OPC and MES 2014 Finland

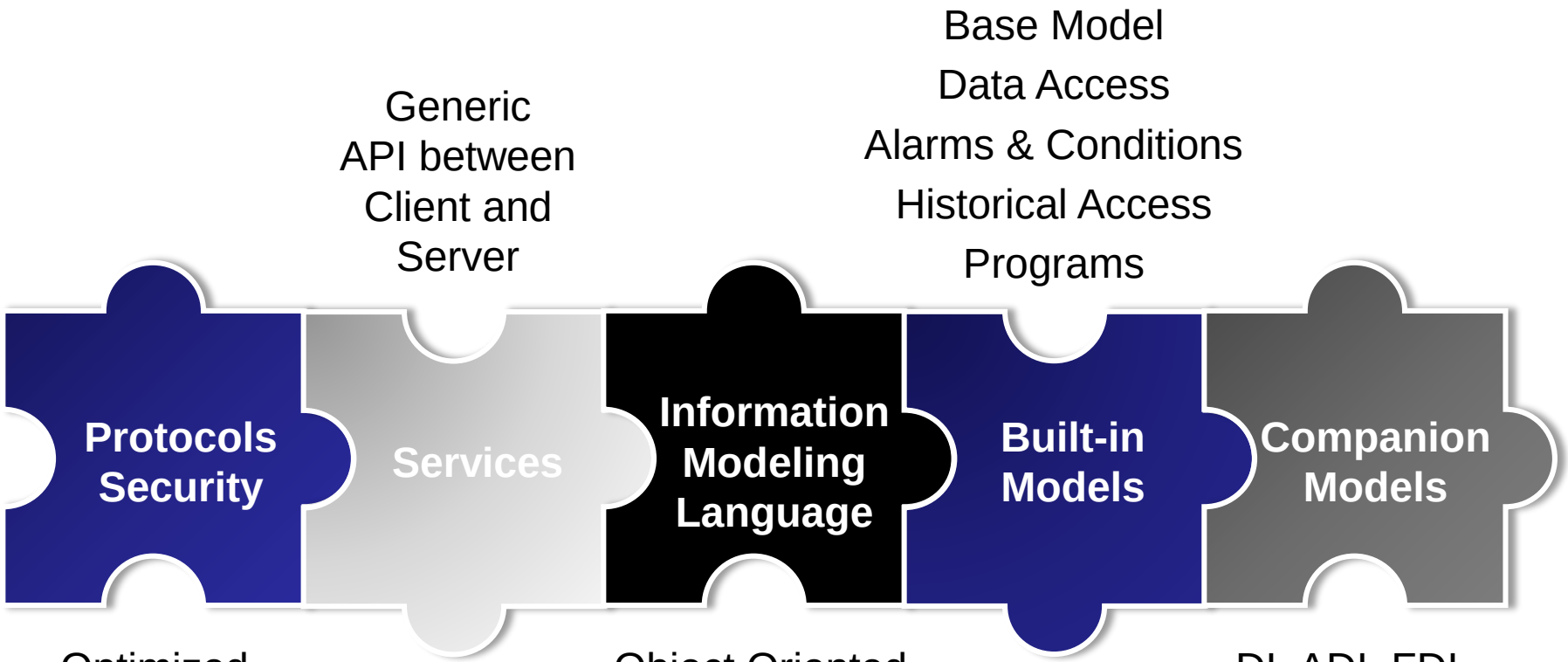
UA Technical Update

Uwe Steinkrauss (ascolab GmbH)

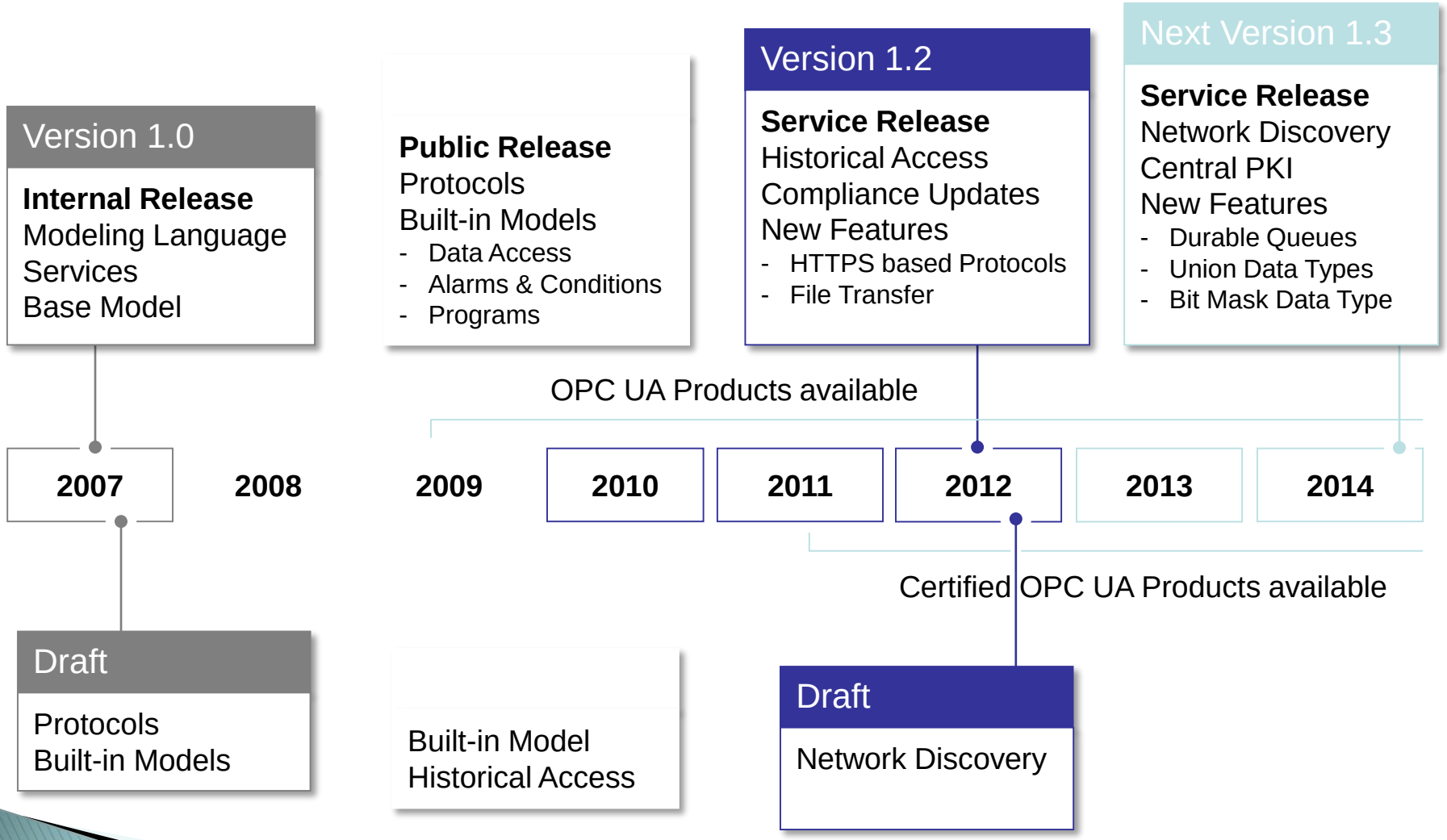
Agenda

- OPC UA Specification Update
- OPC UA as IEC 62541 Update
- OPC UA Companion Specifications Update

