WIND RIVER LINUX 7.X AND INTEL IOT GATEWAY

COURSE DESCRIPTION
The Wind River® Linux and Intel® IoT Gateway course provides engineers and system designers with a fast, cost-effective way to learn to use Wind River Intelligent Device Platform XT as part of Intel IoT Gateway to build high-performance products that are secure, manageable, support various connectivity options, and have a controlled run-time environment.

After this course, participants will be able to perform the following:
• Configure, build, and validate a Wind River Linux kernel and file system
• Use layers and templates effectively
• Install and build run-time and kernel packages
• Design, develop, debug, build, and test applications in a target-host development environment with Linux
• Fully utilize the capabilities of target hardware to increase the security, manageability, and connectivity of applications software
• Configure, build, and deploy various Intelligent Device Platform XT software collections in a secure manner
• Create and deploy Intelligent Device Platform XT compatible software applications
• Securely store and manage data in the cloud

PRODUCTS SUPPORTED
• Intel IoT Gateway
• Wind River Helix™ Device Cloud 1.2
• Wind River Linux 7

HARDWARE SUPPORTED
• Intel Quark™ SoC X1000 (codenamed Cross Hill)
• Intel Galileo Gen 1 and Gen 2
• Intel Atom™–based boards
• QEMU-KVM simulated target

COURSE FORMAT
• This four-day, expert-led course consists of lectures and lab sessions.
• Students receive personal guidance from expert Wind River instructors.

Course title: Wind River Linux and Intel IoT Gateway
Duration: Four days
Format: Instructor-led lectures and hands-on lab sessions; instructor-led Live Remote delivery available
Content:
Day 1: Introduction to Wind River Linux; Application Development
Day 2: Software Management; Layers and Templates
Day 3: Introduction to Intelligent Device Platform XT; Intelligent Device Platform XT Architecture; Introduction to IoT Security; Verified and Secure Boot; Linux Grsecurity; Secure Remote Management Basics
Day 4: Integrity Measurement; Managing Intelligent Device Platform XT Targets Remotely; Connectivity; Intelligent Device Platform XT Application Stacks; Wind River Helix Device Cloud

AUDIENCE
• Developers involved in IoT on Intel general purpose processors
• System architects and system integrators involved with the design of devices that are part of IoT

PREREQUISITE SKILLS
• Intermediate knowledge of Linux platforms
• C or Java programming skills

PREREQUISITE COURSES
• Introduction to Linux
RELATED COURSES
• Wind River Linux User Space Programming
• Wind River Linux Device Drivers
• Wind River Linux BSP Development

SYLLABUS

Day 1
INTRODUCTION TO WIND RIVER LINUX
• Overview
• Wind River Linux platform
• Creating a build environment
• Build environment structure
• Building target images
• Optimizing builds
• LAB: Getting Started with the Wind River Linux Lab Environment
• LAB: Managing a Build Environment in Workbench
• LAB: Managing a Build Environment from the Command Line

APPLICATION DEVELOPMENT
• Application development workflow
• Migrating applications to a build environment
• Application debugging
• LAB: Building Applications from the Command Line
• LAB: Building Applications in Workbench
• LAB: Debugging Applications in Workbench
• LAB: Debugging a Program Crash in Workbench

Day 2
SOFTWARE MANAGEMENT
• Overview
• Build lifecycle
• Managing packages
• Integrating new software
• Recipes
• LAB: Managing Packages
• LAB: Patching Packages
• LAB: Writing a Recipe
• LAB: Integrating New Applications

Day 3
INTRODUCTION TO INTELLIGENT DEVICE PLATFORM XT
• What is Intelligent Device Platform XT?
• Why use Intelligent Device Platform XT?
• How does Intelligent Device Platform XT work with other products?
• Intelligent Device Platform XT workflow

INTELLIGENT DEVICE PLATFORM XT ARCHITECTURE
• Architecture
• Secure remote management (SRM) components
• Device management
• LAB: Getting Started with Intelligent Device Platform XT

INTRODUCTION TO IOT SECURITY
• Device security
• Cloud security
• Device to cloud security
• Cloud API security
• Security development cycle

VERIFIED AND SECURE BOOT
• Secure boot
• GRUB boot loader
• SPI flash
• Verified boot
• SRM signing tool

LINUX GRSECURITY
• Grsecurity
• PAX and ASLR
• ACL/RBAC
• Grsecurity tools
• LAB: Using Grsecurity
SECURE REMOTE MANAGEMENT BASICS
• Public-key cryptography
• Intelligent Device Platform XT personas
• Key management
• Trusted Software Stack
• SRM features using Trusted Platform Module
• LAB: Generating Keys for Intelligent Device Platform XT

Day 4
INTEGRITY MEASUREMENT
• What is integrity measurement?
• Role of IM tools
• Application integrity measurement (AIM)
• Maintaining integrity measurement
• Embedded Control
• LAB: Using the Tamper-proof File System
• LAB: Deploying Signed RPMs
• LAB: Using McAfee Embedded Control
• LAB: Configuring Encrypted Storage

MANAGING INTELLIGENT DEVICE PLATFORM XT TARGETS REMOTELY
• Wind River Helix Device Cloud
• TR-069
• OMA DM
• LuCI
• LAB: Exploring LuCI
• LAB: Configuring LuCI

CONNECTIVITY
• Hardware connectivity options
• Software connectivity options
• Multi-WAN

INTELLIGENT DEVICE PLATFORM XT APPLICATION STACKS
• OpenJDK
• Lua/MQTT
• Python
• SQLite
• OSGi
• LAB: Working with Lua-MQTT Software
• LAB: Using OpenJDK
• LAB: Integrating Python Applications
• LAB: Integrating SQLite3 Applications

WIND RIVER HELIX DEVICE CLOUD
• LAB: Configuring the Device Cloud Agent

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.

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Wind River is a world leader in embedded software for intelligent connected systems. The company has been pioneering computing inside embedded devices since 1981, and its technology is found in nearly 2 billion products. To learn more, visit Wind River at www.windriver.com.

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