



# Hardware-Accelerated Computing Solutions

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*Software-to-hardware solutions*

Impulse Accelerated Technologies  
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# Impulse Software-to-FPGA Tools



## Program using standard C

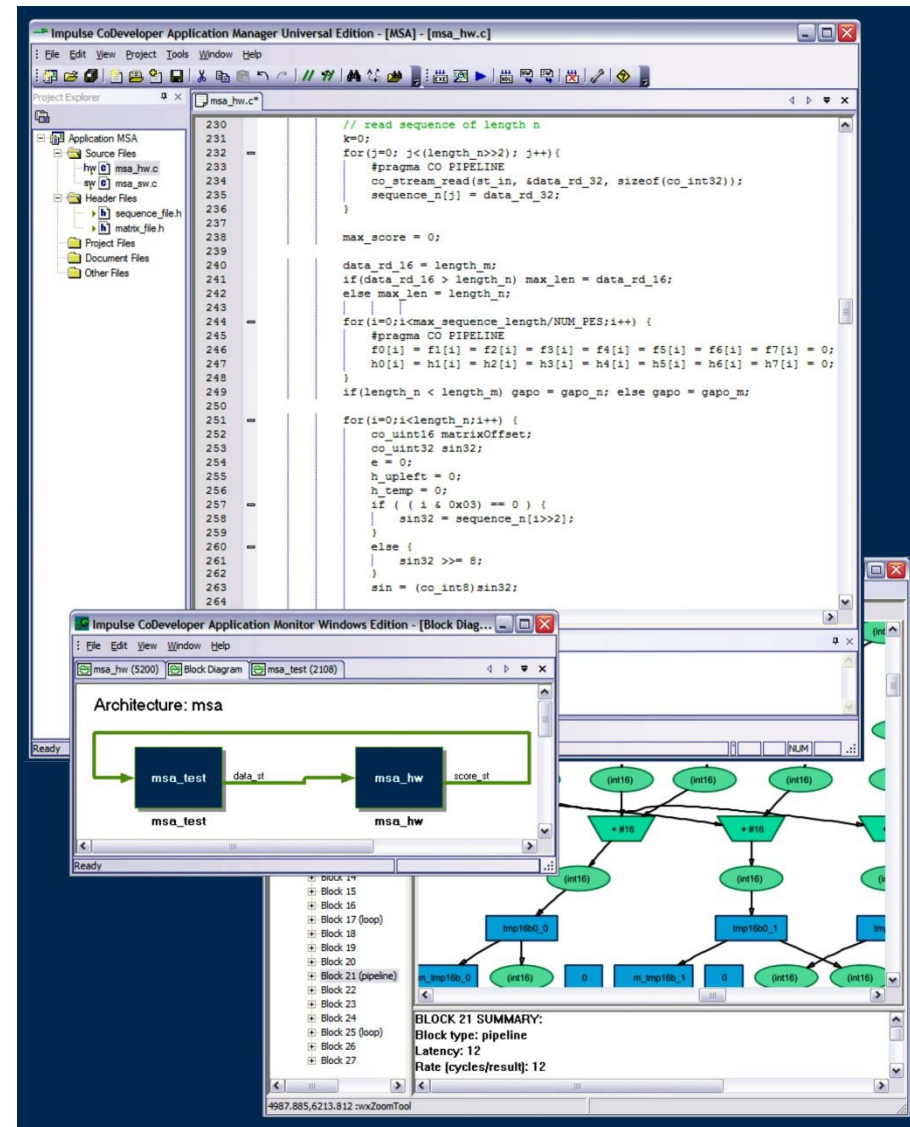
- ❑ Supports agile, software-oriented methods of FPGA programming
- ❑ Compatible with standard software tools including GCC and Visual Studio
- ❑ Compatible with HDL based design flows
- ❑ Compatible with a wide range of FPGA-based platforms

## Accelerate S/W applications

- ❑ Create FPGA hardware from C-language software
- ❑ Combine C-language with HDL and other methods

