

Latest news about OPC UA (and OPC Foundation)

OPC Day France – Dec 9th, 2022



Stefan Hoppe
President & Executive Director OPC Foundation
stefan.hoppe@opcfoundation.org

Agenda

- ▶ **Organization**
- ▶ **Technology: Status & roadmap**
 - **Field Initiative**
 - **Cloud Initiative**
- ▶ **Collaborations & Information Models**
- ▶ **Other News**
- ▶ **Call for Actions**

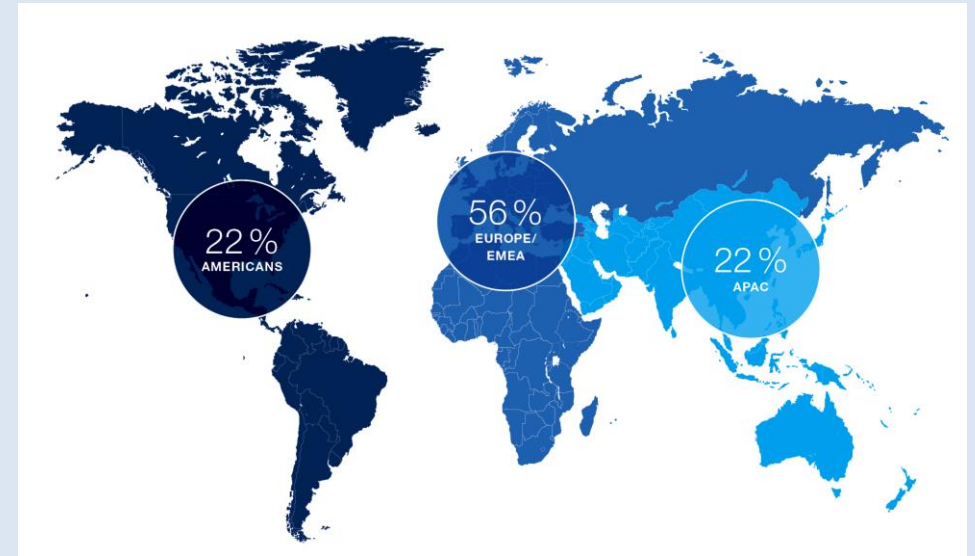
OPC Foundation <https://opcfoundation.org>

- ▶ Vision
 - Secure & reliable
 - Vendor, platform, and domain agnostic
 - interoperability from sensor to enterprise and beyond
- ▶ Global Profile
 - Non-profit organization (founded 1995)
 - Companies from Automation & IT
 - Internationally recognized: OPC UA is IEC62541
- ▶ Deliverables
 - Specifications: openly available
 - Tools and code examples: open source for faster, easier adoption (AnsiC/C++, C# .NET Standard, Java)
 - Certification: OPC Labs open to everyone
 - Marketing: Evangelize solution in various markets
- ▶ Ecosystem with toolkits and education
- ▶ Modern IPR policy



Organizational Overview

Membership: 899 (Status: Dec 7th, 2022)



Board of Directors (elected for 2022/2023)

Microsoft	Honeywell	Rockwell
SAP	Yokogawa	Schneider
Siemens	Mitsubishi	ABB
Beckhoff	Ascolab	VDMA



OPC Unified Architecture

Largest Ecosystem for Cross-domain Industrial Interoperability

895+ Member Companies



The Industrial Interoperability Standard

Open Scalable
Independent Secure
Robust and reliable International IEC standard
Transport extendable Modeling

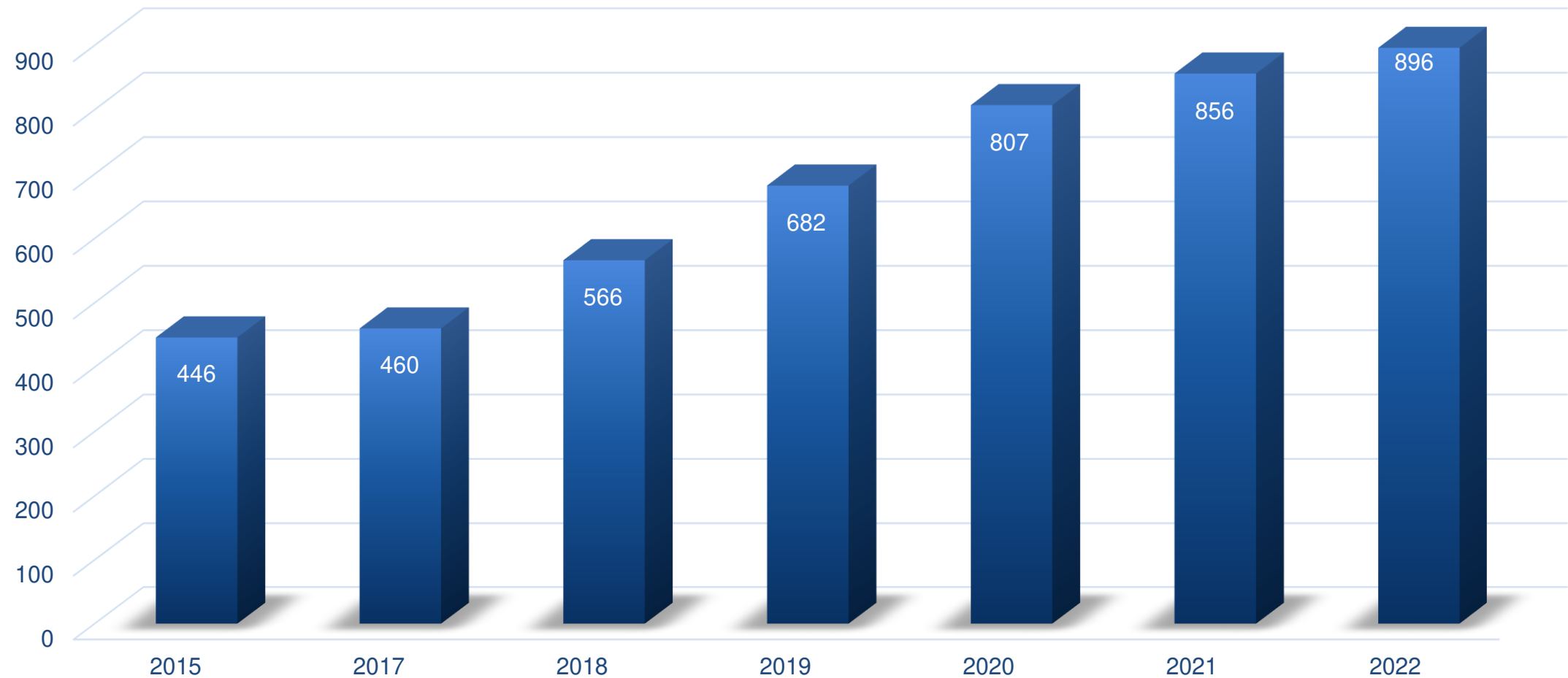
OPC World

Nov 12th, 2021: 850 members

Nov 12th, 2022: 896 members (40 from France)

