20 years of OPC UA Standardization

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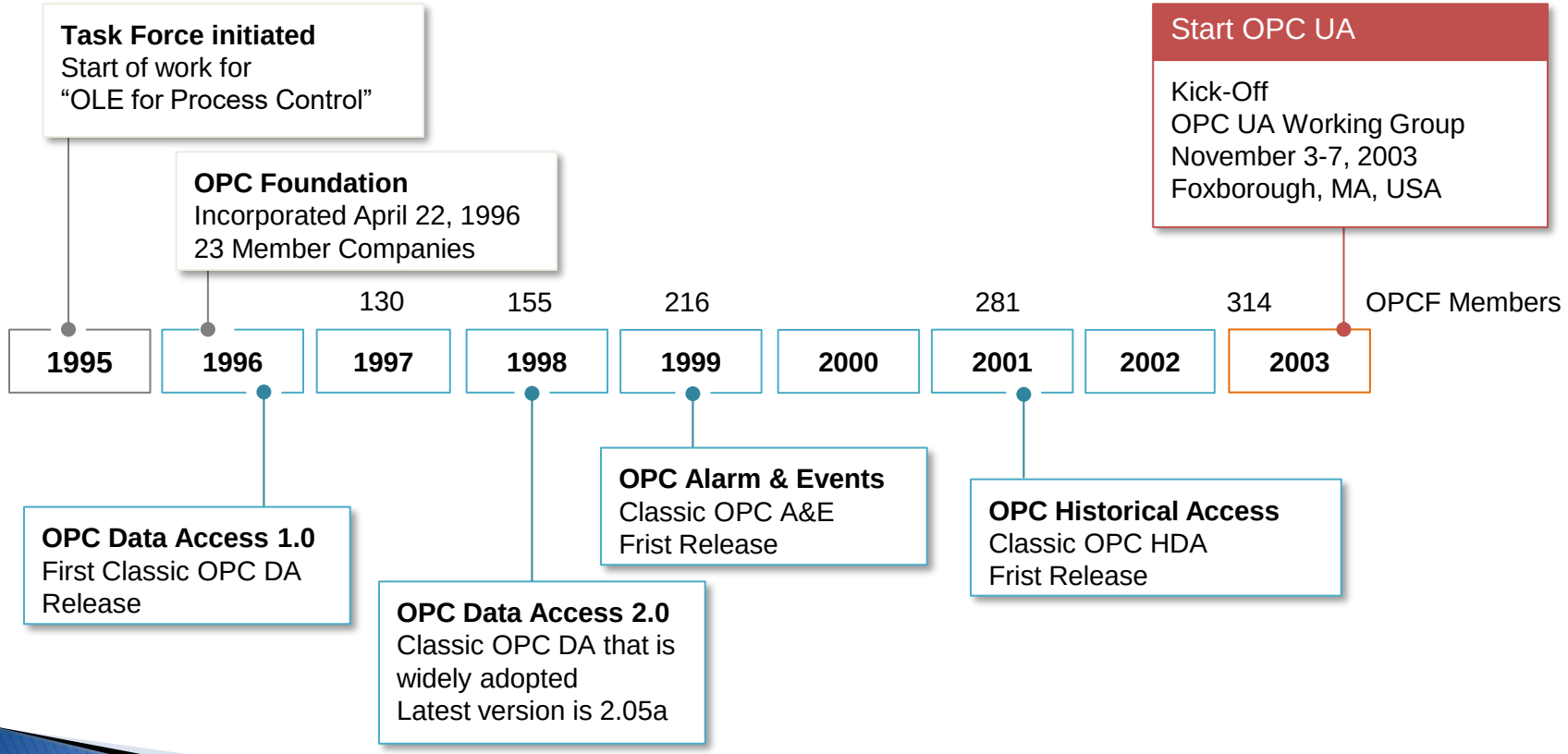
Editor Part 4 Services & Part 14 PubSub & Part 18 Role-Based Security
Chairman MQTT subgroup of OPC UA WG
Chairman OPC UA for Devices WG
OPC Foundation Technical Control Board
OPC Foundation Board of Directors

