

VxWorks MILS Platform 2.x Fundamentals

Wind River Education Services enables you to unleash the power of Wind River's technology. Our training and mentoring empowers developers with the knowledge and proficiency required to program and manage device software faster and more reliably. Reduce your project risks and shorten your development timelines by equipping your engineers with the right training by our experts.

Course Description

The VxWorks MILS Platform 2.x Fundamentals training workshop provides engineers with a fast, cost-effective way to learn to deliver the security foundation that meets real-time operating system (RTOS) requirements for High Robustness (EAL6+) multilevel secure (MLS) systems.

After this course, participants will be able to do the following:

- Describe the Common Criteria, Multiple Independent Levels of Security (MILS) architecture, and high assurance security principles.
- Explain how Wind River VxWorks MILS Platform 2.x and high assurance security standards form the basis of a security-certified partitioned system, including networking support, XML configuration, and debugging.
- Accelerate the configuration, development, and deployment of MILS systems using the built-in XML development tools and Wind River Workbench.
- Configure, debug, build, and test secure MILS applications with VxWorks MILS Platform 2.x.

Products Supported

- Wind River VxWorks MILS Platform 2.1

Who Should Attend

- Application developers utilizing the MILS architecture to create secure applications
- Those who will develop applications using the VxWorks MILS kernel

Prerequisite Skills

- User-level familiarity with the host operating system on which the Wind River VxWorks MILS Platform 2.x will be installed
- One year C or C++ programming
- Basic understanding of operating systems and debugging techniques

Prerequisite Courses

- Real-Time Programming for Embedded Systems
- VxWorks 6.x and Workbench Fundamentals

Course Title:	VxWorks MILS Platform 2.x Fundamentals
Duration:	Four days
Format:	Instructor-led lectures and hands-on lab sessions; instructor-led Live Remote delivery available
Price:	Contact your local sales representative

Related Courses

- Workbench On-Chip Debugging Fundamentals for VxWorks and Linux

Course Format

- This four-day instructor-led course consists of lectures and lab sessions.
- Students receive personal guidance from expert Wind River instructors.
- Students use Wind River VxWorks MILS Platform 2.1, VxWorks MILS Debug Agent, and Wind River's on-chip debugger to gain experience with the topics presented.
- Lab sessions allow hands-on application of course concepts.

Global Reach of Wind River Education Services

With more than 20 years of device software experience, we provide education services in every region of the world. You can rely on our expertise—acquired by delivering hundreds of classes each year to thousands of students—to provide a highly effective learning experience, wherever your developers are located.

Private Classes

Private classes are conducted at your location, scheduled for your convenience. Private classes include the use of a preconfigured laboratory environment that may consist of a connection to a remote lab environment or equipment that we bring to your facility. Private classes can be tailored to your specific needs by adding or removing topics from multiple courses, maximizing the benefit of your time in class.

Mentoring

Our Rapid Integration and Mentoring programs provide coaching from a seasoned expert who can increase your team's productivity and reduce your project's risk. An experienced engineering specialist will review your specific goals, project environment, and challenges and address productivity obstacles. Whether you need assistance with product installation and configuration, advice on development workflow, debug assistance, or optimization best practices, mentoring can shorten your trial-and-error cycle, document recommended procedures, and ensure your developers are using tools and technology efficiently.

Syllabus

Day 1

Introduction to MILS

- Security Overview
- Common Criteria Overview
- Protection Profiles
- Separation Kernel Protection Profile (SKPP)
- MILS and Evaluation Process Overview
- Validation Oversight Review
- Role-Based Development

Getting Started

- Wind River VxWorks MILS Platform Overview
- Mapping of VxWorks MILS to SKPP
- Guest Operating Systems
- Debug Tools
 - On-Chip Debugging
 - VxWorks MILS Debug Agent
- Directory Structure
- Documentation and Support
- Hands-on: Getting Started

Day 2

System Architecture

- MILS Kernel
 - Scheduling and Initialization Function
 - Configuration Data, Vector Sets
 - VxWorks MILS "Separation Kernel"
 - Secure Inter-partition Communication
 - Shared Memory
- Virtual Boards
 - Guest Operating Systems
 - VxWorks MILS VxWorks Guest OS
 - General Network Stack
 - High Assurance Environment
 - Linux Guest OS
 - Device Drivers
- Two-Level Scheduling
- Trusted Delivery and Certification Evidence
- Hands-on: System Concepts

Payloads and Booting Virtual Boards

- Payloads Overview
- milsKernel.elf
- Boot Process
- VB Booter

Configuring and Building MILS Applications

- Configuration and Build Partitioning Overview
- Configuration and Build Features and Process
- XML Introduction and Tools
- XML Configuration Files
 - Schemas
 - MILS System Parameters
 - Application Parameters
- Build Process
- Hands-on: Configuration and Build

Day 3

Wind River Workbench and Application Debugging

- Wind River Workbench
- Workbench Source Analysis
- Workbench Editor Features
- Debugging
 - VxWorks MILS Debug Agent
 - On-Chip Debugging
- Target Connections
- Kernel Objects Viewer
- Source-Level Debugger
- Other Debug Aids
 - AMIO: Application Multiplexed I/O
- Hands-on: Debugging
- Hands-on: On-Chip Debugging

Day 4

System API

- API Overview
- VxWorks Guest OS API
- High Assurance Environment API

Wind River MILS Network Stacks

- Overview
- VxWorks MILS General Network Stack
- VxWorks MILS High Assurance Network Stack
- Hands-on: Configuring and Building a High Assurance Network Stack

Debugging Linux Guest OS Applications

- Overview
- Integrating Linux Guest OS into a VxWorks MILS System
- Application Debugging with usermode-agent
- Hands-on: Integrating a Linux Guest OS
- Hands-on: Debugging Linux VB with usermode-agent

Use Case

- Networking Through a Guard
 - Information Flow Control—SIPC
 - Security Policy Definition
 - Data and Fault Isolation
 - Time Partitioning
 - Understanding of Layered Assurance Principles
 - Hands-on: Use Case

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