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**Interconnectivity unleashed:
OPC UA Pub/Sub, companion
specifications and TwinCAT
powering industrial interoperability**

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Productmanager TwinCAT
Connectivity and IoT



Integrated security

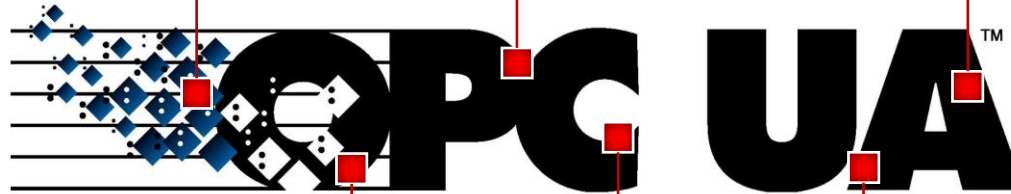
Transport and application security mechanisms to secure industrial data.

Wide adoption

Many vendors from different industries have already integrated OPC UA into their components.

Platform- and vendor-independent

No royalties or vendor-login, no operating system dependencies.



Universally applicable

Connect ERP-, MES-, HMI-, PLC-systems, M2M communication and Device2Cloud.

Communication patterns

Different communication patterns allow to transport data efficiently: polling, subscriptions, service calls, publisher/subscriber.

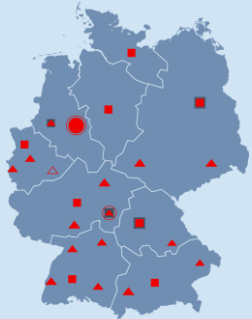
Standardized information models

Integrated type system to describe data points, companion specifications define standardized information models from different industries.

