

Automating Hardware Design Documentation

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Introduction

Design documentation – few desire to spend time creating it, but many complain loudly when they need it to perform their jobs and it is not present. Useful documentation should be complete, yet concise and most of all, it should be accurate. This paper describes a methodology for speeding the production of design documentation by automatically generating design diagrams from VHDL or Verilog HDL code and publishing designs as a navigable hierarchically HTML website.

Key Points

A picture is still worth a thousand words. That's why most engineers toil with Visio or some other graphics program to create diagrams representing their HDL code for design reviews and design documentation deliverables. Every time the code changes, these diagrams must be updated by hand. This process is time-consuming at best, and can also lead to discrepancies between the HDL code and the associated manually created diagrams.

By automatically generating block diagrams, connectivity tables, state machine bubble diagrams, and flow charts from VHDL and/or Verilog code, this manual process can be avoided and accuracy can be ensured. Every time the code changes, the diagrams in the documentation can be immediately synchronized accordingly.

For distributed team collaboration and design reviews the ability to publish a design as an hierarchical, interactive website is also explored. HTML that can be displayed in any web browser is ideal for allowing designers to copy and share information with team members and customers. While it's interactive, the actual design data is secured and the design team can control how much data is visible to protect proprietary or preliminary code. In addition to the HDL code and any related diagrams, the exported HTML design website should include any other associated design data including synthesis scripts and simulation results files to completely document the hardware design project.

Finally a representative design project is explored to estimate the productivity gained through the use of these automated design documentation features. Depending primarily on the size of the design project and the number of design reviews required on the project, the timesavings can be impressive.