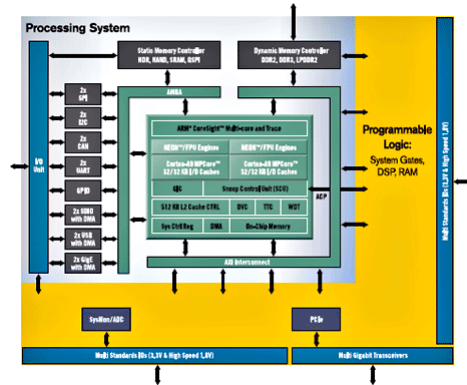


ASSPs selber bauen: Zynq machts möglich



Courtesy Xilinx

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Missing Link Electronics

In November 2011 MLE has proudly joined the elite group of Certified Xilinx Alliance Partners. We passed a comprehensive review by Xilinx of technical, business, quality, and support processes and we will continue to commit engineers to passing the same rigorous training used by Xilinx Field Application Engineers worldwide.



Being a Certified Xilinx Alliance Partner MLE has gained early access to Xilinx Zynq technology.



The "PONG" Demo



Code named "PONG" MLE implemented a real-time video processing application that combines the hardware and the software processing capabilities of Xilinx Zynq-7000 series FPG.

Together with Xilinx, the PONG Demo was successfully demonstrated live at the Embedded World 2012.

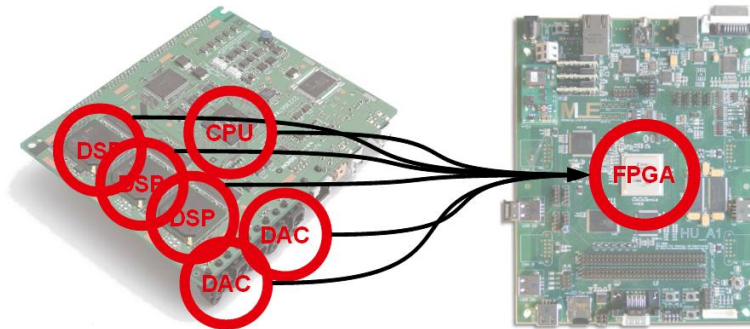


Z-Market.org



MLE also hosts z-market.org - Appz for Zynq which is a community-based web site for sharing solutions and applications for the new Zynq-7000 Extensible Processing Platform from Xilinx.

Software-Defined Printed Circuit Boards



Integrating individual microcontroller, DSP, ADC/DAC and I/O controller devices into one single FPGA-based System-on-a-Chip gives more flexibility for hardware changes without re-spinning a new PCB.

Flexible IO Connectivity



- FPGA devices support a multitude of different I/O standards, including:

- Differential LVDS 2.5V, Hypertransport, PCIe, ...
- Single-ended LVTTTL, LVCMOS 1.5V, 1.8V, 2.5V, 3.3V, PCI, ...