Beckhoff Automation - Facts and figures

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Verl, Germany

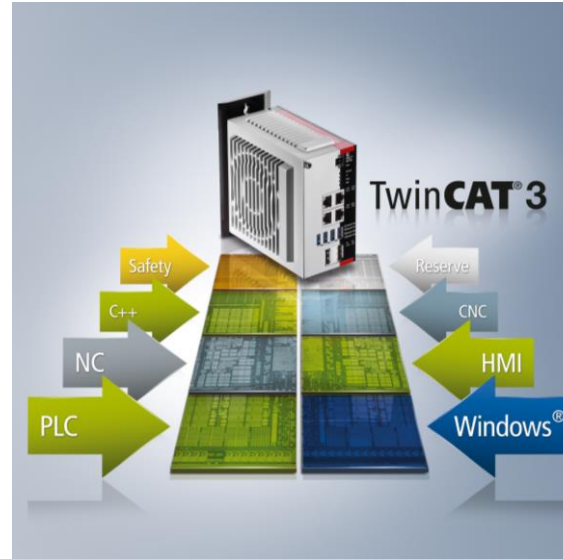


Headquarters

6,000



Employees worldwide



40



Subsidiaries/
representative offices

> 75

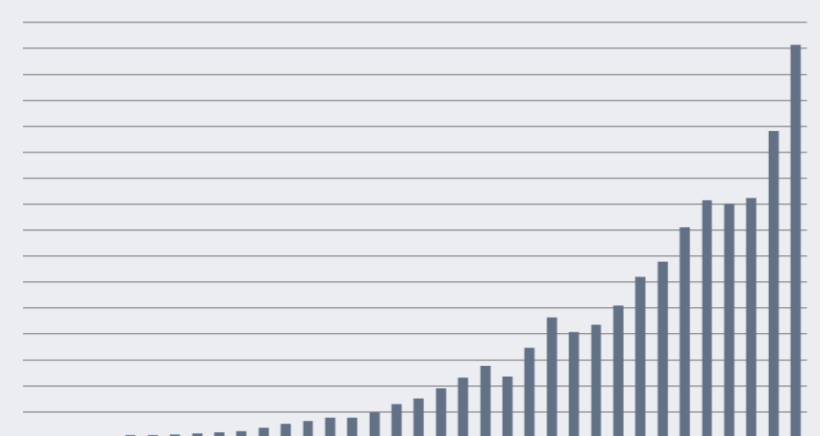


Representatives
worldwide

€1.515
billion

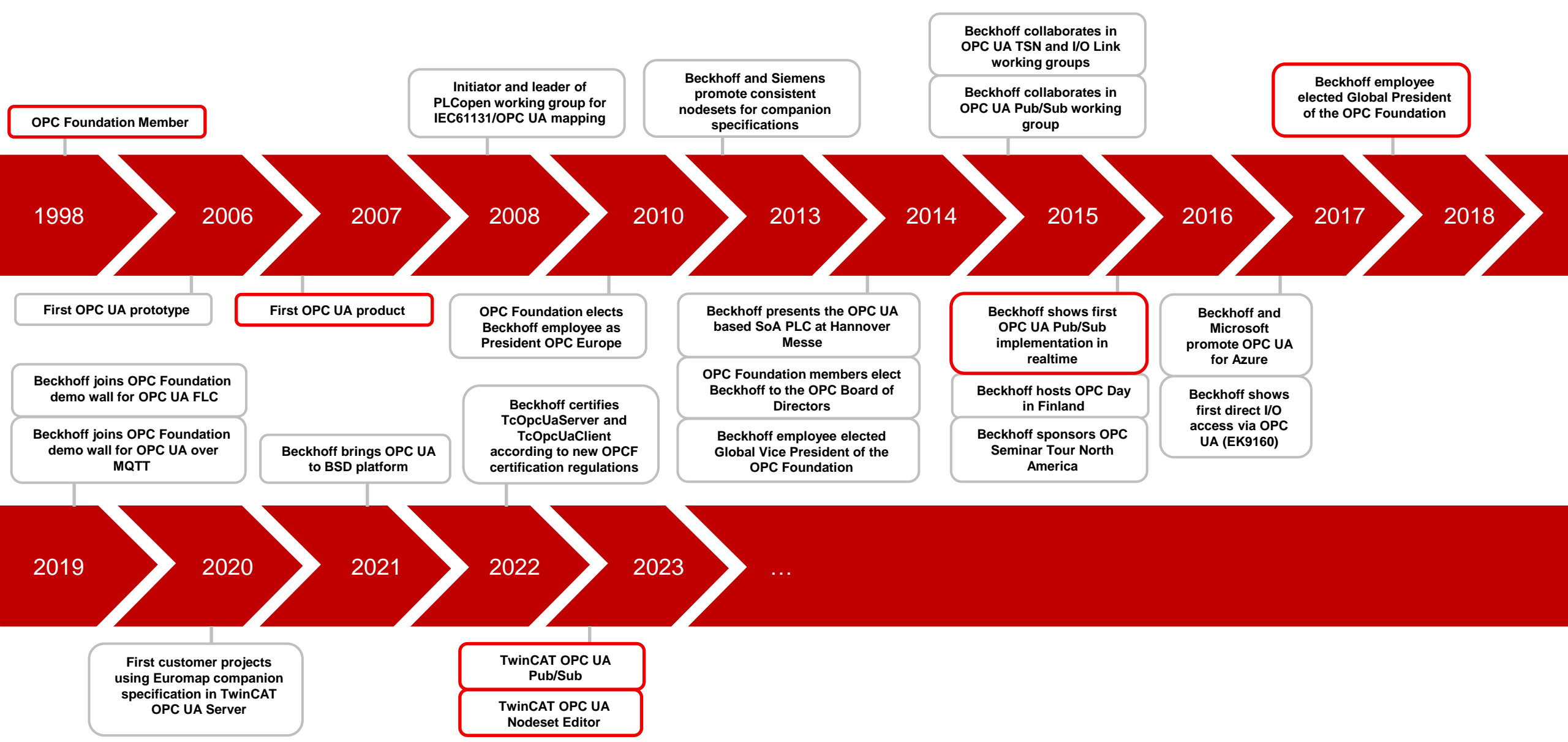
+28%

Sales
worldwide 2022



Beckhoff and OPC Foundation history

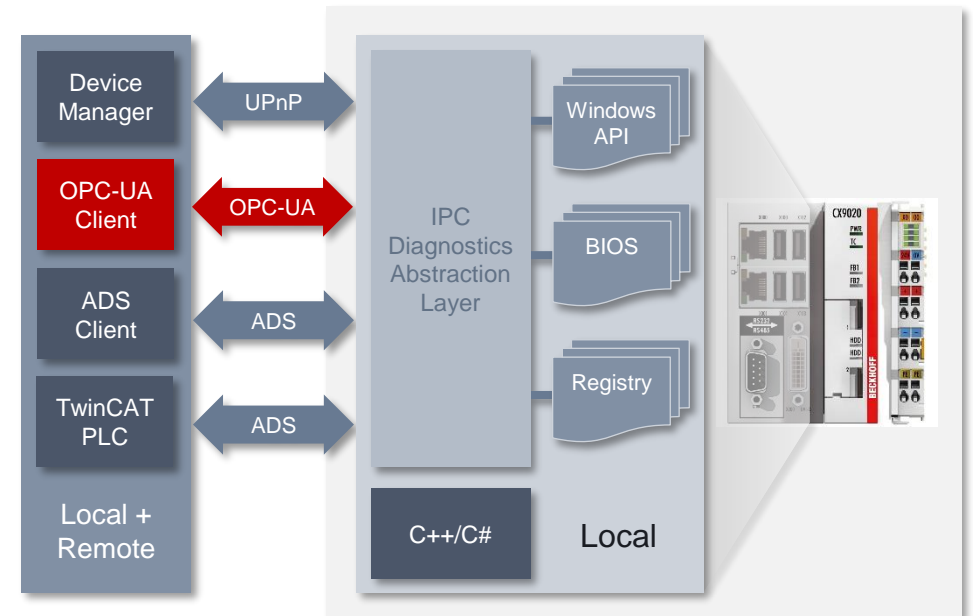
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Simple configuration and monitoring using OPC UA