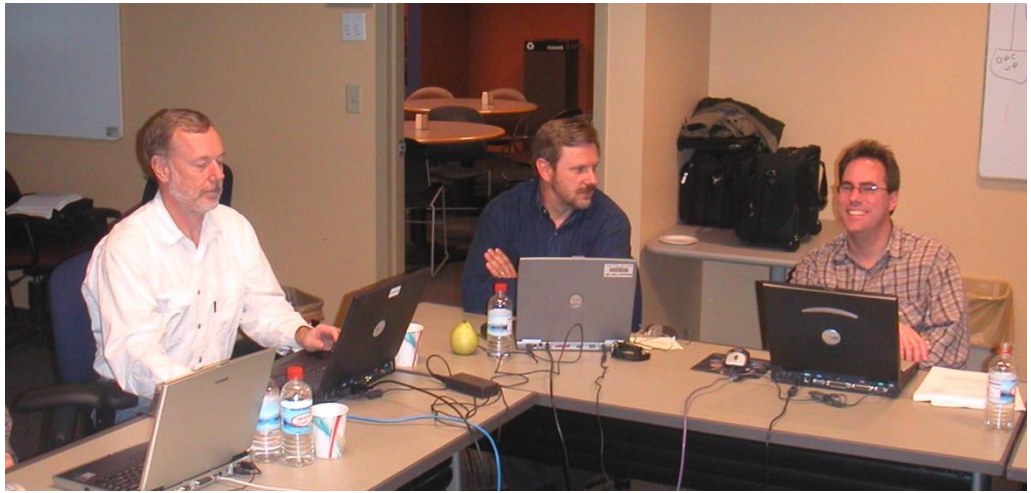
Unified Automation

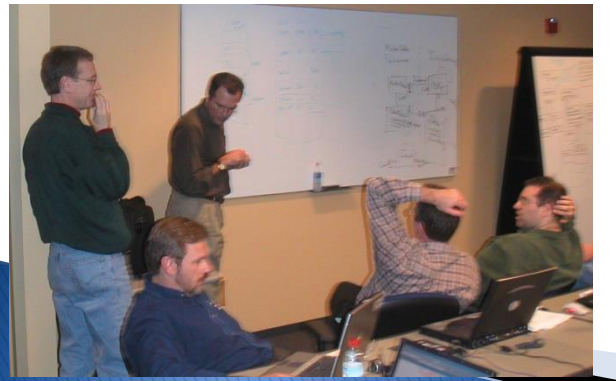
1996 – 2003: From Classic OPC to start of OPC UA Working Group



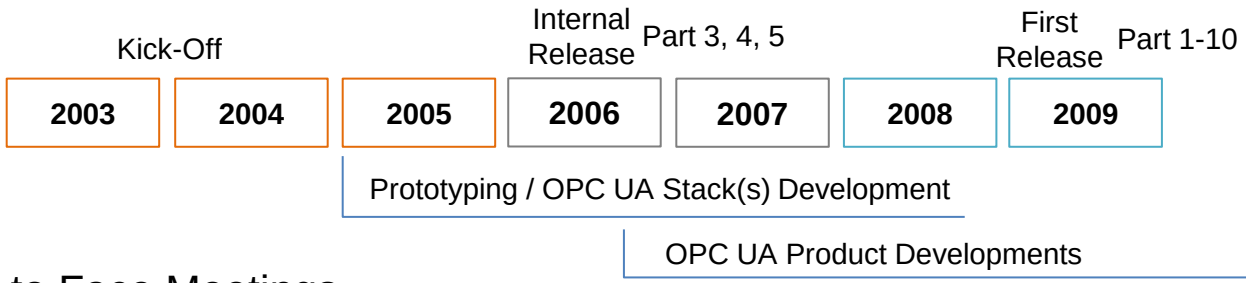
November 3-7, 2003: Kick-Off OPC UA Working Group

ⓘ Foxborough, MA, USA





2003 – 2008: Initial OPC UA Development Phase



- Face to Face Meetings
  - Six one week meetings per year
  - USA and Europe
- Weekly Phone Conferences and Web Meetings
- Multipart Specification with 13 Parts
  - All Parts planned from beginning
  - First Release: Part 1 – 10
  - Parts 11 – 13 added in service releases

