optimize!

softing

Technology, Products and
Services for Secure and
Reliable Data Integration

Industrial

OPC Technology

OPC is the world's leading interoperability standard for secure and reliable data exchange in industrial automation and other applications. It ensures the seamless flow of information between devices and software applications of different manufacturers. The current OPC UA (Unified Architecture) standard is platform-independent, leveraging advanced security and data modeling technologies to deliver future-proof, scalable and extensible solutions. Companion Specifications further simplify the use of OPC UA for the end user.

Secure and Reliable All-in-One Solution for OPC Communication and IoT Cloud Connectivity

dataFEED OPC Suite is a software solution for OPC UA and OPC Classic communication and for cloud connectivity in a single product. The integrated OPC UA Server including store-and-forward provides secure and reliable access to PLCs of all leading manufacturers, including Siemens SIMATIC S7, Rockwell ControlLogix, B&R, Mitsubishi, and Modbus controls as supplied by Wago and others.

By acting as a gateway between the two OPC standards, dataFEED OPC Suite also enables the integration of existing OPC Classic components and applications with modern Industrie 4.0 OPC UA solutions. Using the MQTT and REST protocols, production data can be transferred to IoT Cloud or Big Data applications on Microsoft Azure, Amazon AWS, Google Cloud, Bosch PPM and Siemens Mind-Sphere platforms. dataFEED OPC Suite also allows production data to be saved out to a file or stored in an SQL database, or in MongoDB or CouchDB. Thanks to the extensive data preprocessing functionality, data can be adjusted easily and flexibly The integrated OPC UA Tunnel functionality ensures secure cross-network OPC Classic communication without the use of DCOM.
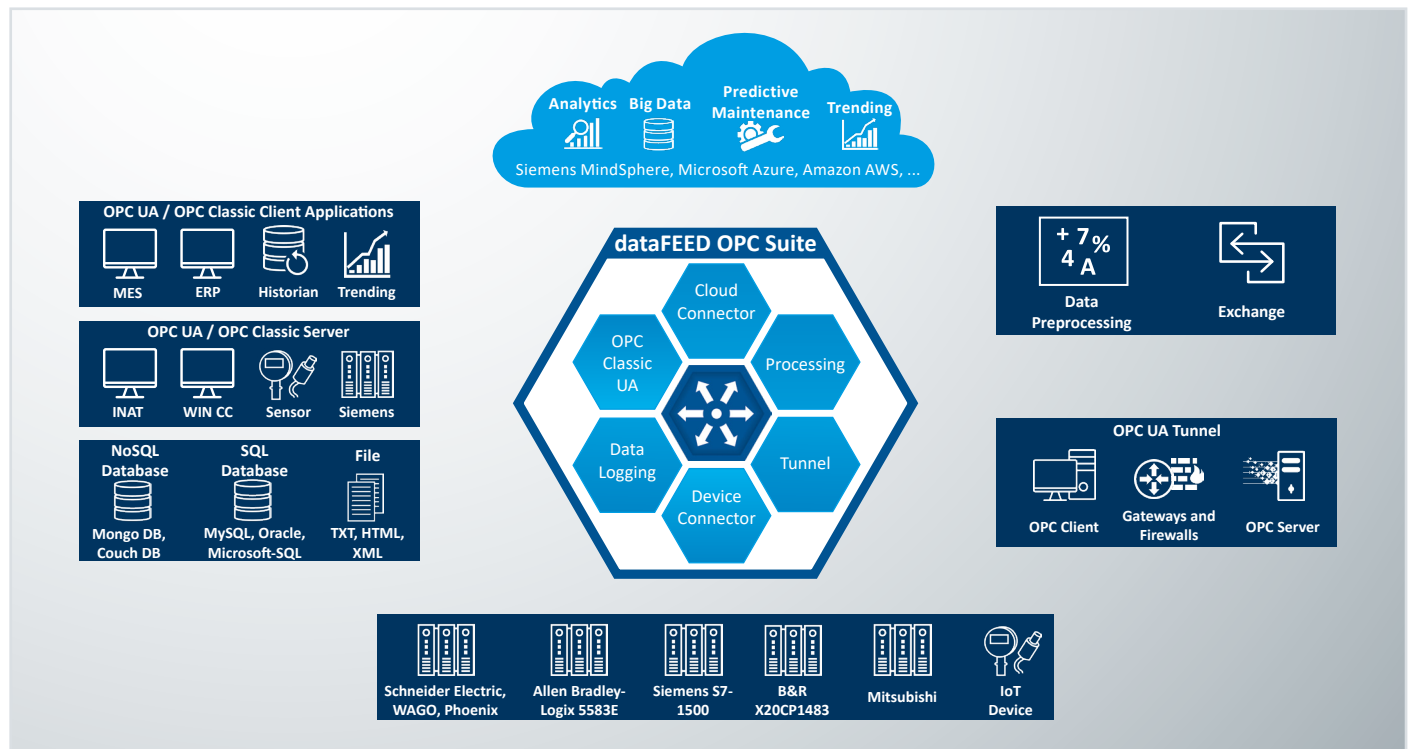
Simple and Independent Access to Controllers and IoT Devices

- Use without modifiying control program
- Integration of non-OPC UA-capable components, such as Siemens S7 controllers, into OPC UA solutions
- Cost savings through further use of already existing OPC Classic components
- Gateway functionality for connecting controllers and components with integrated OPC UA Server to OPC Classic applications
- Direct connection of IoT devices (MQTT Publisher) without using an MQTT Broker

Gateway to Big Data and IoT Clouds Solutions

- Integration of automation devices via MQTT Publisher/ Subscriber and REST Client functionality in IoT cloud applications, e.g. Siemens MindSphere, Amazon AWS or Microsoft Azure
- Easy integration of production data into NoSQL Big Data storage solutions such as MongoDB
- State-of-the-Art security by SSL/TLS support, including certificates
- Protection against data loss through Store & Forward for OPC, MQTT and REST

Extensive and flexible data processing

- Data conversions of values, e.g. conversion from Celsius to Fahrenheit
- Varied logical operation such as extraction of bits from an integer
- Extensive data type conversion options
- Comprehensive and complex data preprocessing through the support of LUA scripts
- Data exchange between different automation worlds (e.g. between Siemens and Rockwell controls) without changing the control program

Easy Configuration

- Modern, intuitive graphical user interface for fast OPC communication configuration
- Use of smart hands-on defaults, setup wizards and drag-and-drop support
- Effective and efficient configuration of distrubuted automation systems with many OPC UA and OPC Classic Servers
- Easy industrial communication by avoiding DCOM and its complex security settings on the OPC Server and OPC Client side

