

Edge AIoT for Aggregate & Construction Materials: Amrize's Open Architecture Approach



Challenges

Open, flexible architecture for Monitoring of Assets & Processes

Amrize, the largest North American producer of aggregate and construction materials (including concrete and asphalt), required a scalable architecture to access data from various heterogeneous assets, heavy machinery, vehicles, vessels, lab equipment, production and storage facilities. This architecture needed to integrate diverse data sources without locking them into a specific asset vendors sited offering. Purpose-built rugged gateways (industrial, transportation) are needed to collect and process telemetry data, and have to be securely managed throughout their lifecycle. Additionally, it had to address issues related to edge hardware and software integration, cybersecurity, lifecycle management, and comply with strict environmental and certification requirements.



The Eurotech Solution

Secure, open Edge AIoT Stack as a solid Foundation

Amrize implemented an open, integration-friendly edge AIoT stack that uses Eurotech gateways, the Everyware Software Framework (ESF), and Everyware Cloud (EC). This setup effectively connects field devices, collects and processes telemetry data, and securely manages devices throughout their lifecycle. Additionally, it integrates edge data with enterprise systems and dashboards and supports compliance reporting and analytics. By transforming real-time edge data from the field into actionable business insights, Amrize organisations can make well-founded and informed decisions when it matters.

The open architecture, built on well-governed, commercially supported open-source projects, results in a flexible, integration-friendly, and future-proof solution that supports a wide range of edge integration projects. Eurotech's integrated, purpose-built Edge AIoT hardware and software components ensure a fast time-to-solution, with proof of concepts (POCs) delivered in just days. Additionally, the development-to-deployment timeline is reduced by 70%, streamlining the implementation process.

Benefits

Solid open architecture that enables a wide range of applications while significantly shortening development and deployment phases. In specific applications, it results in substantially improved operational excellence, with additional positive effects on safety and customer satisfaction.

Situational Awareness

Real-time visibility into inventory levels, equipment status, and operational conditions. In the context of asphalt production and storage monitoring, this enables timely detection of critical situations, such as tank overfilling, which can lead to significant financial losses and safety risks.

Optimized Quality Management

One of the implemented applications supports concrete curing tests and compliance workflows. By automating repetitive measurement and data-collection tasks, the solution improves reporting accuracy, enhances safety procedures, and increases operational efficiency for quality assurance teams. At the same time, this led to reduced manual work by approximately 1 hour / day for each laboratory operator performing these tasks



Eurotech on AWS

Eurotech is a multinational company that designs, develops and supplies ruggedized Edge Computers and Internet of Things (IoT) solutions to system integrators and enterprises. The portfolio ranges from IoT software stacks to Edge Gateways and Edge Servers to High Performance Edge Computers and Edge AI Systems. Eurotech complements the AWS offerings by enabling customers with application optimized Edge / IoT building blocks for demanding verticals like manufacturing, transportation, agriculture, energy, utilities and medical. Eurotech is part of a global AWS ecosystem that allows to create and leverage "best in class" solutions for the Industrial IoT, without compromising operational technology (OT) requirements.



Features



Effective Development and Reduced Time-to-Market

is ensured by a well-integrated and optimized set of building blocks and a powerful low-code / no-code development solution. It consists of proven Eurotech application-optimized hardware (Gateways, Edge Computers) and a software stack that includes an optimized, managed Linux operating system and a powerful IoT device middleware, the Everyware Software Framework (ESF). ESF comes with a wide range of supported field protocols, addressing the development and connectivity challenges encountered in utilities and smart grids applications. The seamless integration with AWS services and the AWS Marketplace offerings allows customers and system integrators to leverage the benefits of AWS services without compromising requirements and best practices from an operational technology perspective.



Clear Focus on Low TCO and Risk Mitigation

A sound edge node & gateway software architecture offers solutions to address major aspects that contribute to the total ownership costs of an IoT solution, such as device software lifecycle management, security, health monitoring, and logging. Device abstraction at the middleware level addresses challenges associated with changing hardware requirements and component end of life. Products are designed to meet demanding security certifications such as IEC 62443-4-2 and CRA. These risk aspects are further mitigated by long product life support, extended warranty options, a broad professional services offering, and an open software foundation that ensures data and code sovereignty.

Case Study:

Improved quality and efficiency in construction materials operations



Challenges



One specific solution built on the Amrize Edge AIoT Architecture is designed to realize operational savings by enabling end-to-end condition monitoring of concrete from production to on-site delivery. The construction industry increasingly demands 24/7 and just-in-time operation – the solution needs to help Amrize to ensure the on-time delivery and expected product quality as efficiently as possible.

Solution



Amrize implemented an open, integration-friendly edge AIoT stack that uses Eurotech gateways, the Everyware Software Framework (ESF), and Everyware Cloud (EC). DynaGATE 10-14 transportation gateways running Eurotech Software Framework (ESF) are, for example, deployed in ready-mix concrete trucks to collect CAN bus telemetry, GPS location data, key vehicle events, and water-addition signals. The data is securely transmitted to Everyware

Results



The implemented Edge AIoT Architecture, streamlining the implementation process, resulted in a reduction of the development-to-deployment timeline per project on average by 70%. The specific solution for monitoring the concrete quality while in transit enables Amrize to improve product quality and yield, reduce material waste, identify process inefficiencies, and lower the costs associated with rejected loads and customer

Get started with Eurotech solutions on AWS

Visit eurotech.com to learn more about Eurotech's Offering for AWS related solutions. Visit AWS Certified Device Catalog for Information on [ReliaGATE](#) IoT Gateways. Find out more about Amrize's [open architecture approach](#)