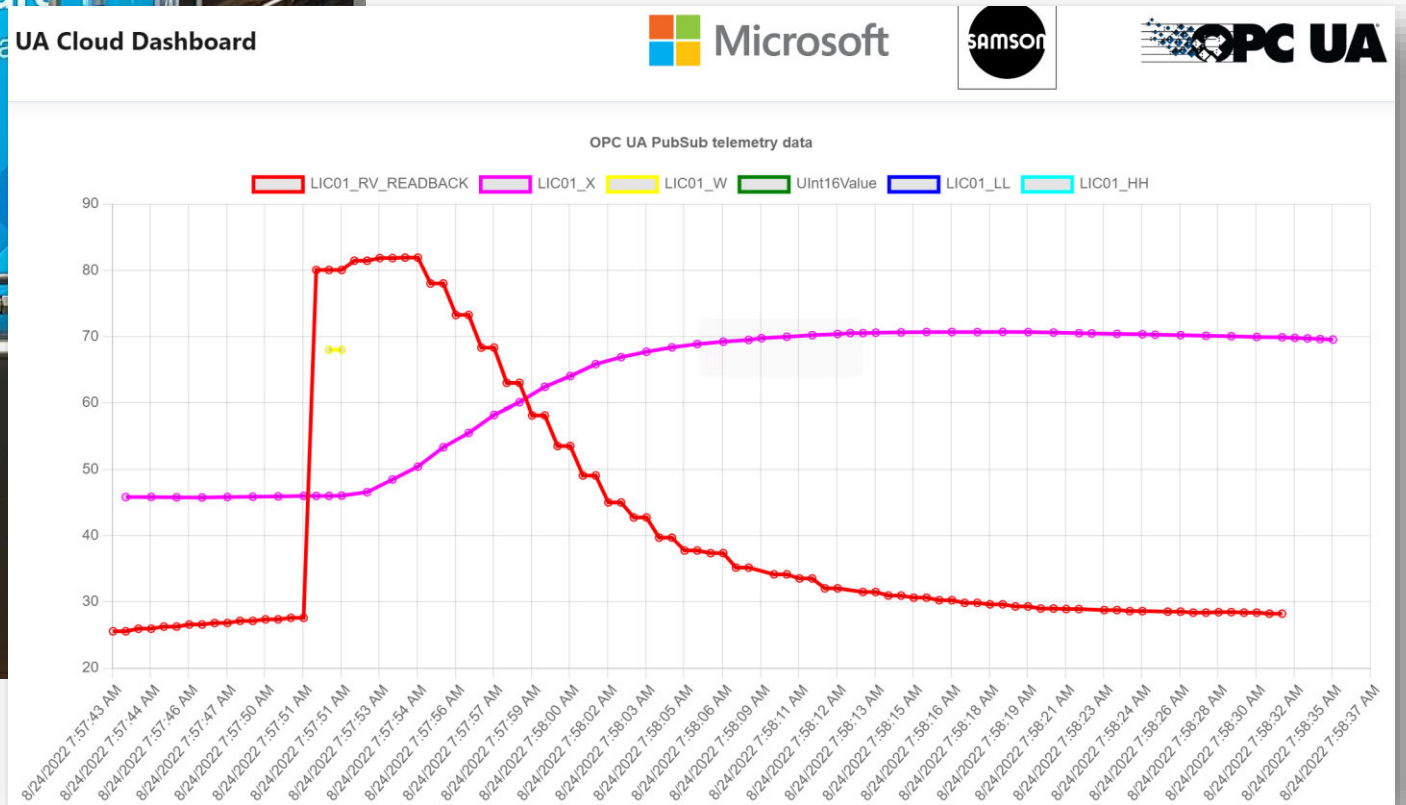
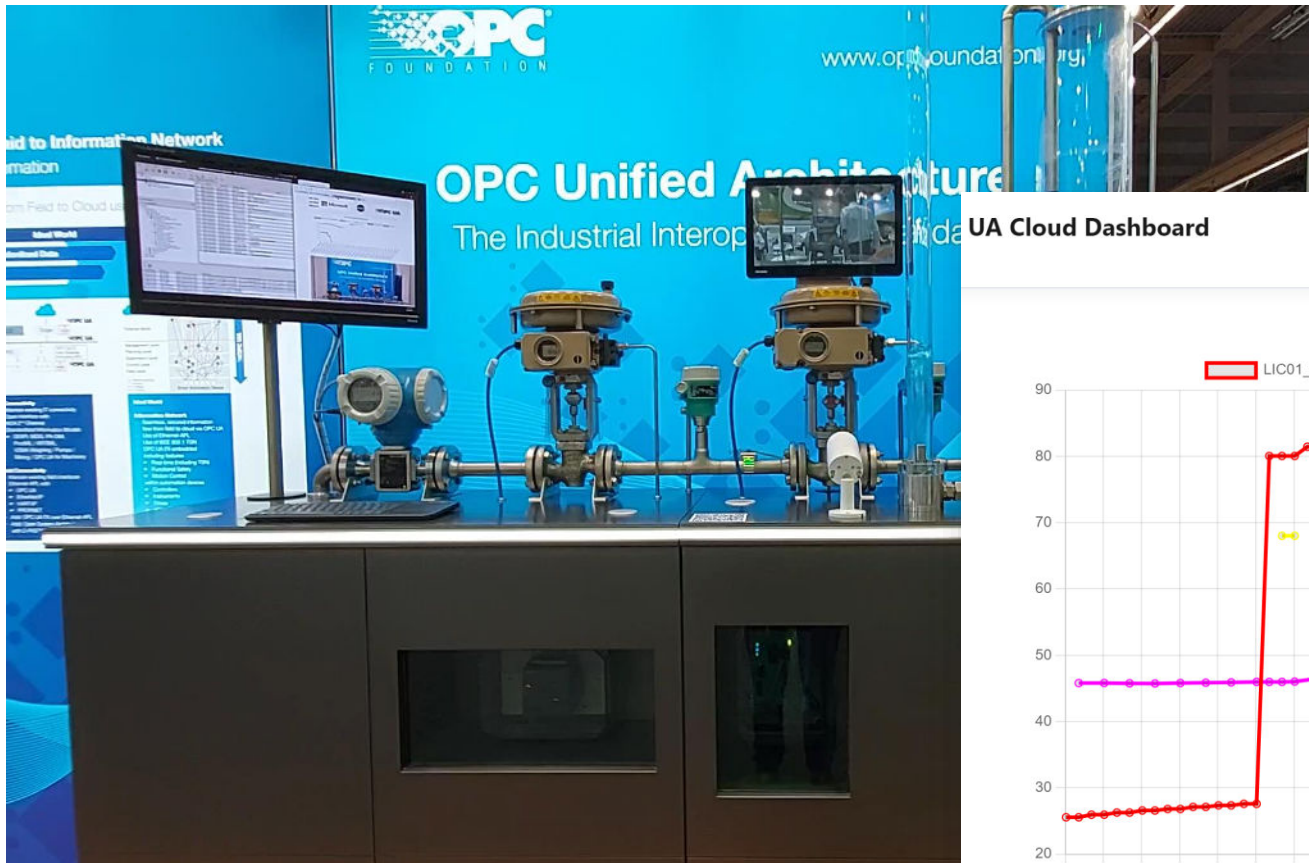
→ 46 new members within 1 year

OPC Foundation Membership Development



Achema 2022: New Class-A member SAMSON

Demonstrator OPC UA leverages MQTT



OPC Foundation – Budget 2022

Total Income	\$ 5,300,000
- Membership Dues	\$ 3,200,000
- Tradeshow Sponsors	\$300,000
- Interop, Certification, Newsletters, etc.	\$ 300,000
- Income FLC (some from savings)	\$1,500,000

Total Expenses	\$ 5,100,000
- Program Services (Marketing, Technical, ..)	\$ 2,500,000
- Support Services (Global)	\$ 1,100,000
- FLC Services	\$ 1,500,000

Total	
Total Income	\$ 5,300,000
Total Expense	\$ 5,100,000
Net Income	\$ 200,000

Numbers based on forecast.

Events 2022: Example Achema 2022

- 324sqm booth ! .. but in vacation time lot of partners canceled
- Partners: Member Siemens – and associations VDMA, FDT, Open Process Automation Forum, COPA
- Huge areas for
 - Technology
 - Field
 - Cloud
 - Collaborations
- 2 hours „OPC Day“



OPC UA:

Exclusively selected by major process industry initiatives

Sync meeting happened in Berlin 2022

OPC UA Adaption in Process Industry

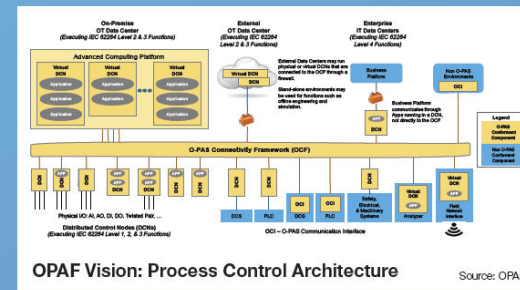
Associations selected OPC UA as their communication framework

Open Process Automation Forum (OPAF)



Mission

- Creating an open standards-based interoperable, portable, secure automation process control architecture



O-PAS is leveraging OPC UA

Version	Year	Theme	O-PAS™	Subject	Reference Standards
V1	2019	Interoperability	Part 1	Technical architecture	IEC 62596 (ISA-95)
V2	2020	Configurability Portability	Part 2	Security	IEC 62449 (ISA-99)
V2.1	2021	Control Functionality	Part 3	Process	I/A
V3	TBD	Application Portability System Orchestration & Physical Platform (Hardware)	Part 4	Connectivity Framework	IEC 62541 (OPC UA)
			Part 5	System management	DMTF (Platform)
			Part 6	Information and Exchange Models	IEC 62541 (OPC UA) IEC 62714 (AutomationML) IEC 62592 (ISA-15.2) IEC 61131-3 IEC 61498
			Part 7	Physical platform	TBD
			Part 8	Application Portability	TBD
			Part 9	System Orchestration	TBD

Source: OPAF

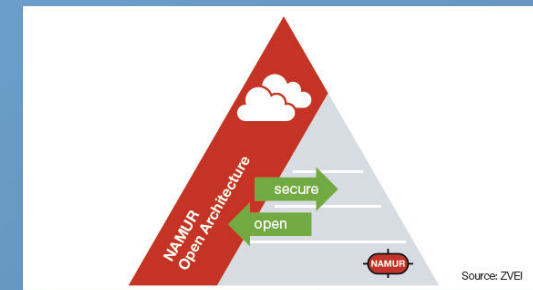
- Open heterogeneous multi-vendor control system
- OPC UA models used for connectivity framework and throughout for alarms, function blocks, information exchange, and execution engines

NAMUR Open Architecture (NOA)

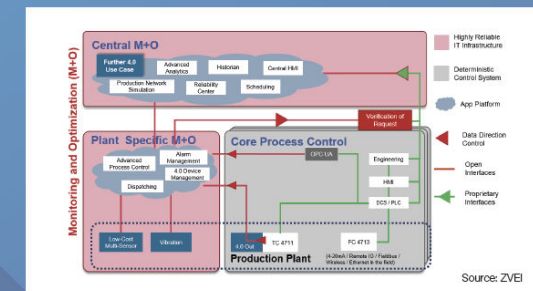


Mission

- Make production data easily and securely usable for plant and asset monitoring as well as optimization



NOA is leveraging OPC UA



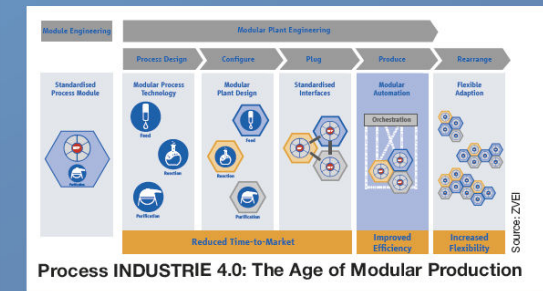
- OPC UA is the desired communication technology in NOA to connect the Core Process Control to Plant Monitoring and Optimization systems

NAMUR, PROCESSNET, ZVEI Module Type Package (MTP)



Mission

- Time reduction of automation engineering and commissioning
- Manufacturer-independent connectivity of equipment modules