## Save time and money

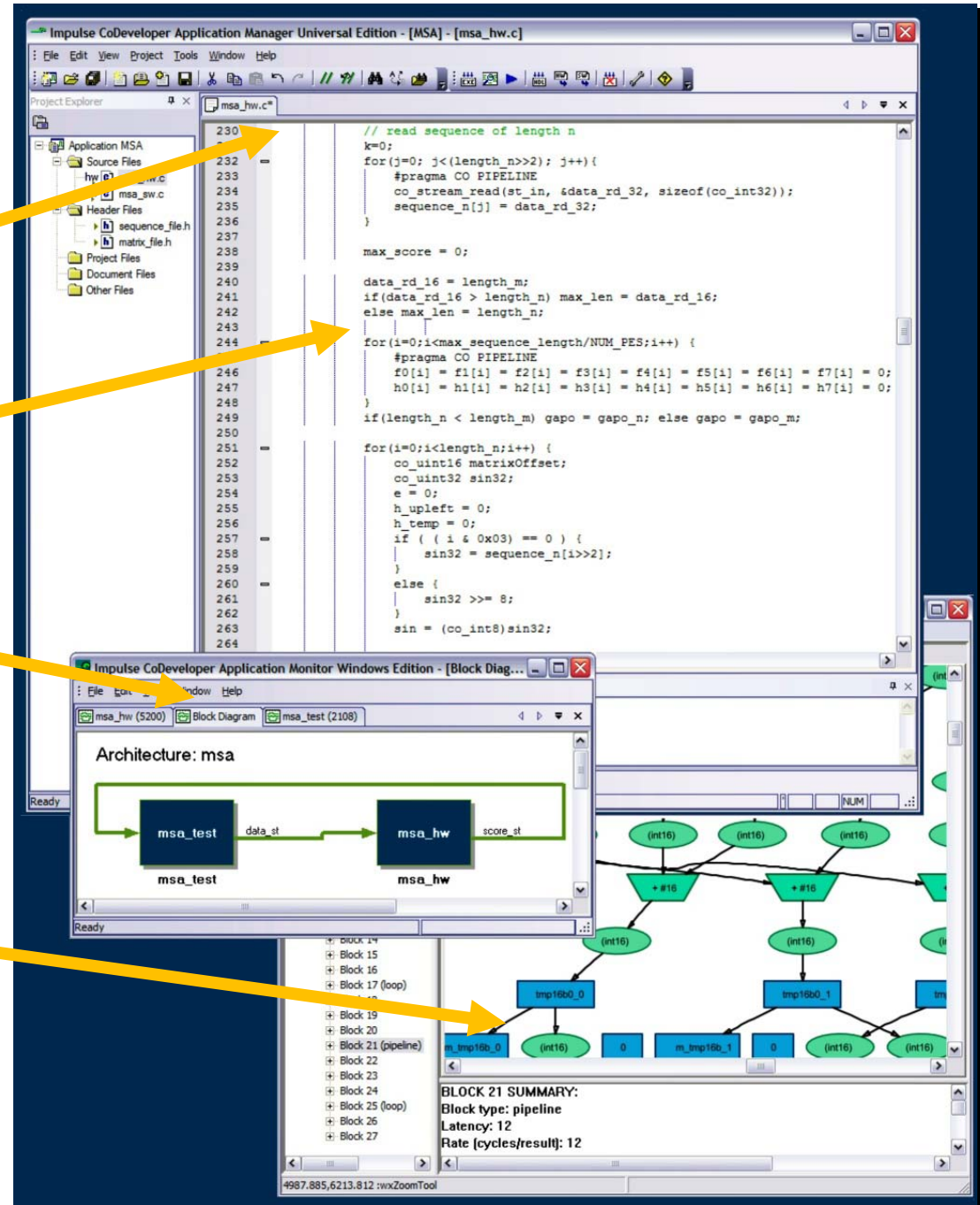
- ❑ Faster development time
- ❑ Faster applications



*Impulse CoDeveloper™*

# Impulse Flow

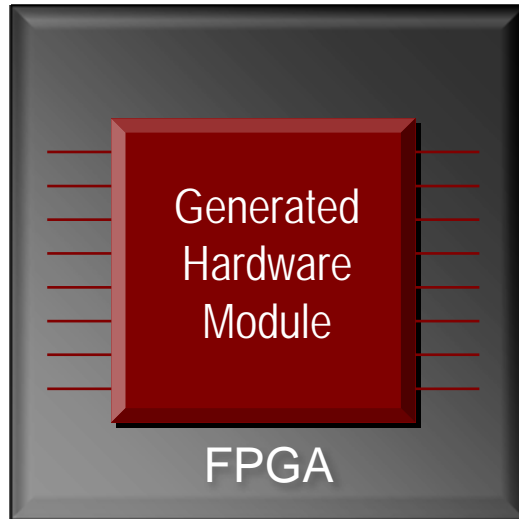
- ❑ Familiar IDE Interface
- ❑ Desktop simulation
  - ❑ Using standard C programming methods
- ❑ Dataflow analysis
  - ❑ Identify bottlenecks
- ❑ Graphical optimization analysis
  - ❑ Balance size and speed to meet performance goals



