



Test & Measurement ARCHITECTURES

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Test & Measurement Architectures

Keywords:

PXI: controller, chassis, modules, backplane

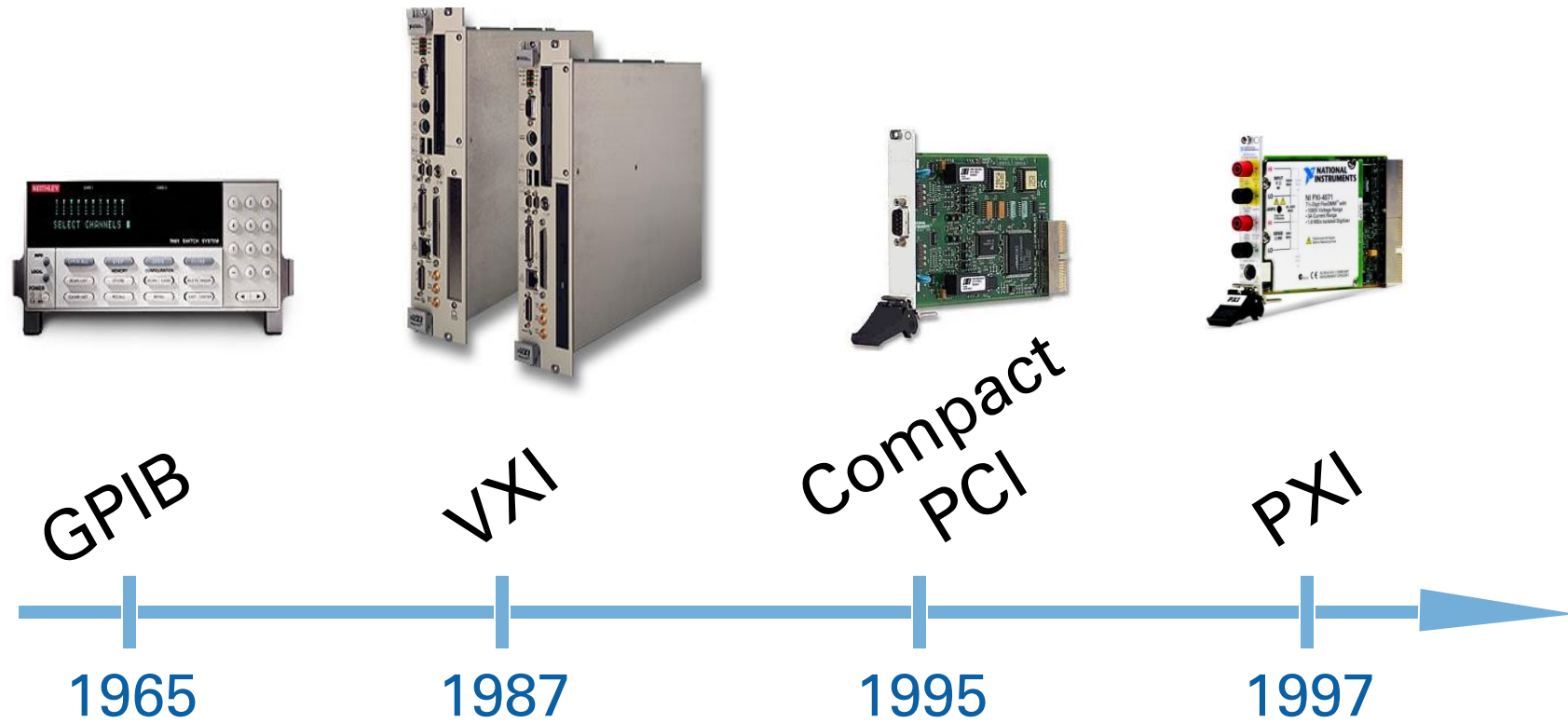
Latency & Bandwidth

Determinism: Real Time, hard, soft