Embedded OPC UA Server Gateways for Siemens and Modbus PLCs

Softing's OPC UA gateway product family offers everything needed to make existing and new systems ready for "Industrie 4.0". The integrated OPC UA Server enables easy and secure data connections to higher-level management systems, such as ERP, MES or SCADA systems. The OPC UA gateways are compact, sustainable and at the same time industry-proven many times over.
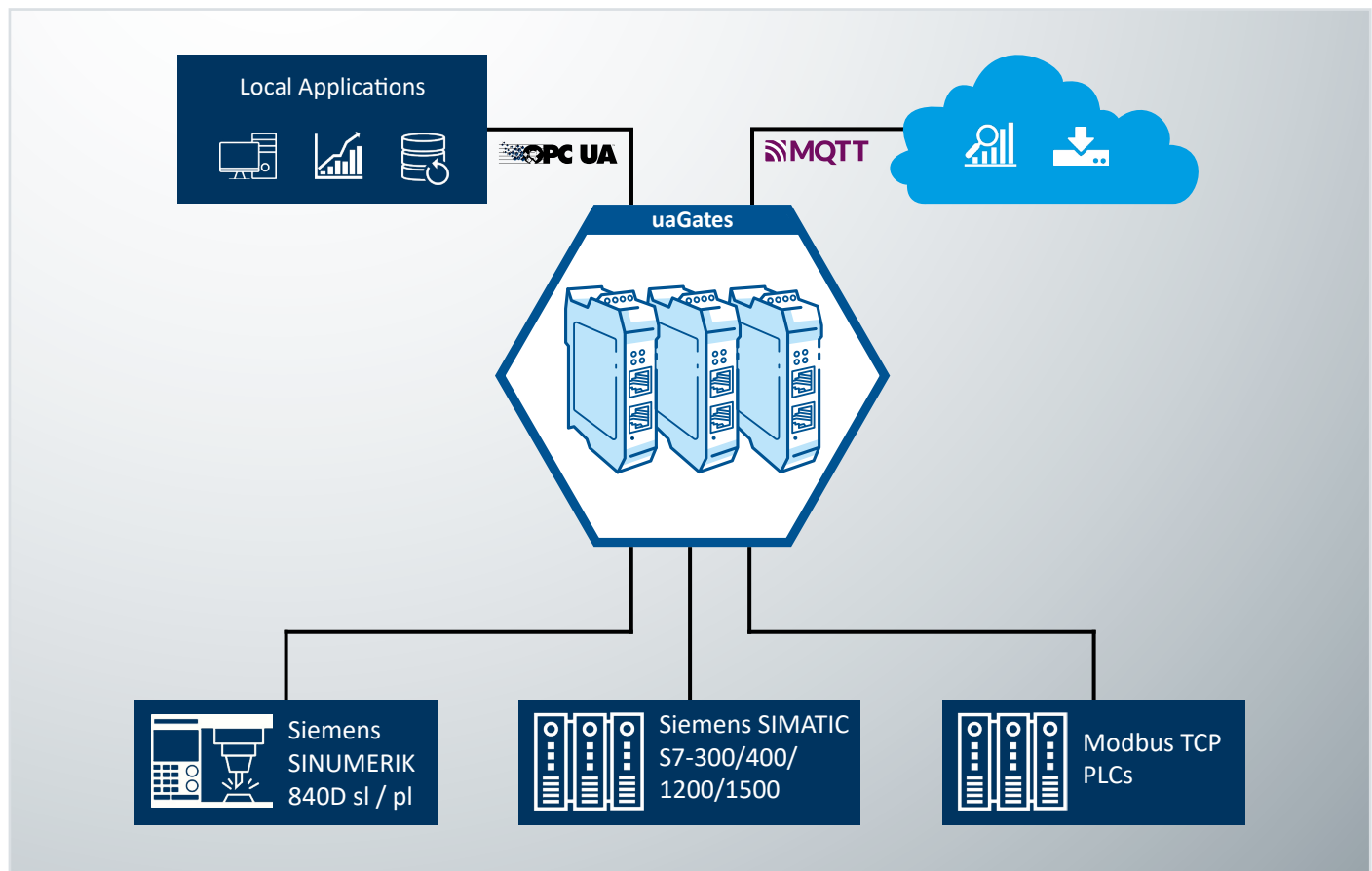
Security Features Proven in Industrial Applications
- Physically distinct interfaces and separate configuration rights for OT and IT networks to prevent intrusions
- Support for security standards such as SSL/ TLS and X.509 certificates
- OPC UA compliant data encryption and user authentication
- Security supported for MQTT communication with private and public clouds

uaGate 840D – OPC UA and MQTT Connectivity for SINUMERIK 840D Data
- Access to PLC, NCK and Drives data from Siemens SINUMERIK 840D
- Integration of different NCU types with software version V4.4 or later
- Delivered with pre-defined symbol files for 4 axes and 4 drives, individually adaptable by user
- Use of data for analysis, condition monitoring, predictive maintenance or data logging purposes

uaGate SI – OPC UA and MQTT Communication Upgrade of Siemens Retrofit Plants
- Easy integration for Siemens S7-300/400/ 1200/1500 controllers
- Direct symbol import from SIMATIC STEP 7 and TIA Portal projects
- Namespace configuration by searching the SIMATIC S7 1200/1500 variables
- Support of optimized data blocks in SIMATIC S7 1200 and S7 1500 controllers

### uaGate MB – OPC UA and MQTT Communication Upgrade of Modbus TCP Plants
- Access to Modbus controllers, e.g. from Schneider Electric, Wago, Beckhoff, Phoenix Contact
- Symbol import via user-created text file
- Easy local and global access to field data and forwarding through firewalls
- Minimum control programming required to set up the registers

Modern Docker Containers

Software Modules for Connecting SIMATIC S7, SINUMERIK 840D, FANUC CNC and Modbus TCP Controllers to Industrial IoT Applications

