

OVERVIEW

Packet Generator is a software tool that will be running on a Host computer and generate traffic patterns. AXI Packet Generator is a product that generates series of AXI4 compliant packets which can be used by emulator platform to generate traffic on DUT's interfaces. It can also be used on Simulation platform to generate traffic on simulation environment on DUT's interface.

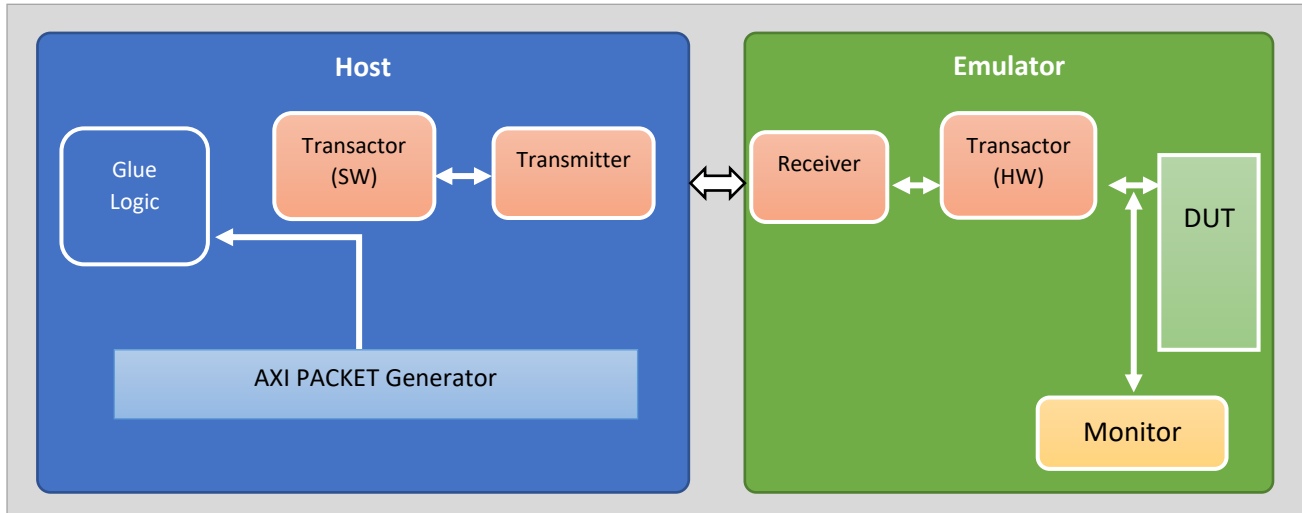


Figure 1: AXI PACKET GENERATOR in EMULATION PLATFORM

FEATURES

The AXI Traffic Generator has following features:

- AXI4 interface is used for register access and data transfers.
- Performs Multi-Mode operation (AXI4 Master, AXI4-Lite Master, and AXI4-Stream Master).
- Flexible data width capability (32/64-bit) on output AXI4 Slave, (32/64/128/256/512-bit) on output AXI4 Master interface
- Flexible address width capability from 32 to 64-bit on AXI4 Master Interface
- Flexible data width capability from 8-bit to 1,024-bit in multiples of eight output AXI4-stream Master/Slave interface
- Supports AXI4-Lite Master interface for system initialization in processor-less system.
- Interrupt support for indicating completion for traffic generation.
- Error interrupt pin indicating error occurred during core operation. Error registers can be read to understand the error occurred. Only supported in Advanced mode.
- Initialization support through Memory initialization files to internal RAM (CMDRAM, PARAMRAM, and MSTRAM) allows you to initialize the contents of all RAMs for a desired traffic profile.
- External global start/stop to synchronize multiple AXI Traffic Generators in the system and to enable AXI Traffic Generator without processor intervention.

BENEFITS

The AXI Traffic Generator can be used in different application at Simulation Platform and at Emulation Platform and following are the benefits:

- Flexible data width capability from 8-bit to 1,024-bit in multiples of eight output
- Interrupt support for indicating completion for traffic generation.
- Error interrupt pin indicating error occurred during core operation. Error registers can be read to understand the error occurred.
- Two Different Modes can be set for following use-cases:
 - Custom Mode**
 - This mode allows selecting different AXI4 interface traffic generation.
 - The available options are AXI4, AXI4-Stream, and AXI4-Lite that include these modes
 - High Level Traffic Mode**
 - This mode allows generating IP specific traffic on the AXI interface for pre-defined protocols.
 - The currently supported traffic profiles include:
 1. Video Mode
 2. PCIe Mode
 3. Ethernet Mode
 4. USB Mode
 5. Data Mode