FPGA: closed loop hard RT control, co-processor, in-line processing, sync

RIO into cRIO, PXI, Instruments, FlexRIO

Instrumentation Timeline



PXI Combines Standard Technologies

Controller

- Embedded PC or remote PC / laptop interface
- Runs all standard software

Chassis

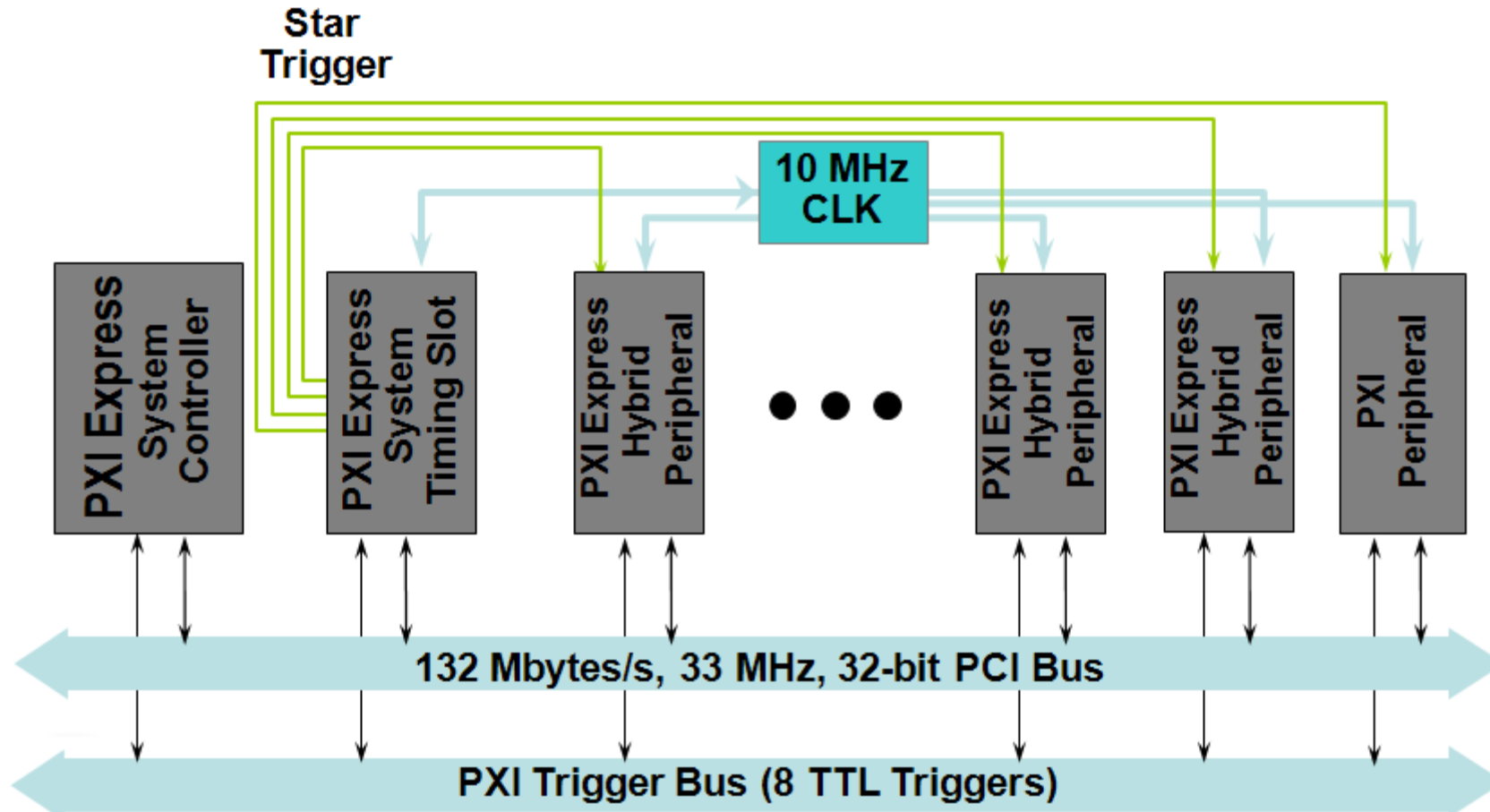
PXI Backplane

- PCI bus
- Timing and Synchronization

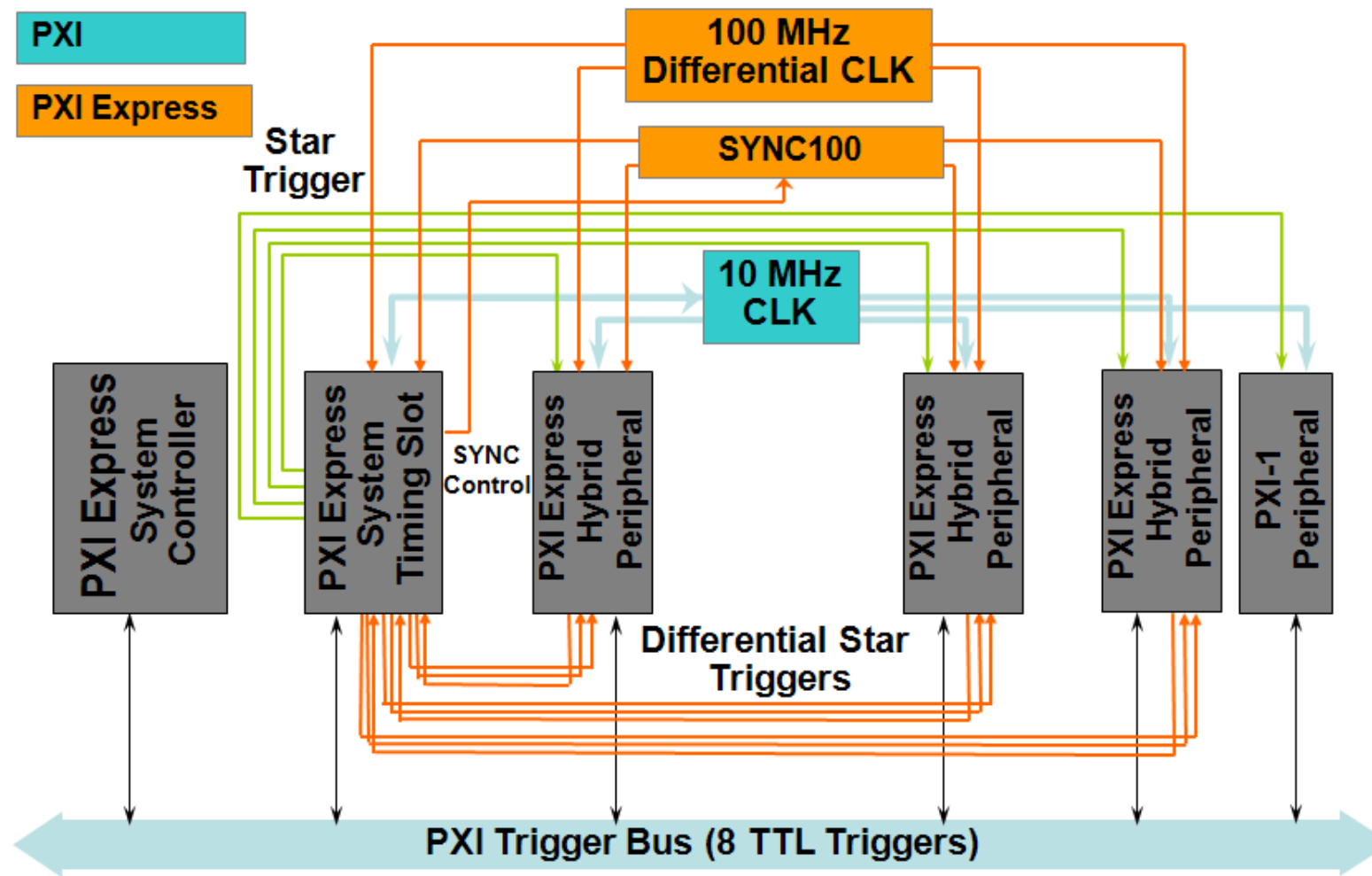
Peripheral Modules



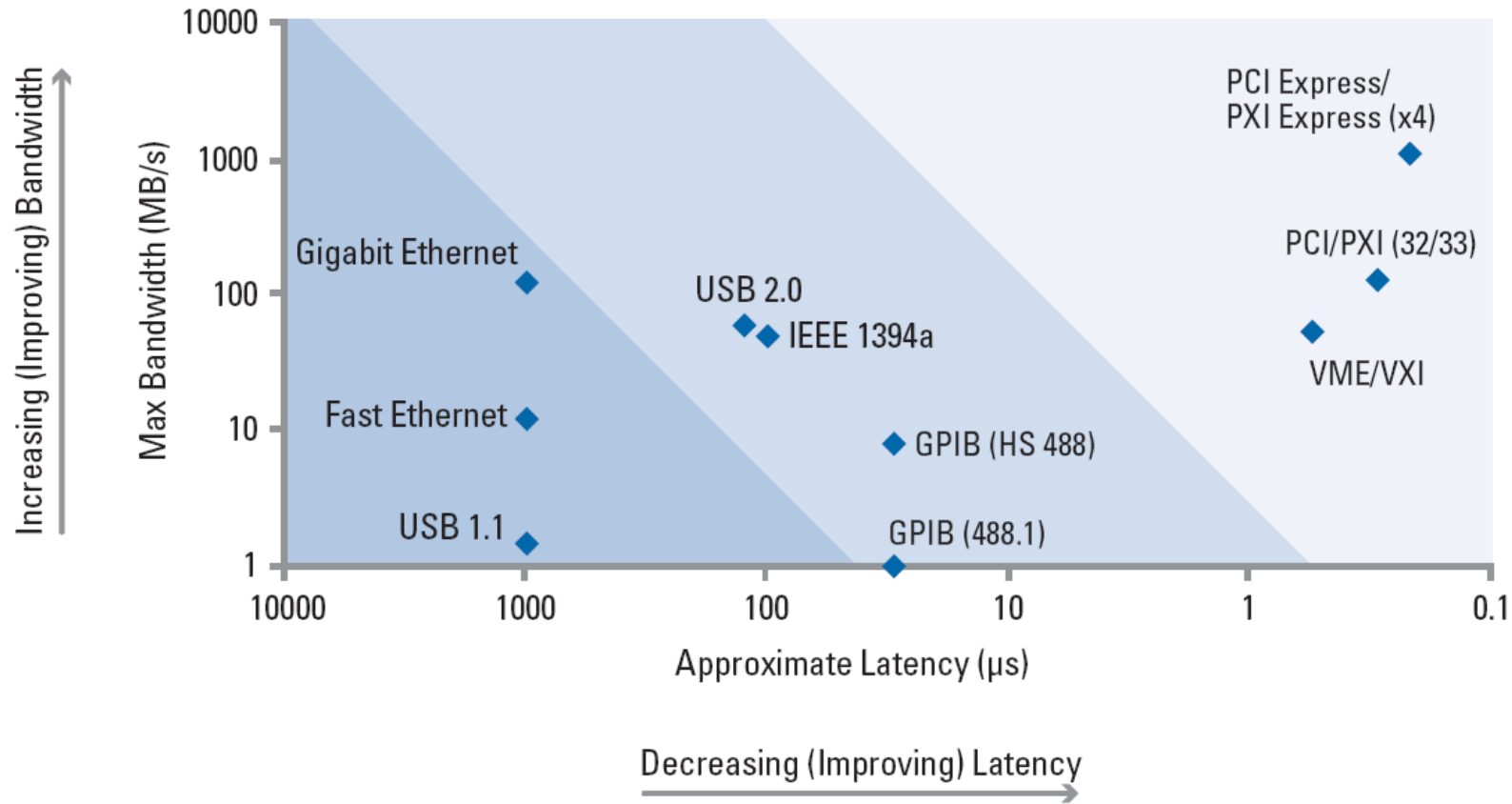
PXI Timing and Synchronization Architecture



