

Mobile Edge AIoT in Transportation. Connected Vehicles & Fleets in Public Transport / Buses



Challenges

Increase operational efficiency and operator safety

Companies and organizations in transportation – especially in public transport - are constantly challenged to improve operational excellence, safety, and customer satisfaction. The cornerstone of effective fleet management is the availability of relevant and near real-time data from the vehicles. This requires strong edge computing and a secure cloud connection for consistent data processing and communication. Edge devices used in these applications must provide relevant certifications, meet cybersecurity needs, and enable cloud connectivity. Among other certifications, the in-vehicle IoT gateway or data logger must satisfy ITxTP, a new standard (and certification) to enable digitalization and integration of mobility services. In addition, cybersecurity certifications must be a key consideration. Increasingly, security frameworks like IEC 62443 or PSA Level 1 are required. Finally, seamless integration with cloud services like AWS enable the storing and processing of data in the cloud, allowing for real-time insights on fleet status, on board diagnostics & data collection for condition monitoring, fault diagnosis, and predictive maintenance.



The Eurotech Solution

On-Board Data Collection and Computation for Edge AI

State of the art transportation-grade devices constantly collect, compute and communicate vital data from vehicles and other field-deployed assets to the cloud. Eurotech's automotive-certified IoT Gateways and Data Loggers (the DynaGate 10-14 product family) collect and aggregate data from as sources such as vehicle field buses (e.g. CAN, Modbus, etc.), video, high precision positioning and other sensors. The DynaGATE 10-14 product family is based on an Arm processor architecture (i.MX 8M Plus, providing a 2.3TOPS AI accelerator and quad core Cortex A53) for IoT workloads as well as general-purpose AI, image processing and computer vision. The devices come with the Everyware Software Framework (ESF) an edge application framework that provides integrated field protocol support, no-code programming, mobile application support and the connectors for AWS IoT Core, AWS IoT Greengrass and / or the Everyware Cloud (EC) IoT Edge Management Platform, also deployable in the AWS Cloud.



Benefits

Substantially improved operational excellence, with further positive safety effects

Mobile Application Challenges Addressed

Eurotech's ready-to-use DynaGATE 10-14 product family is purpose-built for transportation. The line is designed to achieve transportation certifications, support high-precision positioning, cope with unreliable communication channels, circumvent power source obstacles, and deal with a variety of environmental requirements like vibration and emissions.

Leveraging the power of Edge AI Applications

AI and advanced analytics at the edge are enabled by full software life cycle management and secure model management, in combination with the necessary software support for hardware acceleration integrated in the Edge Stack.

High Level of Situational Awareness

Being able to react, even instantly, to information gathered and computed in vehicles while in motion, has a significant impact on maintenance and repair tasks in transport applications and helps achieve higher safety goals. Predictive maintenance further optimizes maintenance schedules, resource efficiency, and vehicle availability.

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

The Eurotech offering marries certified hardware with a full software stack, including a managed Linux OS and a powerful IoT device middleware ESF (Everyware Software Framework). ESF comes with a low-code/no-code development solution, a wide range of supported field protocols and ready to use AWS IoT Core and AWS IoT Greengrass integrations. The IoT Management Platform EC (Everyware Cloud), enables remote and full lifecycle management, advanced logging and health monitoring features.



Clear Focus on Low TCO and Risk Mitigation

The offering addresses major aspects that add to the total ownership costs of an IoT solution, like security, device software lifecycle management, health monitoring and logging. Device abstraction on a middleware level does address challenges associated with changing hardware requirements and end of life of components. Product designs to meet demanding security framework requirements as defined in IEC 62443 or PSA Level 1 mitigate cybersecurity and compliance risks. These risk aspects are further mitigated by long product life support, extended warranty options and a broad professional services offering.

Case Study:

Cloud Connected Public Transport Fleets (Buses)

Challenges



The goal: to increase operational efficiency of a large city bus fleet (e.g. fuel consumption optimization, route optimization, vehicle allocation & timetables) and to further improve the safety of passengers and drivers. Vehicle data would also be collected to implement predictive maintenance applications aimed at improving efficiency in vehicle maintenance and repair. Costs were constrained meaning the total cost of the integration, security and device management needed to be kept to a minimum.

Solution



The DynaGATE 10-14 IoT Gateway with ESF is designed for transportation applications, including buses. The device is automotive grade ITxPT certified and comes with AI accelerated compute power and the required software stack pre-integrated. In the customer's AWS account Eurotech's Everyware Cloud (EC) is deployed to enable device life cycle and security management. The gateway interfaces with the vehicle bus (CAN) and other sensors like video cameras and passenger counters to enable real-time updated passenger numbers for each stop, the collection of door movements, vehicle and route information with the associated GPS positioning.

Results



The data from the field is now available to the customer for analytics, business logic and customer-facing applications. The visibility into fleet management improves operational efficiency and provides situational awareness in near real-time. According to McKinsey & Company research***, IoT-enabled predictive maintenance can reduce maintenance costs by up to 30%, downtime by up to 45%, and extend equipment life by up to 20%.

*** McKinsey & Company, Nov. 2021: "The Internet of Things: Catching up to an accelerating opportunity"

Get started with Eurotech solutions on AWS

Visit eurotech.com to learn more about Eurotech's offering with AWS. Visit AWS Certified [Device Catalog](#) for information on transportation-grade [DynaGATE](#) IoT Gateways and [DynaCOR](#) Edge Server and Edge AI Systems

