

Test Driven Development and Puppet

Jan & Johan

And We Are ? -> Johan

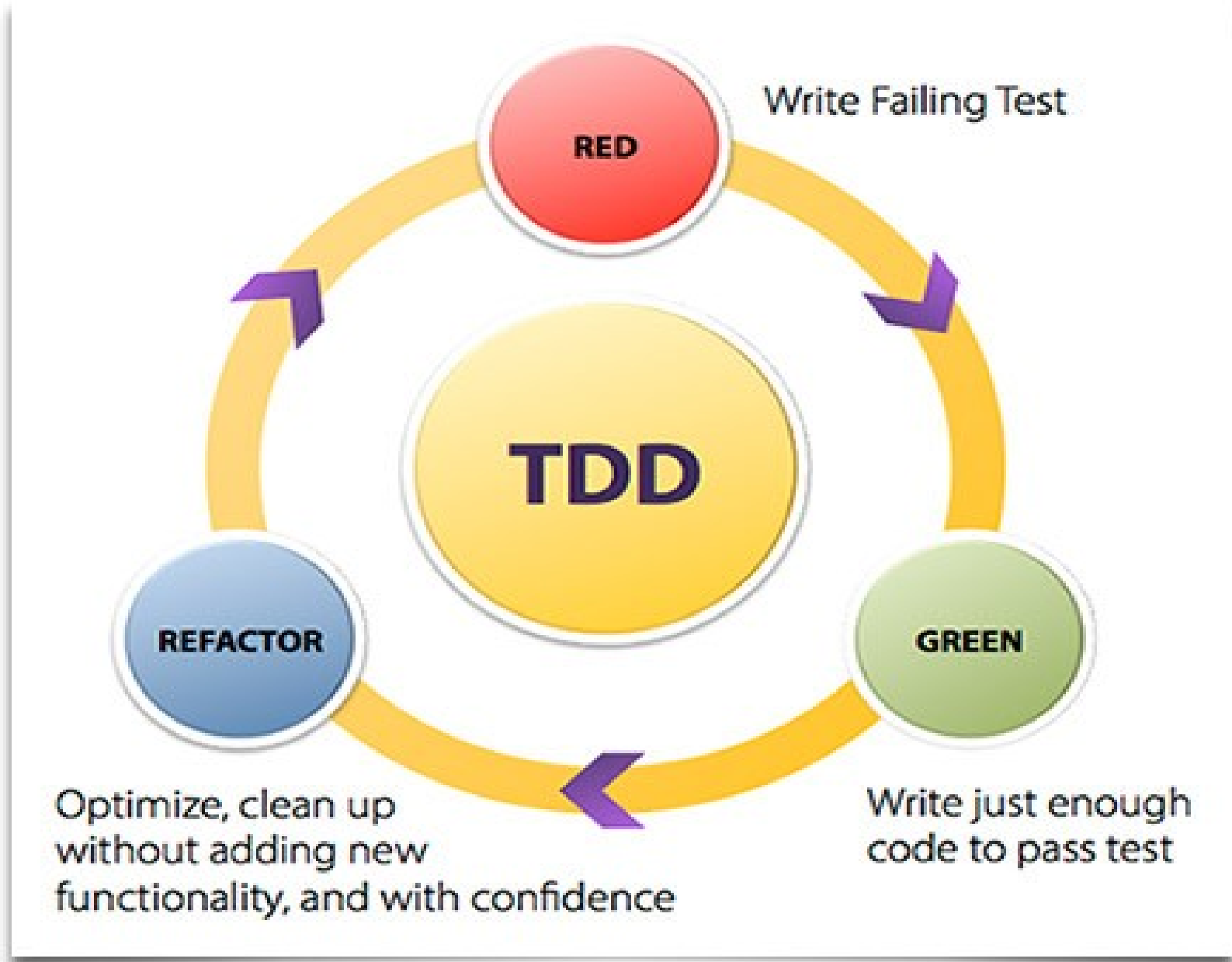
- Open Source Consultant @ open-future
- Puppet addict (and still learning ...)
- Member Belgian Puppet User Group
- A Sys-Admin
- A very poor developer (but working on it)
- Convinced that (automated) testing is important
- Email: johan@open-future.be



Why this talk ?

- We want to do it the 'good' way -> TDD
- rspec-puppet.com – rspec for modules
- ...
- No docs found, any pointers ?
- Looking at the puppet code to learn

What is Test Driven Development



Benefits of TDD

- Test case from the beginning
- Tests are maintained during life cycle
- Small moves – coding just to pass test
- Encourage simple design
- First step in test automation

TDD does not

- Replace integration testing
- Replace compliance testing
-

TDD for a sysadmin

- We have to learn developing
- Huge mindshift
- Culture schift
- Rspec for modules is ok
 - Writing modules is already adopted by sysadmin
see Rspec-puppet.com => tutorial
- Rspec for type/providers
 - Still looking for docs
 - Use the (puppet) source

[Web](#)[Images](#)[Videos](#)[Maps](#)[More ▾](#)[Search tools](#)

About 160,000 results (0.21 seconds)

[rspec-puppet](#)

[rspec-puppet.com/ ▾](#)

Installing. \$ gem install **rspec-puppet**. If you don't have Puppet installed as a system package, you'll also need to. \$ gem install puppet ...