Applications

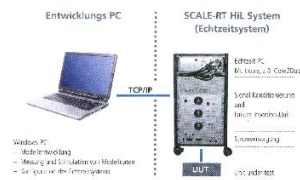
- Industrial Sensing



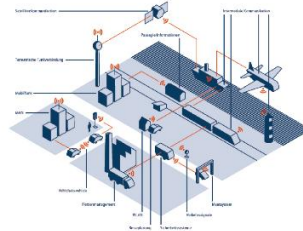
- Automotive Telematics



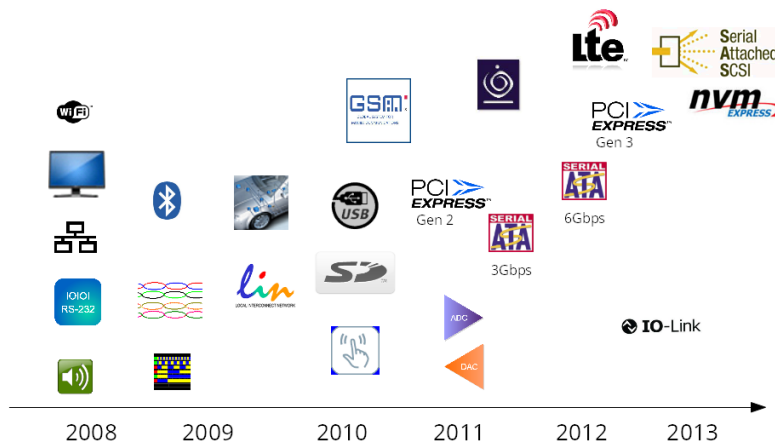
- Test & Measurement



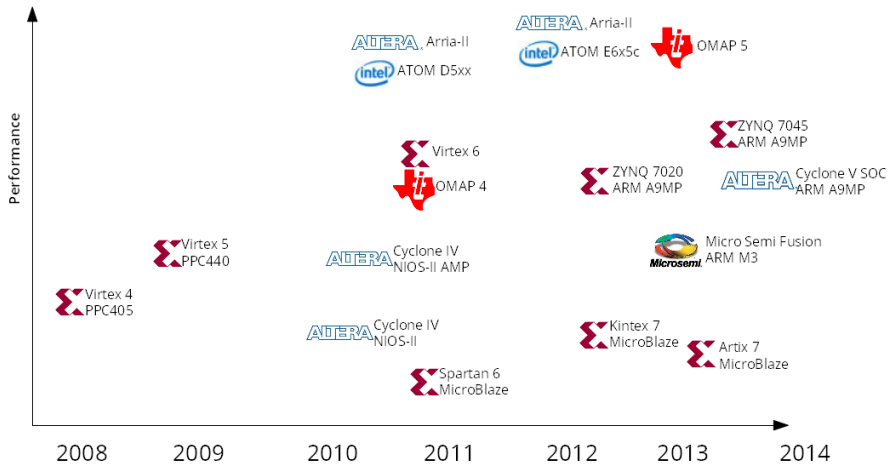
- Smart Products



IO Connectivity Roadmap



Processing Roadmap



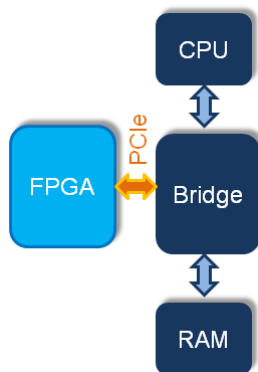
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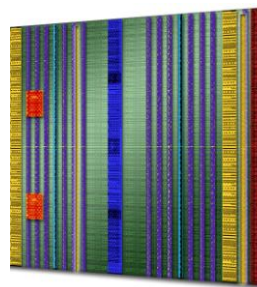
7

FPGAs and CPUs as Companions

- Companion Chips



Integrated Solutions



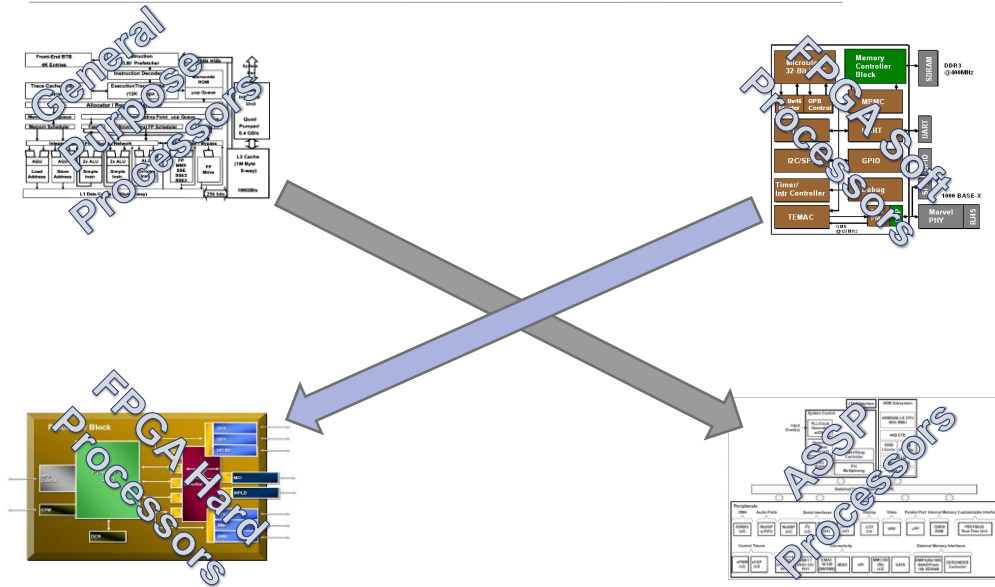
"A symbiosis of CPU and FPGA on one die to reduce cost and PCB space!"

