

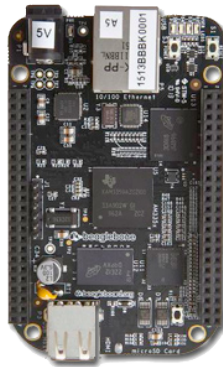
Linux development training (LEVEL 1)

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| Title | Linux development training |
| Overview | Understanding the Linux filesystem Setup TFTP and NFS services Understanding bootloaders u-boot bootloader Practical labs with ARM-based board |
| Duration | ONE day - 8 hours. 50% of lectures, 50% of practical labs (approx.) |
| Trainer | Marco Cavallini m.cavallini (AT) koansoftware.com |
| Language | Oral lectures: English or Italian Materials: English. |
| Audience | People that need to learn how to use a Linux system People using and managing an embedded Linux system |
| Prerequisites | Knowledge of Linux commands as covered in our embedded Linux training (http://koansoftware.com/en/content/linux-embedded-course) Knowledge and practice of Unix or GNU/Linux commands People lacking experience on this topic should not attend this course. |
| Required equipment | For public sessions Everything is supplied by KOAN in public sessions except the PC. Participants must have their own PC laptop computer with: <ul style="list-style-type: none"> • PC computers with at least 2GB of RAM, and 40GB of free disk space. • VMWare Player > 6.x installed. • We will work with Lubuntu Desktop 14.04 (64 bit) We don't support other distributions, because we can't test all possible package versions. • Connection to the Internet (direct or through the company proxy). • PC computers with valuable data must be backed up before being used in our sessions. Some people have already made mistakes during our sessions and damaged work data. For on-site sessions please add the following <ul style="list-style-type: none"> • Video projector • Connection to the Internet (direct or through the company proxy). |
| Materials | Print and electronic copies of presentations and labs. Electronic copy of lab files. |

Hardware

The hardware platform used for the practical labs of this training session is the **BeagleBone Black** board, which features:

- An ARM AM335x processor from Texas Instruments (Cortex-A8 based), 3D acceleration, etc.
- 512 MB of RAM
- 4 GB of on-board eMMC storage (4 GB in Rev C)
- USB host and device
- HDMI output
- 2 x 46 pins headers, to access UARTs, SPI buses, I2C buses



Note:

Content and order of this agenda may slightly vary between sessions and will be determined by the participants and the specific needs of the class.

Day 1 - Morning

Lecture - Setup and Introduction

- Virtual machine setup
- Introduction to embedded linux
- Advantages of using linux
- Systems running linux
- Typical embedded hardware
- System architecture

Lecture - Linux commands and filesystem

- Linux commands
- Linux filesystem
- Virtual filesystems
- Understanding the development process

Lab - Using linux

Using the Virtual Machine

- Using the Unix command line
- using the vi text editor
- Discovering procs and sysfs
- Using TFTP and NFS connect the board to development PC

Day 1 - Afternoon

Lecture - Configuring, compiling and booting the Linux kernel

- Busybox
- Bootloaders
- u-boot
- Autotools concepts
- Booting the kernel using TFTP and NFS

Lab - Kernel configuration, cross-compiling and booting on NFS

Using the Virtual Machine

- Configuring TFTP server on the host machine
- Configuring NFS server on the host machine
- Flash a Linux image on a SDCard
- Booting the target board using TFTP and NFS