PXIe Timing and Synchronization Architecture



Latency versus Bandwidth

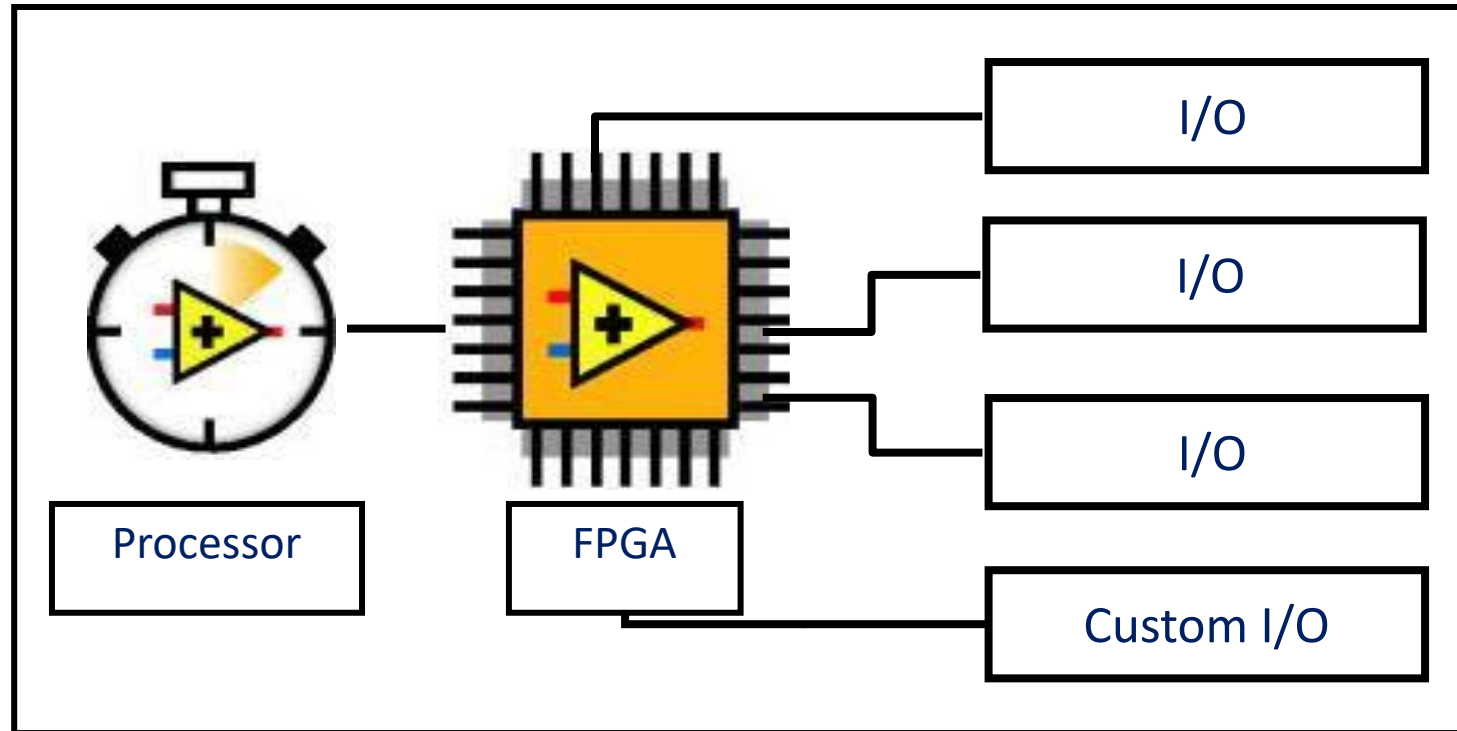


What Is Real-Time?

