

**Title:**

The ease of use of Cadence® Virtual System Platform for virtual prototype creation and embedded software development on ARM® fast models and using Verum® ASD:Suite.

**Paper Category:** System Design

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**Abstract:**

Software is everywhere, its complexity and development costs are no longer inferior to the hardware, and software problems are more and more often the cause of product failures after market introduction. All this requires that Semiconductor companies today have to deliver silicon including a working software stack to allow easy development and deployment of the most complex and emerging software applications - “apps”. The early availability of a high performance virtual prototype is no longer point of discussion to reduce software development costs while speeding up development time and increasing product quality.

While the creation of such a virtual prototype in the past was difficult, time consuming, error-prone and limited to SystemC/TLM2.0 gurus only, its creation today in Cadence® Virtual System Platform is easy, fully automated and offers almost realtime simulation performance.

This presentation will focus on both the creation and the usage of a virtual prototype for early software development. It will handle aspects like ease of use, native integration into Cadence Incisive® Verification Platform, automated generation and integration of TLM2.0 model templates with register-intent awareness, compliancy with industry standards like TLM2.0 and IP-XACT, smooth integration of third-party models and usage of third-party compilers and debuggers, close to real time simulation performance, fully synchronized and coherent hardware/software debugging using advanced debugging features and offering full visibility.

The proof of the pudding will be given by creating an ARM-based platform including ARM® Fast models of the ARM Cortex™ A9 Microprocessor that runs hundreds of millions of software instructions per second (MIPS) and provides lock-step software and hardware co-debugging. The demo will show real time booting of Linux, co-debugging of a UART device driver running on the ARM and interfacing with the UART model and the Linux kernel. In addition, a fancy “apps” – Android game will be shown on both the virtual platform and on a real tablet to illustrate the performance and binary compatibility of the virtual platform. The software will be modeled using Verum® Analytical Software Design solution “ASD”, an automated model driven design approach with formal verification to guarantee the generation of defect free software.

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