# Uses for Impulse C-to-FPGA

Usage

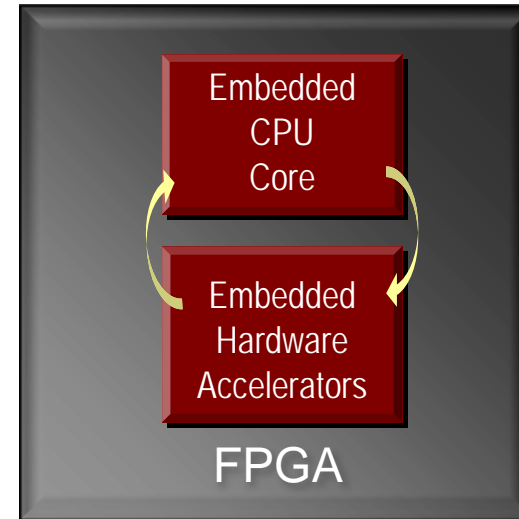
1



*Create a hardware module*

Usage

2

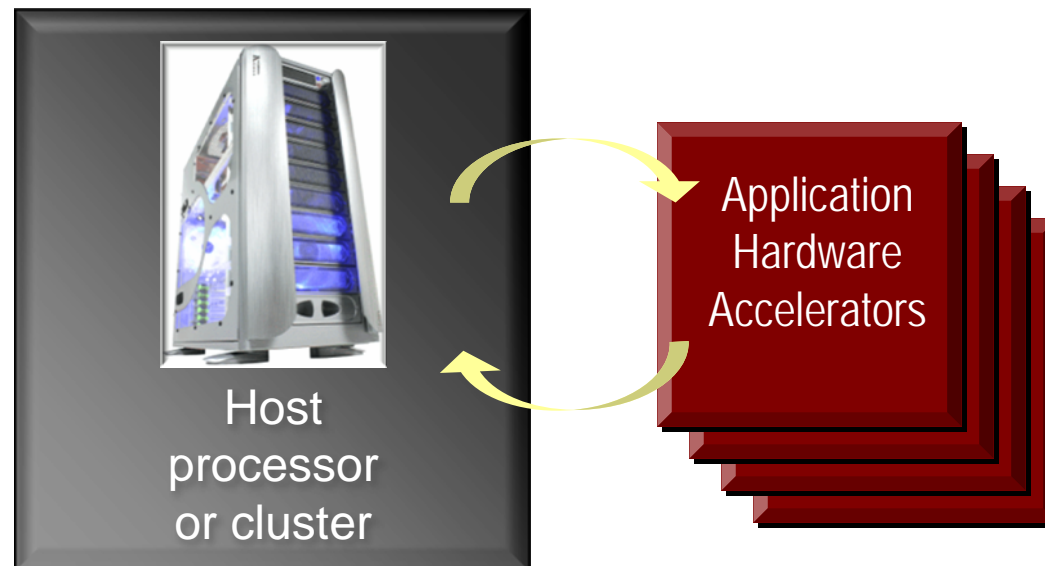


*Accelerate an embedded CPU*

Usage

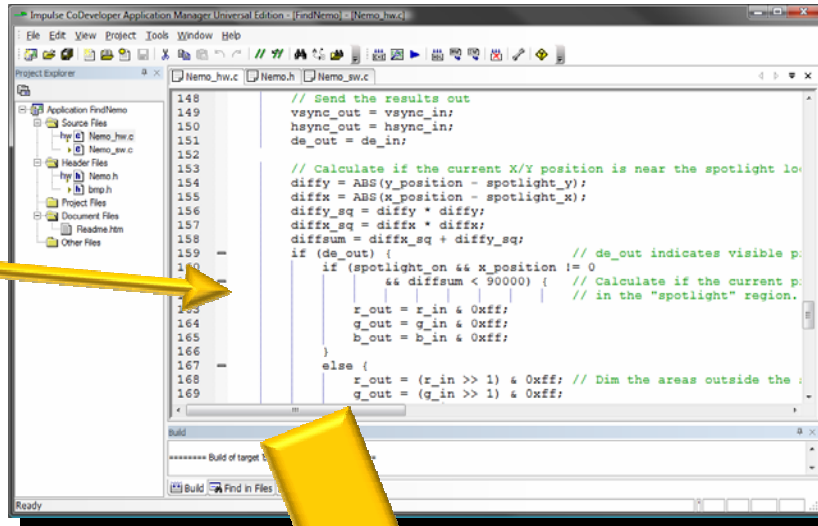
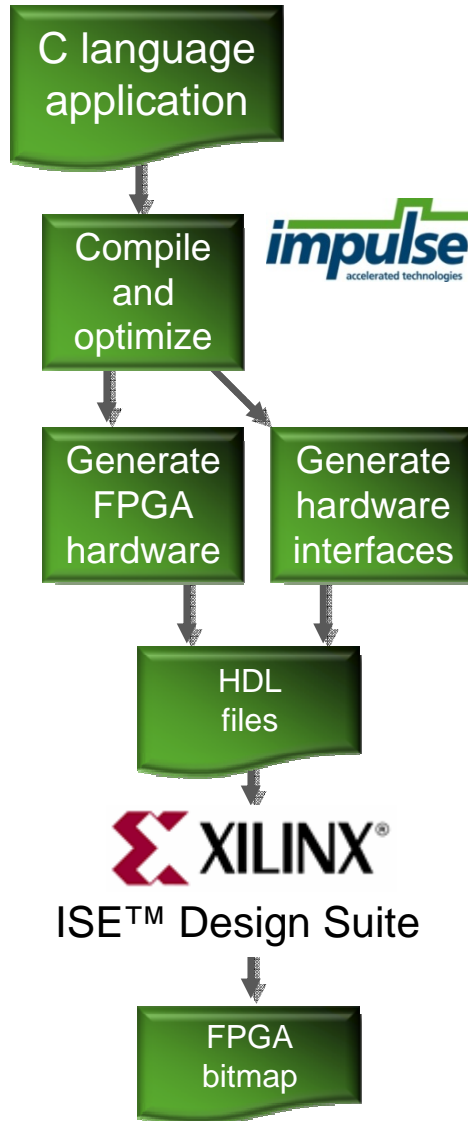
3

