TestCov

Test Execution and Coverage Measurement in Test-Comp

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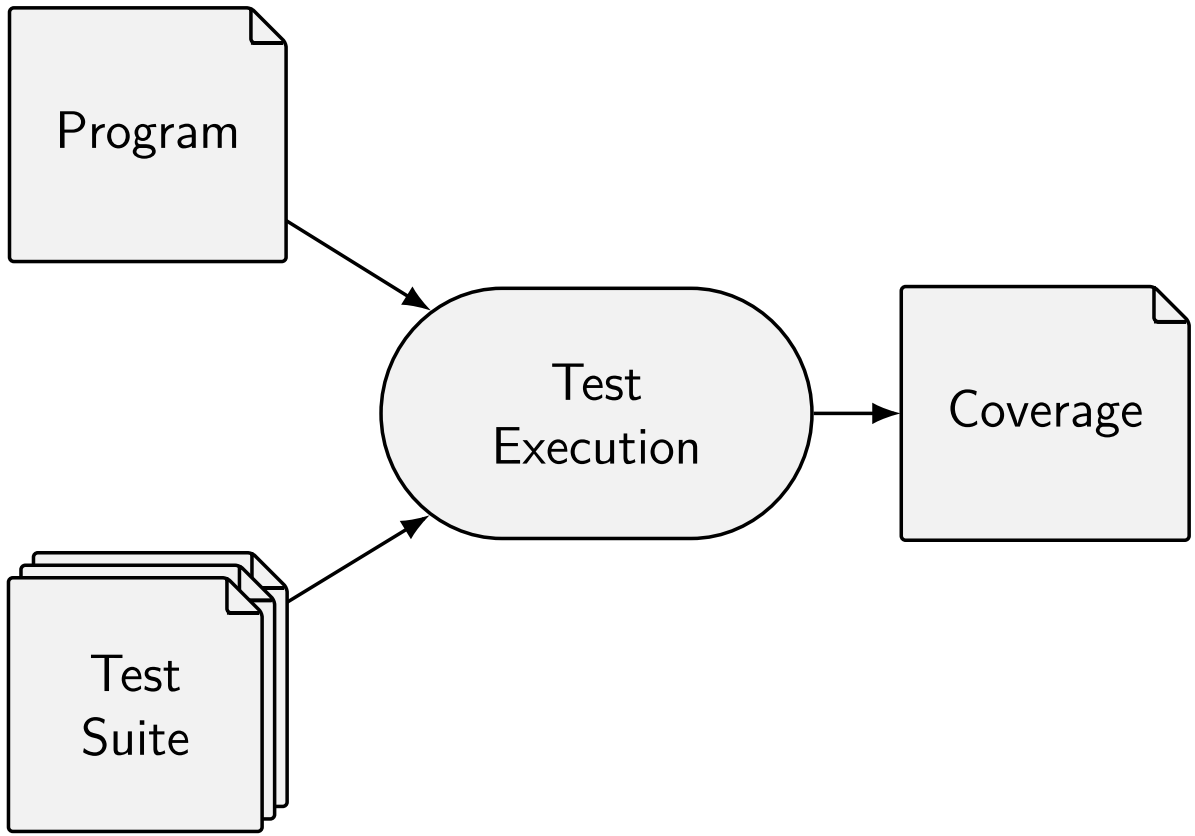
SoSy-Lab Software Systems

Our Starting Point



The Issue

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3  extern char input();
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5  int main() {
6    char x = input();
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8      while (1) {
9          fork();
10     }
11   } else {
12     remove("important.txt");
13     if (access("important.txt", F_OK) != -1) {
14       return 1;
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- Goal: Achieve 100 % branch coverage
- But: We don't want to use our system to execute the test suite that achieves that.

Existing Solutions to Robust Execution

- Virtual Machines
- Containerization (Docker etc.)