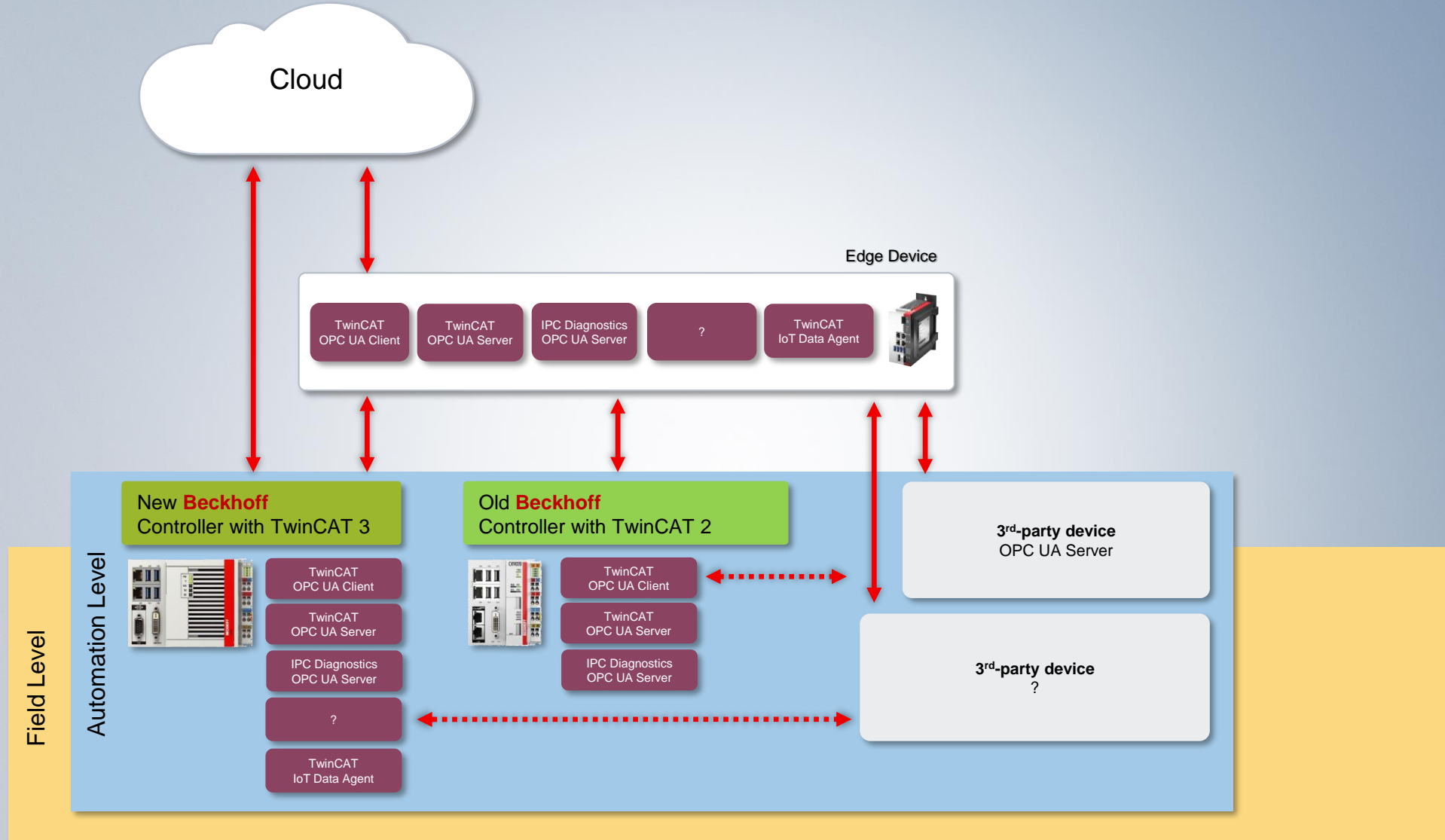
- Configuration and monitoring of IPC parameters
 - cpu (temperature, usage, ...)
 - hard disk (s.m.a.r.t. status, usage, ...)
 - fan speed
 - network configuration
 - ...
- pre-installed on every Beckhoff IPC/EPC
- different interfaces to acquire system data
 - Device Manager website, ADS, OPC UA, APIs
- TwinCAT not required