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mlc Convergence of Processing Solutions

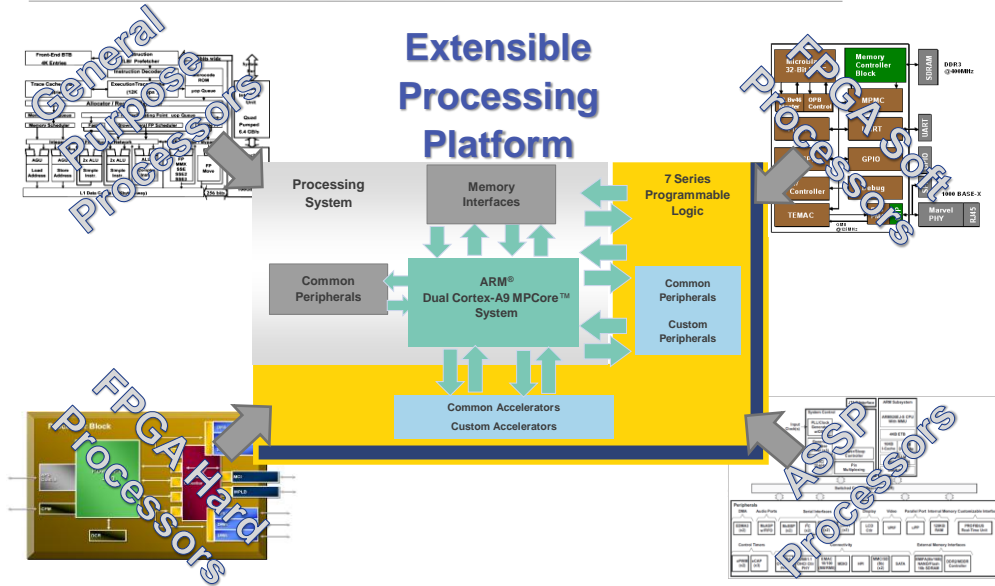


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mlc Convergence of Processing Solutions



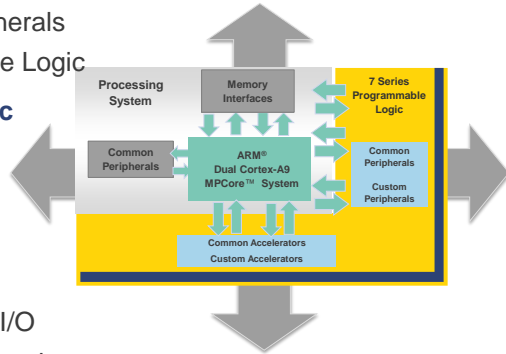
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Courtesy Xilinx

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Zynq-7000 Extensible Processing Platform

- **Complete ARM®-based Processing System**
 - Dual ARM Cortex™-A9 MPCore™, processor centric
 - Integrated memory controllers & peripherals
 - Fully autonomous to the Programmable Logic
- **Tightly Integrated Programmable Logic**
 - Used to extend Processing System
 - Scalable density and performance
 - Over 3000 internal interconnects
- **Flexible Array of I/O**
 - Wide range of external multi-standard I/O
 - High performance integrated serial transceivers
 - Analog-to-Digital Converter inputs

