



EDUCATION SERVICES

# VXWORKS 653 3.X MULTI-CORE EDITION ESSENTIALS

## COURSE DESCRIPTION

The VxWorks® 653 3.x Multi-core Edition Essentials course provides engineers with a fast, cost-effective way to acquire the skills necessary to develop safety-critical applications with VxWorks 653 3.x Multi-core Edition.

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

- Take a requirement specification to a working application
- Develop, test, and debug safety-critical applications with the VxWorks 653 real-time operating system (RTOS)
- Accelerate the development and configuration of ARINC 653 safety-critical systems
- Use VxWorks 653-specific Wind River Workbench facilities to configure VxWorks 653 applications
- Build applications within partitions, and use ARINC ports for I/O from partitions
- Use core tools efficiently: debugger, Wind River System Viewer, monitoring, file systems, network stacks

## PRODUCTS SUPPORTED

- VxWorks 653 3.x Multi-core Edition (version 3.0.1)
- VxWorks 653 3.x Multi-core Edition (version 3.1.1)

## COURSE FORMAT

- This four-day expert-led course consists of lectures and lab sessions.
- Attendees use VxWorks 653 3.x Multi-core Edition to gain experience with the topics presented.
- Participants examine and exercise simulated network topologies in hands-on labs.
- Participants receive individual guidance from an expert engineer who has extensive experience with Wind River technologies.

## PREREQUISITE COURSES

- None

Course title:	<b>VxWorks 653 3.x Multi-core Edition Essentials</b>
Duration:	Four days
Format:	Instructor-led lectures and hands-on lab sessions; instructor-led Live Remote delivery available
Content:	<b>Day 1:</b> Getting Started with VxWorks 653 Multi-core Edition; Partitions; Processes; Intra-partition Communication <b>Day 2:</b> Inter-partition Communication; Health and Error Management; System Architecture; Shared Data Regions <b>Day 3:</b> Multi-core Systems; Advanced System Creation; DO-178B Network Stack; VxWorks 653 Source Level Debugging <b>Day 4:</b> VxWorks 653 System Viewer; VxWorks 653 Monitoring Tools; Deploying a VxWorks 653 System; VxWorks 653 Certification

## AUDIENCE

- Application developers creating standards-based safety-critical applications
- Developers who primarily use C and need to develop partition-based applications using the features of the VxWorks 653 RTOS

## PREREQUISITE SKILLS

- One year of C or C++ programming experience

## RELATED COURSES

- VxWorks 653 Platform 2.x Porting and Advanced Topics

## SYLLABUS

### Day 1

#### GETTING STARTED WITH VXWORKS 653 MULTI-CORE EDITION

- ARINC 653 overview
- The specification
- System overview
- Creating a system
- Booting and connecting host and target
- XML editors
- Hands-on lab
- Key references
- **LAB: Getting Started with VxWorks 653 Multi-core Edition**

#### PARTITIONS

- Partitions introduction
- Essentials
- Key references

#### PROCESS

- Time in ARINC 653
- Introduction to processes
- Essentials
- Hands-on lab
- Key references
- **LAB: Scheduling VxWorks 653 Processes**

#### INTRA-PARTITION COMMUNICATION

- Intra-partition communication introduction
- Essentials
- Hands-on lab
- Key references
- **LAB: Communication Within a Partition**

### Day 2

#### INTER-PARTITION COMMUNICATION

- Inter-partition communication introduction
- Essentials
- Hands-on lab
- Key references
- **LAB: Communicating Between Partitions**

#### HEALTH AND ERROR MANAGEMENT

- Introduction to health monitoring
- Process-level error handling
- Partition and module-level error handling
- Hands-on lab
- Key references
- **LAB: Monitoring the Health of Processes**

#### SYSTEM ARCHITECTURE

- Overview
- Concept review
- Partition space
- Kernel space
- Key references

#### SHARED DATA REGIONS

- Overview
- Configuration and access
- Key references

#### MULTI-CORE SYSTEMS

- Introduction to multi-core
- VxWorks 653 multi-core support
- XML configuration
- Hands-on lab
- Key references
- **LAB: Creating a Multi-core VxWorks 653 System**

### Day 3

#### ADVANCED SYSTEM CREATION

- Project structure
- Adding partitions
- Hands-on lab
- Key references
- **LAB: Creating an Advanced VxWorks 653 System**

#### DO-178B NETWORK STACK

- Introduction
- Configuration
- Key references
- **LAB: Creating a VxWorks 653 System with Network Stack and I/O Partition**

## VXWORKS 653 SOURCE LEVEL DEBUGGING

- Source code debugger overview
- Adding debug agent
- Debugging details
- Hands-on lab
- Key references
- **LAB: Debugging VxWorks 653**

## VXWORKS 653 SYSTEM VIEWER

- Introduction
- Configuring System Viewer
- Using System Viewer
- Hands-on lab
- Key references
- **LAB: Using VxWorks 653 System Viewer**

## Day 4

## VXWORKS 653 MONITORING TOOLS

- Memory usage monitoring
- Performance monitoring
- Port monitoring
- Hands-on lab
- Key references
- **LAB: Using VxWorks 653 Monitoring tools**

## DEPLOYING A VXWORKS 653 SYSTEM

- Cert subset
- Debugging a deployed system
- Payloads
- Independent build, link, and load
- Key references

## VXWORKS 653 CERTIFICATION

- Introduction to DO-178
- Background and definitions
- DO-178 and software safety
- DO-178 processes and objectives
- Software verification
- VxWorks 653 considerations

## OPTIONAL APPENDICES

- Embedded RTOS overview
- Miscellaneous certification elements
- XML primer

## GLOBAL REACH OF WIND RIVER EDUCATION SERVICES

With more than 30 years of device software experience, Wind River provides education services in every region of the world. Our private classes can be tailored to your needs by adding or removing topics from multiple courses. If you have more specific project challenges, Wind River Mentoring provides coaching by experienced engineers to help you integrate Wind River solutions into your environment. And when you're too busy to attend a whole class, our On-Demand Learning options provide around-the-clock access to advanced and specialized topics. All of our education services are led by expert engineers who are closely connected to the Wind River technical community for access to specific expertise.

## CONTACT US

For more information about Wind River Education Services, visit [www.windriver.com/education/](http://www.windriver.com/education/).

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