Training: The Linux Foundation
LFD460 Embedded Linux Development with Yocto Project

THE LINUX FOUNDATION AUTHORIZED TRAINING PARTNER

TRAINING GOALS:

This 4 days course will teach you how to take advantage of the Yocto Project – the open source collaboration effort that provides templates, tools and methods to help you create and maintain custom Linux-based systems for embedded products regardless of the specific hardware architecture.

You will learn about more advanced tools like toaster, devtool, wic, eSDK, and eclipse IDE integration. This course builds on the Embedded Linux topics learned in the LFD450 class.

During this course you'll learn:

- How to use the Poky and Bitbake build process, with its recipes and layers to customize Linux kernel and packages for a custom embedded application
- How to build Linux on an embedded board
- How to use emulators for verification
- How to create board support packages (BSP) for target hardware
- And more.

The information in this course will work with any major Linux distribution.

CONSPECT:

- Introduction
  - Objectives
  - Goals
  - Audience
  - Who You Are
  - The Linux Foundation
  - Linux Foundation Training
  - Linux Distributions
  - Platforms
  - Preparing Your System
  - Using and Downloading a Virtual Machine
  - Things change in Linux

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    - Documentation and Links
    - Course Registration
- Preliminaries
    - Linux Distributions
    - Procedures
    - Labs
- How to Work in OSS Projects **
    - Overview on How to Contribute Properly
    - Study and Understand the Project DNA
    - Figure Out What Itch You Want to Scratch
    - Identify Maintainers and Their Work Flows and Methods
    - Get Early Input and Work in the Open
    - Contribute Incremental Bits, Not Large Code Dumps
    - Leave Your Ego at the Door: Don’t Be Thin-Skinned
    - Be Patient, Develop Long Term Relationships, Be Helpful
- The Yocto Project and OpenEmbedded
    - What is the Yocto Project?
    - What is OpenEmbedded?
    - The Yocto Project Family
    - Yocto Project Terms
    - Resources
    - Summary/Slides
- Poky and bitbake
    - Poky and BitBake Concepts
    - Yocto/OE Architecture
    - The BitBake Build Engine
    - Summary/Slides
    - Labs
- Setting up the Yocto Project Build System
    - Labs
    - The Yocto Project Reference System Structure
- Building an x86 Emulation Image
    - Labs
    - Build Environment Structure
- Troubleshooting Build Failures
    - Debugging Build Failures

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- Basic Target Development Board Setup
  - Objectives of the Lab
  - Labs
- Booting the Target Development Board from uSD
  - Objectives of the Lab
  - Labs
- Booting a Target Development Board over Ethernet
  - Objectives of the Lab
  - Labs
- Board Support Packages
  - Concepts of Yocto Project BSPs
  - Labs
- Building a Yocto Project BSP
  - Building a Yocto Project BSP
  - Creating a BSP Layer with the yocto-bsp Script
  - Labs
- Customizing Images
  - Extending a Pre-defined Image
  - Inheriting from Core-Image
  - Package Groups
  - Using Image Features
  - Labs
- Toaster
  - What is Toaster?
  - Dependencies and Set Up of Toaster
  - Running Toaster (local)
  - Remote or hosted Setup
  - Labs
- Adding Packages
  - Recipe Conventions and Best Practices
  - Single C-File Package
  - Makefile-based Package
  - Autotooled Package
  - Labs
- Layers
  - Why Layers?

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- Working with Layers
- Labs

- Kernel Recipes
  - Yocto Kernel Recipes
  - Configuring the Yocto Project Kernel
  - Building a Custom Kernel
  - Extending the Yocto Project Kernel
  - Labs
- Development Tools
  - devtool
  - wic
- Software Development Toolkit(s)
  - SDK and eSDK Basics
  - Labs
- SDKs and Eclipse integration
  - Eclipse IDE Integration
  - Labs
- Licensing and Compliance
  - License Management with Yocto
  - License Tracking
  - Enabling Commercially Licensed Recipes
  - Labs

REQUIREMENTS:

This course is primarily intended for **experienced embedded Linux engineers who are interested in learning how to repeatably build an embedded Linux system. This course assumes you have basic knowledge of Embedded Linux systems such as building and install boot loaders, kernels and user space software (the kinds of things you learn in LFD450: Embedded Linux Development). You should also be familiar with building code from the command line,** basic Linux utilities and text editors. Some experience with Python is helpful but not required.

Difficulty level



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CERTIFICATE:

The participants will obtain certificates signed by The Linux Foundation.

TRAINER:

Certified The Linux Foundation Trainer.

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