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The All Programmable SOC FPGA at the Heart of Embedded Systems

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Abstract: Today's FPGAs have become 'All Programmable SOC Platforms' that integrate in one single device multi-core CPU's, programmable DSP functions, programmable IO and programmable logic, all immersed in a rich and configurable interconnect network. These programmable platform FPGA's allow for the implementation of heterogeneous multi-core architectures that combine traditional CPU's with application-specific processing cores and dedicated data transfer and storage functions. This is enabled by tools that guide designers during the partitioning and mapping of high-level specifications onto a combination of software running on embedded processors and hardware implemented in programmable logic.

FPGAs are well placed to continue to benefit from Moore's law. Advances in process scaling will be augmented with new circuit and architectural improvements along with innovations in system-in-package technology to solve IO challenges and integrate heterogeneous technologies. These innovations will allow designers to build higher performance and lower power systems that optimally exploit the programmable FGPA architecture.

As FPGA platforms continue to deliver more performance at lower cost and lower power, they are becoming the heart of embedded applications such as complex packet processing for networks with line rates of 400+ Gbps; high performance digital signal processing in novel wireless baseband and radio functions; and future video and image processing systems.

About the speaker: Ivo Bolsens is senior vice president and chief technology officer (CTO), with responsibility for advanced technology development, Xilinx research laboratories (XRL) and Xilinx university program (XUP). Bolsens came to Xilinx in June 2001 from the Belgium-based research center IMEC, where he was vice president of information and communication systems. His research included the development of knowledge-based verification for VLSI circuits, design of digital signal processing applications, and wireless communication terminals. He also headed the research on design technology for high-level synthesis of DSP hardware, HW/SW co-design and system-on-chip design.

Bolsens holds a PhD in applied science and an MSEE from the Catholic University of Leuven in Belgium.