

*Delayed Failures in Software
using
High Volume Automated Testing*

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Introduction

- ⇒ High Volume Automated Testing (HVAT)
- ⇒ Tens of thousands of test cases
- ⇒ State-based test oracle
- ⇒ Delayed failure vs. instantaneous failure

Research problem

- ⇒ Random (stochastic) testing
- ⇒ Penetration (robustness) testing
- ⇒ Delayed failure due to invalid input value
- ⇒ Hybrid testing approach

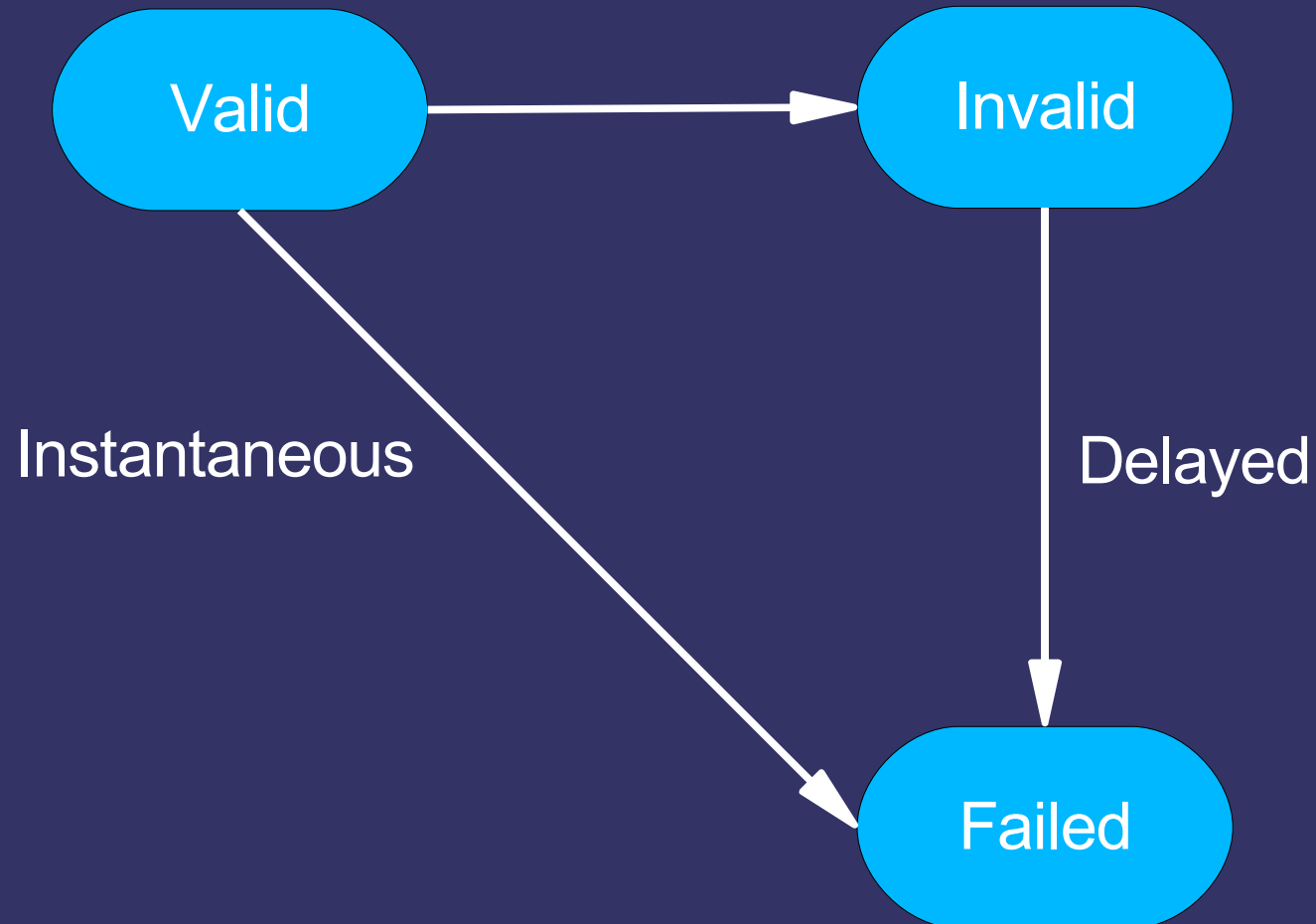
Importance of the research

- ➔ Lack of studies in the literature
- ➔ Delayed failures unlikely to be revealed by conventional testing techniques
- ➔ Corroboration of related work

