



How cocotb Saved us £1000s & Thousands of Hours

Grant Bowers

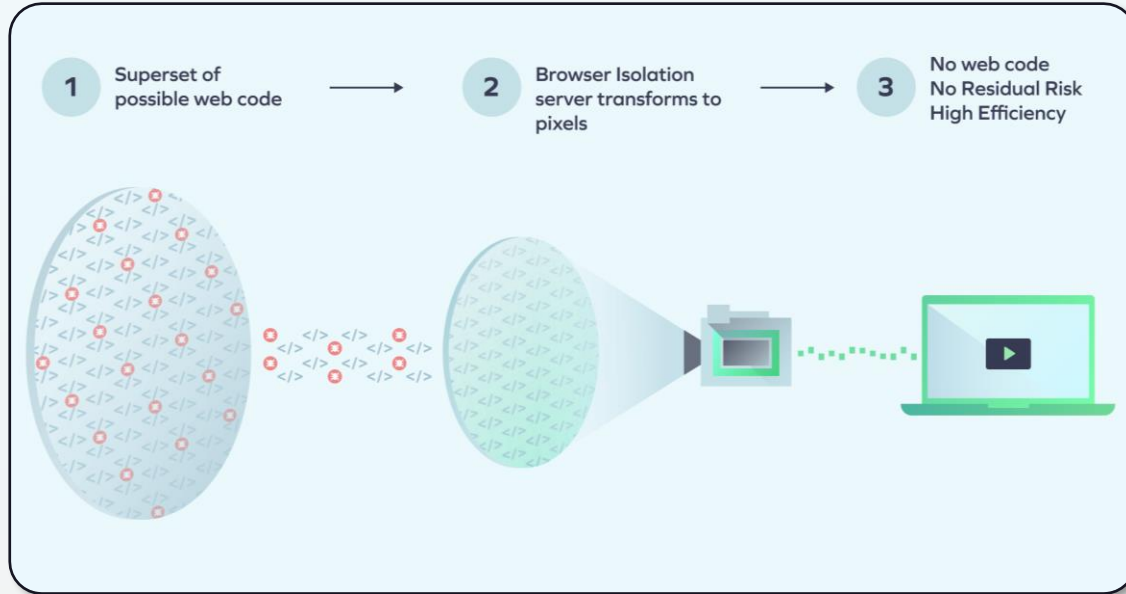
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Summary

- Introduction
- Why cocotb?
- Our Simulation Framework & Workflow
- CI And Regression Testing
- Simulator Compatibility

Introduction



Remote Browser Isolation

Cross Domain Solutions

Hardware Enforced Cybersecurity

Government & Commercial

Why cocotb?

Before

VHDL testbenches.

TCL, Makefiles & Modelsim.

Python pre-gen for stimulus.

Difficult to review.

Hard to get UVM buy-in.



After

Simpler test code.