2005 – 2006: First OPC UA Events

April 19-20, 2005
First OPC UA DevCon
Microsoft / Seattle

October 2005
First OPC Day Finland

October 2006
OPC UA DevCon Munich
First OPC UA demos

October 2006
OPC Day Finland

May 2007
IOP Workshop Florida
First OPC UA Tests

2009: First OPC UA Case Study

Areva-Multibrid, BECKHOFF, Unified Automation

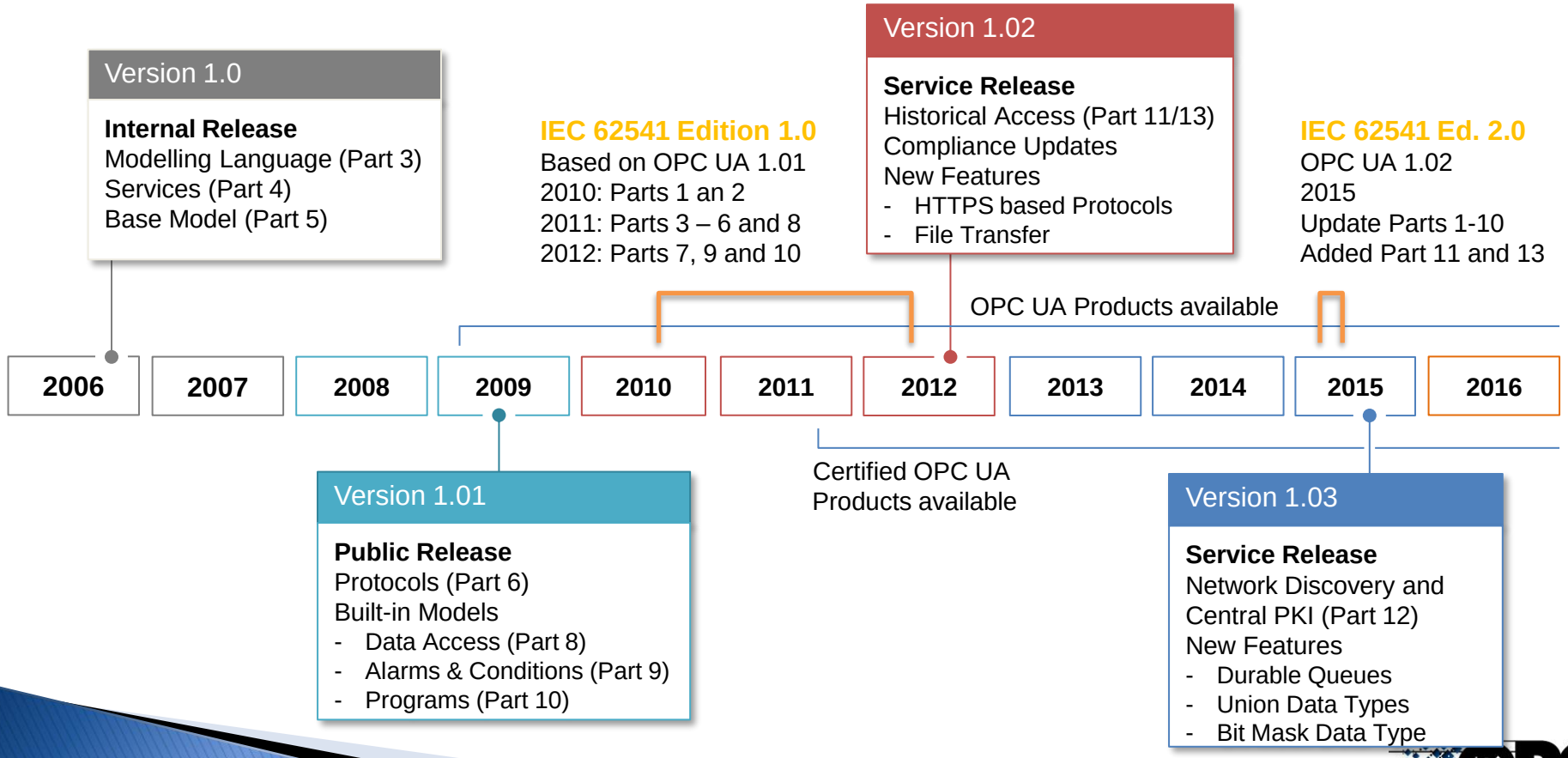
OPC UA connects wind turbines in Germanys first offshore wind park Alpha Ventus

Built-in security and an authentication mechanism are the determining factors in choosing OPC UA

Beckhoff PLC with integrated OPC UA server in wind turbines

Unified Automation OPC UA Client SDK for integration of OPC UA into Areva-Multibrid wind park SCADA system

