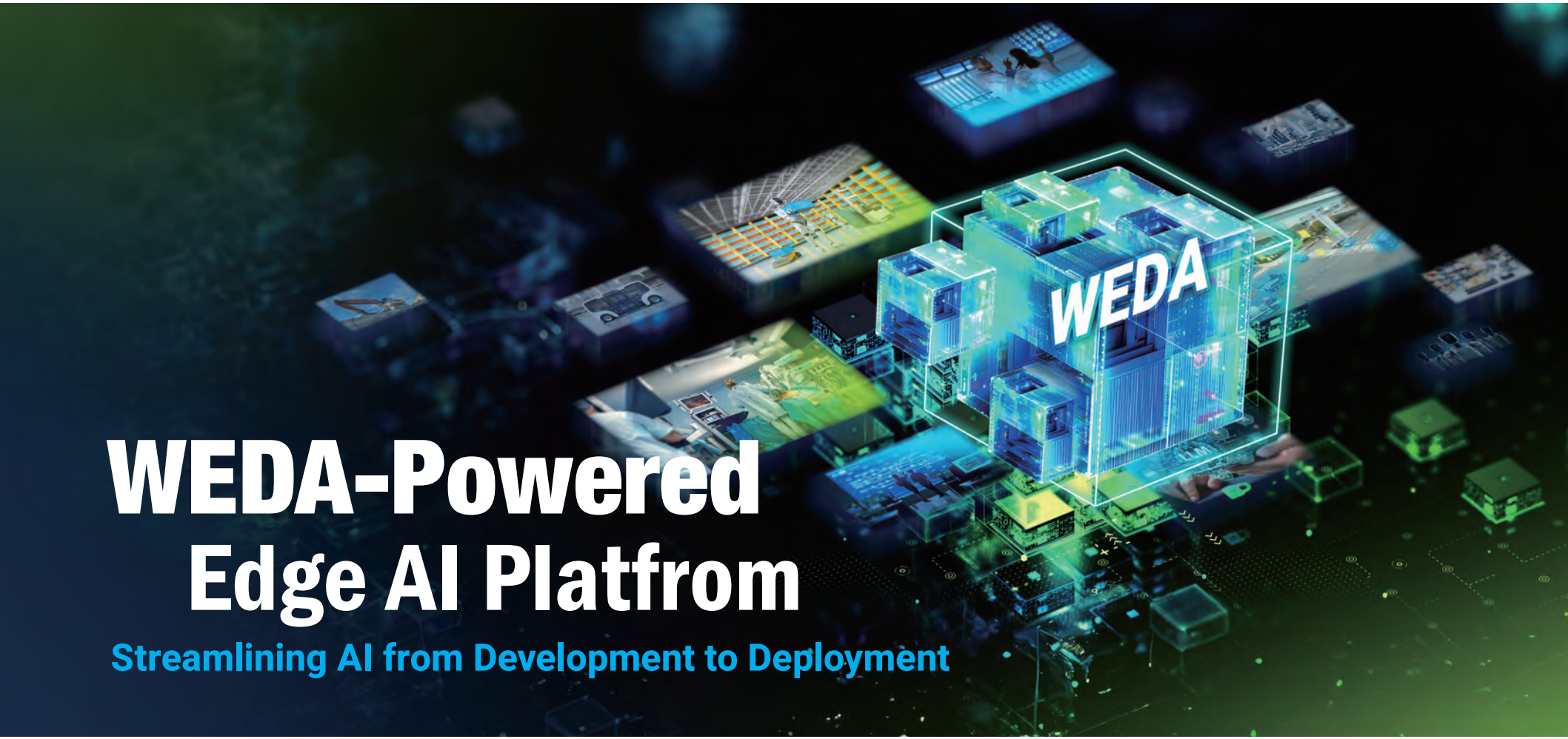


WEDA-Powered Edge AI Platfrom

Streamlining AI from Development to Deployment

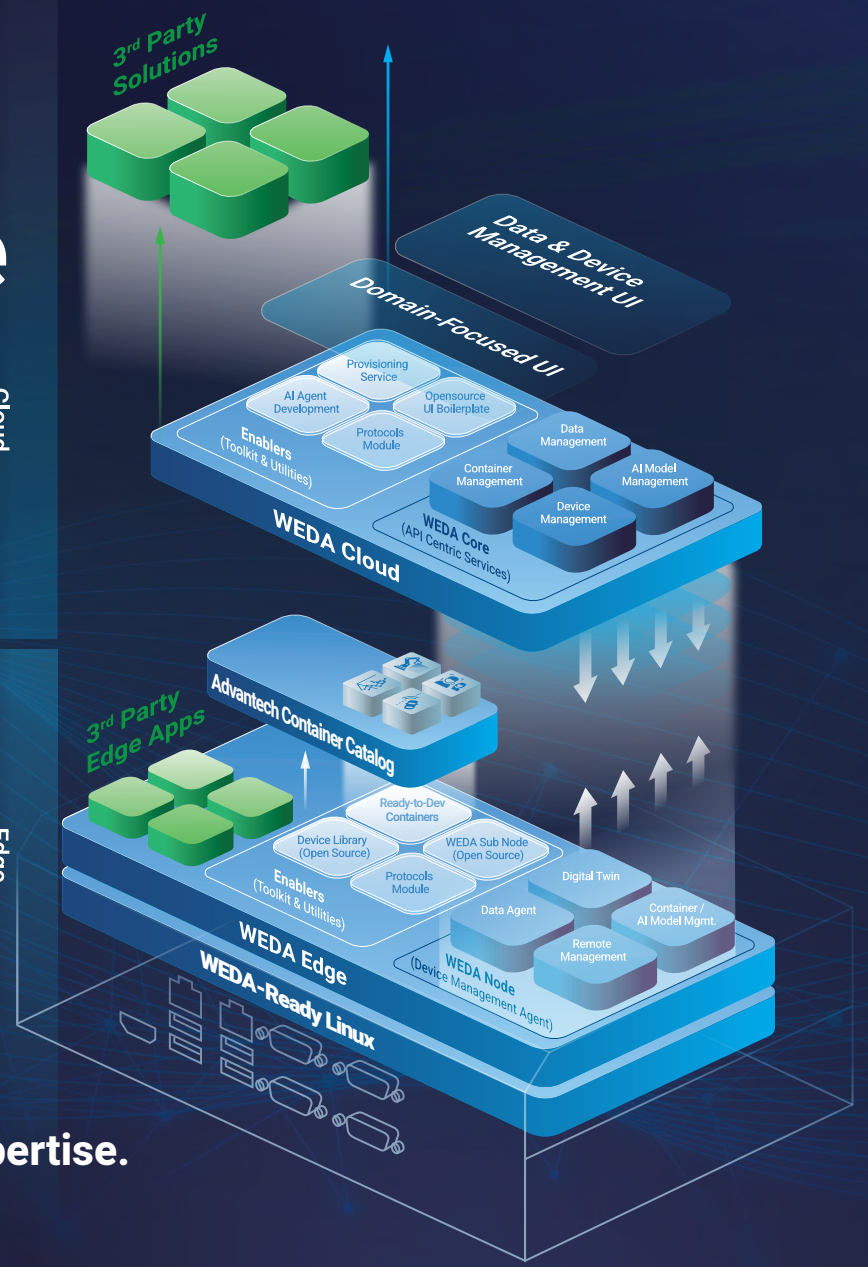
ADVANTECH

Enabling an Intelligent Planet

WEDA: WISE-Edge Developer Architecture

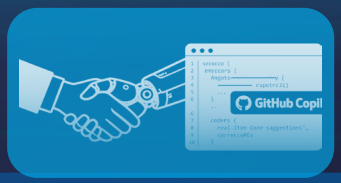
The Strategic Blueprint for Edge Intelligence

- **From Connective Chaos to a Standardized Stack**
  By integrating WEDA Edge and WEDA Cloud, we provide a complete, end-to-end architecture.
- **From "Ready-to-Dev" to "Ready-to-Use"**
  Leverage the Advantech Container Catalog (ACC) to bypass infrastructure complexity.
- **Openness | API-Driven | Toolsets**
  Openness of WEDA Edge, the APIs of WEDA Cloud, and the Toolsets of ACC.
- **AI-Agent Friendly Ecosystem**
  Optimized for AI agents with standard interfaces and skills to automate full-stack logic.