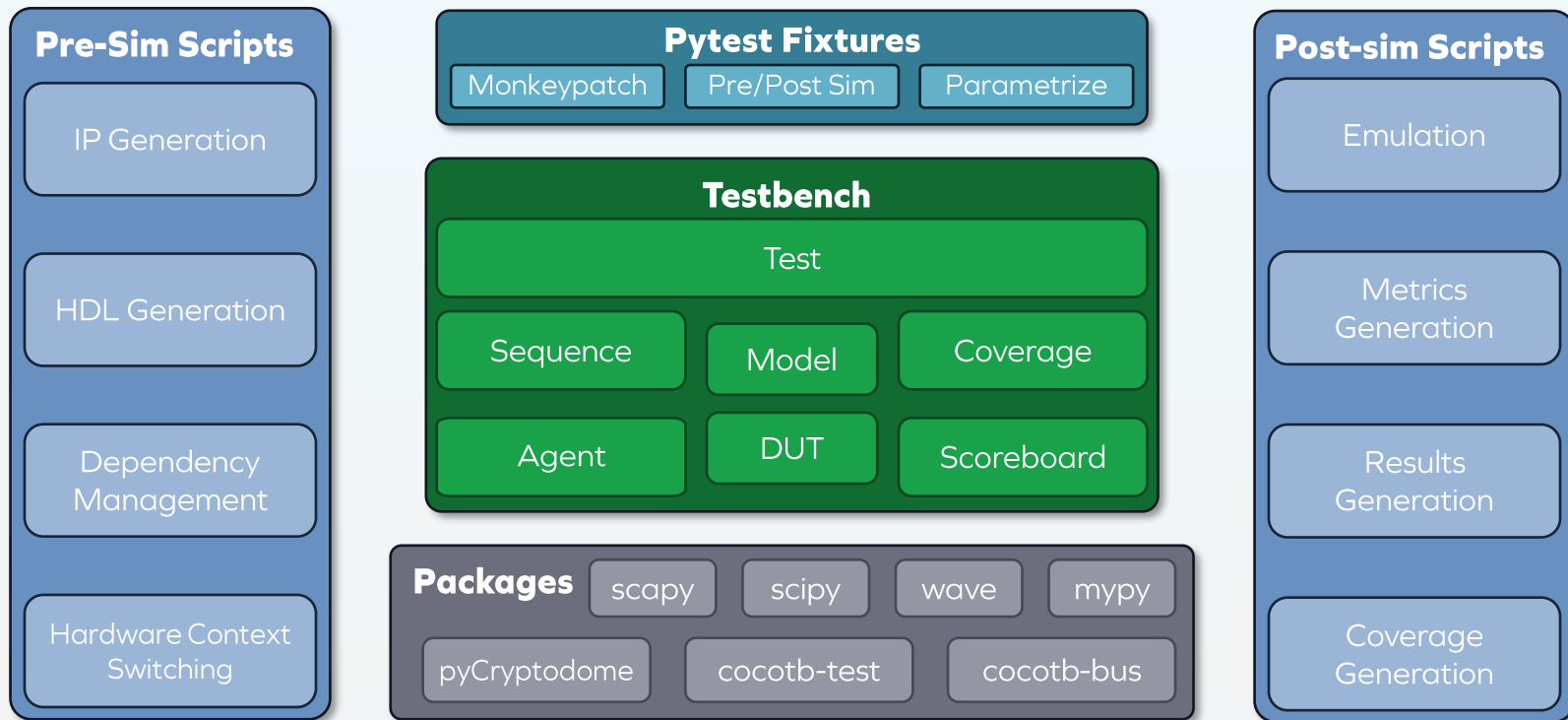
Easier to recruit.

Simpler review process.

