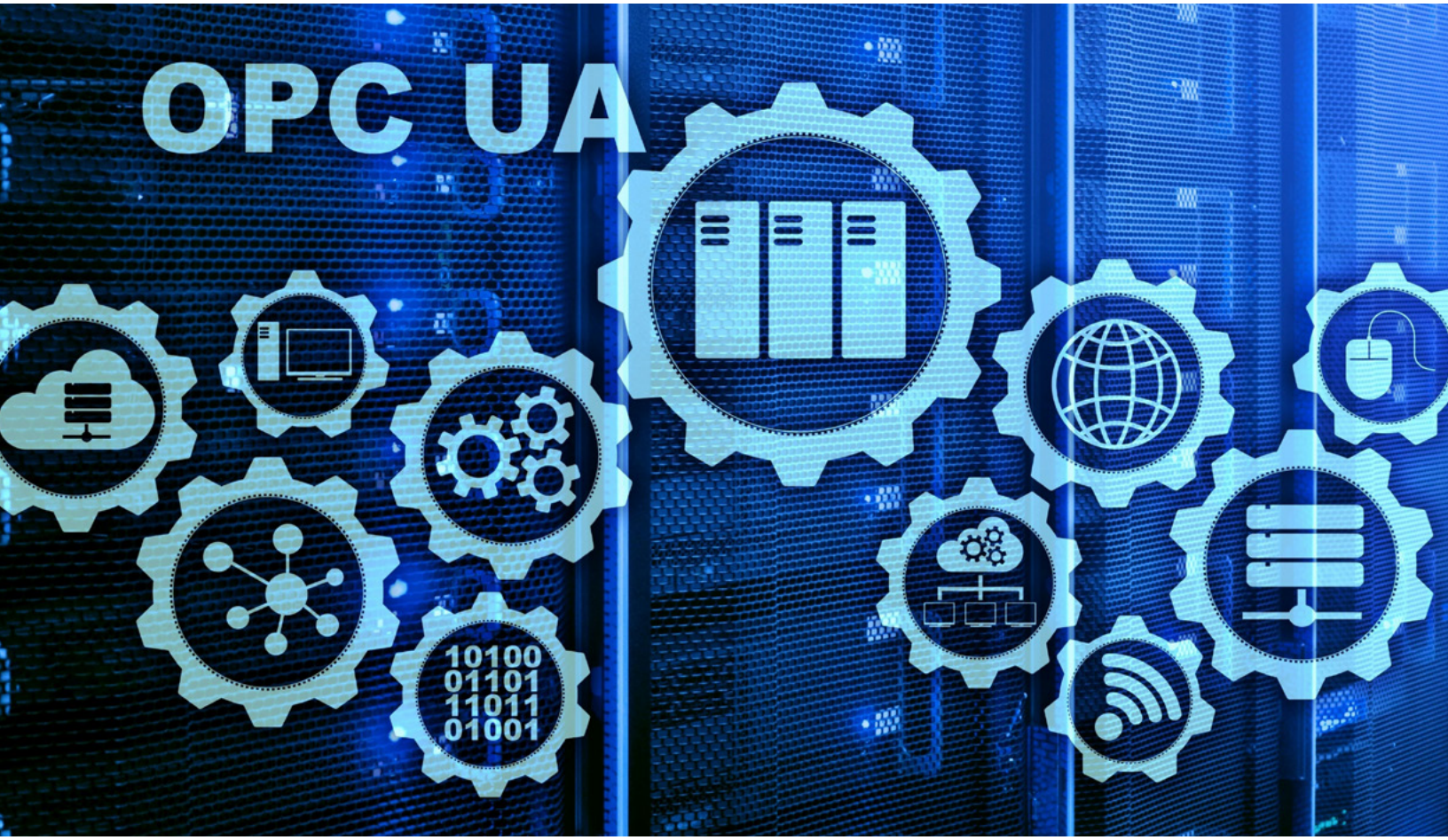

Making OPC UA solutions easy to use:

Efficient engineering with a hands-on approach

Learn more about

- The three pillars of OPC UA
- Simple steps to get started with OPC UA, despite its large scope
- How an automation system with a comprehensive OPC UA portfolio can help users implement OPC UA efficiently

Introduction

OPC UA is and will remain one of the most important communication technologies. OPC UA features a comprehensive range of functions and enables the modeling of very simple to highly complex data structures. Using this standard opens up many possibilities and opportunities, but it also carries the risk of overwhelming new users. The automation market has responded to this combination of possibilities and the need for guidance with intuitive solutions and application examples.

In the context of Industry 4.0, OPC UA is undoubtedly one of the most important technologies for mapping and making complex data available. OPC UA is a manufacturer-neutral standard that is being driven forward by the OPC Foundation, a manufacturer-independent technology consortium. OPC UA is based on three pillars:

Pillar 1

- **Data modeling: the modeling rules even enable the creation of complicated information models.**

Pillars 2 and 3

Companion standards that define model elements for specific assets or technologies.

- **Security: OPC UA includes built-in security mechanisms, such as encrypted data transmission and role-based access management.**
- **Communication: Two communication paradigms – client/server and pub/sub – are available for exchanging data.**

Because of its large scope, getting started with OPC UA technology can be challenging. For example, a user who only wants to implement a special use case quickly faces several standards, functions, and models that are difficult to navigate. An open automation platform with an OPC UA portfolio can prevent this scenario by providing a variety of simple and complicated application examples for various communication cases. Such a platform can also utilize open-source software tools as support aids and meaningful, easy-to-understand documentation to help learning. ■

Contents

An online marketplace with a package of simple and complex examples

In many cases, OPC UA-related control components – client and pub/sub-licenses and application examples – can be obtained via an online marketplace, such as PLCnext Store [1]. On the online marketplace, there is an example package for the PLC-based client as well as for pub/sub communication between the controllers. Each package contains one simple and one complex example, as well as instructions for commissioning and operating the sample.

