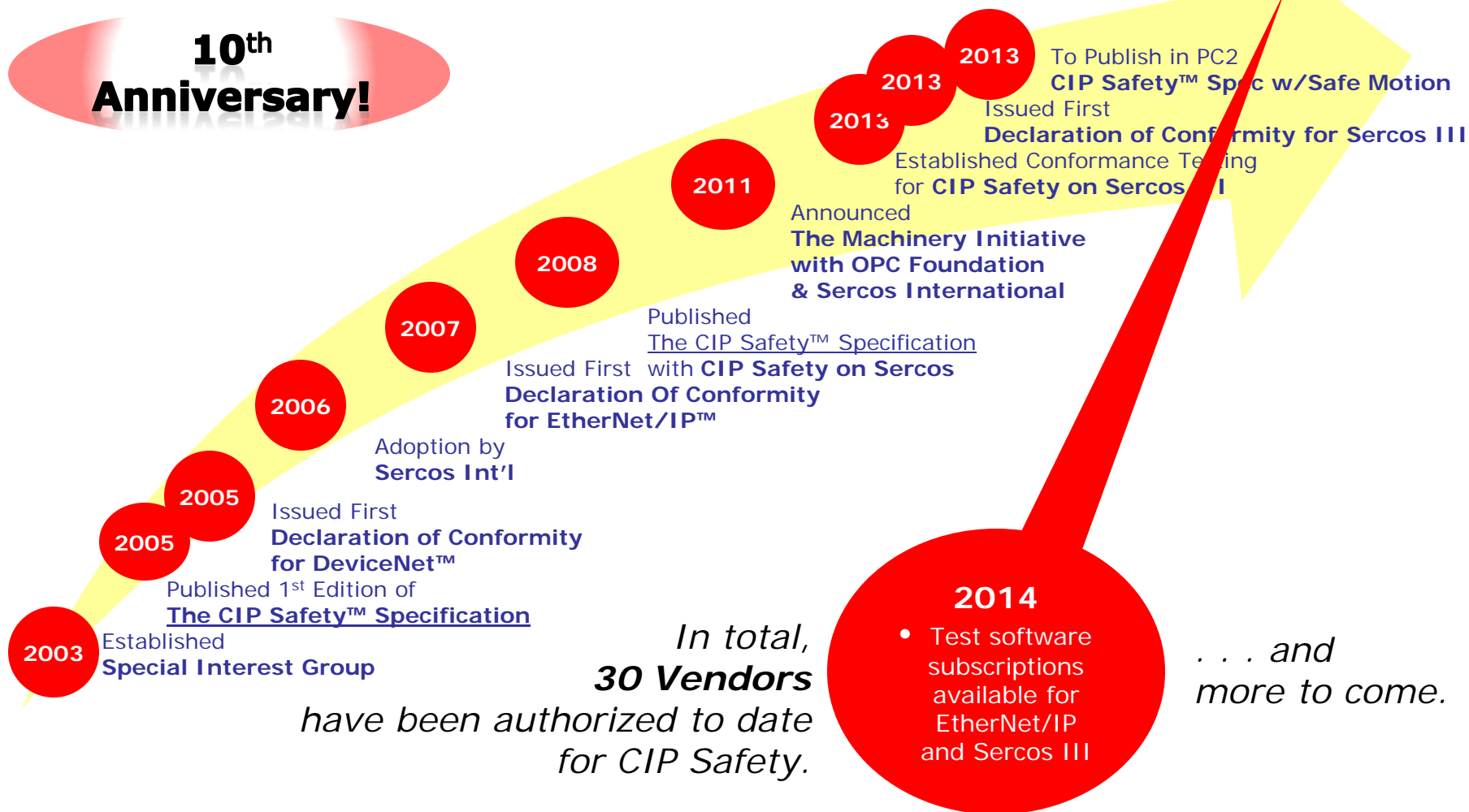
CIP Safety

**10th
Anniversary!**



Technology Milestone CIP Safety

**10th
Anniversary!**





16th Term in Review

Report on Technical Activities of the Association

Rich Harwell, chief technology officer

General Session and
16th Annual Meeting of Members

When riding the IP wave ...



... one should focus on keeping up.

- *Organization and process review*
- *Key deliverables since 15th general session*
- *Key work in process*

Organization and Process Review

Strategic Initiatives

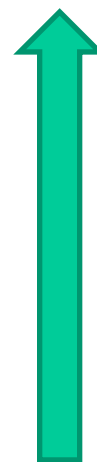
- Energy
- Machinery
- Process



Board of Directors
and Officers

Technical
Review
Board

Technical
Working
Groups
(SIGs+)



SIG Work Plans and
Spec Enhancements

Roster of Technical Working Groups

No.	Working Group	Chair/Co-Chair(s)
1	SIG - CIP Safety	P. Kucharski, Rockwell Automation
2	SIG - CIP System Architecture	D. VanGompel, Rockwell Automation
3	SIG - CompoNet	T. Li, OMRON
4	SIG - Conformance	Q. Zeng, ODVA
5	SIG - DeviceNet of Things	T. Peter, Weidmüller Interface (acting)
6	SIG - DeviceNet Physical Layer	B. Woodman, Molex
7	SIG - Distribution Motion	S. Zuponcic, Rockwell Automation
8	SIG - Energy Applications	R. Blair, Schneider Electric/R. Morgan, Rockwell Automation
9	SIG - EtherNet/IP Infrastructure	B. LaRette, Schneider Electric
10	SIG - EtherNet/IP Physical Layer	R. Lounsbury, Rockwell Automation
11	SIG - EtherNet/IP System Architecture	B. Batke, Rockwell Automation
12	SIG - Integration of I/O-Link	F. Moritz, SICK
13	SIG - Integration of Modbus	T. Snide, Schneider Electric
14	SIG - Machinery Information	R. Beudert, Schneider Electric/L. Leurs, Bosch Rexroth/S. Zuponcic, Rockwell Automation
15	SIG - Vertical Industry Semiconductor	open, election of successor pending
16	Workshop - EtherNet/IP Implementors EU	Ulrich Kaemmerer, Schneider Electric
17	Workshop - EtherNet/IP Implementors NA	Kevin Knake, HMS Industrial Networks

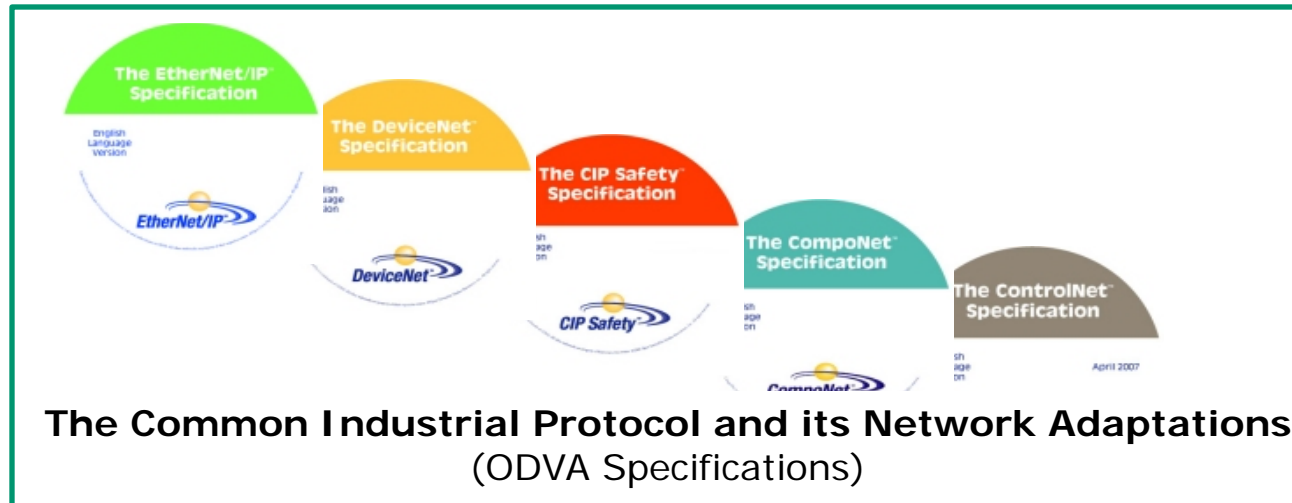
**Thanks to the chairs for their organization and leadership on
behalf of the greater ODVA community and technology!**

