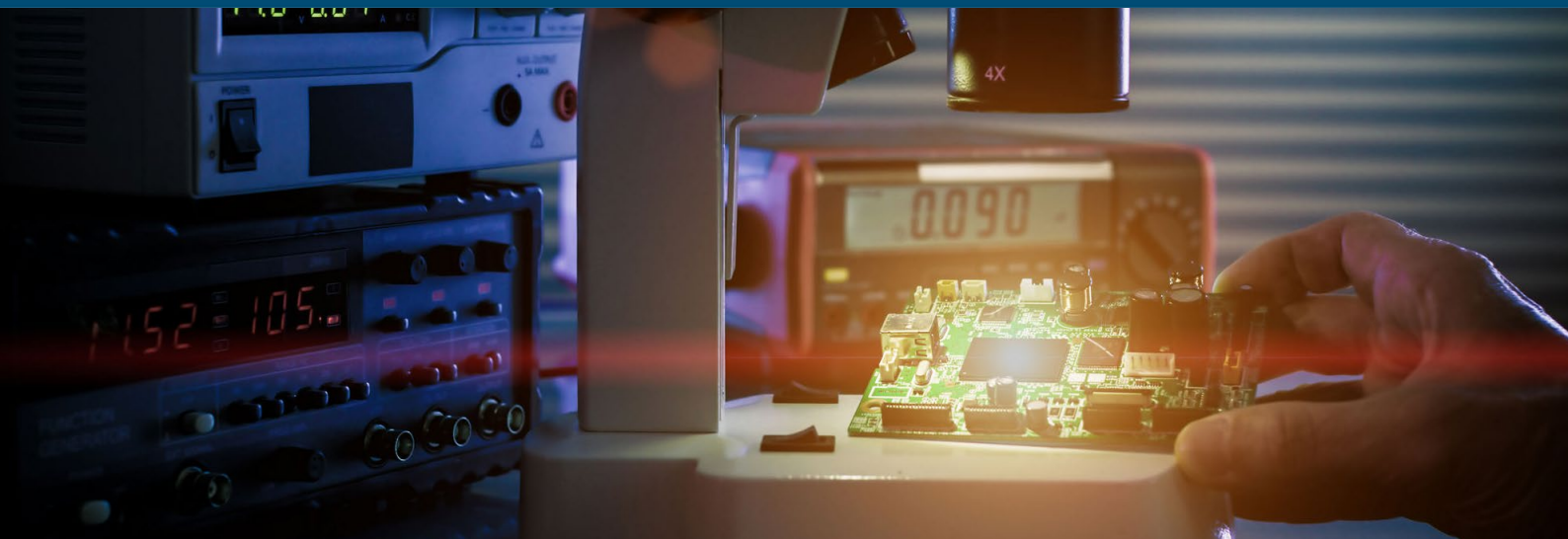# PerfMon
Performance Monitor

Overview:

eInfochips' PerfMon utility is the Industry's most comprehensive generic plug-and-play, protocol independent performance verification monitor for verification of SoCs (e.g. mobile communication, network, automotive protocols based SoCs). PerfMon allows performance parameters, like bandwidth and latency, to be measured on variety of traffics on different interfaces and reported uniquely using a single extensible component. As per the project requirement user can easily configure a PerfMon and the rest of the steps of performance verification will be taken care of by the monitor, that significantly reduces the time and cost of verifying performance on complex system designs.

PerfMon provides a simple yet powerful user interface which drastically reduces the time and effort needed to configure and integrate PerfMon in verification environment and help in verifying critical performance parameters thoroughly to ensure first time right silicon. The monitor has rich performance result reporting features, which helps in debugging by providing a detailed performance track for each traffic pattern per interface

PerfMon is reusable, highly configurable, pre-verified, plug-and-play verification component developed in System Verilog using UVM Methodology and being protocol independent makes it possible for performance verification of Module, Chip and System level for any kind of protocols.
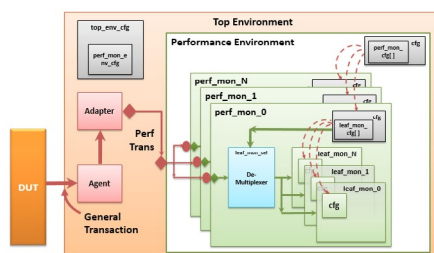
Architecture:

Figure 1: Performance Monitor Architecture

PerfMon comprises of following major elements.

- Monitor per interface per traffic type
- CSV based Configuration for each monitor
- APIs
- Callbacks
- Coverage Capability
- Configurable Report Generator
- Performance Tracker

Application:

PerfMon utility provides quick and efficient way to verify Performance requirements in complex SoCs having multiple interfaces with different protocols. Having plug-and-play protocol independent entity to measure performance helps in easy integration on bunch of targeted data paths and with the simple method of configuration user can easily control measurement types and report generation.

Change in performance requirement, measurement window or addition/removal of path for performance verification, can easily be handled using PerfMon.

Additional features like performance measurement over alternate window, comparison of performance result across paths, and run-time performance result extraction and configuration change, add more value to user for faster verification.