In the simple client example, the client reads (subscribes to) a variable that is continuously incremented (counted up) on the server side. The client writes another variable, which is continuously decremented (counted down) on the client side, to the server.

The complex client example includes a system simulation for a remote-controlled process-related storage container with functions for filling, pumping, and emptying the container (figure 2).

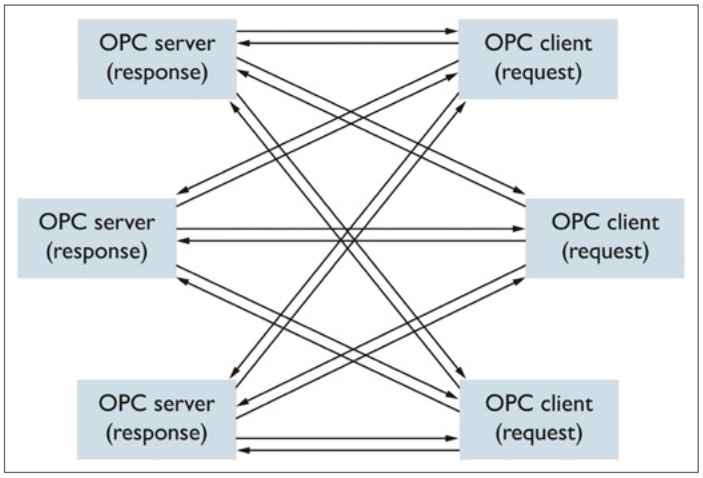

Figure 2:
In the case of OPC UA client/server communication, the server provides data in its address area. Clients connect to the server and have read and write access to the data.

The simple pub/sub example project contains two controllers, each of which publishes (writes) one variable and subscribes to (reads) one variable. One of the variables is cyclically incremented, and the other is cyclically decremented. The complex pub/sub example consists of system simulations for a pallet warehouse and a conveyor system that exchange data with each other via the OPC UA pub/sub model (figure 3). ■

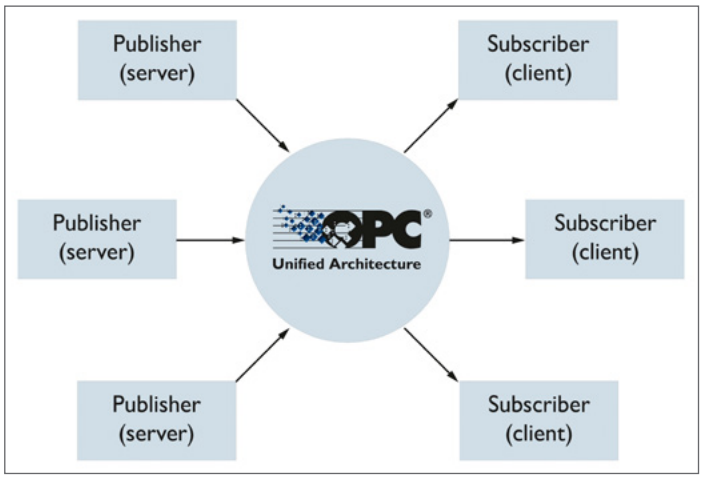

Figure 3:
With OPC UA pub/sub communication, both publishers and subscribers have a dataset configuration. The publisher writes its data exactly as per the structure specified in the dataset, and the subscriber expects and interprets the data exactly as defined in the dataset.

Support with intuitive software tools and understandable documentation

The helpful open-source software tools mentioned above can be obtained via a GitHub repository [2]. For example, the eUA_Client_Configurator_Example is available here. This is a tool written in C#, which can help create complicated client configurations. The example code repository also contains comprehensive instructions and documentation. Further records on all topics relating to OPC UA in the PLCnext Technology ecosystem, as well as the general open ecosystem, can be called up freely in the PLCnext Info Center [3].

An automation system with a comprehensive OPC UA portfolio – with its variety of examples, documentation, and open-source software – pursues a consistent hands-on approach. This enables both inexperienced and experienced users to implement their individual use cases in a targeted and efficient manner. ■

Data sources and captions:
[1] URL: https://www.plcnextstore.com/#/ (Status: 2024-01-09)
[2] URL: https://github.com/orgs/PLCnext/repositories (Status: 2024-01-09)
[3] URL: https://www.plcnext.help/te/About/Home.htm (Status: 2024-01-09)

OPC UA portfolio in the context of the PLCnext Technology ecosystem

The OPC UA portfolio in the context of the PLCnext Technology ecosystem from Phoenix Contact is based on the following elements:

- The ability to intuitively configure the programming of the controllers, as well as through files for advanced users
- Trial licenses for all fee-based OPC UA components (client and pub/sub)
- A variety of simple and complex application examples for the different communication scenarios
- Open-source software tools as support aids
- Meaningful and easy-to-understand documentation. ■

Read more:
https://www.phoenixcontact.com/en-us/technologies/communication-technologies/opc-ua

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https://www.phoenixcontact.com/en-us/

About Phoenix Contact

Phoenix Contact is a global market leader based in Germany. Phoenix Contact produces future-oriented components, systems, and solutions for electrical controls, networking, and automation. With a worldwide network reaching across more than 100 countries, and with over 20,300 employees, Phoenix Contact maintains close relationships with its customers, which is essential for shared success. The company's wide variety of products makes it easy for engineers to implement the latest technology in various applications and industries. Phoenix Contact focuses on the fields of energy, infrastructure, process, and factory automation.

For more information about Phoenix Contact or its products, visit **www.phoenixcontact.com**, call technical service at **800-322-3225**, or email **info@phoenixcontact.com**.

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