Test Driven Design using

by: Ryan Davis, Seattle.rb

Old Skool

1. Make it run.

2. Make it right.

3. Make it fast.

Old Skool is too Old

- aka "WaterFall"
- Exemplifies the "Over the Wall" QA mentality of yesteryear:
  - Do engineering (for too long), then send an amorphous blob of gunk to QA for testing in a vacuum.
  - Lacks tight feedback loops necessary to close bugs fast enough.
  - …is most often the thing cut to hit ship dates.
- These are **real**, even **prevalent**.
- I worked on one just *6 months ago!*

New Skool:
Test Driven Design

1. Make it right.

2. Make it run.

3. Make it fast.

New Skool:
Test Driven Design

- aka "Test First"
- Drives design desisions through testing.
  - Ensures things *are* testable.
  - Provides a fast and tight feedback loop.
- Attacks the problem at the specification level.
  - Doesn't wait until the last minute to see if things work.

TDD Mantra

- Go Red - produce failing testcase
  - Failures should make you *happy!*
- Go Green - implement and pass test
- Refactor - clean up - made safer by previous two steps
- Repeat until done

Our Driving Philosophy

- Make it: Right, Run, Fast *(enough)*.
- Simplicity & Clarity
  - Otherwise, you don't *fully* understand.
- Speed comes ***last***, and only objectively.
- Balance size and speed.
- Accelerate Maturity by splitting from parents.
- ***Have fun!*** Otherwise, what's the point?

A *Very* Quick Intro to TDD

- A Special Thanks to Steven Baker:
  - He ***nailed it*** at Canada on Rails.
  - Rewriting these slides felt like a violation of DRY.

```
class AccountTest < Test::Unit::TestCase
  def test_new_account_should_have_zero_balance
    account = Account.new

    assert_equal 0, account.balance
  end
end
```

```
E

  1) Error:
test_new_account_should_have_zero_balance:
NameError: uninitialized constant Account
    ./test/unit/account_test.rb:6:in
      `test_new_account_should_have_zero_balance'

1 tests, 0 assertions, 0 failures, 1 errors
```

```
class CreateAccount < ActiveRecord::Migration
  def self.up
    create_table "accounts", :force => true do |t|
      t.column :balance, :integer, :default => 0
    end
  end
end

class Account < ActiveRecord::Base
end
```

```
Started
.
Finished in 0.055268 seconds.

1 tests, 1 assertions, 0 failures, 0 errors
```

```ruby
class DepositTest < Test::Unit::TestCase
  def test_should_update_balance_when_making_deposit
    account = Account.new
    account.deposit(10)
    assert_equal 10, account.balance
  end
end
```

```
.E

  1) Error:
test_should_update_balance_when_making_deposit(DepositTest):
NoMethodError: undefined method `deposit' for #<Account...>
    ./test/unit/deposit_test.rb:8:in
`test_should_update_balance_when_making_deposit'

2 tests, 1 assertions, 0 failures, 1 errors
```

```
class Account < ActiveRecord::Base

  def deposit(amount)
  end

end
```

```
.F

  1) Failure:
test_should_update_balance_when_making_deposit:
<10> expected but was
<0>.

2 tests, 2 assertions, 1 failures, 0 errors
```

```
class Account < ActiveRecord::Base

  def deposit(amount)
    self.balance += amount
  end

end
```

```
Started
..
Finished in 0.242602 seconds.

2 tests, 2 assertions, 0 failures, 0 errors
```

It *really is* that simple...

New & Improved!

No Peekie TDD:

rubyholic.com

rubyholic

Seattle.rb Seattle, WA — Edit

Locations

Red Line Cafe @ 1525 E Olive Way, Seattle, WA 98122 (map)

Robot Co-op @ 1205 E Pike #2F, Seattle, WA 98102 (map)

Schedule

2006-04-11 7:00p to 10:00p at Red Line Cafe - Weekly Hacking

2006-04-18 7:00p to 10:00p at Red Line Cafe - Weekly Hacking

2006-04-25 7:00p to 9:00p at Red Line Cafe - April Meeting

Add to Calendar

Contacts

Seattl

No Peekie TDD

- Rubyholic.com is a ruby group registration system written in about a week.
- Went to private beta -- all bugs found were from holes in our tests.
- Then went to designers to make it pretty.
- **Launched without ever loading in a browser.**

No Peekie TDD

"The revolutionary part of this is that it speeds development by helping you develop without needing to open your web browser! I find myself thinking more about the functional issues that need to be solved rather than the placement of an image or the color of a link."

