Xilinx Foundation Series ISE Software–Delivering the Benefits of HDL Design

Integrated design flows increase your productivity and accelerate your time to market.

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Teams of software engineers from Synopsys, Synplicity, Model Technology, Visual Software Solutions, and Xilinx, working in close collaboration, have created the ultimate in design automation tools–Xilinx Foundation Series™ ISE (Integrated Synthesis Environment). The Foundation Series ISE software gives you the most advanced design automation tools, in a fully integrated, fast-working environment that increases your productivity and accelerates your time to market.

The Foundation Series ISE software includes:

- Synopsys FPGA Express - HDL synthesis software.
- Synplicity Synplify - HDL synthesis software.
- Model Technology ModelSim - HDL simulator.
- Visual Software Solutions HDL Bencher - Automatic testbench generation tools.
- Visual Software Solutions StateCAD-Automatic State machine generation tools.
- Xilinx XST synthesis technology - For further optimization.
- Xilinx implementation tools - For optimum use of device resources and the fastest place and route times in the industry.

The Keys to Increased Productivity

In the past, most large digital design companies relied on individual point tools, and were less concerned with managing the flow of data between the tools. Solving the problem of connecting point tools came later, and required customized design flows. This need to connect data flows between various point tools led to development of standard information exchange interfaces, such as HDL. But HDLs, including Verilog and VHDL, though useful as industry standards for hardware design, did not deliver a complete solution. For example, various simulation and synthesis tools might interpret and optimize differently, and produce undesirable results.

Today, there's a new focus. As more and more competing companies address the problem of designing a "system on a chip," they see more value in integrated tools that work together seamlessly, than in individual point tools, because tool integration is the key to increased productivity.

Integrated Design Flow Management

Today, you need fast, reliable flows of design information between tools. And, you want to specify common information, just once, for multiple tools; this includes the location of simulation libraries, macro libraries, and timing information. Though a homegrown, customized process for specification of common information can often be automated, updating a single point tool within a flow usually calls for a complete rewrite of setup information. And using various point tools within a design flow often requires creation of additional design data files. That additional design work and processing decreases your productivity, and slows time to market.

The Foundation Series ISE software automatically communicates common information to each tool and eliminates the need to create data file overhead. Unlike homegrown flow automation, an integrated design tool suite is aware of downstream tool requirements. For example, when you want to perform timing simulation after place and route, an integrated tool suite can instruct its place and route tools to produce the timing simulation netlist, so it can be read by the simulator. Today, winners in the race to market are focusing on design automation tools that are integrated (see Figure 1).

Integrated Project Management

Given the large number of source files, control files, and implementation files generated by today's complex, time-pressed design projects, it is not merely desirable, but necessary, to have an automated, integrated software tool that can manage project files. For example, a design project may consist of HDL files, IP cores, netlists, user constraints, or any combination of these. You know it can be difficult to manage the project when

one, or more of these design modules are modified.

The Foundation Series ISE software will manage all modules in the design for you. For example, it knows about all of the HDL code in your design, and it knows when the code has changed; therefore it will know, and can tell you, when HDL-generated netlists must be updated, and processes re-run. Then it will clearly display all design sources and implementation results, and provide easy access to the appropriate editing tool for every source file.

Many HDL compilers, as well as schematic entry tools, require that you specify a device family library up front, to provide appropriate library symbols and components for a given architecture. Additionally, if your design is retargeted to a new device architecture in the middle of your design project, then you must change the project libraries to match the new architecture. The Foundation Series ISE software makes the changes for you. You're left with nothing to do but select the device family, once. Your selection will set the appropriate device libraries for design entry. And automatically pass device information forward to place and route tools.

In the course of a design cycle, it's highly likely a design will be implemented many times. For example, revisions may be made to timing constraints, target device, and place and route options, in pursuit of the best overall design implementation. The Foundation Series ISE software provides revision control by archiving each implementation, along with all design flow control files and design constraint files, for future reference or use. With this information, you can consult or deploy an archived implementation anytime, without recompiling your entire design (see Figure 2).

