



Embedded Linux Training

Overview :

This 5 days training is intended for developers who want to develop for or build an Embedded Linux system from scratch or from commercial Embedded Linux solutions.

The training covers the various components of an embedded Linux target, the development choices and the different debugging possibilities. A detailed look is also taken at the Linux kernel architecture and important issues such as cross compilation and building of the main components. The training finishes with specific subjects to the choice of the participants (Real Time Linux, Qt development, etc.).

During this training all participants get the opportunity to build and experiment with a multifunctional small footprint embedded target with a serial port and a network interface, which can be kept after the training.

Knowledge prerequisites :

IT Background and general Linux skills. Linux Power User or similar experience, Linux System Administration or similar practical experience (knowledge of things like kernel compilation and filesystem internals are prerequisites), C/C++ Programming experience.

Method :

Course/Workshop, classical educations with practical exercises.

Course Flow :

Day 1 & 2:

Welcome and Walkthrough

In-depth look at the system architecture

- Kernel
- File systems
- Processes
- Networking
- More on Bash
- Text Editor and Linux command line utilities

Development

Development tools

- GNU make, gas, gcc, ld, gdb
- Linux bootup process
- Compiler options
- Remote debugging
- Options, built-ins and defaults
- Build hierarchy - structure, scripts and makefiles

- Setting up the cross compiler environment toolchain
- Busybox, buildroot, openembedded/angstrom, Itib

Day 3:

Advanced Development

Kernel architecture

- Processes and the scheduler
- Interrupts
- Memory management
- Modules, kernel
- char, block, network
- How to optimize the kernel for latency
- How to optimize boot time
- Realtime Linux

Day 4 & 5:

Embedded Development

Host / Target relationship

- Cross compilation
- Compiler preparation (exercise)
- Linker preparation - ldscript, crt0
- Building an embedded kernel
- Building the root file system
- Most important components
- Booting – u-boot, redboot, grub, lilo, others
- A running system
- Upgrading your target

Additional subjects

Additional subjects chosen by participants, such as:

- Networked targets updating techniques
- Linux kernel development overview
- Real Time Linux and Xenomai, Performance analysis
- Deeper look into Embedded GTK, Qt Embedded, Webkit and Enlightenment, building from a distribution of choice, etc...
- Further study

Courseware :

Course materials provided, complemented with 2 books (“Building Embedded Linux Systems” and “Linux Kernel Development (3rd Edition)”), and a free ARM-based Embedded Linux board. Currently we provide the BeagleBone Black 1Ghz ARM Cortex-A8 based board.

Course Dates & Location:

Please contact us for available dates and locations.

Price :

2.950,- € + VAT per attendee (incl. HW development board, 2 books, and lunches during the 5 days).