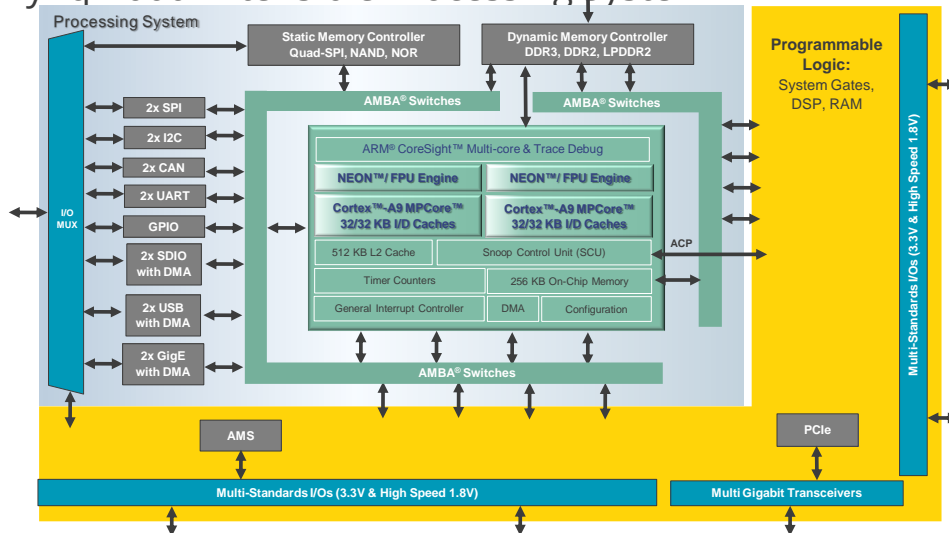


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Zynq-7000 Extensible Processing System

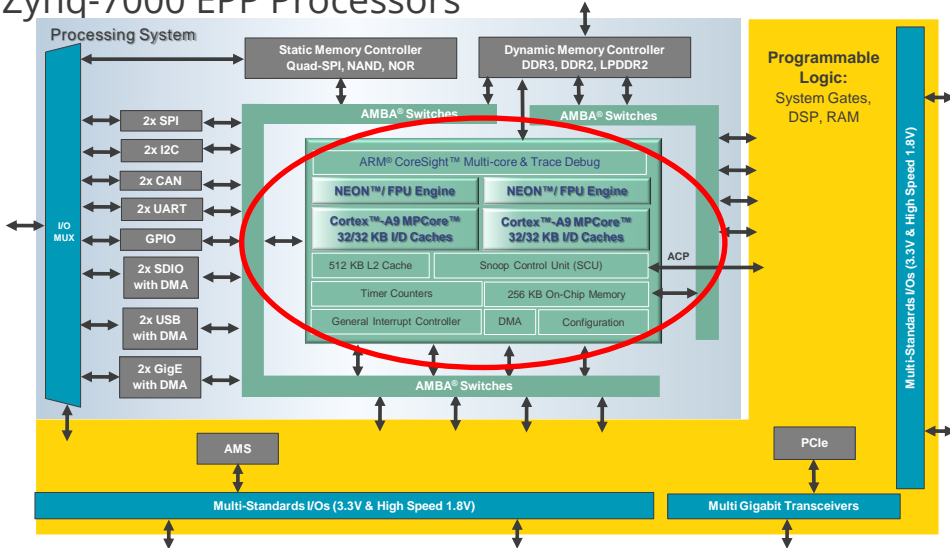


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Zynq-7000 EPP Processors

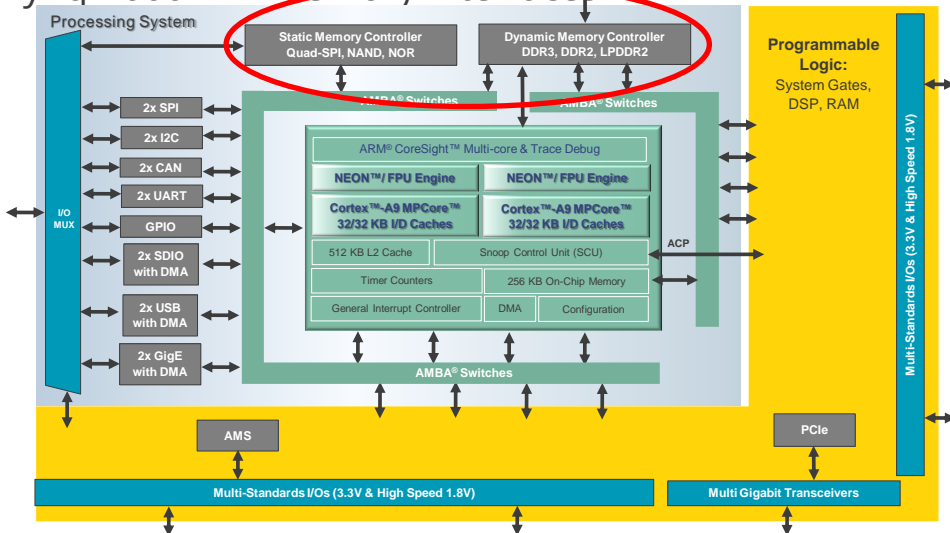


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Zynq-7000 EPP Memory Interfaces

