Case Study: Verification of PCIe Gen 5 IP

Functional Verification of PCIe Gen 5 IP using third party VIP as Root Complex and End Point

**BUSINESS REQUIREMENTS**

- Develop a verification plan for functional verification of PCIe Gen 5 IP code targeting FPGA
- Develop a testbench, integrate third party VIP, scripts and test cases for verification
- Execution and maintenance of test cases, help design team to debug RTL issues

**OUR SOLUTIONS**

- System Verilog based test bench, test cases with auto verification of 90% of the test cases
- Perl and shell scripting for independent test case simulation and regression
- Parameterized execution for scalability and reusability

**TOOLS /TECHNOLOGIES**

- Mentor Questasim, Xilinx Vivado, Linux, Perforce, Shell and Perl script
- System Verilog, Verilog and VIP integration
- PCIe Gen 5 and AXI4 protocols, DDR4 memory models

**BUSINESS IMPACT**

- Strong domain knowledge and parameterized code development approach enabled the delivery of a future proof verification environment
- Close co-ordination with design team helped to resolve issues promptly
- Better functional coverage minimized number of bugs in the field

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PCIe TX or RX

PCIe RC VIP

VIP

PCIe EP VIP

FPGA (DUT)

DDR4 models

Test Bench

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About Happiest Minds Technologies

Happiest Minds, the Mindful IT Company, applies agile methodologies to enable digital transformation for enterprises and technology providers by delivering seamless customer experience, business efficiency and actionable insights. We leverage a spectrum of disruptive technologies such as: Big Data Analytics, AI & Cognitive Computing, Internet of Things, Cloud, Security, SDN-NFV, RPA, Blockchain, etc. Positioned as “Born Digital . Born Agile”, our capabilities spans across product engineering, digital business solutions, infrastructure management and security services. We deliver these services across industry sectors such as retail, consumer packaged goods, edutech, e-commerce, banking, insurance, Hi-tech, engineering R&D, manufacturing, automotive and travel/transportation/hospitality.

Headquartered in Bangalore, India, Happiest Minds has operations in the U.S., UK, The Netherlands, Australia and Middle East.

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