The Evolution of System integration

The evolution of the EDA community is driven by the changing problems and bottlenecks that designers are experiencing. As designers run into new roadblocks, a need is created, and EDA start-ups spring up to address these needs. The initial solutions tend to be rough technology offerings, but they evolve over time and become easier to adopt and integrate into a designer's existing flow. This process repeats itself as each new obstacle is identified, creating new market opportunities for EDA companies and bringing growth and innovation to the design community. These innovations can merely enhance an existing process, or result in massive methodology shifts, such as those brought on by RTL synthesis tools.

So what is the challenge that is facing the design community today? For years, we have concentrated on better and faster ways to develop hardware, and this is where EDA developments have historically focused. Today, however, we are facing a very different kind of problem: hardware development is no longer the bottleneck, software is! Designs are increasingly moving to SoC architectures, and in many design teams software engineers outnumber hardware engineers by 10-to-1 or more.

This shift in product composition requires a shift in the focus and attention of the industry to remove these new bottlenecks. While this change has been happening gradually over the years, we have reached a critical juncture where the design and verification solutions of the past will no longer meet our needs moving forward. Most of us, however, want to leverage our existing investment in our design environments and methodologies and so we need to figure out how to make these changes in an evolutionary fashion. We still need to solve the problems of the hardware engineer, but we now need to also see these solutions from the perspective of the software engineer as well. The end result has to be a solution for both the hardware and the software engineer.

Today's design environment requires that the needs of the hardware and software engineer get equal billing. The evolutionary approach needs to leverage and build upon existing hardware and the software methodologies. These methodologies include more than just tools and also need to include existing intellectual property: hardware IP, verification IP, and software IP.

While the specific challenge is new, this is the type of problem that the EDA community has always embraced. The convergence of multiple disciplines involves a high level of expertise in all of those disciplines. Just as algorithm development, hardware development, and software development come together in a product, there is an opportunity for system level solutions that include all three of these areas of expertise. This allows us to help our customers continue to bring increasingly complex products into mass production on time and with the right features.

Just as no single technique can fulfill the range of validation required today, no one tool is going to provide the solution either. True system level validation is not being solved by a single tool or vendor, not even by the big EDA vendors, but rather by the cooperation of an entire eco-system aimed at providing the interlocking parts of a total solution. This is where we see true evolution in action. Instead of acting independently, EDA and IP vendors are learning how to work together as a team with each providing their particular domain expertise to the solution.

This type of partnership is shown in action with the partnerships that Carbon has forged with IP and Tool vendors such as ARM, CoWare, MIPS, Synopsys, and others. Our partners provide the platform environments and the commercial IP for major design blocks, and Carbon enables the effective use of the designer's IP in this platform. Each vendor provides their part, but it is only by assembling all of the parts together that the complete solution becomes truly valuable. The end result is a virtual platform that leverages all of the existing development effort provided by the hardware engineering team, and provides a valuable development environment for the software engineers.

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