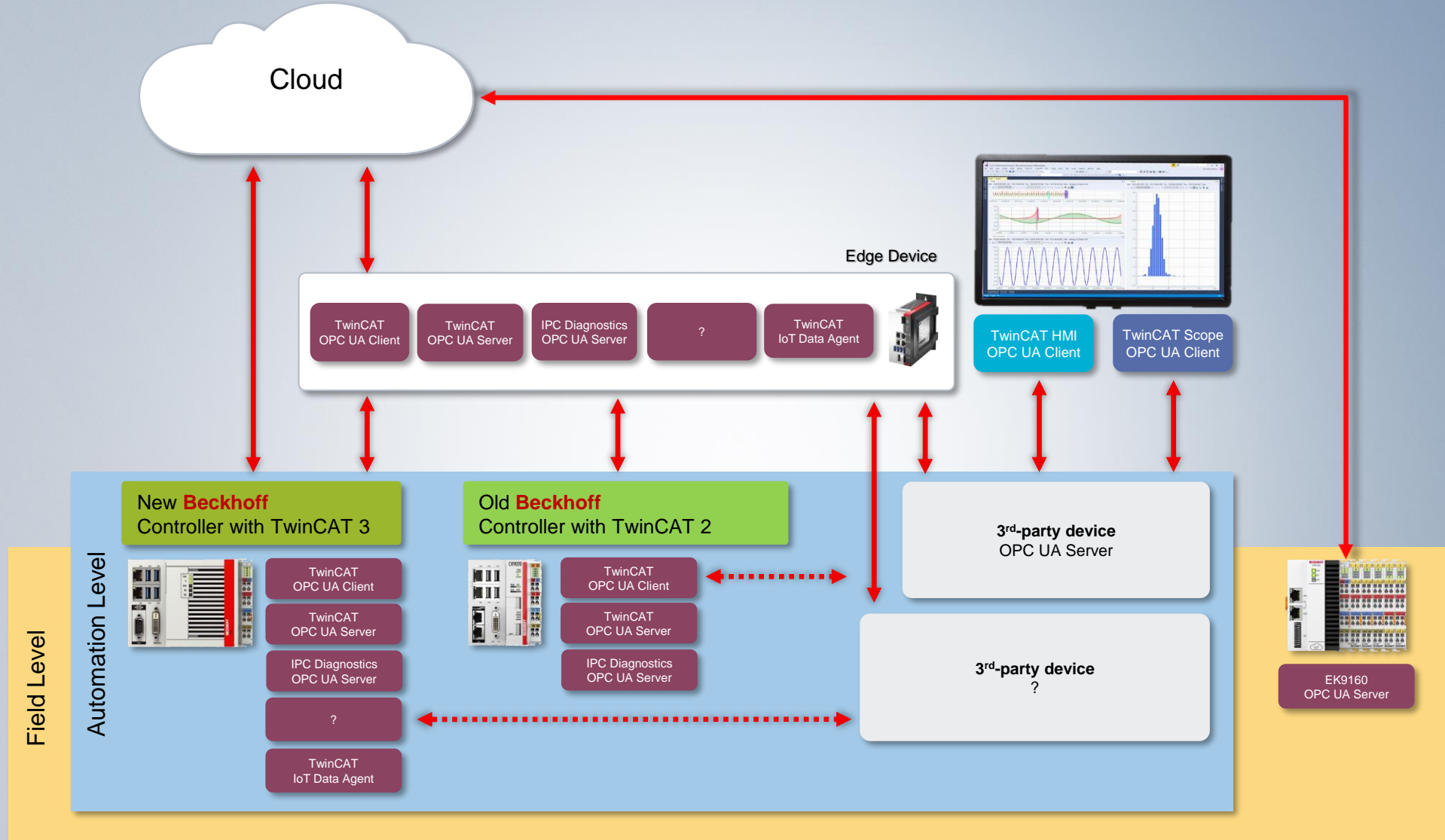


Providing an interface to
machine-data using OPC UA

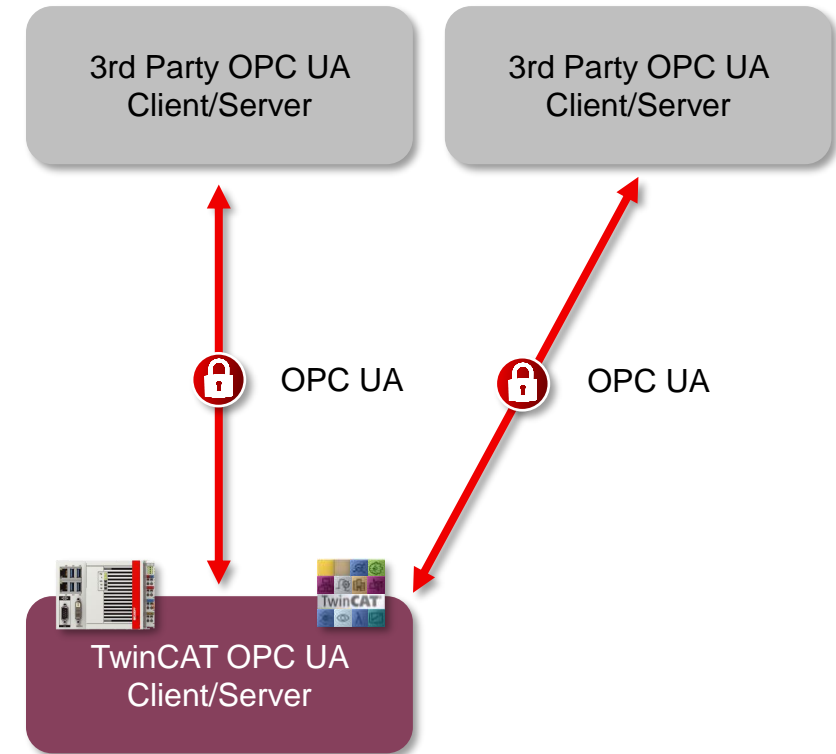




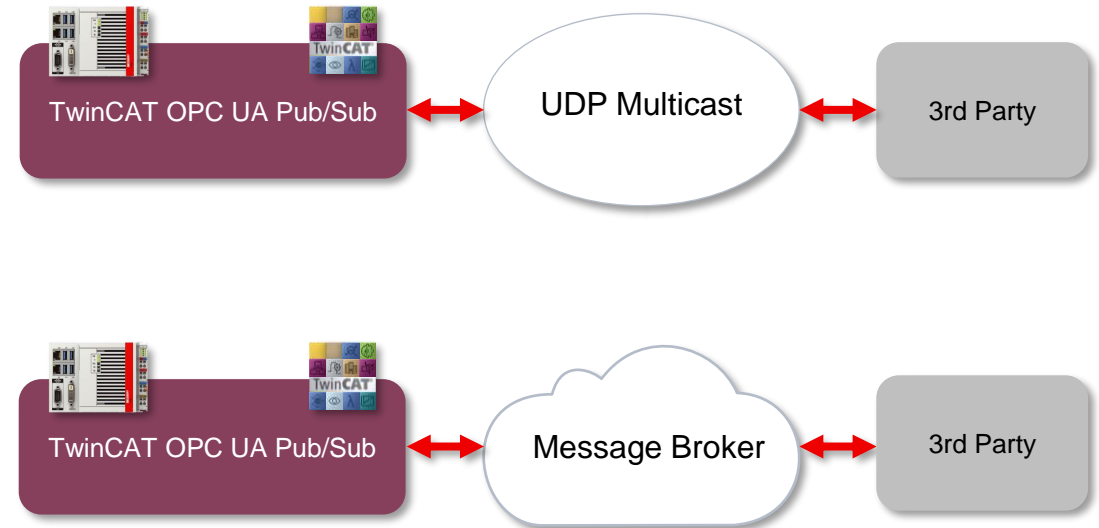




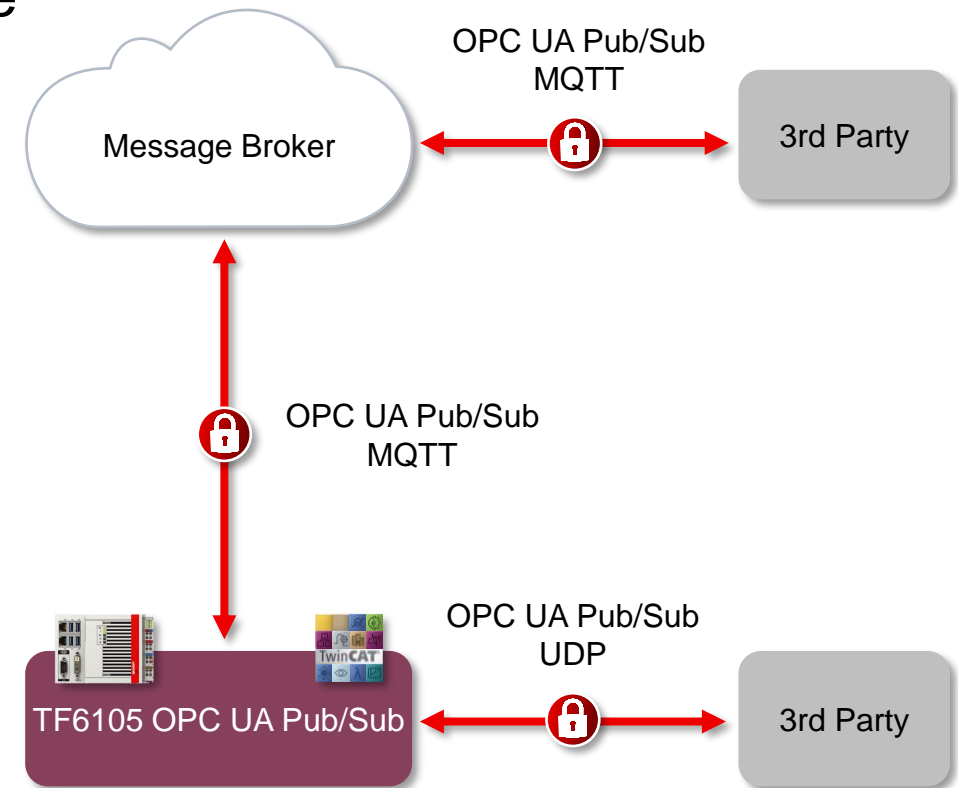
- OPC UA has had a client/server architecture since its beginning in 2006
- This has been perfectly suited for direct communication between devices, e.g. an HMI that directly connects to the PLC to read data
- However there are challenges:
 - Firewalls that need to be configured in order to allow access
 - Poor scalability to hundreds or even thousands of devices
 - Poor performance because of the underlying TCP channel that is used for client/server



- OPC UA Pub/Sub addresses these challenges by decoupling the sender and receiver
- Messages are exchanged via a so-called "message-oriented middleware"
- In case of UDP transport this can be a UDP Multicast group
- In case of MQTT transport this can be a Message Broker

