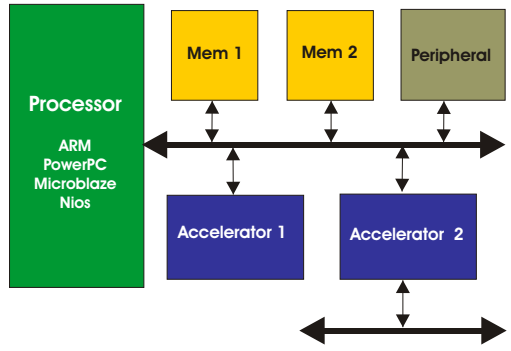
POSEIDON Design Systems

Triton Builder™

Hardware Accelerator Synthesis Tool

Triton Builder is a design automation tool that synthesizes application specific hardware accelerators. With the use of Triton Builder, system designers achieve lower power dissipation and obtain dramatic performance improvements for processor-based platforms. The tool is optimized for audio, video, VoIP, imaging, wireless, storage, and security devices.

Many current processor-based platforms are inadequate to satisfy the demands of the increasing complexity and real time performance constraints of embedded systems. Builder is a tool that improves the performance of existing platforms through hardware acceleration. The elimination of manual effort for RTL generation will also result in reducing design risk and hardware design cycle.



Typical System with Hardware Accelerator for optimum operation

Builder Design Flow

The Builder flow begins by profiling the application co-simulated with the system hardware. The tool identifies the computational bottlenecks at both the loop and function levels. These candidates for acceleration are presented to the user along with their performance statistics, which aids the user in selecting the hardware generation to meet the system performance goals.

The user controls the selection of the desired routines for acceleration. The Builder tool creates efficient RTL and transactional model of the new hardware accelerator for each selected task. The tool also generates all of the required drivers and source modifications to utilize the new hardware. By automating the generation of "application-specific" accelerators, Builder provides orders of magnitude improvement in performance and design cycle.

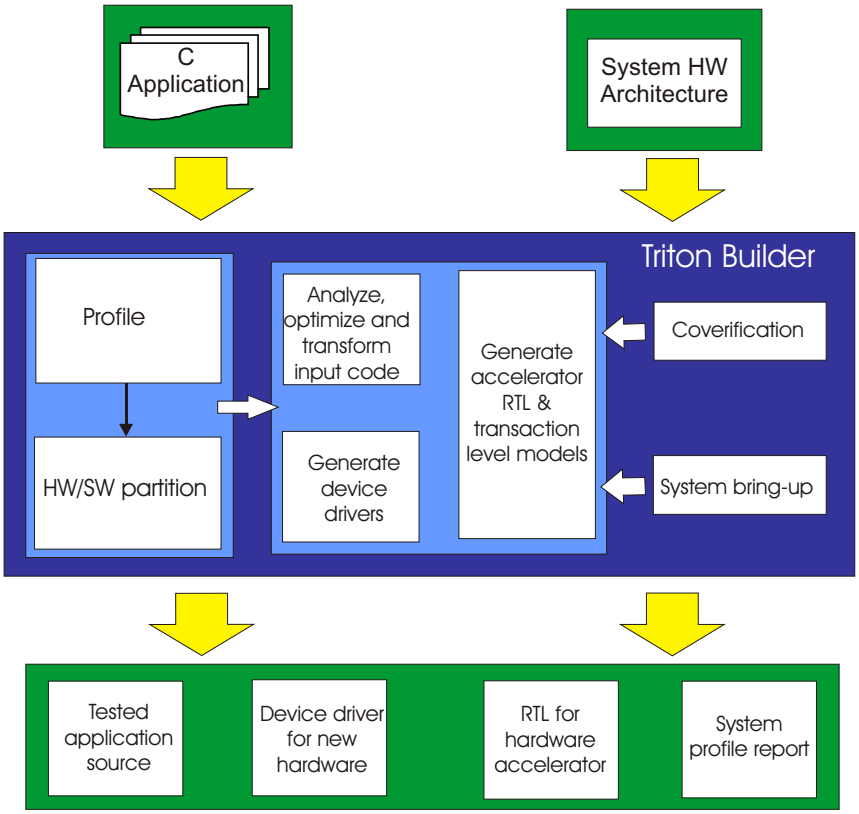
Innovative Technology

While there are many design challenges in creating custom hardware accelerators two of the key issues are:
1) identifying the functionality of critical algorithms which need to be accelerated; 2) creating efficient communication interfaces to get the data into and out of the custom hardware. Poseidon has developed key technologies in both areas to create the most effective solution in the marketplace.

Key Features of Builder

- Synthesizes application specific hardware accelerators directly from standard ANSI C
- Profiles application to identify candidates for hardware implementation
- Generates efficient RTL for new hardware accelerator in either Verilog or VHDL
- Multiple accelerator communication options to meet system requirements
- Integrated environment using Triton Tuner to verify the accelerated system
- Automatic generation of test benches, drivers, and modified application code
- Optimizing precompiler - optimize source to generate more effective accelerator hardware
- Easy to use system bring-up features to ensure success and rapid verification

Triton Builder Design Flow



- Inputs source code and system description
- Analyzes source with optimizing precompiler
- Profiles and partitions application
- Generates Drivers, accelerator RTL, and C model
- Generates modified source
- Generates system bring-up support

Use Triton Builder to:

! Increase system performance by offloading processor intensive algorithms to hardware
! Speed up computational intensive algorithms up to 100X
! Decrease system power consumption
! Reduce system hardware development time by automating the accelerator synthesis process
! Reduce system software development time by automating the generation of device drivers and other hardware related software
! Accelerate system bring up and verification

Processors Platforms Supported - ARM, Microblaze™, PowerPC™, Nios II™

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