OPC Unified Architecture



OPC UA Specifications



https - Hybrid Binding (V1.2)

- OPC UA Binary Encoded Data send over HTTPS
- Use of 443 Port
- Firewall friendly
- Uses TLS transport encryption
- High performance

- No new protocol, just different transport for UA-binary-encoded data → optional

File Transfer (V1.2)

- File Type representation within OPC UA Information Model
- OPC UA Methods (open, close, read, write)

- No changes to the basic UA Service Sets, just enhancement of the Information Model

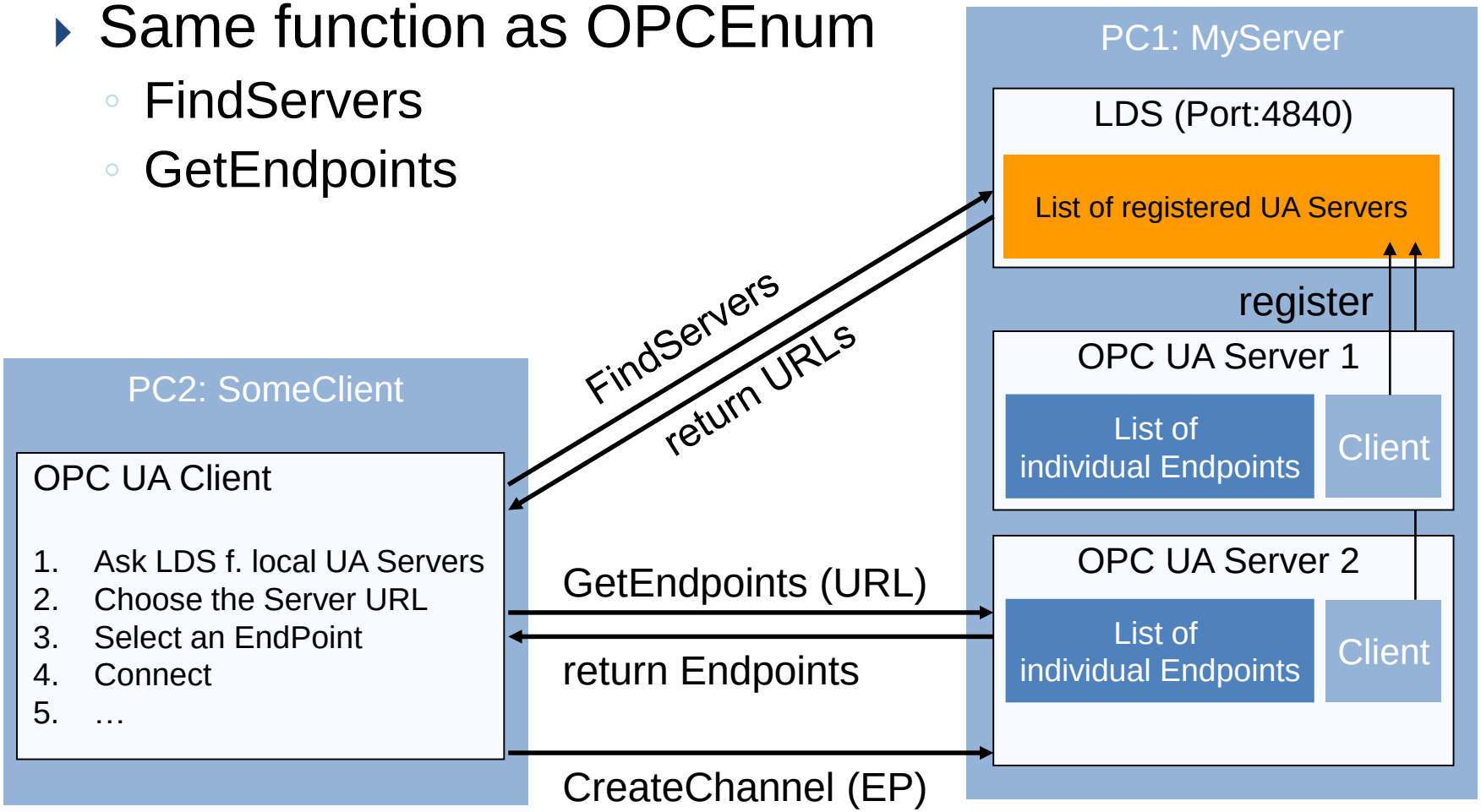
OPC UA XML NodeSet (V1.2)

- Standardized XML Schema for representation of OPC UA Information Model
- Offline Browsing
- Import/Export of Information Model (TypeSystem)

- Not suitable for high performance and large address space (InstanceSystem)

Local Discovery Server (LDS)

- Same function as OPCEnum
  - FindServers
  - GetEndpoints



source: www.ascolab.com

Ad-Hoc Discovery/Dynamic DNS

Features provided:

- Host name resolution without central DNS server
- Find OPC UA servers with feature list in local network

Advantage:

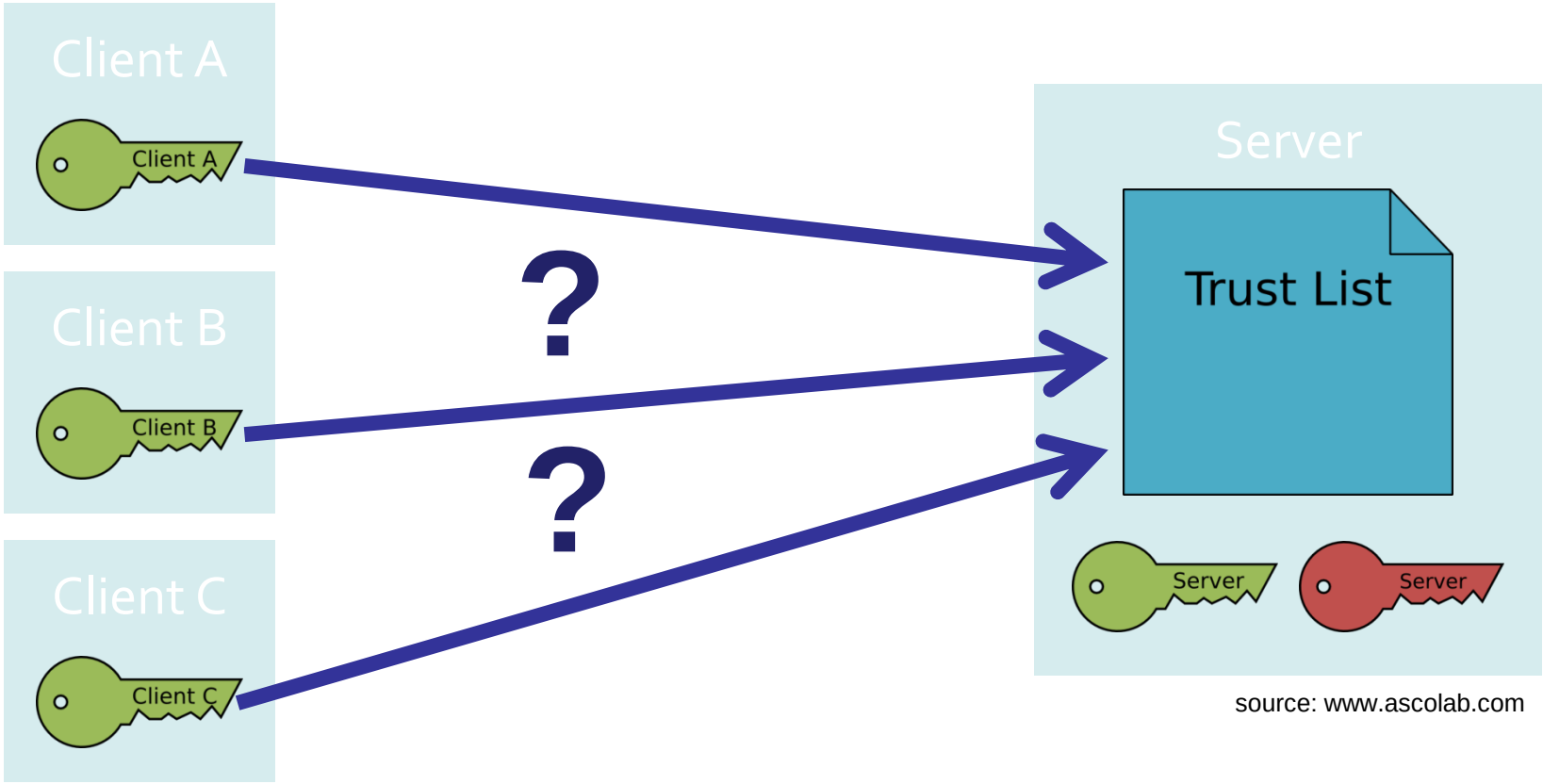
No central infrastructure required

Limitation:

Works only in local subnet

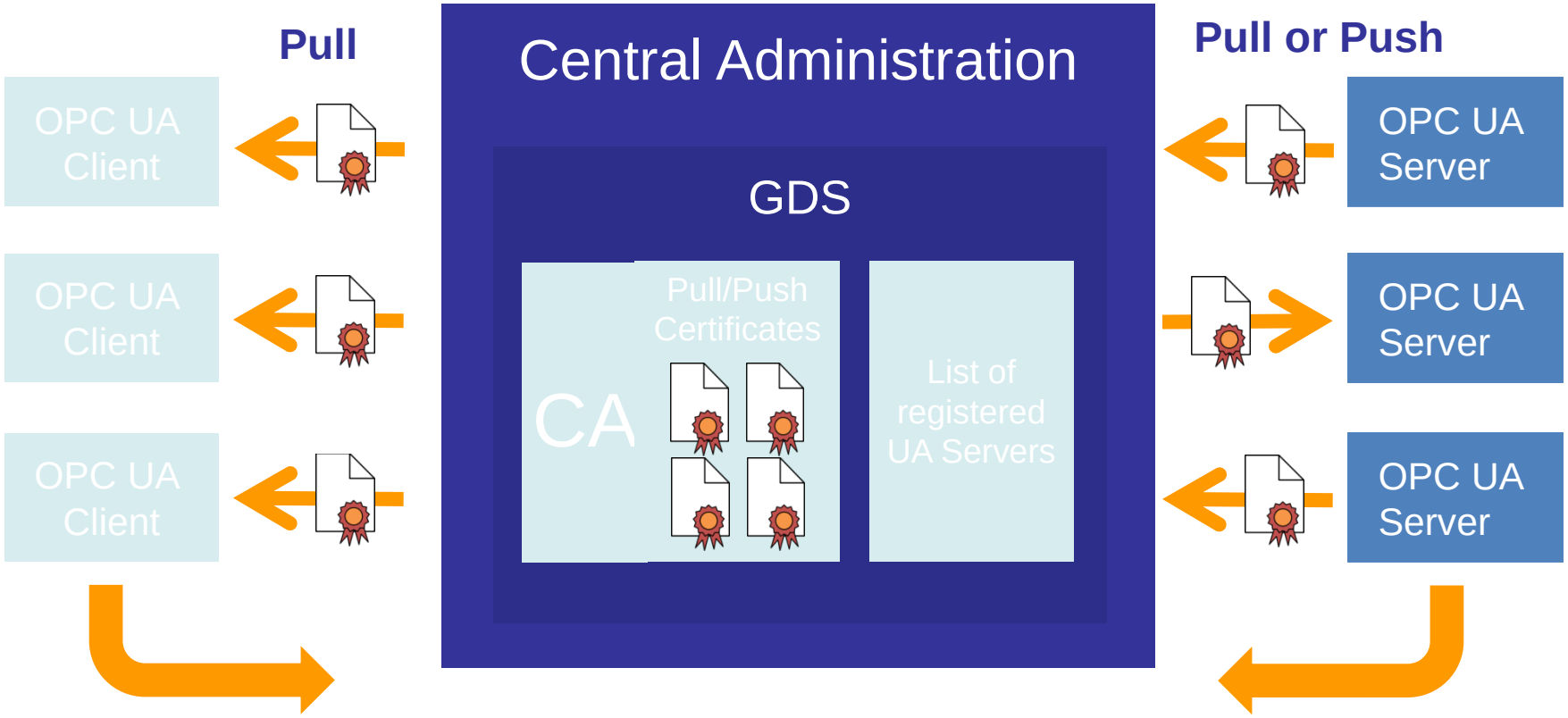
source: www.ascolab.com

Enhanced Appl. Authentication



source: www.ascolab.com

Global Directory Service (GDS)



Application Registration
Initial Configuration/Certificate Generation
Update Trust List/Revocation Lists