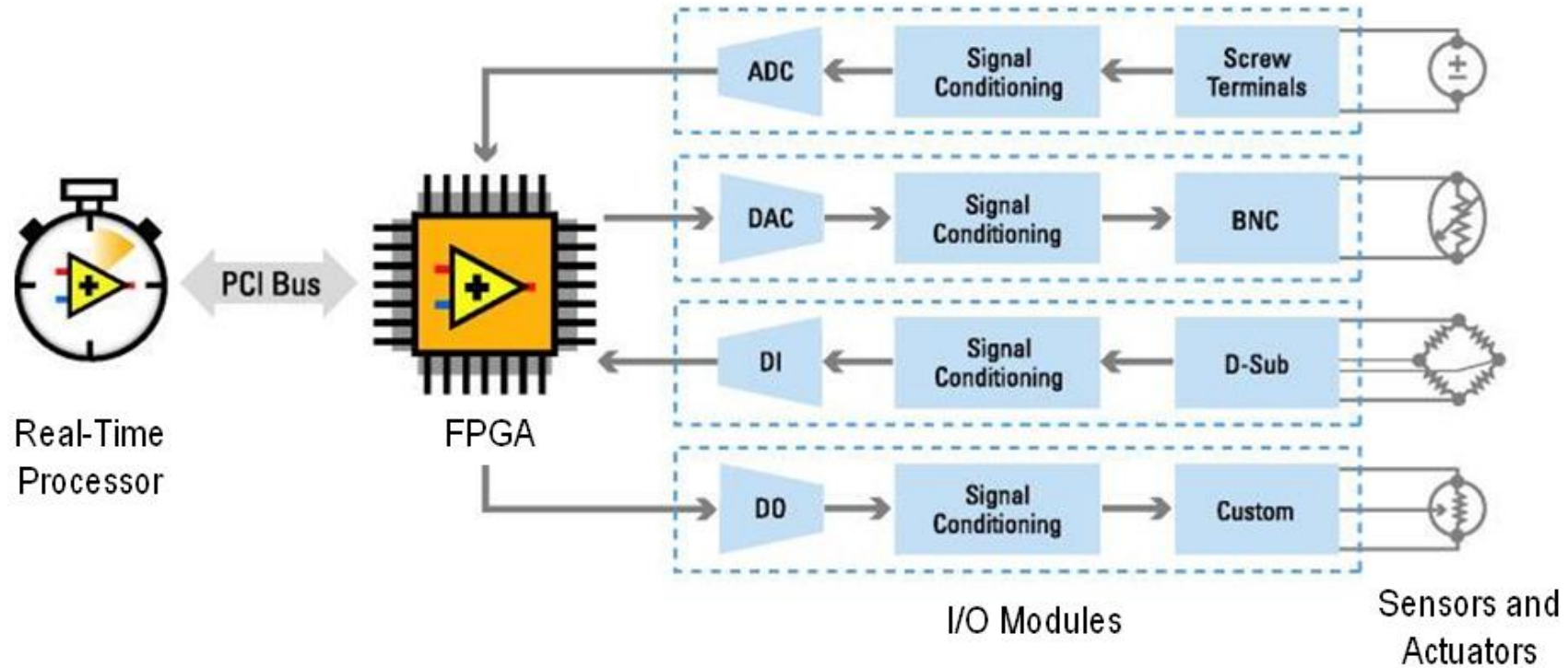
- Deterministic response
 - Ability to perform an operation within a fixed time
- Increased reliability
- Embedded operation



