

Mobile Edge AIoT in Transportation. Example: Road Infrastructure Maintenance



Challenges

Increase operational efficiency and safety on motorways, rail

Transportation infrastructure operators, regardless whether road, rail or waterways, are constantly challenged to improve operational excellence and safety. Essential for effective management of traffic infrastructure is beyond the simple collection of relevant data from the field, but to deploy highly specialized applications, as developed by Waterview, that allow the computation of huge amounts of data coming from high resolution video and other sensors at the edge. These applications in highway maintenance scenarios range from automatic inspection of jersey and bridge junctions, checking structural integrity of safety barriers, identifying pavement defects, verifying road sign compliance while ensuring already at the edge GDPR compliance by anonymizing (removing faces & number plates). It is a challenge, combining the envisioned hardware and software building blocks into a solution that allows the addition and change of edge (AI) applications, while ensuring the required life cycle management and security.



The Eurotech with Waterview Solution

On-Board Data Collection and Computation leveraging Edge AI

State of the art edge servers collect, compute and communicate constantly vital data from vehicles and other assets in the field to the cloud. Eurotech's automotive-certified IoT Edge Servers and Edge AI Systems (ReliaCOR 44-11) collect and aggregate data from as different sources as vehicle field buses (i.e. CAN, Modbus, etc.), high resolution video, lidar, CAN, high precision positioning and other sensors. The ReliaCOR product family offers the required hardware acceleration (e.g. GPU's) for Edge AI and 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, deployable in the AWS Cloud. Seamless integration with AWS services makes it possible to store and process data efficiently in the cloud, to gain real-time insights from the powerful Waterview AI applications running in the vehicles while "on the road".



Benefits

Substantially improved operational excellence, with further positive safety effects

Mobile Application Challenges Addressed

Ready to use hardware and software that is designed to achieve vertical certifications, support high precision positioning, to cope with changing and unreliable communication channels, challenging power sources, and to 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 (GPU's) integrated in the Edge Stack

High Level of Situational Awareness

Being able to react, if required instantly, on information gathered and computed in vehicles while in motion, does greatly improve aspects of maintenance and repair tasks in road and rail infrastructures and by that also contributes to achieve higher safety goals.

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. These risk aspects are further mitigated by long product life support, extended warranty options and a broad professional services offering.

Case Study:

Mobile Edge AIoT in Road Maintenance



Challenges



A company responsible for road and highway infrastructure, was looking for an integrated hardware & software solution to deploy a variety of Edge AI applications securely and fully managed in a fleet of highway maintenance vehicles. The goal: to increase operational efficiency with regards to the highway maintenance efforts and to further improve the safety of the highways. TCO, including integration effort, security and device management to be kept to a minimum.

Solution



The DynaCOR 44-11 Edge AI System with ESF is the selected edge platform deployed in motorway maintenance vehicles. The device is automotive grade and comes with an Nvidia A2 GPU with the required software stack pre-integrated. EC deployed in the customers AWS account for device life cycle and security management. Together with Waterview, competent partner with a focus on Edge AI applications, the operator could start to deploy the solution with an initial set of applications in their service vehicles after a short POC phase, cutting the Time-to-Market significantly.

Results



Waterview AI Applications deployed in the vehicles ensure the assessment of road sign compliance in construction sites, the structural integrity check the of bridge joints or safety barriers and documentation of pavement defects / potholes. These applications greatly improve the ability to react quickly (from days to hours) on issues requiring maintenance and repair, greatly improving the efficiency and safety of the highways. In addition, an AI application that acts as an "anonymizer" (removing faces, numberplates), addresses a multitude of potential GDPR issues at the edge.

Get started with Eurotech 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

