

WIND RIVER

Wind River VxWorks Platforms 6.9

The market for secure, intelligent, connected devices is constantly expanding. The key to successful products is to match exciting applications with outstanding hardware performance and reliability, all while delivering a high-quality product to market on time. Innovators who create the products that change our world tomorrow need a platform they can count on that leverages the latest and greatest enhancements in processor and hardware technology.

Wind River VxWorks is the innovator's platform that provides scalability, reliability, and rock-solid real-time performance, with comprehensive multi-core processor support, including asymmetric multiprocessing (AMP) and symmetric multiprocessing (SMP) operating system configurations and hardware-optimized multi-core acceleration capabilities. Included in the platform is VxWorks 6.9, a fully 32-bit and 64-bit capable real-time operating system (RTOS), as well as Wind River development and multi-core tools.

VxWorks ensures high performance along with deterministic behavior. This proven technology package is backed by a 25-year track record, an exceptional ecosystem of hardware and software partners, and the industry's most comprehensive support organization.

Wind River VxWorks platforms are optimized develop-and-run solutions for a range of devices, from aerospace and defense (A&D) applications to networking and consumer electronics, robotics and industrial applications, precision medical instruments, and car navigation and telematics systems. The platforms provide a robust foundation for companies that need to leverage their investment in proprietary intellectual property. VxWorks has been deployed successfully in hundreds of millions of devices worldwide.

The Foundation: VxWorks RTOS

Built on a highly scalable, deterministic, hard real-time kernel, the VxWorks RTOS enables companies to scale and optimize their run-time environments using only the specific technologies required by their devices. From the smallest footprint requirement to the highest performance level, VxWorks gives developers the flexibility to build their optimal solution quickly and easily while meeting cost, quality, and functionality requirements.

VxWorks supports POSIX and industry-standard protocols such as IPv6 and TIPC, ensuring maximum code portability and interoperability. VxWorks 6.9 is backward-compatible with previous releases, so developers can leverage and reuse existing projects, applications, board support packages (BSPs), and drivers as well as open source applications.

Development Suite

Wind River Workbench

Software Partners

Ada Support		Advanced Security
Browsers	CAN	Common Internet File System
Databases	Design Tools	3D Graphics
High Availability	Java	Others

Additional Middleware*

Wireless Ethernet	Mobile IPv4/IPv6	802.1Q VLAN	Media Library Graphics
SSL & SSH	IPsec & IKE	NAT/Firewall	IGMP/MLD
RADIUS and Diameter Client	Wireless Security	Crypto Libraries	EAP
SNMP v1/v2/v3	Web Server	CLI/MIBway	Learning Bridge
VRRP	Web Svcs-Interop/SEC	DCOM	CAN/OPC

Base Middleware**

TIPC MIPC	Distributed Shared Memory	USB 1.1, 2.0
dosFs	Flash Support (TrueFFS)	Highly Reliable FS
IPv4/IPv6 Network Stack		PPP

Operating Systems

VxWorks/VxWorks Multiprocessing (SMP/AMP)

Hardware Partners

Reference Designs, Semiconductor Architectures
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Services

Education Services and Installation	Platform Customization
System Design	Design Services
Hardware/Software Integration	

VxWorks platform components

* Included in VxWorks industry-specific platforms

** Included in all VxWorks platforms

VxWorks 6 includes frameworks for file systems, power management, and interconnectivity, as well as comprehensive security capabilities that begin at the core operating system level for absolute application and device security.

Multi-core Support

Wind River VxWorks platforms feature multi-core support capabilities within the operating system, network stack, and development tools to provide the easiest path to multi-core technology for embedded software developers. The multi-core-enabling capability of the VxWorks platforms is complemented by Wind River's unmatched services and support capabilities.

VxWorks can be optionally paired with Wind River Hypervisor to allow even more flexibility in hardware partitioning, introduce additional capabilities, and make the promise of multi-core processors real.

The VxWorks 6.9 multiprocessing capability is included in all VxWorks 6.9-based platforms, with support for the latest market-leading multi-core silicon. VxWorks multiprocessing-enabled platforms allow customers to do the following:

- Deliver higher-performance, hardware-optimized, multi-core-powered products, on the latest silicon, with reduced risk and development investment.
- Speed time-to-market by using commercially available and supported run-time platforms and developer tools with support for multiprocessing.
- Increase productivity by using the same development process and environment as for uniprocessor development, leveraging multiprocessing extensions to existing development tools.
- Partition available hardware resources in a multi-core environment between multiple SMP and unsupervised AMP operating system configurations, including the ability to run multiple SMP operating systems side by side.
- Leverage the powerful Wind River Hypervisor product to enable flexible multi-core configurations such as multi-OS, supervised AMP, and combinations of AMP and SMP on the same platform.
- Enable a flexible design approach using Wind River's expertise and broad technology support for multiprocessing.

Full 64-Bit Processing Support

Join the 64-bit revolution with the innovator's RTOS, VxWorks 6.9. Many embedded systems are already using 64-bit processors, but up until now, commercial RTOSes have not taken advantage of these advancements in processor technology. VxWorks 6.9 is the first commercial RTOS to offer full 64-bit processing, I/O, and memory support. Full 64-bit processing enables memory access beyond the 4GB barrier plus unlocks performance enhancements available on 64-bit processors.

Integrated Middleware

VxWorks platforms include comprehensive networking and middleware technology that has been pre-integrated, tested, and validated. Leveraging these standard technologies saves

development time and allows you to focus on adding value and differentiating functionality to your device.

Optimized Development Suite

As system complexity rises, a toolchain that's deeply integrated with the operating system becomes increasingly important. The VxWorks platforms include the award-winning Wind River Workbench integrated development suite, with the optional Wind River Workbench On-Chip Debugging JTAG tools, offering deep capability across the development process in a single integrated environment, with complete platform integration, including powerful tools for debugging, code analysis, and test.