- Geoffrey Grossenbach

ZenTest

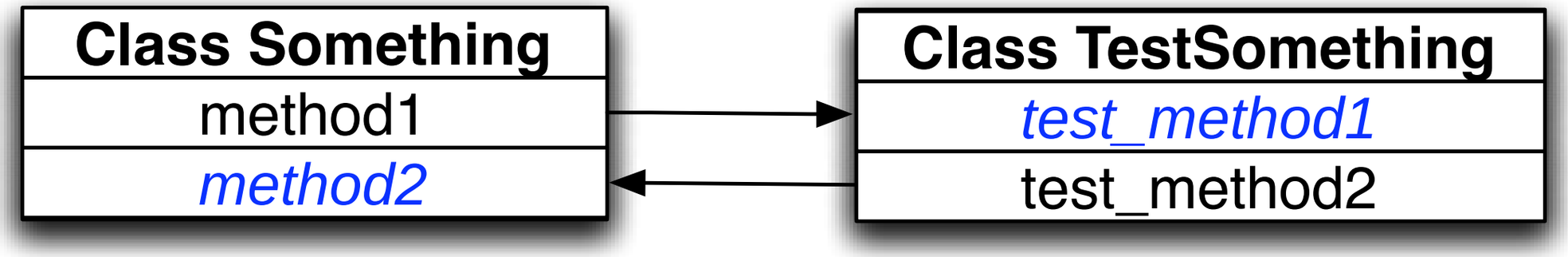
- Suite of 5 tools:
  - ZenTest - Accelerate TDD and audit code.
  - unit_diff - Clarify errors using diff.
  - autotest - Test feedback on turbo.
  - multiruby - Execute multiple rubies.
  - Test::Rails - Enhanced rails testing library.

zentest

- Bidirectional auditing and code generation.
- Can automatically evaluate generated code to accelerate TDD.
- Measures assertion to method ratio.

ZenTest

Generating Tests



ZenTest in Action

```
575 % cat test_factorial.rb
```

unit_diff

Illuminating Issues

```
& ./test.rb
...
  1) Failure:
test_conditional4(TestTypeChecker)
    [./r2ctestcase.rb:1068:in `test_conditional4'
     ./r2ctestcase.rb:1055:in `test_conditional4'].
<t(:if,
 t(:call,
  t(:lit,
  :==,
  t(:arg
  t(:retur
  t(:if,
   t(:call
    t(:lit
    :>,
    t(:arg
  t(:return, t(:lit, 3, Type.long), Type.void),
  t(:return, t(:lit, 4, Type.long), Type.void), Type.void),
Type.void)> expected but was
<t(:if,
 t(:call,
```

Or this:

```
& ./test.rb | unit_diff
...
  1) Failure:
test_conditional4(TestTypeChecker)
12c10
<     :>,
---
>     :<,
```

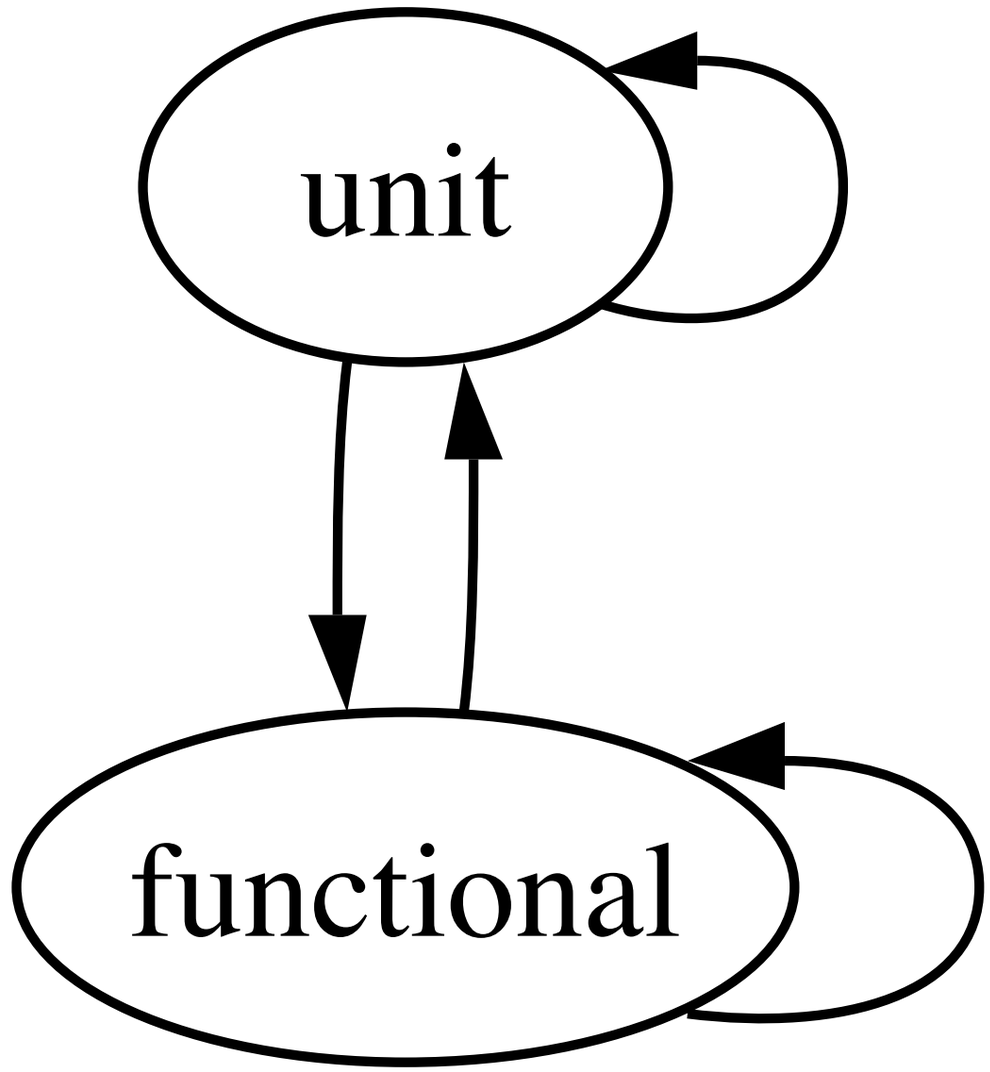
unit_diff in Action

```
$ make
ruby -w -I.:../../ParseTree/dev/lib:../../ParseTree/dev/test:../../RubyInline/de
v test_all.rb
Loaded suite test_all
Started
.....................................................................................
.....................................................................................
.....................................................................................
.....................................................................................
.....................................................................................
.....................................................
Finished in 3.96993 seconds.

377 tests, 841 assertions, 0 failures, 0 errors
$
```

