OpenPOWER™

The CAPI SNAP Framework Deep Dive

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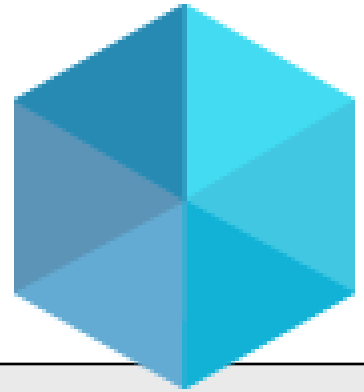
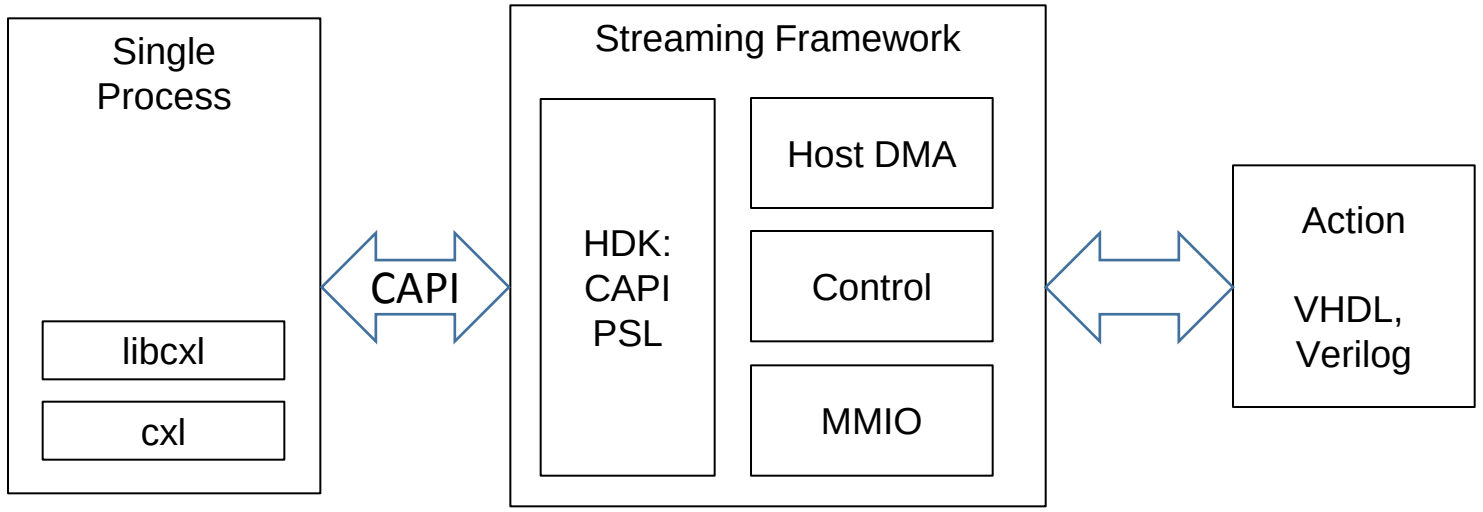


CAPI SNAP Framework Motivations

SNAP = Storage, **N**etworking, and **A**nalytics **P**rogramming

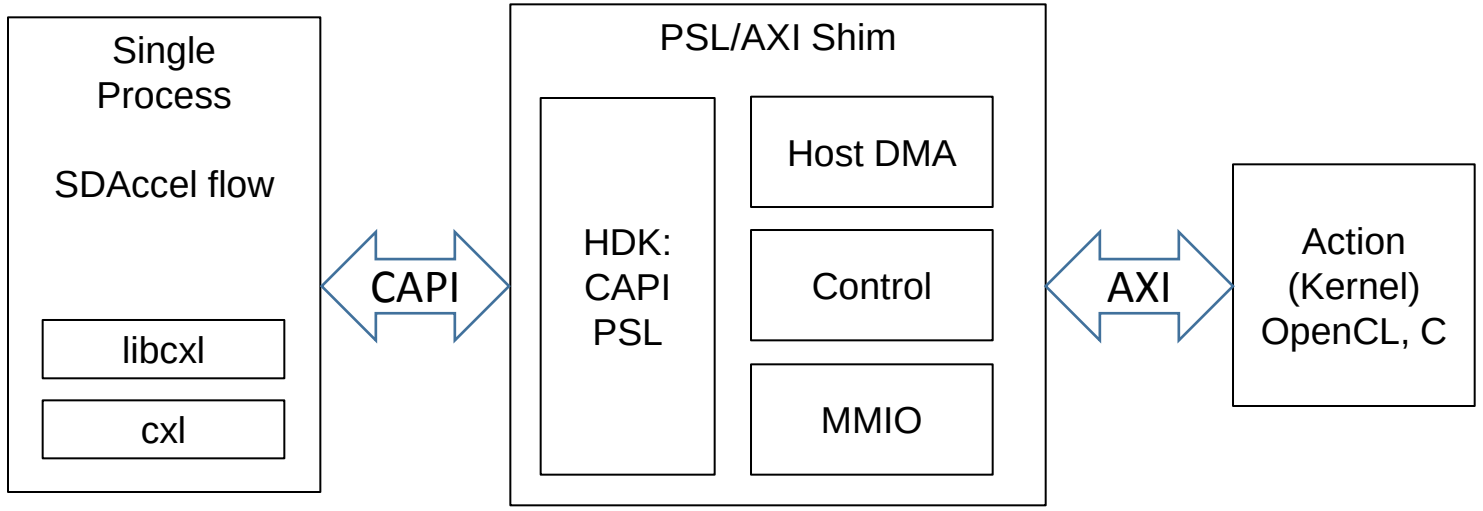
- Leverage the high IO bandwidth of FPGA cards to place compute closer to the data.
- Leverage POWER8's CAPI interface for its thread programmability model and high performance exchange between host and FPGA.
  - Architect for future generations (CAPI 2.0, OpenCAPI)
- Target Application Developers with two directives:
  1. The framework must make it easy for programmers to call accelerators and write their own acceleration IP.
  2. The framework must be open source to enable continued enhancements and cross company collaboration.

