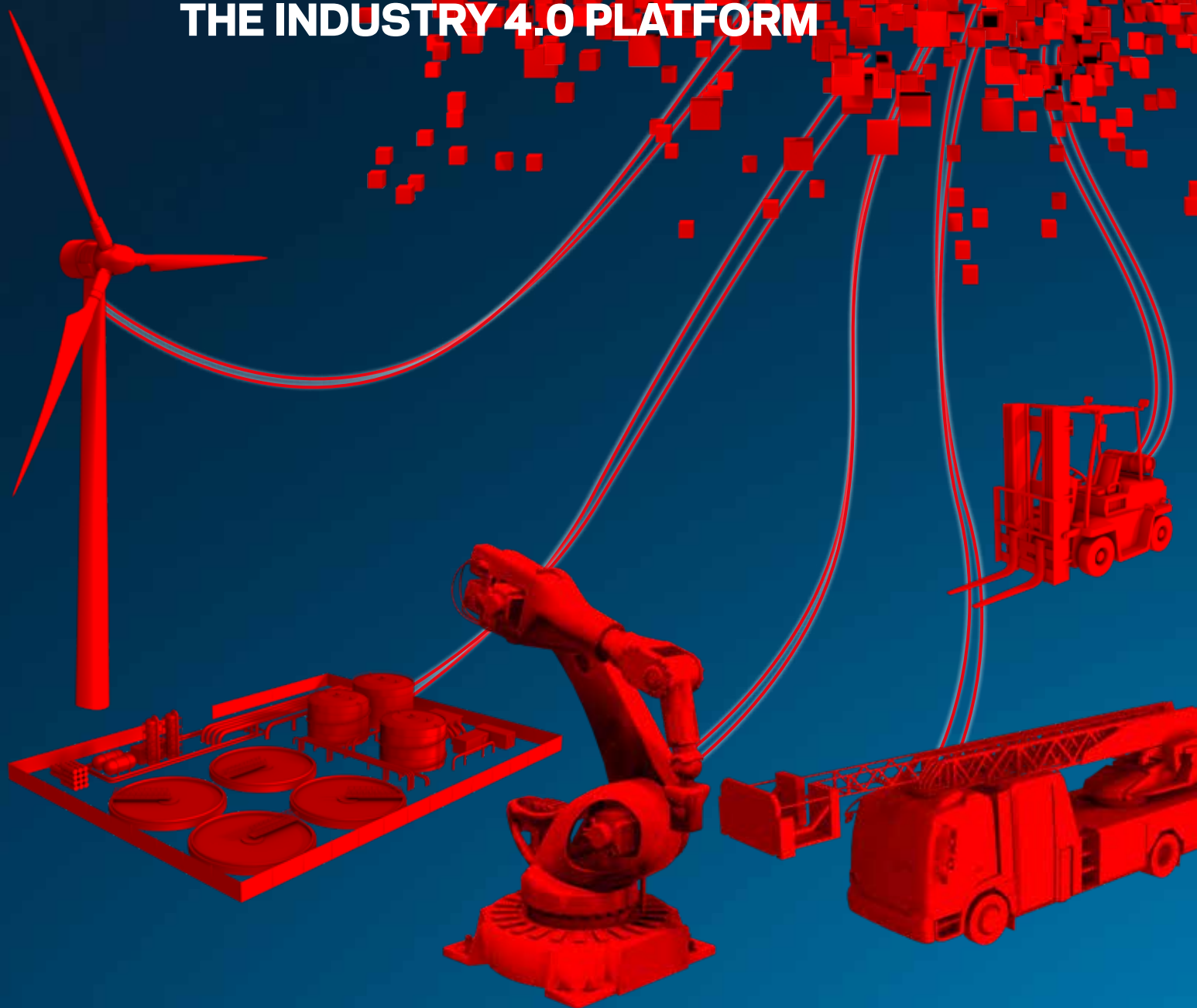CODESYS

AUTOMATION SERVER

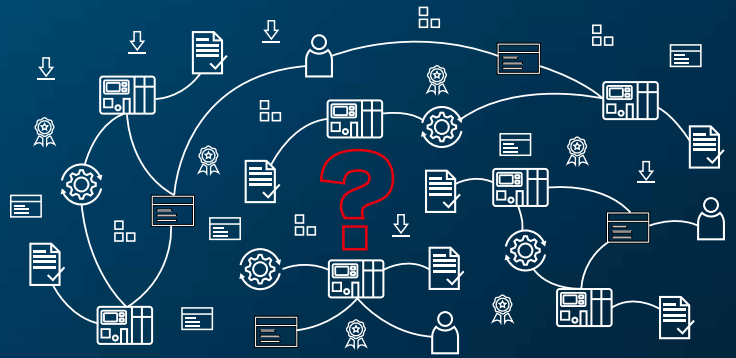## THE INDUSTRY 4.0 PLATFORM

EVERYTHING UNDER CONTROL.

