▶ Aerospace & Defense Supplier Utilizes CloudRail for Secure OT-to-AWS Connectivity

- CloudRail chosen due to fulfilling highest IT-security and compliance requirements of the aerospace and defense sector

- First machine (CNC milling) connected through CloudRail to AWS IoT within 2 hours

- Successful CloudRail use case as first step for standardized global IIoT rollout process with remote deployments

- CloudRail solution able to ensure reliable & secure operation and maintainability for thousands of connected machines

The Customer

The customer is a multinational aircraft, aerospace and defense corporation with >50,000 employees and sales of >10 billion euros. The customer has more than 200 facilities, spanning 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 has a broad range of customers, including airplane and helicopter manufacturers, airlines and armed forces. Among these customers are Airbus, Boeing, Bombardier, and the European Space Agency (ESA).

The Challenge

The customer operates several hundreds of CNC machines across various global production sites. To improve the overall effectiveness of their production, the company aims to monitor the condition of the machines to detect anomalies before they turn into system failures, allowing maintenance to be dispatched or scheduled before the machine actually breaks down.

Historically, acquiring data from various industrial machines, regardless of the age of the asset, has been a challenge for IIoT projects. Heterogenous technologies and different communication protocols added to project complexities resulting in a great deal of manual effort, which exponentially increased project costs and risk for errors in data.

Moreover, the aerospace and defense industry have some of the highest IT security requirements, particularly when considering the connectivity of critical production equipment with cloud-services.

The Approach

Before starting their global rollout, the customer benchmarked two IIoT PoCs for their technical features, retrofitting approaches and integration into AWS IoT service.

The first test was conducted with a standard industrial edge gateway, which required a high degree of manual configuration. **After several weeks** of intense development, a connection between the machine and the AWS cloud could not be established reliably and the effort was thus halted. Additionally, it remained unclear on how to structure a successful global rollout and manage each gateway while complying to strict IT security standards.

The second PoC was performed using the CloudRail solution with its retrofitting approach using IO-Link sensors. After a **mere two hours**, including hardware installation and network configuration, vibration data from a CNC machine was readily available in the customer's AWS IoT SiteWise environment — automatically normalized following a pre-defined semantic model.

Recognizing the value of this fast Plug&Play solution that can be seamlessly scaled to a complete IIoT ecosystem, the customer selected the CloudRail solution to interconnect their global fleet of CNC machines and manage the transfer of machine data to the customer's AWS data lake. As these machines are spread across multiple global locations like North America, EMEA and APJ, the remote configuration and deployment through the CloudRail.DMC (Device Management Cloud) requires no IoT / IT experts on-site for implementation, which further accelerates the roll-out process.

The CloudRail solution met the customer's strict IT security requirements globally. Besides features like TPM, end-to-end encryption, firewall and separation between IT and OT network, the customer also required sophisticated processes and managed services to ensure their large fleet of Edge Gateways are secure. The CloudRail.DMC, with its granular user and rights management, allows the customer to ensure that only specific employees can access a certain Edge Gateways. CloudRail's managed service, in combination with remote firmware updates, ensures that security patches are available and can be deployed to thousands of Edge Gateways in minutes without physical access.

The customer's solution will be used to globally monitor the condition of their CNC machines. Vibration and temperature sensors surveil the operation of the machines in real-time. The data then is used to visualize the production in dashboards and notify the machine operators about unexpected functioning of the mills. This enables the plant staff to react quickly to prevent downtimes and improve multi-machine applications.

![CloudRAIL logo]

The Results

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 is possible due to the Plug&Play functionality and the seamless integration of the CloudRail solution into AWS IoT. The centralized device management service allows the the customer's team to configure and deploy machine data acquisition remotely without the need for global travel. These factors ensure a scalable and standardized rollout process that saves time, reduces costs and enables the high-speed realization of a global IIoT infrastructure. CloudRail's solution lays the groundwork for condition monitoring services like global production monitoring, KPI reporting and downtime analysis.

Additionally, the CloudRail solution meets the strict security requirements imposed on the customer, with features like end-to-end-encryption, firewalls, network separation, TPM, user & rights management and remote updates.

> As CloudRail reduces the effort of machine connectivity, the Return on Investment (ROI) of the condition monitoring solution improved significantly. We even got more excited once we realized that CloudRail also provided answers for large scale IIoT installations and just fulfilled all our strict IT-security requirements out of the box. Furthermore, the standardized solution makes a global rollout way easier, as IoT experts don't have to travel to global production sites.
> Digital Shopfloor Manager

For more information, visit
https://cloudrail.com