MTP is leveraging OPC UA

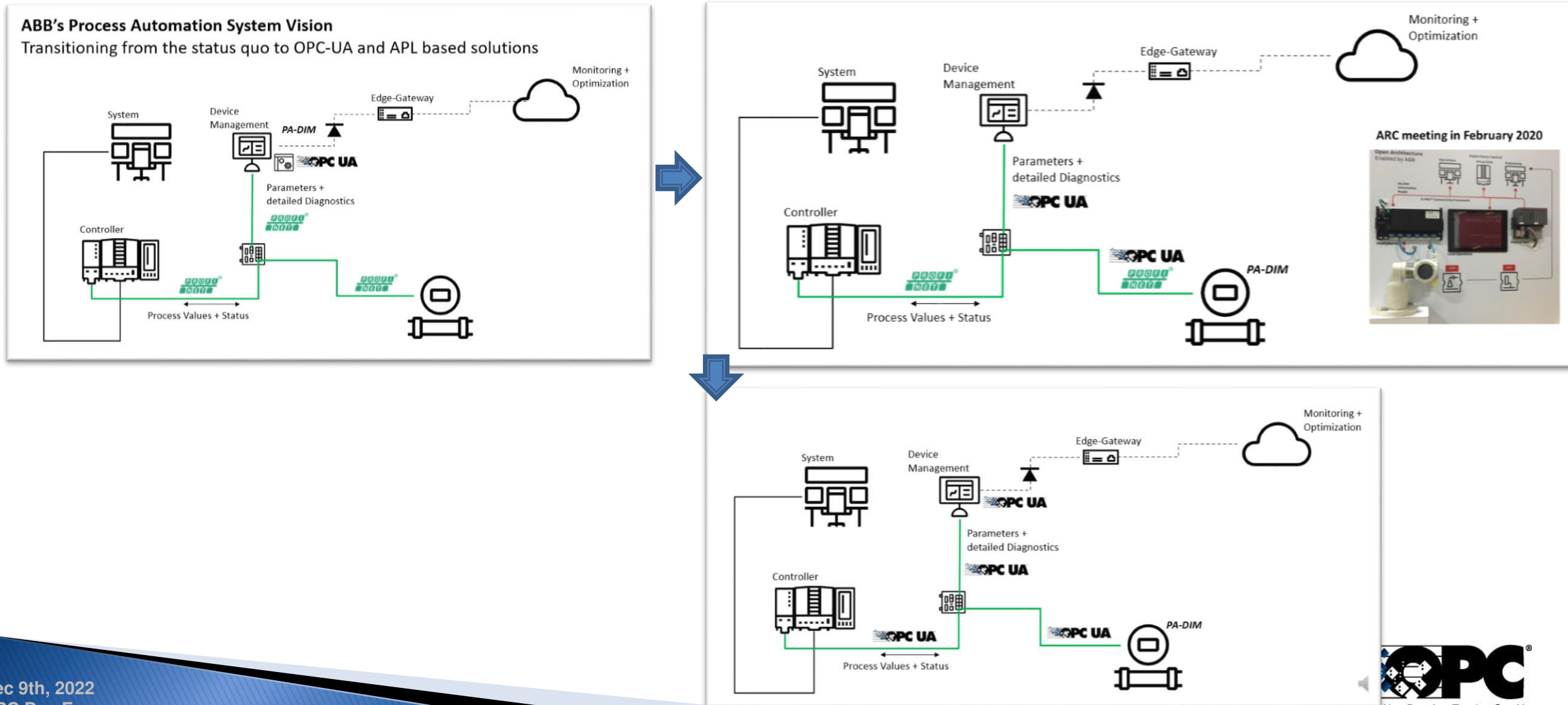
Domain Specific Typicals	Chemical Engineering	Automation Engineering
	Data and Services Model for Bio-Pharma Equipment BioPhorum Operation Group	Data and Services Model for XXXX Equipment XXX Group
Methods & Models	Modular Equipment and Plant Engineering VDM/DE 2776 DEXPI P41D	Module Type Package VDM/DE/NAMUR 2655 IEC 665/663/NP (MWP)
Serialization	Process Data Exchange ISO 15926	CAEX IEC 62424
Communication		OPC UA IEC 62541

Source: ARC Forum

- OPC UA (IEC62541) is today the only communication channel for MTP

Achema 2022: OPC Press Conference – ABB statement

- ABB's Process Automation System Vision: 3 Steps to OPC UA



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 - **Field Initiative**
 - **Cloud Initiative**
- ▶ Collaborations & Information Models
- ▶ News
- ▶ Call for Actions

OPC UA: One Harmonized Solution

News about Extending OPC UA to the Field



Visit us at: OPC Booth // Hall 5 – 140

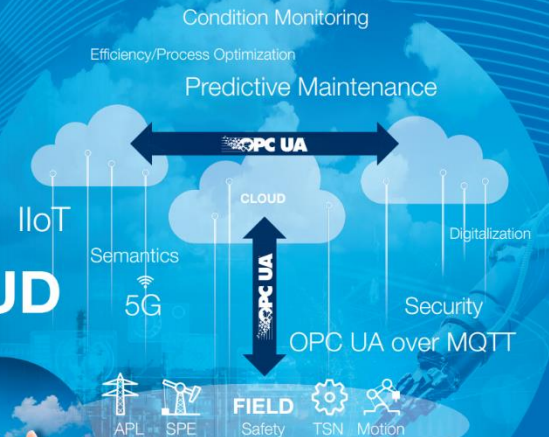
ONE HARMONIZED
SOLUTION FOR
PROCESS & FACTORY
SCALING FROM
FIELD TO CLOUD

OPC UA
FOR FIELD

Factory Automation
Process Automation

OPC UA
FOR CLOUD

OPC UA IIOT
STARTER KIT
AVAILABLE



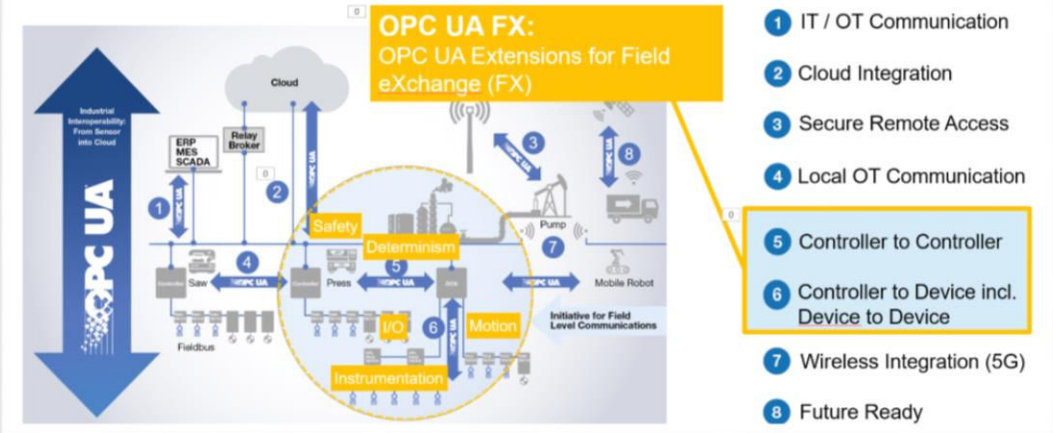
Four Years Field Level Communications (FLC) Initiative (11/2018 - 11/2022)



Press Conference November 2018



FLC Initiative to create OPC UA Field eXchange (FX) specifications:
Extending OPC UA to the field incl. Determinism, Safety & Motion

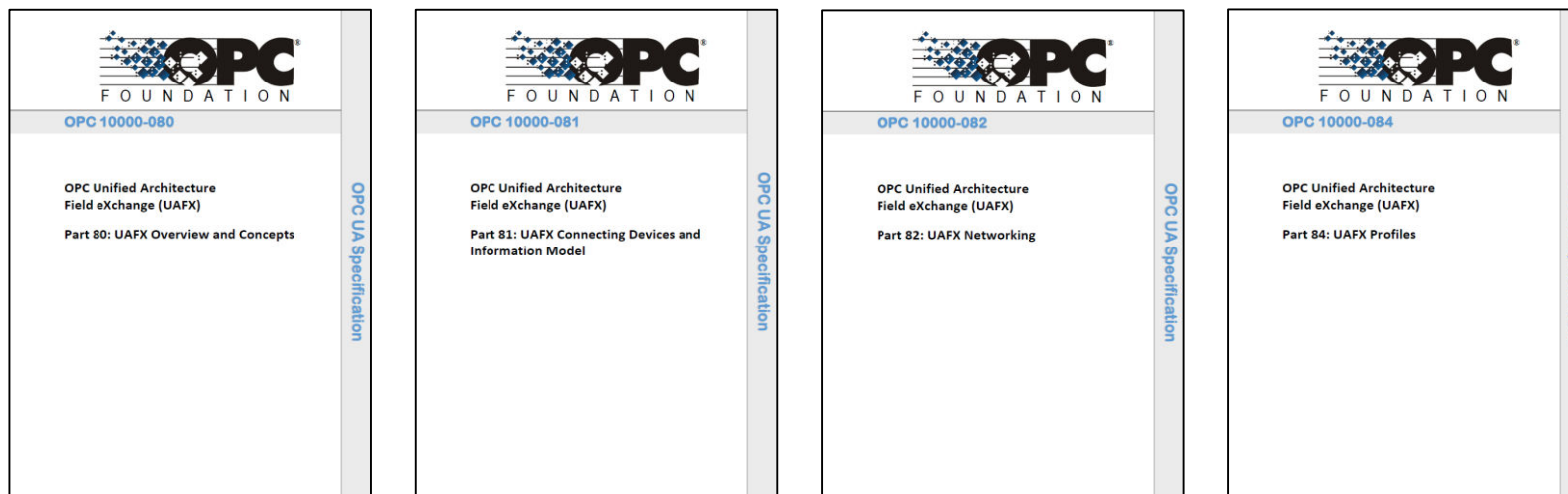


Members of the Field Level Communication (FLC) Initiative's Steering Committee



OPC UA FX Specifications: Parts 80, 81, 82 & 84

First Release



Congrats & Thanks to
more than 320 experts
from more than
65 OPCF member companies!

- ▶ **First Release published** with the focus on Controller-to-Controller (C2C)
 - Consists of 4 Parts (OPC 10000-080, 10000-81, 10000-082, 10000-084)
 - UAFX specifications have passed in-depth OPCF member reviews and extensive prototyping to ensure their implementations maintain cross-vendor interoperability
 - Automation vendors can now start adopting UAFX functionality in their offerings, and end-users can look forward to the advantages UAFX-based field communications offer
- ▶ **Test specifications & Test cases are being developed to provide conformance testing by end of Q2/2023**

OPC UA Safety Specification: Part 15

Upcoming Revision

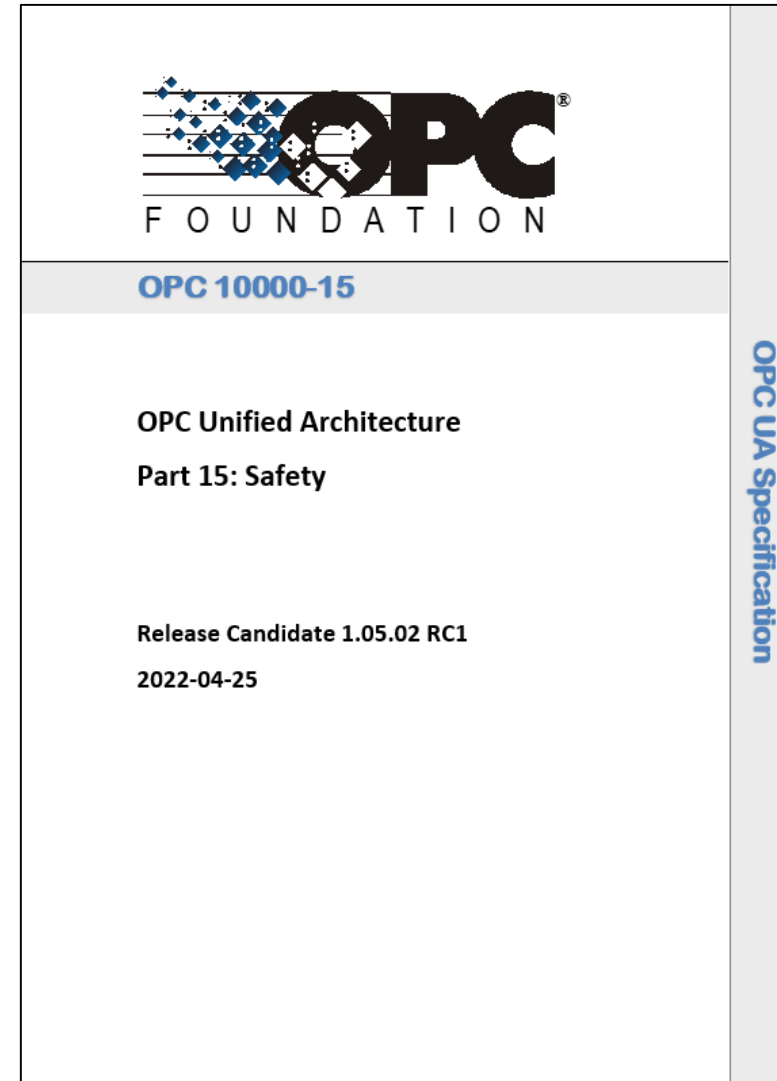
- ▶ OPC UA Safety Specification R 1.05.02 currently under member review, publication planned for Q4/2022