Softing's edgeConnector products securely connect production lines and machines to the cloud. They use modern Docker container technology for easy scaling of IIoT solutions and fast OT/IT integration. The integrated OPC UA Server enables easy and secure data connections to higher-level management systems, such as ERP, MES or SCADA systems. The data can also be transmitted using MQTT.
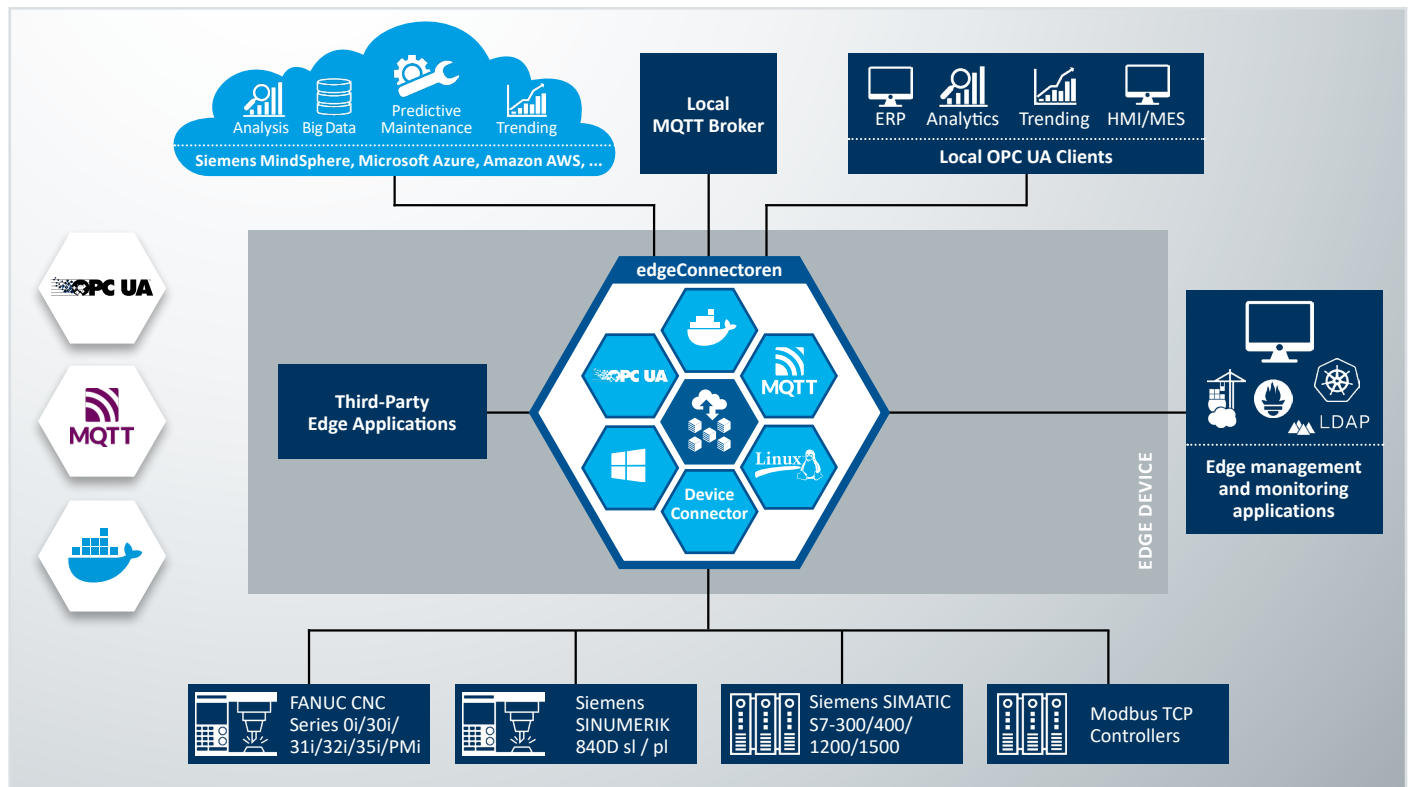
Lightweight Flexible Container Solution

- MQTT Publisher and OPC UA Server functionality for connecting industrial networks to IT applications running on-premise or in cloud
- Less resources required plus increased scalability and flexibility
- Support of security standards such as SSL/TLS, X.509 certificates, authentication and data encryption
- Highly flexible state-of-the-art application to be started or stopped immediately, if needed
- Deployment and configuration also via management systems such as Kubernetes, Azure IoT Edge or AWS IoT Greengrass
- Dedicated for retrofit upgrades of existing controllers

edgeConnector 840D – Accessing Tooling Machine Data from OPC UA Applications

- Provision of SINUMERIK 840D Solution Line and Power Line data
- Pre-defined namespace, customizable for special machine data sets
- Automatic tool recognition and listing of all available magazines and tools
- Reading of NC/PLC alarms, as well as GUD variables and R parameters

edgeConnector Modbus – Accessing Data in Modbus Controllers by OPC UA Applications

- Access to Modbus controls, e.g. from Schneider Electric, Wago, Beckhoff, Phoenix Contact, etc.
- Namespace configuration using a text file created by the user with standard Modbus syntax
- Minimum control programming required to set up the registers

edgeConnector Siemens – Accessing Siemens PLC Data from OPC UA Applications

- Access to SIMATIC S7-300/400/1200/1500 data
- Support of optimized data blocks in SIMATIC S7-300/400/1200/1500 controllers
- Namespace configuration by importing SIMATIC STEP 7 or TIA Portal project files or by directly browsing the variables in S7-1200/1500 controllers

edgeConnector FANUC CNC – Accessing Tooling Machine Data from OPC UA Applications

- Provision of FANUC 0i-, 30-i, and PM-i CNC Series data
- Pre-defined namespace, customizable for user defined PMC areas

Secure and Flexible OPC UA-based IT/OT Integration Solution

Secure Integration Server (SIS) provides a powerful OPC UA data integration layer. Based on the OPC UA aggregation server users implement flexible solutions combining the various OPC UA Servers at automation level with their associated address spaces and making the data available to IT applications via a consistent OPC UA interface. Secure Integration Server covers the full range of OPC UA security features and enables the implementation of state-of-the-art security solutions.

The interface abstraction of Secure Integration Server enables continuous adaptation and scaling of OPC UA-based IoT solutions throughout their entire lifecycle. Users gain a high degree of flexibility and at the same time significantly reduce integration and configuration costs.
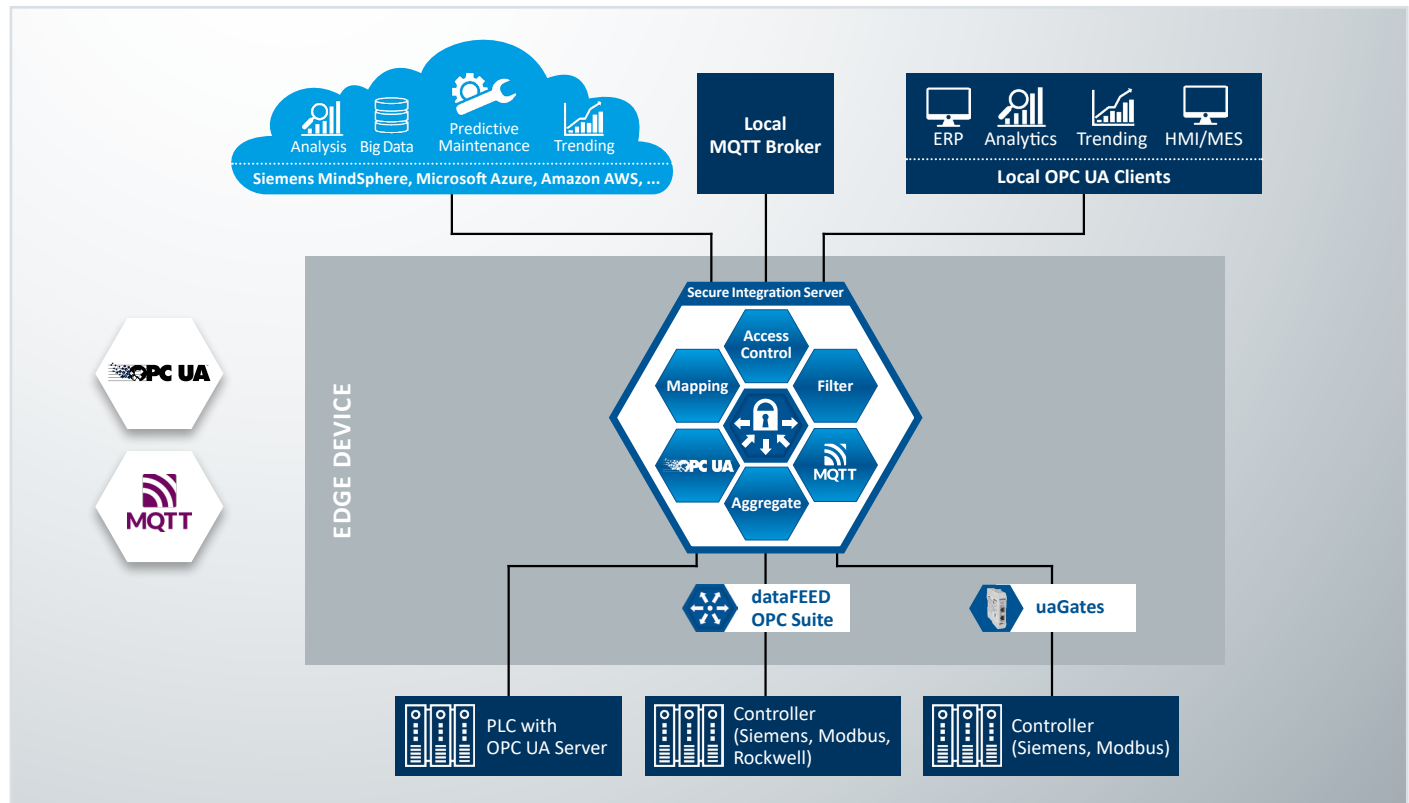
Secure OPC UA Communication