OPC FOUNDATION

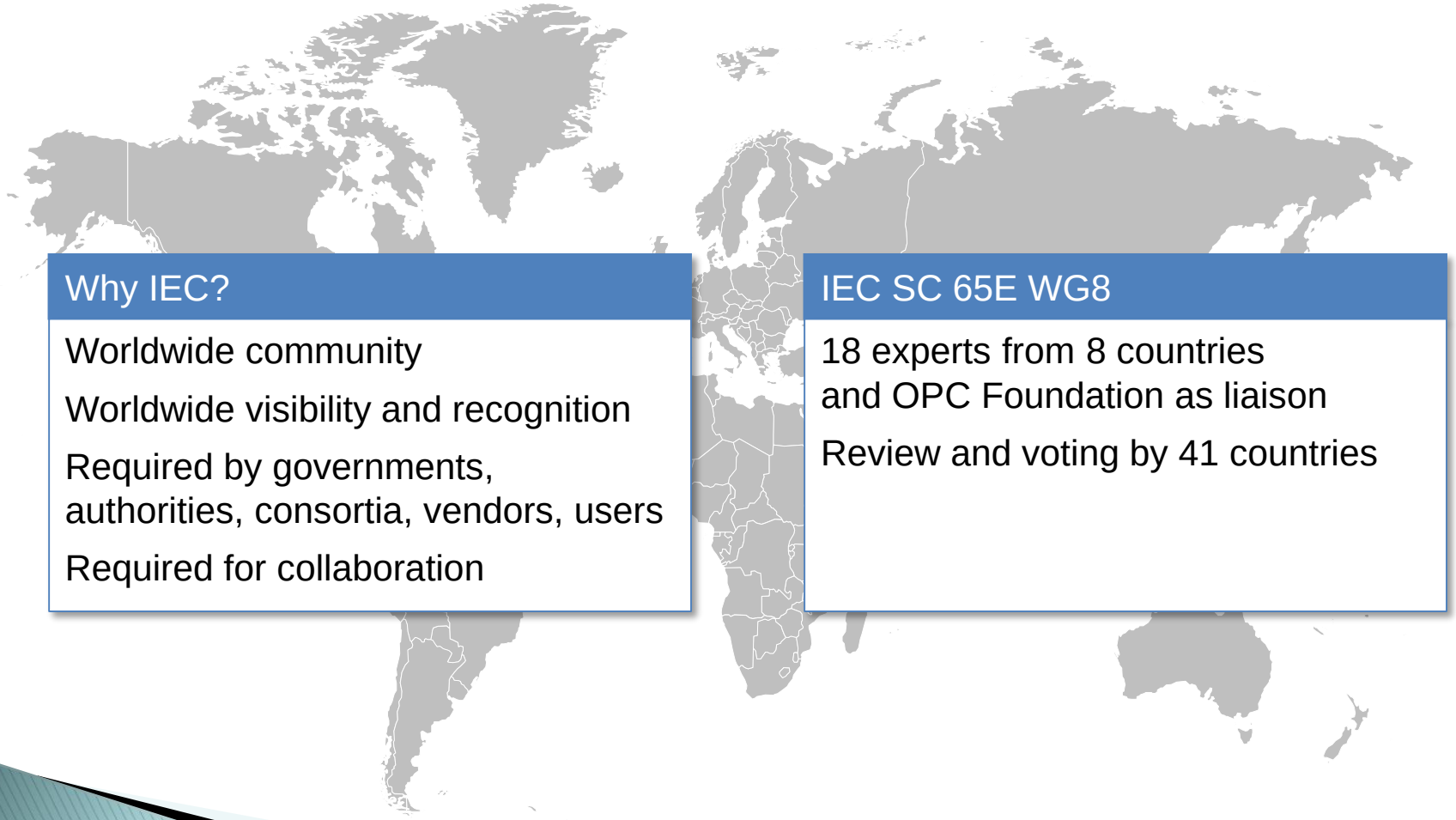
Future Topics under Discussion

- Secure Multicast
- High Speed Data Streaming, Video Streaming, Audio Streaming
- Quality of Service
- Communication through Relays
- Low Bandwith Networks

Agenda

- OPC UA Specification Update
- OPC UA as IEC 62541 Update
- OPC UA Companion Specifications Update

OPC UA IEC Working Group



Why IEC?

Worldwide community

Worldwide visibility and recognition

Required by governments, authorities, consortia, vendors, users

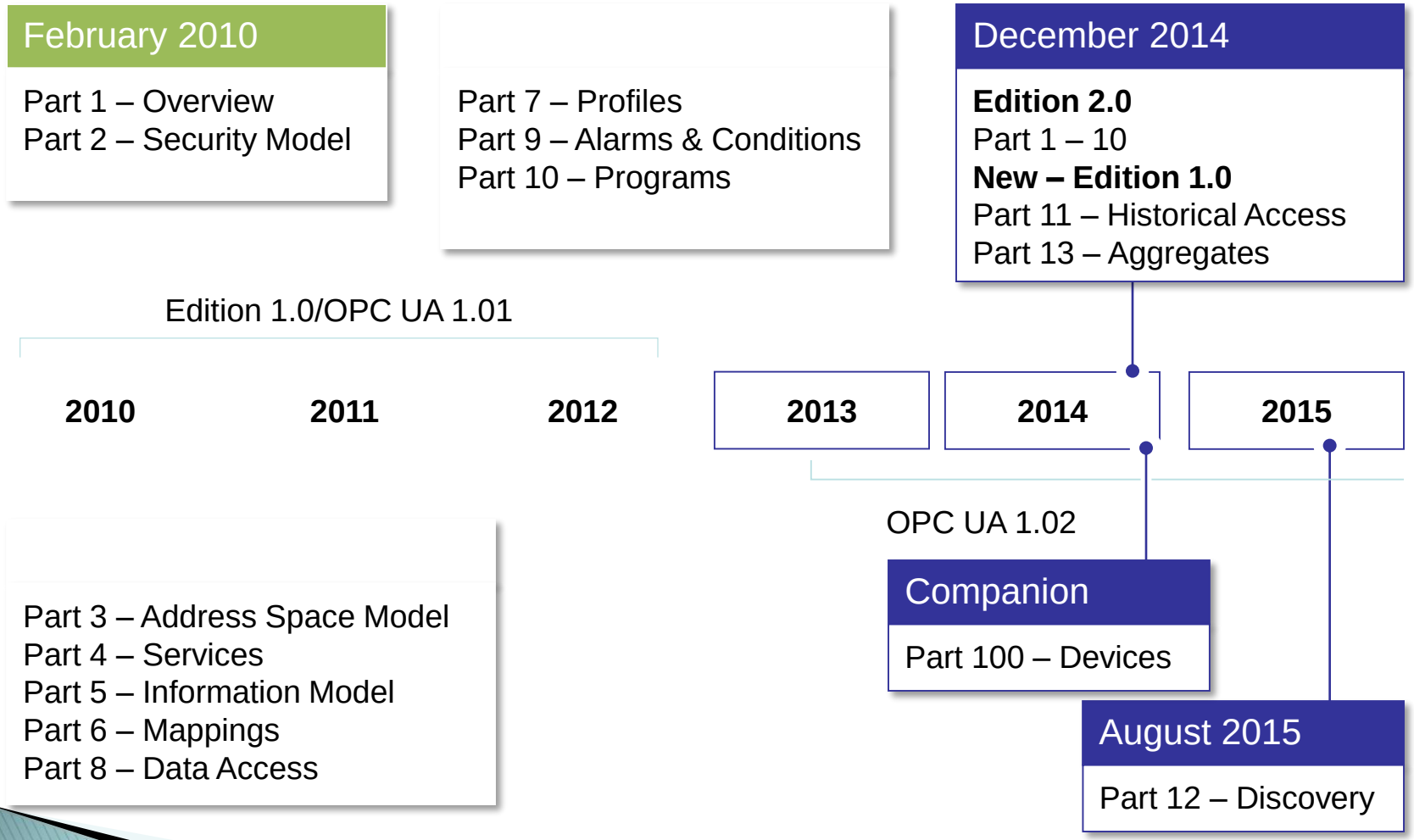
Required for collaboration

IEC SC 65E WG8

18 experts from 8 countries and OPC Foundation as liaison

Review and voting by 41 countries

IEC 62541


February 2010
Part 1 – Overview
Part 2 – Security Model
Part 3 – Address Space Model
Part 4 – Services
Part 5 – Information Model
Part 6 – Mappings
Part 8 – Data Access
Part 7 – Profiles
Part 9 – Alarms & Conditions
Part 10 – Programs
December 2014
Edition 2.0
Part 1 – 10
New – Edition 1.0
Part 11 – Historical Access
Part 13 – Aggregates
Edition 1.0/OPC UA 1.01
2010
2011
2012
2013
2014
2015
OPC UA 1.02
Companion
Part 100 – Devices
August 2015
Part 12 – Discovery