Make-up of the Technical Review Board (TRB)

1. Chair **Rich Harwell** (ODVA chief technology officer, employee of Eaton)
2. Representative **Rudy Belliard** (employee of Schneider Electric)
3. Representative **Paul Didier** (employee of Cisco Systems)
4. Representative **Jörg Hähnliche** (employee of Endress+Hauser)
5. Representative **Rich Jackson** (employee of Omron)
6. Representative **Oliver Kleineberg** (employee of Belden)
7. Representative **Ludwig Leurs** (employee of Bosch Rexroth)
8. Representative **Eric Scott** (employee of Molex)
9. Representative **Dave VanGompel** (employee of Rockwell Automation)

Meeting at least 2X per month, the TRB is responsible for approval of all work plans for ODVA's technical working groups, providing technical guidance to SIGs in their development of specification enhancements (SEs) and approval of SEs for integration into ODVA's specifications.

ODVA Technology



Contributors

- Technical Working Groups
- TRB
- ODVA staff



ODVA Conformance Testing Practice

(test plans, testware, administration, documentation, know how)



Technical Publications

(recommendations, guidelines)

Deliverable Highlights



3 publication cycles since last meeting
69 Specification Enhancements

Highlights include:

- Safety Motion Objects
- First Cyber Security Related Updates
- IPv6 Plan (Pre-SE)
- Parallel Redundancy Protocol – PRP
- Energy Extensions
- File Object Enhancements
- EtherNet/IP CT11, DeviceNet CT25

Major Work In Process

Highlights of work in progress in SIGs

- **EtherNet/IP System Architecture** – Accommodation plan for implementation of IPv6, enhancements for cyber security
- **IO-Link Integration** – enhancements to Volume 7
- **DeviceNet of Things** – Phase 1: initial enhancements to The CIP Networks Library (primarily in Volumes 1 and 3)
- **Process Initiative** – rationalization of proposed technical work, formation of new SIG
- **Energy Applications** - Phase 3: transacting energy for the best result
- **EtherNet/IP Physical Layer** – Volume 3, Chapter 8, rewrite with industrial 1G PMD interfaces
- **Machinery Information** – Phase 1: data model for logical groupings and then map the model into CIP objects and services to support exchange of the information between machines and supervisory systems
- **CIP Motion** – enhancements to support machine-to-machine synchronization



Candidates for Election

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Nominations

Board of Directors



Michael Höing
Weidmüller Interface

Board of Directors



Kent Howard
Balluff

Representative to the TRB



Eric Scott
Molex

Representative to the TRB



Joakim Wiberg
HMS Industrial
Networks



EtherNet/IP in Packaging

Daren Myren, Aagard Group

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Industry leader in primary and secondary packaging machines

- ▶ Sleevors
- ▶ Cartoners
- ▶ Case Packers
- ▶ Combination Systems



Leverage automation to create innovative solutions

- ▶ Electrical savings
- ▶ Operational savings
- ▶ Increase overall line efficiencies

Packaging Industry

- ▶ Aagard's Purpose and Values:
 - Aagard will enhance people's lives while providing unique packaging solutions that help our customers win.
 - WINNING TOGETHER HONORABLY
- ▶ Aagard is laser focused on maintaining a culture that fosters creativity through collaboration. We strive to bring excitement and innovative thinking to every project we work on. And we're dedicated to forming true collaborative partnerships with our customers, which allows us to design unique, industry-leading solutions that give them a competitive advantage.

Equipment Overview

Custom Machinery

- ▶ Up to 40 or 50 axes of motion (typically 20 – 30)
- ▶ Motion coordination via CIP Sync and CIP Motion

Maksimal Pouching System

- ▶ Form, fill & seal 200 pouches/min
- ▶ Pouch film speed: >600 mm/sec
- ▶ 1 automation controller
- ▶ 17+ servos dependent on requirements



Pouching Application:

Film Registration

Task: Identify correct cutting & sealing positions on the film

- ▶ Challenge: Film speed $\approx 666\text{mm/second}$ but fluctuates slightly due to the nature of film
- ▶ Trending is necessary for precise cutting & sealing
- ▶ Sensor detects the registration mark & triggers the SOE module 200 times per minute
- ▶ Servo drive position is correlated with the registration mark & film feed velocity is adjusted for precise speed control

Cartoner Application:

Random Timing Infeed

Task: Adjust random product timing to match continuous machine timing

- ▶ Sensor is connected to the SOE module
- ▶ Rising edge trigger initiates timestamp
- ▶ Extrapolate actual and desired position
- ▶ Adjust the speed of product
- ▶ EtherNet/IP & CIP Sync eliminate variances of previous system
 - Product travels 1.5" in 10 ms



Cartoner Application:

Carton Sealing

Task: Control Glue Gun

- ▶ Challenge: Carton Velocity
 - 105 inches / second
 - Product travels 1" in 9.5 ms
- ▶ Sensor is connected to the SOE module
- ▶ Rising edge trigger initiates timestamp
- ▶ Allows glue gun on/off timestamps to be calculated and written to a scheduled module
- ▶ Scheduled module turns glue gun on and off at required times



Network Design

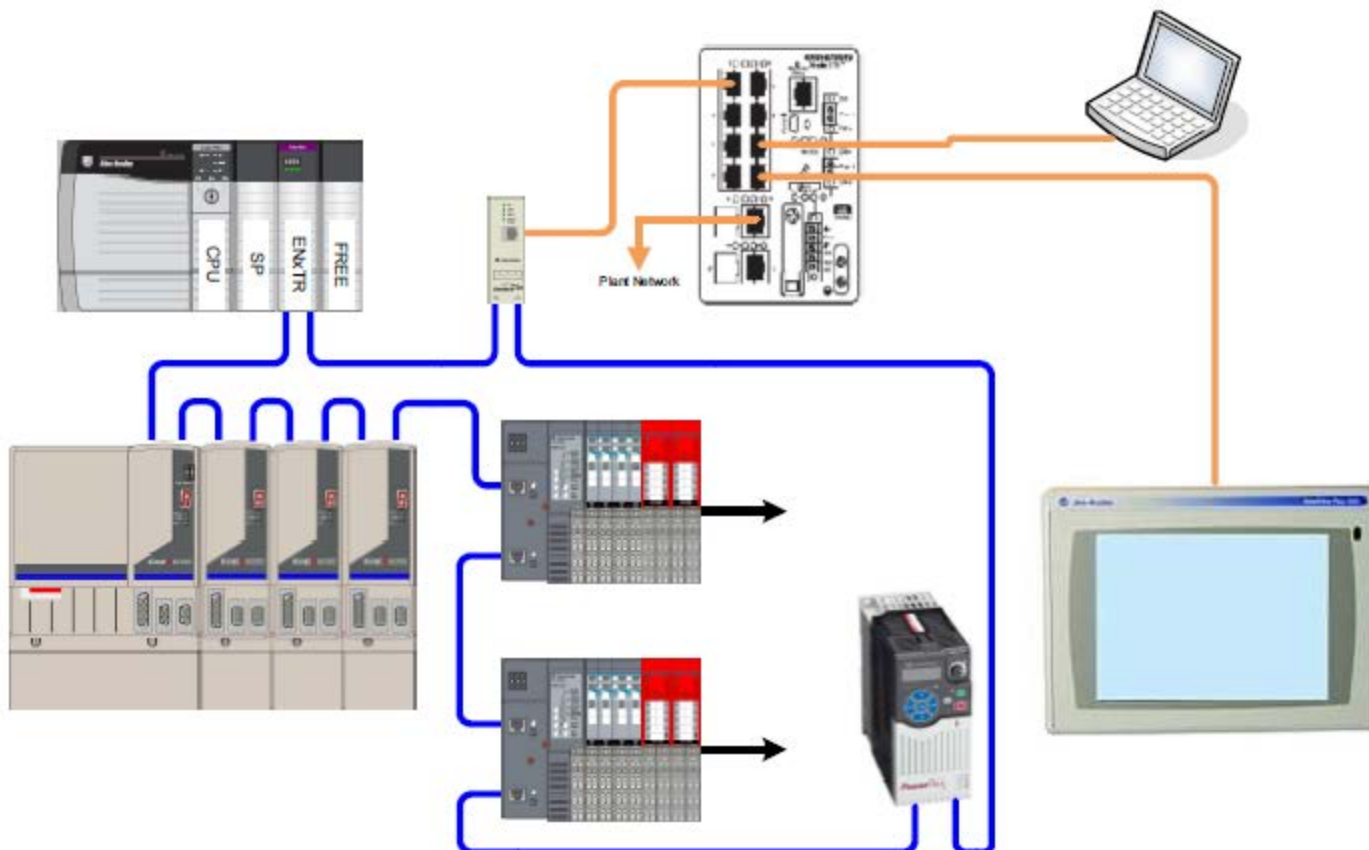
Simplification:

