WNDRVR

VXWORKS

The World's Leading Real-Time Operating System for the Intelligent Edge

The intelligent edge is rapidly transforming the development of software for highly deterministic, secure, and safe systems. New technologies and modern approaches are taking hold to increase developer productivity while maintaining the rigid requirements of devices and systems that must deliver determinism, high performance, and ultra-reliability.

VxWorks® is the industry's most trusted and widely deployed real-time operating system (RTOS) for mission-critical embedded systems that must be secure and safe. It delivers a proven, real-time, and deterministic runtime combined with a modern approach to development. Regardless of industry or device type, companies building intelligent edge systems rely on the VxWorks pedigree of security, safety, high performance, and reliability.

BENEFITS

Confidently deploy embedded and safety-critical applications on a proven software foundation: VxWorks is the leading real-time operating system for embedded systems at the intelligent edge. For more than 30 years, VxWorks has served as the trusted foundation to power billions of intelligent devices, machines, and systems. From Mars to Planet Earth, from medical infusion pumps and imaging systems to manufacturing robots and other devices at the intelligent edge, software development teams have repeatedly selected VxWorks as the RTOS for innovative solutions.

Increase developer productivity with a modernized RTOS approach: VxWorks leads the industry with support for the latest technologies used in the development of software for embedded systems. Developers can achieve greater efficiency using popular programming languages including C++17, Python, and Rust. VxWorks is also the only RTOS supporting IT-like application deployment with OCI container support. This allows device makers to easily manage and deploy software on VxWorks, leveraging existing cloud infrastructure. Developers also benefit from the continuous feature and performance optimizations being made in VxWorks to support the most advanced processors and SoCs.

Achieve determinism and performance where and when it matters most: VxWorks delivers the hard real-time, determinism, and performance you need, irrespective of specific industry or application. Award winning and certified for more than 600 projects, VxWorks is chosen by companies across the globe to design their software with the assurance that their systems can be certified to meet the most stringent industry safety regulations.

✔ Real-time and deterministic

✔ Broad hardware support

✔ Safe, secure, and certifiable

✔ Container support

✔ AI/ML ready

KEY FEATURES

- **Extensive multi-core and multiprocessing support:** Use hardware to its fullest potential. VxWorks supports 32-bit and 64-bit multi-core processors based on Intel®, Arm®, Power, and RISC-V architectures. Its comprehensive processor support allows OS configurations for asymmetric multiprocessing (AMP), symmetric multiprocessing (SMP) with CPU affinity to address bound multiprocessing (BMP) scenarios, and hardware-optimized multi-core acceleration.

- **OCI containers:** Deploy applications at the speed of IT. Package and deploy all applications using IT-like tools and methods. Push your applications to standard container registries (such as Docker Hub, Amazon ECR, or Harbor) and pull them from your deployed VxWorks-based devices. Use Kubernetes for container orchestration.

- **Security:** Start with a foundation that adapts the security response to the threat. VxWorks integrates an extensive and continuously evolving set of security capabilities that map to the CIA triad. From booting operations to power down, these capabilities allow architects to develop a level of security appropriate for the attack surface and threats unique to their applications and environments.

- **Certifiable:** Meet regulatory requirements for your deployment. VxWorks has an extensive portfolio of safety certification history, including 600+ programs with more than 360 individual customers. Its robust safety features provide advanced time and space partitioning capabilities to enable reliable consolidation of multiple applications with different levels of criticality on a single or multi-core platform. Additionally, conformance to standards such as POSIX® and the FACE™ Technical Standard have been leveraged in the certification of VxWorks to DO-178C, IEC 61508, IEC 62304, and ISO 26262 safety standards.

- **Rich connectivity and communications:** Employ the broad range of communications necessary in a connected world. VxWorks supports IPv4 and IPv6 stacks, Routing Information Protocol (RIP), quality of service (QoS), and more. Additionally, VxWorks enables Time-Sensitive Networking (TSN), guaranteeing real-time communications and packet delivery within a bounded time or latency on a switched Ethernet network. VxWorks supports innovative industrial applications based on OPC Unified Architecture (OPC UA). It also supports SocketCAN, used in automotive applications, and provides host, target, and OTG USB support.