- Support of all safety functions of OPC UA standard
- Provide different data for different users and applications
- Support for multiple OPC UA Endpoints (client or server), each with its own certificates
- Filtered access, depending on IP address (White List / Black List for OPC UA Endpoints)
- Detection of DoS (Denial of Service) attacks on OPC UA authentication

Data Aggregation

- Aggregation of data from multiple sources in a server (aggregation of OPC UA Namespace)
- Application access to aggregation servers, not too many individual data sources
- Extensive and flexible OPC UA Service-based address space filtering, down to OPC UA Item level
- Reduced configuration effort (Configuration not required individually for each OPC UA data source and each OPC UA Client)

Interface Abstraction

- Common, stable OT interface for different IT applications
- Adaptations in automation network transparent for IT applications
- Support for standardized address spaces (companion specifications)
- Flexible variables mapping of integrated OPC UA servers to different loaded address spaces (Address Space Mapping)
- Decoupling of investment decisions in IT and OT environment

MQTT Gateway for the Integration of OPC UA Applications into Modern Industry 4.0 or IoT Cloud Solutions

- Individual use of all security mechanisms of the MQTT standard, e.g. SSL encryption including certificates
- Protection against data loss through the Store&Forward function: data buffering when the connection is lost and automatic transmission after the connection reactivation
- Extensive and flexible trigger options through "LUA Script Engine" support
- Freely definable and customizable JSON data format

edgeAggregator

Container-based OT/IT Integration Solution Based on OPC UA and MQTT

edgeAggregator provides a powerful OPC UA data integration layer in combination with a modern Docker-based IoT edge solution. The OPC UA aggregation server can be used to combine different OPC UA Servers at the automation level with their respective address spaces. The data is made available to the IT applications via a consistent OPC UA interface.

The edgeAggregator's interface abstraction enables continuous adaptation and scaling of OPC UA- and MQTT-based IoT solutions throughout their entire lifecycle. Users gain a high degree of flexibility and at the same time reduce their integration and configuration costs.
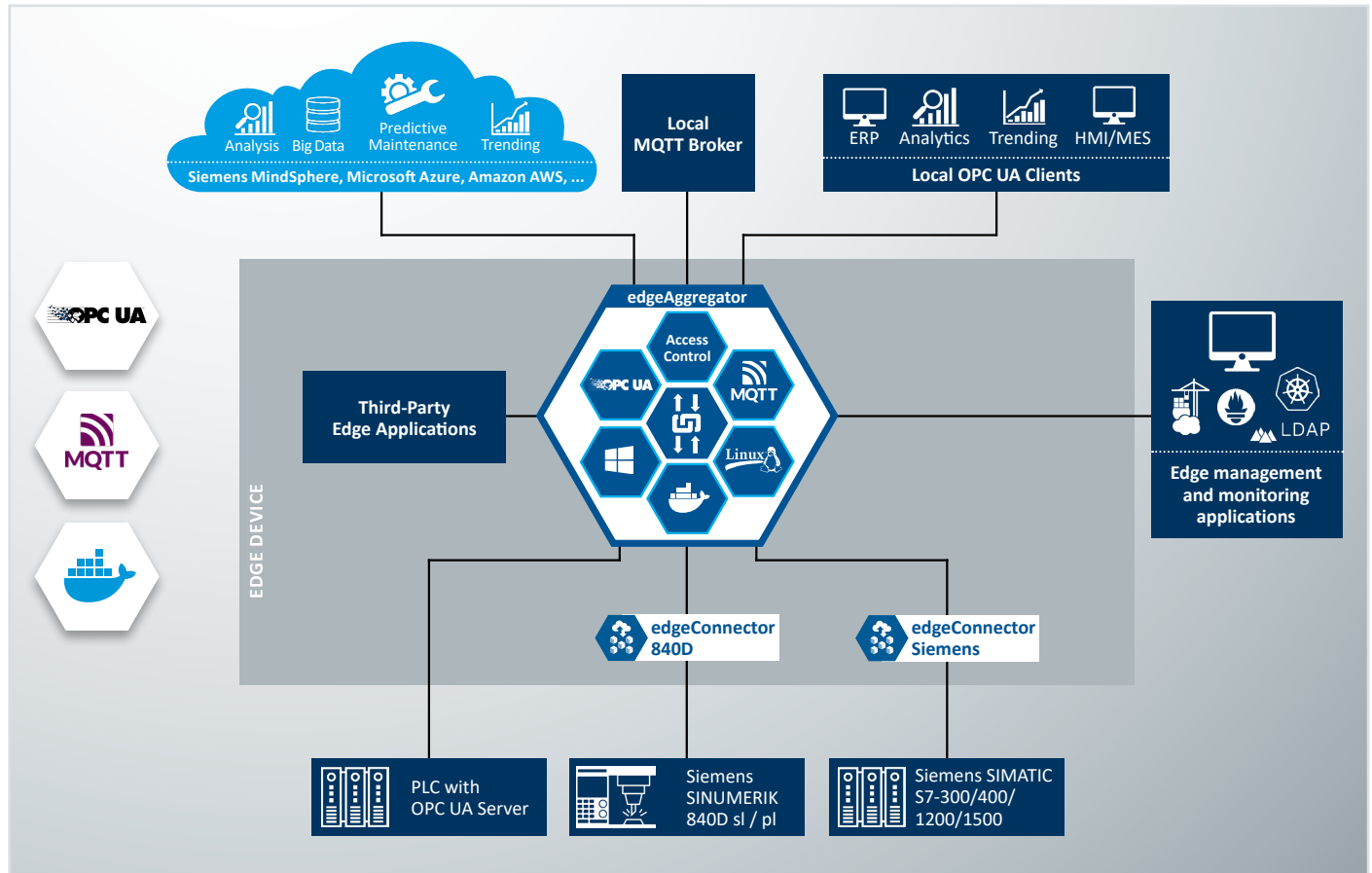
Secure Communication
- Support of all OPC UA and MQTT security features
- Provision of different data for different users and applications
- Filtered access, depending on IP address (White List / Black List for OPC UA Endpoints)
- Detection of DoS (Denial of Service) attacks on OPC UA authentication

