WIND RIVER

WIND RIVER INTELLIGENT DEVICE PLATFORM XT

The Foundation for Building Devices That Connect to the Internet of Things

The opportunities presented by the burgeoning Internet of Things (IoT) may be new, but Wind River® has been providing the intelligence that powers interconnected, automated systems for decades. Wind River Intelligent Device Platform XT is a scalable, sustainable, and secure development environment that simplifies the development, integration, and deployment of IoT gateways. It is based on Wind River industry-leading operating systems, which are standards-compliant and fully tested, as well as Wind River development tools.

The platform provides device security, smart connectivity, rich network options, and device management; and it includes ready-to-use components built exclusively for developing IoT gateway applications. Intelligent Device Platform XT provides outstanding software and expertise to fuel the rapid innovation and deployment of safe, secure, and reliable intelligent devices through more efficient development cycles, standards-based data connections, and intuitive management tools.

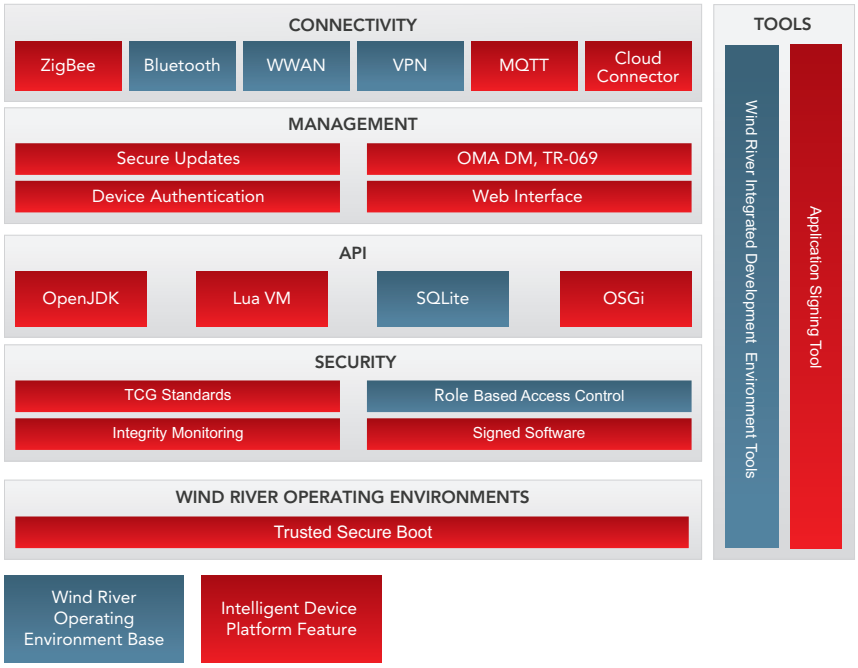

Figure 1: Wind River Intelligent Device Platform architecture

INTEL, MCAFEE, AND WIND RIVER, BETTER TOGETHER

Intelligent Device Platform XT is part of Intel® Gateway Solutions for Internet of Things (IoT), a family of platforms that enables companies to seamlessly interconnect industrial devices and other systems into a system of systems. Intel Gateway Solutions for IoT enables customers to securely aggregate, share, and filter data for analysis. It helps ensure federated data generated by devices and systems can travel securely and safely from the edge to the cloud and back—without replacing existing infrastructure.

Intel Gateway Solutions for IoT offers companies a key building block to enable the connectivity of legacy industrial devices and other systems to IoT. It integrates technologies and protocols for networking, embedded control, enterprise-grade security, and easy manageability on which application-specific software can run.

Intel Gateway Solutions for IoT provides:

- Connectivity up to the cloud and enterprises
- Connectivity down to sensors and existing controllers embedded in the system
- Preprocess filtering of selected data for delivery
- Local decision-making, enabling easy connectivity to legacy systems
- A hardware root of trust, data encryption, attestation, and software lockdown for security
- Local computing for in-device analytics.