Unlocking Complexity to Empower Your Domain Expertise.

Evolution of AIoT Application Engineering

	Past	Present	Future
	• Siloed Edge Systems • Manual Deployment • Basic Logic	• Hybrid Connectivity • Containerized Dev • AI-Assisted Ops	• Seamless Orchestration • Zero-Touch Deployment • AI-to-AI Ecosystem
			ADVANTECH WEDA
❶ Development	**Manual & Rigid** Hard-coding for specific hardware and OS.	**AI-Assisted** AI writes code, but manual setup remains.	**Natural Language Engineering** Deploying systems via direct human intent.
❷ Cloud-Edge	**Isolated Silos** Offline devices with zero cloud synergy.	**Manual Sync** Complex API mapping and high latency.	**Seamless Orchestration** Autonomous data fabric from Edge to Cloud.
❸ Containerization	**Bare Metal** Direct installation with high dependency risks.	**Manual Containers** Run Docker manually with slow orchestration.	**Advantech Container Catalog** Instant deployment with standard blueprints.
❹ AI Model	**Fixed Rules** Static logic with no learning capability.	**Fragmented AI** Manual pruning with complex edge deployment.	**AI-to-AI Ready** Self-optimizing models in a closed physical loop.
❺ Breakthrough	***Physical Constraints***	***The Deployment Gap***	***Autonomous AIoT Ecosystem***

WEDA Highlights

WEDA is a unified full-stack **architecture** that standardizes the entire Edge AI lifecycle, bridging **Cloud** orchestration and **Edge** execution through **digital twin synchronization** to enable scalable, containerized application deployment.

Complete your Edge AI Lifecycle

1 Build Cross-Silicon Edge AI Effortlessly & FREE

"Ready-to-Develop" Containers

- Unified AI development container OS layer
- Edge LLM AI Agent, RAG, Vision/VLM containers
- AMD, Intel, NVIDIA, NXP, Qualcomm

2 Scale AI Securely with Standard API Calls

- Deploy custom edge containers to the fleet with 1 click to fleet
- Update AI Models in a secured volume with access control

3 Refine Closed-loop Edge AI

- Raw data harvesting + User-defined filtering mechanism
- Integrable to 3rd party MLOps Retraining
- OTA for Edge App Containers & AI Models

Make your IoT Digital Twin

Bridge Edge to Cloud Seamlessly FREE

- Prebuilt **WEDA Node** Agent in WEDA-Ready Linux on Advantech Edge HW
- Connect unlimited Advantech devices to **WEDA Cloud Free SaaS**, unlocking WEDA APIs of :

✓ **Device Zero-touch Onboarding**
✓ **Device Health Monitoring:** CPU, RAM, Disk, Temperature, Network, etc.
✓ **Data Harvesting:** numeric, data pack, image data telemetry
✓ **Data Preprocessing:** DSP filters to minimize cloud bandwidth & cost
✓ **Container Management:** Mass deployment, version control, status monitoring
✓ **AI Model Management:** secured storage, deployment, versioning
✓ **TCP Tunneling**

Advantech Container Catalog

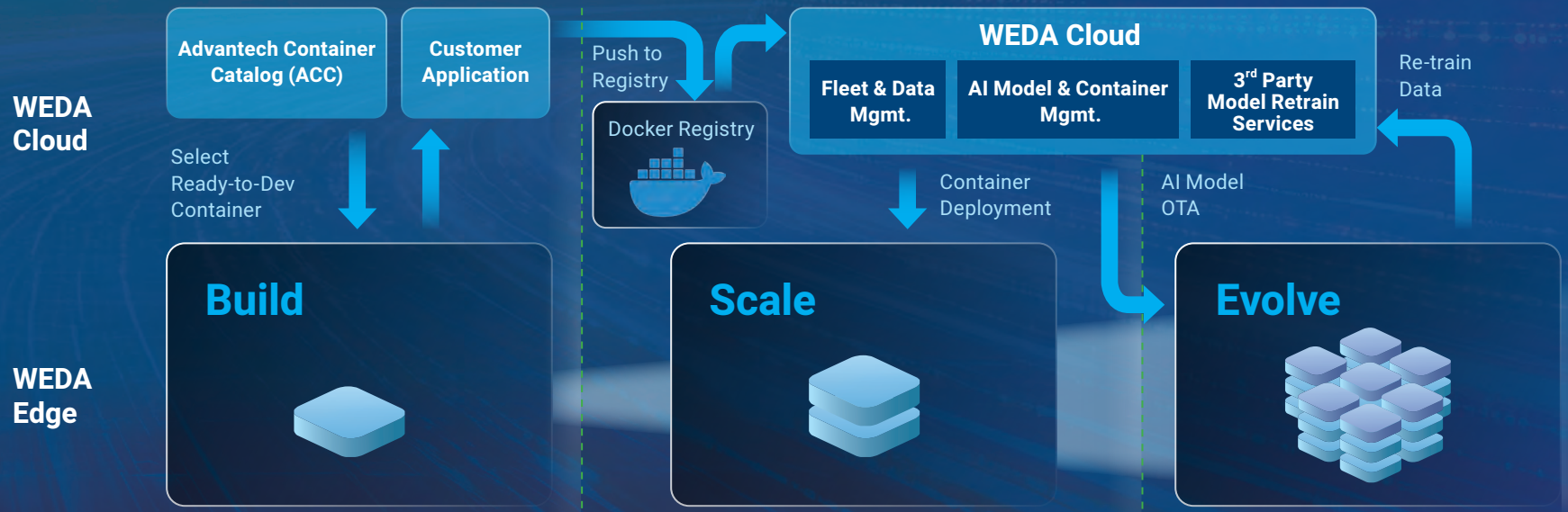
Request WEDA Free SaaS

WEDA API Documentation

WEDA Webpage

WEDA User Journey: Your Highway to Production-Ready Edge AI

Efficiency via Containerization & API Architecture



BUILD your Edge AI easily with ***Advantech Container Catalog (ACC).***

Accelerate 0-to-1 Edge AI building.

SCALE your tailor-made edge solution seamlessly via WEDA Cloud & APIs.

Standardize 1-to-Fleet scaling.

EVOLVE your edge intelligence with WEDA Secure AI Model Management & Data Harvest APIs.

Keep AI models accurate & secure.