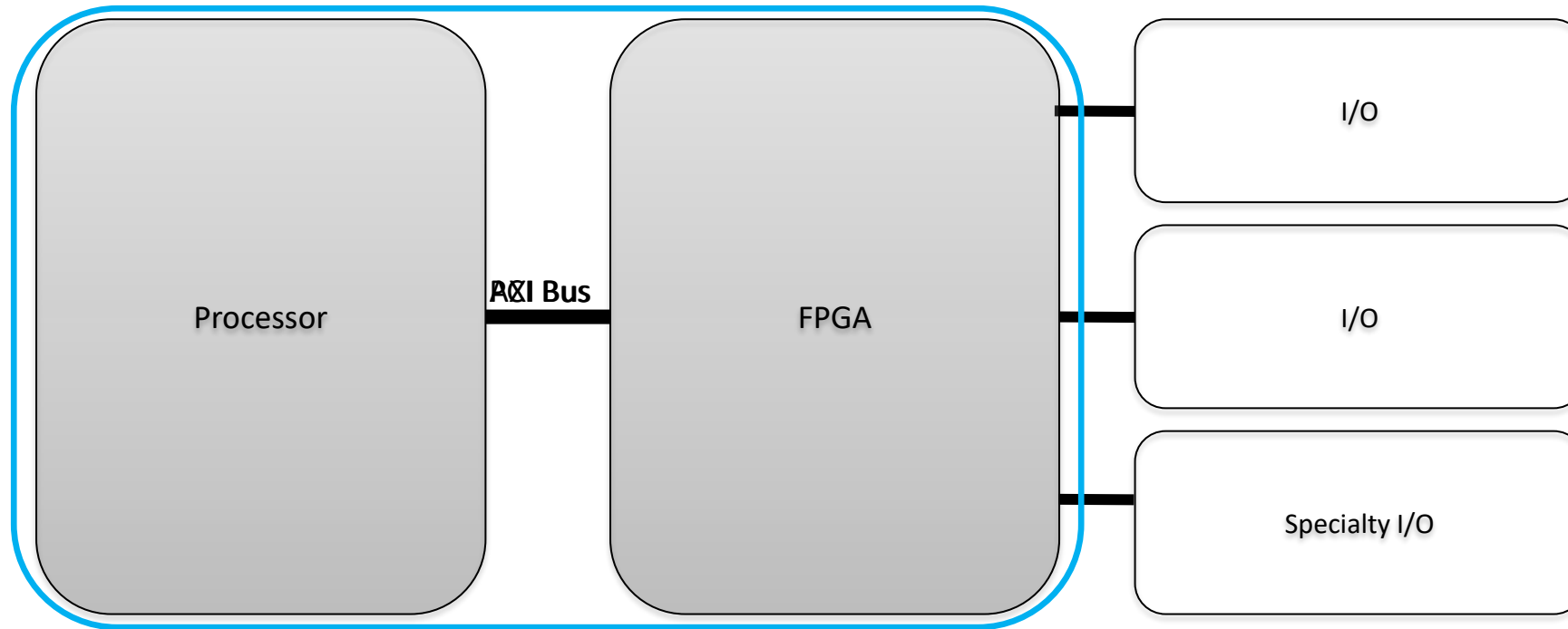
NI RIO Architecture



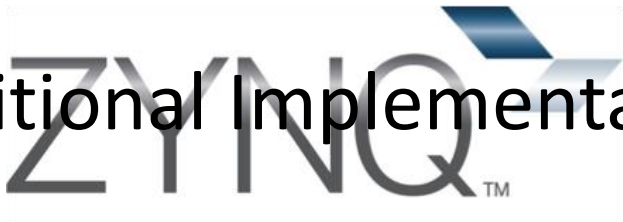
NI RIO Architecture



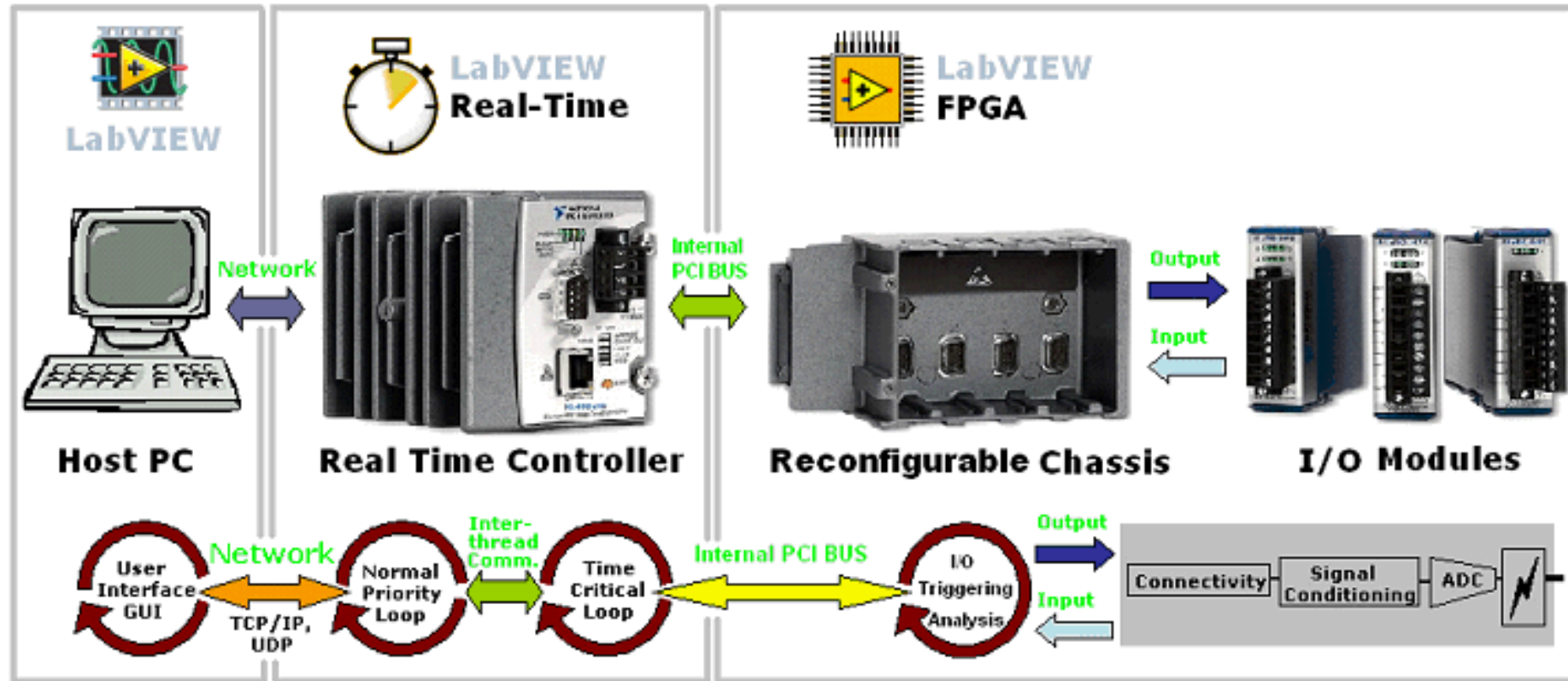
What is Zynq?