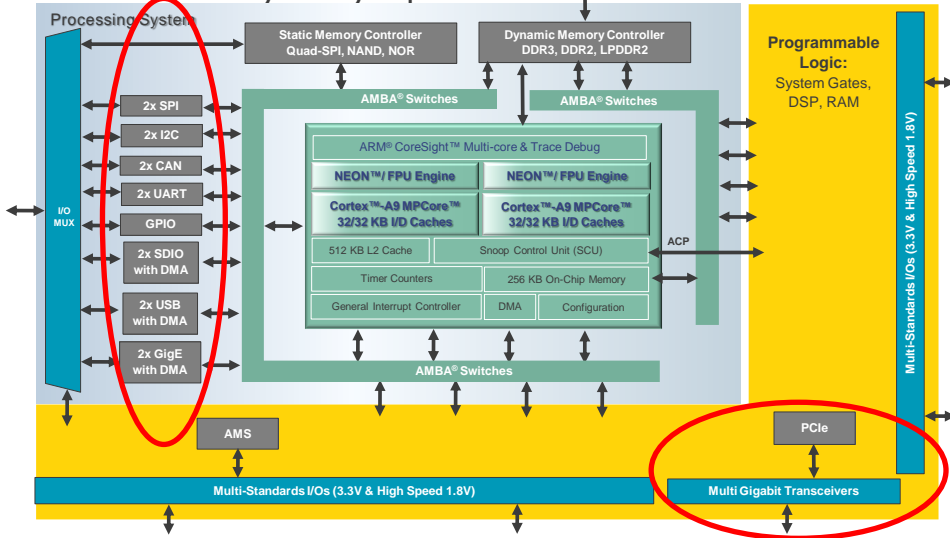


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I/O Connectivity in Zynq-7000 EPP

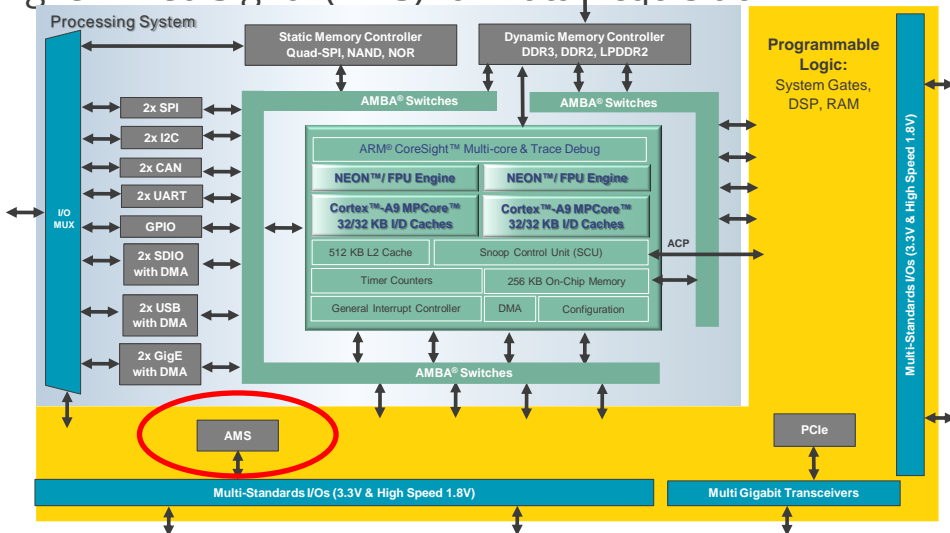


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Agile Mixed Signal (AMS) for Data Acquisition