Agenda

- OPC UA Specification Update
- OPC UA as IEC 62541 Update
- OPC UA Companion Specifications Update

OPC UA for Devices (DI)

Device Model

Defined in Version 1.0, extended in 1.1

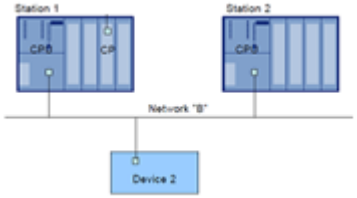
Configuration model for devices and configurable components

Device parameters and commands

Device Communication Model

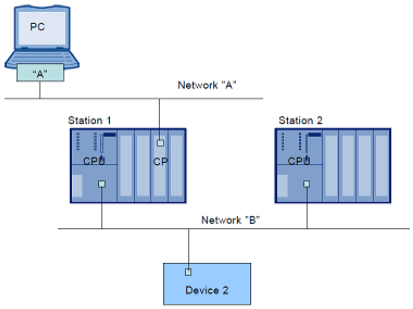
Added to Version 1.1 (from FDI)

Creation and configuration of a device communication topology



Added to Version 1.1 (from FDI)

Configuration of a device network through a central configuration server



Version 1.1 Released July 2013

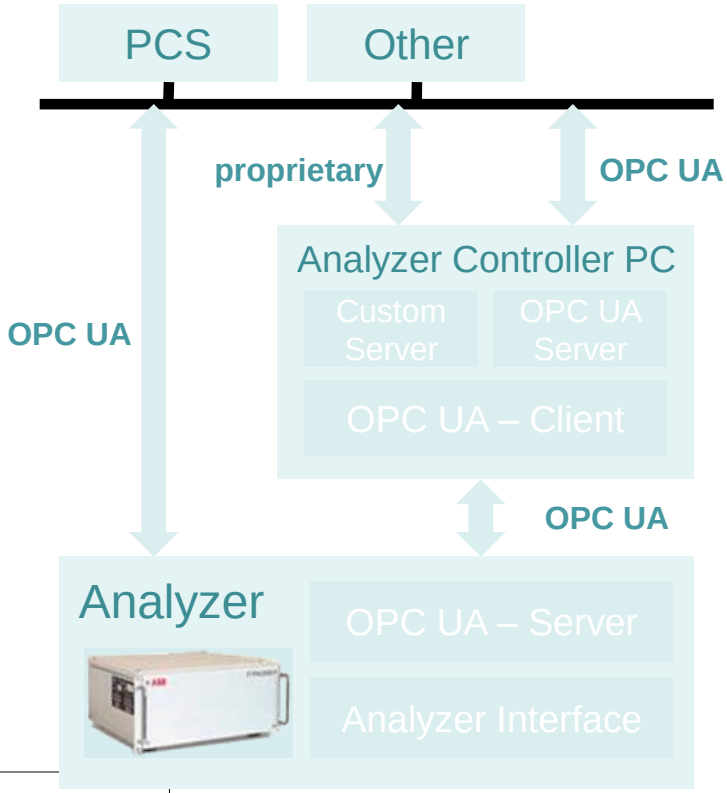
Analyzer Device Integration (ADI)

