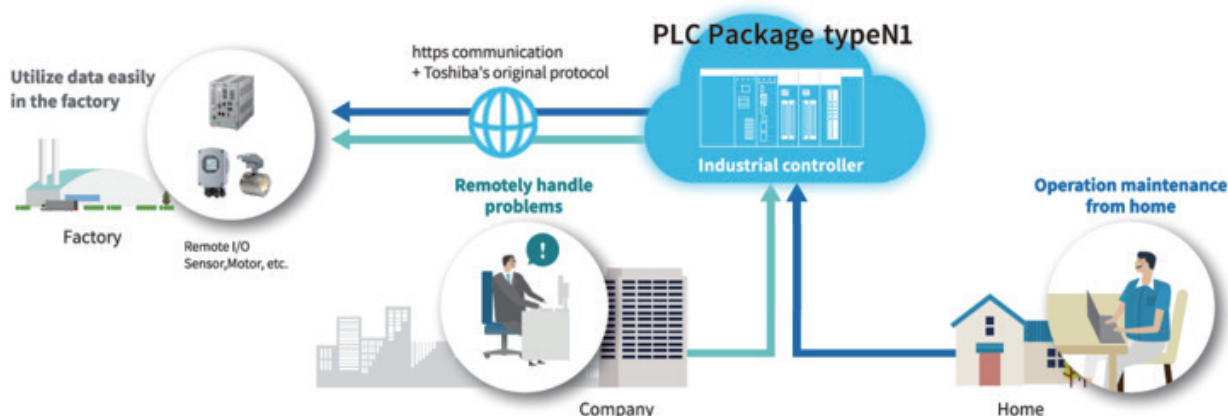


Cloud based PLC

Features

- ◆ This service provides industrial controllers via the cloud. Traditionally, the construction and maintenance of control systems, using industrial controllers, were performed on-site. However, this service enables these processes to be completed entirely in the cloud. Facilitating smooth data integration with MES (Manufacturing Execution Systems), AI and other technologies, this service accelerates the convergence of IT (Information Technology) and OT (Operational Technology). This advancement is poised to enhance smart manufacturing processes. Additionally, by reducing the number of installed devices in a factory, it can reduce power consumption and enable the realization of control panel-less operations in the future.
- ◆ **Benefit 1: Accelerated problem resolution through remote operation and maintenance**
The service's remote monitoring capabilities substantially reduce the need for on-site personnel, thereby streamlining the management of workers. Remote programming, debugging, control adjustments and log monitoring, are all feasible through this platform. Furthermore, the remote capability ensures a quick recovery of system failures.
- ◆ **Benefit 2: Innovation through real-time data utilization**
The accumulation and analysis of data enabled by this service allows for the optimization of control processes. Furthermore, the integration with diverse IT solutions, via the cloud, fosters the development of new solutions, including the utilization of CO2 emission data for sustainability initiatives. Additionally, real-time data acquisition also supports the creation of digital twins.
- ◆ **Benefit 3: Asset-light manufacturing environments**
Enabling centralized monitoring and the management of multiple control devices, this service significantly reduces Operational Technology (OT) costs. It also contributes to energy savings by minimizing the number of physical industrial controllers required on-site. Additionally, the system's easy update mechanism ensures that new features and functionalities can be seamlessly integrated, providing long-term operational benefits.



The control core, which continuously executes control programs on the cloud (AWS), controls on-site sensors and other I/O through the edge agent. The managed service of the control core monitors the state of the cloud-based PLC.

◆ Communication

Communication between the control core and the edge agent, as well as between the control core and the managed service, uses the general secure communication protocol HTTPS. Therefore, no special configuration is required, even when passing through gateways, such as proxy servers.

◆ Real-time capability

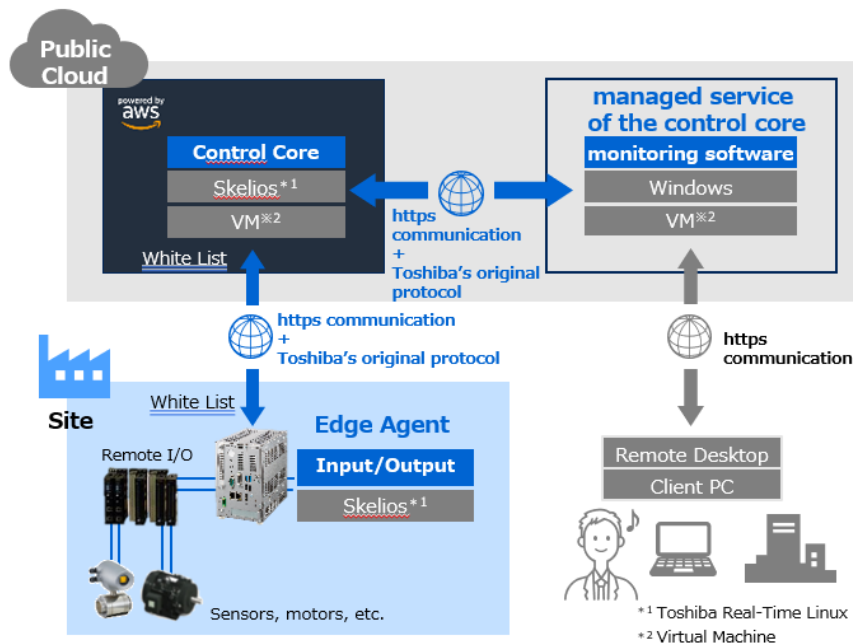
The OS for both the control core and the edge agent device is Skelios, a Linux distribution supported for long-term use by the Civil Infrastructure Platform (CIP). Skelios, enhanced with a Real-Time (RT) patch, excels in real-time performance, minimizing delays in control and communication processing.

◆ Security measures

Communication channels are encrypted using HTTPS and security is further enhanced through mutual authentication. Additionally, both the control core and the edge agent device implement malware protection via a whitelist approach. This method strengthens security by allowing only pre-registered, safe programs to execute.

◆ Industrial computer

The edge agent device is based on the standard compact embedded industrial computer "CP30 model 300." To achieve a high environmental resistance, it features a fan-less design and uses a Solid-State Drive (SSD) as an auxiliary storage, eliminating mechanical drive components, to create a spindle-less mechanism. Furthermore, an optional OS shutdown battery ensures that in the event of a power outage, the system automatically switches to backup power, enabling a safe shutdown, even during unexpected power interruptions.



Energy-Saving Effects & Special Notes

- ◆ Reduce the number of installed devices in the factory and decrease the power consumption.
- ◆ Utilizing solutions, such as energy monitoring, the system contributes to reducing CO2 emissions.
- ◆ AWS actively uses renewable energy.

Implementation Results or Plans

Domestic Light industries, such as food and textiles.

Overseas Under consideration.

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