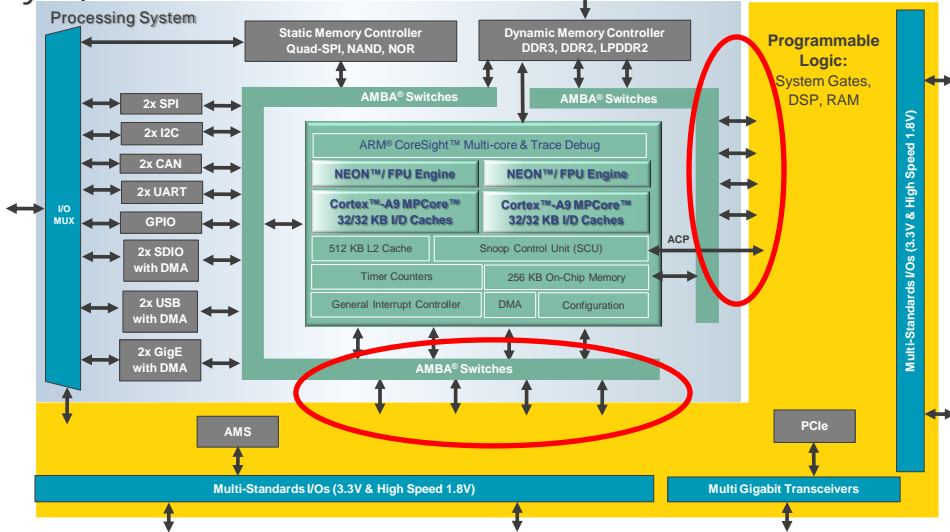


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Zynq-7000 Hardware / Software Interfaces



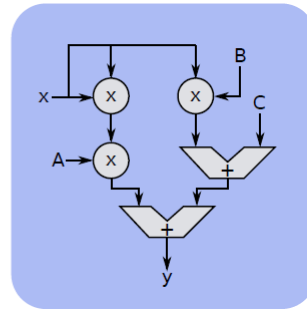
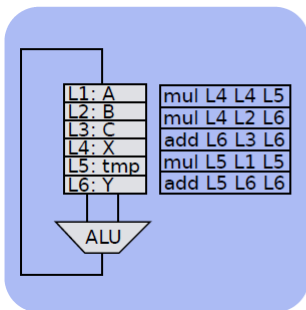
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Courtesy Xilinx

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Hardware vs. Software

- Sequential Processing with CPU
- C, C++ Program
- Parallel Processing with Logic Gates
- VHDL, Verilog "Program"



Courtesy: Dr. Andre DeHon, UPenn

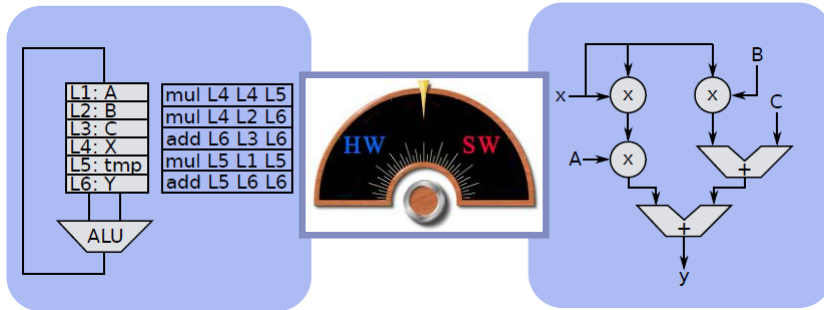
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Put the Burdon Where It Belongs

- Extensible Processing Platforms
- Allow optimum system partitioning between software and hardware
- Build configurable systems that match your application!



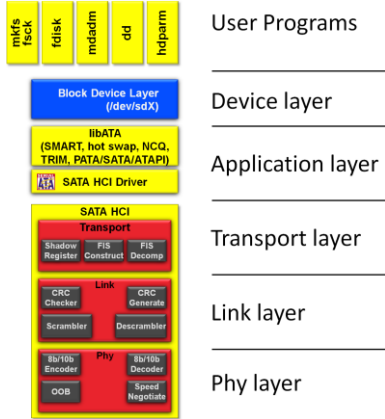
Courtesy: Dr. Andre DeHon, UPenn

The Challenge of Building Your Own ASSP Is to Get the Right Compute Architecture!