autotest

- Intelligent Fast Feedback - run the right tests every time you save.

- Focus on Failures - reruns failed tests until they pass.

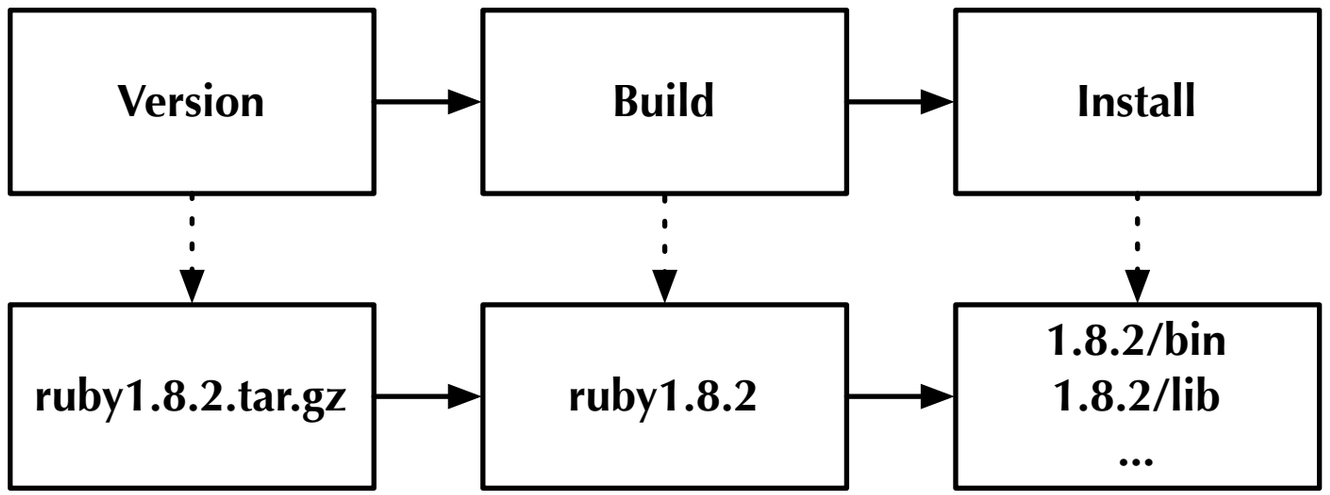


AutoTest in Action

```
File Edit Options Buffers Tools P4 Help
    assert_equal("test_method",          @tester.normal_to_test("method"))
    assert_equal("test_method_equals", @tester.normal_to_test("method="))
    assert_equal("test_spaceship",       @tester.normal_to_test("<=>"))
    assert_equal("test_times",           @tester.normal_to_test("*"))
    assert_equal("test_times2",          @tester.normal_to_test("**"))
    assert_equal("test_unary_minus",     @tester.normal_to_test("@-"))
    assert_equal("test_unary_plus",      @tester.normal_to_test("@+"))
    assert_equal("test_class_index",     @tester.normal_to_test("self.[]"))
  end

-uu-:---F1  test_zentest.rb   59% (507,0)     (Ruby Abbrev)--------------------
Loaded suite -e
Started
.........................................
Finished in 0.263702 seconds.

44 tests, 140 assertions, 0 failures, 0 errors
# Passed
# All passed
# Waiting for changes

-uu1:**-F1  autotest          Bot (366,0)     (Shell:run Shell-Compile)--------
Quit
```

multiruby

- Multiruby runs your command through multiple versions of ruby.
- Automatically configures, builds, and privately installs any number of ruby versions.
  - Just drop in a tarball to add a version.
- Essential for extension writers and compatibility testing.