- ▶ Electrical panels distributed throughout machine
- ▶ Capable of one network
 - Previously 3 separate networks
 - I/O, motion, safety

With EtherNet/IP:

- ▶ Everything combined into one

Common Network Topology



Additional Benefits

Design Modularity

- ▶ Simplified design
- ▶ Faster installation
- ▶ Operational savings and line efficiencies

3rd Party Device Integration

- ▶ Barcode scanners
- ▶ Cameras
- ▶ Laser printers
- ▶ Gluing systems

Troubleshooting

Challenges:

- ▶ Intermittent communication loss
- ▶ Tracing network problems could take days
- ▶ No indication of failure point
- ▶ Often difficult to repeat the problem

With EtherNet/IP:

- ▶ Problem can usually be identified within minutes
- ▶ Ring topology means built in redundancy

Data Reporting

Better monitoring, reduced downtime

- ▶ EtherNet/IP allows more data to be extracted from drives
- ▶ Continuous monitoring of status & fault information

Simplified data collection

- ▶ Data collection and performance tracking now standard
- ▶ Seamless transfer to enterprise systems
 - Machine Mode & State
 - Product counts

EtherNet/IP with CIP Motion & CIP Sync

- ▶ Simplified design
- ▶ Greater flexibility
- ▶ Easier integration with 3rd party devices
- ▶ Better system monitoring
- ▶ Reduced downtime
- ▶ Simplified data collection and enterprise integration



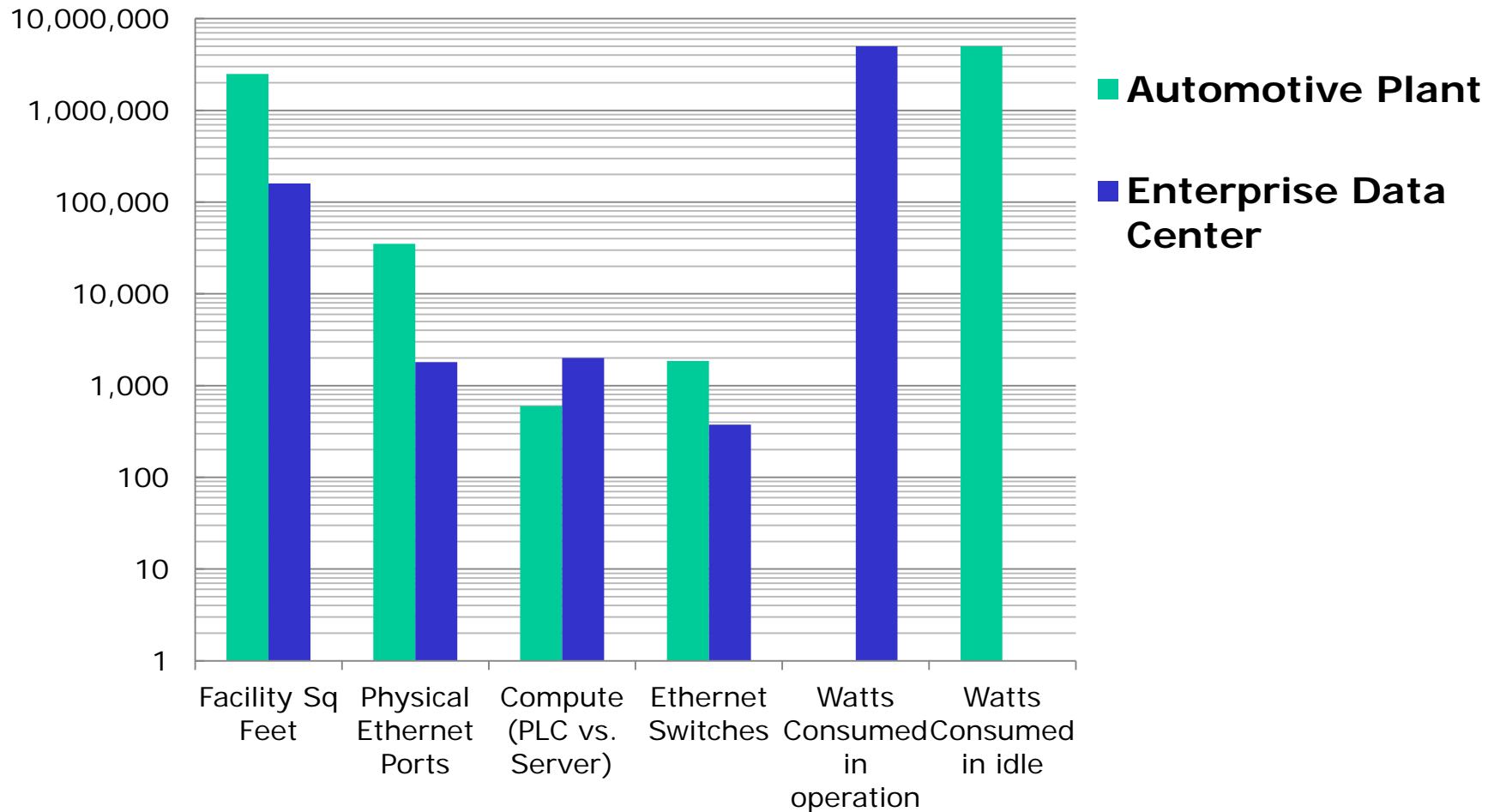
Software Defined Networks - Will They be the Next Frontier in Industrial Automation?

Should ODVA create specifications for configuration and operation of integrated automation networks?