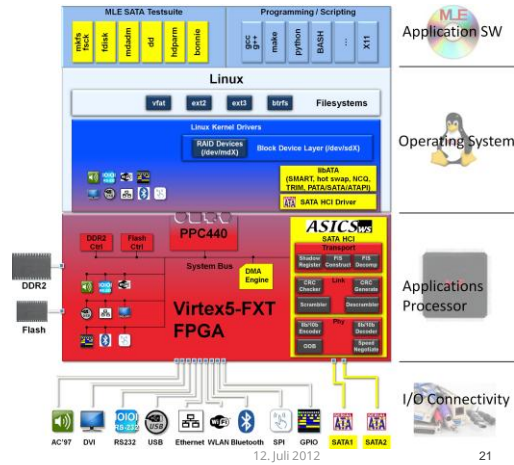


Build Your Own ASSP: Serial ATA Example

- SATA is a complete system stack with hardware and software

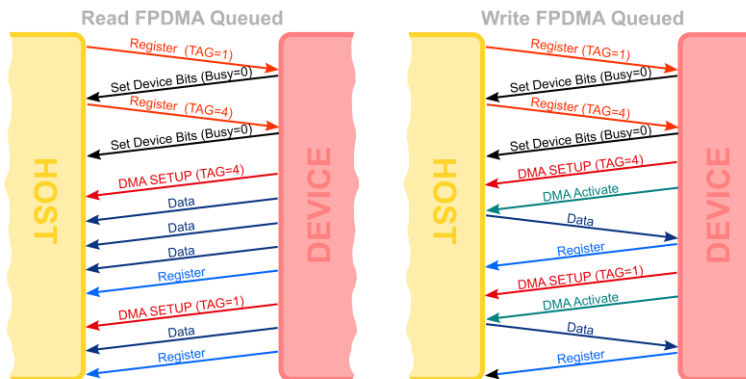


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Challenge in HW/SW Co-Design for SATA is: Make Performance, Use NCQ and FPDMA

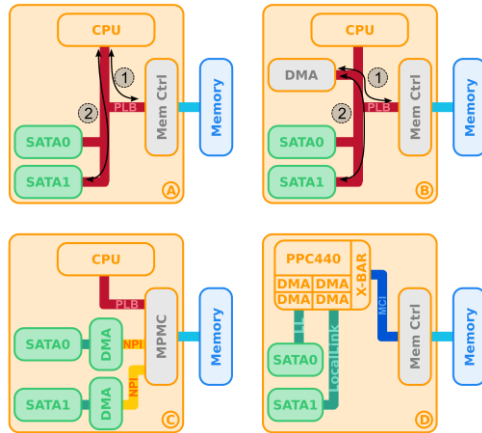


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Architectural Choices for SATA

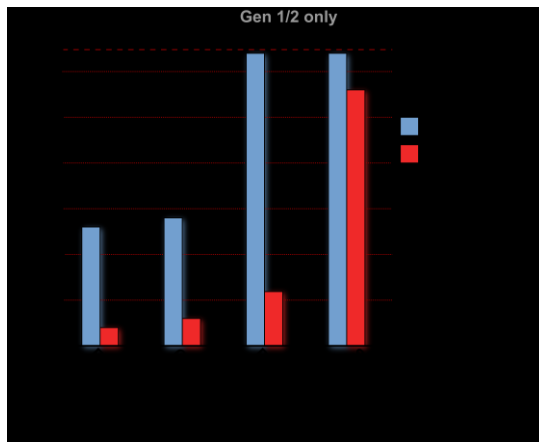


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Performance Aspects of HW/SW Partitioning



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References

- "Building a Better Crypto-Engine – The Programmable Way", Xilinx XCELL Magazin Issue 72
- "SATA Connectivity Solutions for Xilinx FPGAs", ASICS.WS and MLE Whitepaper, ChipEstimate.com
- "Multicore and Real-time – Making It Work", Glenn Steiner (Xilinx), Endric Schubert (MLE), Embedded Systems Conference Boston, 2011
- "Managing Latency and Bandwidth in HW/SW Co-Processing", Endric Schubert, Embedded World Conference, 2012

ASSPs selber bauen: Zynq machts möglich

Dr. Endric Schubert
Missing Link Electronics
Marlene-Dietrich-Straße 5
89231 Neu-Ulm

www.missinglinkelectronics.com
Tel: +49 (731) 141-149-0

