

# SECURITY PROFILE FOR VXWORKS

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Powering over 1.5 billion embedded devices, VxWorks® is the world's most widely deployed real-time operating system (RTOS). Leading innovators worldwide trust VxWorks for its rock-solid determinism, reliability, multi-core and multi-OS acumen, and its unprecedented ecosystem of complementary third-party hardware and software technologies. VxWorks 7, the revolutionary new release of the RTOS, combines a modular, future-proof architecture with the scalability, security, safety, and connectivity manufacturers of embedded systems need to harness the opportunities created by the Internet of Things (IoT).

The pervasive connectivity of IoT exposes devices to more security risks than ever before, and VxWorks 7 together with Security Profile for VxWorks deliver a comprehensive set of security features to efficiently and effectively protect devices and data at every stage—from boot-up to operation to data transmission to powering down. Security Profile is compatible with VxWorks 7 Core Platform and all industry-specific profiles for VxWorks.

## BENEFITS

- **Best-of-breed security feature set for your customers:** VxWorks 7 with Security Profile for VxWorks provides a comprehensive set of software-based security features so that you can deliver cutting-edge, rock-solid security in your devices.
- **A readily expandable security solution:** Security Profile is a software-based solution that can be enhanced for the needs of security-critical applications with hardware-based security from Wibu-Systems, which has been validated for compatibility and seamless integration by Wind River®.
- **Encryption to protect your intellectual property:** Security Profile supports Advanced Encryption Standard (AES) encryption of binary files to protect your intellectual property from piracy and reverse engineering.
- **The RTOS foundation for today and tomorrow:** The expandable, upgradable architecture of VxWorks 7 separates the core kernel from middleware, applications, and other packages, enabling bug fixes, upgrades, and new feature additions to be accomplished faster. Delivered as RPM packages, the features available as part of Security Profile can be individually upgraded to newer versions without disrupting the OS core or other technologies in an installation.

## KEY FEATURES

Security Profile for VxWorks delivers the capabilities to protect connected devices at every stage.

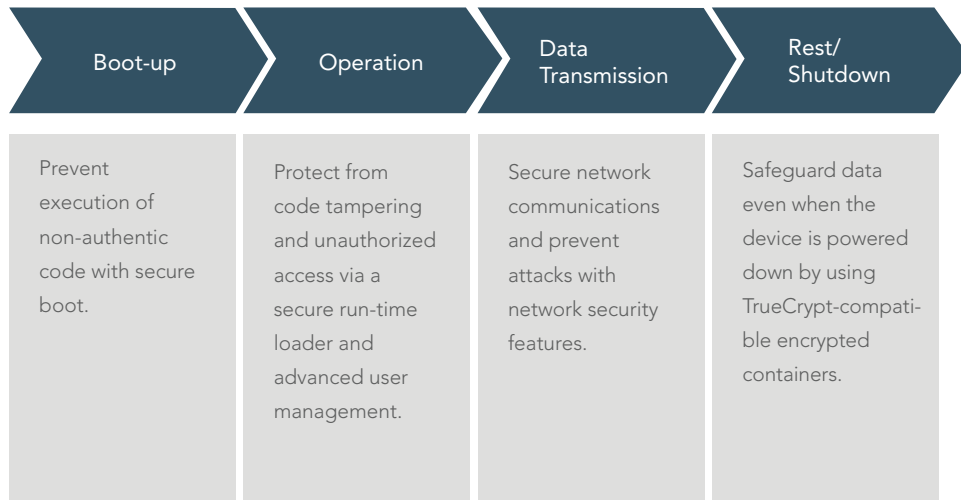


Figure 1: Protect connected devices at every stage with Security Profile for VxWorks

### Secure Boot

It is imperative for security-critical systems to be able to prevent the injection and execution of malicious code by only allowing authenticated (signed) binaries to run. Security Profile for VxWorks verifies binaries at every stage of the boot-up process. If a component fails to pass signature verification, boot will stop.