A TYPICAL CONTROLLER NETWORK IN A TYPICAL COMPANY

What does device linking look like today?

7 controllers,

4 CODESYS projects,

4 boot applications,

7 individual parameter sets …

… are processed by multiple developers at different locations. On top of that, there is an indefinite number of access rights, certificates, and other additional files.

Who coordinates this, and above all – How?

The CODESYS Automation Server is the Industry 4.0 platform for professional automation.

The CODESYS Automation Server uses conventional web technologies to simplify typical tasks of automation engineers that are very difficult to solve.

The system allows for convenient administration and commanding of controllers and the installed software in the browser of a PC, tablet, or smartphone. A ticket system allows assignments to be forwarded in a targeted and secure manner.

The CODESYS Automation Server is intended as ‚Software as a Service' and runs in a public cloud infrastructure. Therefore users do not have to invest in any hardware, and at the same time a higher availability is reached. Services such as traffic or data volume can be purchased as needed in the CODESYS Store in addition to the standard package.

This means that users only pay for the resources they actually need. Cloud security has top priority with the CODESYS Automation Server. Production and controller data, source code, and other sensitive information are optimally protected at all times.

+ Currently available functionality

Perfect overview of your control landscape
Including information about topology, controller status, current project, boot application, as well as application parameters

Controller-specific functions
Such as automatic backup/restore of the application software via ticket system, rollout of application changes, and usage of application templates

+ Progressive extension of functionality

Additional controller-specific functions
Certificate management, firmware update, and user management

Continuous integration processes
With a build server to create the boot application, static code analysis to avoid potential application errors, profiling for runtime analysis of the PLC program, unit tests for function testing

Central tool data storage
With repositories for devices, libraries etc., as well as installations of the CODESYS Development System

Implementation of individual, specific services on an online server platform
Using a practice-oriented framework for the CODESYS Automation Server

Easy logging and analysis of process data and events
As a lean supplement or alternative to public cloud systems

EASY LINKING:
WHAT EXACTLY IS THE BENEFIT?

The required devices are always linked to the CODESYS Automation Server by an edge gateway, which abstracts the controllers and thereby clearly separates IT and OT networks. This edge gateway encloses the communication via TLS. It can be installed either on dedicated hardware or directly on an existing controller.

The linking and administration in an individual controller network takes place on three levels:

CODESYS Store

The first booking of the CODESYS Automation Server takes place via the CODESYS Store. Subsequently, the CODESYS Store account offers an immediate overview of current usage data and related costs. The possibility to scale and limit data traffic, storage space, and number of connected controllers gives users full control of all costs.

CODESYS Development System

A seamlessly integrated plug-in in the CODESYS Development System (version 3.5 SP15 and later) implements the link to the CODESYS Automation Server. It allows for the setup of communication between edge gateway and the user`s own server. It also provides useful services such as project synchronization.

CODESYS Automation Server „WebApp"