User only need to create an adaptor class to convert protocol interface (on which performance to be measured) to generic performance transaction and provide it to PerfMon utility using uvm_analysis_port.
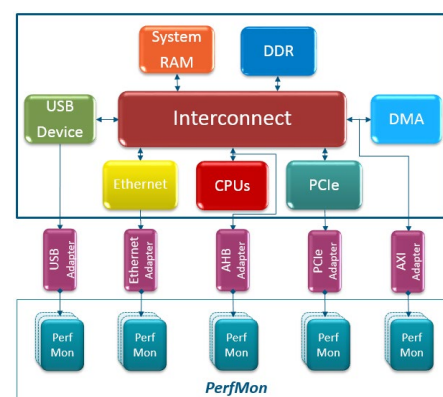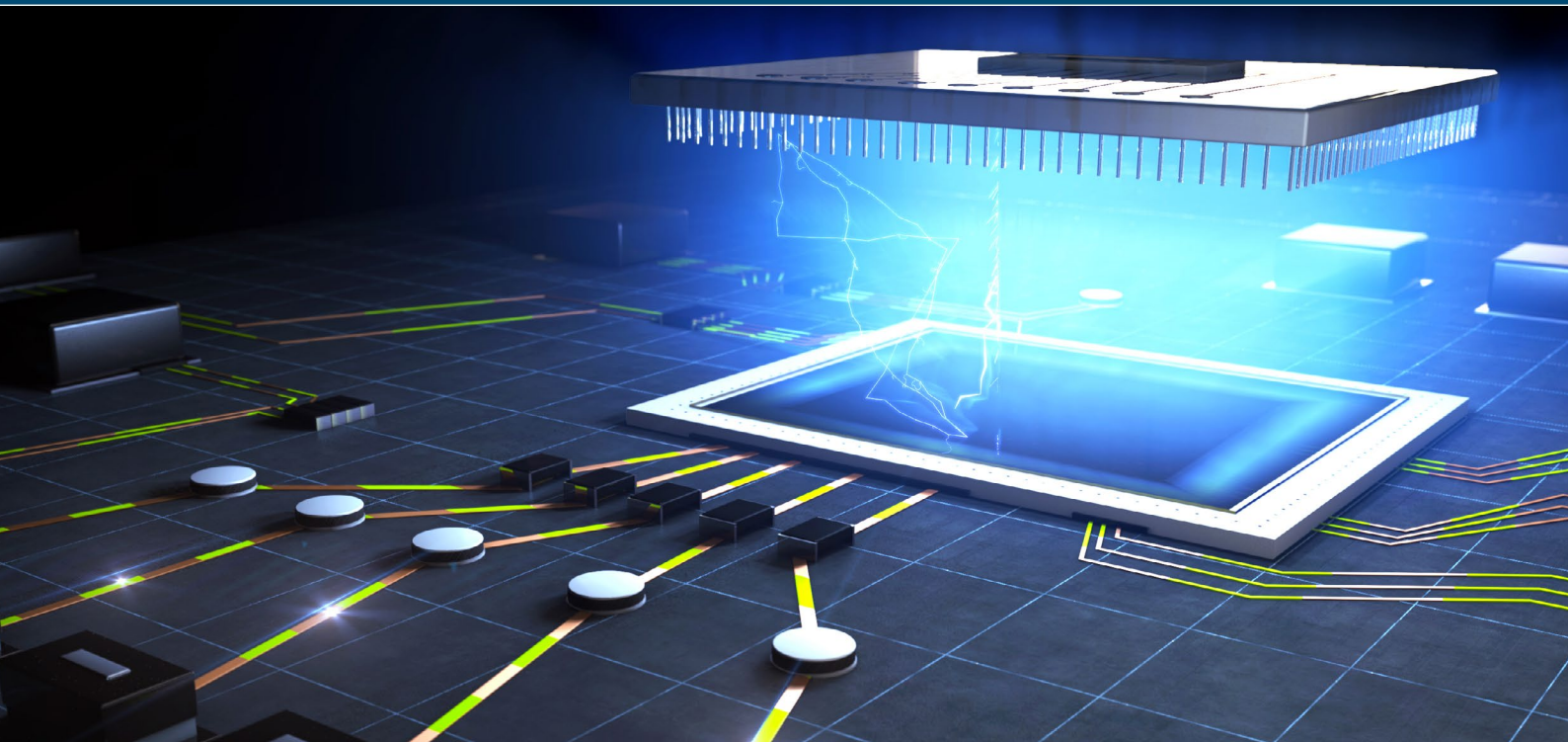

Figure 2: PerfMon Use at SoC

Major Product Features:

Configurable

- Supports multiple traffic patterns per multiple paths
- Allows configurable units for latency (ns, us, ms) and bandwidth (KBps, MBps, GBps, Kbps, Mbps, Gbps)
- Convenient and uncomplicated configuration methods
- Compliance check for Configuration

Measurement Types

- Per transaction & Average latency
- Bandwidth
- Counter-Base and Event-Base window selection
- Alternate bandwidth and latency window

Reporting

- Supports verbose level configuration to control measurement reporting

- Performance result trace for each traffic type per interface
- Error reporting in case of incorrect result
- Run time reporting of measurements

Extended Capabilities:

- Fully compliant to Methodology : UVM
- Callback support to collect functional coverage
- API support to query performance statistics on-the-fly simulation
- Supports facility to enable/disable majority of PerfMon features.
- Configuration support to program Setup and Hold Transactions for Counter-Base window
- Supports tolerance configuration to waive expected variance in performance result
- Supports performance tracker (trace file) per traffic type per interface
- Cumulative bandwidth measurement

for multiple traffic patterns on same interface/path
- Uniformity comparison between different interfaces
- Root Mean Square (RMS) value calculation for latency, bandwidth and error values

Deliverables:

- PerfMon System-Verilog UVM based Source Code
- User Guide and Release Notes
- Sample Verification Environment
- Sanity Testcases