Circuit Simulation with VHDL

Seminar

Applicable Technologies	Requirements	Contact
All Xilinx® FPGAs including SoCs	Basic knowledge of the hardware description language VHDL	Michael Schwarz P. +49 7664 91313-15 E. info@plc2.de

Fee (net per person)	Inclusive	Duration
SE Free of charge	Training material Beverages during breaks Lunch	1 day

Workshop

The course »Circuit Simulation with VHDL« is part of a free series of PLC2 seminars for beginners.

Programmable logic devices, such as FPGAs, have been established in all areas of our daily life. They are used in mobile phones, IoT devices, automobiles, and data centers.The areas of application are as diverse as their size. They serve as protocol adapters, signal converters, or accelerators to analyse video, radar, and sensor data. VHDL is a powerful hardware description language which meets all requirements to design a digital circuit of this scale. Various abstraction mechanisms enable the developer to create such designs quickly and effectively. VHDL already eliminates various programming errors during the design. Typically, VHDL is used at the Register Transfer Level (RTL) to design digital circuits of any complexity. Furthermore, VHDL can be used to integrate larger subcircuits on the system level. In addition to the VHDL language constructs for synthesis, the language offers various functionalities to describe complex verification models. Hence, it is possible to verify digital circuits from a simple gate to the System on Chip (SoC) in advance.

With recourse to already gained VHDL knowledge, extended language constructs will be used to create simulations according to the VHDL testbench concept. The taught language elements are based on the language revision IEEE Std. 1076-2008.

Agenda

01. VHDL review
- Processes and concurrency
- Wait statements, delta cycles

02. Testbench concepts
- Inline testbenches
- Modular testbenches
- Assertions
- Stimuli and checks

03. Simple stimuli generation
- Simple stimuli generation
- Analog stimuli
- Random stimuli
- Self-checking testbench

04. File I/O
- Reading and writing files
- Logging

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