History:

- ▶ Cooperation with PROFIBUS & PROFINET International (PI) started in 02/2018
- ▶ Release 1.04: Client/Server support (10/2019)
- ▶ Release 1.05: PubSub support (11/2021)
- ▶ Release 1.05.02: Revisions

Related Activities:

- ▶ Safety Test Tool (UASCTT) and Safety Stack prototypes available
- ▶ TÜV Assessment & Certification planned for Q1/2023



SPS 2022: UAFX Controller-to-Controller Multi-Vendor Demo

OPC UA Field eXchange (FX): Extending OPC UA to the Field including Determinism, Instrumentation, Motion and Functional Safety

OPC UA for Field eXchange (FX)

Semantic Industrial Interoperability on Field level
Controller and Device: C2C, C2D, D2D



OPC UA for Field eXchange (FX)

Standardized Information flow between
different Vendors, Assets, Markets



OPC UA over 5G

Wireless and Functional Safety
Controller-to-Controller Communication
with OPC UA over 5G and OPC UA Safety



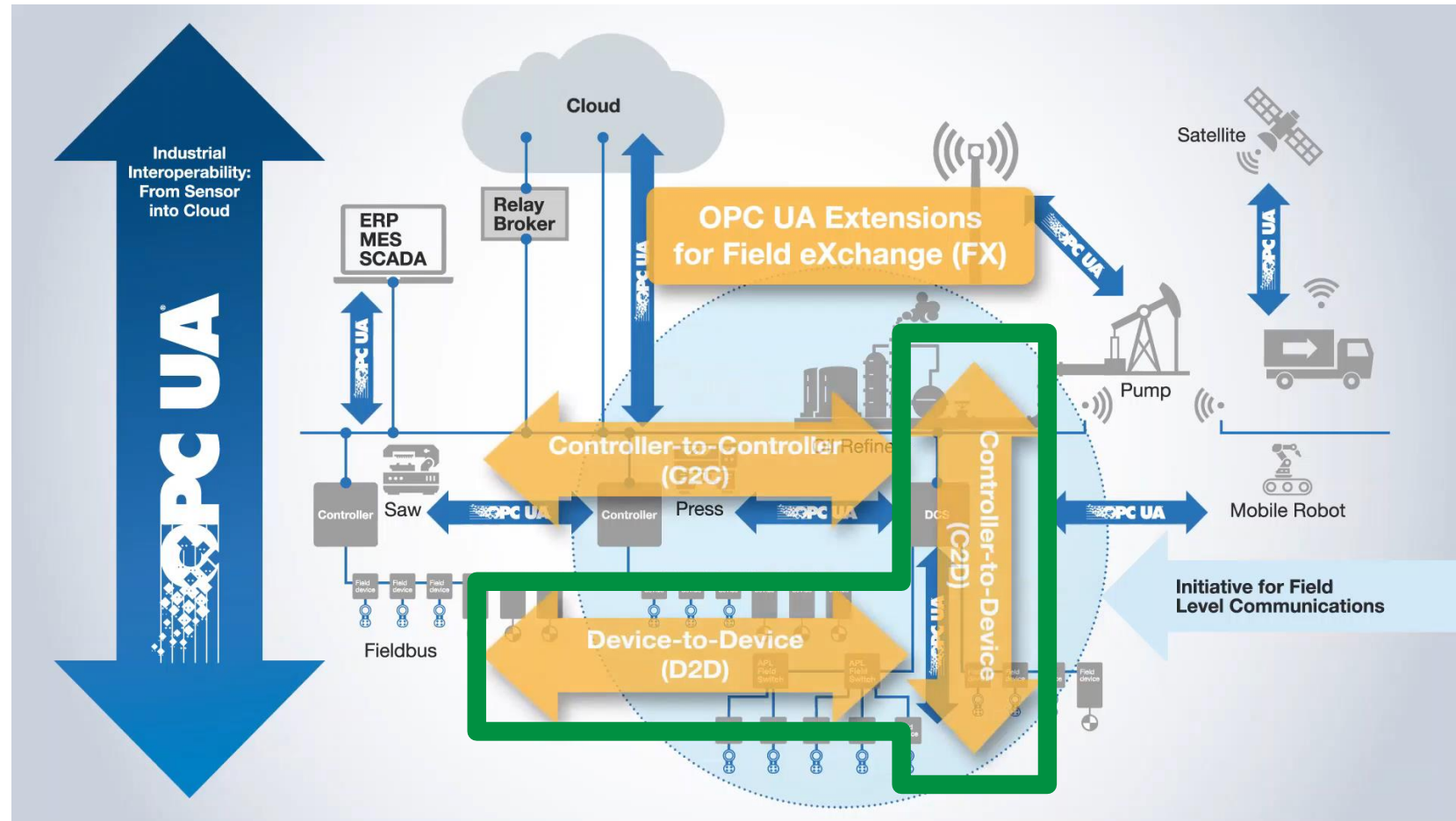
OPC UA Safety

Functional safety communication with OPC UA
using Client/Server and PubSub, supporting UAFX



FLC Initiative: Further Roadmap

- ▶ Kick-off Technical Work on Controller-to-Device (incl. Device-to-Device) held on July 26-28, 2022
- ▶ Handover of Requirements
- ▶ Work Items:
 - Parametrization
 - Networking
 - Diagnosis
 - Motion
 - Instrumentation
 - I/O
- ▶ Working group structure established



OPC UA for field: APL and TSN as enabler for OPC UA

- ▶ Ethernet APL and TSN are enablers for OPC UA
 - Ethernet APL is the enabler to scale from edge down to field to sensor
Integrate OPC UA into field devices to implement information model as near as possible at data source
 - OPC UA has strategic benefits for future compared to established fieldbus solutions
OPC UA provide data transfer, information modelling, Safety and IT security scaling from field to cloud
 - ABB announced to replace existing solutions with OPC UA over APL in future
- ▶ TSN is the enabler for deterministic real-time
At begin: Expected to be inside machines with fixed set of configuration like
 - ProfiNET over TSN
 - CC-Link over TSN
 - EtherCAT over TSN
 - OPC UA over TSN

Criteria for success at market: Speed, costs, easiness to enable (setup) and maintenance (diagnostic)

OPC UA: One Harmonized Solution

News from Cloud initiative



Visit us at: OPC Booth // Hall 5 – 140

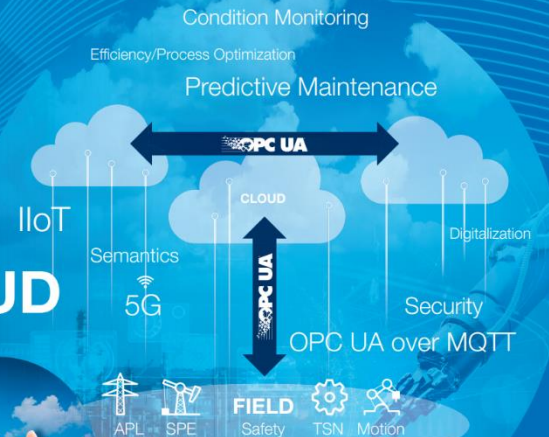
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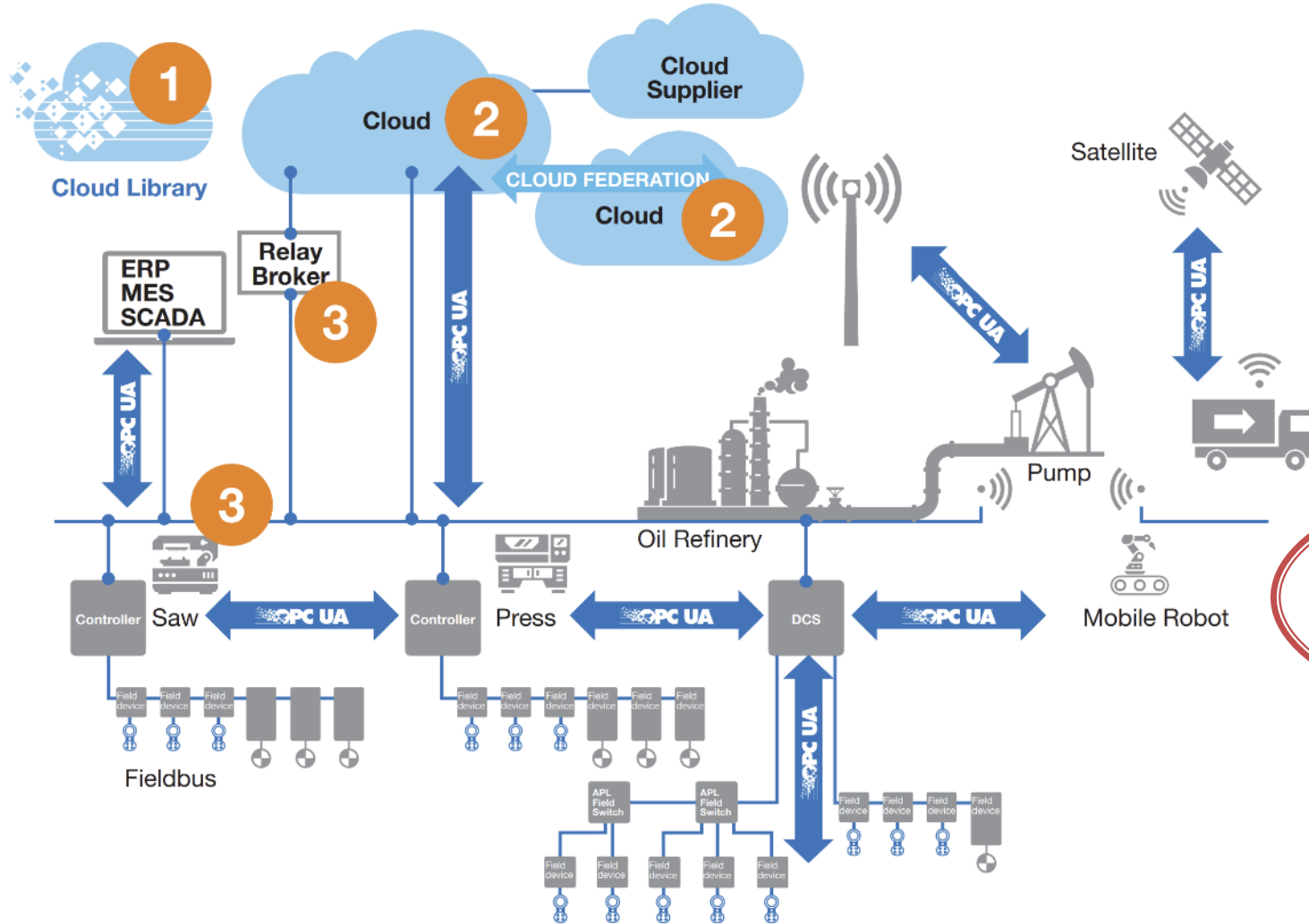
Factory Automation
Process Automation

