



Whitebox functional and statistical coverage service

What gets compromised the most in the constrained random verification?

Stimulus? No.

Checks? No.

It's the functional coverage. Agree?

Although black box functional coverage gets its share but the whitebox functional coverage is almost ignored.

Designers do write functional coverage or assertion but their main focus is on their assumptions and their fears. It's less focused from stimulus quality point of view. For example, in an arbiter, whether first request came from different requesters or whether all combinations of requesters were exercised, may not bother designer but it's important for stimulus quality.

Most critical bugs are often hidden at the intersection requirements and micro-architecture. One of the example, let's say a in communication protocol maximum packet size allowed is 1024 bytes but internal buffer allocation works in multiple of 256 bytes then packets of size around 256 bytes are special over 1024 other pure black box possibilities. Unless statistical coverage analysis is done on the relative distributions its difficult to prove stimulus is emphasizing what matters to your design. This is one of the case where statistical coverage comes into play.

I hear what you are thinking. We know about it but we don't have time for it.

That's where our services will help you. We have built a framework of various pre-defined and customizable coverage models. Several man years of work and experience embedded in it.

Some of the pre-defined and customizable models include FIFOs, Arbiters, Low power, Clocks, Sidebands, FSMs, Registers and various typical RTL bugs.

We can quickly analyze and generate the customized whitebox functional and statistical coverage for your designs and provide you insights on your stimulus quality.

Highlights

- Reduce the risk of first time design tape out
- Get the confidence you need on verification quality before critical release or purchase of third party IP or legacy IP with significant changes
- Reduce wastage. Invest your simulation time and resources based on importance and priorities of features, to achieve the desired quality goals optimally
- Make sure your critical bugs and late features are verified completely
- Spot false positive in your existing functional coverage
- Get all this done with very minimal disturbance to your current project execution

Curiosity framework

Curiosity is python based framework using the concepts of

- Data analytics
- Reusable functional coverage models
- High-level coverage modeling