WEDA Block Diagram

Domain Solution

Customized Dashboard | AI Agent | Data Insights | Domain SRP

WEDA Cloud
Applications & AI

WEDA Core

API Layer | MCP Interface

Device Management | AI Model Management

Data Management | Container Management

Digital Twins Integration

Cloud Enablers

AI Agent Development

Provisioning Service

Custom Device Service (Analytic Engine)

UI Boilerplate (Open Source)

MQTT, NATS, Web, TCP

3rd Party Integration

EDGE IMPULSE

NVIDIA OMNIVERSE

Grafana

WEDA Edge
Containerized Baselines

WEDA Node

Data Agent | Container Mgmt. Client

Digital Twin Client | AI Model Mgmt. Client

Edge Enablers

Advantech Container Catalog
Ready-to-Dev Containers

Sub Node

Data Pre-processor

Device Library

MQTT, Modbus, OPC UA

Own-Tuned Edge AI Models

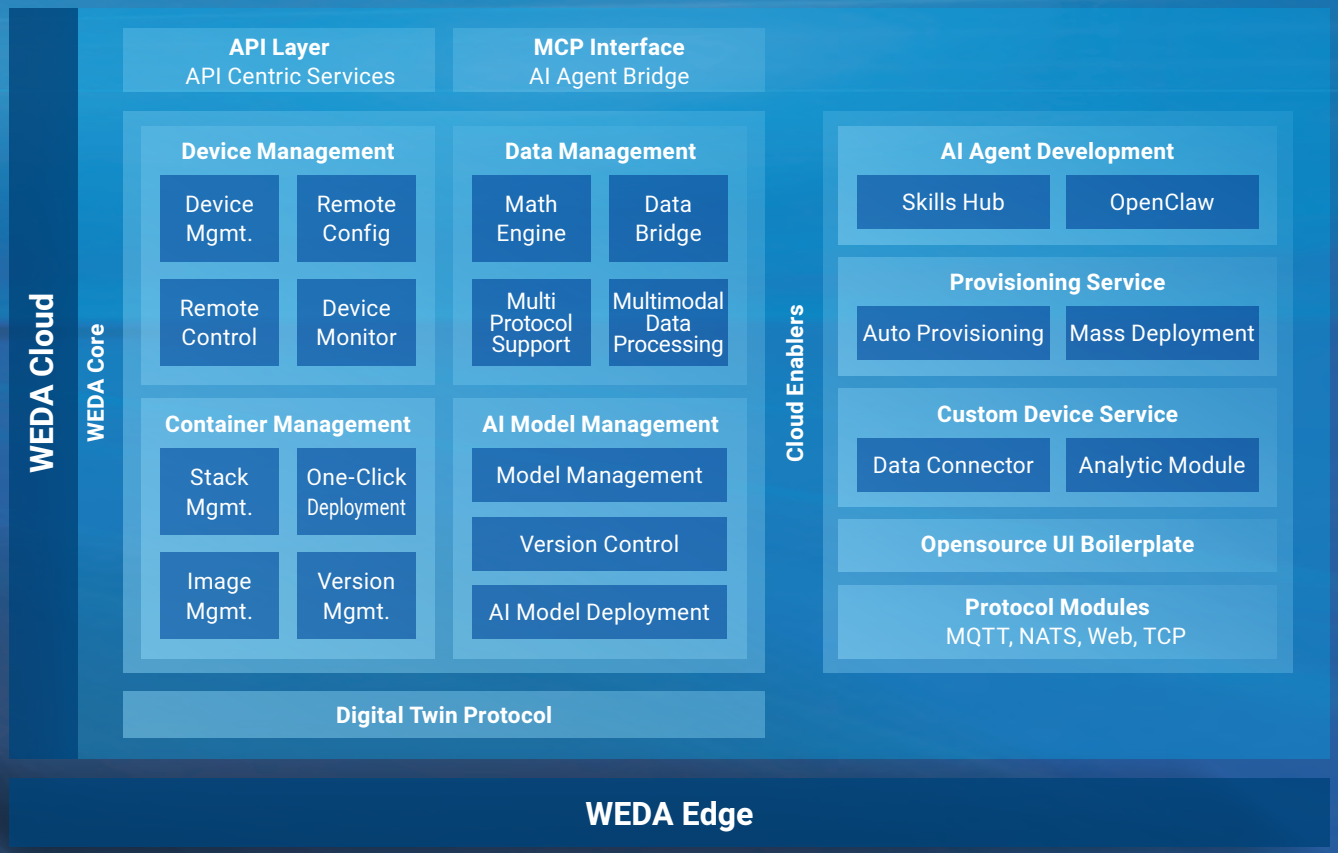
Data Source Integration

3rd Party Sensors

WEDA-Ready Linux

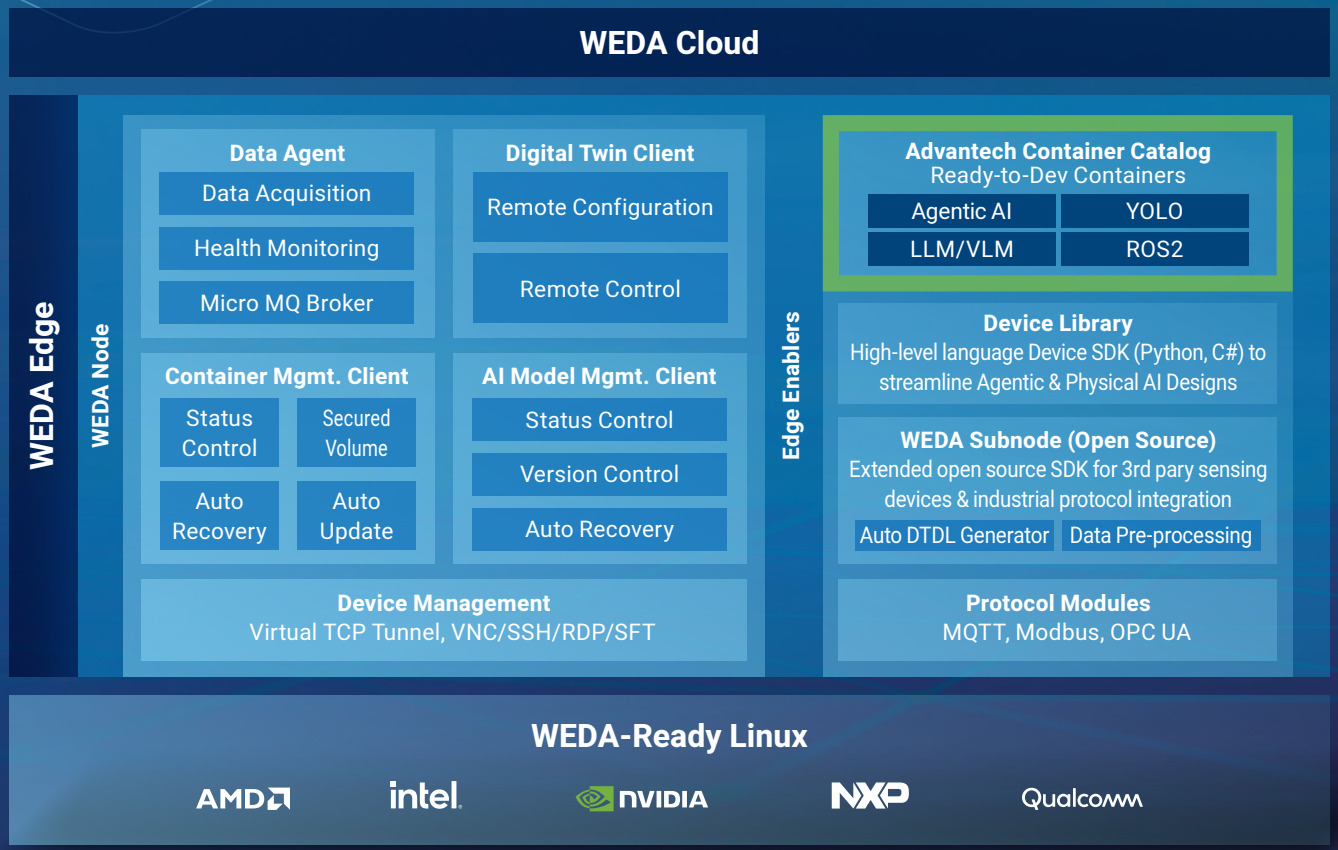
Advantech Devices

WEDA Cloud –
Edge AI Cloud-Edge Orchestration



- **Build Fast**
  API centric design, AI agent in the loop to help developers start with one.
- **Replicate Easier**
  Full digital twin and OTA functions. Seamlessly replicate AI applications across multiple sites.
- **Scale Seamlessly**
  Auto provisioning and mass deployment function. Scale effortlessly to thousands of edge nodes
- **Easy Maintenance**
  Digital twin-based remote monitoring and diagnostics. Reduce onsite visits with centralized version control and automated recovery.

WEDA Edge –
Containerized Edge Intelligence from OT-Cloud



- **Ready to Develop**
  Advantech Container Catalog empowers developers to accelerate Edge AI innovation
