

LINUX CONTAINERS AND VIRTUALIZATION

COURSE DESCRIPTION

The Linux Containers and Virtualization course provides engineers with a fast, cost-effective way to become familiar with, and deploy, Linux virtualization solutions based on containers or virtual machines.

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

- Understand technologies present in the Linux virtualization field and their internals
- Configure, build, and optimize an OpenEmbedded/Yocto Project/Wind River[®] Linux based host system that can accommodate virtualized guests
- Design, implement, and deploy various Linux containers or virtual machines with guest systems

PRODUCTS SUPPORTED

- OpenEmbedded/Yocto Project based distributions
- Wind River Linux LTS

COURSE FORMAT

- This three-day expert-led course consists of lectures and handson lab sessions.
- Attendees use several virtualization technologies (containers, virtual machines) to gain experience with the topics presented.
- Participants examine and exercise emulated or real hardware targets in hands-on labs.
- Participants receive individual guidance from an expert engineer who has extensive experience with Linux virtualization technologies.

AUDIENCE

- Developers responsible for evaluation of Linux virtualization technologies
- Developers responsible for design, implementation, and deployment of Linux virtualization projects

PREREQUISITE SKILLS

- Functional knowledge of Linux
- Basic understanding of operating systems and debugging techniques

Сс	ourse title:	Linux Containers and Virtualization
Du	iration:	Three days
Fo	rmat:	Instructor-led lectures and hands-on lab sessions; instructor-led Live Remote delivery available
Fo	rmat:	Day 1: Introduction to Virtualization; Hardware Virtualization; QEMU and KVM; Linux Containers (LXC); Yocto Project Virtualization; OverC; Docker; Open Container Initiative
		Day 2: Runtime Environments; Real-Time Considerations; Storage
		Day 3: Network Virtualization; Security; Orchestration and Monitoring; RESTful APIs Orchestration and Monitoring;

PREREQUISITE COURSES

• None

RELATED COURSES

• None

SYLLABUS

Day 1

INTRODUCTION TO VIRTUALIZATION

RESTful APIs

- What is virtualization?
- Virtual machines
- Containers
- Implementation and deployment
- LAB: Configuring and Building a Virtualized System

HARDWARE VIRTUALIZATION

- Overview
- CPU
- Memory
- Networking

QEMU AND KVM

- Overview
- Usage
- Networking
- Debugging

LINUX CONTAINERS (LXC)

- Linux containers overview
- Namespaces
- Cgroups
- Linux containers configuration and workflow
- LAB: Working with Linux Containers
- LAB: Networking with Linux Containers
- LAB: Working with the Linux Containers Web Panel

YOCTO PROJECT VIRTUALIZATION

- Yocto Project overview
- Meta-virtualization layer

OVERC

- OverC overview
- OverC architecture
- OverC commands
- OverC workflows
- LAB: Working with OverC Containers

DOCKER

- Docker overview
- Working with Docker
- LAB: Working with Docker Containers
- LAB: Networking Docker Containers
- LAB: Creating Docker Images

OPEN CONTAINER INITIATIVE

- Open Container Initiative overview
- Open Container Initiative runtime specification

- Open Container Initiative image format specification
- Open Container Initiative image distribution specification

Day 2

RUNTIME ENVIRONMENTS

- Kvmtool
- Libvirt and Virsh
- Runv and Kata containers
- Runc
- Containerd
- Container runtime interface

REAL-TIME CONSIDERATIONS

- Planning a hypervisor
- Benchmarking virtualization platforms
- Debugging virtualization platforms
- Tuning virtualization platforms

STORAGE

- OpenStack storage
- QEMU KVM storage

Day 3

NETWORK VIRTUALIZATION

- Network virtualization essentials
- QEMU networking
- LXC networking

SECURITY

- Container security overview
- Container security mechanisms

ORCHESTRATION AND MONITORING

- Introduction to container orchestration
- Container orchestrator examples
- Container orchestration within OpenStack
- LAB: Working with the Docker Swarm Orchestrator

RESTFUL APIS

- Introduction to REST API calls
- Using RESTful APIs with containers

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For more information about Wind River Education Services, visit www.windriver.com/education.

Wind River World Headquarters

500 Wind River Way Alameda, CA 94501 USA Toll-free: 800-545-9463 Tel.: 510-748-4100 Fax: 510-749-2454

training@windriver.com

Wind River EMEA

Steinheilstrasse 10 85737 Ismaning Germany Tel.: +49 89 962 445 0 Fax: +49 89 962 445 999

emea-training@windriver.com



Wind River is a global leader in delivering software for the intelligent edge. Its comprehensive portfolio is supported by world-class professional services and support and a broad partner ecosystem. Wind River is accelerating digital transformation of critical infrastructure systems that demand the highest levels of safety, security, and reliability.

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