



Keeping Other Compilers Honest

Validating LLVM with the GCC
Regression Test Suite

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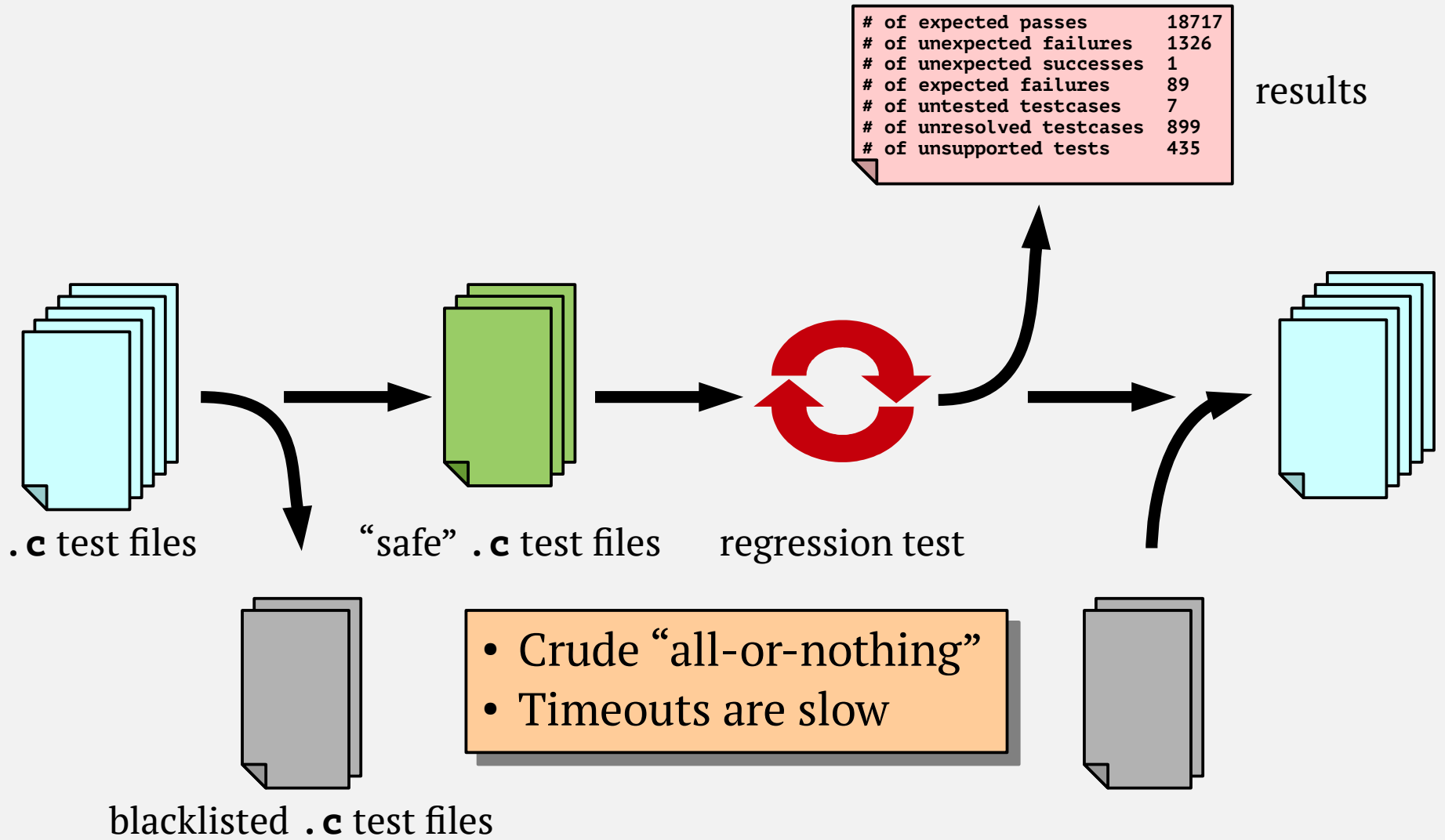
- The first step in testing GCC
- Checks we haven't broken what we fixed before
- C Test Suite as of 8 Aug 2015 consists of
 - ~1,600 compile tests
 - ~1,600 execute tests
 - ~11,000 target specific tests
 - ~9,000 parameterized “dg” tests
 - Compiled with various flags for ~110,000 tests total

