



VARISCITE LTD.

VAR-SOM-MX6

Embedded Linux with VAR-SOM-MX6 Course



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Document Revision History

Revision	Date	Notes
1.0	07/Nov/2017	Initial D.R

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1. Objectives

Building embedded Linux on Variscite's VAR-DVK-MX6 evaluation kit.

This course targets engineers who wish to implement Embedded Linux systems utilizing Variscite's VAR-SOM-MX6 System on Module.

Going through theory and hands-on labs, the course will get you familiar with the Variscite's VAR-SOM-MX6 System on Module, VAR-DVK-MX6 and the supporting Linux ecosystem.

The course will cover:

1. Evaluation kit basics: Unboxing the evaluation kit, booting the system, flashing images to the SOM
2. Yocto basics: Overview, customizing and building a Yocto-based filesystem
3. Customizing Variscite U-boot and kernel. Integration with Yocto
4. Kernel device tree basics
5. Understanding the boot process. SPL, U-Boot, Kernel, filesystem.
6. Flashing binaries to SOM

2. Outline

Below are the main topics that we cover:

- Overview and Introduction:
 - Unboxing, connecting and booting your board
 - Introduction to Embedded Linux and Android 1 - Linux Kernel and Userspace
 - Introduction to Embedded Linux and Android 2 – System power-up and Bootloaders
- Introduction to Yocto Project
- Developing for Variscite's i.MX6 SOM with Yocto Project 1 - basic interfaces manipulation
- Developing for Variscite's i.MX6 SOM with Yocto Project
- Device tree basics

3. Day 1 Outline

Morning:

Development kit overview

1. Development kit unboxing, cables connection and console
2. Variscite's rescue SD-Card
3. Powering and booting the kit. Boot straps
4. GUI demos
5. Switching from Linux to Android

Afternoon:

Working with the various interfaces. Step-by-step with [variwiki](#) - Ethernet, Wi-Fi, UARTs, GPIOs, Gstreamer, Bluetooth, LVDS, Audio, RTC.

4. Day 2 outline

Morning:

Linux and Yocto basics

1. Introduction to Linux components: SPL, U-Boot, Kernel, filesystem
2. Kernel space vs user-space
3. Understanding the boot sequence and console debug printouts
4. Introduction to Yocto build system:
 - Yocto overview
 - Layers
 - Recipes
 - Bitbake
 - Variscite's BSP layer
 - Yocto basic commands and build options

Afternoon:

1. Git basics
2. Hands-on Lab:
 - Adding a new library (web browser) to the Yocto build
 - Step-by-step Yocto build from source
 - Installing Yocto-built images on an SD-Card and NAND flash

5. Day 3 Outline

Morning:

1. Kernel development:
 - Cloning Variscite's kernel into a customer's proprietary kernel in GitHub
 - Customizing the kernel configuration (defconfig)
 - Building Yocto using new kernel tree
2. Beginning of Kernel's device tree basics

Afternoon:

1. Cont. device tree basics
2. Hands-on lab:
 - Modifying pin-muxing configuration of a GPIO in the device tree
 - Compile device tree
 - Installing new. dtb on SOM's NAND flash
 - Pin toggling from userspace.

6. Day 4 Outline (optional)

QT application debugging on VAR-SOM-MX6.

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