OPC UA
FOR CLOUD

OPC UA IIOT
STARTER KIT
AVAILABLE



UA Cloud Initiative



1 Cloud Library

- Repository for OPC UA based information models (IMs)
- Upload, store, search, download IMs

2 Cloud Federation

- Standardized communication
- Cloud to Cloud

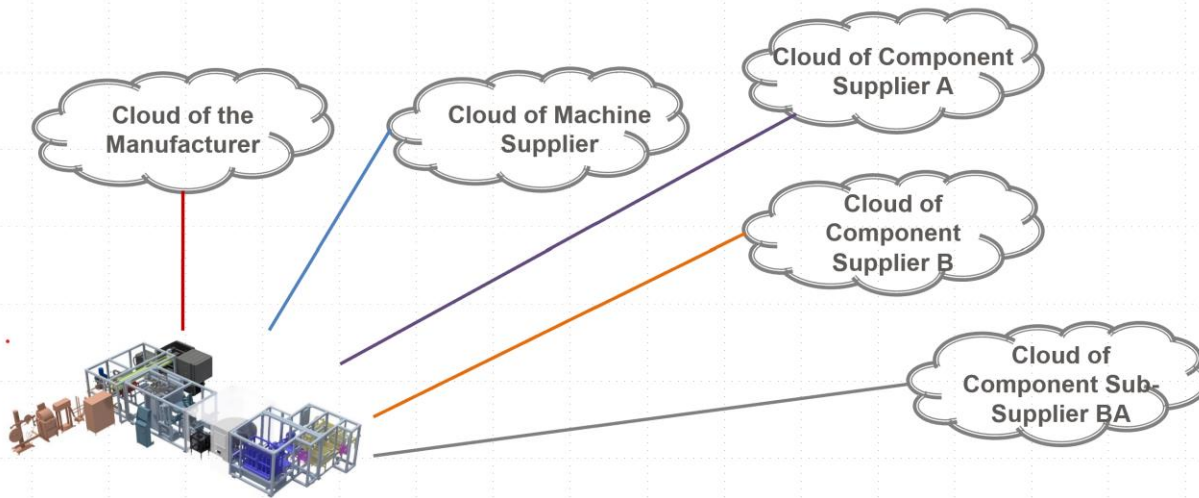
3 Asset / Edge / Cloud

- Standardized communication
- Field to Cloud
- Cloud to Field

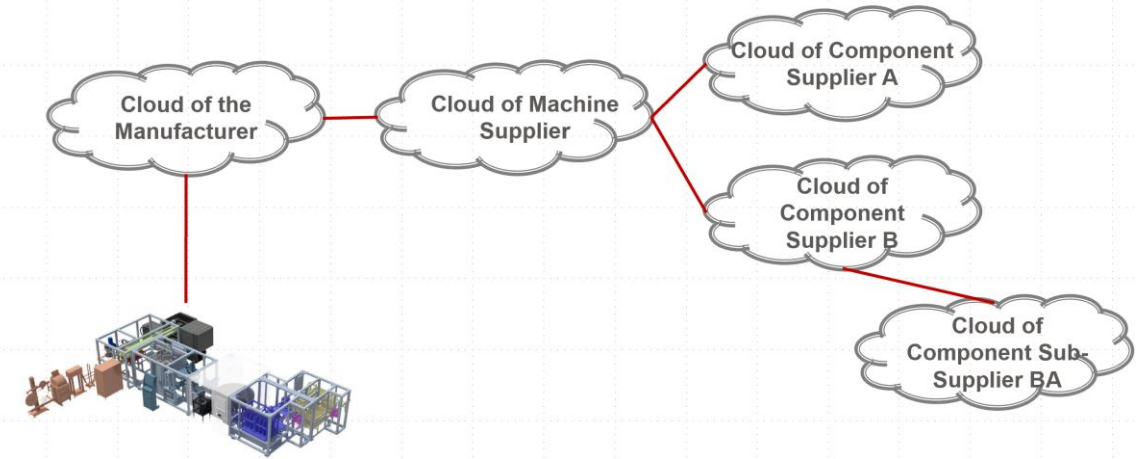
4 Education, IIOT Starter Kit

- Success stories

Industrial Cloud Federation: Networked Communication



Machine at manufacturer's site



Machine at manufacturer's site

- June 2021: Start of JWG “OPC UA for Industrial Cloud Federation”
- Cooperation between DIN and OPC Foundation – based on results of DIN92222
- 2 work items on verification of connected clients
 - Manufacturer-Broker need to be configured “who is allowed to consume what information”
 - Manufacturer-Broker verify the connected supplier-clients/broker and the communication topics

Define mapping of data

Group handed over a proposal to OPC UA core team to get integrated into OPC UA Part 14 PubSub

2021: Support by 2 OT companies and 1 IT company

Challenge:

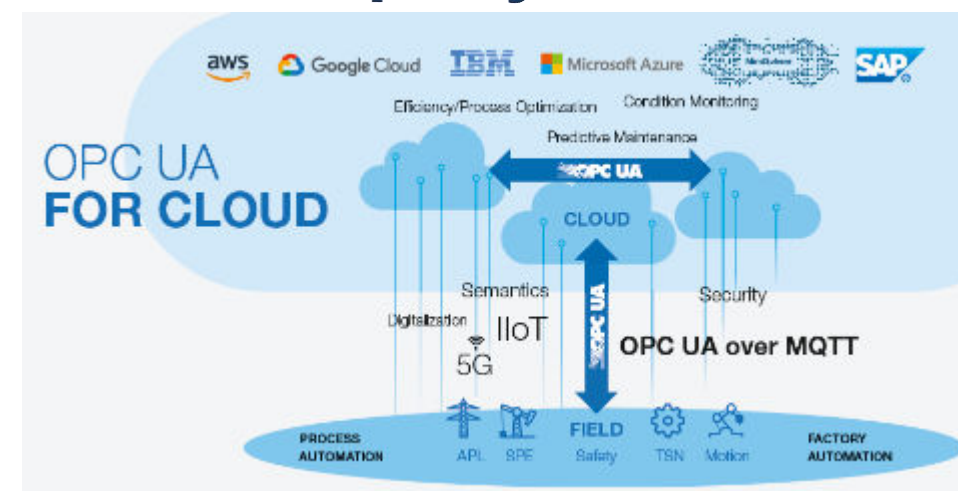
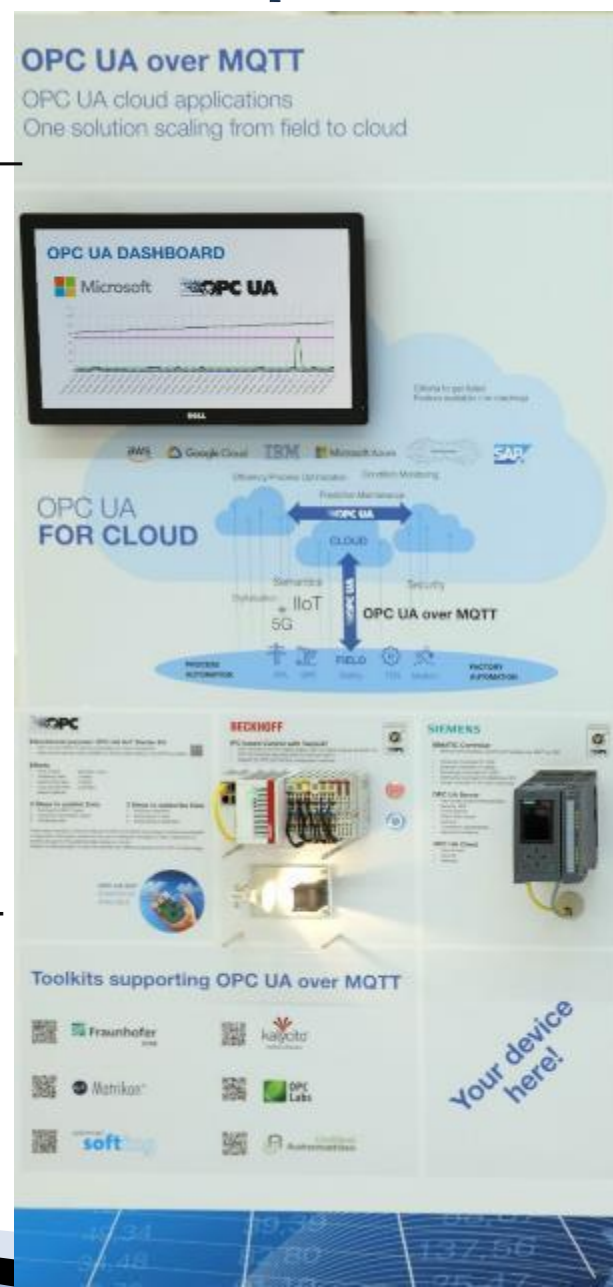
- MQTT is set as transport to cloud
BUT: MQTT does not define payload – results in multiple company or consortia mapping definitions

Solution:

- OPC UA Pub/Sub (over UDP and MQTT) published in Feb 2018
- Different bindings (JSON/BINARY) for different use-cases

Eco-System:

- Major cloud suppliers like aws, GoogleCloud, IBM, MS Azure, MindSphere, SAP confirmed to support „OPC UA over MQTT“
- Implementers of OPC UA over MQTT Beckhoff, Siemens,
- UA IIoT Starterkit / Toolkits available
- Plugfest is established – live!



