# SoC Studio: A User-Centric Framework for Custom System-on-Chip Design, Emulation, and AI Integration
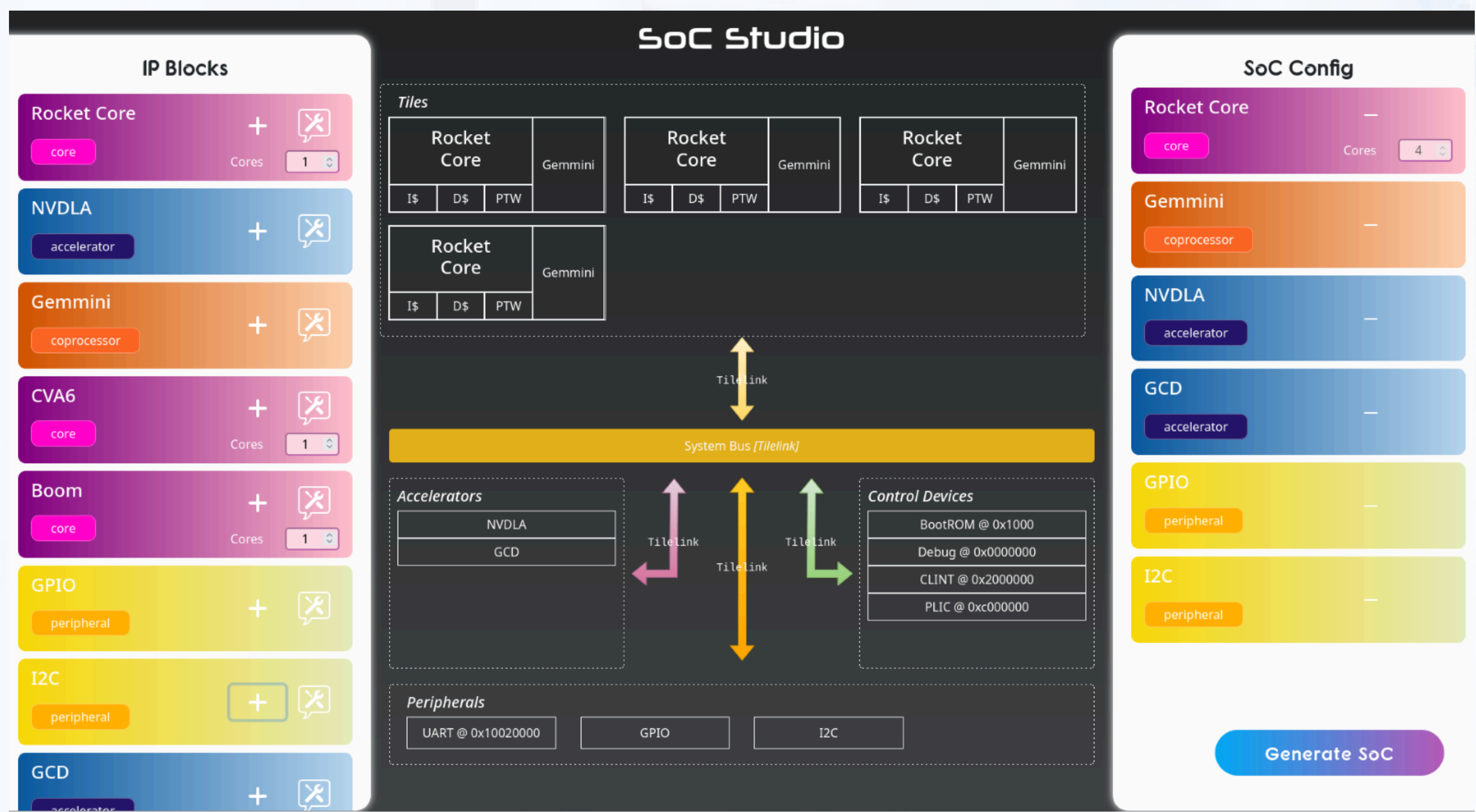
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SoC Studio is a web-based application for designing and rapidly prototyping RISC-V designs by enabling users to configure, simulate, and emulate custom SoC designs and A.I. inference through an intuitive interface.