The Intel Gateway Solutions for IoT development kit is designed to speed innovation and maintain interoperability with legacy systems. Developers can quickly develop, prototype, and deploy intelligent gateways that meet emerging IoT market requirements, while maintaining interoperability with legacy systems including sensors and datacenter servers.

Intel development kits are completely pre-configured and pre-validated with hardware, software, and security capabilities, and are available now from third-party providers.

- Intel Gateway Solutions for IoT, based on Intel Quark™ system-on-chips (SoCs) and Intel Atom™ processors, bring intelligence to the edge and easily interoperate with existing network applications and services.
- Intel development kits simplify integration, minimize development cost, and accelerate time-to-market with a complete solution that includes a fully configured board, chassis, power supply, antennas, and software.
- Standards-based interfaces enable Intel Gateway Solutions for IoT to easily connect and interoperate with legacy systems, down to sensors and controllers and up to datacenters and the cloud.
- Kits include software from Wind River and McAfee Embedded Control 6.1 to monitor and protect data security by dynamically managing whitelists. Intel provides an integrated software stack with drivers and scripts that support the built-in hardware-based root of trust.

TECHNICAL SPECIFICATIONS

Connectivity

Connectivity options include both local connectivity and IoT system or cloud connectivity. Popular IoT application protocols such as Message Queue Telemetry Transport (MQTT) are included. Intelligent Device Platform XT is designed to take advantage of drivers and systems software available in the operating environment—lowering development cost, optimizing reuse, and saving development time.

MQTT

- Lightweight (low power, low network bandwidth) publish-and-subscribe messaging protocol
- Paho client
- Command-line utilities for publishing and subscribing to MQTT topics
- Mosquito server

Cloud Connector

- Device connector to cloud-based services
- Flexible interface

ZigBee

- Local wireless connectivity
- Complete, robust implementation that allows manufacturers and software developers to easily incorporate ZigBee connectivity into their designs

Bluetooth

- Local wireless connectivity
- Bluetooth 4.0 with BLE support

Management

Device management requires facilities for provisioning, software, and configuration updates, along with providing device status. Intelligent Device Platform XT provides a wide range of options for device management. Along with the standard device management protocols, the platform also offers a lightweight web-based management tool.

Secure Updates

- Package updates
- Firmware updates

Device Authentication

- Certificate-based remote attestation

Standards-Based Management Protocols

- OMA DM
- TR-069

Web Interface

- webif UI

Security

Security is a primary design consideration for connected devices within an IoT system. Intelligent Device Platform includes features to implement a robust security plan for a wide array of IoT systems. Security features include access control of critical system resources and digital signature validation for trusted software, in addition to the network security features, such as IPsec or L2TP, of the supporting operating environment.

TCG Standards

- TSS Service Provider Interface (TSPI)
- TSS Core Services Interface (TCSI)
- TSS Device Driver Interface (TSDI)

Role-Based Access Control

- System protection from applications
- Ability to set resource access policies for each application
- Protection of system resources, including memory, CPU cycles, files, and network resources

Integrity Monitoring

- Verification of the RSA signature before running an application
- Ability to set policies for integrity failure
- No execution of an appliction without the signature of an authorized certificate
- No execution of an application that has been tampered with

Signed Software

- Certificate-based signing tool for bootloader, kernel, and applications
- Trusted stack for critical software

Application Programming Interface

The application programming interface (API) layer is designed to support popular application environments for IoT software, including Java, OSGi, and Lua scripting language. These environments are configurable and can be selected by a system developer via the development tools for inclusion into a particular IoT gateway or device.