Lightweight Flexible Container Solution
- Less resources plus increased scalability and flexibility
- Highly flexible state-of-the-art application to be deployed, adjusted or started and stopped immediately, if needed
- Deployment and configuration also via management systems such as Kubernetes, Azure IoT Edge or AWS IoT Greengrass
- Container images stored in different online repositories like Docker Hub or Azure Container Registry (ACR)
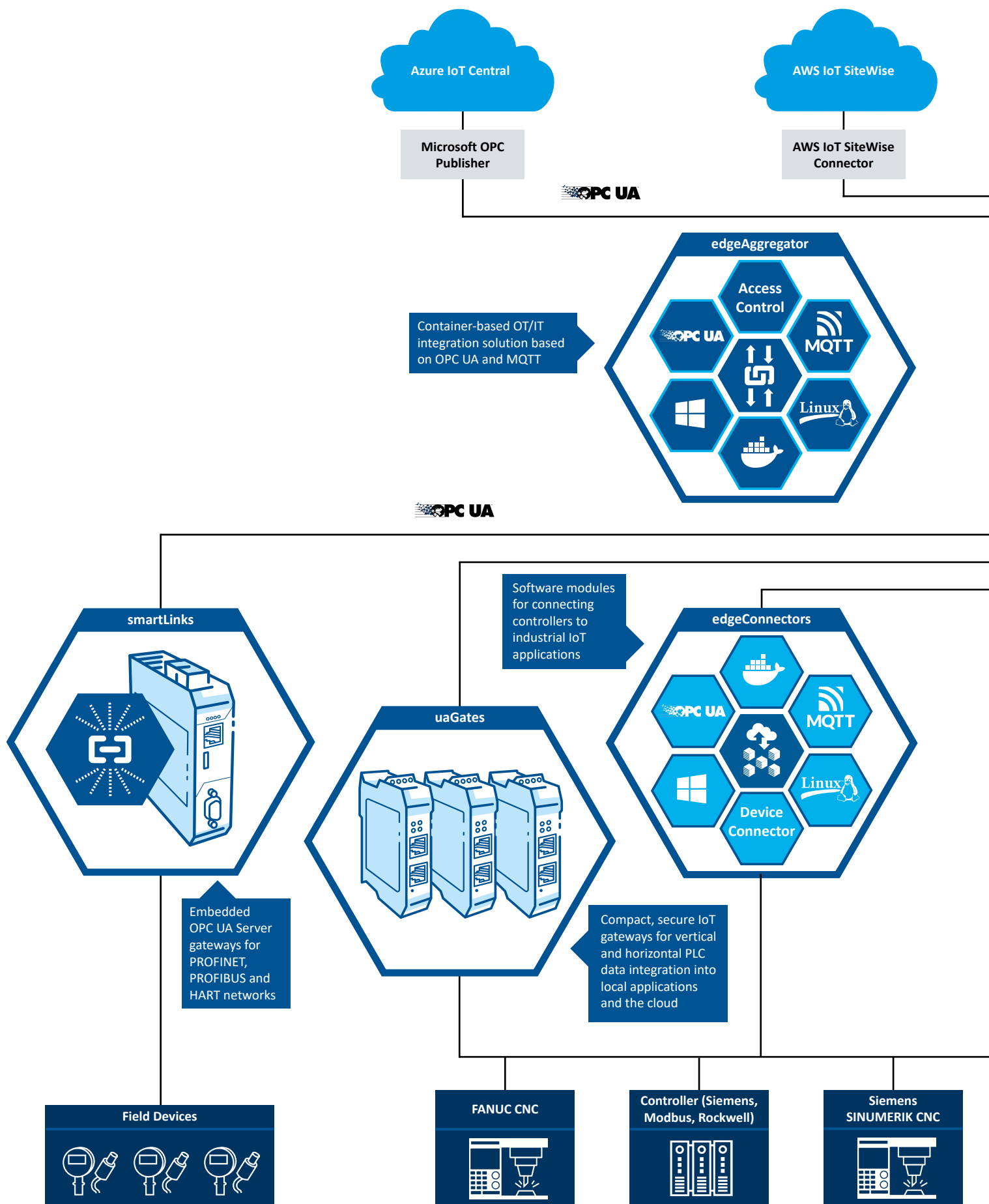
Data Aggregation and Interface Abstraction
- Aggregation of data from multiple sources in a server (aggregation of OPC UA Namespace)
- Application access to aggregation servers instead of many individual data sources
- Extensive and flexible OPC UA Service-based address space filtering, down to OPC UA Item level
- Reduced configuration effort (no separate configuration required for each OPC UA data source and each OPC UA Client)
- Adaptations in automation network transparent for IT applications

Solutions for Edge Architectures
- Edge solution with features and benefits identical to those resulting from using central cloud platforms
- Running local clients (e.g. for edge analytics) in parallel with cloud-based applications
- Start with small edge-based IoT solution, with gradual adaptation and expansion possible over time

OPC UA Expertise from Softing

Azure IoT Central

Microsoft OPC Publisher

AWS IoT SiteWise

AWS IoT SiteWise Connector

OPC UA

edgeAggregator

Container-based OT/IT integration solution based on OPC UA and MQTT

Access Control

OPC UA

MQTT

Linux

OPC UA

smartLinks

Software modules for connecting controllers to industrial IoT applications

edgeConnectors

OPC UA

MQTT

Linux

Device Connector

uaGates

Embedded OPC UA Server gateways for PROFINET, PROFIBUS and HART networks

Compact, secure IoT gateways for vertical and horizontal PLC data integration into local applications and the cloud

Field Devices

FANUC CNC

Controller (Siemens, Modbus, Rockwell)

Siemens SINUMERIK CNC

Local OPC UA Applications

OPC UA

Quick and easy integration of OPC UA Client/Server & Publisher/Subscriber communication

Secure Integration Server

- Access Control
- Mapping
- Filter
- OPC UA
- MQTT
- Aggregate

Software for OT/IT integration based on the OPC UA interoperability standard

OPC UA

OPC UA Demo Client

OPC UA Demo Client for testing OPC UA Server connections

OPC UA

OPC UA

dataFEED OPC Suite

- Cloud Connector
- OPC Classic UA
- Processing
- Data Logging
- Tunnel
- Device Connector

Secure and reliable All-in-One Solution for OPC communication and IoT Cloud connectivity