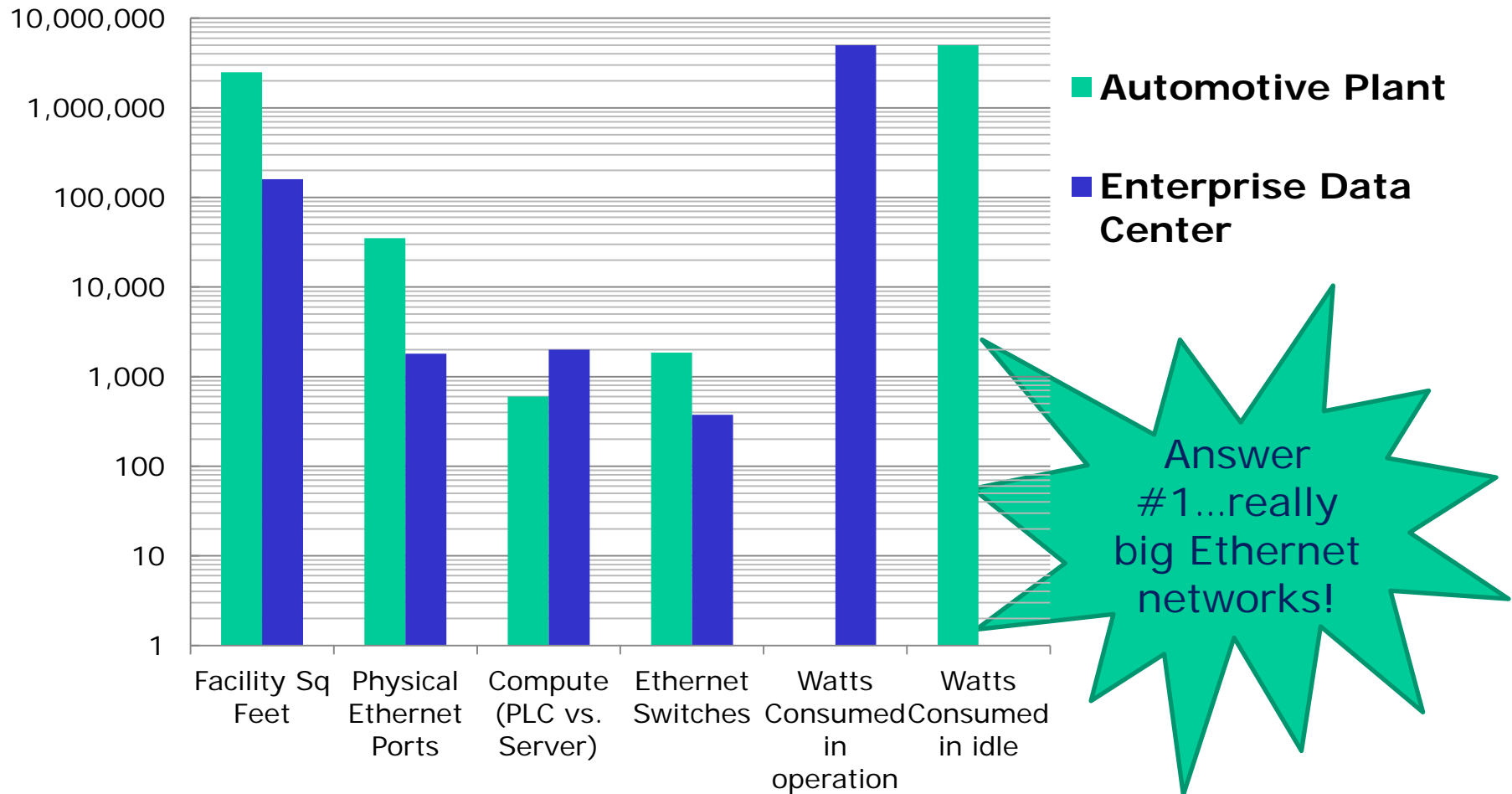
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What do a Data Center and Automotive Plant Have in Common?



What does an Automotive Plant Have in Common with a Data Center?



Software Defined Networking



**SDN enables automation and virtualization of
enterprise data centers.
Open standards are starting to take hold.**

What does an Automotive Plant Have in Common with a Data Center?



What does an Automotive Plant Have in Common with a Data Center?



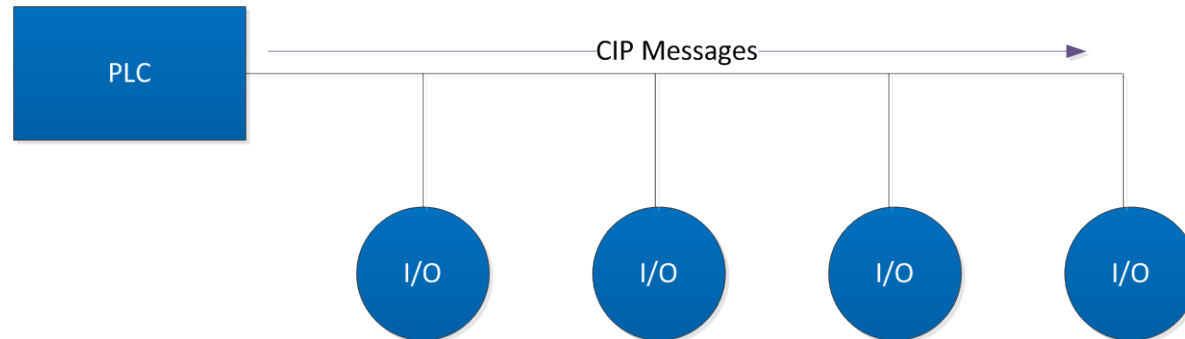
Answer #2...they have functions that manage and control the flow of data are somewhat similar!

So what is all this about?

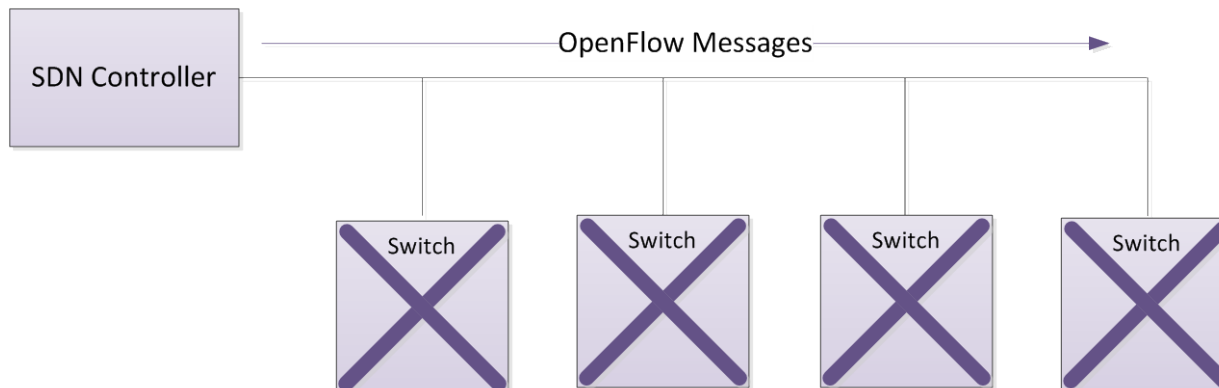
- ▶ **Software Defined Network controllers focus on controlling the flow of data across a network in a standard and programmatic way.**
- ▶ **PLCs control movement of devices and thus product through a manufacturing system in a standard and programmatic way.**
- ▶ **An SDN Controller is like a PLC.**
- ▶ **A switch or router is like an I/O block.**

Functions are Somewhat Similar

A Network Manager is like a PLC. . .



. . . and a switch or router is like an I/O block.

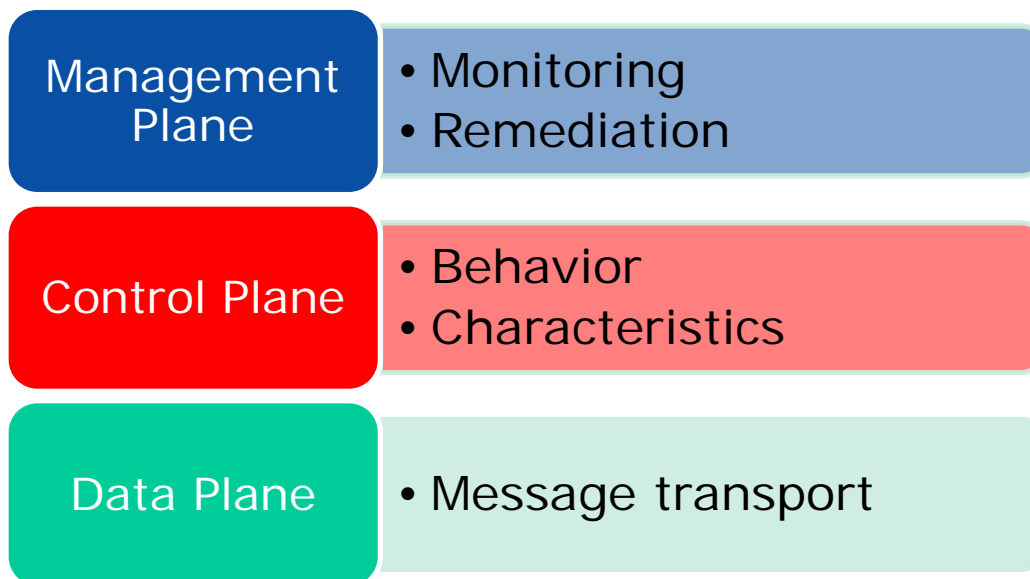


- PLCs control movement of devices and thus product through a manufacturing system in a standard and programmatic way.

