# Verification of AHB2APB Bridge

*Project Proposal*

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ECE-595: Emulation and Functional Specification Verification

The Advanced Microcontroller Bus Architecture (AMBA) is an on-chip bus architecture. This is a widely used interconnection standard for system on chips. We plan on verifying an AHB2APB bridge design on the Emulator using UVM. AHB2APB bridge the communication gap between low bandwidth peripherals on APB and the high bandwidth devices on AHB. A block diagram of the bridge is given below.

**AHB2APB Bridge Block Diagram:**
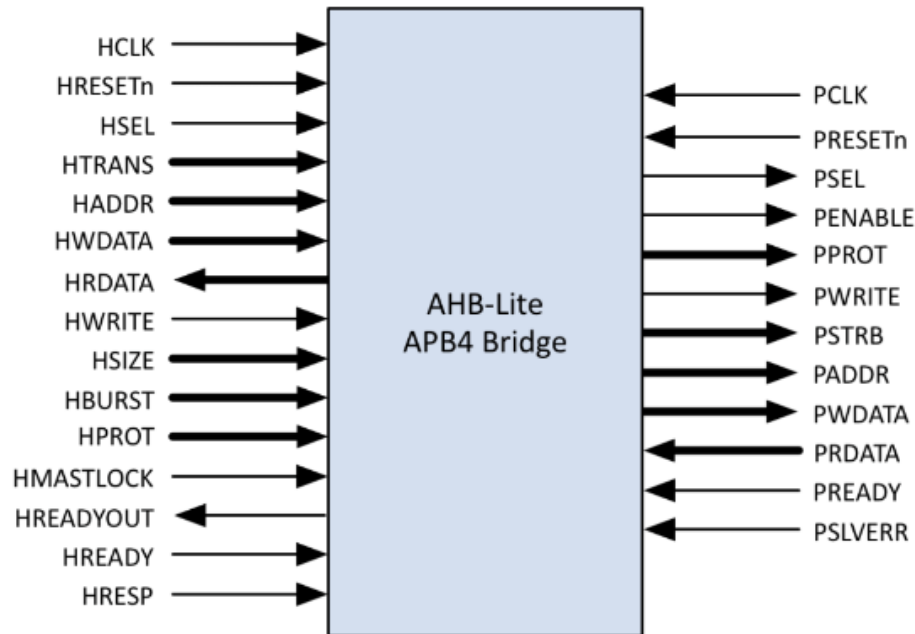


**Verification Strategy:**
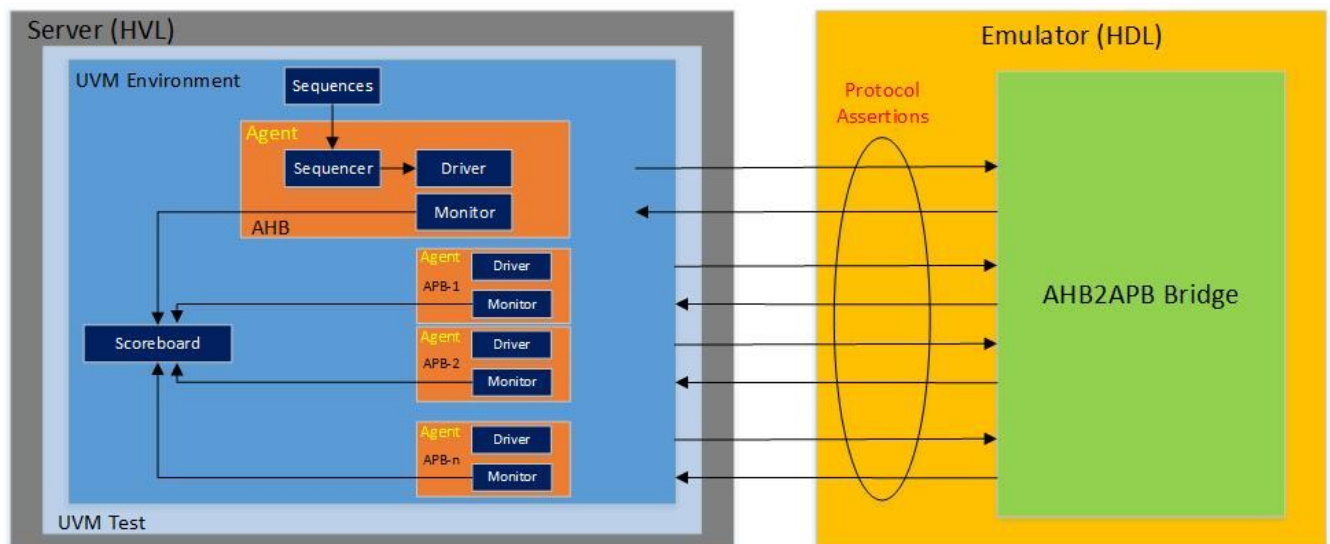
- Write UVM Sequences randomizing read and write addresses targeting different slaves.
- Here both Master and Slave are stubs imitating actual hardware using AMBA protocol.
- Use the TBX mode with SV interface loaded on the emulator. SV interface will have tasks to transfer/receive data as per the protocol.
- Generate constrained random test cases and try to get maximum coverage.
- Write Covergroups to monitor if interesting aspects of the protocol are covered.
- Write assertions for AHB and APB protocols in the SV interface.
- Instantiate multiple bridges with multiple test benches testing them to achieve high speedup compared to simulation.