On supported architectures, the target system can be configured to only allow digitally signed VxWorks images to load. On Intel®-based platforms, for example, Security Profile delivers a secured Unified Extensible Firmware Interface (UEFI)-based VxWorks boot loader to prevent unauthorized VxWorks images from being loaded.

### Secure Run-Time Loader

Preventing unauthorized execution and other forms of tampering with your code is a critical component for securing devices in operation. Wind River has partnered with Wibu-Systems to deliver a solution that can decrypt (AES) and verify digital signatures (ECC) of downloadable kernel modules and real-time processes (RTPs). This solution effectively protects the integrity of the system and safeguards your intellectual property from piracy and code from reverse engineering. Wind River Workbench or command line can be used to digitally sign the VxWorks image, applications (LKMs, DKMs, and RTPs), and shared libraries to generate trusted binaries.

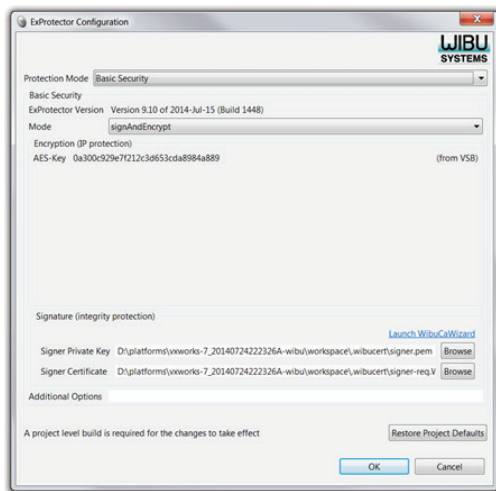
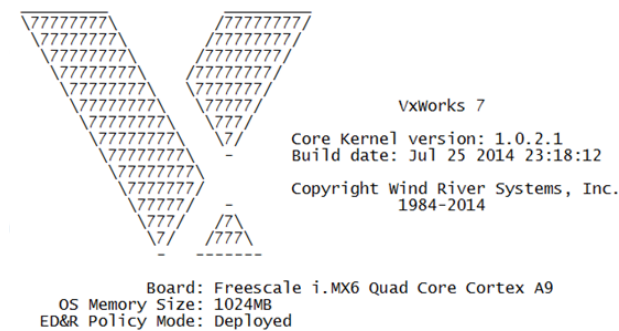


Figure 2: AES encryption and signature configuration

Security Profile and its secure run-time loader are a software-only solution for applications with a low-to-medium level of security criticality. For security-critical applications, Security Profile can be enhanced and seamlessly integrated with Wibu-Systems' CodeMeter® hardware-based solution that has been tested and validated for interoperability.

### Advanced User Management

User management features protect devices from unauthorized access and enable the definition and enforcement of user-based policies and permissions. In addition to basic user management included in VxWorks 7 Core Platform, Security Profile provides a centralized, unified system that allows you to assign privileges and manage users at run-time, implementing restrictions and controlling access to the device based on user credentials.



VxWorks login:

Figure 3: Access to the target can be protected with a login and a password

### **Network Security**

Security Profile incorporates the latest version of Wind River SSL, the Secure Sockets Layer protocol to enable state-of-the-art encryption; as well as Wind River SSH, an implementation of the Secure Shell protocol; Wind River Cryptography Libraries; and Wind River IPsec and IKE, the Wind River implementation of Internet Protocol Security and Internet Key Exchange; to effectively secure network communications.

### **Encrypted Containers**

To safeguard data when the device is powered down, Security Profile includes support for TrueCrypt-compatible AES-encrypted file containers. Passkeys to the containers can be protected using customizable functions for maximum flexibility. Data in containers remain encrypted even when the device is idle or powered off.

### **WIND RIVER PROFESSIONAL SERVICES**

A CMMI Level 3–certified organization, Wind River Professional Services offers 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. For more information, visit [www.windriver.com/services](http://www.windriver.com/services).

### **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 you the fastest possible time-to-resolution. We are proud to have achieved Service Capability and Performance certification, recognized as the gold standard for delivering world-class customer support. For more information, visit [www.windriver.com/support](http://www.windriver.com/support).