The CODESYS Automation Server, hosted in a public cloud, is operated and used by means of a single web interface. The domain name of this website is derived from the desired host name. Available edge gateways and all connected controllers are displayed quickly and clearly. The same goes for stored projects, boot applications, tickets, controller details, and all other available information.
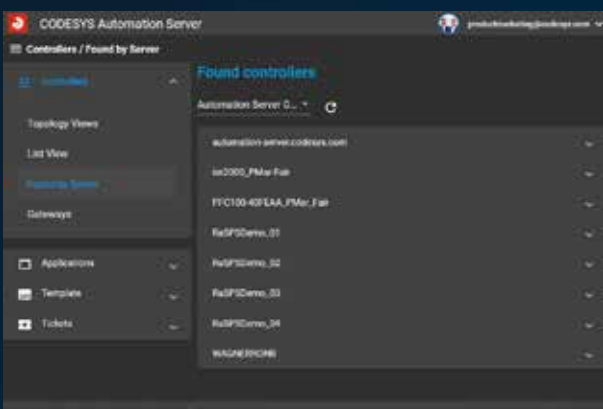
DIGITAL TWIN: PERFECT OVERVIEW
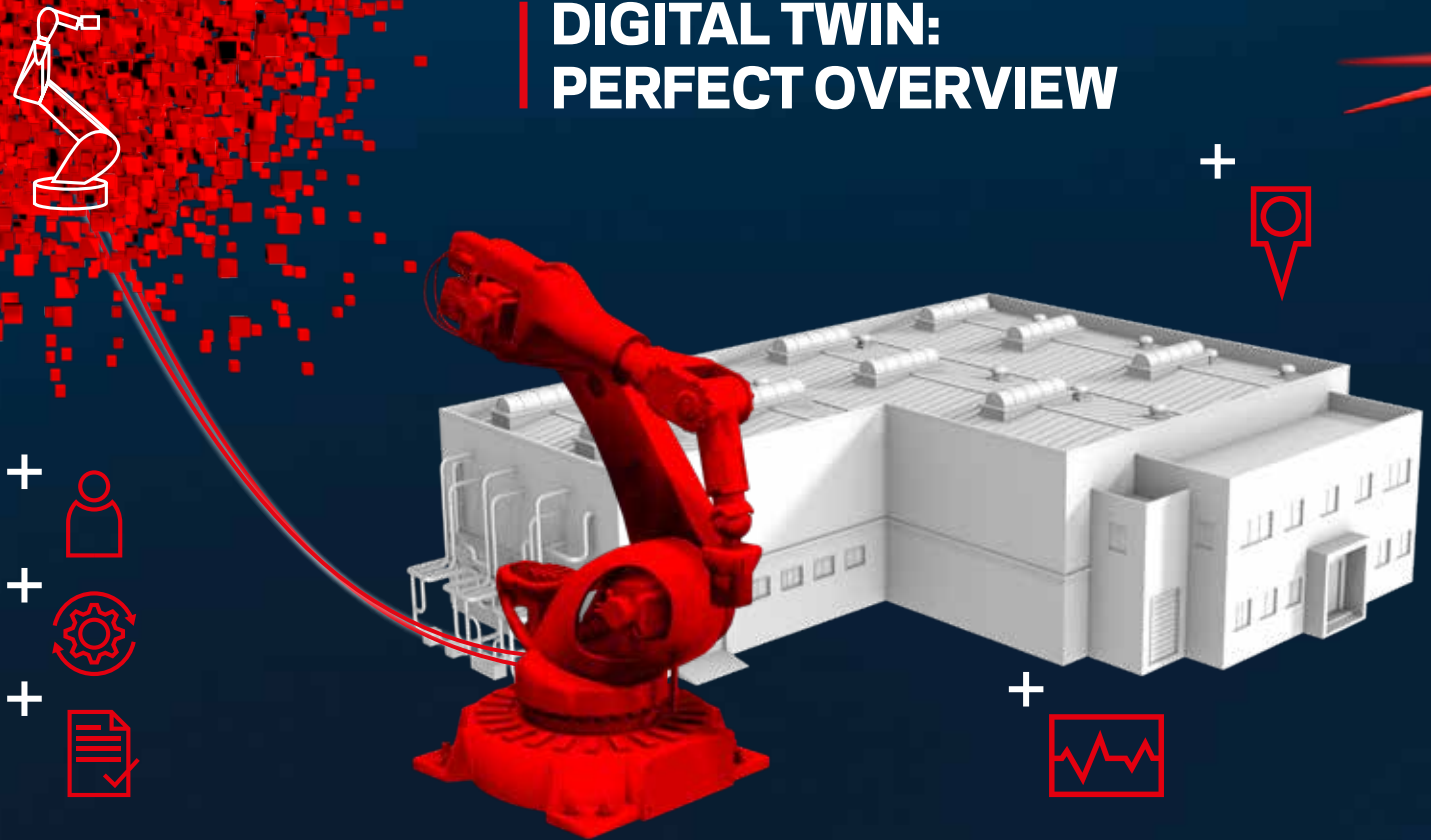
A digital counterpart to every device in an industrial environment is essential for efficient value creation. The CODESYS Automation Server creates such a digital counterpart in the cloud for every physical controller and provides full access to it.