Direct integration of an OPC UA Server into a ControlLogix chassis

Quick and easy integration of OPC UA Client/Server & Publisher/Subscriber communication

eATM OPC UA Server

ControlLogix

Control with OPC UA

Sensor with OPC UA

# OPC UA SDKs

Fast Development of OPC UA Applications

Softing's OPC UA SDKs enable the fast integration of OPC UA connectivity capabilities in automation applications. The SDKs consist of a comprehensive set of libraries featuring a simple and well-documented programming interface, relevant example applications, along with test and simulation tools, allowing short time-to-market of OPC UA-enabled programs.
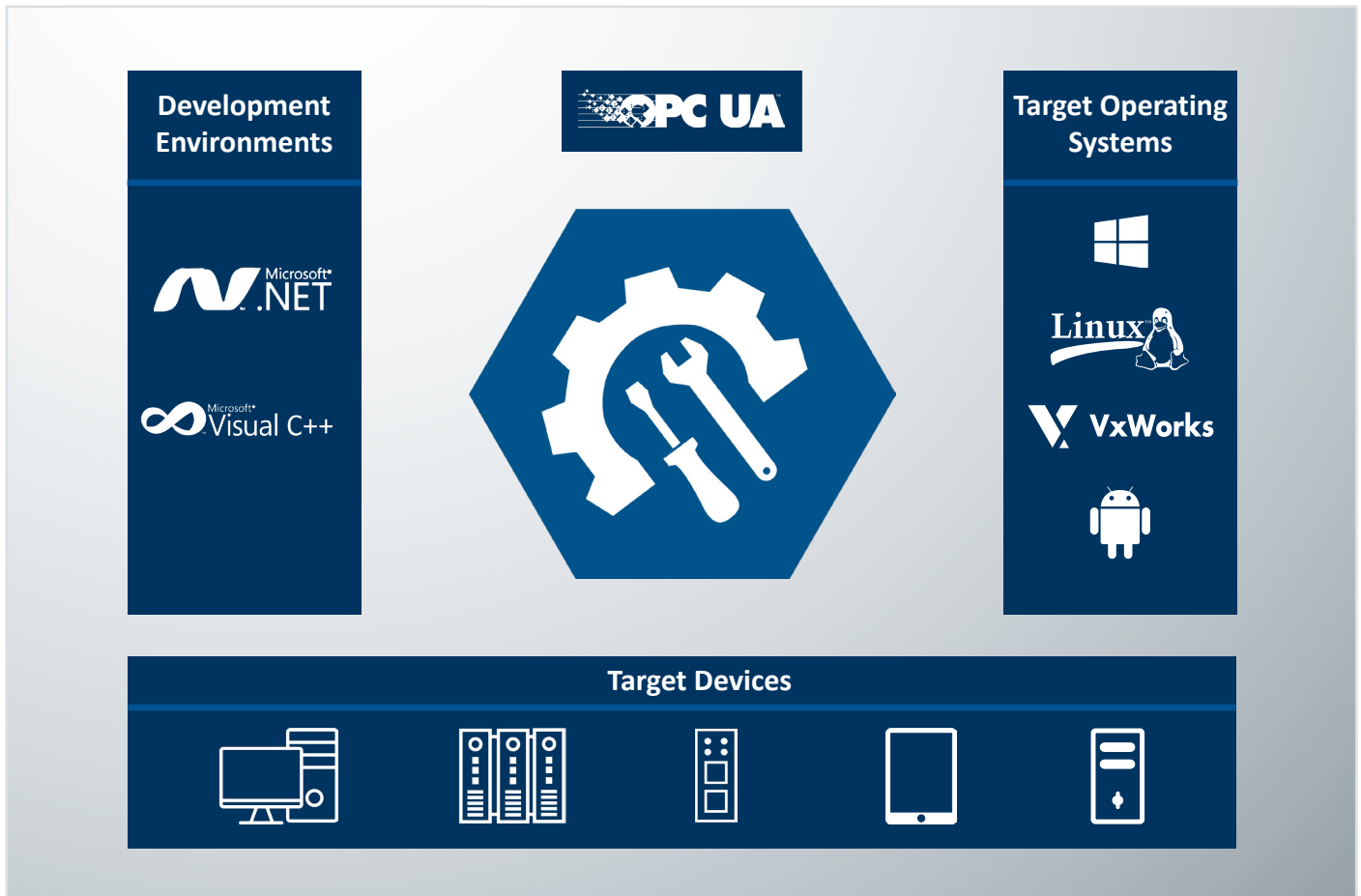
Complete Solution Addressing all Customer Requirements

- Comprehensive set of building blocks offering encapsulation and easy-to-use functionality required for implementing OPC UA Clients/Servers and OPC UA Publishers/Subscribers

- Modular design to scale OPC UA functionality according to current requirements

- Wide range of available functionality, including Extended Security, Data Access, Complex Data, Events, Alarms & Conditions and Historical Access

- Integrated security protocols allowing safe remote data transfer actively addressing modern security threats

- Can be used for time-critical control tasks and complex automation projects

- OPC UA Servers and Clients capable to move data and information between factory floor and enterprise level

Comprehensive Scope of Delivery for Easy and Fast Development

- Optimized Application Programming Interface (API) and easy to understand documentation

- Complimentary how-to example applications, step-by-step tutorials, complex test and simulation clients and servers enabling a quick start of OPC UA development

Investment Security Through Innovative License Model

- Implementation according to the latest OPC UA Client and Server specifications

- Free migration to upcoming OPC UA SDK versions thanks to SDK software and 3 years' right to updates to future versions

- Technology proven by use in Softing's OPC Server and middleware products

OPC UA Demo Client

Free Software for Integrating OPC UA Communication in Customer Applications with the Help of SDKs

The OPC UA Demo Client provides an easy way to access OPC UA data in development or manufacturing environments. The OPC UA client created with the help of the .NET Standard SDK shows the possibilities that exist for using an SDK. End users can take their first steps with OPC UA communication with the free OPC UA client. The OPC UA client provides support in commissioning OPC UA products, such as the dataFEED OPC Suite or the edgeConnectors.
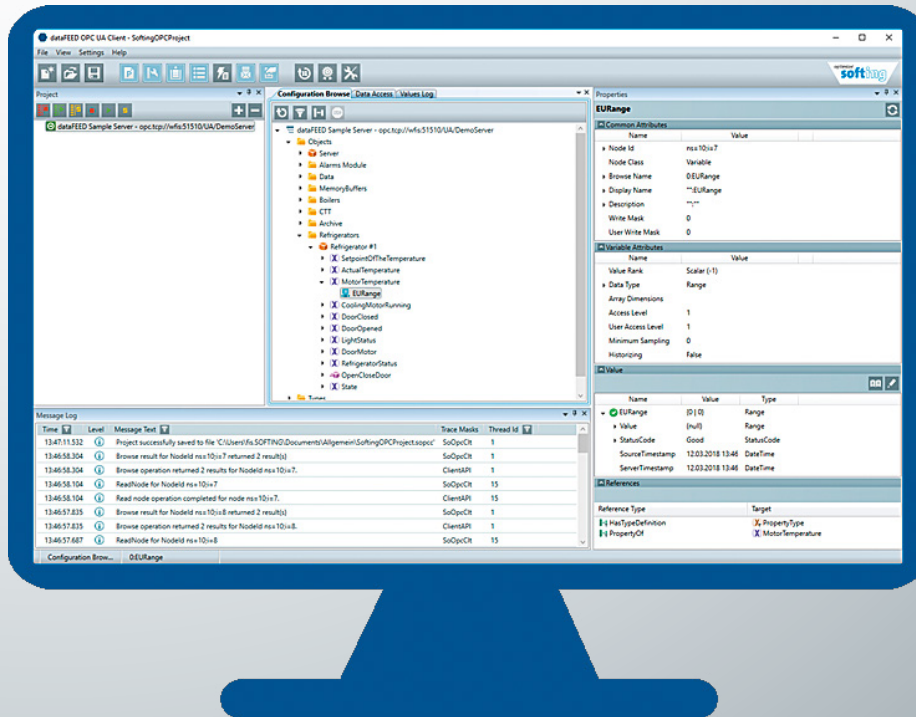
Secure Communication
- Use of the latest security interfaces
- Secure, encrypted data communication