- **Cross-Platform Capability**
  Enable consistent performance across diverse chipsets (AMD, Intel, NVIDIA, NXP, Qualcomm) and OS environments. Decouple your logic from hardware constraints with a standardized runtime.
- **Autonomous Edge Mgmt.**
  Simplify large-scale operations with auto-provisioning and self-healing nodes. Effortlessly scale your deployment to thousands of sites with centralized OTA and status control.

Delivery Platform – WEDA-Ready Linux

A Unified Edge Software Foundation, Bridging Hardware, AI Workloads, and Cloud Orchestration.

A

Device Management

Ecosystem Management and Orchestration for Edge Fleets

WEDA enables centralized device visibility, automation, security, and lifecycle control for distributed edge systems.

Monitor

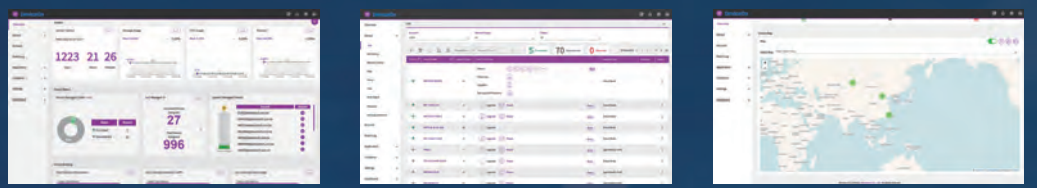
- Real-time telemetry and device health monitoring
- Remote diagnostics and recovery
- Predictive maintenance with AI-driven warnings
- OOB hardware-level control for unresponsive systems

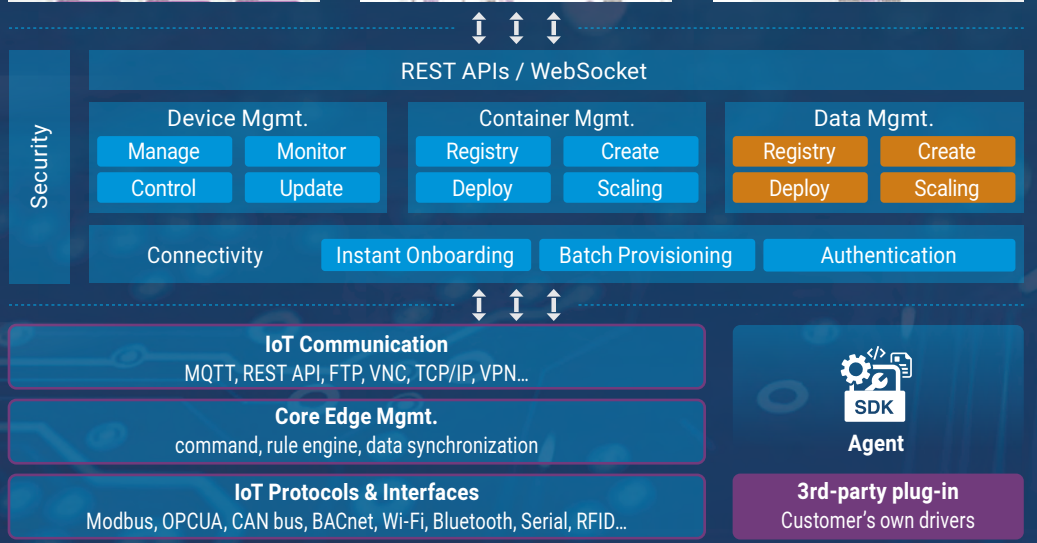
Automate

- Automated onboarding and configuration synchronization
- Orchestrated OTA updates
- Containerized application lifecycle management
- Rule-driven operation automation

Secure

- Whitelist-based access control
- Digital signature and checksum verification
- Peripheral asset governance
- Hardware watchdog support for system uptime





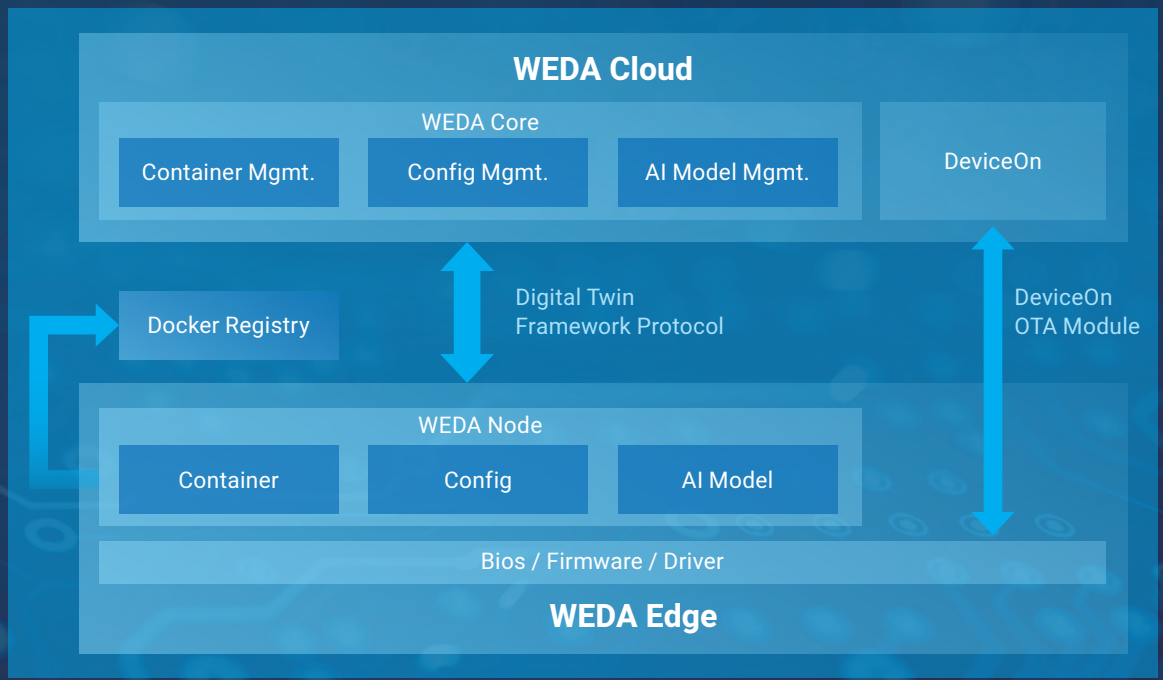
B

Over-the-Air Update

Reliable Updates Across Distributed Edge Systems

WEDA enables controlled application, configuration, and AI model updates through cloud-edge orchestration and digital twin synchronization.

