UVM CRAVE
1st Prototype

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Goals

- Combine UVM-SystemC with CRAVE for Constrained-Random Verification

- Maintain SystemVerilog like syntax as in original UVM

- Demonstrate solution on an appropriate example

CRAVE: www.systemc-verification.org

Jelly Beans

- UVM Tutorial for Candy Lovers
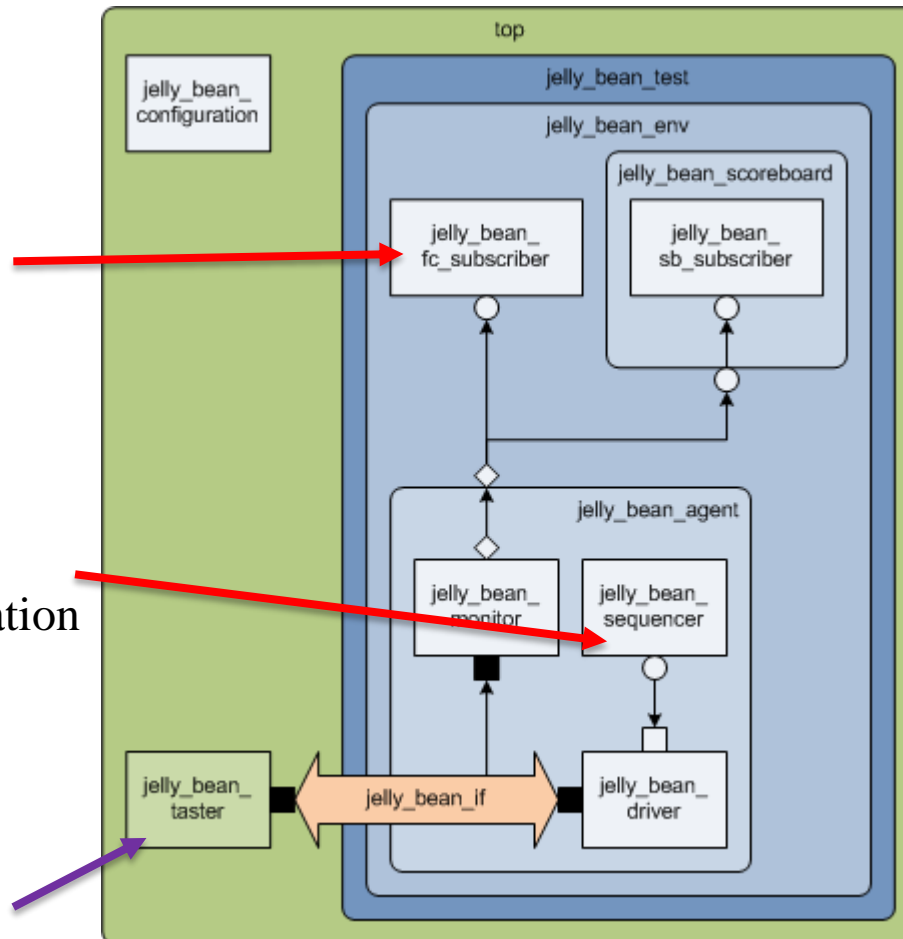 http://cluelogic.com/2011/07/uvm-tutorial-for-candy-lovers-overview/

Jelly Beans Overview

CRAVE Coverage

CRAVE Randomisation

DUT

1. Sequencer (uses different sequences)

2. Driver

3. IF

4. DUT

5. IF

6. Monitor

7. Functional Coverage Subscriber

8. Scoreboard Subscriber

DUT

```
8   SC_MODULE(jelly_bean_taster) {
9       sc_in<sc_uint<2> > color;
10      sc_in<sc_uint<3> > flavor;
11      sc_in<bool > sugar_free;
12      sc_in<bool > sour;
13      sc_in<bool > clk;
14      sc_out<sc_uint<2> > taste;
15
16      void taste_bean(){
17          if(flavor.read() == 0x4 && sour.read()){ //Chocolate and sour
18              taste.write(0x2); //Yucky
19          } else {
20              taste.write(0x1); //Yummy
21          }
22      }
23
24      SC_CTOR(jelly_bean_taster) : color("color"), flavor("flavor"), su
25          SC_METHOD(taste_bean);
26          sensitive << clk;
27      }
28  };
29
```

UVM Randomization Prototype #1

- Jelly Bean Transaction – CRAVE Cstrs
  CandyLovers/verification/transactions/jelly_bean_transaction.h

- Same flavoured Sequence – Inline CRAVE Cstrs and variable length
  CandyLovers/verification/sequences/same_flavored_jelly_beans_sequence.h

  - Randomize_with(): flavor identical for all beans in the sequence

UVM Randomization Prototype #2

- ## Test
  CandyLovers/verification/jeally_bean_test.h
  - – one jelly been: single transaction
  - – same flavored: sequence of transactions (2..4)
  - – gift boxed: sequence of sequence (2..3 of 2..4)

- ## Functional Coverage Subscriber – CRAVE Coverage
  CandyLovers/verification/subscriber/jelly_bean_fc_subscriber.*
  - – Alpha phase (experimental output)

UVM Randomization Prototype #3 CRAVE Interface

- 2 Files:
  uvm_randomized_sequence_item.h
  uvm_randomized_sequence.h

- Multiple inheritance:
  - Engineer uses now "uvm_randomized_sequence_item" instead of "uvm_sequence_item"