FEATURES
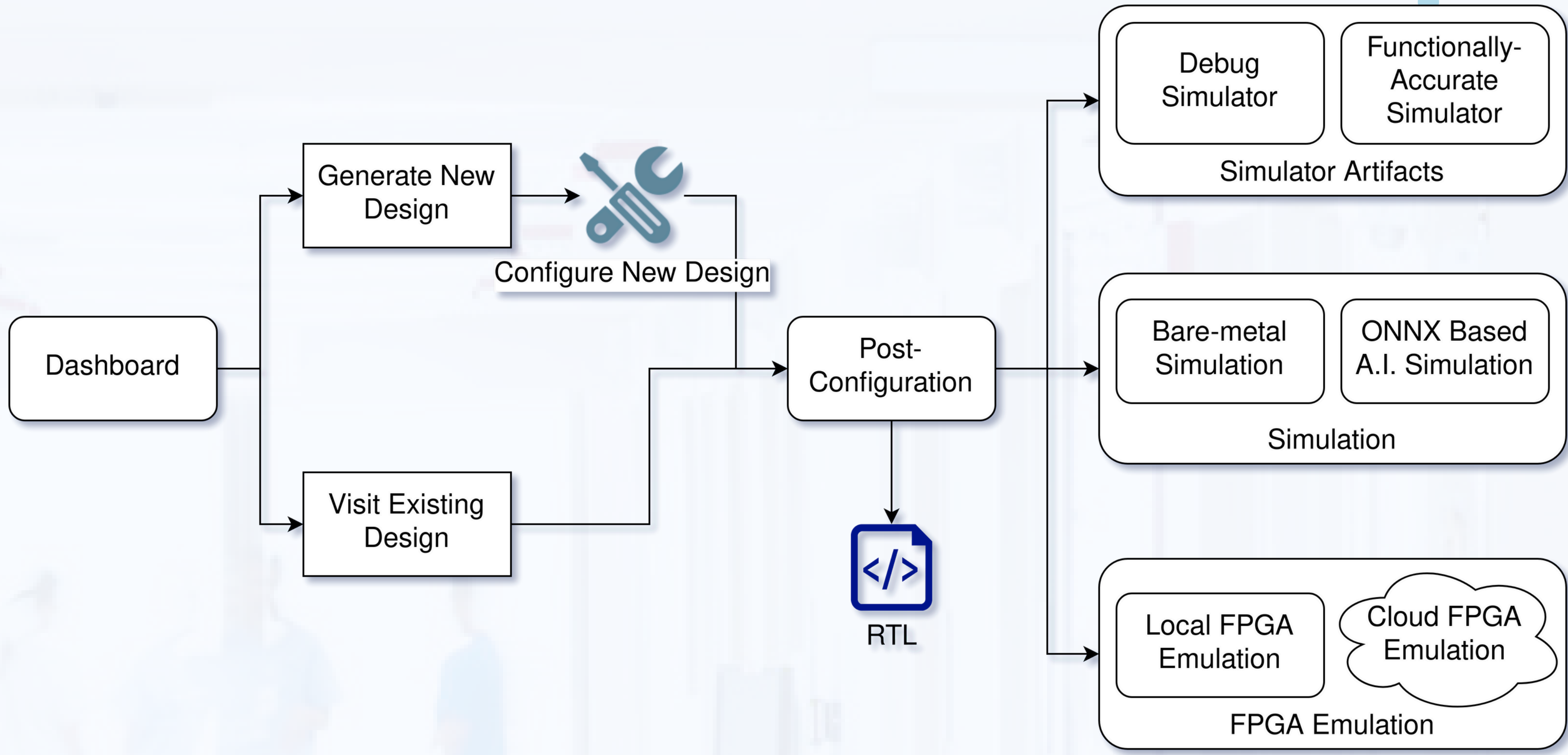
☑ GUI Interface

The GUI approach helps users understand and visualize their design while avoiding errors that may arise from command line or file-based approaches