Integrated Environment for Design Optimization

You usually have some overall design strategy that you are looking to optimize in your design flow. For example, your strategy may place highest priority on fitting the design in the smallest possible device, or on getting the fastest performance. A synthesis tool can be used to optimize the design's performance based on timing requirements, but for the best results, the place and route tools must then receive the same information to complete the design. This can mean setting requirements twice. However, with the Foundation Series ISE software, you only have to define the settings once, so you can optimize your design strategy faster and more reliably.

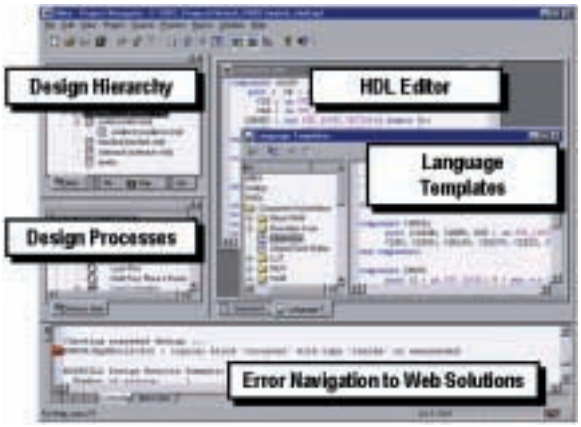

Figure 1 - Foundation Series ISE –well-integrated HDL solution

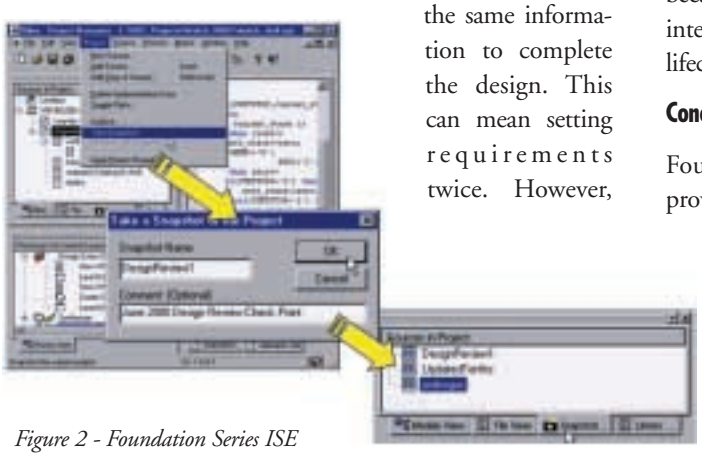

Figure 2 - Foundation Series ISE project snapshots for effective project management

The Foundation Series ISE software ensures that the software tools work well together; the tools must communicate with each other to efficiently transfer design data automatically. What's more, front to back design flow strategies are used, enabling the individual tool's features to be leveraged to their greatest benefits. In a non-integrated environment these communications tasks and decisions are left to you.

Integrated Environment for Collaboration

To facilitate the efficient flow of design data constraints and strategies, it is far more efficient if teams of software developers work in collaboration. An integrated environment makes possible, and enhances, collaborative work, which is critical during the project development phase. However, collaboration presents a new challenge.

Designers, working with an integrated tool, in an integrated environment, depend on software quality. When your in-house designers collaborate with third party partners for example, and use different tools, interoperability problems may occur; you can only hope solutions are available from each tool's vendor.

When you use the Foundation Series ISE software, you are assured of software quality because it has been tested thoroughly for tool interoperability, across the project creation lifecycle.

Conclusion

Foundation Series ISE provides you with a complete HDL design environment. Now you can manage and optimize your design projects, and your engineers can work collaboratively, with confidence in Xilinx quality and technical support.

Learn more about how Xilinx Foundation Series ISE meets your requirements for integrated design automation. See and hear the Xilinx internet presentation, "Xilinx Foundation Series ISE: Delivering the Benefits of HDL Design to Programmable Logic Designers," by going to www.netseminar.com/tbd/tbd.