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Aerospace & defense supplier elevates security with CloudRail

Case Study

Customer

The customer is a multinational corporation in the aircraft, aerospace and defense sectors, employing over 50,000 people and generating sales exceeding 10 billion euros. The company operates more than 200 facilities across North and South America, Africa, Asia-Pacific, Europe and the Middle East.

As a major tier-1 supplier to the aerospace and defense industries, the company serves a diverse range of clients, including airplane and helicopter manufacturers, airlines and armed forces. Notable customers include Airbus, Boeing, Bombardier and the European Space Agency (ESA).

Challenge

The customer operates hundreds of Computer Numerical Control (CNC) machines across various global production sites. To enhance production effectiveness, the company aims to monitor machine conditions to detect anomalies before they lead to system failures, enabling proactive maintenance.

Historically, data acquisition from diverse industrial machines, regardless of their age, has posed significant challenges for Industrial Internet of Things (IIoT) projects.

Heterogeneous technologies and varying communication protocols have added complexity, resulting in substantial manual effort. This has increased project costs and raised the risk of data errors.

The aerospace and defense industry also has stringent IT security requirements. These requirements are particularly critical when connecting production equipment to cloud services.

Solution

Before initiating their global rollout, the customer assessed two IIoT Proof of Concepts (PoCs) for their technical capabilities, retrofitting strategies and integration with Amazon Web Services (AWS) IoT services.

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This rapid and efficient setup demonstrated CloudRail´s solution capability for seamless integration and scalability.

The first PoC utilized a standard industrial edge gateway, necessitating extensive manual configuration. Despite several weeks of intensive development, a reliable connection between the machine and the AWS cloud could not be established, resulting in the discontinuation of the effort. Furthermore, there were uncertainties about how to structure a successful global rollout and manage each gateway while complying with strict IT security standards. These challenges highlighted the need for a more efficient solution.

The second PoC employed the CloudRail solution, a comprehensive platform designed for industrial cloud connectivity, enabling seamless integration of shop-floor data with IIoT applications. The solution is leveraging its retrofitting approach with Input-Output (IO)-Link sensors. Within just two hours, including hardware installation and network configuration, vibration data from a Computer Numerical Control (CNC) machine was successfully integrated into the customer's AWS IoT SiteWise environment, a managed service designed to simplify the collection, storage, organization and monitoring of data from industrial equipment at scale. The data was automatically normalized according to a predefined semantic model.

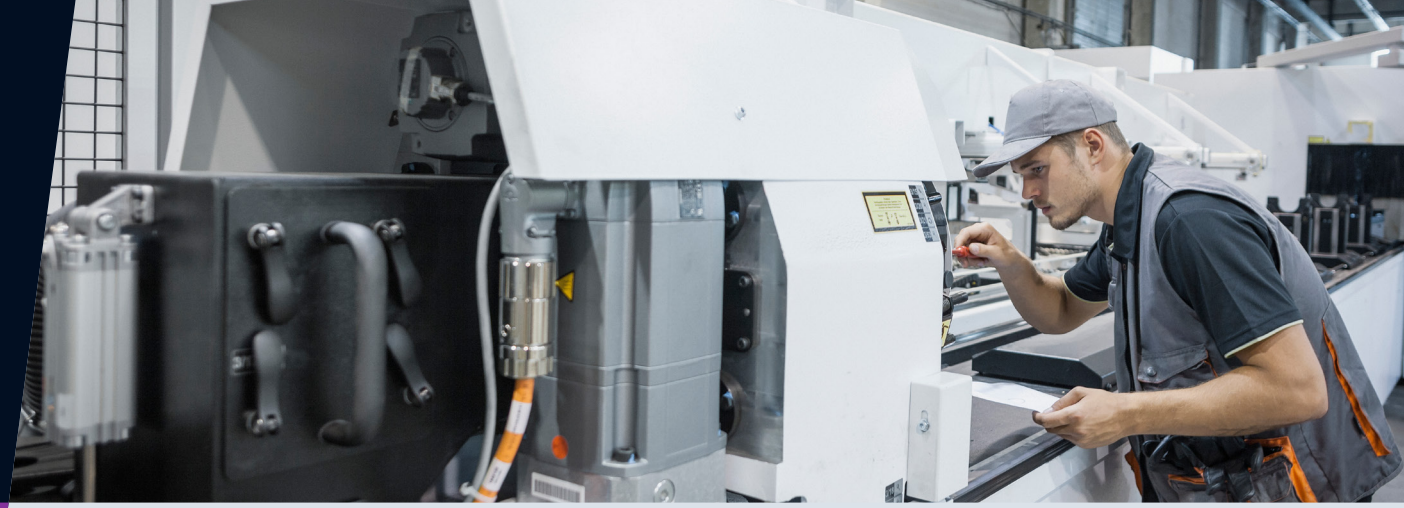
This rapid and efficient setup demonstrated CloudRail´s solution capability for seamless integration and scalability. Recognizing the value of this rapid Plug&Play solution, the customer selected CloudRail to interconnect their global fleet of CNC machines and manage the transfer of machine data to their AWS data lake. The solution can be seamlessly scaled to a comprehensive IIoT ecosystem. With machines distributed across multiple global locations such as North America, Europe, Middle East, Africa (EMEA), and Asia Pacific, Japan (APJ), the remote configuration and deployment through the CloudRail.DMC (Device Management Cloud) eliminated the need for on-site IoT/IT experts. This significantly accelerated the rollout process.

