



WIND RIVER INTELLIGENT DEVICE PLATFORM XT

By 2020, more than 200 billion devices will be connected to the cloud and to each other in what is commonly called the Internet of Things (IoT). Intelligent devices and systems are nothing new—they’ve been used in the manufacturing, automotive, aerospace, healthcare, transportation, and other industries for decades. But many of these devices are not connected to the Internet and are cloistered in specialized systems with unique communications protocols. With greater insight into and control of these intelligent devices, businesses and society can benefit in nearly unlimited ways. But to take advantage of these revolutionary opportunities, businesses can no longer protect devices by simply isolating them from the greater world of the Internet.

Building safe and secure systems is the hallmark of Wind River®; for the past 30 years we’ve been ensuring that safety-critical systems, for everything from industrial plants and electrical substations to jet airliners and commuter trains, absolutely work without fail. We’re now harnessing our decades of field experience to deploy advanced technologies such as software agents and microkernels to more fully integrate our ultra-reliable operating systems into IoT; to help manage diverse devices; and to translate all kinds of data for travel across networks and into analytical cloud systems, where businesses and other organizations can gain insights for operational efficiencies and transformative improvements.

Wind River Helix™ is our comprehensive portfolio of software solutions for addressing the system-level challenges and opportunities of IoT. At the heart of Helix is the gateway, and our flagship product offering for the gateway is Wind River Intelligent Device Platform XT.

TABLE OF CONTENTS

Intel and Wind River, Better Together 2
Technical Specifications 3
Connectivity. 3
Management 3
Security. 4
Application Programming Interface 4
Wind River Operating Environments 5
Wind River Linux Development Tools 5
Web-Based Configuration Management 5
Supported Hardware 5
Documentation 5
Wind River Professional Services 6
Wind River Education Services 6
Wind River Customer Support 6
How to Purchase 6

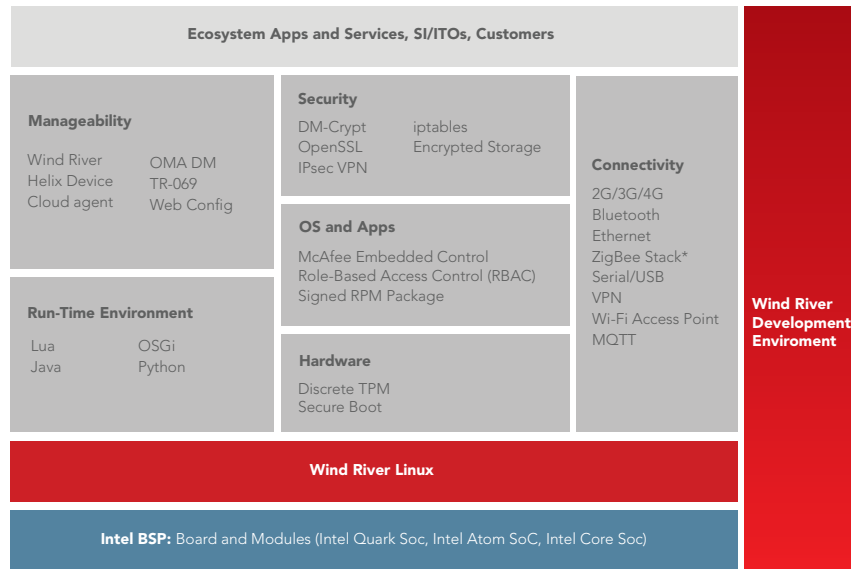


Figure 1: Wind River Intelligent Device Platform XT components

INTEL AND WIND RIVER, BETTER TOGETHER

Intelligent Device Platform XT is part of Intel® IoT Gateways, a family of platforms that enables companies to seamlessly interconnect industrial devices and other systems into a system of systems. Intel IoT Gateways enable customers to securely aggregate, share, and filter data for analysis. They help 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 IoT Gateways offer companies a key building block to enable the connectivity of legacy industrial devices and other systems to IoT. They integrate technologies and protocols for networking, embedded control, enterprise-grade security, and easy manageability on which application-specific software can run.

Intel IoT Gateways provide:

- Connectivity up to the cloud and enterprise systems
- 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 IoT Gateway 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 IoT Gateways offer a scalable range of processors, including Intel Quark™, Intel Atom™ Baytrail, and Intel Core™ 64-bit processors.

- 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 IoT Gateways 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 6.6 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

ZigBee (Exegin Q58 SPI Module)

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

Cloud Connector

- Gateway agent for Wind River Helix Device Cloud
- Customizable interface to legacy cloud services

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 is preconfigured with the Wind River Helix Device Cloud agent, providing a wide range of options for device management. In addition, the platform also offers a lightweight web-based management tool and third-party device management options.

Secure Updates

- Package updates
- Firmware updates

Standards-Based Management Protocols

- OMA DM
- Device Cloud
- TR-069

Device Authentication

- Certificate-based remote attestation

Web Interface

- LuCi

Security

Security is a primary design consideration for connected devices within an IoT system. Intelligent Device Platform XT 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, L2TP, and Kerberos with Microsoft® Active Directory, of the supporting operating environment.

TCG Standards

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

Integrity Monitoring

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

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

Signed Software

- Certificate-based signing tool for bootloader, kernel, and applications
- Trusted stack for critical software
- Secure boot with tamper-proof firmware

Application Programming Interface

The application programming interface (API) layer is designed to support popular application environments for IoT software, including Java, OSGi, and the 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 OpenJDK 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: Supported Elements in Intel IoT Gateway Development Reference Boards

SoC	Intel Baytrail Intel Quark Intel Core
Wi-Fi module	Azurewave NB159H wireless module Intel 7260 wireless module
I/O	2 Mini PCIe slots 1x USB 1x 10/100 Ethernet 1x VGA 1x HDMI
Memory and storage	4 GB DDR3 500 GB SATA disk
Software (includes combined developer and end-user license agreement)	Wind River Intelligent Device Platform XT 3 Wind River Workbench McAfee Embedded Control 6.6

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

Intel IoT Gateways are sold through Intel. To subscribe to services for the gateway, such as Wind River Helix Device Cloud, Wind River Customer Support, Wind River Education Services, and Wind River Professional Services, 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.