☑ Artifacts

SoC Studio generates RTL of the configured design, a cycle-accurate simulator, called the Debug Simulator, which enables generation of waveforms of bare-metal programs and software running on the custom SoC, as well as a functional-accurate simulator which provides only the post-simulation terminal output.
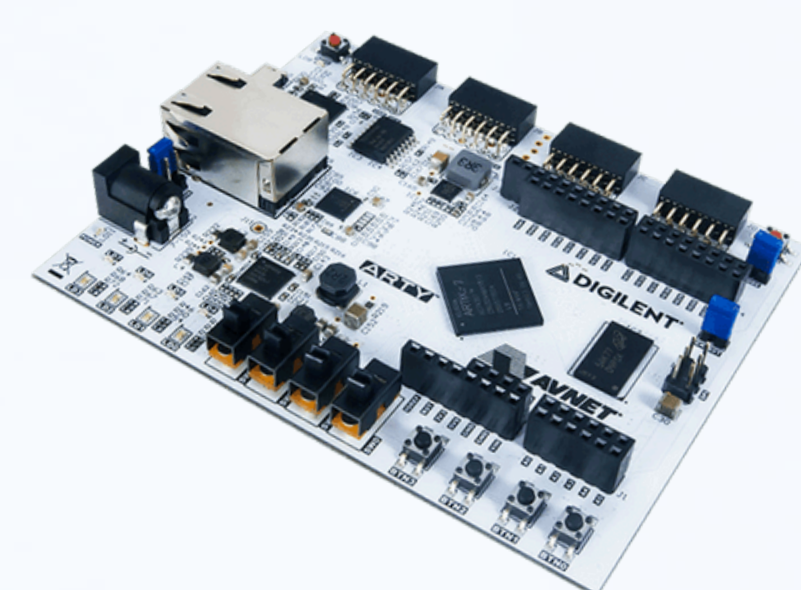
☑ Simulation
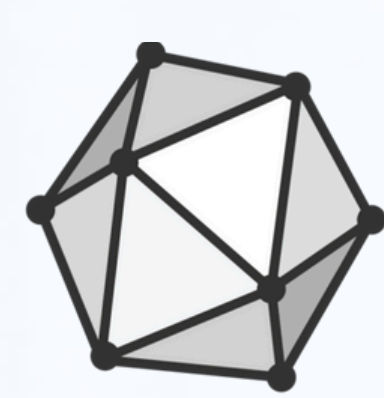
Bare-metal simulation as well as ONNX-based A.I. inferencing simulation, if the design has an A.I. accelerator configured in it. Upload custom or select pre-trained ONNX-based A.I. models to run on a RISC-V based ONNX runtime for the simulation.
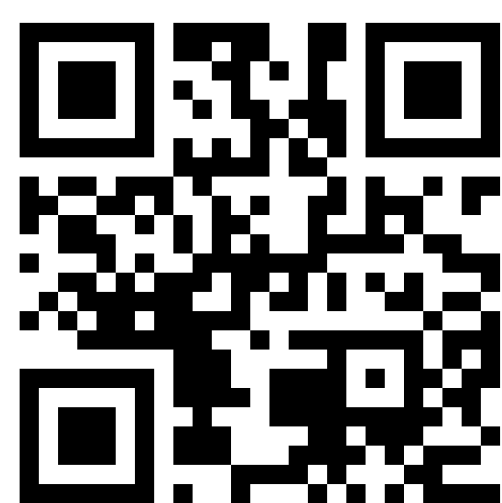
☑ FPGA Emulation

Deploy designs on cloud-based FPGA instances (e.g., AWS F1) or local boards (e.g. Xilinx Zynq, Intel Altera) for rapid prototyping. Post-emulation, generate comprehensive PPA reports and detailed FPGA resource utilization metrics.

☑ Custom IP Integration
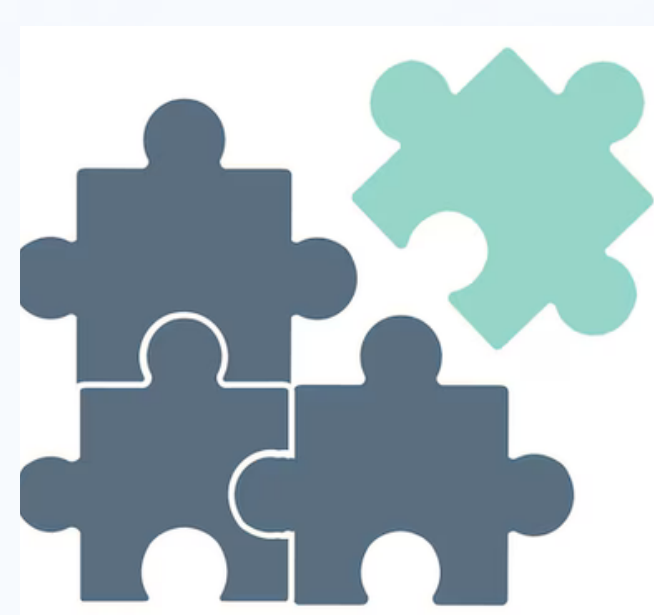
Integrate custom IP blocks into the SoC architecture either by augmenting the Memory-Mapped I/O (MMIO) address space with custom or pre-validated IPs, or attach as a host (core) or a coprocessor. Blackbox abstraction for plug-and-play compatibility of externally developed RTL modules possible via interconnect standards such as Tilelink and AMBA.

Available for Cite