2006 – 2015: From first OPC UA Release to Feature Completion



2009 – 2022: OPC UA Companion Specifications Releases

2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Devices Analyzer Devices	IEC 61131			ISA 95		AutoId IEC 61131 FB		MDIS CNC	IEC 61850 Tobacco Industry PackML AutomationML Field Bus Mappings

2019 5 Releases

10000-100, UA for Devices, V1.02
40010-1, Robotics Part 1
30070-1, MTConnect Part 1
30200, Commercial Kitchen Equipn
40100-1, Machine Vision

2020 9 Releases

30000 – IEC 61131-3, Version 1.2
30260 – OpenSCS
30050 – PackML
40501-2, UA for MachineTools, Part 1
40001-1, UA for Machinery, Part 1
10000-200, Industrial Automation
30010 – UA CS for AutoID, 1.01.07
40200, UA for Weighing Technology
30081, PADIM

2021 11 Releases

30141 – PROFIenergy
40084-12 – Extrusion – Calender
10000-100 – OPC UA for Devices, v1.03
11031-4 – ISA-95 Job Order
30261 – OpenSCS Job Orders
40223 – Pumps and Vacuum Pumps
40083 – PlasticsRubber – General Types
30270 – UA for Asset Administration Shell
40250-1, UA for Compressed Air Systems
10000-200, Industrial Automation, v1.01
40600 – Weihenstephan Standards

2022 11 Releases

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

2023 15 Releases

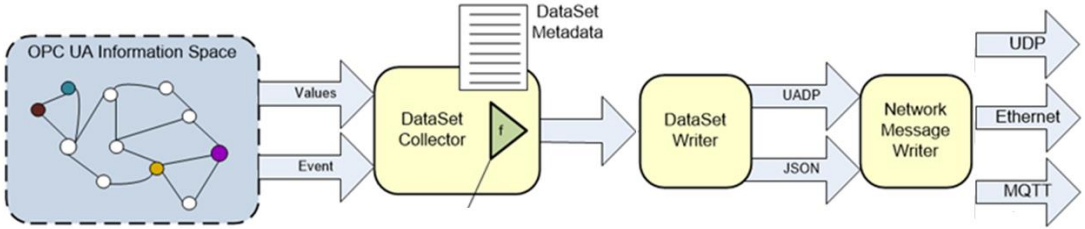
2024 10 Releases till October

OPC FOUNDATION

2015 – 2022: New Use Cases – New Features – Triggered by TSN

Version 1.04

PubSub (Part 14)
Extensions to user security
Reverse connect
New protocol binding options
- WebSockets
- JSON encoding



OPC UA PubSub:

(1) Cyclic Device to Device Communication
(2) Messaging to IT and Cloud Applications

2015 | **2016** | **2017** | **2018** | **2019** | **2020** | **2022** | **2023** | **2024**

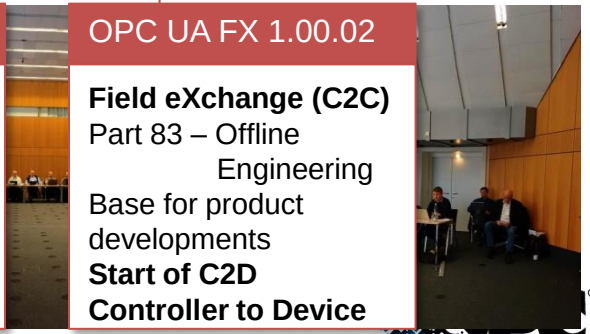
Version 1.03

Kick-Off FLC Working Group

Field Level Communication WG
Controller to Controller
Controller to Device
Kick-Off with 90 participants from 38 companies
WG starts with 160 members from 43 companies