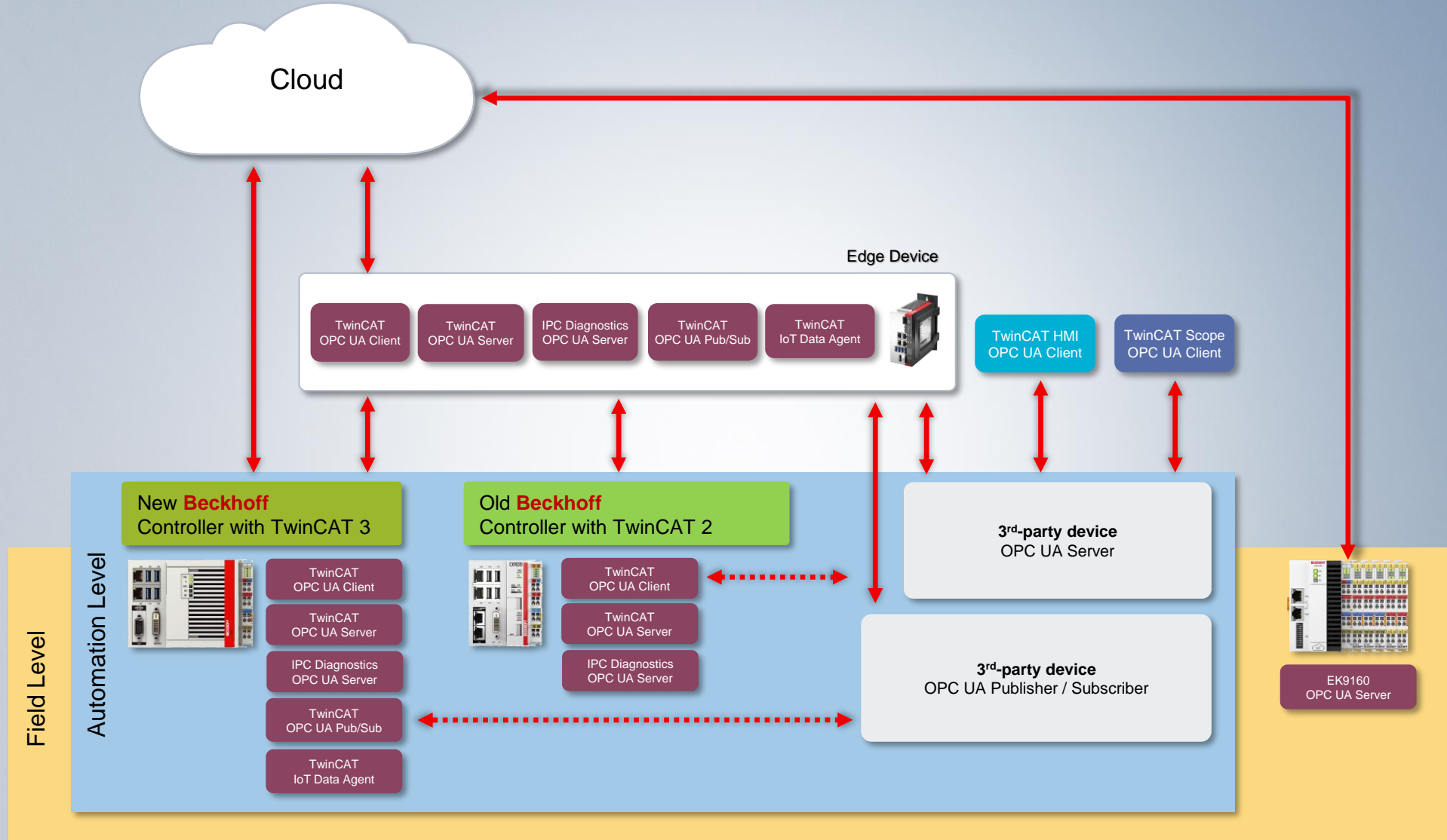


- Implements OPC UA Pub/Sub (OPC10000-14) for the TwinCAT ecosystem
- Supports two transport channels:
 - UDP: Device-to-Device (within local network)
 - MQTT: Device-to-Cloud (across the network)
- Configuration/Engineering
 - TwinCAT Engineering
 - Pub/Sub configuration interface
- Implementation based on a TwinCAT 3 real-time driver
- Supported platforms:
 - Windows 7/10 32-bit/64-bit
 - TwinCAT/BSD



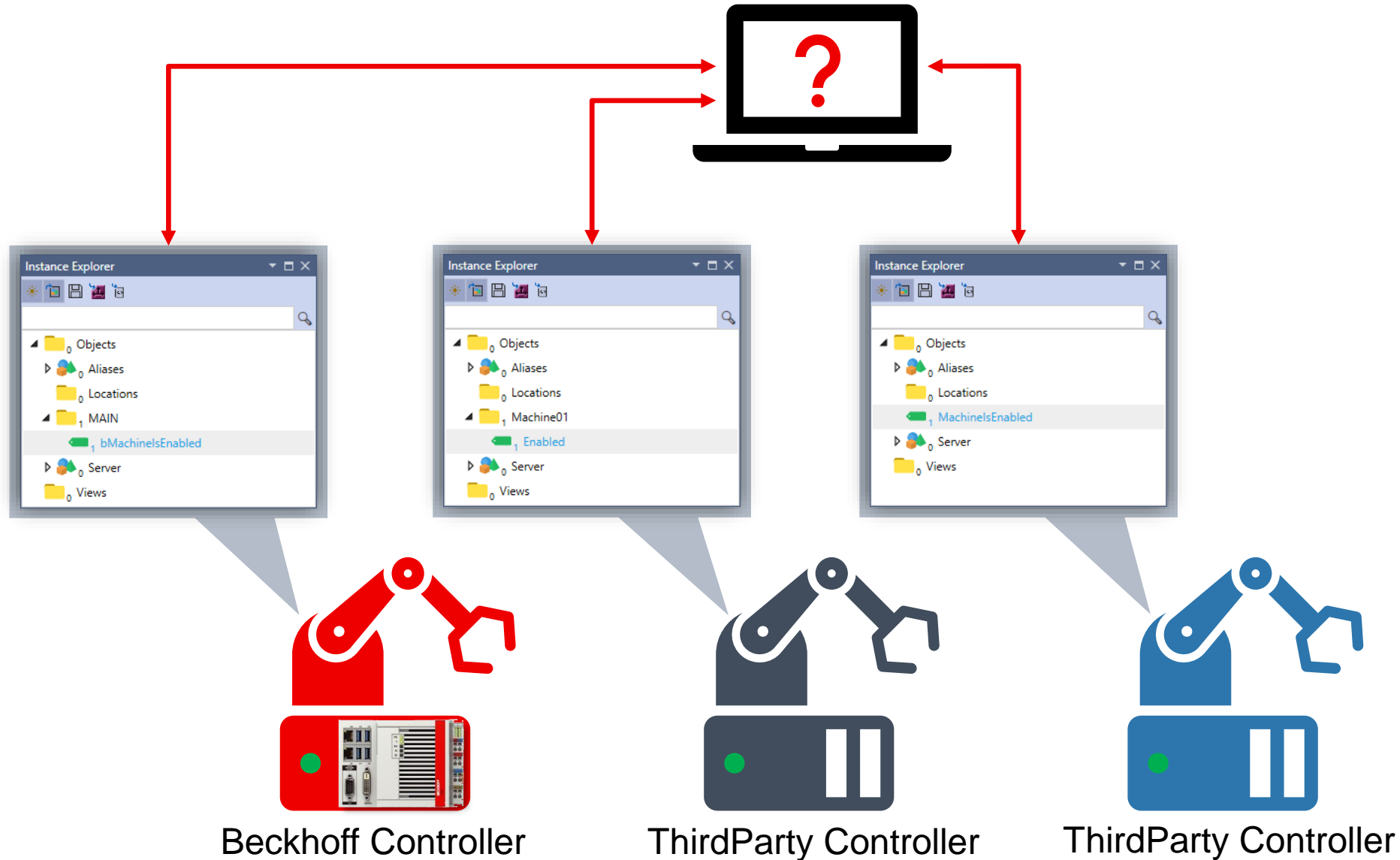
OPC UA enabled products for every use case