- Network Controllers focus on controlling the flow of data across a network in a standard and programmatic way.

What does an Automotive Plant Have in Common with a Data Center?

Their Ethernet networks all share the following embedded in all network devices

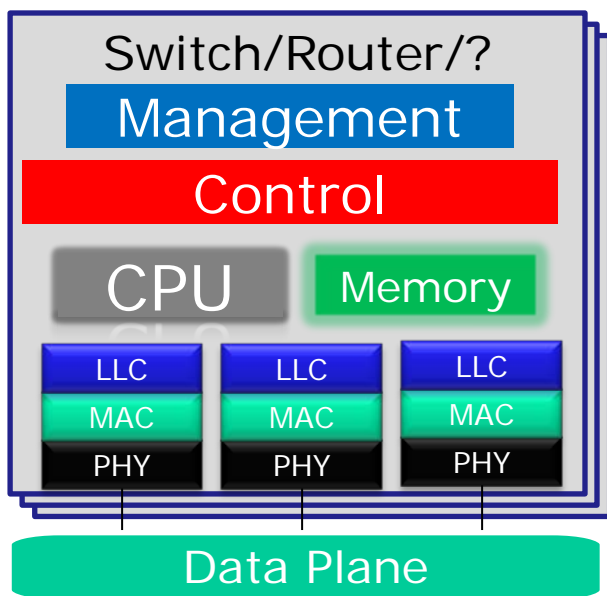


Traditionally each network device must be “touched” to configure and manage these planes - with the Control Plane being touched the most –
creating complexity

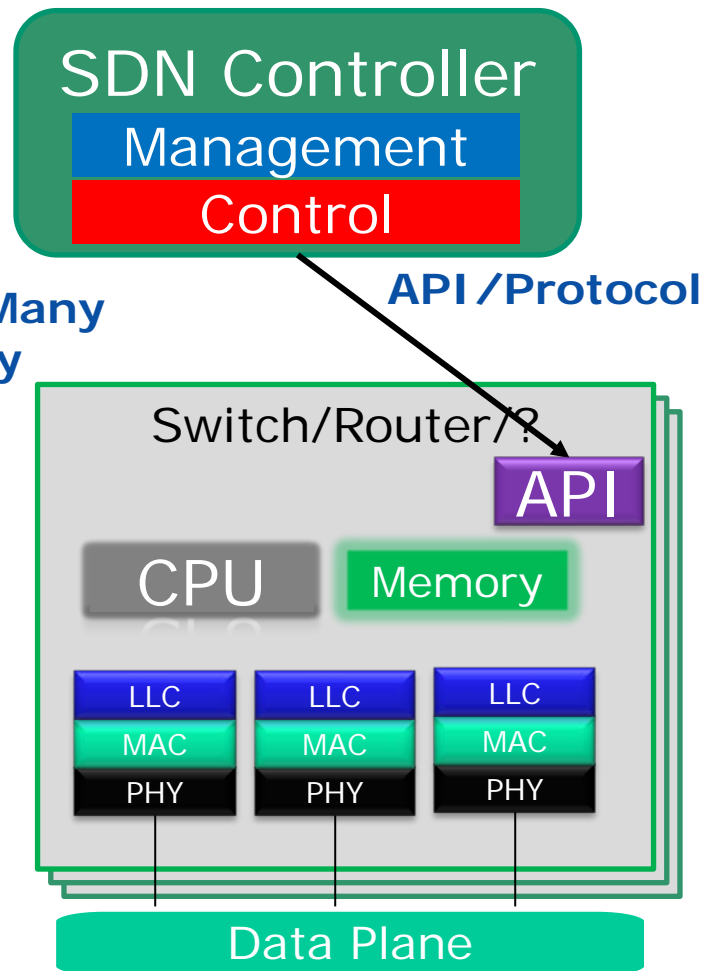
SDN Helps Reduce Complexity by Automating the Configuration of Planes Today and Tomorrow



