Reducing Time-to-Market for Edge AI Applications

Wind River's platforms are pre-integrated with Zededa and market-leading hardware to simplify the use of AI to improve industrial operations.

WIND RIVER AND ZEDEDA ENABLE INTELLIGENT SOLUTIONS

To improve safety and efficiency in industrial applications, Wind River® and Zededa have collaborated to deliver a pre-integrated solution for real-time, context-aware edge AI.

This approach powers critical applications — including computer vision, sensor analytics, industrial automation, and security — across a wide range of industries, such as manufacturing, healthcare, logistics, and energy. These kinds of applications require higher levels of safety, availability, and reliability than consumer applications.

By processing data locally at the edge, organizations benefit from lower latency, reduced bandwidth costs, enhanced privacy, and improved reliability, even in environments with limited connectivity. The solution from Wind River and Zededa enables developers to easily deploy such real-time, edge AI applications to address real-world problems.

Challenge

- Companies need systems that can make intelligent, real-time decisions
- AI solutions designed to make those decisions require support directly on devices where data is generated
- These mission-critical systems must be robust and reliable

Solution

- Created architecture to support AI-powered, context-aware applications, such as real-time detection of workplace safety violations
- Leveraged Zededa technologies for development, deployment, and management of edge AI applications
- Powered the solution with Wind River's VxWorks® and eLxr

Results

- Lower latency and reduced bandwidth costs
- Enhanced privacy with all data processed locally
- Improved reliability

SAFETY AT THE EDGE

One important example of the need for edge AI is in the industrial market. Manufacturers form the backbone of modern economies, transforming raw materials and components into countless products globally. As intense competition, skilled labor shortages, inflation, and stringent quality expectations rise, manufacturers are increasingly turning to automation and more collaborative operation between humans and robots.

This is leading to new health and safety concerns, such as the risk of physical collision, the increased need for monitoring and oversight of often repetitive tasks, and the risk of system failures or unexpected behavior. Including traditional risks such as equipment malfunctions or human error, millions of workers are injured annually due to work-related incidents.

For businesses, the consequences can be severe, ranging from financial losses and operational disruptions to reputational damage, decreased workforce morale, higher turnover rates, and challenges in attracting talent.

A MORE INTELLIGENT APPROACH

In the ongoing race to address both efficiency and safety, new artificial intelligence (AI) tools offer immense promise. Executed well, they can transform industries by enabling real-time intelligence and decision-making directly on devices where data is generated, rather than relying solely on distant cloud servers.

However, edge AI is difficult to implement. This is particularly true for industrial applications, which must perform with a high level of safety, availability, and reliability, while remaining continuously certified and up to date.

Done right, edge AI can deliver powerful, scalable solutions that connect real-time data from complex, asset-heavy systems with digital enterprise processes, enabling smarter decisions, faster response times, and operational agility for companies across industries.

EXAMPLE: SAFETY CHECKS

The Wind River and Zededa solution is designed to prevent injuries by minimizing human error and enhancing workplace safety in environments with increased automation.

A camera monitors the manufacturing floor, and Zededa's advanced AI analyzes the image to ensure workers are equipped with the correct safety gear, such as hard hats and vests. When workers have the proper protective equipment, the system enables robots in the area to become operable. If someone removes a hard hat, for example, the system detects the change and instantly stops robots from operating.

