Advanced Synthesis with LeonardoSpectrum

QUARTUS™

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Introduction

Altera now provides a full-featured version of the LeonardoSpectrum™ software to all customers who have an active subscription. This world-class synthesis tool increases productivity and enhances design performance.

All customers who have an active subscription will receive the LeonardoSpectrum software version 1999.1j with the Quartus™ software version 2000.03 and the MAX+PLUS® II software version 9.6 upgrade shipments.

LeonardoSpectrum Version 1999.1j Features

The LeonardoSpectrum software offers many advanced features and capabilities, including:

■ Powerful mapping and optimization with advanced constraint entry features
■ Tool command language (Tcl) scripting capabilities for custom commands and procedures
■ Efficient multipass optimization for advanced designs
■ Flexible black boxing
■ Easy-to-use graphical user interface (GUI)
■ Architecture-specific optimization for Altera® products
■ Windows 98/NT and UNIX (Solaris 2.6 and HP-UX 10.20) environment support

Power & Ease of Use

The LeonardoSpectrum software combines power with ease of use by offering advanced mapping and optimization features, Tcl scripts, and architecture-specific optimization for Altera products. The LeonardoSpectrum software also offers designers an easy-to-use GUI with the FlowTabs™ feature that organizes the synthesis process. The software supports both Windows (98/NT) and UNIX (Solaris 2.6 and HP-UX 10.20) environments. This technical brief describes these advanced features and capabilities.

Advanced Mapping & Optimization

Designers can efficiently control the mapping and optimization process with the advanced constraint entry features in the LeonardoSpectrum software. Users can enter constraints through the GUI or from scripts. After the mapping and optimization process, place-and-route constraints (i.e., system performance (f_{MAX}), clock-to-output delay (t_{CO}), and pin assignments) are placed on either a Tcl script for the Quartus software or an Assignment & Configuration File (.**acf**) for the MAX+PLUS II software.

Tcl Script Support

Tcl is a popular scripting language similar to many shell scripting and high-level programming languages. Tcl scripts allow designers to create custom commands or procedures for multi-platform programming. This popular scripting language provides support for control structures, variables, network socket access, and application programming interfaces (APIs) for integration. The LeonardoSpectrum software provides support for Tcl by allowing users to source Tcl files from the user interface.

Fast & Efficient Multipass Optimization

The LeonardoSpectrum software also features multipass optimization. This feature guides a design through four different optimization algorithms and filters the best result from the four passes. Users can control the number of passes that a design optimizes. Although using the multipass optimization feature will increase compilation time, it may improve overall performance.

Flexible Black Boxing

The library of parameterized modules (LPM) and APEX™ device megafunctions like `altclklock`, `altlvds`, and `altcam` are supported in the LeonardoSpectrum software through black boxing. Modules can be black-boxed with the `NOOPT` or `DONT_TOUCH` attribute. For flexibility, these attributes can be set in the source code from the user interface or from a script.

Easy-to-Use Interface

There are many features in the user interface that simplify navigation through the software. The FlowTabs feature organizes the user interface by guiding users through everything from HDL coding to synthesis. The SynthesisWizard™ feature further simplifies the synthesis process by providing new users with complete, step-by-step instructions.

High-Quality Results with LeonardoSpectrum & Altera Devices

The LeonardoSpectrum software offers architecture-specific optimization for Altera devices with higher quality results. Designs targeting the APEX 20K device family are mapped to ATOM netlist files, while designs targeting the FLEX® 10K device family are mapped to look-up tables (LUTs), carry chains, and cascade chains.

Conclusion

The LeonardoSpectrum software is a powerful synthesis tool that offers many advanced features and capabilities. By offering the LeonardoSpectrum software, Altera places a world-class synthesis tool in the hands of designers, all at no additional cost.

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