The CloudRail solution also met the customer's stringent global IT security requirements. Along with features like the Trusted Platform Module (TPM), end-to-end encryption, firewall and separation between IT and OT networks, the customer required sophisticated processes and managed services to ensure the security of their extensive fleet of Edge Gateways.

CloudRail's managed service, combined with remote firmware updates, guarantees that security patches are available. These patches can be deployed to thousands of Edge Gateways within minutes without physical access.

The customer's solution will be used to globally monitor the condition of their CNC machines. Vibration and temperature sensors will monitor the operation of the machines in real-time. The data will be visualized in dashboards and notify machine operators of any unexpected machine functions, enabling plant staff to react quickly to prevent downtimes and enhance multi-machine applications.

CloudRail has joined Belden's Automation Solutions (AS) business, which includes prominent brands like Hirschmann, ProSoft Technology, OTN Systems and Lumberg Automation. The combination of CloudRail's strengths in data acquisition and cloud connectivity with Belden's expertise in industrial networking and edge computing creates a comprehensive networking infrastructure solution. This synergy enhances automation and digitalization efforts, providing seamless connectivity from sensors to the cloud.



Results

By leveraging CloudRail, the customer reduced the average time to connect a CNC machine to AWS IoT SiteWise from several weeks to less than an hour.

This was achieved through the Plug&Play functionality and seamless integration of the CloudRail solution with AWS IoT.

The centralized device management service enables the customer's team to configure and deploy machine data acquisition remotely, eliminating the need for global travel.

These factors ensure a scalable and standardized rollout process, saving time, reducing costs and enabling the rapid realization of a global IIoT infrastructure.

CloudRail's solution, designed to streamline industrial data acquisition and integration with cloud platforms, lays the foundation for condition monitoring services.

These services include global production monitoring, Key Performance Indicator (KPI) reporting and downtime analysis.

The solution meets the highest IT security and compliance requirements of the aerospace and defense sectors. It ensures reliable and secure operation and maintainability for thousands of connected machines, featuring end-to-end encryption, firewalls, network separation, TPM, user and rights management and remote updates.

About Belden

Belden Inc. delivers complete connection solutions that unlock untold possibilities for our customers, their customers and the world. We advance ideas and technologies that enable a safer, smarter and more prosperous future. Throughout our 120+ year history we have evolved as a company, but our purpose remains – making connections. By connecting people, information and ideas, we make it possible. We are headquartered in St. Louis, USA, and have manufacturing capabilities in North America, Europe, Asia and Africa.

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