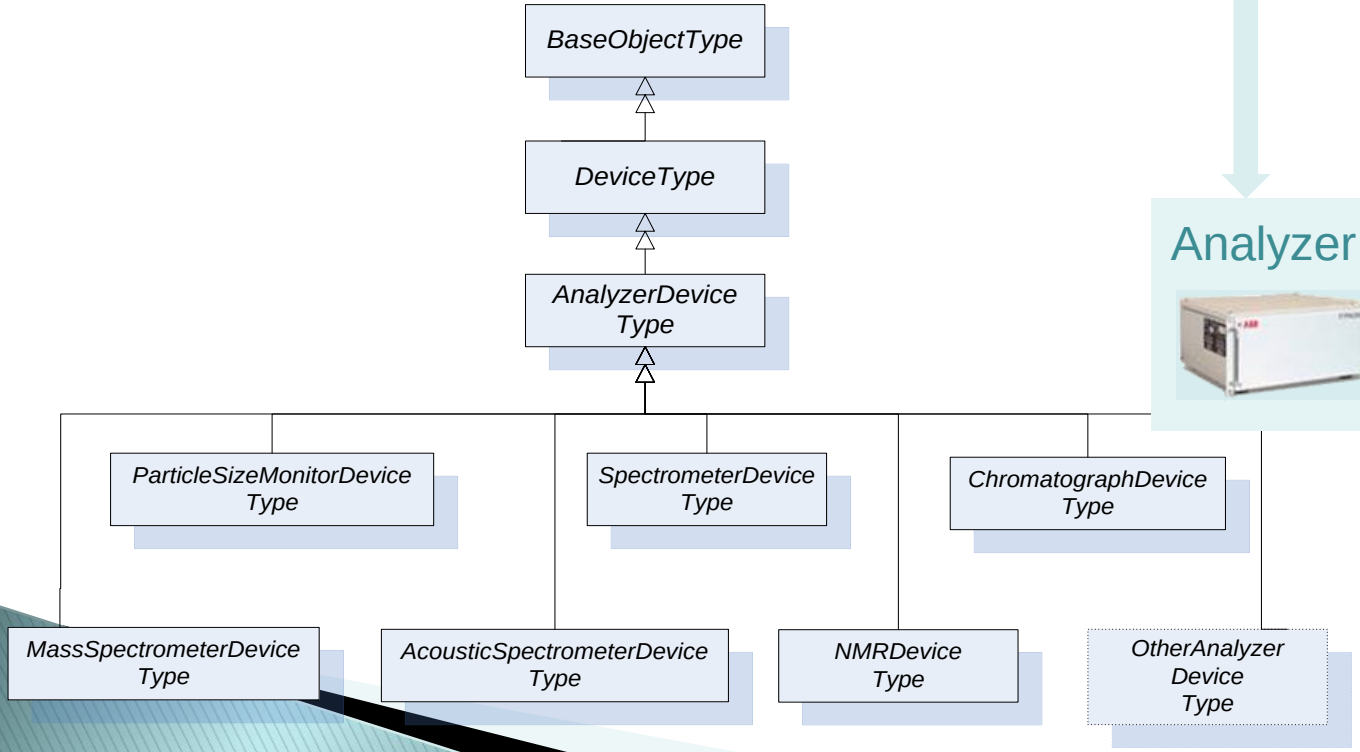
V 1.1 Released July 2013

Information Model for process analyzers

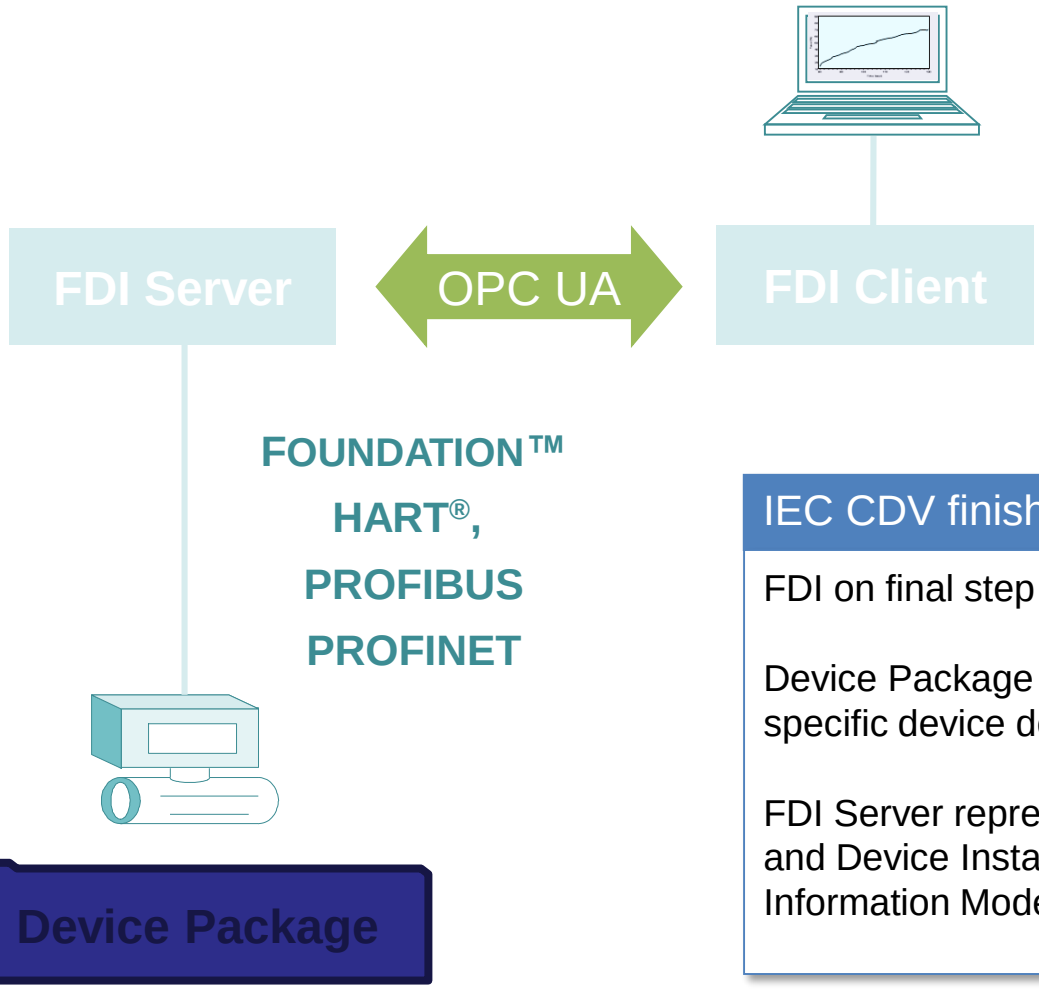
Update driven by vendors implementing the model

Generic Variable Types moved to OPC UA Part 8





Field Device Integration (FDI)



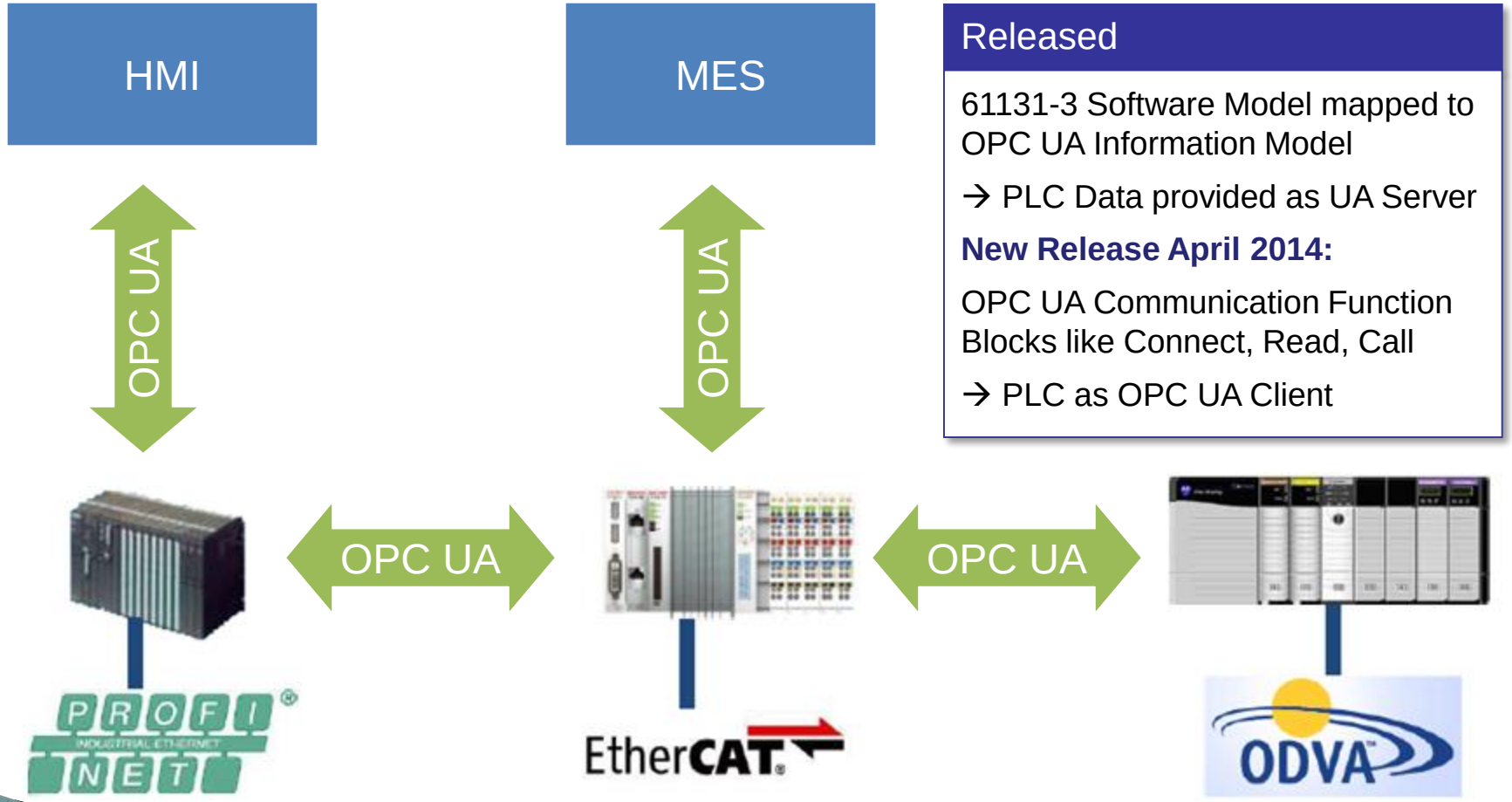
IEC CDV finished

FDI on final step to IEC Standard

Device Package contains vendor specific device description

FDI Server represents Device Types and Device Instances as OPC UA Information Model