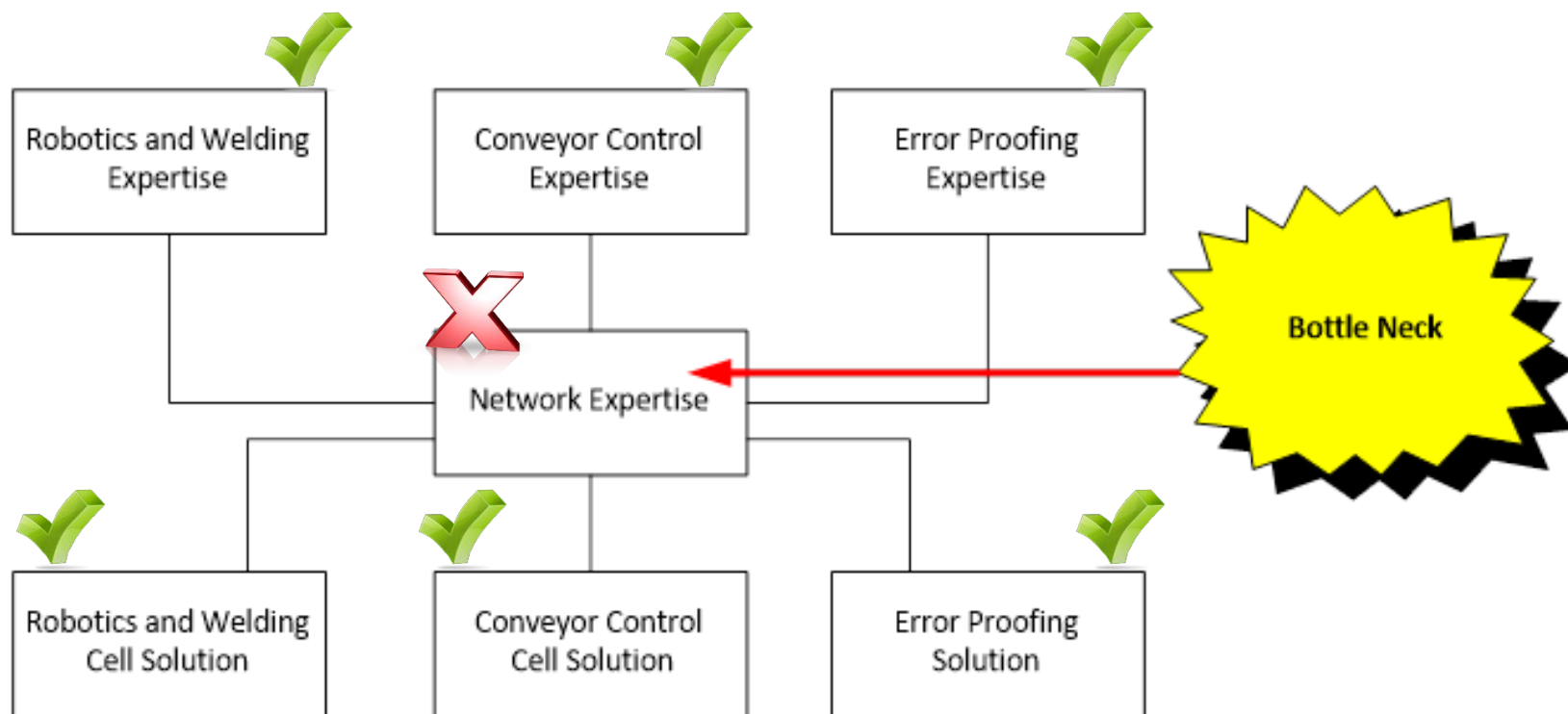
Touch Many
Configure Many



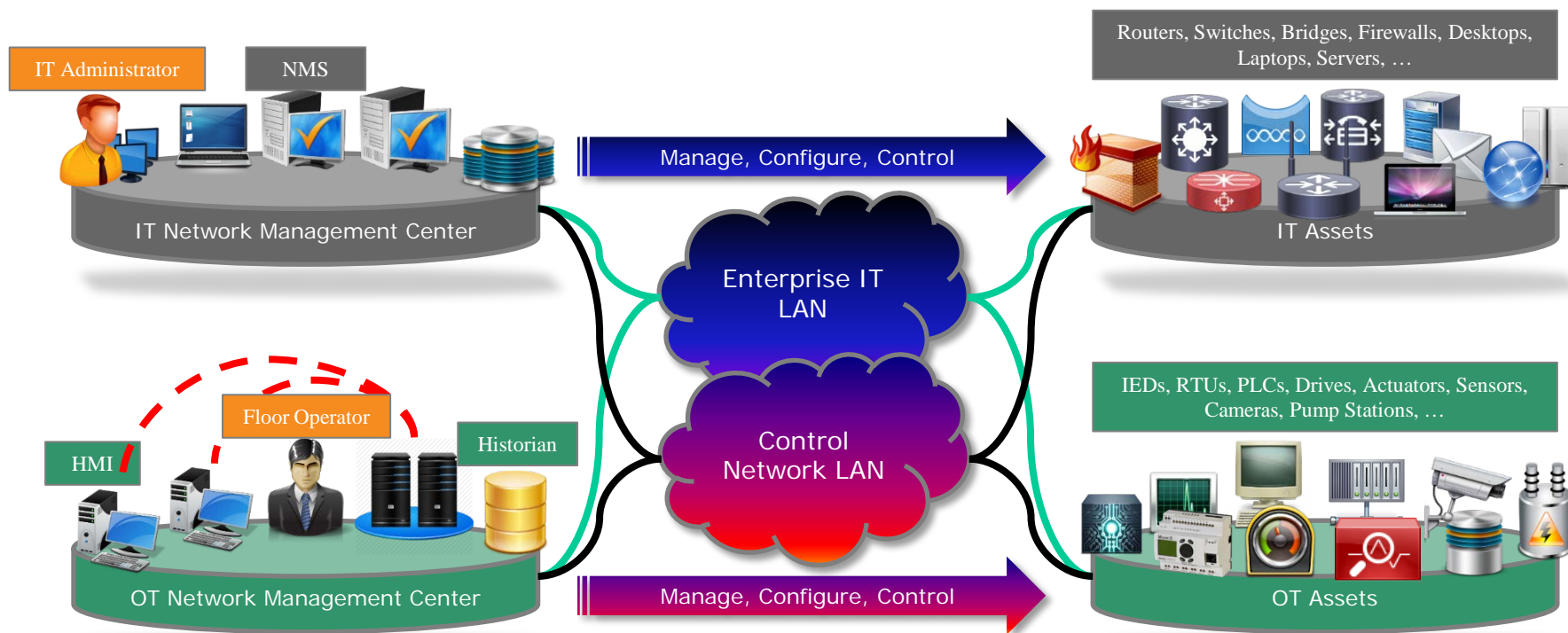
Touch One
Configure Many
Dynamically



The Challenges of Convergence and Expertise



Today - Separate Management of Network Assets



Problems and Challenges



Two Sets of
Management
Systems



No Policy
Integration



Insufficient
Network
Security
Practices

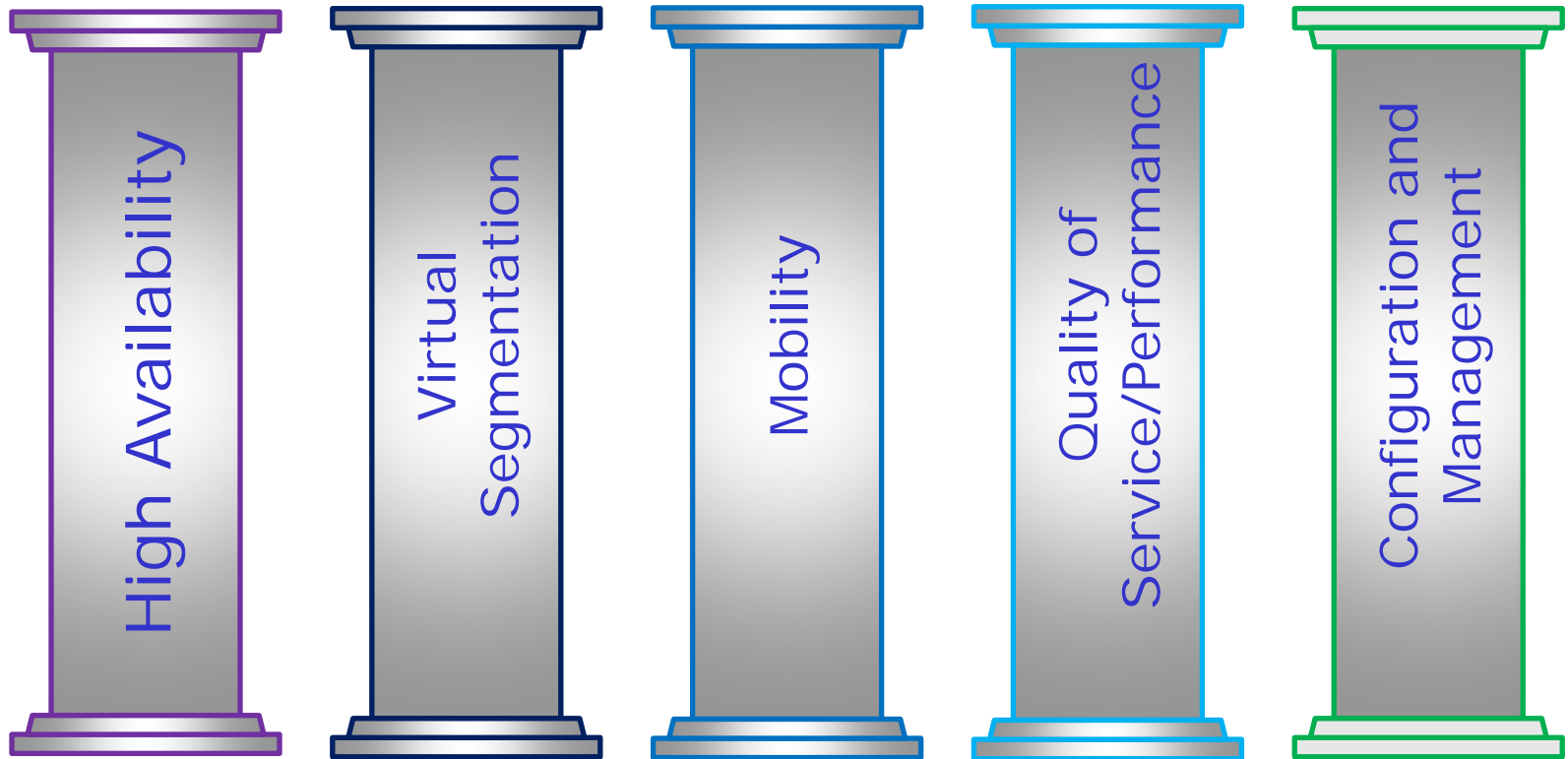


Hard to
diagnose
network
problems



So where is the complexity?

- ▶ The Control Plane has five Pillars that require specific network expertise.
- ▶ Currently each Pillar must be configured separately yet each has an impact on the others.



