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Sign Up

ModelSim Training

3 days (21 hours)

Overview

ModelSim is an HDL simulation environment that enables you to verify, debug, and validate VHDL, Verilog, and SystemVerilog designs using an interactive and rigorous approach. With its debug windows, signal analysis, and simulation scripts, ModelSim is an essential tool for ensuring the reliability of digital architectures.

Our ModelSim training course enables you to go beyond basic use of the tool and master the simulation methods used in development and verification contexts.

You will learn how to organize a project, compile and run a simulation, interpret the results, effectively analyze waveforms, and structure your debugging process.

The training also covers automation using Tcl, library management, testbench best practices, and the essential skills needed to accelerate the analysis of functional behavior.

By the end of the course, you will be able to conduct more reliable simulations, diagnose design errors more quickly, and work with a methodology tailored to electronics projects in a professional environment.

Like all our training courses, this one will introduce you to **the latest stable version** of the technology and its new features.

Objectives

- Understand the role of ModelSim in an HDL verification workflow.
- Create, organize, and compile a simulation project in a structured manner.
- Run simulations and interpret the results in the various debug windows.

- Use waveforms, signals, and messages to diagnose anomalies.
- Automate common tasks using Tcl scripts and simulation commands.
- Adopt best practices to improve test reliability and speed up debugging.

Target Audience

- Electronics Engineer
- Verification engineers
- FPGA developers
- VHDL Designer
- Verilog Designer

Requirements

- Basic knowledge of VHDL or Verilog.
- Understanding of the fundamentals of digital design and test benches.
- Basic experience with a technical development or HDL simulation environment.
- Basic understanding of reading timing diagrams and analyzing signals.

Technical Prerequisites

- A recent computer with sufficient memory to run ModelSim smoothly.
- A stable network connection—either Wi-Fi or Ethernet—for remote training resources.
- A working installation of ModelSim or a lab environment provided by the instructor.
- A text editor or IDE compatible with VHDL and Verilog files.
- A microphone and headset if the session takes place in a virtual classroom.

ModelSim Training Program

[Day 1 - Morning]

Introduction to the ModelSim Environment

- The role of ModelSim in an HDL verification workflow.
- Overview of the interface, main windows, and navigation logic.
- Managing projects, libraries, and the project tree.
- Differences between interactive simulation and command-line execution.
- Organizing source files, testbenches, and associated resources.
- Hands-on workshop: getting started with the interface, creating a project, and importing an initial set of source files.

[Day 1 - Afternoon]

Compiling and running a simulation

- Compiling VHDL and Verilog files.
- Resolving syntax errors and reading simulator messages.
- Setting up an initial simulation configuration.
- Running a simple test scenario and observing the results.
- Managing dependencies between entities, architectures, and modules.
- Hands-on workshop: Compiling a mixed-language design and correcting blocking errors until a valid simulation is obtained.

[Day 2 - Morning]

Analyzing signals and timing diagrams

- Use the Wave window to track the temporal evolution of signals.
- Adding, grouping, and formatting signals useful for debugging.
- Reading logic states, transitions, and delays.
- Exploring the Structure, Variables, and Messages windows.
- Analysis methods for isolating a functional anomaly.
- Hands-on workshop: building a clear timing diagram and identifying the source of unexpected behavior.

[Day 2 - Afternoon]

Effectively Debugging a Design

- A methodical approach to functional debugging.
- Using breakpoints, observed signals, and execution messages.
- Analysis of common causes of discrepancies between intended behavior and simulation results.
- Handling deadlocks, loops, and connection errors.
- Best practices for reducing investigation time.
- Hands-on workshop: diagnosing a simulation failure and proposing a well-reasoned correction.

[Day 3 - Morning]

Automation with Tcl and Scripts

- Principles of scripting in ModelSim.
- Essential commands for compiling, simulating, and quickly rerunning a scenario.
- Creating reusable scripts to standardize launches.
- Setting up a more productive workflow for teams.
- Introduction to naming conventions and script structuring.
- Hands-on workshop: writing a Tcl simulation script and running it on a complete project.

[Day 3 - Afternoon]

Scaling Up Verification

- Building a more robust test environment.
- Reusing scenarios and capitalizing on simulation campaigns.
- Best practices for documenting results and sharing observations.
- Organizing a validation process tailored to a specific project context.
- Reviewing key points to build proficiency with the tool.
- Hands-on workshop: conducting a mini verification campaign and producing a report that the project team can use.

Target Audience

This training is intended for both individuals and companies—large or small—that wish to train their teams in new, advanced IT technology or to acquire specific industry knowledge or modern methods.

Assessment at the Start of Training

The pre-training assessment complies with Qualiopi quality standards. Upon final registration, the learner receives a self-assessment questionnaire that allows us to evaluate their estimated proficiency with various types of technologies, as well as their expectations and personal goals for the upcoming training, within the limits imposed by the selected format. This questionnaire also allows us to anticipate certain connection or internal security issues within the company (intra-company or virtual classroom) that could pose challenges for monitoring and ensuring the smooth running of the training session.

Teaching Methods

Hands-On Training: 60% hands-on, 40% theory. Training materials distributed in digital format to all participants.

Organization

The course alternates between theoretical input from the instructor—supported by examples and reflection sessions—and group work.

Assessment

At the end of the session, a multiple-choice quiz is administered to verify that participants have successfully acquired the skills.

Certification

A certificate will be issued to each trainee who has completed the entire training program.