- **Application Deployment**
  - Container updates through Docker Compose file transfer
  - Configuration updates through digital twin protocol
  - AI model updates through NATS protocol
- **Lifecycle & Version Governance**
  - Version snapshots for complete edge status tracking
  - Rollback function for safer recovery
  - State consistency between edge and cloud
- **Total Edge Coverage with DeviceOn**
  - Unified device management service
  - In-band and out-of-band control
  - Digital signature and MD5 checksum verification



C

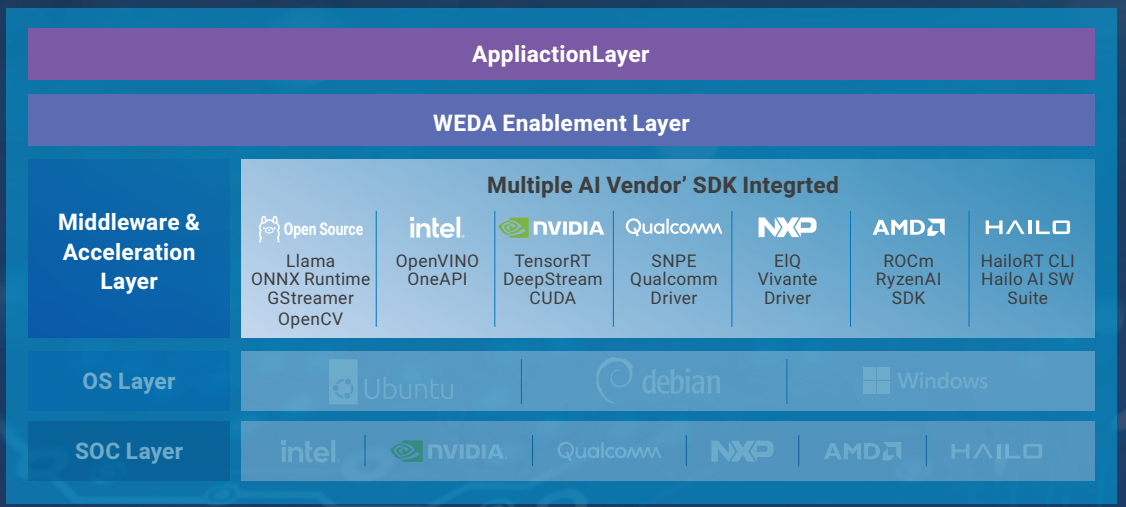
Edge AI SDK

Unified Toolkit for Scalable Edge AI Development

Edge AI SDK simplifies AI development by providing pre-validated environments, optimized runtimes, and cross-platform support.

- Pre-validated hardware and software integration reduces compatibility issues
- GenAIStudio - Model Post-training
- Inference Kit - Inference Deployment
- Orchestration Platform - LifecycleManagement
- Support for AI accelerators and edge devices including Jetson, x86, and heterogeneous platforms
- Integration with orchestration platforms enables remote management, OTA updates, and large-scale deployment

EdgeAI SDK Inference Kit Buiding Block



Faster time-to-market

Lower integration complexity

Cross-platform scalability

Optimized inference performance

End-to-end AI lifecycle support

D

Real-Time Operation

Deterministic Performance for Industrial and Edge AI Workloads

Advantech provides pre-validated real-time configurations to reduce latency and jitter for mission-critical applications.

- Supports PREEMPT_RT and Xenomai environments
- Enables predictable timing behavior for industrial control and robotics
- Reduces integration effort with pre-validated configurations
- Supports diverse hardware platforms and edge deployment environments
- Improves stability under heavy workloads
- Meets requirements for automation, robotics, and control systems

Deterministic Response

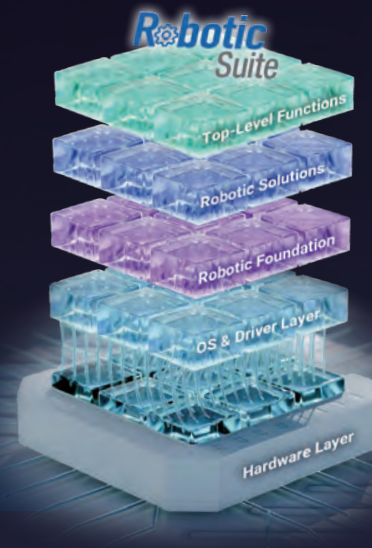
Predictable Performance

Industrial Reliability

E

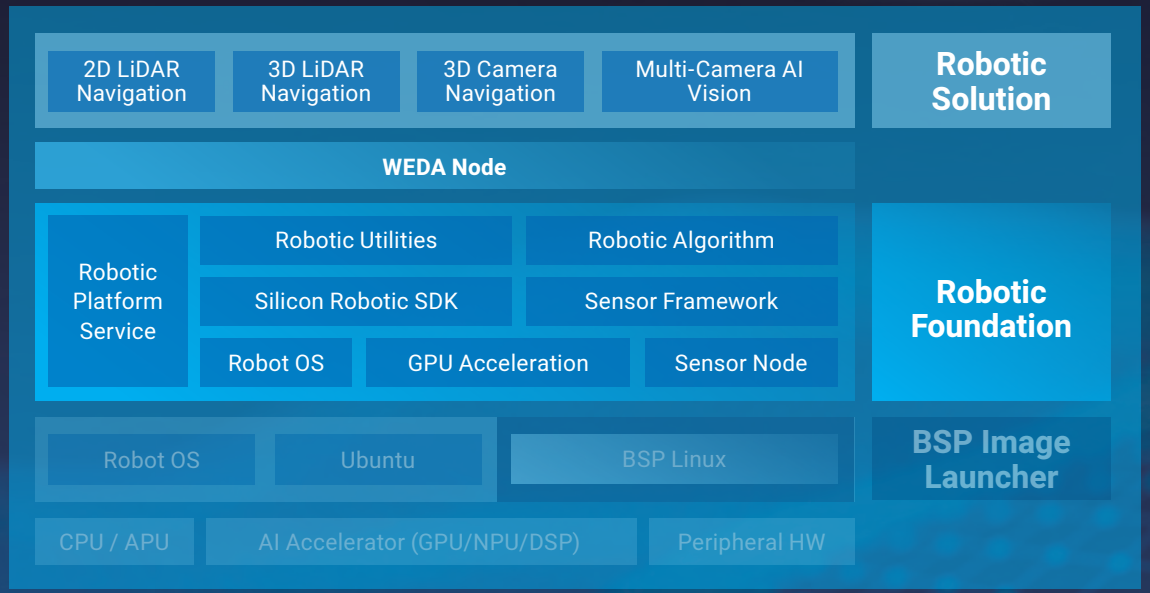
Robotic Suite

Accelerating ROS-based Robotics Development with WEDA Node



Advantech Robotic Suite simplifies robotics application development through pre-validated ROS components, sensor integration, and hardware acceleration.