OPC UA for IEC 61131 (PLCopen)



Released

61131-3 Software Model mapped to OPC UA Information Model

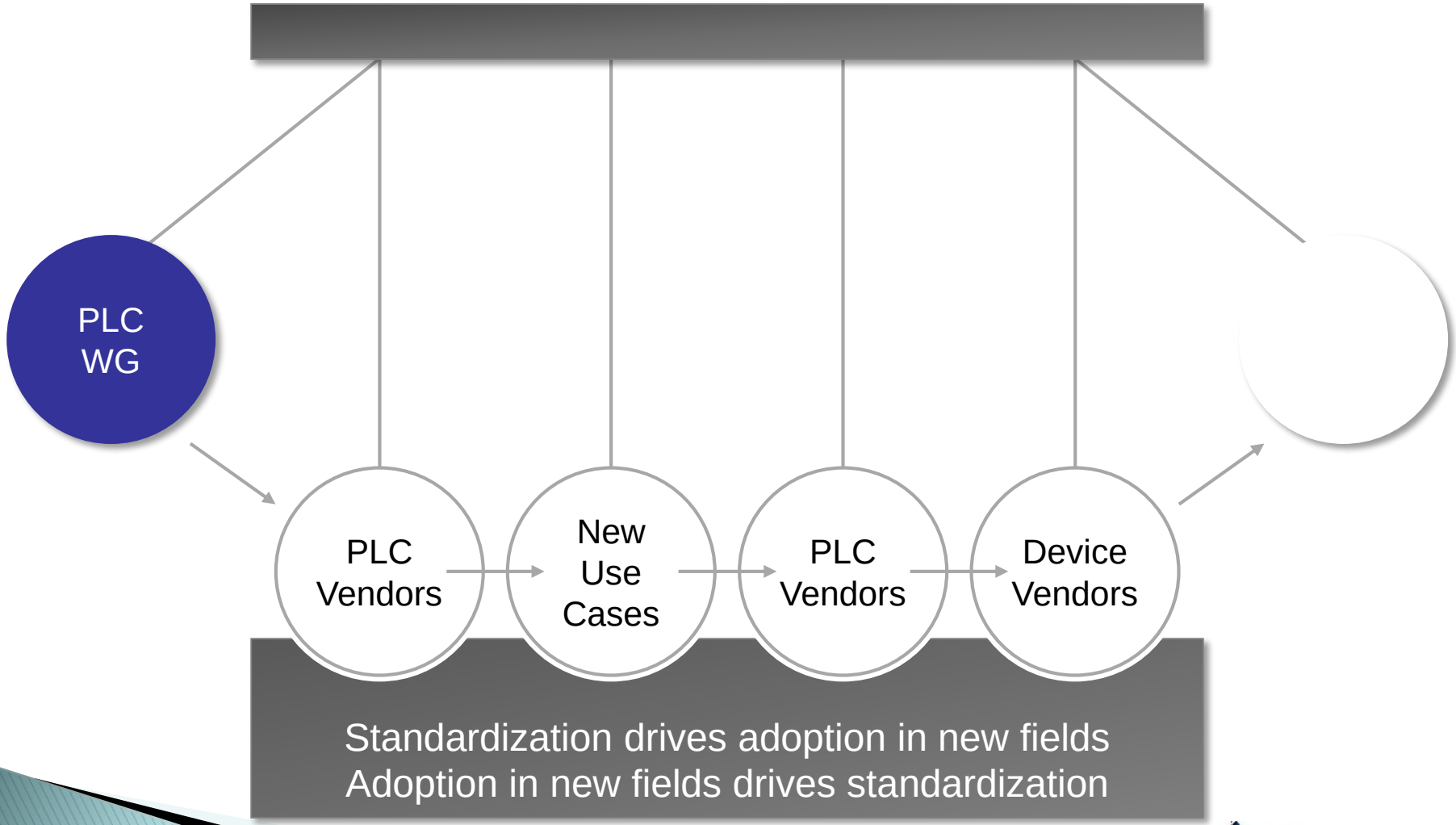
→ PLC Data provided as UA Server

New Release April 2014:

OPC UA Communication Function Blocks like Connect, Read, Call

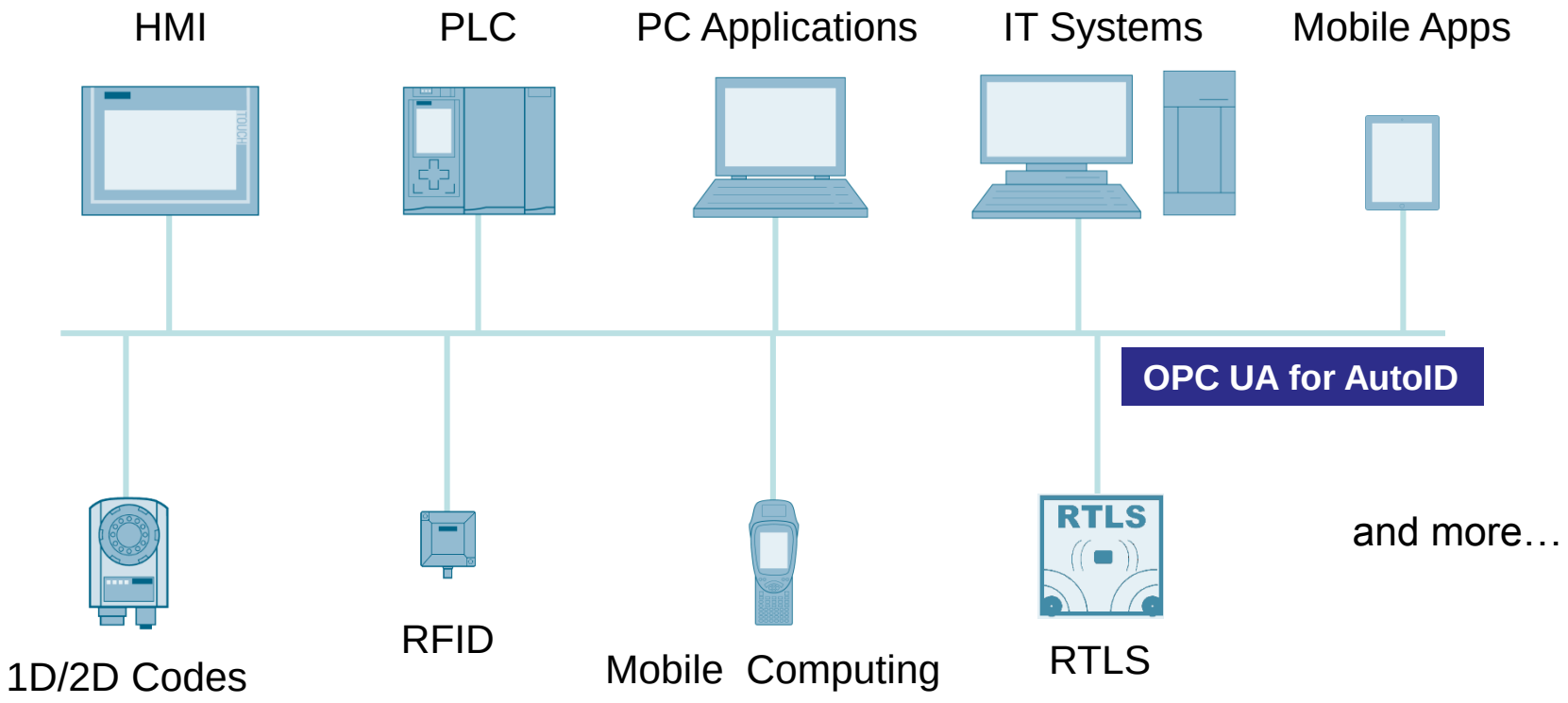
→ PLC as OPC UA Client

Dynamics of OPC UA Adoption



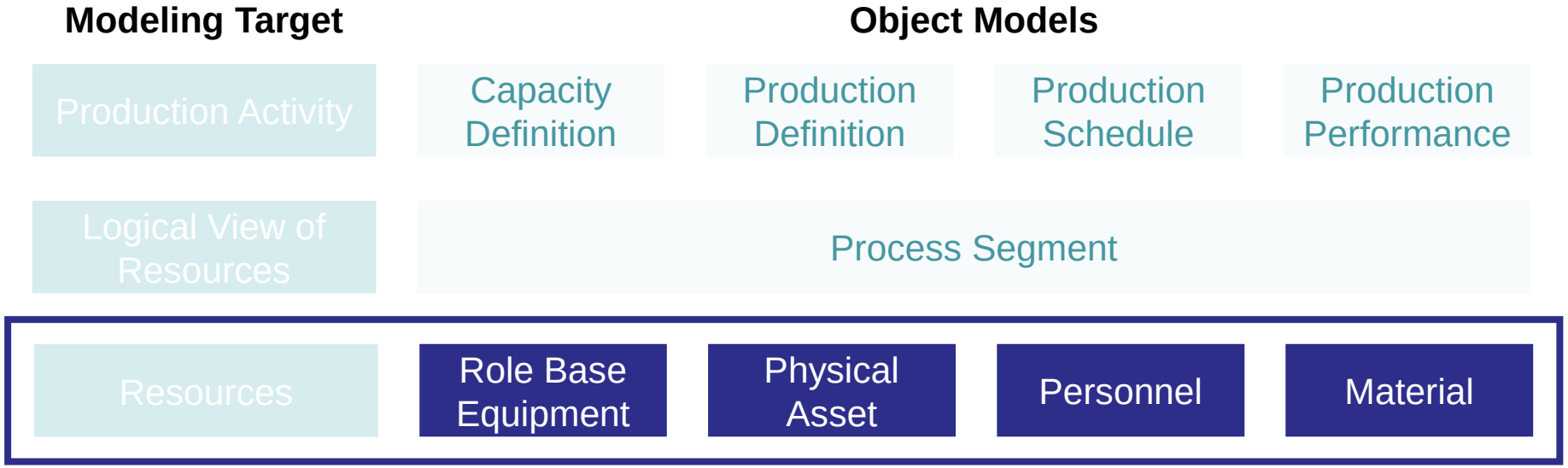
OPC FOUNDATION

AIM - OPC UA for AutoID



Connect Smart Products with Smart Devices Working Group Started

ISA 95 Common Object Model



Common Object Model

Version 1.0 Released in October 2013

ISA 95 defines a model for Enterprise/Control System integration

OPC UA mapping for ISA 95 Resources Models

- Role based equipment information
- Physical asset information
- Personnel information
- Material information

OPC FOUNDATION

BACnet – Building Automation

Release Candidate Specification

BACnet OPC UA Mapping

- BACnet objects to OPC UA objects
- BACnet events to OPC UA alarms
- BACnet logging to OPC UA HA
- BACnet structure to OPC UA structures
- BACnet units to OPC UA units

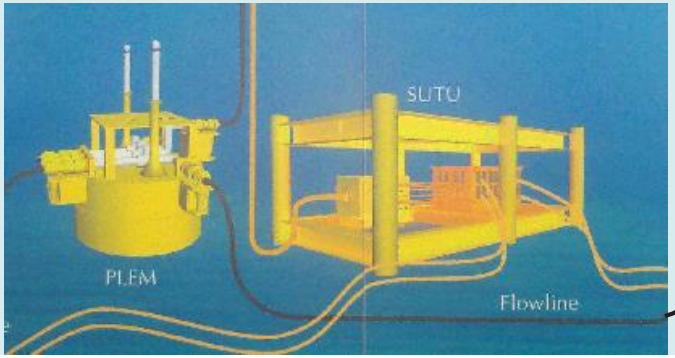
MDIS – Oil & Gas Industry

Working Group since 2012

MCS – DSC Interface Standard

Working Group consists of

- All major Oil companies (operators)
- All major DCS vendors
- All major Subsea vendors



OPC UA for communication between Subsea Production and DCS Systems

More to Come

Power Generation

IEC 61850/61400

IEC 61970

IEC 61968

Working group started 2014

AutomationML

Exchange of configuration data between plant engineering tools

Collection of data exchange formats

Working group started 2014

FDT

Field Device Tool for device configuration

Access from generic OPC UA clients to device information

Working group started 2014

MTConnect

Standard for Machine Tools

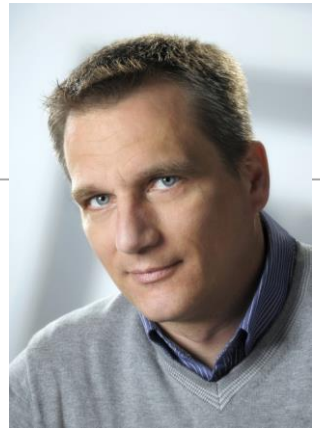
Release Candidate Spec available

Summary

- Secure, Cross Platform Protocols and Generic Services
- Multi Vendor Interoperability
- Semantic Interoperability – More than a protocol
- Multi Standard Interoperability
- The enabler for Industry 4.0 and Internet of Things

OPC FOUNDATION

Thanks for Your Attention !



Uwe Steinkrauss
Executive Director

ascolab GmbH
Am Weichselgarten 7
D-91058 Erlangen
Phone +49-9131-691-120
info@ascolab.com