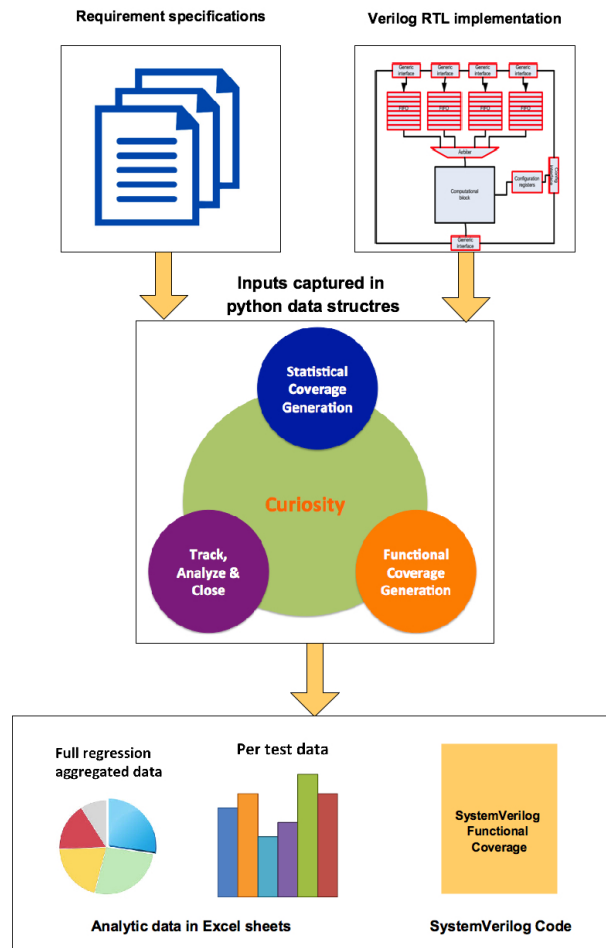


Figure 1: Curiosity framework - Input and Output

Curiosity Analytic and Coverage APPs

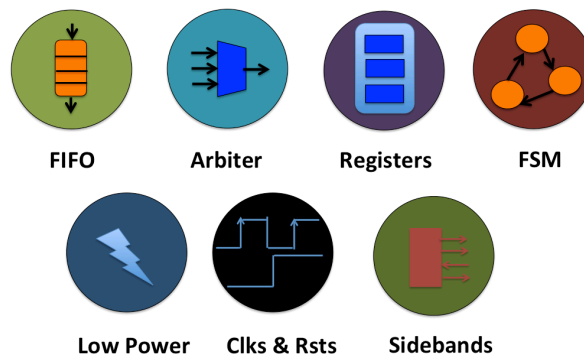
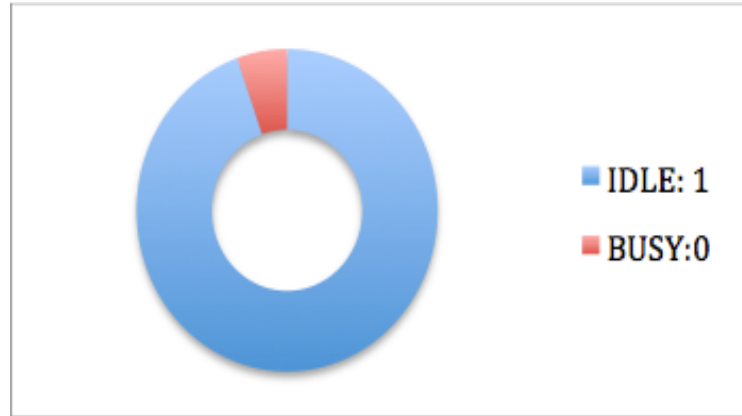


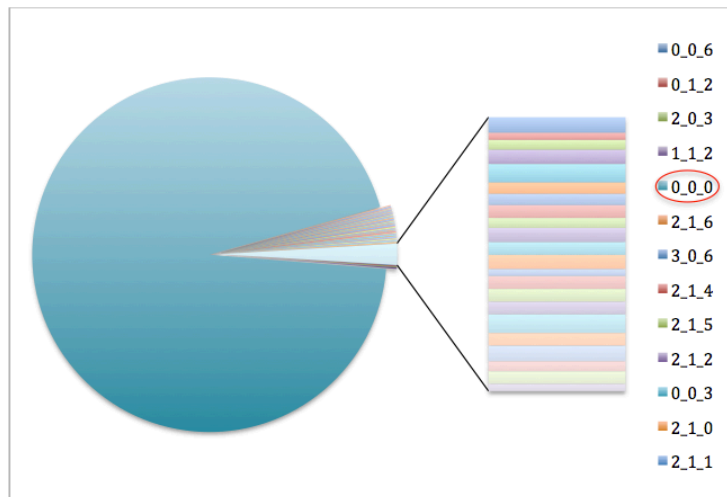
Figure 2: Built-in APPs for insights from micro-architecture

Example of statistical coverage

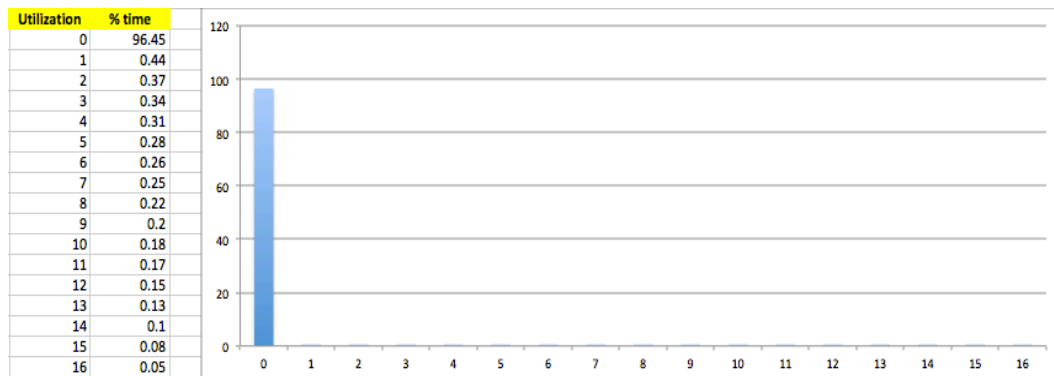
Percentage duration of time design is IDLE across regression



Percentage of time spent in different configurations/modes across regression



FIFO Utilization duration percentage across regression



Features

- Verification methodology independent
 - Instantaneous feedback on effectiveness of design or test bench changes
 - Your RTL and Test bench will not be touched
 - Leverages design's intent and knowledge to strengthen verification
 - Easily portable across unit, cluster and SOC environments
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Process

- We study your design and identify the areas for whitebox coverage generation
- We setup the custom coverage around these areas using our framework
- Collect the data generated by monitors from your regular nightly/weekly regressions
- We analyze and summarize the results/trends in excel sheets using our framework
- Your team reviews and provides the feedback for next iteration
- Based on results and feedback we generate the functional coverage to track the low coverage areas for closure

Deliverables

- Summarized coverage data in excel format
- Whitebox functional and statistical coverage in SystemVerilog format
- Summary of actions identified

We have flexible engagement model that can be delivered on site, remotely or combination of both. Our goal is to provide the knowledge and insights backed by data to help you achieve your functional verification quality goals optimally.

Full case studies and customer references can be provided on request.

For more information:

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