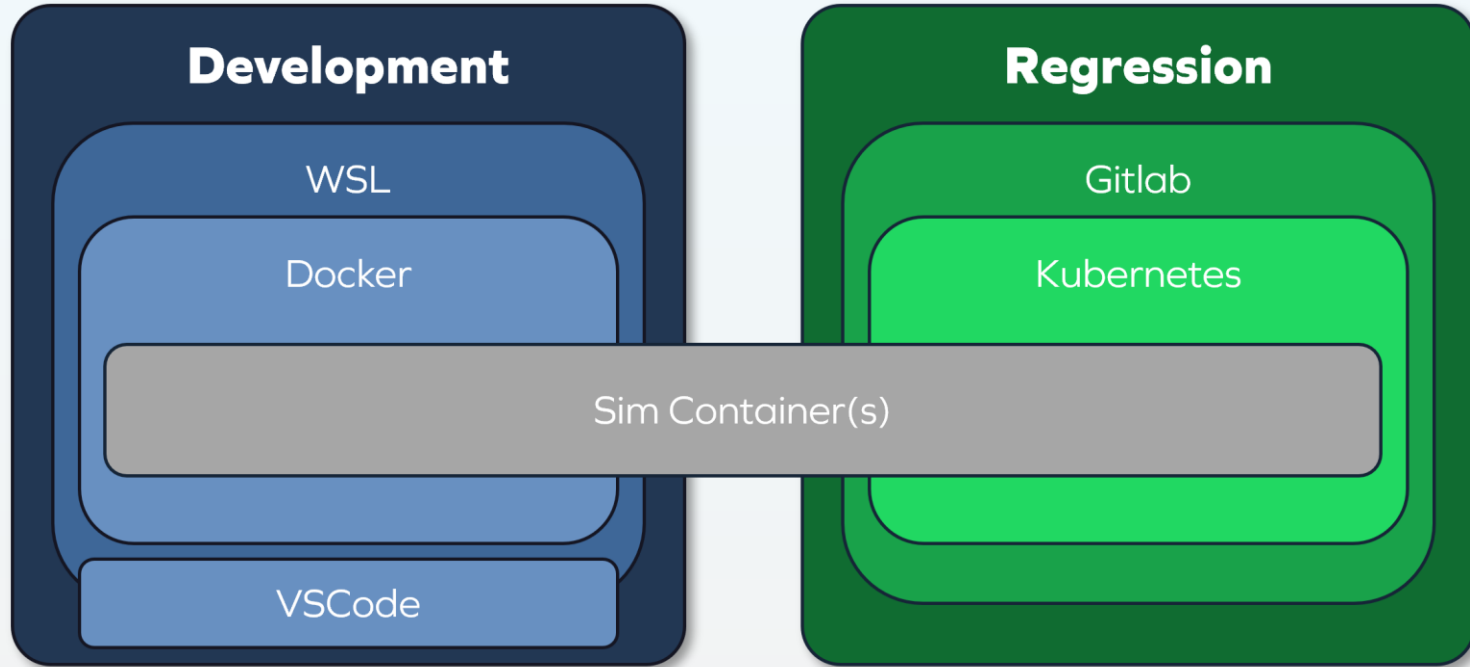
Shorter tests.

Better coverage.