News Release

Leading IoT Vendors Commit to OPC UA Adoption

Major IoT vendors including AWS, Google Cloud, IBM, Microsoft, SAP and SIEMENS leverage secure, standardized information exchange in edge-to-cloud applications based on OPC UA

Scottsdale, AZ – February 1st, 2022 – Leading Internet-of-Things (IoT) vendors are adopting OPC UA technology for edge-to-cloud applications. The growing list includes Amazon Web Services (AWS), Google Cloud, IBM, Microsoft, SAP and SIEMENS.

Key drivers behind this progression are, first and foremost, the global adoption of OPC UA as the open standard of choice for secure production-system interoperability across OT and IT networks, leveraging standardized data exchange. As such, there are over 850 registered OPC Foundation members supporting a large, rapidly growing eco-system of end-users, standards bodies, and vendors.

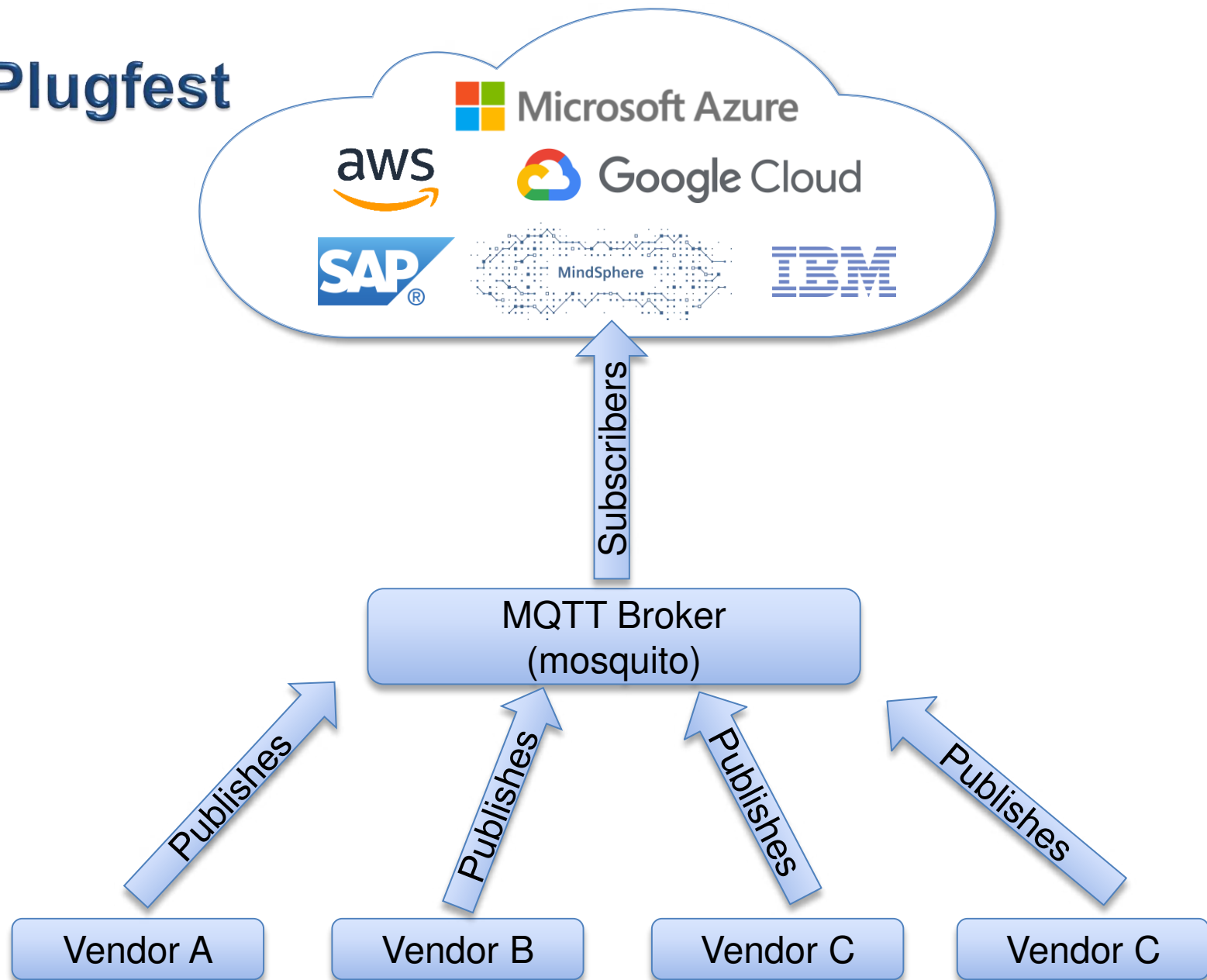
Second, OPC UA uses a standardized method of defining, discovering, and using Information Models (IMs) and services associated with the production systems. This standardized approach to semantic information sharing prevents vendor lock-in and costly custom programming needed for non-standard IM ingestion in the cloud. With the launch of the UA Cloud Library, OPC UA IMs are globally available to all cloud applications, making it easy for cloud applications to directly utilize OPC UA-based semantic information as well as live data coming from the edge.

**Feb 01st, 2022 OPC Foundation PR:
Leading IoT Vendors Commit to OPC UA Adoption**
<https://opcfoundation.org/news/press-releases/>



OPC UA over MQTT Plugfest

- ▶ OT faster with adaption then IT
- ▶ Participating vendors
 - Beckhoff
 - Kalycito
 - KUKA
 - Matrikon
 - Mettler Toledo
 - Microsoft
 - OPC Labs
 - Pilz
 - Prosys OPC
 - Phoenix Contact
 - Siemens
 - Softing
 - Systerel
 - TRUMPF
 - Unified Automation
 - VDW
 - WAGO



SPS 2022:

Cloud giant AWS supporting OPC UA PubSub over MQTT

OPC UA over MQTT

Directly from the device to the cloud
Interoperability for cloud connectivity



OPC UA: Interoperability for Cloud Connectivity

Semantic, normalized data directly available in cloud services
Open eco-system – international accepted – vendor independent – multi-domains

Available on





Challenge

- MQTT is not as transparent to cloud, BUT:
- MQTT is a "payload agnostic" protocol
- No definition of the message payload
- Results in multiple company or consortia mapping definitions

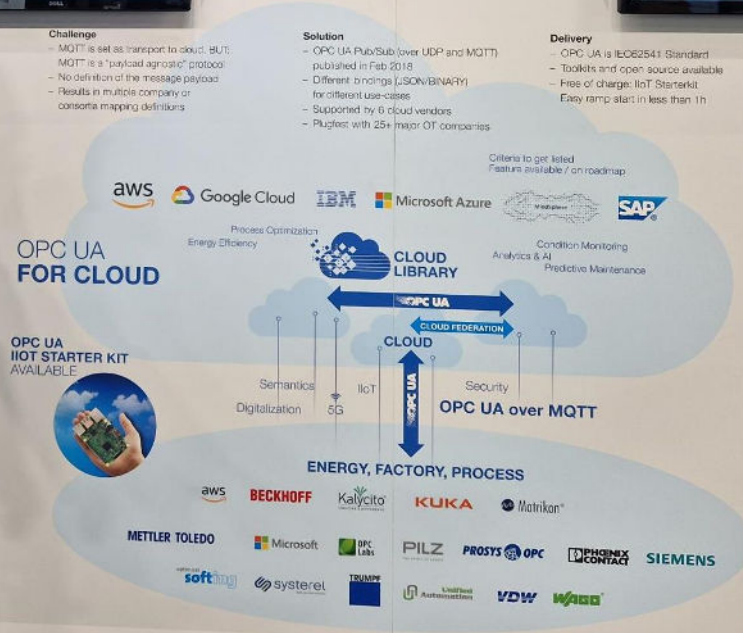
Solution

- OPC UA PubSub (over UDP and MQTT) published in Feb 2018
- Different bindings (JSON/BINARY) for different use-cases
- Supported by 6 cloud vendors
- Plugfest with 25+ major OT companies

Delivery

- OPC UA is IEC 62541 Standard
- Toolkits and open source available
- Free of charge: IoT Starterkit
- Easy ramp start in less than 1h

Criteria to get listed
Feature available / on roadmap



OPC UA FOR CLOUD

Process Optimization
Energy Efficiency

Condition Monitoring
Analytics & AI
Predictive Maintenance

OPC UA IIOT STARTER KIT AVAILABLE

ENERGY, FACTORY, PROCESS

Logos: AWS, Google Cloud, IBM, Microsoft Azure, SAP, Beckhoff, KUKA, Matrikon, Siemens, etc.