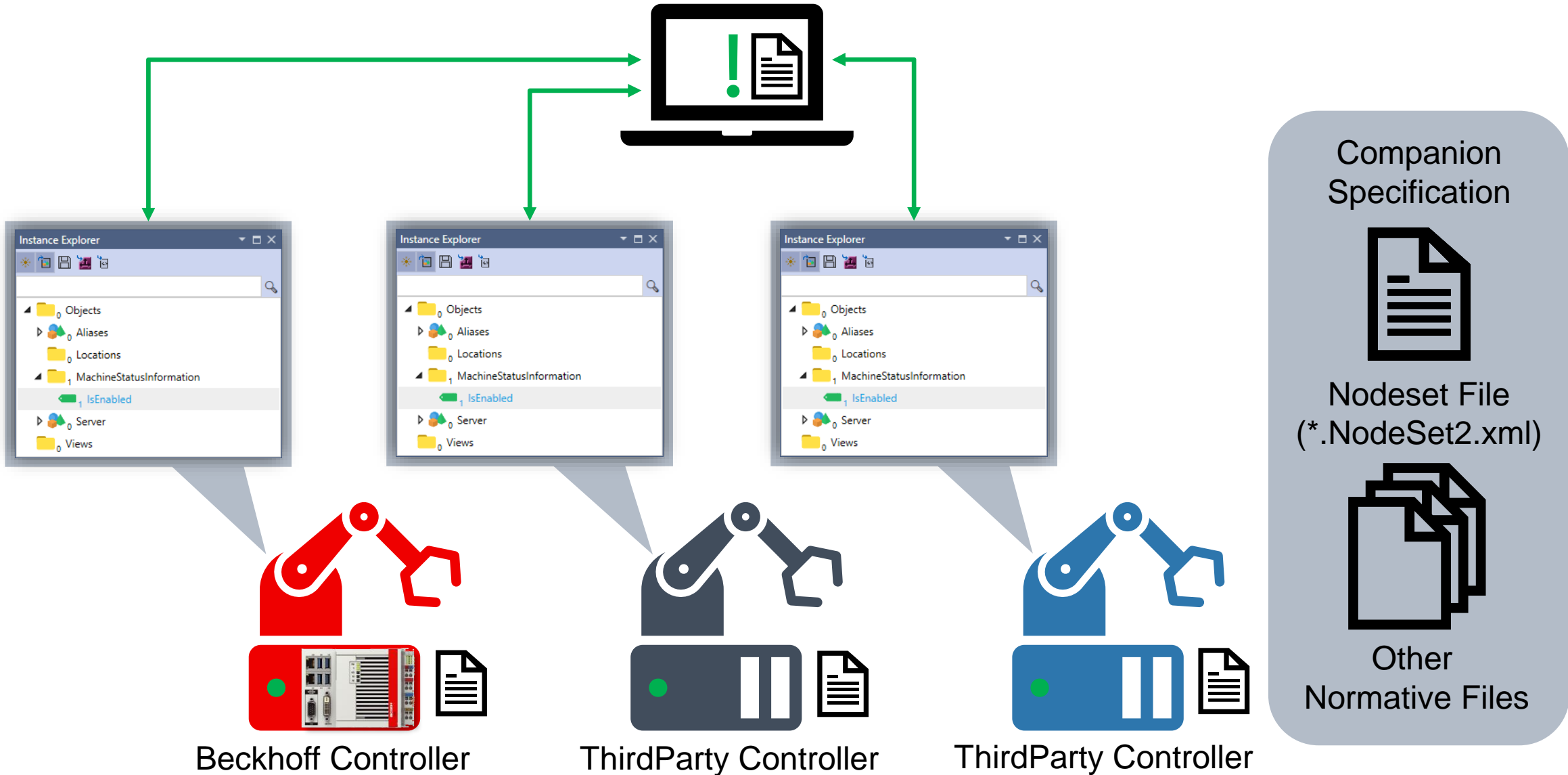
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Providing a **standardized**
interface to machine-data
using OPC UA