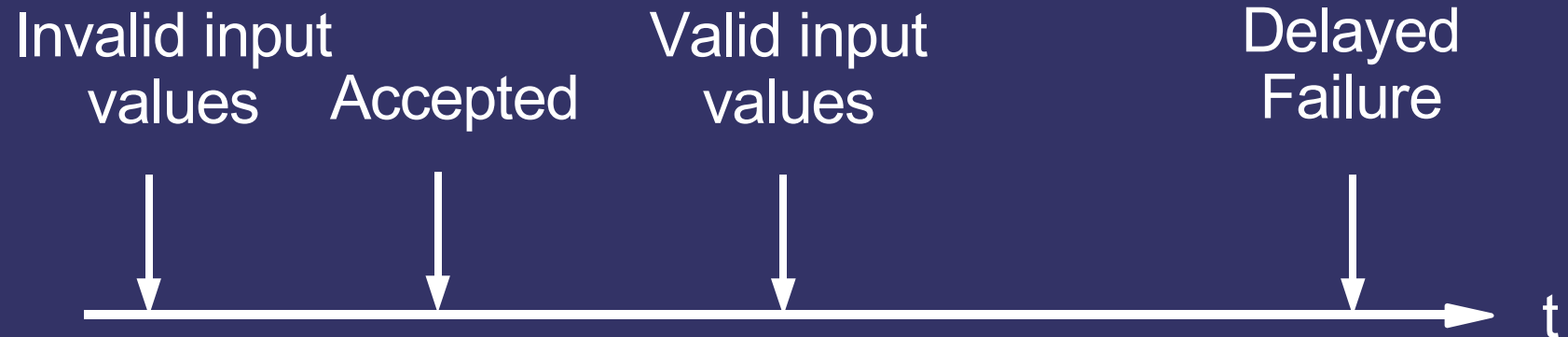
Related work

- ⇒ Random Generation of SQL (RAGS)
Massive Stochastic Testing of SQL
Slutz 1998
- ⇒ PROTOS
The Story Behind the SNMP Vulnerabilities
Havana & Takanen 2002
- ⇒ High Volume Test Automation
Kaner, Bond & McGee 2003

Research hypothesis



Research method



Experimental design

Software under test

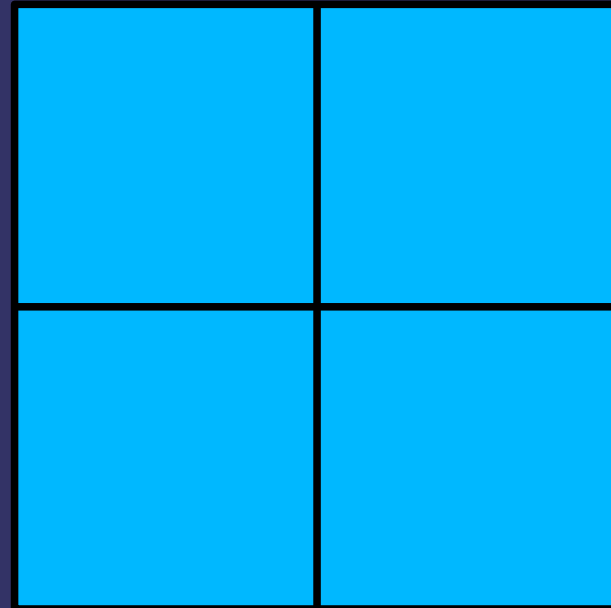
S1

S2

T1

Generating technique

T2



Results

- ⇒ MySQL 4.0
- ⇒ Generation of random valid SQL from BNF
- ⇒ 3 crashing bugs found – cf. RAGS (Slutz)
- ⇒ Generation of invalid SQL

Bug reports

- Bug #166 `select @@ not_a_variable` closes the connection
- Bug #1434 MySQL crashes on `CREATE TABLE IF NOT EXISTS ... SELECT ...`
- Bug #4046 using column type `DECIMAL(0,11)` will crash MySQL

Future work

- ⇒ Effectiveness of different HVAT techniques
- ⇒ Protocol-based software
- ⇒ Reliability, robustness and fault tolerance

Summary

- ⇒ High volume automated testing
- ⇒ Research problem
- ⇒ Research hypothesis
- ⇒ Research method

<http://www.woomerang.com/research/hvat.pdf>

Questions