Monitor Health of Industrial Assets with AWS IoT

- Remotely Control & Monitor Machines from Multiple Sites
- Observe Operational Health Data with Digital Twins
- Preemptive Maintenance through Machine Learning

OPC UA: Interoperability for Cloud

Semantic, normalized data directly available for the cloud
Open eco-system – International IEC 62541 standard



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SEMANTIC Interoperability: The key for the digitalization

Generic Device Models: Cloud, Controller, Field Device, Process Device	Manufacturing Devices: Robots, Machines, Machine Tools	Enterprise, Asset Mgmt, Packaging
– OPC 30400 – UA for Cloud Library – OPC UA for Cloud Federation* – OPC 10000-100 – UA for Devices – OPC 10020 – UA for Analyzer Devices – OPC UA for Analytical System Integration (CAISI) (under prep) – OPC 30000 – UA for PLCs based on IEC 61131-3 – OPC 30001 – UA for IEC 61131-3 Function Blocks – OPC 30010 – UA for AutoID Devices – OPC UA for Laboratory Devices (LADS)* – OPC 30081 – UA for Process Automation Devices (PA-DIM) – OPC UA for Power Consumption Management* – OPC UA for Global Positioning*	– OPC 40001-1 – UA for Machinery – Basic Building Blocks – OPC 40001-100 – UA for Machinery – Result Transfer – OPC 30070-1 – UA for MTConnect, Part 1: Device Model – OPC 40502 – UA for Computerized Numerical Control (CNC) Systems – OPC 40501 – UA for Machine Tools – OPC 40083 – UA for Plastics Rubber – General Types – OPC 40077 – UA for Plastics Rubber – Injection Moulding Machines to MES – OPC 40079 – UA for Plastics Rubber – Injection Moulding Machines to Robot – OPC 40082-1...n – UA for Plastics Rubber – <device> – OPC 40084-1...n – UA for Plastics Rubber – Extrusion – OPC 40100 – UA for Machine Vision – OPC 40010 – UA for Robotics – OPC 40200 – UA for Weighing Technology – OPC 40451 – UA for Tightening Systems – OPC UA for High Pressure Die Casting* – OPC UA for Powertrain* – OPC UA for Surface Technology* – OPC 40550 – UA for Woodworking Machinery – OPC 40301 – UA for Flat Glass Processing – OPC 40223 – UA for Pumps and Vacuum Pumps – OPC 40250 – UA for Compressed Air Systems – OPC UA for Intralogistics Communication* – OPC UA for Process Air Extraction and Filtration (PAEFS)* – OPC UA for Fibre and Yarn Testing Devices (FYTD)* – OPC 40560 – OPC 40569 – UA for Mining (Release Candidate) – OPC UA for Geometrical Measuring Systems* – OPC UA for Cranes and Hoists*	– OPC 10030 – UA for ISA-S95 – OPC 10031-4 – UA for ISA-95 Job Control – OPC UA for Mimosi CCOM* – OPC 30280 – UA for OpenSCS Serialization Model – OPC 30261 – UA for OPEN SCS – Job Order Profiles – OPC 30050 – UA for PackML (OMAC) – OPC 40600 – UA for Weihenstephan Standards – OPC 30270 – UA for Industrie 4.0 Asset Administration Shell
Oil & Gas		Engineering
– OPC 30020 – UA for MDIS – OPC UA for Energetics ProdML* – OPC UA for Energetics WitsML*		– OPC 30250 – UA for DEXPI – OPC 30040 – UA for AutomationML
Energy		Field Device Integration
– OPC 10040 – UA for IEC 61850 – Electrical Substation Automation (Release Candidate) – OPC UA for UA for Wind Power Plants (IEC61400-25)*		– OPC 30080 – UA for Field Device Integration (FDI) – OPC 30090 – UA for Field Device Tool (FDT)
Building		Field Communication
– OPC 30030 – UA for BACNET (Release Candidate)	Miscellaneous	– OPC 30100 – UA for SERCOS Devices – OPC 30110 – UA for POWERLINK – OPC 30130 – UA for Control & Communication System Profile (for Machine) CSP+ (CCLink) – OPC 30120 – UA for IO-Link Devices and IO-Link Masters – OPC 30140 – UA for PROFINET – OPC 30141 – UA for PROFinergy – OPC 30142 – UA for PROFINET Remote IO – OPC UA for CIP Devices*
	– OPC 30060 – UA for Tobacco Machines – OPC 30200 – UA for Commercial Kitchen Equipment	

► 85+ groups with domain experts have defined the semantics for their verticals

► Largest eco-system for information models for the automation world

► New landing page with complete overview here:
www.opcfoundation.org ->
[About](#) -> [Working Groups](#) ->
[List of Working Groups](#)

Collaborations – Status overview working groups

Status Sept 2022: 12 releases and 5 new working groups

► Releases

- OPC 10000-1..24, OPC UA v1.05
- OPC 10000-100, Device Model v1.03
- OPC 10000-110, Asset Mgmt Basics
- OPC 10000-200, Industrial Automation v1.01
- OPC 30400-1..2, Cloud Library
- OPC 30080, FDI v1.03
- OPC 30142, PROFINET-RemoteIO
- OPC 40001-1 Machinery Basic Building Blocks v1.02
- OPC 40501-1 Machine Tools v1.01
- OPC 40084-1..12 PlasticsRubber-Extrusion v2.00
- OPC 30060 Tobacco Machinery v2.00
- OPC 4056n Mining

► New Working Groups

- Power Consumption Mgmt
- Additive Manufacturing
- Analyzer System Integration
- Global Positioning
- OPC UA for CAISI”
Common Analytical Instrumentation
System Integration

Power Consumption: Joint activities including OPCF, PNO, ODVA and VDMA

► Development of energy management interfaces for IoT technologies

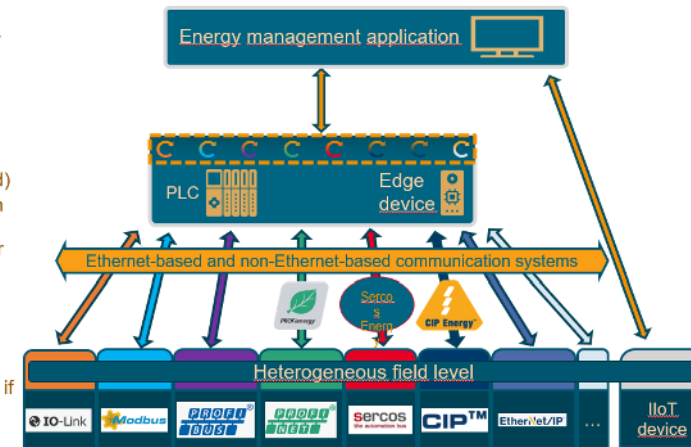
→ With the help of an energy information model

- Unification of energy information in an energy information model
- Use of energy information from different sources of the heterogeneous field level
- Development of the energy information model based on existing standards and OPC UA

State of the Art - Communication of energy information



- Energy information originate of different sources of a heterogeneous field level
- Challenges for plant operator to use energy information in the energy management application
 - Different communication interfaces (Ethernet-based and non-Ethernet-based)
 - Different semantics of energy information
 - Existing approaches for standardization → energy profiles (e. g. PROFenergy for PROFINET)
 - Have individual semantics
 - Lowers the effort for energy program development
 - High engineering effort to communicate energy information into upper levels
 - Unification of energy information needed if different source should be used



VDMA | Power Consumption Management | Heiko Herden

05.11.2022



**OPC UA
FOR A HARMONIZED
ENERGY MODEL**

www.opcfoundation.org/podcast



**PROF. DR.
KARL-HEINZ
NIEMANN**
UNIVERSITY OF
APPLIED SCIENCES,
HANNOVER

OPC Foundation: Promise for OPC UA based, secured Industrial Interoperability

**Interoperability
Robustness & Security**

Vendor, Platform, Market and OS
Independent

Scalable From Sensor to Cloud

**Discoverable Services Oriented
Architecture**

Independent of transport protocol

Non-Profit (OPC Foundation)

Widely Adopted: >50M install base

Open Source on GitHub

Security Design from Ground up

**66+ Joint Working Groups
Data Modelling/Harmonization**

Graph Support, preserves source context

Vendor **extendable** data model via
Companion Specifications

Relevant: Enables domain specific
information models

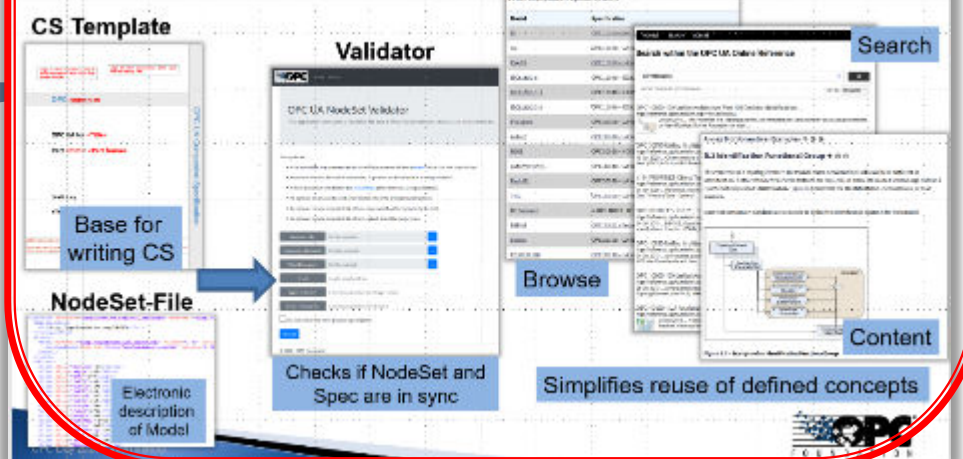
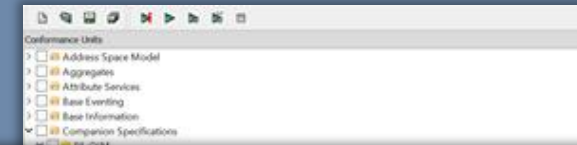
- Discrete: Robotics, Machine Vision, ...
- Process: FDI, FDT, PA-DIM, MDIS, NOA..
- Energy: IEC61850, ..

**Validating / Certification
Online Reference**

Validation of Companion Specs

Compliance Test Tool (CTT): Open available
1800 test scripts for the OPC UA core functionality
and for the Companion Specifications
e.g. for PA-DIM / PLCopen / MDIS / ...

Online Reference: Public reference with all models



CTT Availability

- ▶ CTT is available for free for Corporate Members of the OPC Foundation
- ▶ CTT is available for 1000 USD for non-paying members of the OPC Foundation
- ▶ OPCF has rules to share with collaboration partners during WG by providing a time limited CTT version
- ▶ Download:
<https://opcfoundation.org/developer-tools/certification-test-tools>

Agenda

- ▶ Organization
- ▶ Technology: Status & roadmap
 - Field Initiative
 - Cloud Initiative
- ▶ Collaborations & Information Models
- ▶ News
- ▶ Call for Action

New: .NET User Group

- ▶ Group of companies to increase quality of the stack and integrate additional functionalities
- ▶ Focus on IT/cloud-connected scenarios
- ▶ Complementing, not competing with commercial toolkits
- ▶ 3 initial funder OPCF Board of Director companies: ABB, Microsoft, SAP
- ▶ No change in licensing
.NET OPC stack will remain available to OPC members and as Open-source release

GitHub: <https://github.com/OPCFoundation>

Nov 8th, 2022: OPC Foundation press release



News Release

OPC Foundation welcomes the new ".NET User Group" to maintain the open-source UA-.NET Standard project

ABB, Microsoft, and SAP have joined forces to extend and enhance the OPC Foundation's open-source .NET offerings

Scottsdale, AZ – November 8th, 2022 - The OPC Foundation (OPCF) welcomes the launch of the ".NET User Group" initiated by three companies represented on the OPC Foundation Board of Directors ABB, Microsoft, and SAP. This group aims to maintain and extend the existing open-source "UA-.NET standard" project, which is available on GitHub. All three companies use this open-source project in their products in addition to commercial solutions.

