Designing with Versal™ Gen1 & Gen2 : Architecture, Tools and Methodology

GENERAL OBJECTIVE OF THE TRAINING

Learn about Versal™ architecture (PS, PL, AI engines, NoC, GT, PCIe, …) and design methodology.

COURSE DURATION

4 days - 28 hours

CONCERNED PUBLIC

- Technicians and Engineers in Digital Electronics
- All our training courses are given at a distance and are accessible to people with reduced mobility.
- People with disabilities may have special training needs. Our partner AGEFIPH accompanies us to implement the necessary adaptations related to your disability. Don't hesitate to to discuss your requirements.

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PREREQUISITES

- Comfort with the C/C++ programming language
- Vitis™ IDE software development flow
- Hardware development flow with the Vivado® Design Suite
- Basic knowledge of UltraScale™/UltraScale+™ FPGAs and Zynq™ UltraScale+ MPSoCs

NOTES

- Release date: 09/10/2025

TEACHING STAFF

- **William Duluc, Electronics and Telecoms Engineer, AMD Expert since 2009 and AMD Trainer since 2017 :**
  - Expert AMD FPGA - Language VHDL/Verilog - RTL Design
  - Expert AMD SoC & MPSoC - Language C/C++ - System Design
  - Expert DSP & AMD RFSoC – HLS - Matlab - Design DSP RF
  - Expert AMD Versal – AI Engines – Heteregenous System Architect

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Training center registration: 73 3105366 31

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TARGET OBJECTIVES AND SKILLS

- 1 - Describe the architecture of Versal at a high level.
- 2 - Describe the different engines of the Versal device
- 3 - Use the different blocks of the Versal architecture to create complex systems
- 4 - Describe the boot
- 5 - Build an application for AI engines
- 6 - Describe GT links, the PCIe and multimedia block, and be familiar with design tools
- 7 - Describe debugging methods and power consumption and dissipation issues

COURSE CONTENT

DAY 1
- Objective 1
  - Introduction & Portfolio {Lecture}
  - Architecture Gen1 & Gen2 Overview {Lecture}
- Objective 2
  - Processing System Gen1 & Gen2 {Lecture}
  - Programmable Logic (PL) {Lecture}
  - DSP Engine {Lecture}
  - AI, AI-ML, AI-MLv2 Engine {Lecture}
  - NoC Introduction and Concepts {Lecture, Lab}
  - Design Tool Flow {Lecture, Lab}

DAY 2
- Objective 3
  - IO Resources {Lecture}
  - Clocking Architecture {Lecture}
  - Memory Solutions {Lecture}
  - NoC DDR4 & NoC2 DDR5 Memory Controller {Lecture, Lab}
- Objective 4
  - Platform Management Controller (PMC) {Lecture}
  - Boot and Configuration {Lecture, Lab}

DAY 3
- Objective 5
  - AI Engine Programming: Kernels and Graphs {Lecture, Lab}
  - AI Engine System Partitioning {Lecture}
- Objective 6
  - Serial Transceivers {Lecture}
  - PCI Express solutions {Lecture}
  - Multimedia Hard Blocks (Gen2) {Lecture}
  - Platform Development Methodology {Lecture, Lab}

DAY 4
- Objective 6
  - System Simulation {Lecture, Lab}
  - Vitis export to Vivado Flow {Lab}
- Objective 7
  - Configuration and Debugging {Lecture}
  - Hard Block Debug {Lecture}
  - Fabric Debug {Lecture, Lab}
  - Power Design Manager {Lecture}
  - Power and Thermal Solutions {Lecture}

TEACHING METHODS

- **Inter-company online training :**
    - Fast Internet connection, webcam, headset
    - Presentation by Webex by Cisco

    - Provision of course material in PDF format
    - Labs on individual Cloud PC by RealVNC

- **Intra-company face-to-face training on customer site : (details to be confirmed prior to training)**
    - Suggested supply by the customer :
        - Training room
        - Video projector
        - Whiteboard
        - Individual PC with AMD tools
    - Provided by MVD Training :
        - Course material in PDF format
        - Practical work on individual PCs (loan of equipment available on request)

RECOMMENDED COMPUTER HARDWARE

- **Inter-company online training :**
    - Recent computer OS Linux or Windows 64-bits
    - Fast Internet, webcam, headset
    - Software tool WebEx Cisco
    - *AMD remote tools :*
        - Software tool RealVNC Viewer
    - *AMD local tools :*
        - Software tool AMD Vitis & Vivado
- **Face-to-face training on customer site :**
    - Recent computer OS Linux or Windows 64-bits
    - Software tool AMD Vitis & Vivado

TEACHING METHODS AND SUPPORT - ASSESSMENT & RECOGNITION

- **Teaching methods :**
    - Alternating lectures, technical questionnaires and exercises on individual machines.
- **Pedagogical follow-up :**
    - Signed attendance sheet
- **Pedagogical assessment :**
    - Continuous assessment and progress sheet :
        - Technical questionnaire
        - Practical work results
        - Validation of objectives
- **Satisfaction survey :**
    - At the end of training: assessment form completed by the trainee
    - At 3 months: evaluation form completed by the trainee after application to the company
- **Certificate :**
    - Training certificate with assessment of learning provided to trainee
    - Certificate of completion provided to employer

TECHNICAL, EDUCATIONAL, ADMINISTRATIVE AND FINANCIAL CONTACT

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