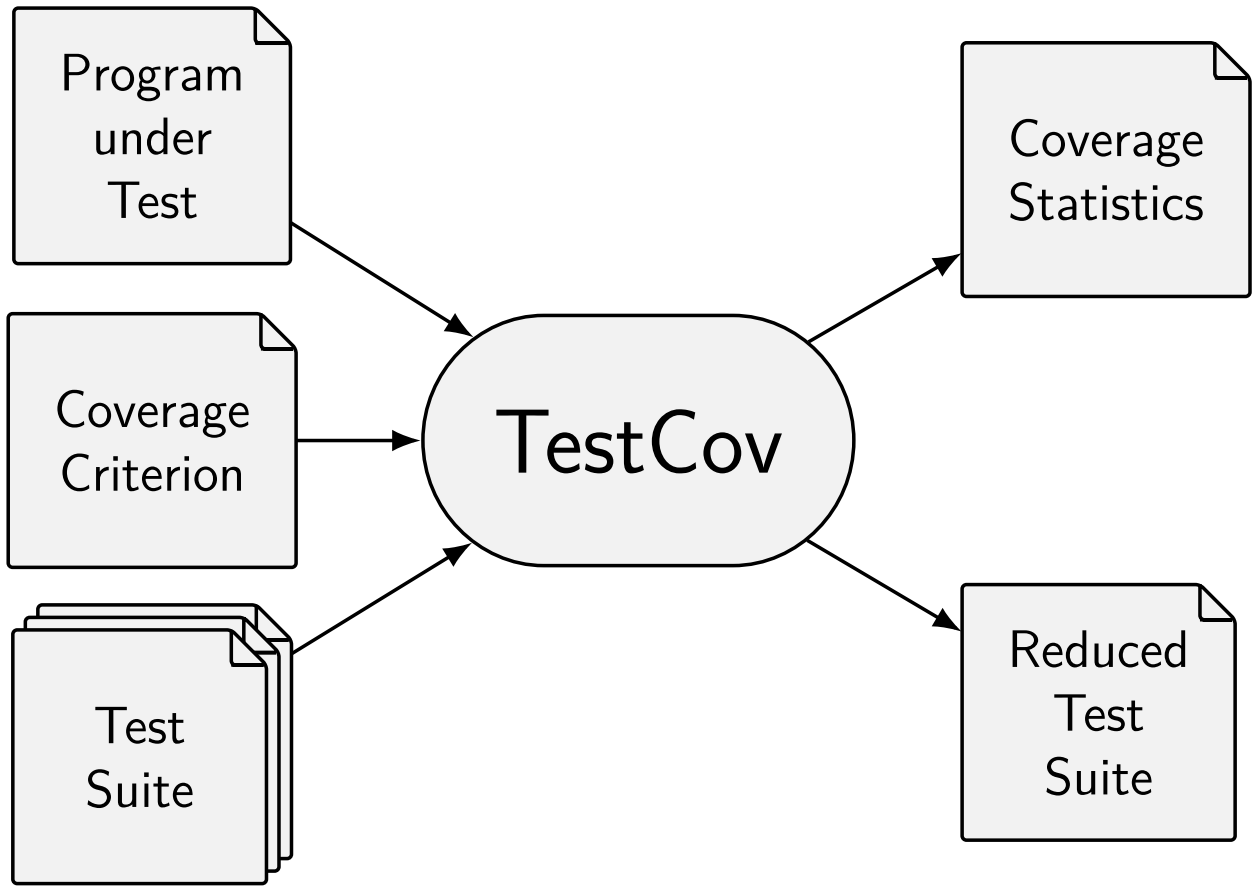
$\Rightarrow$ Potentially large overhead

$\Rightarrow$ Manual setup

$\Rightarrow$ Setups consist of multiple tools

$\Rightarrow$ Require superuser privileges

Our Solution



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  - Dependencies between tests

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  - Reduced test suite

TestCov available open source (Apache 2.0):

https://gitlab.com/sosy-lab/software/test-suite-validator/

Appendix

References

[1] D. Beyer, S. Löwe, and P. Wendler.
Reliable benchmarking: Requirements and solutions.
Int. J. Softw. Tools Technol. Transfer, 21(1):1–29, 2019.

Test-Suite Format

- XML-based
- Two components:
  1. `metadata.xml`
  2. one XML-file per test case
     - Sequence of test inputs
- Handled as zip archive

Metadata

```
<?xml version="1.0"?>
<!DOCTYPE test-metadata PUBLIC "+//IDN sosy-lab.org//DTD test-format te
<test-metadata>
  <sourcecodelang>C</sourcecodelang>
  <producer>Testsuite Validator v2.0</producer>
  <specification>CHECK(FQL(cover EDGES(@CONDITIONEDGE)))</specificatio
  <programfile>example.c</programfile>
  <programhash>eeecda9cbf27c43c9017fa00dd900c19a5ec18d46303f59a6e0357db78
  <entryfunction>main</entryfunction>
  <architecture>32bit</architecture>
  <inputtestsuitefile>original-suite.zip</inputtestsuitefile>
  <inputtestsuitehash>11911d658dcfbf8501390bf0faa96eb193b11bb1</inputtestsui
  <creationtime>2019-06-19T14:17:34Z</creationtime>
</test-metadata>
```

Test Case

```
<?xml version="1.0"?>
<!DOCTYPE testcase PUBLIC "+//IDN sosy−lab.org//DTD test−format testcase
<testcase>
  <input>'b'</input>
  <input>10</input>
  <input>0x0f</input>
</testcase>
```