Each company is donating a full-time development resource to coordinate the future direction of the initiative, increase project quality, and implement new features. This ensures that important extensions to the standard, like ECC security, are integrated in a timely manner. Through coordinated project management, the group is helping all users, and the broader developer community, to more quickly and easily implement OPC UA in their applications. The initiative is open for additional OPC Foundation members and encourages the public to continue their contribution to the open-source project.

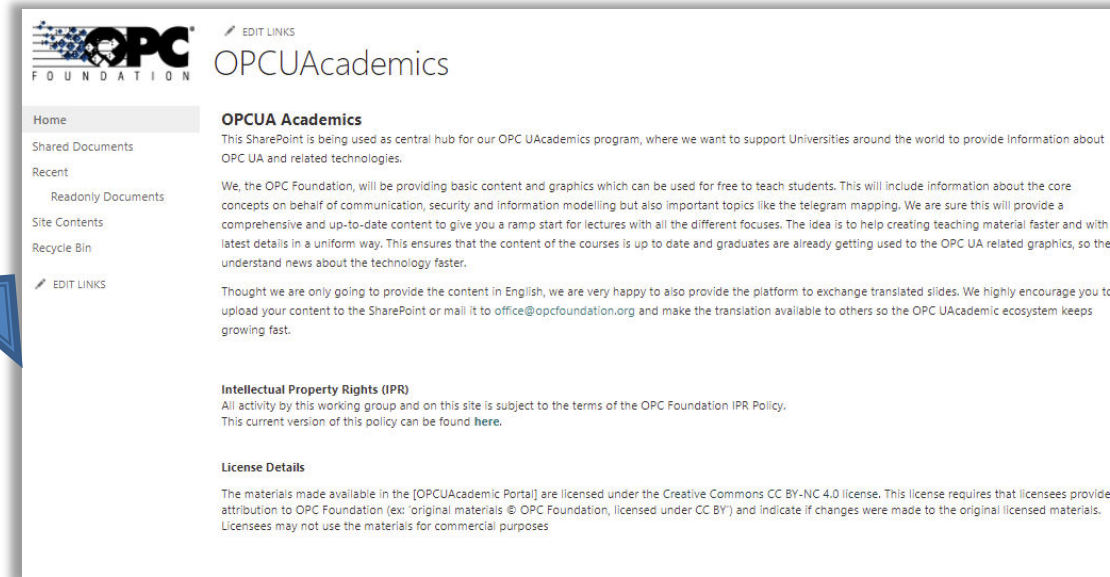
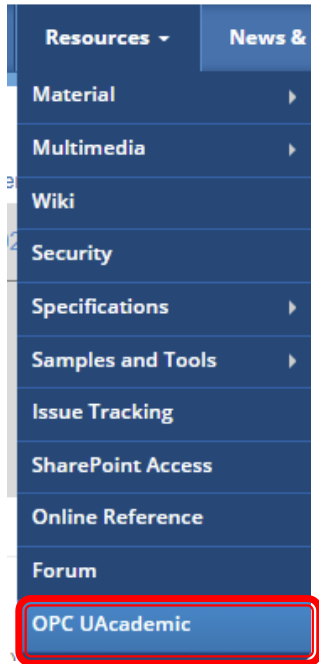
With the engagement of the new .NET User Group Initiative, there will be no change to the existing license of the UA-.NET code on GitHub: The dual license allows RCL for OPC Foundation corporate members and GPLv2 for others. RCL allows corporate members to use the code in their products without opening their own additional implementation.

Mr. Martin Regen from Microsoft chairs the .NET User Group Initiative. The three founding companies manage the UA-.NET Standard development. The UA-.NET Standard project is still freely available to all developers for use in their in-house and commercial applications. OPC Foundation members who want to help maintain the UA-.NET project are welcome to join the initiative. To get started, the OPC Foundation invites interested parties to contact Martin Regen by email martin.regen@microsoft.com.

Claudius Link, of SAP, commented, "For SAP customers, transparency and fluid availability of manufacturing data is critical. Openness and industry-wide accepted standards are indispensable to connect SAP applications with equipment and systems on the shop floor. We are excited to be one of the founders of the '.NET User Group', where we continue to develop and maintain the OPC UA-.Net Standard library in an open-source community."

Stefan Hoppe, OPC Foundation President, said, "One of the OPC Foundation special advantages is the strength of our community where members from diverse industries and competing companies regularly work together to improve the OPC UA standard and make it easier to adopt. The .NET User Group Initiative is an excellent example of this process in action." Mr. Hoppe concluded, "The OPC Foundation

OPC UAcademics



- Done: (100%) Recording of the slides done - professors see/hear what we want to highlight with a slide
- Done: Translate to Chinese done
- Next:
Translation to other languages like Japanese, French, Spanish, Arabic

OPC UA: IIoT Starter Kit – available – shows easiness of OPC UA

Efforts

- ▶ Publicly available <https://github.com/OPCFoundation/UA-IIoT-StarterKit>
- ▶ Educational purpose – open source - no commercial aspect
- ▶ Show easy user experience for OPC UA PubSub incl. semantics
- ▶ Learn cloud communication via OPC UA over MQTT
- ▶ Success in less than 1 hour

Efforts

- | | |
|-------------------------------------|------------------|
| ▶ Time in total | less than 1 hour |
| ▶ Publishing data | 3 Steps |
| ▶ Subscribing data | 3 Steps |
| ▶ Cost savings from lessons learned | Unlimited |

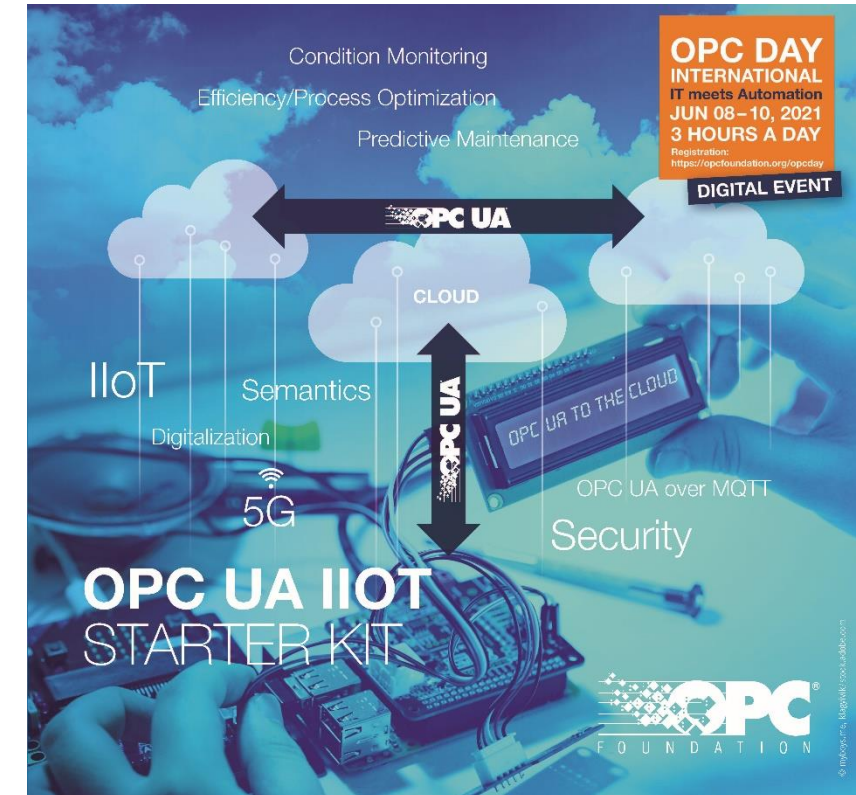
3 Steps to publish Data

- ▶ 1. Running the MQTT Agent
- ▶ 2. Chose the information model
- ▶ 3. Publishing data

3 Steps to subscribe Data

- ▶ 1. Discover publishers
- ▶ 2. Subscribing to data
- ▶ 3. Subscribing to MetaData

Delivered June 2021



eBook – 7th edition (under prep)

- ▶ eBook <https://opcfoundation.org/resources/ebooks/>



- ▶ Concept
 - Publish 3 editions per year
 - Content is about podcasts, success stories etc.
- ▶ OPCF regions
 - Content is available for local language channels
 - Call for action: Please provide content

eBook – Edition 7 published Dec 9th, 2022



Success Stories

- ▶ <https://opcfoundation.org/resources/case-studies/>

Resources ▾	News & Events ▾
Material ▶	Presentations
Multimedia ▶	Logos
Wiki	Brochures
Security	eBooks
Specifications ▶	Case Studies
Samples and Tools ▶	Technology Articles
Issue Tracking	Whitepapers
SharePoint Access	Books
Online Reference	hule

- ▶ equinor, Microsoft, Prediktor
- ▶ Renault & Google Cloud
- ▶ Miele & Microsoft
- ▶ Rosendahl-Nextrom, Siemens



Call for action:
Provide your end customer success story

Huge number of initiatives

- Large enterprise companies have no issues supporting this... however...
- Small / Medium enterprise companies are confused about unclear interaction of all these initiatives
Confusion prevents the adaptation!

Catena-X Manufacturing-X OPC UA

Gaia-X AutomationML 85+ OPC UA
Companion Specs

umati Asset Administration Shell

MTP IDTA → Digital Twin MetaVerse

OPAF DataSpace

Digital Twin Consortia

Open Industry Alliance
“Service Bus”

Position paper (in progress):

„The interaction of management shell, AutomationML and OPC UA -

A big picture of interoperability solutions“

**Cooperation
AML, IDTA, OPCF, VDMA**

Call for Actions

- **Membership**

Support the activities of the OPC Foundation and become a member

If you are a logo member, please register as full (corporate) member

If you are end-user, why not register as corporate member

- **Success stories**

Please share your experience with the rest of the world

- **Your success story will be written by journalist – review and approval by your company**
- **Podcast**
- **Presentation at OPC Day International**

- **Share your requirements with OPC Foundation**

- **Initiate new groups**

- **Become active contributor**

OPC Foundation: The United Nations for Industrial Automation

Thank you! - Questions? Please contact us!



Stefan Hoppe
President & Executive Director
OPC Foundation
Stefan.hoppe@opcfoundation.org

Looking for more information?
<https://opcfoundation.org/>

