How to Design Xilinx Embedded Systems in 1 Day

Embedded 2

EMBD13000-ILT (v1.0)

Course Specification

Course Description

The workshop introduces you to fundamental embedded design concepts and techniques for implementation in Xilinx FPGAs. The focus is on fundamental aspects of Xilinx embedded tools, IP, and the Embedded Targeted Reference Design (TRD). Design examples and labs are drawn from the Embedded TRD.

Only essential theory is introduced in order to lay a foundation for the material and topics covered in this workshop, which complements more detailed training found in subsequent Xilinx courses.

Level – Embedded 2

Course Duration – 1 day

Course Part Number – EMBD13000-ILT

Who Should Attend? – FPGA designers and logic designers

Prerequisites

- FPGA design experience
- Completion of the *Essentials of FPGA Design* course or equivalent knowledge of Xilinx ISE® software implementation tools
- Basic microprocessor experience and understanding of Cortex™-processor and MicroBlaze™-processor systems

Software Tools

- Xilinx ISE® Design Suite: Embedded or System Edition 14.2

Hardware

- Architecture: Zynq-7000 All Programmable SoC and 7 series FPGAs*
- Demo board: Zynq-7000 All Programmable SoC ZC702 or Zed or Kintex™-7 FPGA KC705 board*

* This workshop focuses on the Zynq-7000 All Programmable SoC and 7 series FPGA architectures. Check with your local Authorized Training Provider for the specifics of the in-class lab board or other customizations.

After completing this comprehensive training, you will have the necessary skills to:

- Describe the various tools that encompass the Xilinx Embedded Development Kit (EDK)
- Rapidly architect an embedded system containing a Cortex-A9 or MicroBlaze processor by using the Base System Builder (BSB)
- Utilize the Eclipse-based Software Development Kit (SDK) to develop software applications
- Modify an embedded system processor design using the System Assembly View
- List some of the IP Catalog components that are the building blocks of an embedded processor system
- Discuss the basic tenants of the AXI interface

Course Outline

- Xilinx Embedded Processing Overview
- Building an Embedded Processing System in XPS
- **Lab 1:** Hardware Construction with the Base System Builder or Processing System Configuration Wizard
- Software Development Using SDK
- Embedded Processing IP Component Features
- **Lab 2:** Adding and Downloading Software
- AXI Overview
- Embedded Targeted Reference Design Overview
- **Lab 3:** Running and Debugging a Linux Application on the Zynq Platform

Lab Descriptions

- **Lab 1:** Hardware Construction with the Base System Builder (Microblaze Processor) or Processing System Configuration Wizard (Zynq All Programmable SoC) – Create an XPS project by using a wizard to develop a basic hardware system and generate a series of netlists for the embedded design.
- **Lab 2:** Adding and Downloading Software – Complete the processes begun in Lab 1 using the SDK tools to create a software BSP and sample application. Configure the device and download the application.
- **Lab 3:** Running and Debugging a Linux Application on the Zynq Platform – Explore a software application executing under the Linux operating system on the Zynq All Programmable SoC.

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