OpenJDK

- Support for both Java SE 6 and 7
- Usage of system libraries such as zlib
- Support for different virtual machines (VMs) such as Zero and Cacao

Lua VM

- Portable application environment
- Small footprint (500K)
- Proven language used in many industrial applications

SQLite

- Embedded SQL lightweight database
- Storage and organization of local data store
- Simple command interface

OSGi

- Addition of Java applications to an IoT gateway
- Independent application lifecycles
- Run-time controls for Java applications

Table 1: Intel Gateway Solutions for IoT Development Kit (Includes Chassis, Antenna, Power Adapter Documentation, USB Installer for Software, and Sample Apps)

SoC	Intel Quark SoC X1000
Cellular module	Telit HE-910
Wi-Fi module	Intel Dual-Band Wireless-AC 7260
I/O	2 Mini PCIe slots (for cellular and Wi-Fi) ZigBee 2x USB 2x 10/100 Ethernet eMMC SD slot RS232, RS485
Memory and storage	512K SRAM, 2 GB DDR3 Onboard eMMC SD card
Temperature range	0°–55° C
Software (includes combined developer and end-user license agreement)	Wind River Intelligent Device Platform XT 2.1 Wind River Linux 5.1 (Host) Wind River Workbench McAfee Embedded Control 6.1

Wind River Operating Environments

Intelligent Device Platform XT is built on the Wind River market-leading operating environments, so developers and system integrators can reuse software assets already deployed in these environments.

Wind River Linux Development Tools

Intelligent Device Platform XT is a flexible platform that includes the development tools needed to build and customize the target system. Developers can add their own software and still apply service updates to their software stack.

Web-Based Configuration Management

Intelligent Device Platform XT includes an easy-to-use web-based configuration tool for device provision, setup, and management.

Supported Hardware

Intelligent Device Platform XT runs in conjunction with Wind River operating environments, and therefore supports a wide array of hardware platforms. The platform comes with pre-integrated hardware support from leading manufactures, and its development tools can be used to optimize the IoT stack for a given hardware platform. Wind River Professional Services also offers assistance in optimizing hardware integration. Contact Wind River for more information.

DOCUMENTATION

Wind River provides documentation that contains configuration and build instructions for Intelligent Device Platform XT and describes the configurations that enable IoT technologies on the platform.

WIND RIVER PROFESSIONAL SERVICES

A CMMI Level 3–certified organization, Wind River Professional Services delivers a mix of embedded and vertical market expertise. We offer consultative thought leadership, deep technical capabilities, and innovative industry solutions to help you overcome your most strategic and pressing development challenges. Our industry-specific offerings span the entire project lifecycle, including consulting, architecture, design, development, porting, integration, and maintenance services; and we leverage our state-of-the-art platform simulation and test tools to accelerate deliverables and provide valuable reporting and documentation. Our global organization provides flexible engagement options for staffing that will meet your project resourcing requirements and budget. For more information, visit www.windriver.com/services.

WIND RIVER EDUCATION SERVICES

With more than 30 years of embedded software experience, Wind River provides education services in every region of the world. We offer flexible training options to meet your business and learning needs, including public, private, and custom courses. For your specific project challenges, Wind River Mentoring provides coaching by experienced engineers to help you integrate Wind River solutions into your environment. And when you're too busy to attend a whole class, our on-demand learning options provide around-the-clock access to advanced and specialized topics. All of our education services are led by expert engineers who are closely connected to the Wind River technical community for access to specific expertise. For more information, visit www.windriver.com/education.

WIND RIVER CUSTOMER SUPPORT

Intelligent Device Platform XT is backed by our award-winning global support organization. With six major support centers, 21 additional support hubs, and more than 150 experts worldwide, you can get the help you need in the language and time zone that work best for you. Our online Wind River Support Network provides multifaceted self-help options, including an active Q&A Forum. Optional premium services are available, including designated support engineers and hosting of customer-specific environments. Wind River Customer Support has achieved Service Capability and Performance certification. For more information, visit www.windriver.com/support.

HOW TO PURCHASE

Visit www.windriver.com/company/contact to find your local Wind River sales contact. To have a sales representative contact you, call 800-545-WIND.

WIND RIVER

Wind River is a world leader in embedded software for intelligent connected systems. The company has been pioneering computing inside embedded devices since 1981, and its technology is found in more than 1 billion products. To learn more, visit Wind River at www.windriver.com