Data Access
- Access to data on all common OPC UA Servers
- Value monitoring
- Writing of values on OPC UA Servers

Up to Date
- Regular updates available
- Support for OPC UA Specification 1.04
- Available for Windows operating systems

Embedded OPC UA Server Gateways for PROFINET, PROFIBUS and HART Networks

The smartLink product family offers Industrie 4.0 connectivity for new and existing networks. The integrated OPC UA Server enables easy and secure data connections to higher-level applications. smartLinks are compact, future-proof and support PROFINET, PROFIBUS and HART.
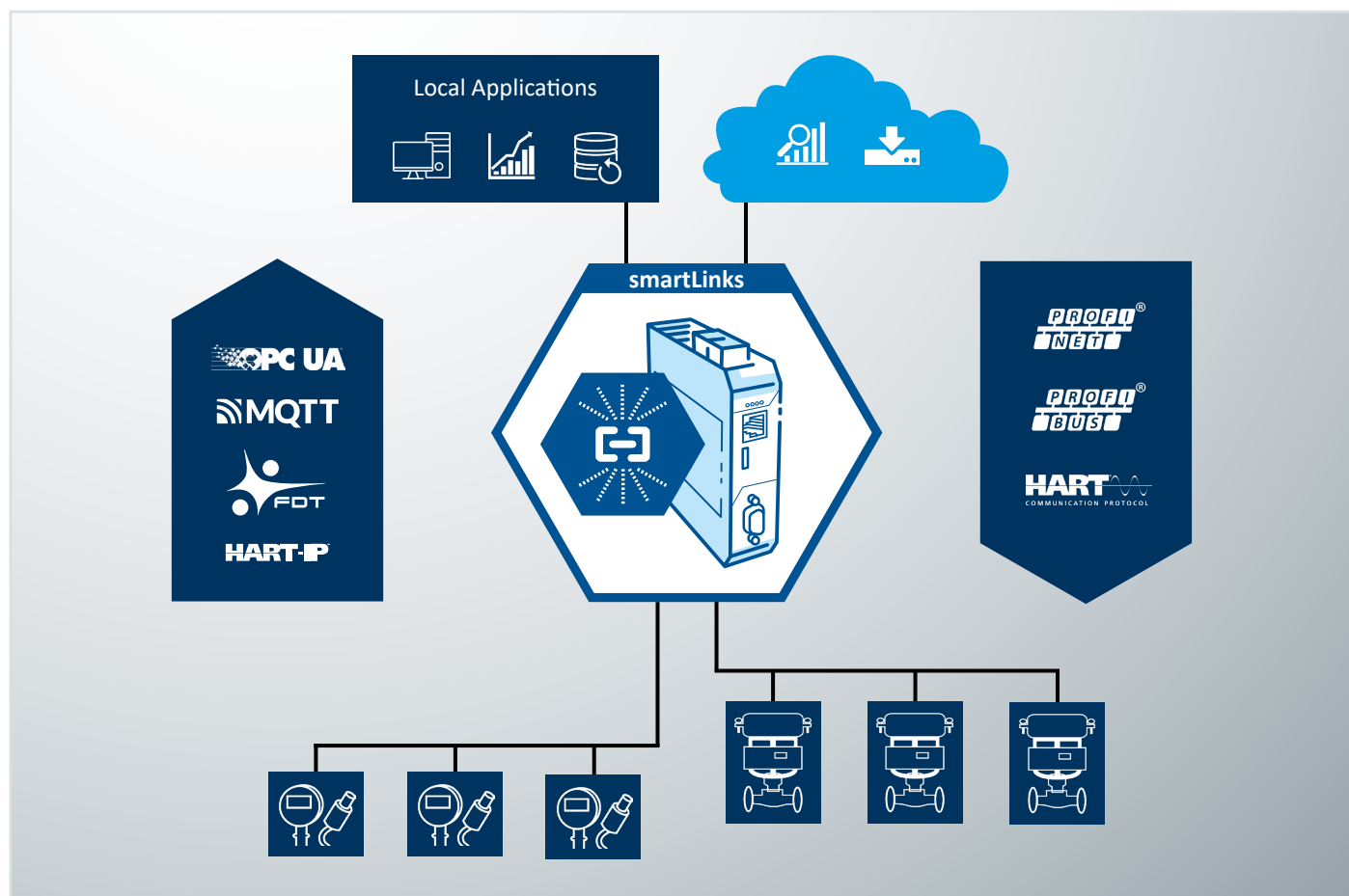
smartLink HW-DP – IIoT Gateway for Connecting to Legacy PROFIBUS Networks

- Enables integration of Industrie 4.0 applications into PROFIBUS & Hart systems
- Device configuration, parameterization and plant asset management using standard industry tools
- Acquisition of all relevant data with minimum footprint
- Independent of the control system used

smartLink HW-PN – IIoT Gateway for Connecting to Legacy PROFINET Networks

- Enables integration of Industrie 4.0 applications into PROFINET, PROFIBUS & HART systems
- Device configuration, parameterization and plant asset management using standard industry tools
- Direct connectivity to the PROFINET network
- Independent of the control system used

smartLink SW-PN – Software for Connecting to Legacy PROFINET Networks

- Enables integration of Industrie 4.0 applications into PROFINET, PROFIBUS & HART systems without requiring additional hardware
- Device configuration, parameterization and plant asset management using standard industry tools
- Direct connectivity to the PROFINET network using the existing infrastructure
- Independent of the control system used

smartLink SW-HT – Hart Multiplexer Software for Accessing Configuration and Diagnostics Data

- Access to HART devices connected to Allen-Bradley, Siemens, Schneider Electric, R.Stahl, Turck HART IO modules or controllers without requiring additional hardware
- Transparent HART communication
- Easy deployment for Windows and Docker

eATM OPC UA Server-Module for ControlLogix

Direct Integration of an OPC UA Server into a ControlLogix Chassis

The eATM (Enterprise Appliance Transaction Module) control module provides an OPC UA Server in a ControlLogix controller that enables the integration of OPC UA Clients. eATM OPC UA server allows data to be exchanged between the IT and automation worlds. This allows recipes and manufacturing instructions to be loaded into the controller or the production history and data to be used for device monitoring in the OPC UA Client.