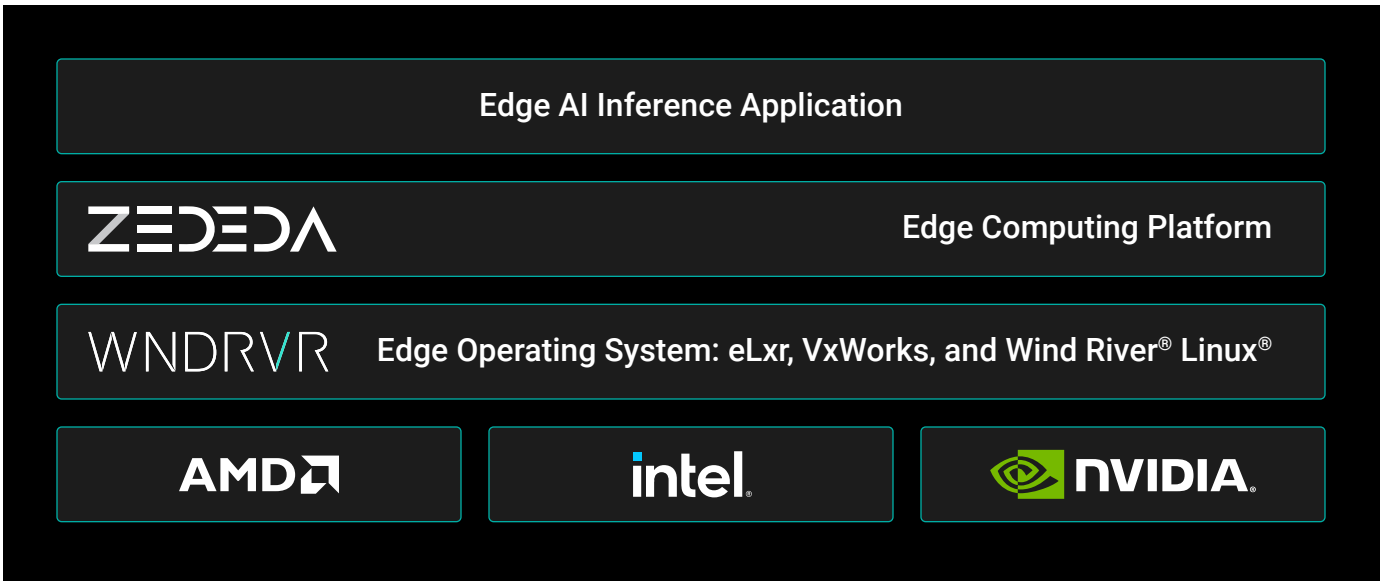
Companies can deploy this kind of solution today with the following components from Zededa, Wind River, and our hardware partners. The following is a simplified representation of the solution stack used:

- Wind River's eLxr Pro™ and VxWorks for robotic arm control
- Zededa edge computing platform running as a virtual machine for edge orchestration
- AI-based inferencing application running in containers for object detection

ENABLING SOLUTIONS ACROSS END MARKETS

Edge AI promises to transform a wide range of industries.

INDUSTRY	EDGE AI SOLUTIONS
MANUFACTURING	Predictive maintenance, quality control, safety detection
ENERGY	Predictive maintenance, safety detection, flare detection
RETAIL	Stored intelligence, improved customer experience, shrinkage reduction
TRANSPORTATION	Predictive maintenance, physical security, safety monitoring
ROBOTICS	Safety detection, quality control, humanoid-robot training



Aptiv and Zededa have pre-integrated a solution architecture to flexibly support edge AI.

ELXR PRO

eLxr Pro from Wind River is a commercial enterprise Linux platform built for cloud-to-edge deployments. It offers long-term support, security monitoring, and customization services, making it ideal for critical workloads in industries such as autonomous vehicles, aerospace, energy, and industrial automation. eLxr Pro is optimized for containerized and AI workloads, supports remote updates, and ensures high performance and reliability. With expert backing from Wind River, it provides a secure, scalable, and open Linux solution for modern edge and enterprise server applications.

ZEDEDA EDGE COMPUTING PLATFORM

Zededa's edge computing platform addresses the challenges of distributed AI workloads, including scalability, diverse hardware, resource constraints, and intermittent connectivity. Its latest updates integrate NVIDIA's AI ecosystem — including the NGC Catalog, TAO Toolkit, and Jetson platforms — enabling seamless AI model development, optimization, and deployment at the edge. Organizations can pull models directly from NVIDIA's catalog, optimize them for edge use, deploy securely with zero-touch management, and monitor performance. Zededa empowers enterprises to accelerate AI initiatives, maintain infrastructure control, and scale from pilots to large deployments across complex edge environments.

Learn More

- Wind River Demonstrates Edge AI for Industrial Applications at Embedded World
- Zededa: How to Build and Deploy Scalable Edge AI with Zededa and NVIDIA
- Exploring the Future of Enterprise Edge AI: Zededa's Enhanced NVIDIA Integration
- Wind River: Enabling the New Industrial Age of Software-Centric Development and Operations