Advantages of the Digital Twin

- Centralized and easy management of all devices instead of complicated management in Excel lists
- Clear and up-to-date display of diagnostic information for all managed devices
- Easy and time-saving rollout of identical applications on multiple devices
- Immediate visibility of project assignments to devices instead of externally managed assignment tables
- Online access to all important device data and functions, such as parameters/parameter sets, status information, firmware statuses, application software on the device (boot applications), location, as well as users and their access rights

Everything at a glance

Plant operators, application engineers, and service technicians have a complete overview of the controller landscape that is customized precisely to their needs – thanks to the digital twin. Depending on the requirements, this can take the form of a filterable list, a comprehensive detailed view of individual controllers, or a freely configurable topology view, e.g. for the entire production site or for individual local control cabinets.

In contrast to commercial routers, the CODESYS Automation Server not only knows the IP addresses of all linked devices, but also the current software status, the current application, and the application parameter sets connected to the devices. This allows you to detect immediately which controller needs a software update, for example, or whether a machine is in error-free operation, or which parameters can be used to optimize an application.

THE TICKET SYSTEM: EFFICIENT AND SECURE PROCESSING OF TASKS

Daily maintenance of the controller is not one of the core tasks of the application engineer.
No matter whether a new controller is to be put into operation, a defective one is to be replaced, or a PLC update with a new application has to be made – the service technician can easily perform these tasks.

This is all made possible by the ticket system of the CODESYS Automation Server.

Processing of assignments with the ticket system

The application engineer

- Creates new or updated application software and uploads it onto the CODESYS Automation Server as a boot application.

- Creates an assignment in the CODESYS Automation Server, e.g. "Download the updated boot application to controller XYZ".

- Creates a ticket for the assignment, identifiable by a QR code.

- Forwards the ticket with the QR code to the service technician, e.g. by e-mail.

The service technician

- Does not need knowledge of CODESYS or the CODESYS Automation Server.

- Does not need personalized access to the CODESYS Automation Server.

- Scans the QR code of the ticket and receives the assignment.

- Completes the application engineer's assignment at a convenient time via web interface on the machine/plant, e.g. during a service break.

- Is granted limited access to the CODESYS Automation Server only for this job with the ticket – without additional operating options.

The CODESYS Automation Server

- Manages assignments and tickets.

- Logs the assignment processing.

- Immediately provides an overview of the status and result of the assignment.

Assignments in the control landscape cannot be completed more effectively.

AUTOMATION-SERVER.COM

REPLACEMENTS:
INTELLIGENT DEVICE EXCHANGE

The CODESYS Automation Server also provides an efficient solution for the worst case scenario of every production line: an unexpected device failure

Even if a replacement device is available, many questions remain unanswered:

Which version of the application software was installed before the failure? Where is the respective project stored? Which version of the development software was used to create the application? Is there a suita-

ble boot application? Where exactly is the affected controller located? Is there a backup of important data and where is it?

The CODESYS Automation Server knows all the answers and thus allows you to exchange and commission in the shortest possible time.

+

The CODESYS Automation Server

- Matches the device identifications.

- Automatically determines the correct boot application.

- Installs the boot application including all parameters and user access rights automatically on the device.

- Saves the backup data in the cloud – the central, natural storage location.

- Implements a simple, automatable res tore process.

- Uses the ticket system for uncomplicated processing.

- Makes sure the production process restarts within seconds instead of hours.