eATM OPC UA Server was developed under the Rockwell Automation Encompass Product Partner program. This allows Softing to offer direct access to backplane bus data and control variables in its modules for the ControlLogix controller.
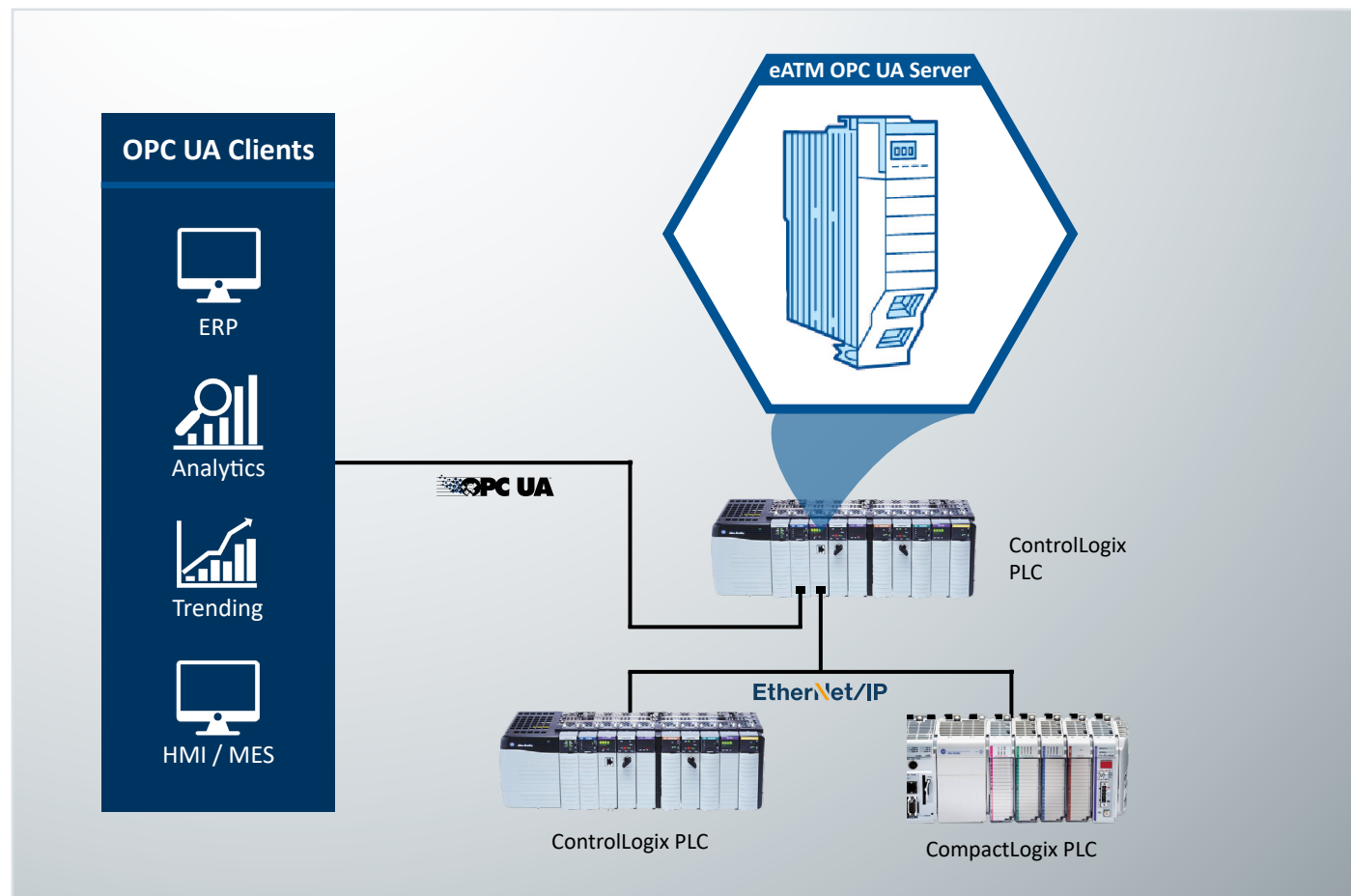
Simple and Fast Connection of OPC UA Clients and Additional PLCs to ControlLogix

- Acts as a transaction server, replacing an additional PC plus software for connectivity

- Automatic generation of SQL transaction code based on easy-to-use menu-driven selections

- Easy integration into OPC UA applications

- Integration of additional Rockwell PLCs for data exchange with databases

- Migration from legacy systems to Industrie 4.0

Rock Solid Security

- Virus-resistant in-chassis module, not requiring anti-virus updates and on-going security patches

- Configuration software with assignable user privileges

Robust Data Handling

- Access to controller data using native backplane communication based on Rockwell Automation Encompass Product Partner program, resulting in increased transaction speed

- No need to modify PLC logic for tag monitoring applications such as monitoring key performance indicators

OPC UA Training and Consulting Based on Extensive Experience

Softing offers a complete portfolio of services ensuring the successful entry to OPC UA technology. These include offerings tailored to meet the specific needs of OPC product manufacturers, software developers or OPC technology users. All services leverage Softing's rich OPC experience and are technically sound and designed for practical use.

CONSULTING   **TRAINING**   **SERVICES**

OPC Development and Consulting

- Customized consulting services for developers on designing, developing, optimizing and testing customers' OPC UA technology products using Softing OPC UA SDKs.

- Development support for C++ and C# programming languages

- Access to in-depth experience in selecting suitable OPC specifications, optimum architecture options and development tools

- Porting of Softing OPC UA SDKs to customer-specific operating systems and hardware platforms

- Consulting on OPC UA compliance certification

OPC User Training and OPC UA Technology Jump Start

- Efficient OPC UA jump start training for decision makers, technical leaders and product managers

- Compact but thorough introduction to OPC UA

- Evaluating the use of OPC UA technology

- Providing support in making decisions about the right time and approach to start OPC UA development

Softing Expertise

With more than 20 years of experience in OPC technology and a close working relationship with the OPC Foundation, Softing is the ideal partner for all OPC-related topics. Softing develops and markets a broad range of development tools and consumer products, including gateways for innovative and secure IoT architectures. This enables customers to implement state-of-the-art solutions for OPC-based data exchange, perfectly tailored to individual requirements, both in brownfield applications and new systems. Since all Softing products support state-of-the-art OPC UA technology, the implemented applications benefit directly from its advantages. The product range is supplemented by appropriate training and development services.

OPC UA

OPC

REST

HART
COMMUNICATION PROTOCOL

PROFI BUS ®

PROFI NET ®

Microsoft Azure
Certified

RA Encompass™ Product Partner
A ROCKWELL AUTOMATION PARTNER

Silver Partner
MindSphere   SIEMENS

MQTT

optimize!
softing