- **Modular ROS-Ready Components**
  Pre-validated ROS nodes for core robotic functions and task automation.
- **Sensor & Driver Integration**
  Pre-integrated drivers and unified sensor framework for faster hardware bring-up.
- **Mobility Solution Support**
  Optimized silicon SDKs and common ROS-based solutions for direct customer access.
- **Performance Enhancement**
  Supports robotic algorithms, sensor node integration, and hardware-accelerated SDKs.



1 2D LiDAR navigation

2 3D LiDAR navigation

3 3D camera navigation

4 Multi-camera AI vision

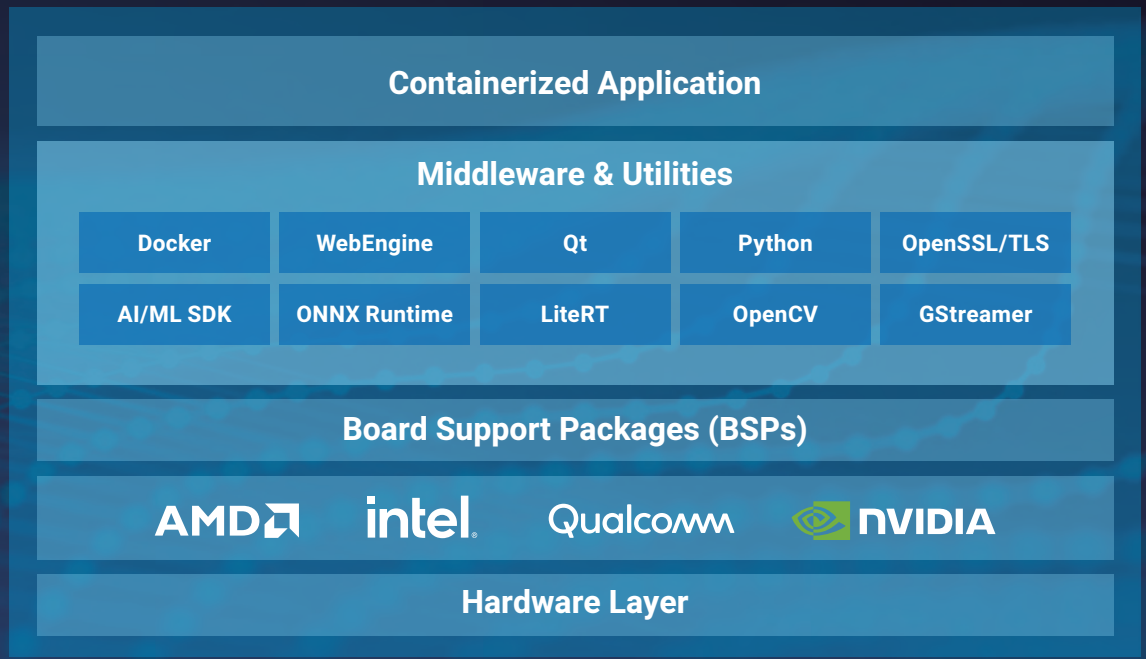
F

Middleware & Utilities

Cross-platform Middleware for Linux-based Edge AI Systems

WEDA middleware abstracts hardware differences and provides standardized software layers for faster migration and scalable deployment.

- **Cross-Platform Consistency**
  Ensures software parity across AMD, Intel, Qualcomm, and NVIDIA architectures.
- **Ready-to-Use Middleware**
  Covers application frameworks, vision, multimedia, and edge middleware.
- **Hardware-Abstracted Development**
  Reduces hardware dependency and simplifies coding through unified middleware standards.
- **Silicon-Aligned AI Acceleration**
  Optimizes NPU and GPU performance through driver and chipset integration.



G

Hardware Abstraction Layer

Unified APIs for Cross-Platform System Control

The WEDA hardware abstraction layer reduces hardware complexity and enables consistent system control across edge AI platforms.

- Linux-based abstraction layer across AMD, Intel, Qualcomm, and NVIDIA platforms
- Powered by Advantech SUSI drivers
- Provides consistent APIs for system monitoring and control
- Reduces hardware dependency for application developers
- Improves portability, scalability, and long-term maintainability
- Enables silicon-aligned tuning and driver integration
- Supports industrial-grade stability and manageability

AI Applications & Middleware

AI Frameworks & Edge Software

Platform Abstraction Layer (Linux PAL)

Advantech SUSI Driver Framework

- GPIO Control
- System Managemen
- HWMonitoring

- Unified APIs
- Hardware Abstraction
- Hardware Abstraction
- System Diagnostics

Board Support Packages (BSPs)

AMD intel Qualcomm NVIDIA

Hardware Layer

H

WEDA-Compatible Operating System Solutions

Open Source Operating System on Linux

Ubuntu

Learn More

Ubuntu is the leading Linux OS, known for its stability, security, and strong developer support. As an IoTleader, Advantech offers Ubuntu Pro for Devices offers 10 years of support for your Ubuntu LTS andmaintenance for 25,000 open-source packages, making it ideal for transportation, robotics, and autonomoussystems.

- **Product Overview**
  Advanced services for Ubuntu Desktop or Server LTS, providing up to 10 years of maintenance and support.
- **Benefits**
  One-time per-device license for 10-year security maintenance, bound to the licensed device and selected Ubuntu LTS version
  Enables Cyber Resilience Act compliance through enhanced OS security, extended maintenance, and timely vulnerability patching
  Easy device management with over the air updates for software update
- **Key Selling Points**
  Compliance with security regulations and profiles like CIS and FIPS 140 Regular maintenance updates for your Ubuntu LTS and 25,000+ open-source applications.

Comparison of Different Linux Distros

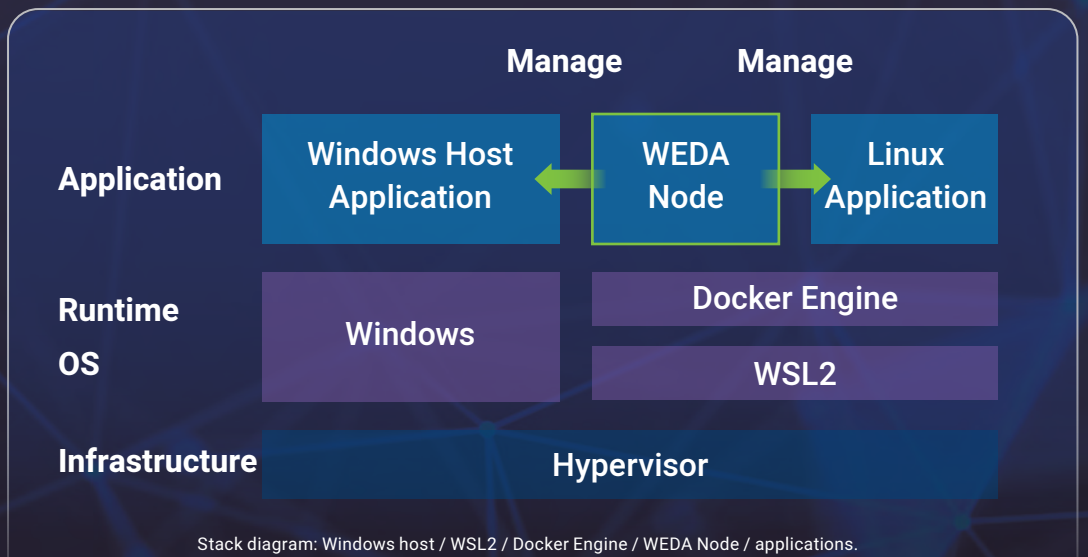
	Ubuntu Pro for Devices	Debian	Yocto
10- years of security maintenance	V	----	----
Security Maintenance for open-source applications without manual operation	V	----	----
Automatically include Real Time Kernel	V	----	----
Device management tooling built-in	V Landscape	----	----
OTA updates for software packages built-in	V Landscape	----	----

WEDA Delivery Platform — Windows

Scalable Edge AI Deployment for Advantech Windows Hardware

WEDA enables Linux-consistent container deployment on Windows through WSL2 and Docker, while preserving native Windows hardware compatibility.