Automatic backup

The CODESYS Automation Server automatically and regularly creates data backups of the controllers, including backups of applications and device parameters. Thus, the automation engineer is perfectly prepared in the event of a controller failure.
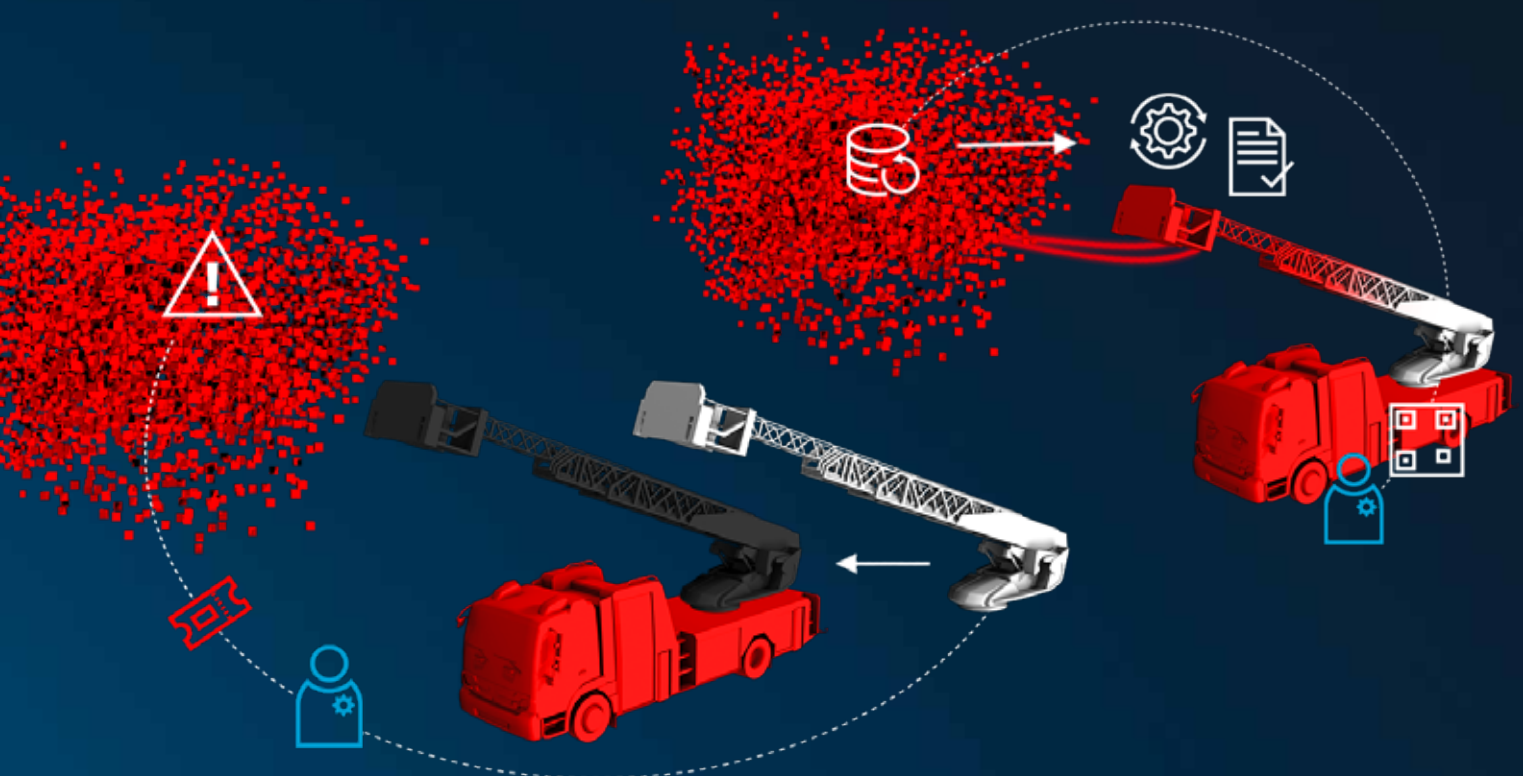
APPLICATION REPOSITORY: PROJECT AND APPLICATION MANAGEMENT

Flexible, easy, and secure

The situation:

A team of application engineers is working on control projects and applications at different workstations. **How can their work be coordinated safely, easily, and efficiently?**
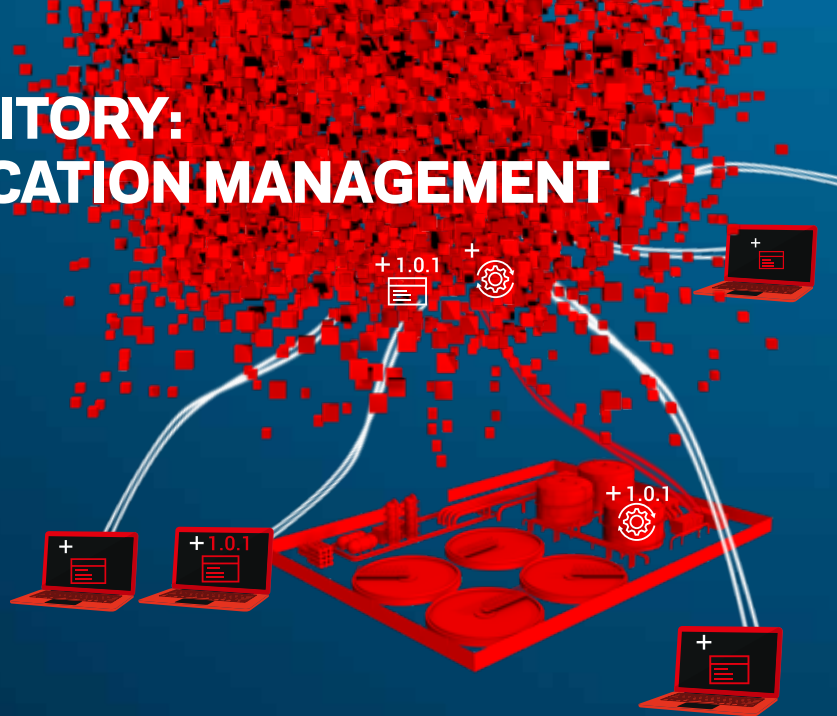
The solution:
The CODESYS Automation Server!