- **Broad board support:** Speed time-to-market by beginning from a solid starting point. Working with our ecosystem of partners, we have optimized VxWorks for the latest advanced processors and SOCs. It also includes the most extensive list of board support packages in the embedded software industry, providing early prototyping, cost savings, and flexibility of choice.

- **Customization and tuning:** Enjoy immense flexibility in customizing your product. Tailor your design to your specific needs with access to full source code, and/or use all the various configuration options to include or exclude predefined components and/or parameters.

- **Virtualization:** Choose from a number of flexible deployment options, from native to cloud. VxWorks is available as a guest operating system for a variety of virtualization environments, including but not limited to Wind River® Helix™ Virtualization Platform, QEMU, VMware, and KVM.

- **Fault-tolerant file system:** Take advantage of integrated fault tolerance. VxWorks comes with a fault-tolerant file system that can be certified.

- **Multimedia:** Benefit from out-of-the-box UI support. VxWorks offers support for many standard graphic libraries, such as OpenGL, OpenGL ES, OpenCV, and Vulkan, as well as libraries that handle JPEG and PNG images.

- **AI/ML:** Digital transformation and creation of added value/service are at your fingertips. Technologies such as pandas, Tensorflow Lite, and others are integrated to easily add AI/ML applications into the device.

- **Python:** Your access is out of the box and fully enabled. VxWorks supports Python, an easy-to-learn programming language that is ideal for quick prototyping, testing, and integrating high-level programs.

- **Feedback loop:** Enjoy digital transformation enablement. VxWorks comes with a variety of communication protocols allowing developers to collect device information and send it to the cloud for mining and analysis.

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COMPLEMENTARY SOLUTIONS FOR EMBEDDED SYSTEMS DESIGN

Wind River Simics

Wind River Simics® simulates systems from the smallest to the most complex, so developers can adopt new development techniques that are not possible with physical hardware. Simics allows teams to move faster and improve quality, easily bringing agile and DevOps software practices to embedded development. For more information, visit www.windriver.com/products/simics.

Wind River Partner Ecosystem

The Wind River partner portfolio includes a large ecosystem of complementary third-party hardware and software solutions. The portfolio helps accelerate time-to-market and differentiate platforms with best-of-breed capabilities, while reducing development costs. Visit our partner ecosystem at www.windriver.com/partners for a full list of our partners and their products.

Wind River Professional Services

The CMMI Level 3–rated Wind River Professional Services organization leverages years of system design and development expertise to work collaboratively with customer design and program teams. Professional Services interprets system requirements; architects platform options; and provides recommendations for meeting business, technical, and program goals. For more information, visit www.windriver.com/services.

Wind River Education Services

Wind River offers instructor-led, on-demand, and mentored learning, including our anytime, anywhere access to online subscription-based e-learning. For more information, visit www.windriver.com/studio/services/education.

Wind River Customer Support

VxWorks is backed by our award-winning global support organization. We offer live help in multiple time zones, the online Wind River Support Network with multifaceted self-help options, and optional premium services to provide developers the fastest possible time-to-resolution. For more information, visit www.windriver.com/support.

HOW TO PURCHASE

Visit www.windriver.com/products/vxworks to purchase up to three seats of VxWorks online (U.S., Canada, Japan, Denmark, Finland, France, Germany, Italy, Spain, Sweden, and UK only). To contact a sales representative, visit www.windriver.com/company/contact, call +1-800-545-9463, or email salesinquiry@windriver.com.

A FAMILY OF PRODUCTS DESIGNED FOR EMBEDDED SYSTEMS

A variety of system architectures require an embedded RTOS or use mixed operating systems. The Wind River family of products covers them all, with versions designed for today's embedded solutions:

- **VxWorks:** The most widely trusted and deployed RTOS for critical infrastructure

- **VxWorks Cert Edition:** VxWorks with safety certification evidence options, to accelerate the certification processes in regulated industries

- **VxWorks 653:** Designed for integrated modular avionics (IMA) solutions requiring safety certification and conformance with ARINC 653, to support consolidation of critical aeronautical applications on a single compute platform

- **Wind River Linux:** The most widely deployed commercial Linux distribution used in embedded designs, meeting the needs of modern DevOps practices for fast prototyping and development

- **Wind River Helix Virtualization Platform:** A heterogeneous platform using virtualization technology to support VxWorks, Wind River Linux, and other guest operating systems integrated into a single environment, providing all the resources needed to design mixed-criticality systems

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