



CADENCE AND FUJITSU VLSI LIMITED

Fujitsu Automates Standard Cell Migration Using Cadence Virtuoso Layout Migrate

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Yukiko Nakaya, Analog Products Business Division, Fujitsu VLSI Limited

CORPORATE PROFILE

- Fujitsu is a leading provider of customer-focused information technology and communications solutions for the global marketplace
- Fujitsu’s Analog Products Business Division designs and develops small, low-power, high-performance ICs for consumer applications

DESIGN CHALLENGE

- Modify and migrate a library of 177 standard cells in order to create a lower-power library within one month
- Improve the efficiency of analog design process

CADENCE SOLUTION

- Implemented Virtuoso® Layout Migrate tool
- Created a Virtuoso Layout Migrate environment and provided migration support to complete project ahead of schedule

CADENCE PRODUCTS AND SERVICES

- Virtuoso Layout Migrate physical layout migration tool

LEADING THE WAY IN LOW-POWER, HIGH-PERFORMANCE SOLUTIONS

The Analog Products Business Division at Fujitsu VLSI Limited (FVD) delivers technology to enable some of the world’s most advanced high-performance, low-power communications and consumer devices. To stay at the forefront of the market, the group is constantly challenging their process, ensuring that they have the fastest, highest quality design and verification flow available.

The FVD Analog Products team had been evaluating new solutions to address their requirements for cell layout migration and optimization. Their current solution was not producing acceptable results. They invited Cadence to conduct a feasibility study using Virtuoso Layout Migrate. The objective of the study was to construct a Virtuoso Layout Migrate design flow for FVD’s cs60 technology, and then migrate six standard cells to meet extensive

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requirements. The demonstration was a success, and the FVD team approved a plan for Cadence to install the new solution and begin training.

URGENT PROJECT PROMPTS FAST-TRACK ADOPTION OF VIRTUOSO LAYOUT MIGRATE TOOL

Soon after completion of the feasibility study, the FVD Analog Products team was assigned an urgent project. "We were facing an unusual situation," said Yukiko Nakaya, an engineer on the Analog design team. "Just as our team completed a successful evaluation of the Virtuoso Layout Migrate tool, we were assigned an urgent project with significant migration challenges. Based on our trust in Cadence and the early results we had seen from the tool, we made the choice to accelerate the implementation of this new solution."

RAPID LAYOUT MIGRATION IMPROVES PRODUCTIVITY

With a schedule of one month to complete the project, the team would have to migrate 177 standard cells to a low-power target technology, including

cell architecture development. Before adopting Virtuoso Layout Migrate, the Analog Products team had been using a manual approach for their physical layout migration. "Had we chosen to stay with a manual approach we would not have been able to meet our deadline," continued Ms. Nakaya. "The complexity of the project demanded an advanced methodology."

Virtuoso Layout Migrate enables rapid layout migration through support of all types of layout hierarchy. In addition, the tool's two-dimensional optimization produces a higher quality result compared with other solutions that use one-dimensional algorithms.

TUNING VIRTUOSO LAYOUT MIGRATE TOOL HELPS TO SATISFY ALL CUSTOMER NEEDS

A critical element in the success of this project was the teamwork between the FVD Analog Projects design team and the Cadence team that was onsite to create the new Virtuoso Layout Migrate flow. "The Cadence team did much more than establish an environment for the new tool flow," said Ms. Nakaya. "They were with our team every step of the way, providing

instant support to tune the environment during our architecture experiments and the migration."

The team did run into a few challenges along the way. "Because this was our first time using the Virtuoso Layout Migrate tool in our flow, it took extra work to achieve the desired results on a few of the cells," said Ms. Nakaya. "However, as the team becomes more proficient with the technology, I fully expect that our results will get better with each design."

The FVD Analog Products team successfully completed all of the required cell architecture experiments, and migrated all 177 standard cells. "Considering the fact that we were using a completely new tool with no training, the time it took to finish was amazing," continued Ms. Nakaya. "Generating the initial environment took only two days. It took us two weeks to complete all of our architecture experiments, and then one week to migrate all 177 standard cells."

VIAABLE SOLUTION FOR AN ANALOG FLOW

The FVD Analog Products team is excited about future possibilities for their Virtuoso Layout Migrate tool. "Our team already uses many Cadence products as part of our design flow, including the Virtuoso custom design platform," said Ms. Nakaya. "We are looking forward to expanding our expertise with the platform by creating our own process design kit, and introducing Virtuoso NeoCircuit DFM and Virtuoso Neocell analog physical synthesis."

cadence™

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