Traditional Implementation

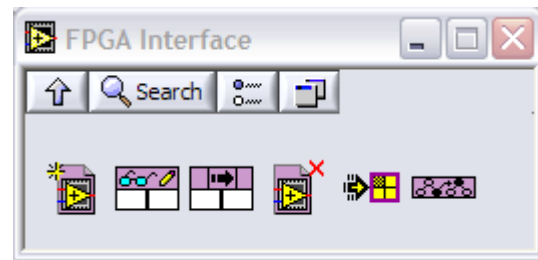
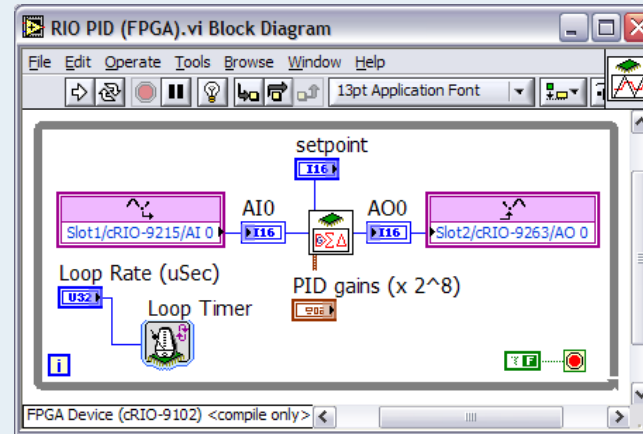
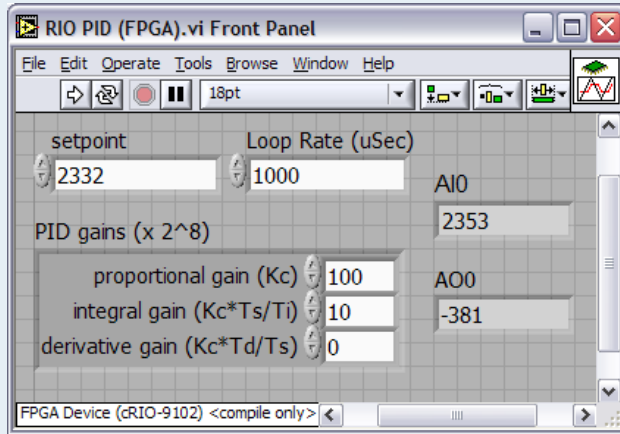