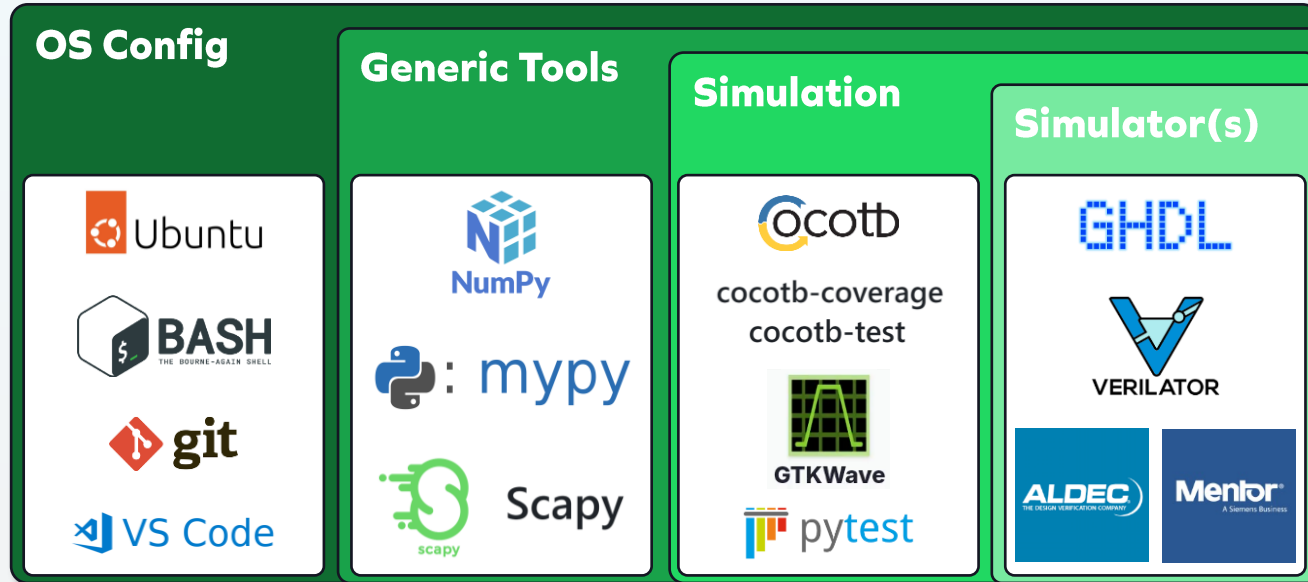
Testbench Structure



Test Environment

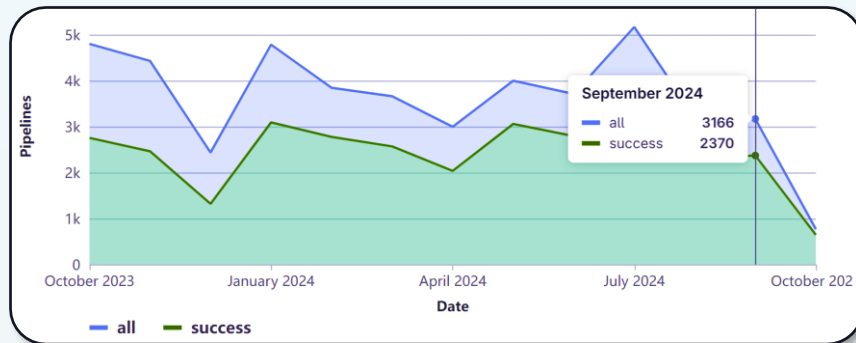
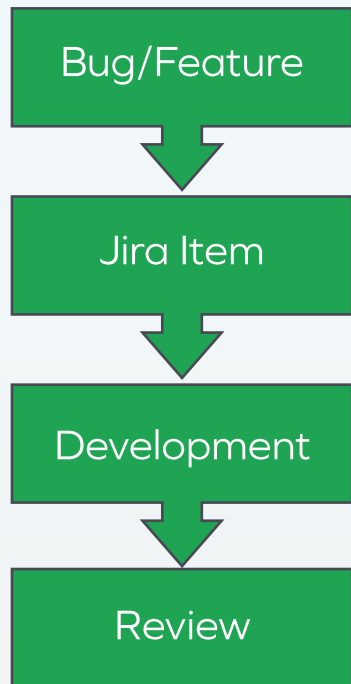


Containers



Example of Layered Container

CI Infrastructure



Annual Number of Pipelines

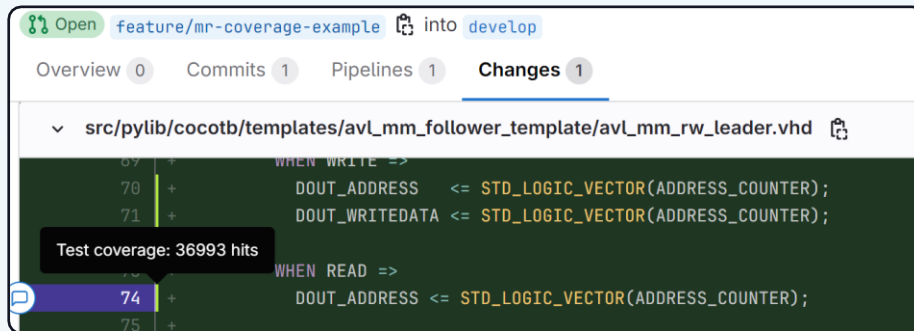
Summary

153 tests	0 failures	0 errors
100% success rate		2d 29m 12s

498 tests	0 failures	0 errors
100% success rate		3d 6h 26m 2s

Number of Jobs per Regression

Metric Reporting



Open feature/mr-coverage-example into develop

Overview 0 Commits 1 Pipelines 1 Changes 1

src/pylib/cocotb/templates/avl_mm_follower_template/avl_mm_rw_leader.vhd

```
69 + WHEN WRITE =>
70 +     DOUT_ADDRESS <= STD_LOGIC_VECTOR(ADDRESS_COUNTER);
71 +     DOUT_WRITEDATA <= STD_LOGIC_VECTOR(ADDRESS_COUNTER);
72 +
73 + WHEN READ =>
74 +     DOUT_ADDRESS <= STD_LOGIC_VECTOR(ADDRESS_COUNTER);
75 +
```