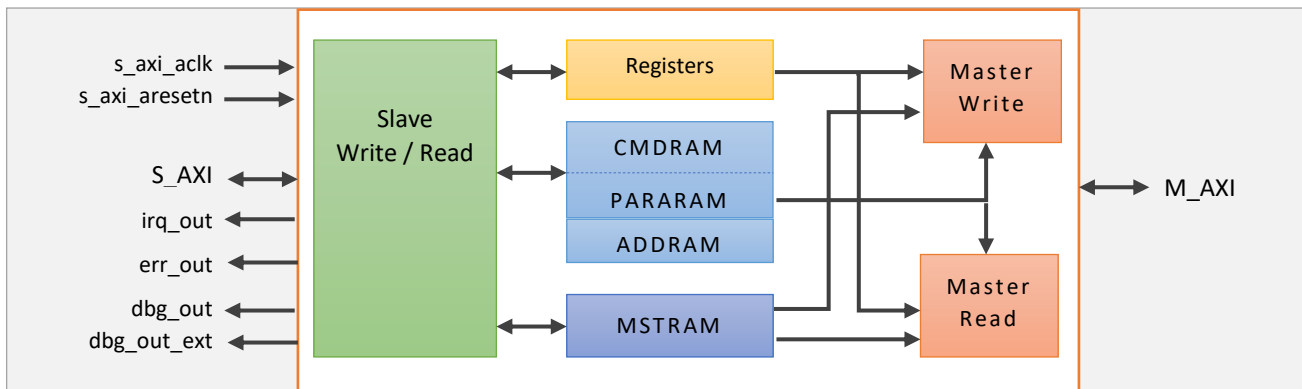


Figure 2: AXI4 Traffic Generator Block Diagram

PRODUCT DETAILS

The AXI4 Traffic Generator IP is a synthesizable core with various configuration options to generate a wide variety of AXI4/AXI4-Stream and AXI4-Lite traffic. The AXI4 Performance Monitor IP allows you to monitor different AXI4 interfaces in system to get metrics for bytes count, transaction count, latencies, idle cycles, etc. Together these powerful IP features allow you to get a detailed estimation and analysis of the system behavior before the actual IP is ready.

There are six different types of modes that can be generated by AXI Traffic Generator.

Mode	Traffic type	Description
Advanced	AXI4	AXI4 support
Basic	AXI4	Lightweight mode with basic AXI-MM features support (for example, narrow/unaligned, out of order transfers not supported).
Static	AXI4	Simple AXI4 traffic generator mode with Fixed address, incremental transactions based on UI configuration. Minimum processor overhead.
System Init	AXI4-Lite	AXI4-Lite master write interface for system initialization. Transactions initiated based on memory initialization file.
Streaming	AXI4-Stream	AXI4-Stream interface with Master, Slave, and Loopback mode option

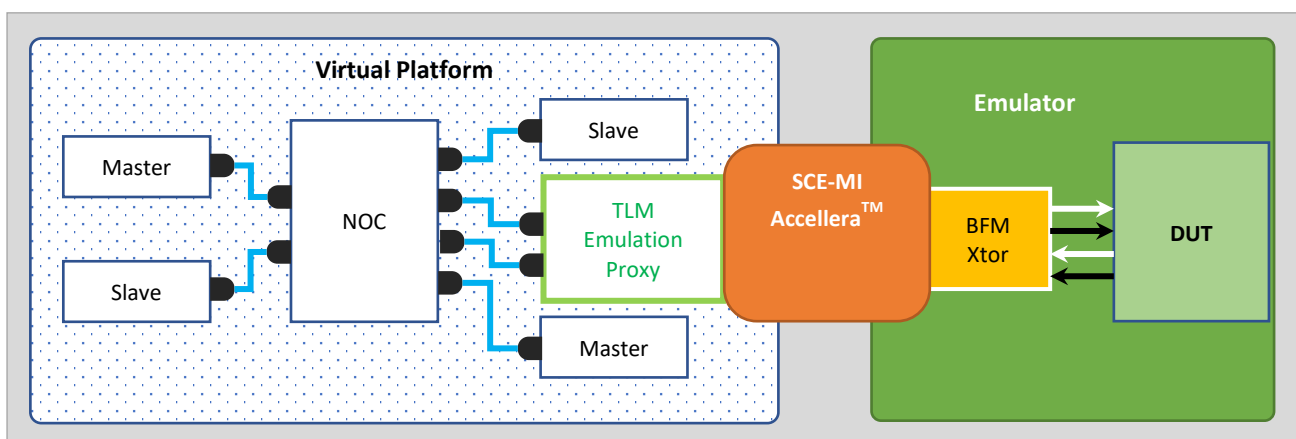


Figure 3: Virtual Platform with DUT in Emulator

Tools & Technologies:
 Verilog, SystemVerilog, C, DPI, UVM
 EDA Tools
 Emulators