- **Native Hardware Compatibility**
  Optimized for Advantech Windows platforms and native host applications.
- **WEDA Node Orchestration**
  Bridges host OS, containers, system monitoring, and data flow
- **Linux-Consistent Runtime**
  Enables “build once, run anywhere” deployment through WSL2 and Docker Engine.
- **Remote Container Management**
  Supports remote deployment and unified lifecycle management for edge AI services.



Stack diagram: Windows host / WSL2 / Docker Engine / WEDA Node / applications.

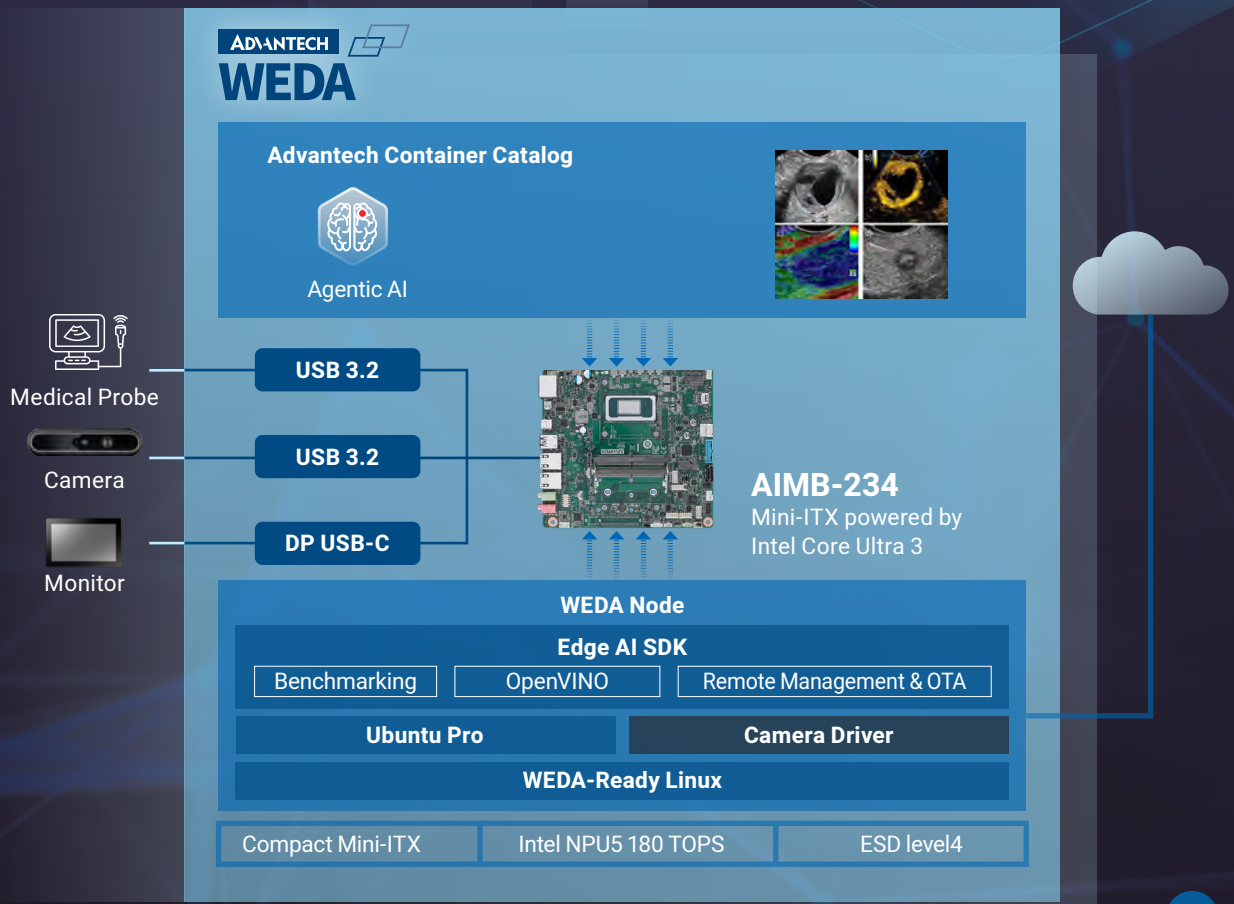
Use Case Scenario

Accelerating Medical AI Imaging with WEDA

Compact Mini-ITX support highly integrated features, plus native GPU and NPU acceleration, with WEDA containized AI model to deliver a reliable and ready to use solution for medical AI development and deployment.

Benefits:

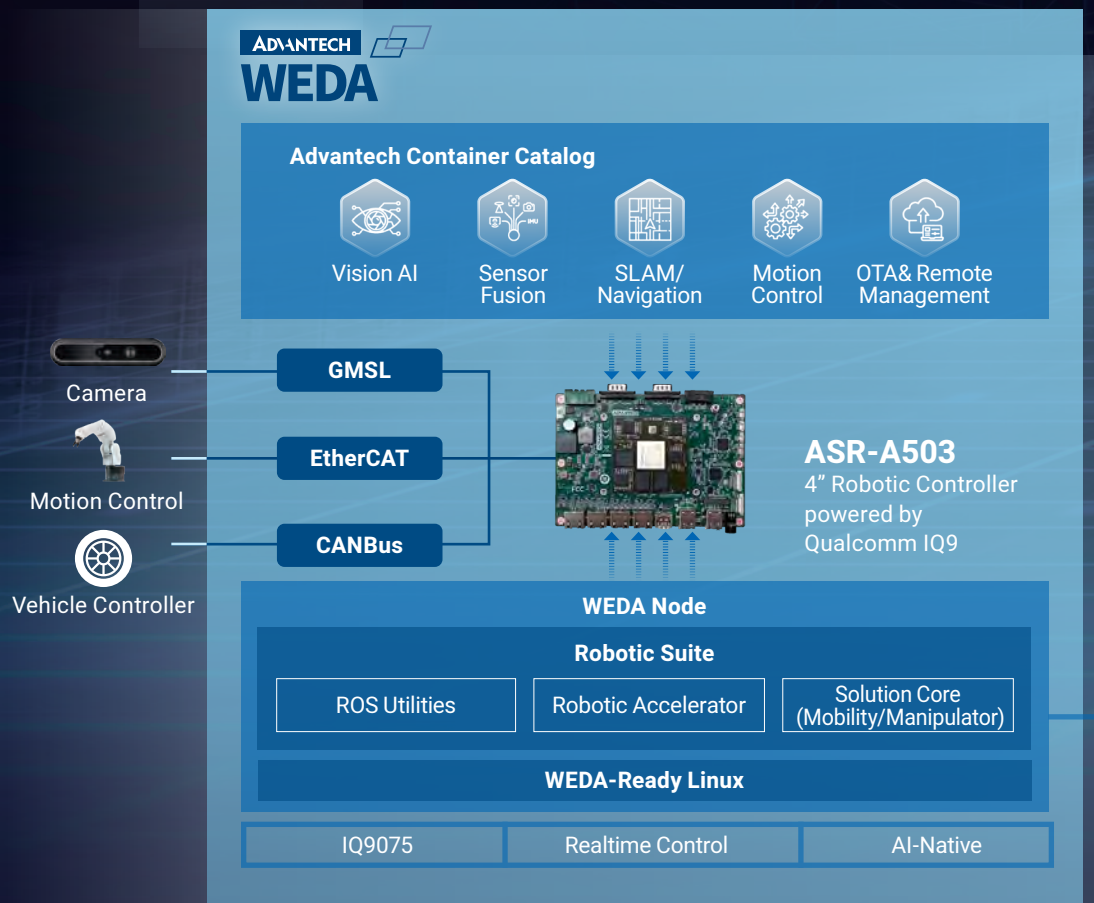
- Accelerate medical AI development, enabling customers to focus on domain design
- Long-term operation with 10-year reliability, stability, and security
- Easy deployment and scalability, with seamless upgrades for on-site equipment