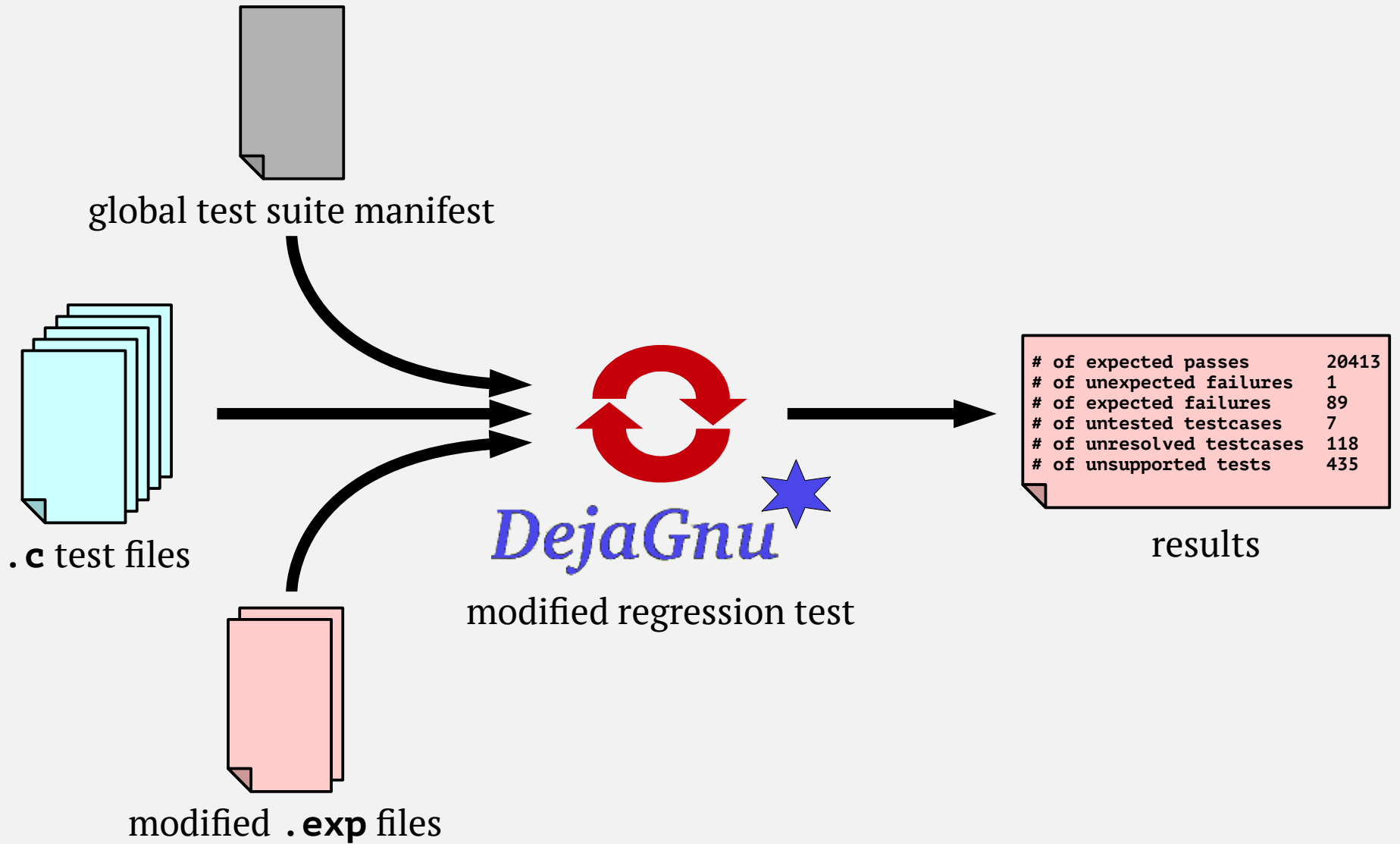
- C compile tests
 - test most corner cases for front ends
- C execute tests
 - good for testing back ends, generally boil down to
 - `is_compiler_working ? exit (0) : abort ();`
 - As side effect, tests libc, debugger, hardware
- Target specific tests
 - test target specific optimizations/builtins/attributes
 - assuming they are common to other compilers

- GNU C specific tests
 - some language features are unique to GCC
 - but other compilers support many of these
- GCC specific tests
 - tests which rely on specific GCC optimizer behaviour
 - tests looking at GCC internals
 - tests which rely on GCC attributes (e.g. mode)

- Run as though it were GCC testing
 - specify the compiler in the board description
 - run the tests
 - ignore any that are not relevant
- This doesn't really work
 - typical results
 - **PASS**: 8,640
 - **FAIL**: 22,590
 - **UNRESOLVED**: 7,388
 - **UNRESOLVED** timeouts mean it takes forever to run

A Better Way: Blacklisting





```
# Each entry is of the form:
# result: [test-name] [flags] [subtest] [subtest-line] comment-field
#
# result          PASS, XFAIL or UNSUPPORTED.
# test-name       The name of the test as it appears in the summary.
# flags           The set of flags this entry applies to.
# subtest         Optional subtest type, commonly 'execute' or 'compile'
# subtest-line    Optional line for the subtest (if appropriate)
# comment-field   Optional and ignored

# Language features intentionally never supported by MyCompiler
UNSUPPORTED: [gcc.c-torture/compile/20010605-1.c]      Variable Length Array
UNSUPPORTED: [gcc.c-torture/compile/20020210-1.c]      VLA

# GCC warns, MyCompiler errors
XFAIL: [gcc.c-torture/compile/920625-2.c]             conflicting types

# Tests for specific optimization behaviour
XFAIL: [gcc.dg/builtins-10.c]                         constant folding
```


=== gcc Summary ===

# of expected passes	20413
# of unexpected failures	1
# of expected failures	89
# of untested testcases	7
# of unresolved testcases	118
# of unsupported tests	435

- Working with GCC 4.2 test suite
- To do
 - roll forward to current GCC test suite
 - extend to other GNU tools (notably GDB)
 - push changes upstream
- Questions
 - how much should we support this explicitly in GCC?
 - should dg tests have “llvm” qualifiers?



Thank You

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