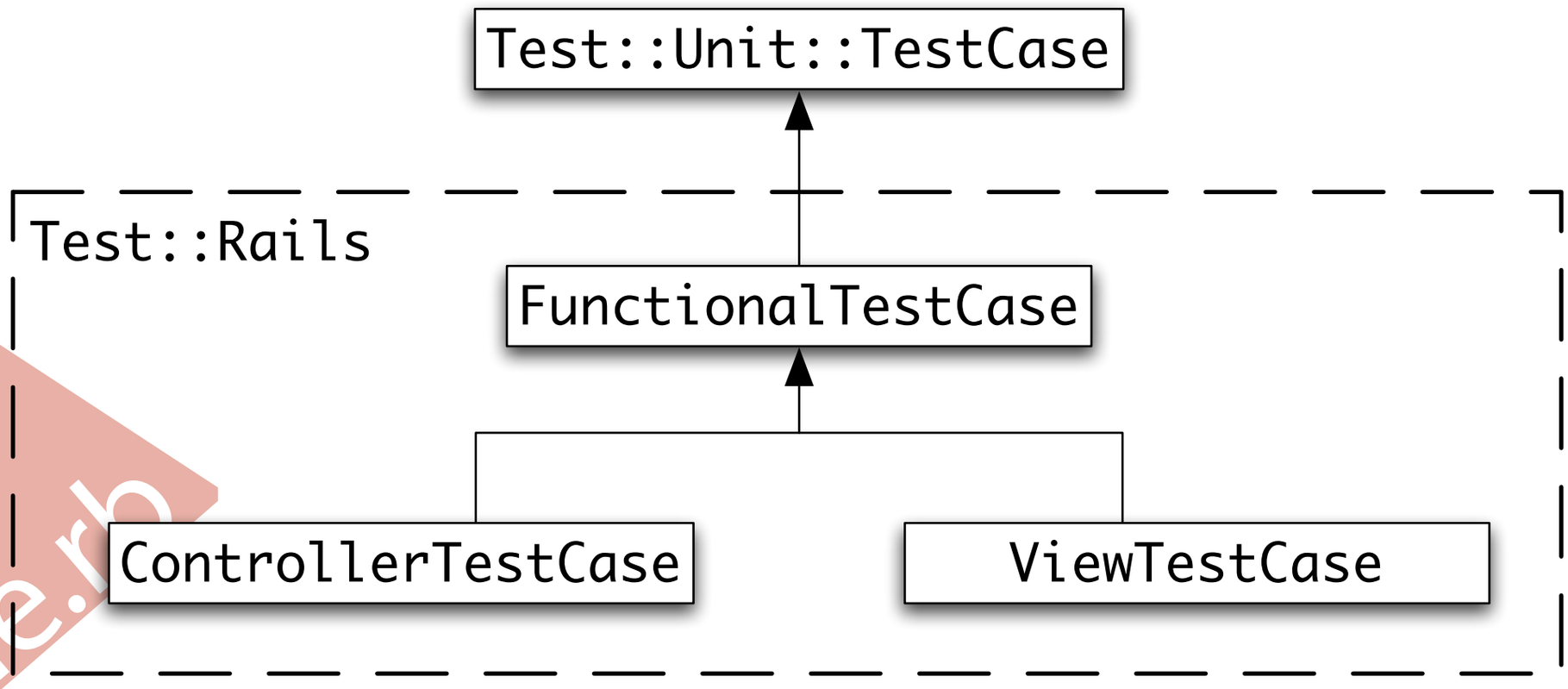
MultiRuby in Action

```
511 % multiruby -w -Ilib:bin:../../RubyInline/dev test/test_all.rb
```

Test::Rails

- Build Industrial-Strength Rails Code
  - Decouple controller tests from view tests.
  - Automatically audit consistency between the two.
  - Test single partials / AJAX actions
  - Extended suite of assertions

Test::Rails



Test::Rails in “Action”

```
class RootControllerTest < Test::Rails::ViewTestCase
  fixtures :points

  def test_point_partial
    render :partial => 'point',
           :locals  => { :point => points(:home) }

    expected = "<mk lat=\"-122.0\" lon=\"47.0\" id=\"100\"/>"

    assert_equal expected, @response.body
  end
end
```

Thank You

http://www.zenspider.com/seattle.rb