Use Case Scenario

Fast-Track Robotic AI Development with WEDA

Advantech Robotic Suite and WEDA help customers accelerate AI-enabled robot development with containerized software modules and Qualcomm-ready SDK integration.



Benefits:

- Faster development – containerized modules
- Easier integration – decoupled sensor / AI / navigation
- Scalable deployment – PoC → production
- Continuous updates – OTA & remote management

Use Case Scenario

Enable Warehouse Safety Monitoring with WEDA

Deploying camera perception and real-time inference enables warehouses to achieve continuous monitoring, intelligent anomaly detection and behavior analysis, allowing them to operate proactively and adapt dynamically.

Benefits:

- Pre-integrated VLM and camera drivers in WEDA Edge accelerate AI development
- WEDA containerized deployment simplifies model updates and device maintenance.
- WEDA Cloud and Edge architecture enable centralized data management, enhancing alert handling

WEDA-Powered Edge AI Computing

Qualcomm

Learn More

AIR-055

- Qualcomm® Dragonwing™ IQ-9075 fanless edge AI system
- Up to 100 TOPS dense AI performance for edge inference
- Dual 2.5G LAN, DIO, COM, CAN & USB-C for rugged edge control

Learn More

AFE-A503

- Qualcomm Dragonwing IQ9075M robot controller board
- Up to dense 100 TOPS AI computing for advanced robotics
- Rich I/O, CAN FD, 16-bit DIO & Robotic Suite for fast development

Learn More

ASR-A503

- Qualcomm Dragonwing IQ9075M robot controller system
- Up to dense 100 TOPS AI computing for advanced robotics
- Rich I/O, CAN FD, 16-bit DIO & Robotic Suite for fast development”

Learn More

AOM-6741

- Qualcomm® DragonWing IQ9075 compact edge AI module
- Up to 100 TOPS AI computing for edge AI inference
- PCIe, USB 3.2 Gen2 & 4x 4-lane MIPI-CSI for vision AI

AMD

Learn More

MIO-5380

- AMD Ryzen™ AI Embedded P100 Series 3.5”” SBC platform
- Up to 12 cores with 50 TOPS NPU for edge AI workloads
- USB4 PD 100W, dual LAN/PoE, MCIO PCIe & EdgeBMC OOB control

Learn More

AIMB-2211

- AMD Ryzen™ AI Embedded P100 Series Processors
- Up to 12 cores, 50 TOPS NPU
- Super speed 5 x USB3.2, USB Type-C with DP alt mode

Learn More

SOM-6874

- AMD Ryzen™ AI Embedded P100
- Up to 80 TOPS AI performance
- High Speed I/Os: 2.5GbE, PCIe Gen 4, USB 3.2 Gen2

WEDA-Powered Edge AI Computing

intel

Learn More

AIR-355

- Powered by Intel® Panther Lake (Core™ Ultra 5/7)
- Up to 180 TOPS (CPU/10, NPU/50, GPU/120)
- Support MXM Type A (60w) or extra 2x M.2 2280(M) SSD

Learn More

ARK-2252

- Intel® Core™ Ultra Series 3 Panther Lake 325/358H platform
- Up to 180 TOPS AI performance for real-time edge inference
- 128GB DDR5, NVMe SSD & 4x 2.5GbE for high-throughput edge A

Learn More

DS-281

- Intel Panther Lake H12Xe CPU for SDM edge display platform
- Intel® SDM Rev. 2.3 compliant for next-gen display integration
- Triple 8K output via DP 1.4a, HDMI 2.1 & golden finger expansion

Learn More

DS-087

- Intel® Core™ Ultra 5/7 PTL-325/356H edge AI platform with GPU & NPU
- 16GB LPDDR5X memory for high-bandwidth AI inference & multitasking
- Dual 8K display, flexible I/O & M.2 expansion for signage/retail

Learn More

MIO-5381

- Intel® Core™ Ultra Series 3 3.5”” SBC with built-in NPU
- Up to 180 TOPS AI performance, including 50 TOPS from NPU
- USB4 PD 100W, MIPI-CSI for GMSL & MCIO PCIe Gen5 x4 expansion

Learn More

AIMB-234

- Intel® Core™ Ultra Series 3 built-in GPU and NPU
- Up to 180 TOPS AI performance
- USB4 Type-C supports alt. mode and 100W PD

Learn More

SOM-5886

- Intel® Core™ Ultra Series 3 Processors
- Integrated GPU & NPU, AI total 180TOPs
- 20x PCIe Gen4, 2.5GbE, 2x SATA, USB4 & USB3

Learn More

SOM-6886

- Intel® Core™ Ultra Series 3 Processors
- Onboard LPDDR5x up to 64GB & SSD 1TB
- 20x lanes PCIe Gen4, 2.5GbE, USB4 & USB3, MIPI-CSI

Learn More

SOM-M250

- Intel® Core™ Ultra Series 3 Processors
- Onboard LPDDR5x up to 64GB & SSD 1TB
- PCIe Gen5, Dual 2.5GbE, MIPI CSI

WEDA-Powered Edge AI Computing

NVIDIA

Learn More

NVIDIA Elite Partner

AIR-075

- Powered by NVIDIA Jetson Thor T5000/T4000, delivering up to 2070 TFLOPS FP4 performance
- Unified memory capacity 128GB/64GB
- Supports 4x 10GbE Base-T, optional PoE

Learn More

NVIDIA Elite Partner Robotic Suite

AFE-A702

- Robot Controller System with NVIDIA Jetson Thor T5000
- Up to 2070 TFLOPs for AI Computing
- Dedicated I/Os : 6x GbE, 6x USB, 1x 10GbE SFP, 2x COM, 2x CANFD, 16Bit DIO

Learn More

NVIDIA Elite Partner Robotic Suite

ASR-A702

- Robot Controller Board with NVIDIA Jetson Thor T5000
- Up to 2070 TFLOPs for AI Computing
- Dedicated I/Os : 6x GbE, 6x USB, 1x 10GbE SFP, 2x COM, 2x CANFD, 16Bit DIO

Learn More

NVIDIA Elite Partner

AIMB-294

- NVIDIA Jetson Thor, up to 2070 FP4 TFLOPS, 128 GB built-in memory, and Blackwell GPU
- Compact thermal cooler for -15~60°C.
- 2x GMSL cameras, 1x DP and 1x HDMI up to 8K

Memo

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Amberg	49-9621-9732-100

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Sweden

Stockholm	46-0-864-60-500

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