What Resides in these Pillars?

1. Scalable High Availability

- EIGRP, OSPF, IS-IS, BGP, MP-BGP, Spanning Tree, MC-LAG, Cluster, VSS, VPC, HSRP, VRRP, GLBP, ISSU, PFR, MPLS TE, etc.

2. Virtual Segmentation

- VLAN, VDC, Contexts, 802.1Q, VRF, MPLS VPN, EVN, VXLAN, LISP, SXP, SGT

3. Mobility (Layer 2 extension and Host Routing)

- OTV, VLAN 802.1Q, L2TPv3, MPLS Pseudo Wire, MPLS VPLS, MPLS EVPN, VXLAN, LISP, CAP/WAP

4. Quality of Service with Service Assurance

- Modular QoS, WRR, DWRR, SRR, Strict Priority, MLS QoS, HQoS, WTD, Policing, Shaping, Hierarchical Shaping, Bandwidth Remaining Ratio, RED, WRED, DBL, WFQ, etc.

5. Single point of configuration and management

- CLI, Cisco Prime Infrastructure, DCNM, Cisco Fabric Manager, XML/CLI Scripting, Cisco Configuration Professional, Cisco Prime Analytics, Cisco Prime Network, Cisco Prime Performance Manager, Cisco Prime Central, Cisco Prime Provisioning, Cisco ONE/XNC, Open Daylight, CIAC, Cloupia, Openstack Nebula, Cisco WAN Manager, etc.

Each is impacted by vendor-specific characteristics requiring expertise to optimize their use.

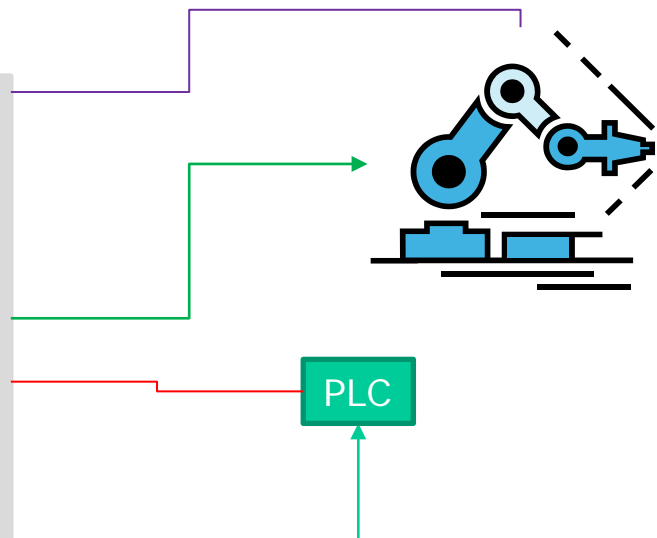
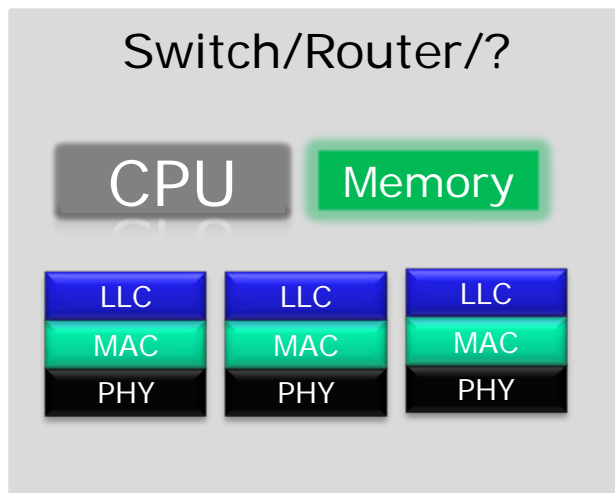
The Benefits of Software Defined Networking Can Apply to Industrial Automation

- Lower Cost
 - Faster deployment
 - More dynamic
 - Control the network configuration as an entity
 - Eliminate device by device configuration treatment
 - Provides for application control of the network
 - Facilitates Network Automation for changes
- } Flexibility

SDN and a VLAN or 2

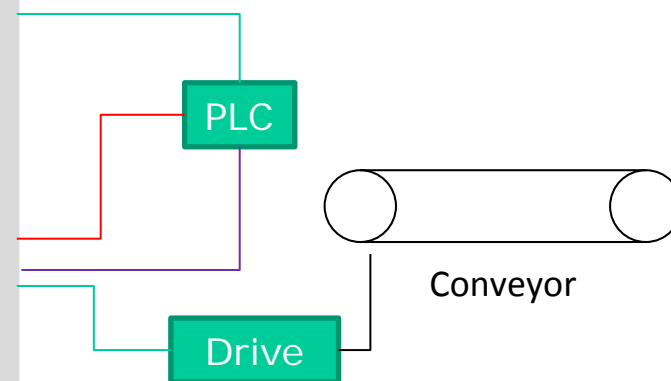
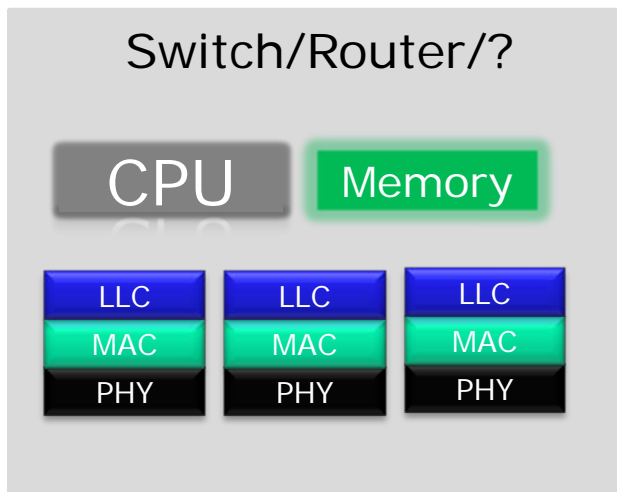
Today manual:

- Determine ports used
- Get/choose VLAN number
- Get/choose IP address
- Create VLAN
- Assign ports to VLAN
- Connect locally and configure via device interface



SDN programmatic:

- SDN server application finds network devices
- SDN server application finds end points connected to network
- Control program requests SDN server to connect devices
- Control Program requests