*Accelerate an external/host CPU*

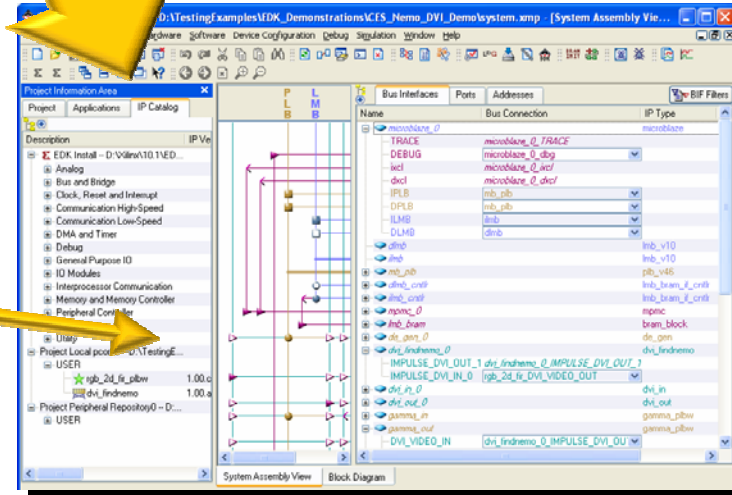


# Impulse Xilinx Design Flow

*Impulse CoDeveloper™*



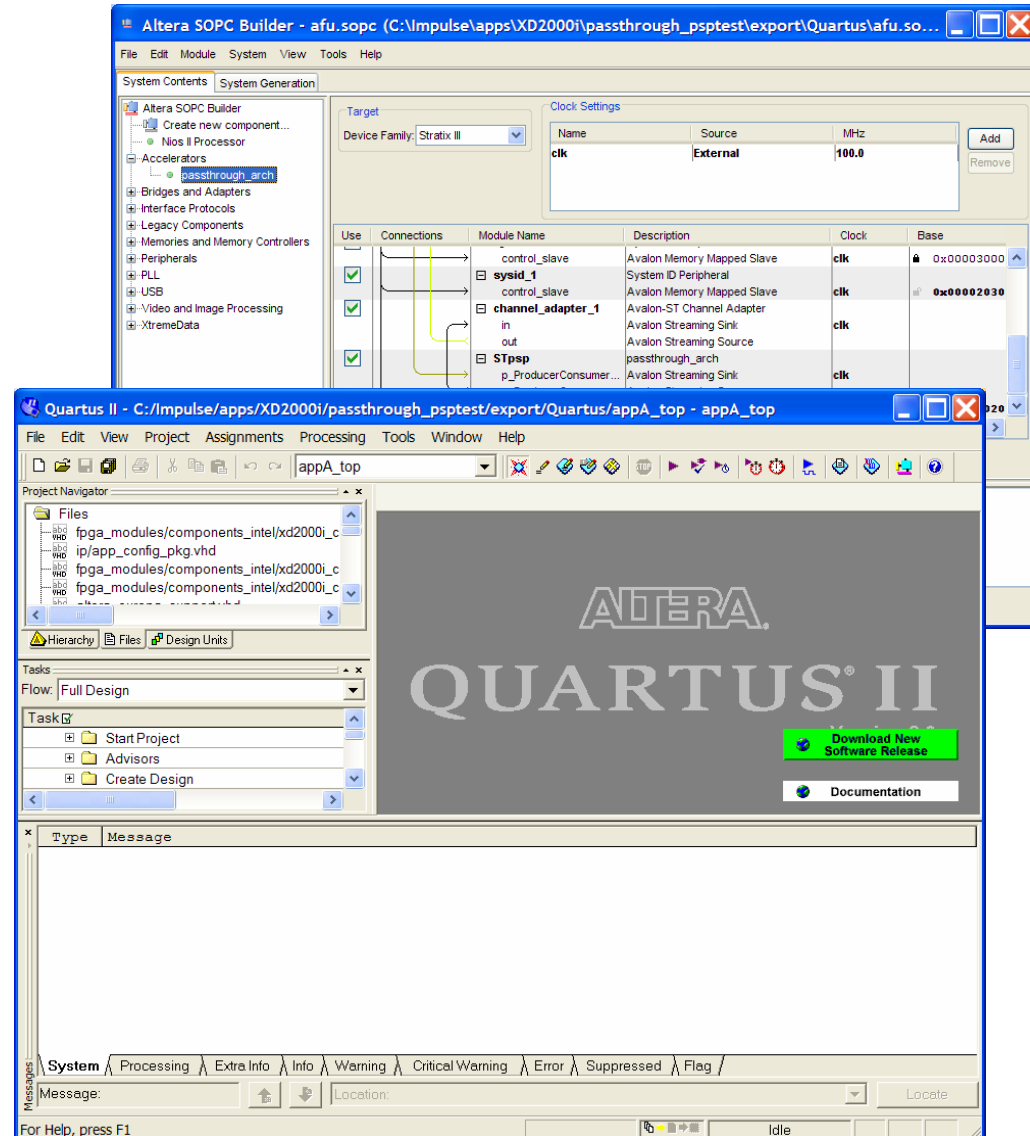
*Xilinx ISE™ Design Suite*



