From the cloud to the edge

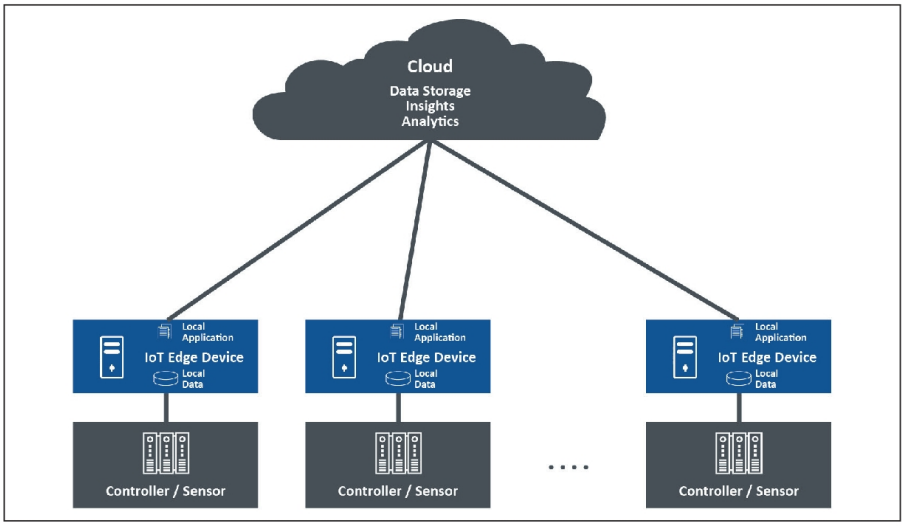
Dr. Christopher Anhalt explains the difference between cloud and edge computing and how they can work together for the successful implementation of IIoT solutions.

The implementation of IIoT applications requires deep integration of production and business processes. Typically it is gateways that connect the automation networks with the IT world, with a central cloud platform acting as IT infrastructure for data collection and data analysis tasks.

However, this architecture has limitations when mapping the specific requirements for individual IIoT applications to the functionality available with cloud platforms.

Firstly, the transfer of huge amounts of production data to the cloud can quickly exceed the capacity provided by the network infrastructure. There is also a requirement to continue processing machine data even if the cloud is temporarily unavailable or the automation process is currently offline. Also, when it comes to critical process data, applications often require a real-time reaction and this is not possible in a scenario where data is first transferred to the cloud to be processed. There will always be some element of latency in such a response.

The solution is to deploy software modules remotely on edge devices, which are also deeply integrated into cloud platforms. Microsoft Azure IoT Edge or Amazon AWS IoT Greengrass, for example, allows certain workloads to be moved to the edge of the network, resulting in a more effective communication with the cloud, a quicker reaction to local data changes and a reliable operation even in extended offline periods. These local IoT edge devices can run selected cloud software modules and access automation data directly and in (near) real-time via its gateway functionality. At the same time, the cloud platform is used for tasks such as device management, analytics, and durable storage of data.



IoT edge devices connect the automation and the cloud level, running cloud applications remotely with access to local data.

Acting as a link

From an organisational perspective, edge services and the management of software components at the edge act as a link between the functional requirements of the shopfloor and IT. Roll-out and the entire life cycle of IoT solutions can be managed more efficiently, compared to solutions which require installation, configuration and updates of software locally and individually in each production facility. On the other hand, the decision to use a cloud platform – including edge services – is a strategic one that may not always be easy to take organisational changes may well be required to successfully coordinate the activities at production and IT level.

Softing Industrial Data Intelligence has risen to this challenge – offering software modules for edge computing applications in brownfield installations or data integration in modern plants. The data acquisition layer provides access to both process and machine data from a range of controllers and devices. The data integration layer uses OPC UA to aggregate data from many data sources and offer additional security. It acts as an abstraction layer, standardising technical differences between applications and unifying their interfaces towards IT. It also can be used as abstraction layer to iron out differences between production sites and offers a unified interface for IoT platforms and other applications.

Christopher Anhalt is business development manager at Softing Industrial Data Intelligence.