

# Advanced Embedded Linux

## Course Number 4094 – 24 Hours

### Overview

This course is aimed to provide embedded system architects, embedded developers and technical leaders the knowledge and the required tools to understand how an embedded Linux system and related tools are built, from what components and how all the parts relate together to form a complete system.

Throughout the course participants will build a complete Linux embedded system and development tool chain from source code downloaded from the Internet, including compiling a tool chain, choosing and building system libraries, configuring and building a custom Linux kernel image, configuring and installing boot loader and system applications such as a HTTP and Secure Shell servers.

The course contents, tutors guidance and selection and academic supervision are provided by Codefidence Ltd, the leader in Linux based embedded system development and support in Israel.

### On Completion, Delegates will be able to

- Build from scratch a complete embedded Linux system and development tool chain, including kernel, system libraries, applications and boot loader from source code
- Understand what components build a complete embedded Linux system and how they interact

### Who Should Attend

Seasoned embedded systems developers (using VxWorks, pSos, Vertex, Nucleos or home grown systems) wishing to be able to build embedded Linux systems.

Seasoned Linux developers wishing to become competent Linux Embedded systems architects.

### Prerequisites

- Experience Programming in C

- Course #911, Programming Embedded Linux or equivalent knowledge

## Course Contents

### Introduction

- What makes an embedded Linux system

### Configuration and build of the Linux kernel

- Configuration options
- Preemption and real time models
- Versions and trees
- Extensions and patches

### Run time libraries

- uClibc vs. Glibc.

### Toolchain

- Assembler, linker and compiler
- Choosing the right versions
- Building the tool chain
- Automatic tool chain build using Crosstoo/buildroot

### File system

- Generic application build
- Cross compiling
- Example application: SSH server
- Example application: HTTP server
- System Init
- Attaching to serial and network
- init and inittab
- Automatic hardware detection using hotplug and udev

### Ptxdist

- An automatic framework for building Linux embedded systems from scratch

### Advanced Debug and profiling tools

- OProfile
- Linux Trace Tool Kit
- Kgdb
- Kdump