WIND RIVER HELIX VIRTUALIZATION PLATFORM FOR INDUSTRIAL

Wind River® Helix™ Virtualization Platform consolidates multi-OS and mixed-criticality applications onto a single edge compute software platform, simplifying, securing, and futureproofing designs in the industrial market. This safe, secure, and reliable virtualization platform uses a Type 1 hypervisor to deliver digital transformation capabilities to next-generation equipment technology, allowing it to securely run control automation systems, equipment operational applications, and network communications, as well as process data analytics at the edge. By creating and managing virtual machines (VMs), safety partitioning capabilities can separate safety-critical applications from general-purpose applications, allowing easy implementation of new and legacy systems.

FEATURES AND BENEFITS

- **Proven market excellence:** Helix Platform is developed from and includes VxWorks®, the Wind River market-leading RTOS product line with a rich pedigree of single- and multi-core development, proven in more than 2 billion devices worldwide for aviation, energy, industrial, medical, transportation, and other segments.
- **Safety certification and partitioning:** Safety and reliability are of the utmost importance to any equipment or device maker. Helix Platform has been designed to be certified and to simplify the certification of safety-critical applications according to the stringent requirements for IEC 61508 industrial functional safety, as well as aviation and automotive safety standards. In addition, its modular, open architecture employs robust partitioning that allows the safe partitioning of a VM running safety-critical applications from interference from other applications and virtual machines.
- **Support for a mix of unmodified guest operating systems:** The Helix Platform hypervisor is OS-agnostic, providing the ability to run any OS, unmodified, inside a VM. Guest OS support includes the leading embedded RTOS, VxWorks; the leading commercial embedded Linux OS, Wind River Linux (and other Linux distributions); Microsoft® Windows®; Android; and other OSes. This allows legacy systems to be run in separate VMs.
- **Mixed-criticality support:** The Helix Platform multi-core scheduler uses hardware virtualization technology, allowing the platform to enable virtualization of mixed-criticality unmodified guest OSes. This allows your safe and non-safe applications to run in parallel on separate cores, increasing safety, security, and robustness, for example on a train control system or on medical equipment.
- **Embedded real-time applications:** Helix Platform is high performance and deterministic for the most demanding embedded real-time applications. The Type 1 hypervisor virtualization layer provides full control over how the hardware is configured. It allows for high-performance compute cycles and low-overhead I/O access using the hardware virtualization accelerators available in today's processors.
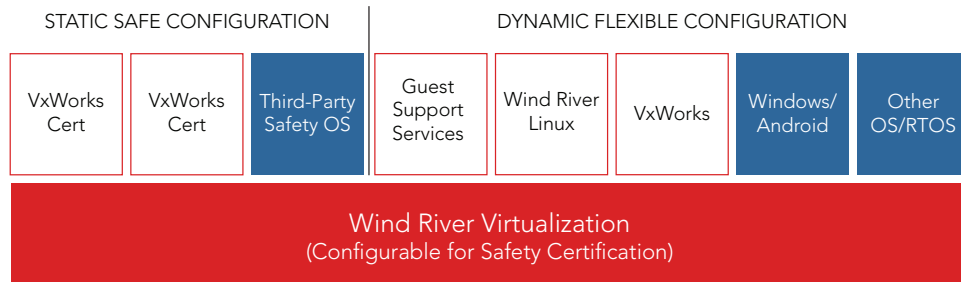
STATIC SAFE CONFIGURATION			DYNAMIC FLEXIBLE CONFIGURATION				
VxWorks Cert	VxWorks Cert	Third-Party Safety OS	Guest Support Services	Wind River Linux	VxWorks	Windows/ Android	Other OS/RTOS

Wind River Virtualization
(Configurable for Safety Certification)

Figure 1. Wind River Helix Virtualization Platform architecture

- **Rapid development environment:** Helix Platform uses standard workflows to configure, build, develop, and debug. It also allows development of products in a heterogeneous virtualization environment that can include safety-critical applications using a configuration model driven by statically defined XML, or applications using the standard configuration model driven by dynamic user inputs. Additional benefits include:
  - Wind River Workbench development suite based on the Eclipse open tool architecture, enabling wide integration of industry toolchains
  - Wind River Simics® support for system simulation and automation
- **Broad range of architectures and CPUs:** Helix Platform provides multi-core hardware support and availability on the latest Arm® and Intel® architectures, and CPUs from Intel, NXP, and Xilinx that enable both 32- and 64-bit guest operating systems.

OPTIMIZED, INTEGRATED DEVELOPMENT SUITE

Wind River Workbench

Helix Platform includes Workbench, which offers best-in-class development and debugging tools, along with cutting-edge system analysis tools for optimizing the Helix Platform environment. A fully integrated Eclipse-based open development suite optimized to support design, development, test, and certification of applications, Workbench consists of a project facility to define application resources and an XML configuration tool to easily define the static configuration required for safety-critical applications.

Helix Platform also enables intellectual property and security separation between the platform supplier, the application supplier, and the system integrator, providing a framework for multiple suppliers to deliver components to a safety-critical platform.

Wind River Simics

Simics enables software to run on virtual platforms just as it does on physical hardware. Along with its capabilities for scripting, debugging, inspection, and fault injection, Simics enables you to define, develop, and integrate your systems without the constraints of physical target hardware. Simics provides the access, automation, and collaboration required to enable agile and continuous development practices.

WIND RIVER PROFESSIONAL SERVICES

Our CMMI Level 3–rated services organization offers a specialized Safety Critical Services Practice that can deliver safety certification evidence for additional software components. Our services team of engineers has extensive experience delivering design, integration, and optimization services tailored to the needs of your industry and is fully equipped to provide professional certification services at any level, including certified board support packages (BSPs), middleware, and application software. 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.

WIND RIVER CUSTOMER SUPPORT

Helix Platform 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 you the fastest possible time-to-resolution. For more information, visit www.windriver.com/support.

HOW TO PURCHASE

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