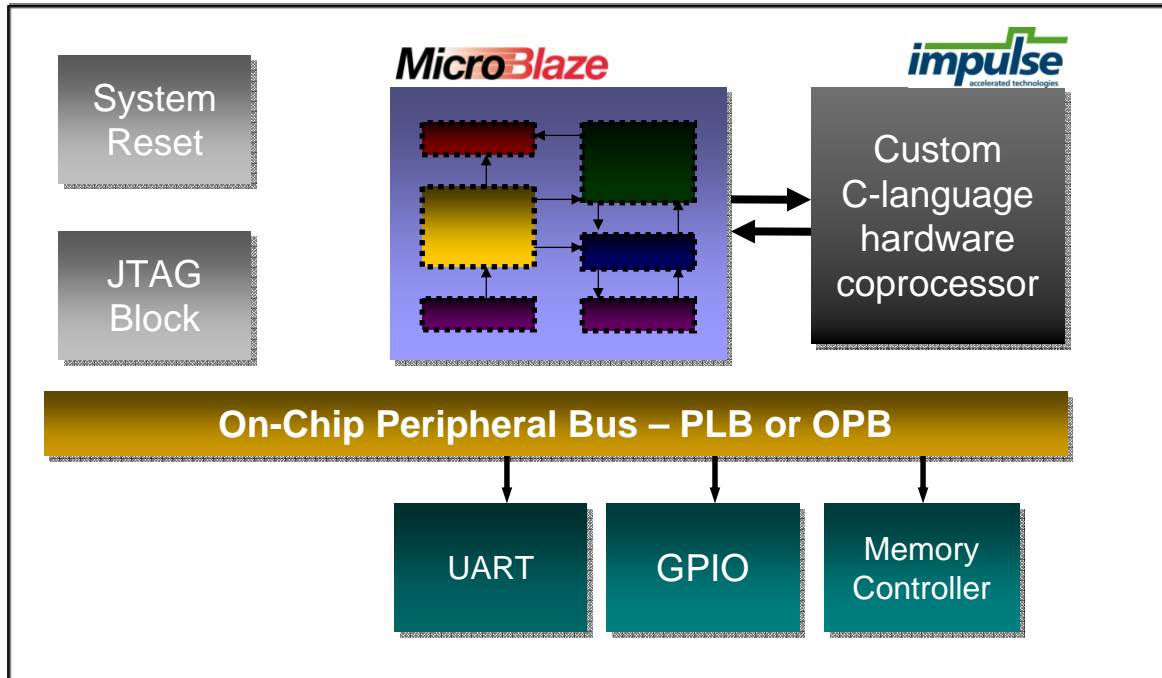


# Impulse Altera Design Flow

- ❑ Impulse C integrates with FPGA vendor tools
- ❑ SOPC Builder
- ❑ Quartus II
- ❑ Export Impulse C modules as IP cores
- ❑ Connect to Avalon



