



# iPROVE

# AMBA Design Toolkit

## Overview

iPROVE AMBA Design Toolkit provides an ideal FPGA-based virtual environment for rapid creation of AMBA-based IP and SoC design and verification. This toolkit is designed to provide both hardware and software designers with easy-to-use development environment, in which designers just pick bus components and connect them to design-under-test blocks to build a complete AMBA system.

iPROVE (intelligent PROtotype Verification Engine) is a design verification tool that verify DUT (Design Under Test) by mapping into FPGA. Thus, iPROVE helps designers to verify their designs prior to fabrication in silicon.

iPROVE tool set consists of hardware and software; iPROVE hardware is a PCI card and iPROVE software includes device driver for various platforms, a set of API/PLI/VPI/FLI/VHPI libraries and GUI based design environment. iPROVE provides BILA (Built-In Logic Analyzer) which monitors signals of DUT with various triggering conditions. iPROVE also provides DPP (Data Pumping Port) through which the external hardware can be connected.

## AMBA Design Toolkit Highlights

- **AMBA AHB and APB supported**
- **AHB and APB bus modules included**
- **AMBA bus monitoring enabled**
- **On-board memory with various interfaces**
- **Software controllable at a transaction level**
- **Native code mode or ARM ISS interfacing supported**

## iPROVE Features

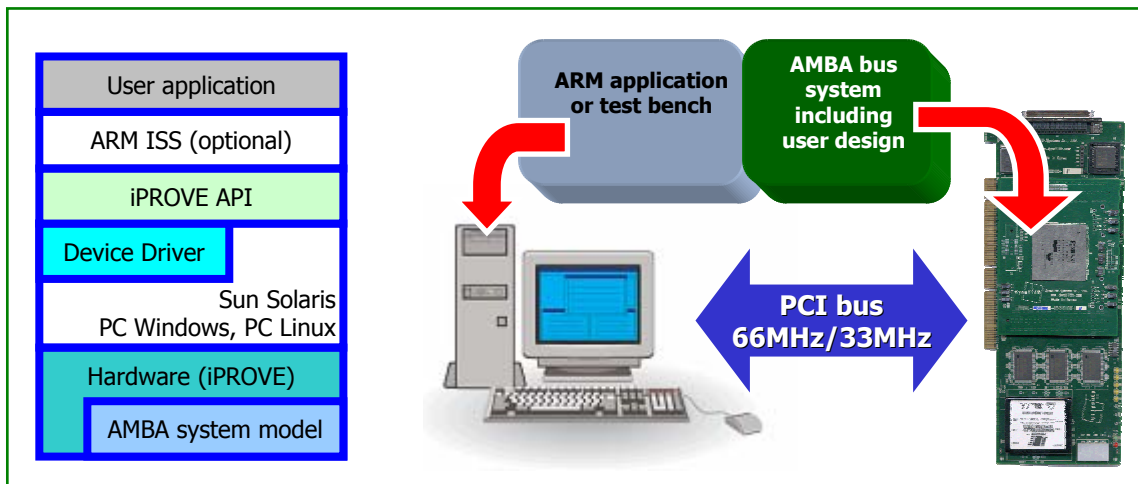
### Hardware

- PCI controller block for 66MHz/33MHz, 64bit/32bit with DMA capability
- BILA for hardware debugging
- On-board memory
- DPP as an external interfacing port
- Xilinx Virtex II/Virtex 4 support
- Reconfiguration through PCI

### Software

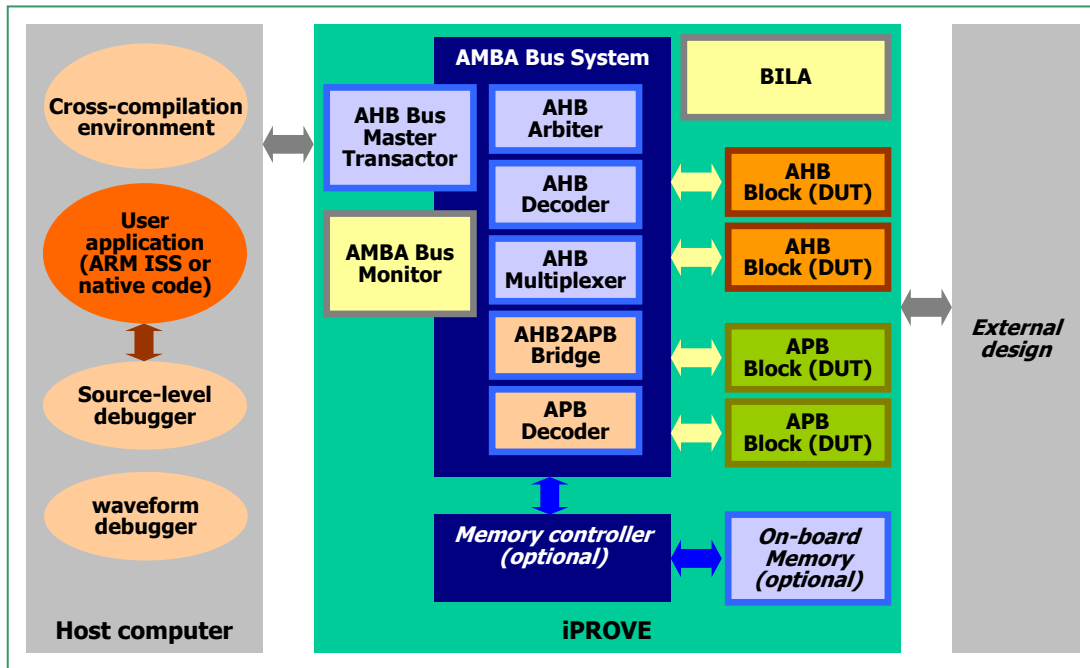
- Device drivers for various platforms
- Various APIs for C/C++ and Verilog/VHDL co-simulation or testing
- FPGA netlist builder for Xilinx
- Supporting cycle-level and transaction-based verification modes

**iPROVE is the best solution to build IP and SoC design and verification environment .**



## Benefits of iPROVE AMBA Design Toolkit

- **Rapid prototype:** FPGA-working AMBA bus system by pick-and-connect AMBA bus modules.
- **High-performance SW-runnable prototype:** SW designer can run actual application with native code or ARM ISS.
- **High-level debugging:** Built-in AMBA bus monitor allows to analysis bus activities at bus transaction-level.



## AMBA Bus Components

- AHB master transactor interfaces user application or ARM ISS running in the host computer.
- AHB arbiter uses a simple priority algorithm.
- AHB decoder selects AHB blocks.
- AHB multiplexer routes data and address.
- AHB2APB bridge connects AHB and APB.
- APB decoder selects APB blocks.
- Memory controller accesses iPROVE on-board SDRAM.
- AMBA bus monitor logs bus transactions.

## Deliverables

- **Prerequisites**
  - ▶ **iPROVE hardware:** iPROVE-X2 series
  - ▶ **iPROVE software:** AMBA Design feature added
  - ▶ **SDRAM package** (optional)
  - ▶ **RealView** (optional): ARM
  - ▶ **SW tool chain** (optional): cross-compiler
  - ▶ **3<sup>rd</sup> party synthesis tool**
  - ▶ **FPGA P&R tool**
  - ▶ **3<sup>rd</sup> party simulation tool** (optional)
- **New license feature:** iPROVE AMBA feature added
- **Documentation:** user guide

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