With Wind River Workbench, you'll find and fix problems faster, accelerate application development, reduce code complexity, improve code quality, and shorten time in test cycles. Connect Wind River's optional JTAG debugging tools for system-level debugging and track down complex multi-core issues. Wind River's technology leadership in debugging multi-core processors with its Workbench On-Chip Debugging solutions enables customers to quickly identify problems between the hardware and software using a unique multi-core debugging technology. Based on the Eclipse framework, Workbench can be extended through in-house, third-party, open source, and commercial plug-ins.

Available VxWorks Platforms

- **Wind River General Purpose Platform:** This versatile platform is used for devices ranging from aerospace and defense, automotive telematics, and small-footprint consumer devices to industrial devices and networking equipment.
- **Wind River Platform for Automotive Devices:** Designed for the development of applications that require high reliability, low power consumption, and a small memory footprint, Wind River Platform for Automotive Devices includes protocols such as Controller Area Network (CAN) and a broad automotive partner ecosystem. Targets for Platform for Automotive Devices include both vehicle and security control systems (powertrain, engine, ABS, crash and airbag sensors, window/door entry) and in-vehicle systems (digital dashboard displays, navigation systems, telematics systems, and entertainment systems).
- **Wind River Platform for Consumer Devices:** This offers a fast-boot, small-footprint run-time environment ideal for memory-constrained devices. Platform targets include digital video, mobile handheld, digital imaging, residential gateways, and broadband access devices.
- **Wind River Platform for Industrial Devices:** This provides industrial device manufacturers with essential multimedia and connectivity middleware, including drivers and protocols for connected devices on the factory floor, wireless peripherals, and other devices within the network infrastructure. Targets include industrial automation, building automation, medical, transportation, and test and measurement devices.
- **Wind River Platform for Network Equipment:** This enables customers to rapidly create, test, deploy, maintain, and manage high-quality network—wired and wireless—infrastructure devices. The platform offers an extensive suite of security protocols to protect network data. It is ideally suited for wireless

infrastructure, enterprise network, core networking, network edge, WiMAX and LTE infrastructure, and broadband access devices.

VxWorks Platform Components

Develop: Wind River Workbench 3.3

- Eclipse-based development environment
- Multiple-target OS support, including support for VxWorks 5.5 (PowerPC and Intel Architecture only), VxWorks 6.3–6.9, Wind River Linux
- Target processor support for Power Architecture, Intel Architecture, ARM, MIPS
- VxWorks host shell
- Dynamic printf() debugging
- VxWorks 6.x Kernel Configurator
- VxWorks Source Build configuration tool
- VxWorks Core Dump Analysis (32-bit)
- Multi-target launch
- Integrated VxWorks Simulator
- Integrated run-time analysis tools
 - System Viewer
 - Performance Profiler (32-bit)
 - Memory Analyzer (32-bit)
 - Data Monitor (32-bit)
 - Code Coverage Analyzer
- Optimizing compilers
 - Wind River Diab Compiler for VxWorks
 - Intel C++ Compiler and Intel Performance Primitives for VxWorks
 - Wind River GNU Compiler

Optional Add-on Products

- Wind River Workbench On-Chip Debugging
 - JTAG tools (multi-core debugging)
- IPL Cantata++ for Wind River Workbench
- Wind River Tilcon Graphics Suite
- ADA development environment

Run: VxWorks 6.9

Included in all VxWorks Platforms

- Industry-leading VxWorks 6.9 kernel, with uniprocessor and multiprocessor support with AMP and SMP
- 32-bit and 64-bit (for Intel Architecture) processing
- Memory protected, real-time process (RTP) user space environment
- Backward-compatibility with VxWorks 5.5 and all previous versions of VxWorks 6.x
- Kernel scalability and performance tuning using VxWorks Source Build
- State-of-the-art memory protection and memory management
- Error management
- Message channels IPC, including support for multiprocessor and multi-OS messaging using TIPC, and Wind River Multi-OS IPC (MIPC)

- Full support for JTRS SCA AEP 2.2.2 and certified conformance to POSIX IEEE Std. 1003.13-2003 PSE52 (achieved in VxWorks 6.4)
- Dual-mode IPv4/IPv6 network stack, with IPv6 Ready Logo certification
- Wind River PPP
- Wind River USB
- TrueFFS (flash file system)
- dosFs (FAT-compatible file system)
- Highly reliable file system (HRFS) with configurable commit points
- High-speed interconnect framework with PCI and local bus support
- VxMP
- VxWorks target shell
- Broad processor and BSP support

Included in VxWorks Industry-Specific Platforms

- VPNC-certified Wind River IPsec and SSL
- Wind River IKE
- Wind River Cryptography Libraries
- Wind River Security Libraries
- Wind River SSH
- Wind River RADIUS and Diameter Client
- Wind River Firewall
- Wind River NAT
- Wind River Wireless Ethernet Driver
- Wind River Wireless Security
- Wind River EAP
- Wind River Mobile IP
- Wind River OPC
- Wind River DCOM
- Wind River CAN
- Wind River CLI, Web, MIBway
- Wind River SNMP
- Wind River Learning Bridge
- Wind River Media Library
- Wind River Web Services
- Wind River L2TP
- Wind River MACsec
- Wind River GNU Make

Optional Add-on Product

- Datalight FlashFX Pro (NAND flash manager)

Manage: Device Management

Optional Add-on Products

- Wind River Test Management
- Wind River Test Diagnostics

WIND RIVER

Wind River is a world leader in embedded and mobile software. We enable companies to develop, run, and manage device software faster, better, at lower cost, and more reliably. www.windriver.com

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