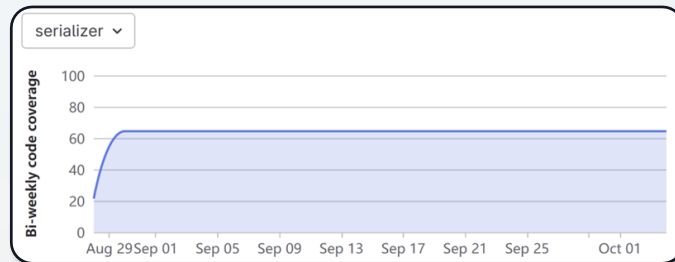
Test coverage: 36993 hits

74

In Line Code Coverage

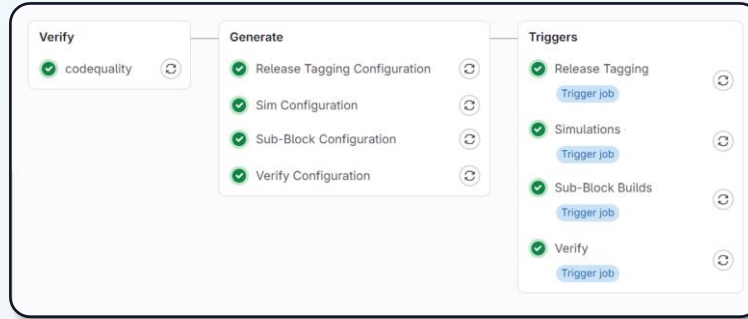
Status	Job	Stage	Coverage
Passed 00:02:38 1 day ago	#16721913: serializer 1:2 develop 9129f598	ghdl	53%
Passed 00:02:38 1 day ago	#16721911: serializer 0:2 develop 9129f598	ghdl	75.8%

Functional Coverage per Test



Code Coverage over Time

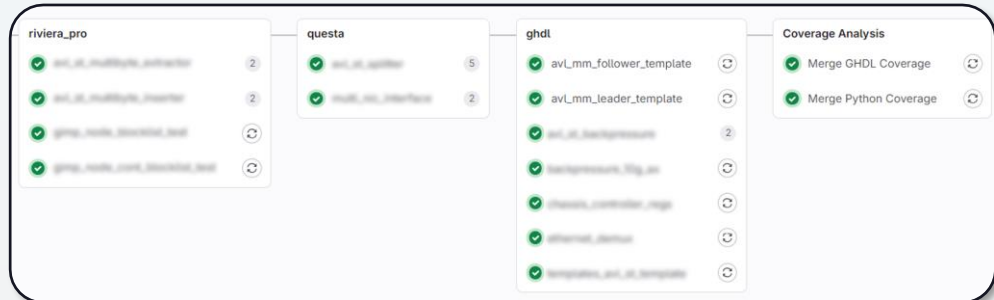
Managing Licensing



Job Generation

QuestaSim License 1	License	QUESTA
QuestaSim License 2	License	QUESTA
QuestaSim License 3	License	QUESTA
QuestaSim License 4	License	QUESTA
Riviera Pro Coverage License 1	License	RIVIERA_PRO_COVERAGE
Riviera Pro License 1	License	RIVIERA_PRO
Riviera Pro License 2	License	RIVIERA_PRO

License Broker



Generated Jobs



Ultra Secure Isolation



Ultra-secure
isolation



Guaranteed user
experience even at
scale



Performance and
affordability

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