Contributions to Ecosystem: DMA Streaming



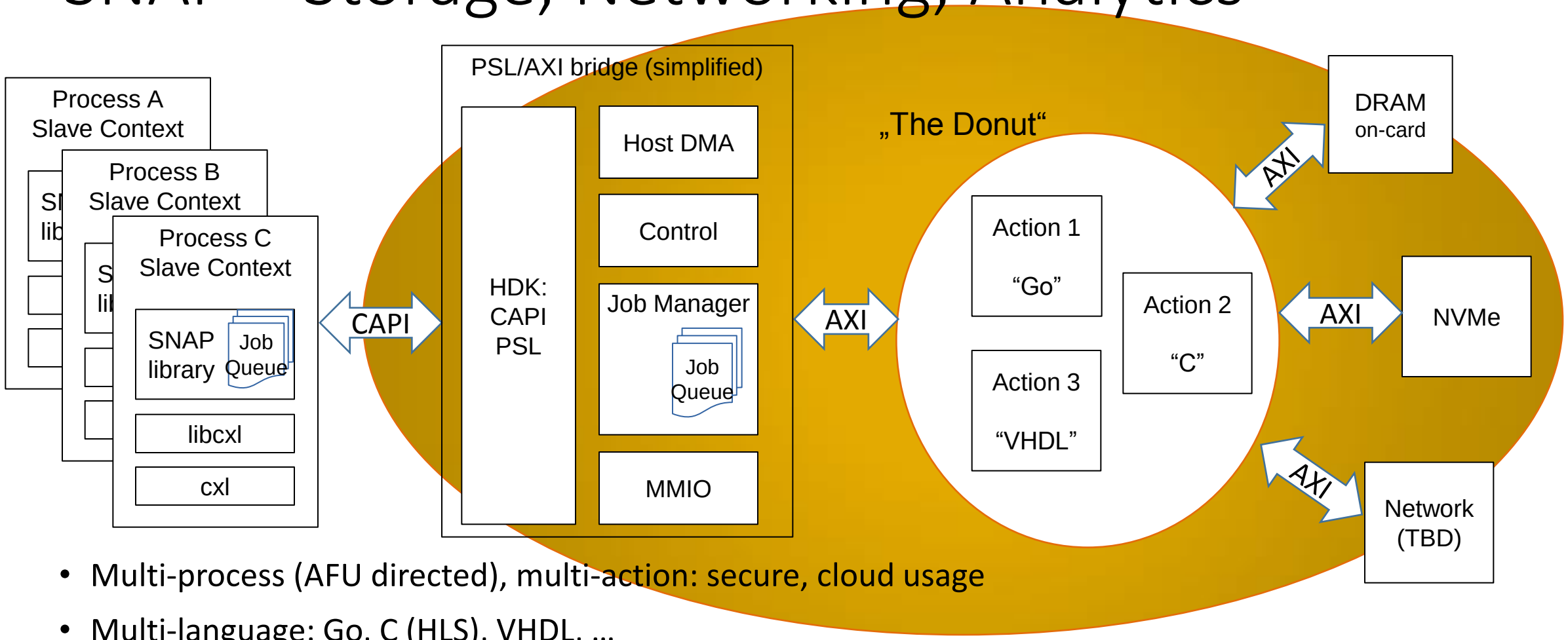
- Address typical application:
  Streaming data from host address to host address

Contributions to Ecosystem: Xilinx HLS



- Leverage OpenCL/HLS flow for CAPI
- Simplify the accelerator programming

SNAP – Storage, Networking, Analytics



- Multi-process (AFU directed), multi-action: secure, cloud usage
- Multi-language: Go, C (HLS), VHDL, …
- Common job scheduling infrastructure including support library
- PSLSE simulation support for NCSIM, XSIM, (Questa)

SNAP – Near-term outlook

- AXI/NVMe bridge, including software support library
  => enables accelerated storage, e.g. database operations
- Network interface with framework streaming operation
- Going public on github.com/open-power/donut
- CAPI 2.0: new features and speed, transparent to accelerated action
- …
- More contributions welcome

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