Tornado 2 Device Drivers

Wind River Education Services enables clients to unleash the power of Wind River’s tools by creating developers skilled in Wind River technology. We provide the knowledge you need to meet your commitments and exceed your company’s expectations. With Wind River Education Services, you will develop, run, and manage your application software faster, better, at lower cost, and more reliably.

Course Description
The Tornado 2 Device Drivers course provides engineers with a fast, cost-effective way to acquire the knowledge necessary to develop device drivers with Tornado.

After this workshop, students will be able to do the following:

• Develop a new device driver from scratch
• Use coding conventions for ease of debugging and driver portability
• Understand cache coherency issues
• Write VxWorks I/O drivers, serial drivers, block drivers, and END/NPT drivers

Who Should Attend
• Developers who work with Tornado and VxWorks
• Developers new to device driver writing
• Experienced developers interested in the interfaces between drivers and VxWorks
• Developers working on current driver projects

Prerequisite Skills
• One year C programming, including experience with structures, pointers, pointers to structures, typedefs, macros, and bitwise operators
• Experience using VxWorks binary and mutual exclusion semaphores, message queues, and pipes, and managing multiple tasks
• Functional knowledge of UNIX or Windows NT
• Functional knowledge of vi or Emacs (UNIX)

Prerequisite Courses
• Real-Time Programming for Embedded Systems
• Tornado 2.2/VxWorks 5.5

Course Title: Tornado 2 Device Drivers
Duration: Four days
Format: Instructor-led lectures and hands-on lab sessions
Price: Contact your local sales representative

Related Courses
• Tornado 2 Board Support Package
• VME for Advanced Tornado Users
• Tornado 2.2 with Platform Components

Global Reach of Wind River Education Services
• 4,000 students per year
• 400 classes delivered per year
• 36 instructors worldwide
• Access to 200 subject-matter experts
• 24 training centers worldwide
• More than 20 years of device software experience

Onsite courses are conducted at your location and include the use of preconfigured laptops and target boards, plus shipping and travel costs. Visit education.windriver.com for registration and schedule information.

Topics
• Devices and Bus Operations
• Cache Coherency Issues
• Methods of Device Driver Design: Access Macro Usage
• Object-Oriented Design
• Error Handling
• Polling and Managing Interrupt-Driven Devices
• VxWorks I/O System Internals
• Writing a Device Driver with a Standard Character Interface
• Writing Serial Drivers That Support VxWorks I/O System and Target Agent
• Writing a Device Driver with a Standard Block Interface (Using VxWorks I/O Interface)
• Writing Enhanced Network Drivers
Agenda

Day 1

Introduction
- Overview
- Driver Support
- Driver Considerations
- Sample Drivers Bridges and Caches
- Device Access
- VME Bus; PCI Bus
- Cache Issues
- Labs Introduction Lab
- Getting Started Lab

Day 2

Interrupts and Polling
- Overview
- Interrupt Handling
- Polling
- Design Considerations Driver Coding Conventions
- Wind River Coding Conventions
- Access Macros
- Debugging; Control Structures
- Debugging and Documentation; Sample Driver
- Using SMC2 as an I/O Device Lab
- Polling Lab
- Interrupt Lab
- Debugging Lab

Day 3

VxWorks Standard I/O
- Introduction
- Standard I/O
- Support Routines
- Supporting Select ()
- Sample Driver Serial Drivers
- ttyDrv
- Driver Routines
- Initialization
- Supporting the Workbench Debugger Agent
- Serial Driver (Advanced)
- Ring Buffer Character Driver Lab
- Character Driver Lab
- Serial Driver Lab
- Advanced Serial Driver Lab

Day 4

Other Drivers
- Block Devices
- SCSI Devices
- Other Devices Writing Enhanced Network Drivers
- The MUX
- Driver Structures
- Driver Initialization
- Memory
- Data Flow
- Supporting Other Functions
- Block Driver Lab
- Enhanced Network Driver Lab
- Enhanced Network Driver Lab (Advanced)

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Wind River is the global leader in Device Software Optimization (DSO). We enable companies to develop, run, and manage device software faster, better, at lower cost, and more reliably. www.windriver.com

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