SDN Standards Today

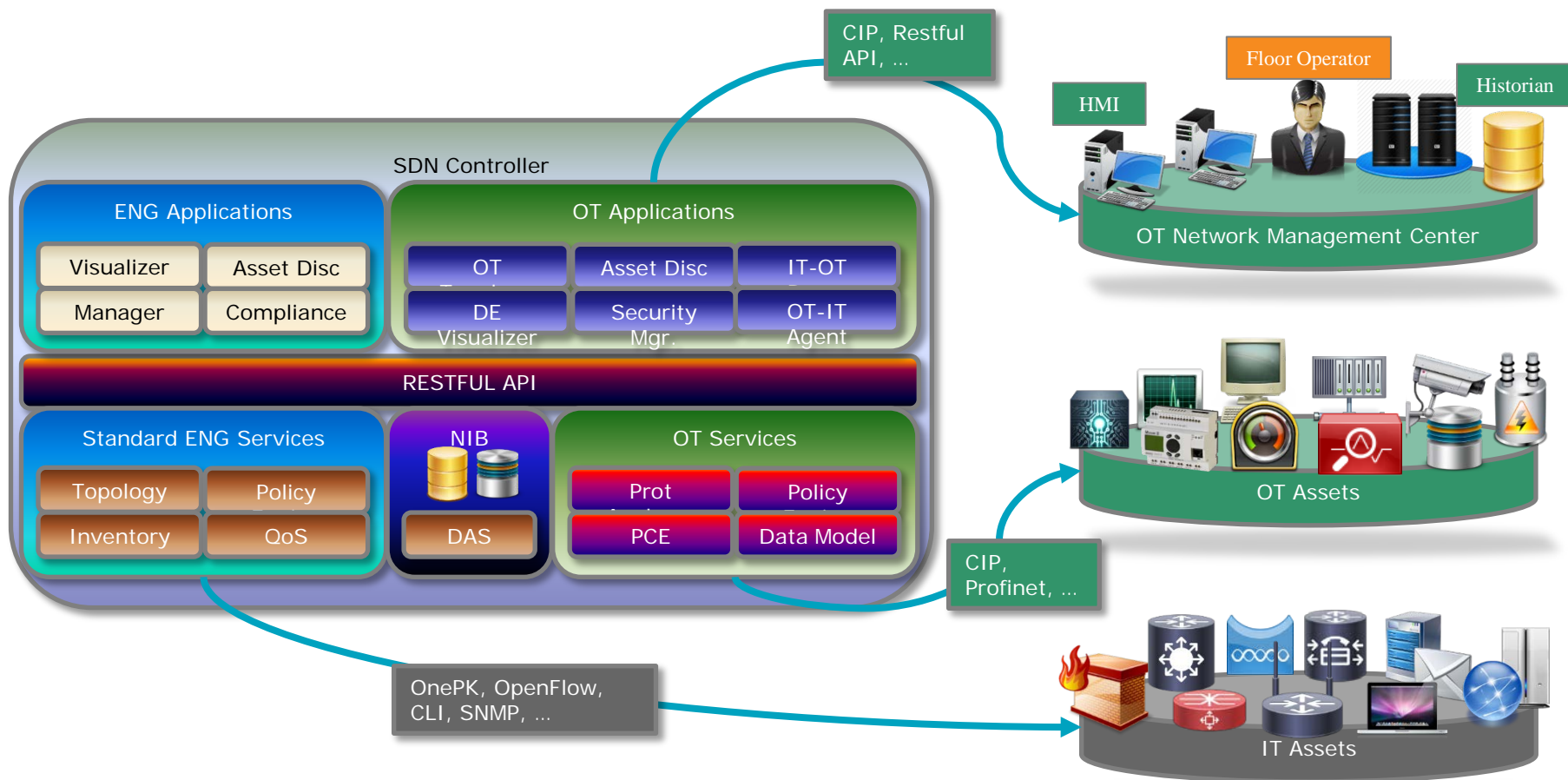
- ▶ OpenDaylight: open source controller
- ▶ OpenFlow: open source protocol/API
- ▶ Both are current communities providing standards for Software Defined Networks
- ▶ Both are open and may be used together
- ▶ Overlapping vendor support
- ▶ Data center focused
- ▶ Underlying hardware provides performance differentiation only; throughput etc.

No thought to the industrial space

Can ODVA Bring SDN Concepts to Industrial Automation?

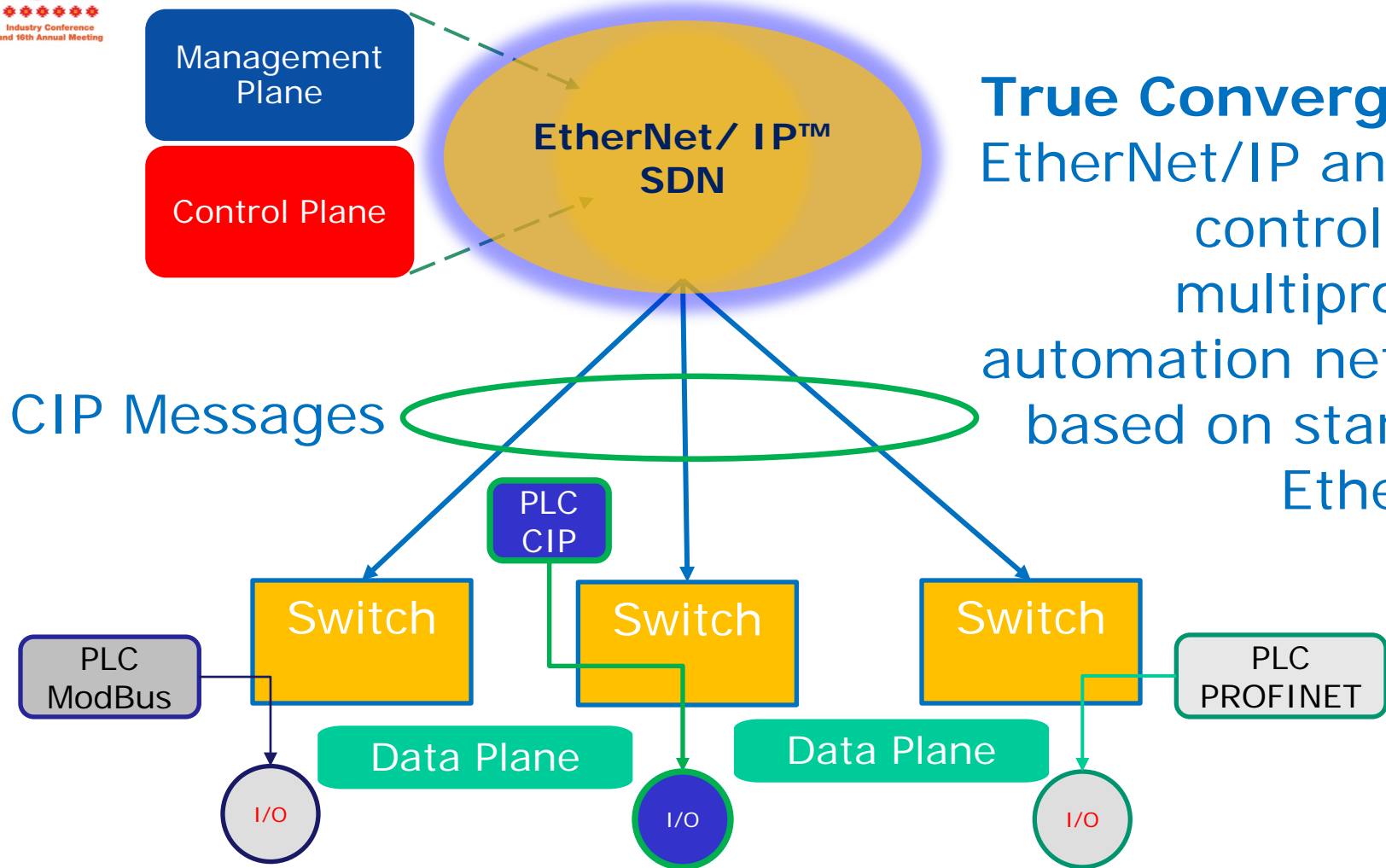
- ▶ CIP and EtherNet/IP can be used to create a an Industrial Network Controller for the automation network infrastructure.
- ▶ This Controller can be used to operate switches and routers as we do I/O today.
- ▶ CIP can be extended to communicate with the network infrastructure devices with new attributes.

Controller Architecture Overview



The Call to Action

True Convergence
EtherNet/IP and CIP
controlling a
multiprotocol
automation network
based on standard
Ethernet.



Thank You



17th Term

Looking Ahead

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The Company Directors



Michael Höing
VP, Electronics Business Unit
Weidmüller Interface



Cyril Perducat
SVP Strategy-Technology
Schneider Electric



Dr. Jürgen Weinhofer
VP, Control Technology & Architecture
Rockwell Automation



Kent Howard
President, Balluff Inc.
Balluff



Tony Shakib
VP, Business Development
IoT Vertical
Cisco Systems



Dr. Thomas Bürger
VP, Engineering
Automation Systems
Bosch Rexroth



Dr. Raimund Sommer
Managing Director,
Process Solutions
Endress+Hauser



Ikuo Tateishi
Omron

The Company Officers

- ▶ **Katherine Voss**, President & Executive Director
- ▶ **Rich Harwell**, Chief Technology Officer
- ▶ **Christopher Lynch**, Secretary
- ▶ **Jürgen Weinhofer**, Treasurer

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