# Embedded Processor Acceleration



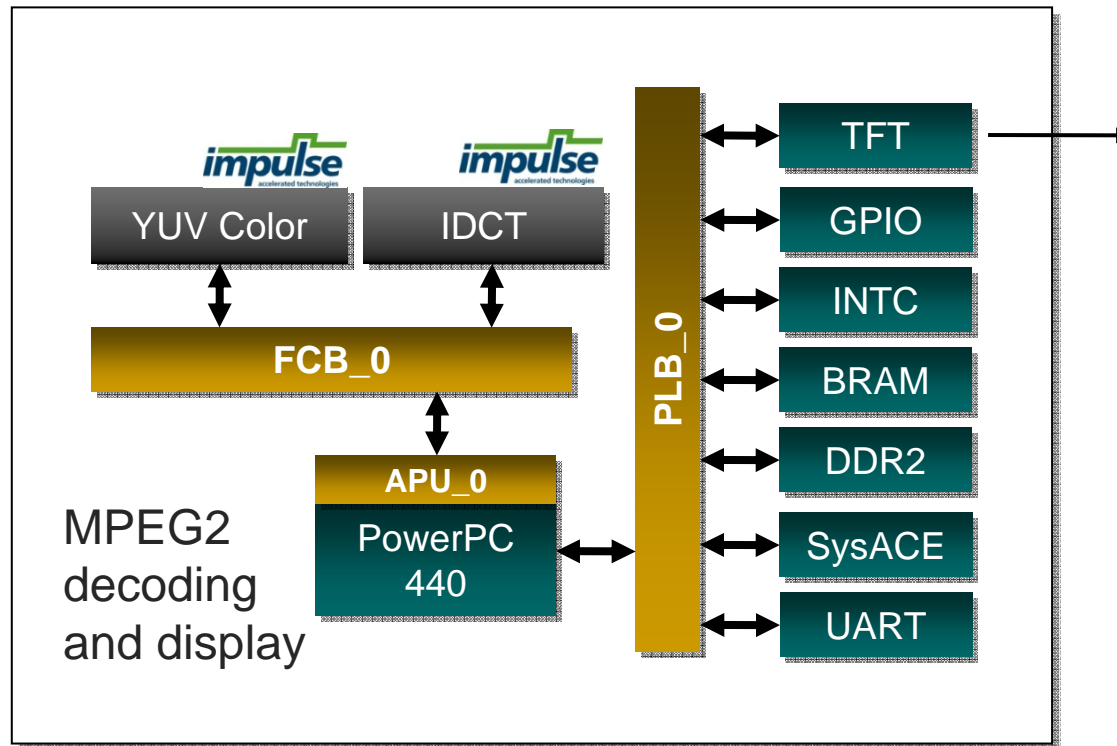
*DSP filter  
acceleration*



## Single-chip solution for accelerated DSP processing

- ☐ System integration using Xilinx Platform Studio™ or Altera SOPC Builder™
- ☐ DSP filter offloading results in over 100X acceleration over software-only version