OPC UA FX 1.00

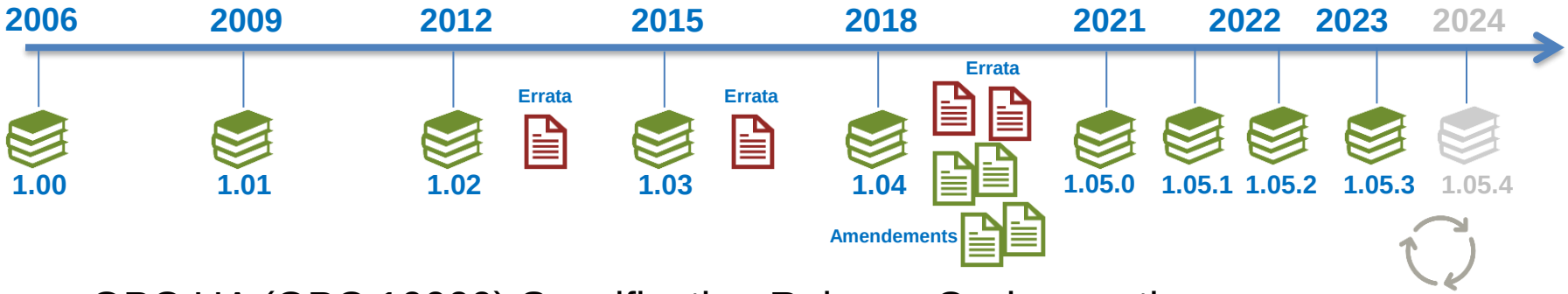
Field eXchange (C2C)
Controller to Controller
Part 80 – Concepts
Part 81 – Connecting Devices
Part 82 – Networking



OPC UA FX 1.00.02

Field eXchange (C2C)
Part 83 – Offline Engineering
Base for product developments
Start of C2D
Controller to Device

Transition to Agile OPC UA Specification Development



- OPC UA (OPC 10000) Specification Release Cycle was three years
- Errata handled as additional document since OPC UA 1.02
- Amendments introduced with OPC UA 1.04
  - Enhancements as feature releases between major spec releases
  - Dedicated Amendment per feature to speed up support for companion working groups
- Change to new release model with OPC UA 1.05
  - Shorter regular release cycle with a duration of six months
  - All parts with changes (clarification, errata, feature) get released as 1.05.XX batch

OPC UA 1.05 Release Status

1.05.00 release completed (10/2021)

1.05.01 release completed (03/2022)

1.05.02 release completed (11/2022)

- New Parts 21, 22, 23 and 24

1.05.03 release completed (12/2023)

- All Parts have a 1.05 version, including Part 11: Historical Access
- Part 14 with enhancements from new MQTT working group

1.05.04 release expected 12/2024

- Update JSON encoding for OpenAPI (Rest) and PubSub
- PubSub Actions from MQTT working group

OPC Number	Title	1.03	1.04	1.05.00	1.05.01	1.05.02	1.05.03
10000-1	Part 1: Overview and Concepts	☑	☑	☐	☐	☑	☐
10000-2	Part 2: Security	☑	☑	☐	☐	☑	☐
10000-3	Part 3: Address Space Model	☑	☑	☑	☑	☑	☑
10000-4	Part 4: Services	☑	☑	☑	☐	☐	☑
10000-5	Part 5: Information Model	☑	☑	☑	☑	☑	☑
10000-6	Part 6: Mappings	☑	☑	☑	☑	☐	☑
10000-7	Part7: Profiles	☑	☑	☐	☐	☑	☐
10000-8	Part 8: DataAccess	☑	☑	☑	☐	☐	☑
10000-9	Part 9: Alarms and Conditions	☑	☑	☐	☑	☑	☑
10000-10	Part 10: Programs	☑	☑	☑	☐	☐	☐
10000-11	Part 11: Historical Access	☑	☑	☐	☐	☐	☑
10000-12	Part 12: Discovery and Global Services	☑	☑	☐	☐	☑	☐
10000-13	Part 13: Aggregates	☑	☑	☐	☐	☑	☐
10000-14	Part 14: PubSub	☐	☑	☐	☑	☑	☑
10000-15	Part 15: Safety	☐	☑	☑	☐	☑	☑
10000-16	Part 16: State Machines	☐	☐	☑	☐	☑	☐
10000-17	Part 17: Alias Names	☐	☑	☑	☐	☐	☐
10000-18	Part 18: Role-Based Security	☐	☐	☑	☑	☑	☑
10000-19	Part 19: Dictionary References	☐	☐	☑	☐	☑	☑
10000-20	Part 20: File Transfer	☐	☐	☑	☑	☑	☑
10000-21	Part 21: Device Onboarding	☐	☐	☐	☐	☑	☐
10000-22	Part 22: Base Network Model	☐	☐	☐	☑	☑	☑
10000-23	Part 23: Common ReferenceTypes	☐	☐	☐	☑	☑	☐
10000-24	Part 24: Scheduler	☐	☐	☐	☐	☑	☐