Linux Device Drivers development training
(LEVEL : Advanced)

Title	Linux Device Drivers development training
Overview	Understanding Linux device drivers Device drivers management with udev Interrupts 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 build Linux device driver People using special hardware with embedded Linux systems
Prerequisites	**Good knowledge of Linux** as covered in our embedded Linux trainings (`http://koansoftware.com/en/content/linux-embedded-course`) **Knowledge and practice of Unix or GNU/Linux commands** People lacking experience on these topics 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: • PC computers with at least **2GB of RAM**, and **40GB** of free disk space. • **VirtualBox 5** 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 • 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
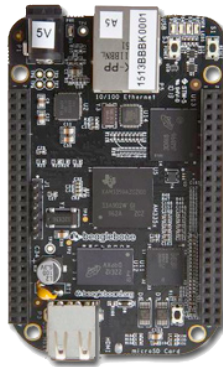
Note:

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 - Developing kernel modules

- Developing kernel modules
- Module parameters ad permissions

Lecture - Linux commands and filesystem	**Lab - Using linux device modules**
- Symbols exported by a module - Modules license - Compiling out-of-tree - Compiling in-tree	*Using the ARM board* - Creation of a simple driver module - Character devices

Day 1 - Afternoon

Lecture - Developing kernel modules	**Lab - Extending linux device modules**
- The device model - File operations - udev - mdev - Interrupt handlers - Threaded interrupts	*Using the ARM board* - Creation of a character devices - Creation of a timer driver - Creation of a interrupt driver