# MPEG2 Acceleration Example



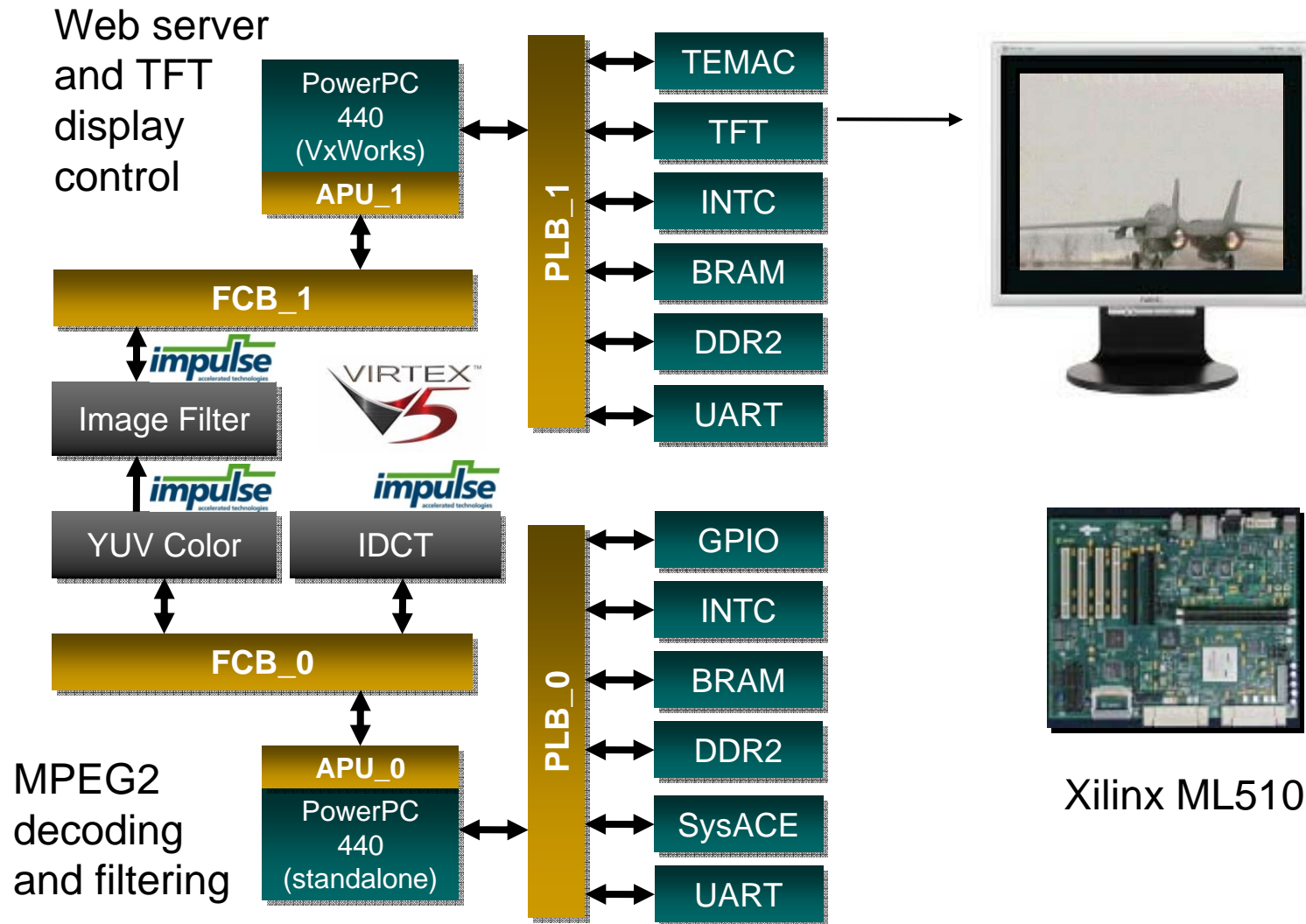
*Complete HW/SW system on a single FPGA device*



