

# (Embedded) Linux for Professionals

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## Day 1

- ❏ **Scheduling in Linux**
- ❏ **Interprocess-/Interprocessor communication**
  - Posix IPC (Shared Memory, Semaphores, Signals, Sockets (MessageQueues), Pipes, Dbus
  - CORBA
- ❏ **„Best Practice“ recommendations for application development**
  - Do's and don'ts
  - Analysis of applications and structured layering of applications
- ❏ **Kernel – roll your own (ryo) Linux kernel**
  - Cross development for ARM architecture
- ❏ **Driver development**
  - Kernel build-system / integration of your own device driver
  - Driver model (structure) of Linux
  - Driver details – shown on the character device driver

## Day 2

- ❏ **Real-time and Linux**
  - Presentation of different approaches (RTAI, Xenomai, Preempt-RT)
  - Design principles and structure of Preempt-RT patch
  - Test programs for user- and kernel space
  - Real-time application development (process, thread, driver, ..)
  - „Best Practice“ recommendations
  - Do's and don'ts
  - Analysis of applications and structured layering of applications

## Day 3

### ❏ Error analysis / debugging of Linux with build-in tools

Use of ftrace - debugging, tracing  
Performance analysis; appropriate tools and methods

### ❏ Introduction to packet management systems for Linux, shown on Debian

Principles and idea of a packet management system  
Structural design of Debian as an example

### ❏ Reasonable HW infrastructure for Linux development

### ❏ Reasonable SW Infrastructure for Linux development (Build System, version control system, distributed development ...)

#### **Software:**

Linutronix provides an USB HDD with an x86 64-bit based Debian system for the host system, a Debian and a Codesourcery toolchain and for the target system an ARM Linux (running in a virtual machine). The HDD is a gift for the participant and can be taken home for further studies.

#### **Hands-On training:**

Scheduled are hands-on examples for the following themes: shell, cross compiling, and cross debugging (hardware could be provided by linutronix; please contact us if wished).

Hands-on examples might be limited to 2 persons for a single device

#### **Number of participants:**

Due to our experience we know that a single instructor could coach a maximum of 6 persons. Our courses are therefore limited to this number of individuals.