OPERA

English

Over the next five years, Moore's Law should continue, providing us with 4x increase in circuit density, a significant speedup of feasible clock rates and a proportional rise in design complexity. This combines with shorter time-to-market requirements and sets increasing pressure to come up with reusable platforms and derivative designs. Current methodologies shift towards platform-based design to ensure that performance constraints are met within shrinking development schedules.

A platform is primarily developed for a given application class that, when implemented, represents its natural solution. The usage of programmable and reconfigurable components provides some scalability to this solution, allowing the derivation of other designs. How efficiently these designs can be derived depends on the availability of a so-called system platform, which is a system-level abstraction of the hardware platform. A system platform enables meet-in the-middle development by properly aligning high-level functional requirements with low-level hardware resources. Current design methodologies, hindered by productivity issues, do not include the development or maintenance of a system platform in their normal flow, resulting in ad-hoc reuse and poor reconfiguration support.

There should be a systematic way of deriving an abstract platform from a programmable design that has reached implementation. The elaboration / extraction of this platform should produce a multi-level resolution model that would allow an easier exploration of the application spectrum. Variable resolution thus enables the development effort to be concentrated around the elements of innovation that characterize a derivative design.

Bottom-up abstraction of a design provides a view of the system that is faster to execute, verify and tune when implementing a new application. Following a systematic abstraction process is a key to iterative refinement of a platform and proper exploitation of reconfigurable hardware.