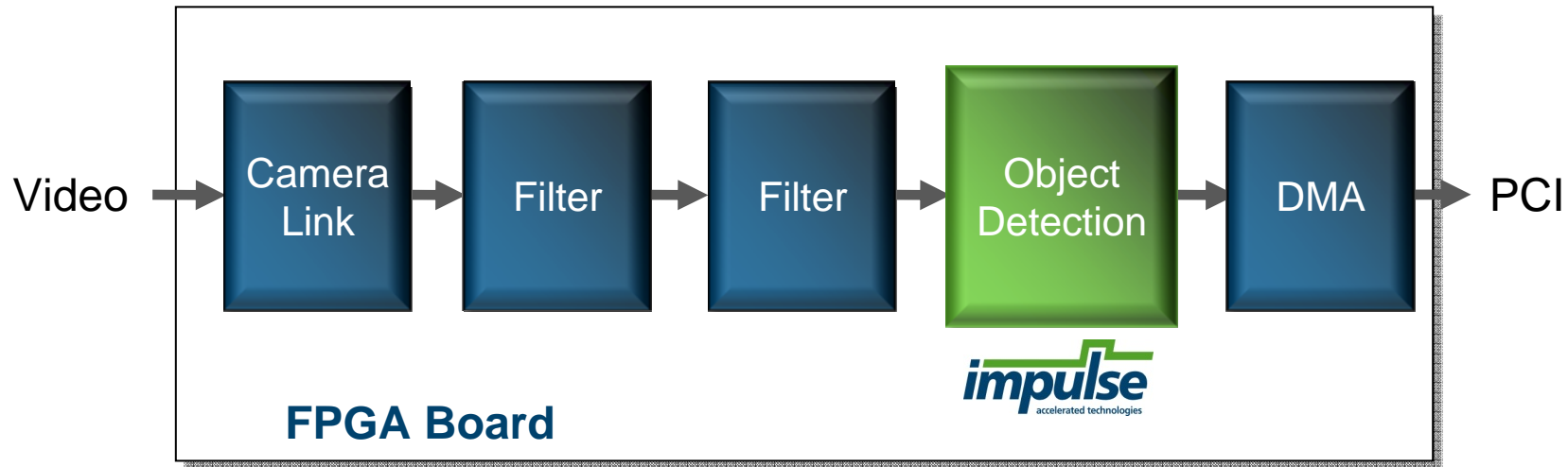
Xilinx ML507



# Multiprocessing MPEG2 Filtering



# CameraLink Streaming Example

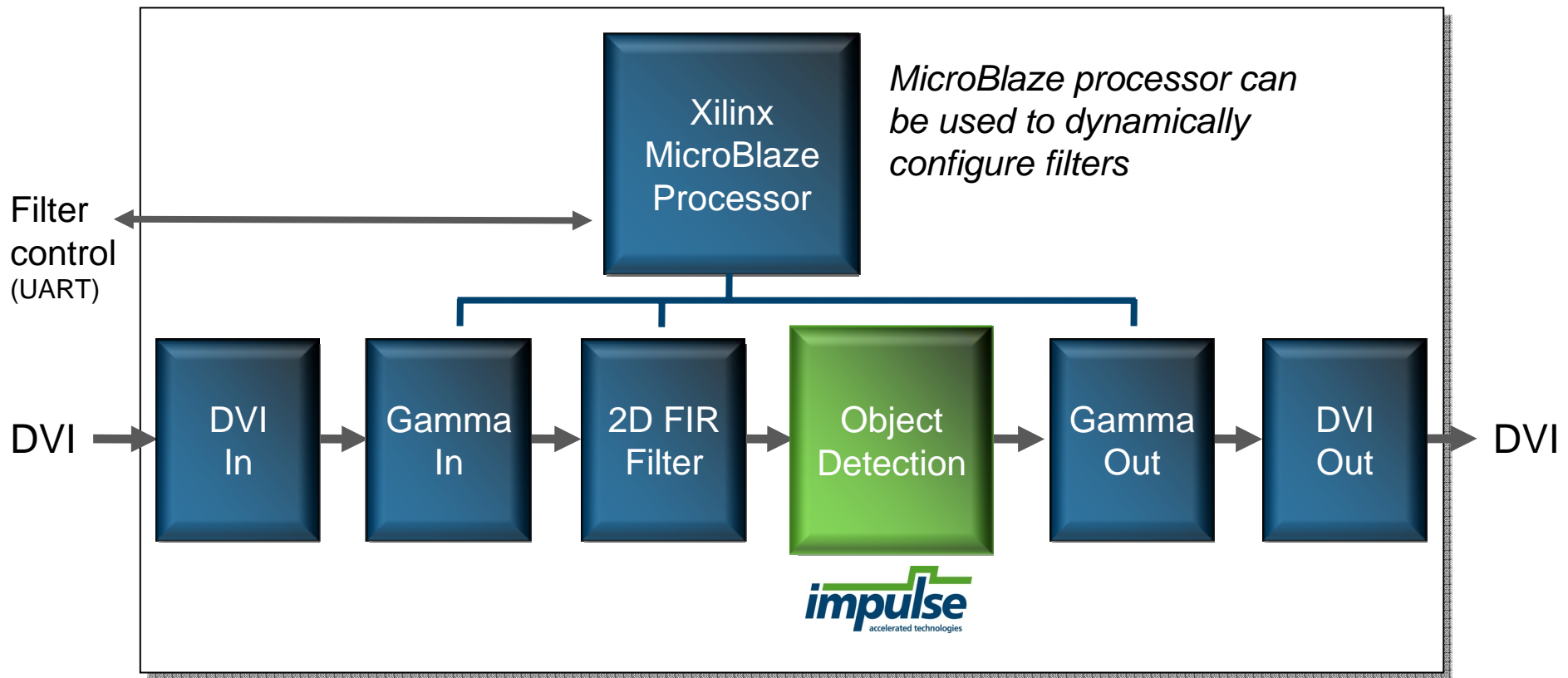


Single-chip solution for real-time video processing

- ☐ Based on off-the-shelf FPGA hardware platform
- ☐ Object detection and other non-common filters created using C-language and Impulse CoDeveloper C-to-FPGA compiler



# Streaming HD Video Example



## Single-chip solution for real-time video processing

- ❑ Gamma and FIR filtering created using System Generator
- ❑ Object detection created using C-language and Impulse CoDeveloper C-to-FPGA compiler

# Impulse Solutions

## We can provide a complete solution for software-to-FPGA development

- ❑ Impulse tools provide a software-oriented, highly productive method of design
- ❑ 3<sup>rd</sup>-party accelerator cards and modules provide high performance and deployment scalability
- ❑ Ready-to-run reference examples provide a fast path to success
- ❑ Training and custom design services are available – contact us for details

## For more information

- ❑ [www.ImpulseAccelerated.com](http://www.ImpulseAccelerated.com)