NI CompactRIO hw&sw Architecture

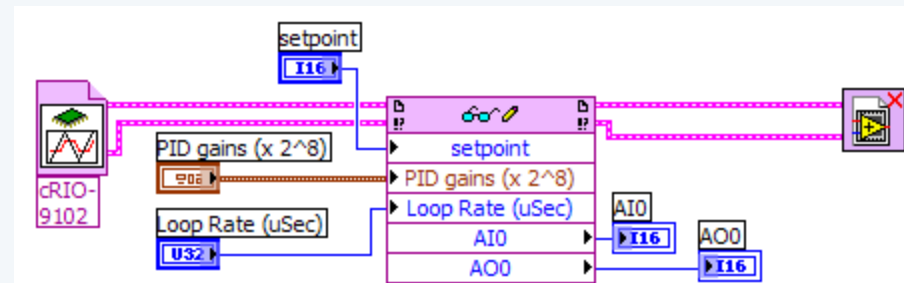


NI LabVIEW FPGA and Host development

FPGA VI

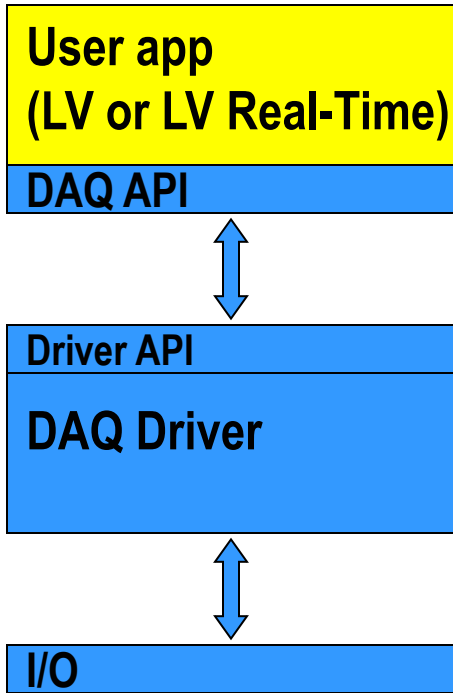


Host VI



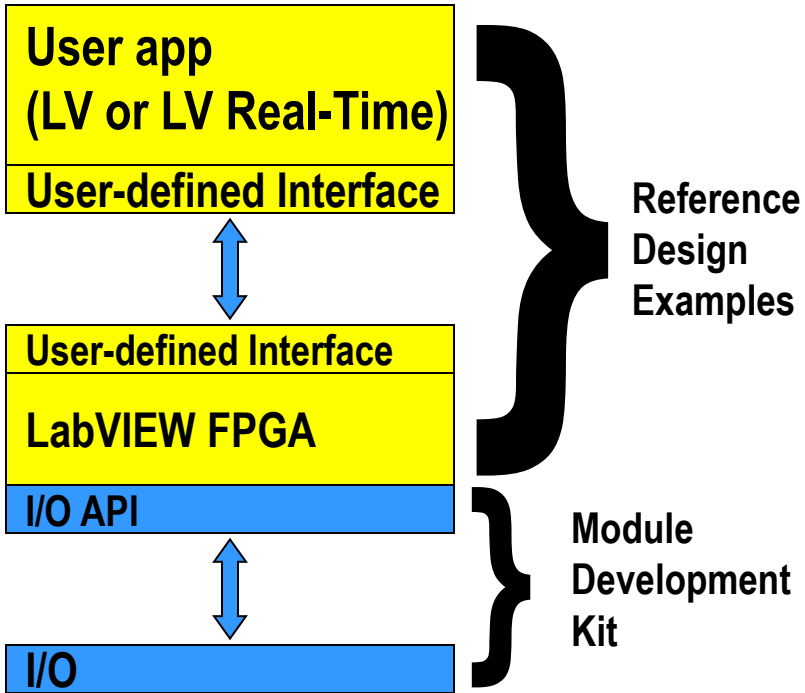
Driver Paradigm

NI-DAQmx driver:

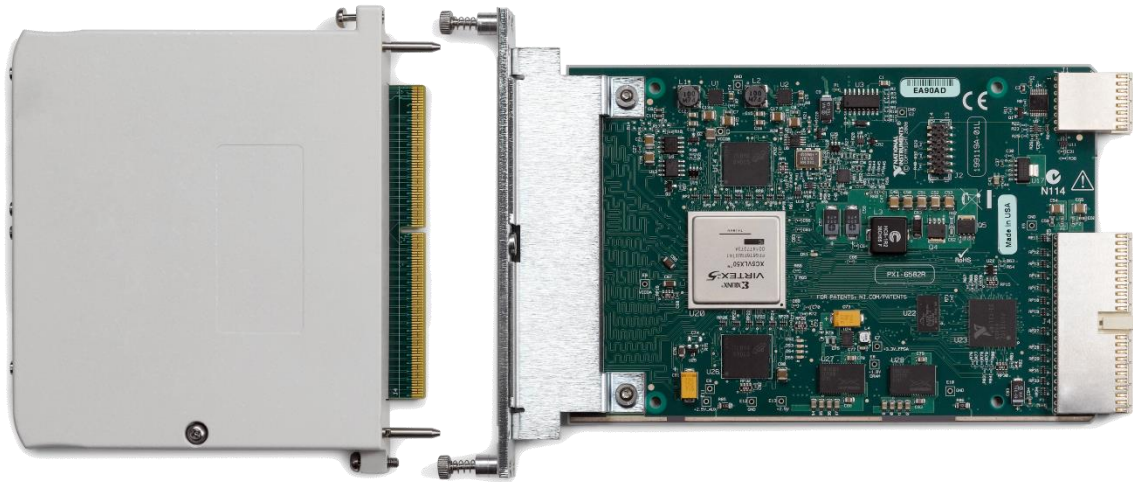


 User-defined
 Vendor-defined

CompactRIO driver:



NI FlexRIO System Architecture



NI FlexRIO Adapter Module

NI FlexRIO FPGA Module



PXI Platform



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QUESTIONS ?

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