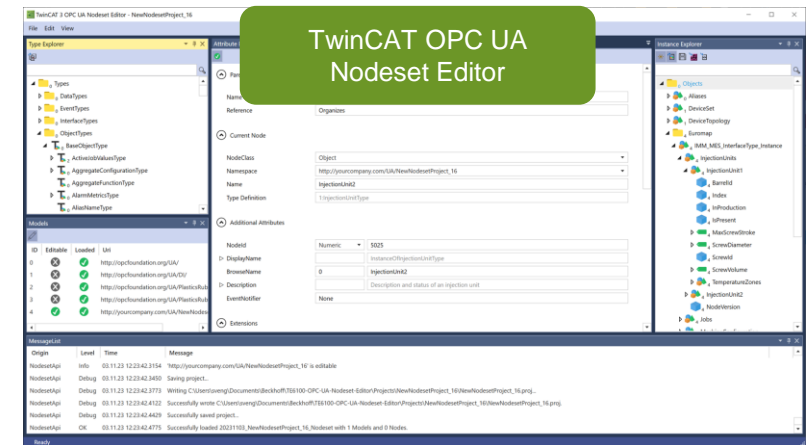




- **New product launch:** TwinCAT 3 OPC UA Nodeset Editor
- **Product purpose:**
 - Import of OPC UA companion specifications into TwinCAT
 - Mapping of PLC Symbols to OPC UA Nodes
 - Works together with our TwinCAT OPC UA Server
 - Automatic code generation to simplify engineering
- **Target audience:**
 - Machine builders that want to fulfill companion specification requirements (e.g. PackML for packaging)
 - Machine builders that are required by their customers to implement “their” companion specification (e.g. large automotive companies)

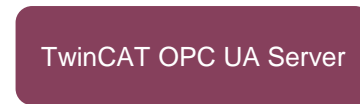


Beckhoff Controller



export

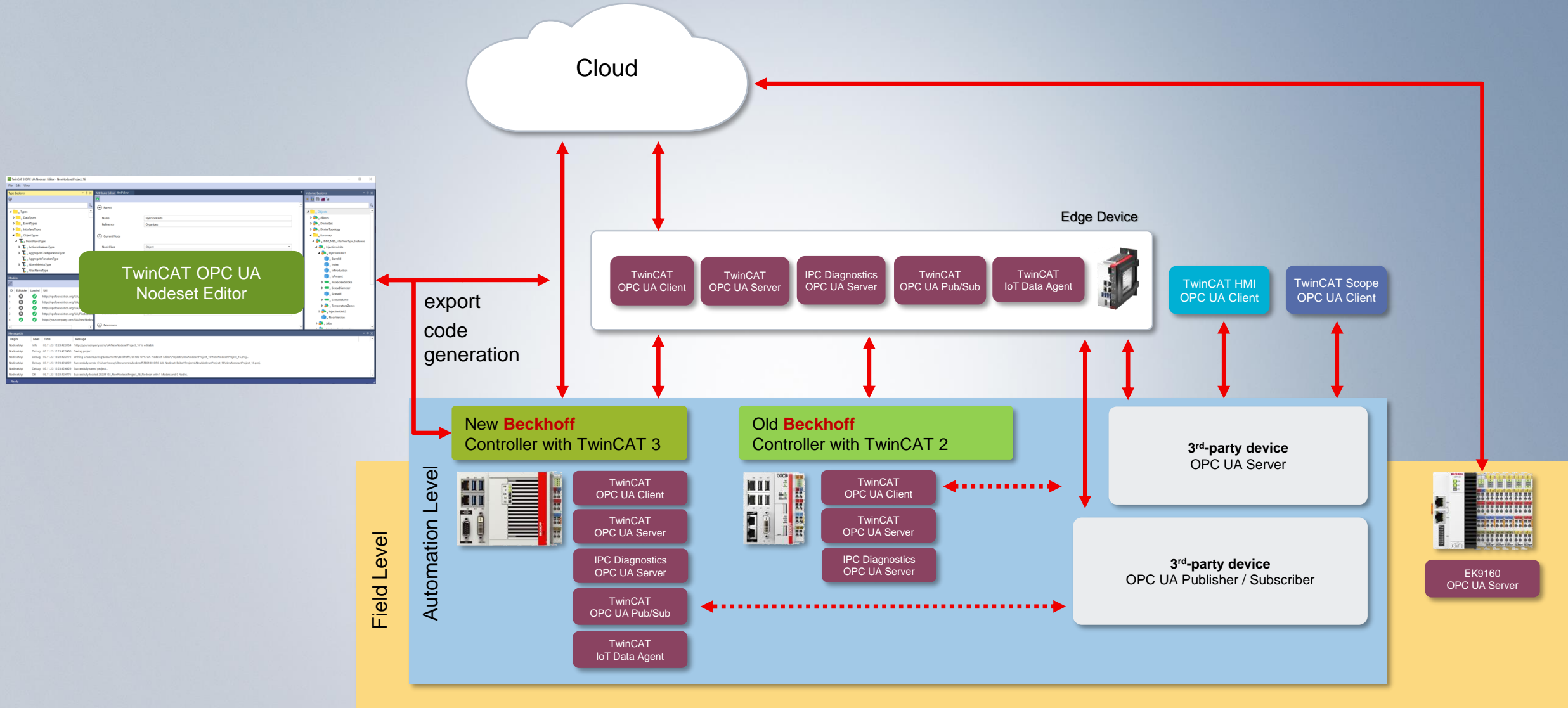
CodeGeneration



Nodeset File
(* .NodeSet2.xml)

Interconnectivity unleashed:

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