The Programmable Platform: Does One Size Fit All?

Telecom Panel Session
Synopsys, Inc.

Abstract

This special panel session brings together several leading technologists representing organisations within the telecom and system-on-chip design communities.

The panel will discuss the trend in platform-based design, where new products are increasingly based on re-programmability or re-configuration of more general-purpose devices. Particular emphasis will be placed on the need to meet the requirements of the Telecom market, where flexibility is a key concern, but with the shift towards third-generation wireless systems, so too is performance.

Summary

The 1999 Dataquest European ASIC Design Starts Survey for the first time highlighted a slowdown, in absolute terms, in designs for the mobile communications sector.

The hypothesis is that this statistic, rather than an indicator of reduced mobile communications design activity, heralds a shift towards platform-based design where product derivatives are increasingly based on re-programmability of a more general-purpose device.

Programmable platforms are attractive for a number of reasons. Changes to software can be made without incurring large NRE costs and with little risk, helping companies achieve their time to market goals for derivative products. Air-interface standards in mobile communications are evolving continually. Flexible, re-programmable platforms can help to accommodate these changing standards.

Implementation of the Software Defined Radio (SDR) concept will enable system upgrades by wireless download of software patches, enabling operators to control the transition between different standards and offer customers new functionality whilst keeping the same handset.

However, implementing 3G services (and beyond) requires some very aggressive signal processing to realize the demanding data rate and performance requirements. Reaching the goals of combined flexibility and programmability with high performance, low energy and low cost is a difficult challenge and will not be achievable through software definition alone. Designs will progressively become more complex. Add to this the eternal desire for product differentiation and it becomes apparent why chip designers still get out of bed in the morning.

Algorithm complexity in evolving wireless systems is increasing faster than Moore's law. In other words riding the technology curve alone will not solve the problem – new algorithms and architectures are required. Innovation continues at a phenomenal rate. Whilst the use of programmable platforms is necessary to provide flexibility and minimum time to product derivative, new and more complex platforms will be developed due to competition in product differentiation and the need to solve new problems.

This panel of key stakeholders will be invited to consider the effects of this apparent shift in the underlying implementation platform. Several key issues will be addressed:

- Is this trend set to continue, or will there be a natural 'levelling out' between new design starts and platform-based design?
- How will the systems developers differentiate their offerings with standard platforms and off-the-shelf software IP available?
- Can re-configurable designs satisfactorily meet the performance and challenging low-power requirements for future mobile information systems?
- Where will the software/hardware line be drawn for mobile information systems?
- Going forward, will this platform shift alter the predominant design methodology? What else is required from the EDA companies?