The procedure:

The application engineers upload control projects and associated boot applications to the CODESYS Automation Server.
The boot applications can be conveniently rolled out from the server to the controllers by means of a web interface.

Every application engineer with access to the CODESYS Automation Server can download the source files to his workstation, continue to develop them, and upload the changes back to the server. These changes can be transferred from the CODESYS Automation Server to other connected workstations. This ensures that all workstations are using the latest version of the application.
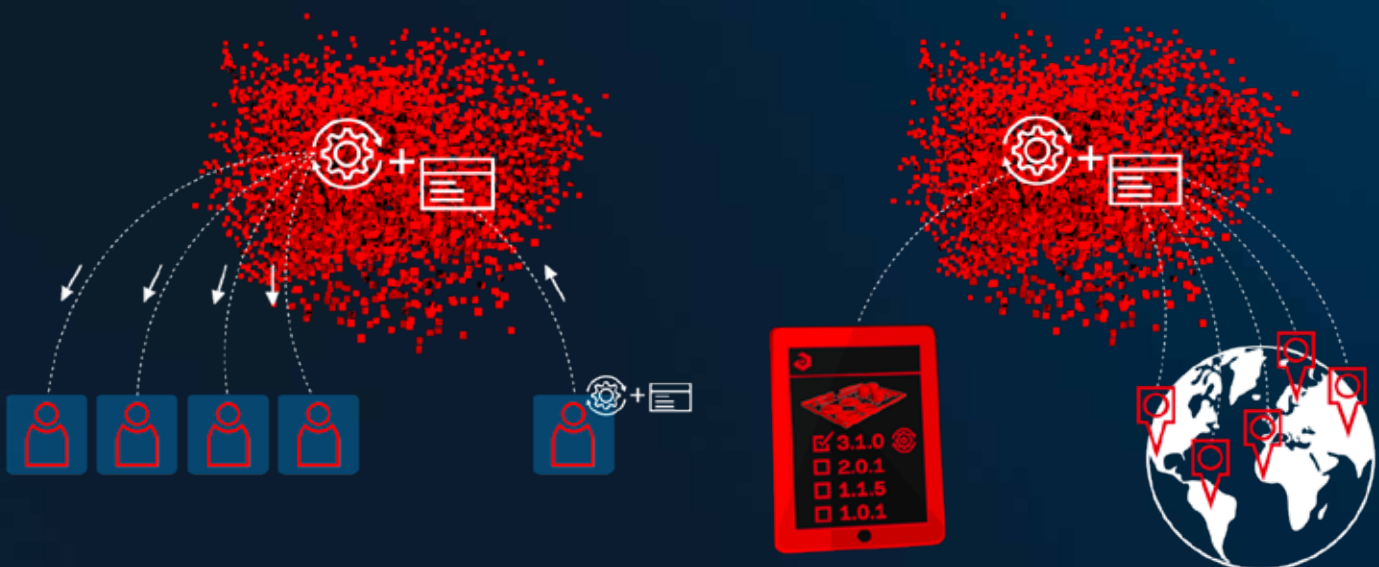
The benefit:

The CODESYS Automation Server minimizes administrative work and the risk of error, especially if several application engineers are working together. The connected application engineers have worldwide access to projects and applications from a central storage location in the cloud.
Project management can be performed either locally in the CODESYS Development System or centrally in the cloud by means of a web browser.

Thanks to the future integration of established version control systems such as Git® or Subversion® on the cloud server, numerous additional functions for professional version and revision management will be available for application engineers.

The result:

Complete control over the version status on the controller, changes in the source code, and collaboration with colleagues at all times.

MORE CONTROL.   MORE OVERVIEW.   MORE ADDED VALUE.

CODESYS – the manufacturer-independent
IEC 61131-3 automation software.

CODESYS Product Families:

Engineering	Runtime	Automation Server
Visualization	Fieldbus	Communication
Motion CNC Robotics	Safety	Services

CODESYS Group | We *software* **Automation.**