



VXWORKS 7

The Safe, Secure, and Reliable RTOS for Critical Infrastructure

Powering billions of intelligent devices, VxWorks® is the world's most widely deployed real-time operating system (RTOS). It delivers unrivaled deterministic high performance and sets the standard for a scalable, future-proof, safe, secure, and reliable operating environment for running the computing systems of the most important critical infrastructure that demand the highest standards. For nearly 40 years, leading global innovators such as Airbus Group, Alcatel-Lucent, Boeing, Collins Aerospace, GE, Huawei, KUKA, Mitsubishi, NASA, Northrop Grumman, Rockwell Automation, Schneider Electric, Siemens, Toshiba, Varian, and many others have leveraged VxWorks to create award-winning, innovative products for aerospace and defense, rail, automobiles, medical devices, manufacturing plants, and communications networks that simply cannot fail.

CORE CAPABILITIES

Enabling the Future of Edge Computing Systems

- **Reliability and performance:** As the world's first RTOS and the first and only RTOS on Mars, where reliability is a must-have, VxWorks delivers the highest levels of performance when it is most needed.
- **Security:** To efficiently and effectively safeguard devices, data, and intellectual property in the connected world, VxWorks provides a comprehensive set of built-in security features that, along with the Wind River security services offering and combined with our development processes, meet rigorous security requirements across industries.
- **Safety:** VxWorks is developed with safety in mind. It is rigorously tested and has been certified to meet specific regulatory requirements.

KEY FEATURES

Industry-Leading RTOS

- Single and multi-core processor support with asymmetric multiprocessing (AMP) and symmetric multiprocessing (SMP) with support for CPU affinity
- Scheduling
 - Priority-based preemption with optional round-robin
 - Time and space partitioning
 - Adaptive scheduling offering foreground and background threading
- Extensive processor and board support
 - 32-bit and 64-bit CPUs
 - Broad spectrum of silicon architectures including Arm®, Power Architecture®, and Intel®
 - Over 80 different boards supported
- Separation between kernel and memory-protected user space environments
- POSIX®

- C11 and C++14 support
- Kernel scalability, modularity, and performance tuning using VxWorks Source Build
- State-of-the-art memory protection and memory management
- Virtualization ready with virtio support
- Multi-OS messaging
- Backward compatible with VxWorks 6.x

Networking

- General purpose network stack with IPv4/IPv6 network stack support
- Real-time network stack with IPv4/IPv6 support
- Time-sensitive networking (TSN)
 - PTP IEEE 1588-2008
 - IEEE 802.1Qbv
 - IEEE 802.1Qbu

WIND RIVER CUSTOMER SUPPORT

VxWorks is backed by our award-winning global support organization offering live help in multiple time zones. For more information, visit www.windriver.com/support.

WIND RIVER PROFESSIONAL SERVICES

Our [CMMI Level 3](#) rated services organization offers BSP development, secure boot services, solution assessment, consulting, design, certification services, and more. For more information, visit www.windriver.com/services.

WIND RIVER EDUCATION SERVICES

Wind River offers technical, hands-on training, mentoring, and on-demand learning. For more information, visit www.windriver.com/education.

HOW TO PURCHASE

Visit www.windriver.com/company/contact to find your local Wind River sales contact. To have a representative contact you, call +1-800-545-9463 or write to salesinquiry@windriver.com.

Connectivity

- IEEE 1394
- Socket CAN
- USB (host, target, and OTG)

File System

- dosFS (FAT-compatible)
- Highly reliable file system (HRFS) with configurable commit NAND and NOR flash support

Multimedia

- Software and hardware support for OpenVG, OpenGL ES1, and OpenGL ES2
- Image library (JPEG and PNG)
- Input device support (mouse, touch screen, keyboard, and others)
- PCM Audio
- OpenCV

Security

- Secure boot (digitally signed image)
- Secure ELF loader (digitally signed applications)
- Secure storage
 - Encrypted container
 - Full disk encryption
- Kernel hardening
 - Non-executable pages
 - Stack guard pages
 - Optional support for Kernel Page Table Isolation (KPTI)
 - Protection of code and read-only data
- Security events
- Built-in access controls
- Advanced user management
 - Login policies
 - Password policies
 - Support for AD/LDAP (Active Directory/Lightweight Directory Access Protocol)
- Cryptography
 - OpenSSL library (includes SSL and TLS)
 - FIPS 140-2 module

- Arm® TrustZone with OP-TEE support
- TPM 2.0 support
- Network security protocols such as SSL, SSH, IPsec, IKE, GDOI, SCEP, etc.
- Firewall
- GE Digital® Achilles Level II certified for compliance with IEC 62443 part 4-2

Safety Certifiable

- DO-178C DAL A
- IEC 61508 SIL 3
- ISO 26262 ASIL D

DevOps Process

- 99.4% of test areas automated
- 94% of release tests running every night
- 49.6% code coverage during system test (2.5 times above industry average)
- 0 build issues, compile errors, and Coverity warnings (99th percentile + for the software industry)
- All release tests run weekly, providing continuous development (CD) capabilities
- CVE monitoring

Wind River Workbench Development Suite

- Eclipse-based integrated development environment
 - Build system
 - Debugger
 - System analysis tools
- Easy integration with partners' plugins
- Compilers
 - LLVM for Arm® and Intel® architectures
 - GCC for PowerPC™ architecture
- Built-in VxWorks simulator