You've visited this page many times. Last visit: 1/19/14

[Matchers - rspec-puppet](#)

[rspec-puppet.com/matchers/ ▾](#)

This matcher also has an optional method that you may want to use, with_all_deps . This will check if all the resources you have specified relationships to (with ...

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[Tutorial - rspec-puppet](#)

[rspec-puppet.com/tutorial/ ▾](#)

Rspec-puppet tests are there to test the behaviour of Puppet when it compiles your manifests into a catalogue of Puppet resources. For example, you might want ...

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[rodjek/rspec-puppet · GitHub](#)

[https://github.com/rodjek/rspec-puppet ▾](https://github.com/rodjek/rspec-puppet)

RSpec tests for your Puppet manifests. Contribute to **rspec-puppet** development by creating an account on GitHub.

You've visited this page 2 times. Last visit: 10/6/13

[Bug #18662: Rspec Tests pec/unit/provider/user ... - Puppet Labs](#)

[projects.puppetlabs.com/issues/18662 ▾](#)

Rspec Tests pec/unit/provider/user/useradd_spec.rb Failing on Redhat due ... Affected **Puppet** version: Branch: <https://github.com/puppetlabs/puppet/pull/1395>.

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[Testing Modules in the Puppet Forge | Puppet Labs](#)

[puppetlabs.com/blog/testing-modules-in-the-puppet-forge ▾](#)

Aug 15, 2011 - We are evaluating **rspec-puppet** and cucumber-puppet. ... of the resource **providers** with my own and then run puppet against those **providers**.

Filling the gap ...

- Initial attempt write Type using TDD
- https://github.com/Open-Future-Belgium/puppet_rspect_demo
- In need of help (i'm kind of stuck)
- Looking for input how to do it right
- Hopefully it results in a good tutorial
-

A Simple TDD Type session

```
[wit]on@laptopfc18 tddmodule]$ tree
.
├── lib
│   └── puppet
│       └── type
│           └── tddtype.rb
├── manifests
│   └── init.pp
├── Modulefile
├── Rakefile
├── Rakefile_new
├── README
├── spec
│   ├── classes
│   ├── defines
│   ├── fixtures
│   │   ├── manifests
│   │   │   └── site.pp
│   │   └── modules
│   │       └── tddmodule
│   │           ├── lib -> ../../../../../../lib
│   │           └── manifests -> ../../../../../../manifests
│   ├── functions
│   ├── hosts
│   ├── spec_helper.rb
│   ├── spec.opts
│   ├── type
│   │   └── tddtype_spec.rb
├── tests
│   └── init.pp
```

A Simple TDD Type Session - spec

```
require 'spec_helper'

describe Puppet::Type.type(:tddtype) do

  # use this without knowing why
  before :each do
    @provider_class = described_class.provide(:simple) do
      # has_features :feature1 :feature2
      mk_resource_methods
      def create; end
      def delete; end
      def exists?; get(:ensure) != :absent; end
      def flush; end
      def self.instances; []; end
    end
    described_class.stub(:defaultprovider).and_return @provider_class
  end

  it "should be able to create an instance" do
    described_class.new(:name => 'config0').should_not be_nil
  end
end
```

A Simple TDD Session - test

```
Finished in 0.00006 seconds
```

```
0 examples, 0 failures
```

```
[witjoh@laptopfc18 tddmodule]$ rake spec
```

```
/usr/bin/ruby -S rspec spec/type/tddtype_spec.rb
```

```
should be able to create an instance (FAILED - 1)
```

```
Failures:
```

```
1) should be able to create an instance
```

```
Failure/Error: @provider_class = described_class.provider(:simple) do
```

```
NoMethodError:
```

```
undefined method `provide' for nil:NilClass
```

```
# ./spec/type/tddtype_spec.rb:7:in `block (2 levels) in <top (required)>'
```

```
Finished in 0.00129 seconds
```

```
1 example, 1 failure
```

```
Failed examples:
```

```
rspec ./spec/type/tddtype_spec.rb:19 # should be able to create an instance
```

```
/usr/bin/ruby -S rspec spec/type/tddtype_spec.rb failed
```

A Simple TDD Session - code

```
require 'puppet'

Puppet::Type.newtype(:tddtype) do

  newparam(:name) do
    end

end
```

A Simple TDD Session - test

```
[witjoh@laptopfc18 tddmodule]$ rake spec  
/usr/bin/ruby -S rspec spec/type/tddtype_spec.rb  
  
Puppet::Type::Tddtype  
  should be able to create an instance  
  
Finished in 0.02288 seconds  
1 example, 0 failures  
[witjoh@laptopfc18 tddmodule]$
```

A Simple TDD Session - rspec

```
# sum all properties/params up, for the generic testing

properties = []
params     = [:name]

describe "Declare all properties" do
  properties.each do |property|
    it "should have a #{property}" do
      described_class.attrclass(property).ancestor.should be_include(Puppet::Property)
    end
  end
end

describe "Declare all parameters" do
  params.each do |parameter|
    it "should have a #{parameter}" do
      described_class.attrclass(parameter).ancestors.should be_include(Puppet::Parameter)
    end
  end
end
```

A Simple TDD Session - test

```
[witjoh@laptopfc18 tddmodule]$ rake spec  
/usr/bin/ruby -S rspec spec/type/tddtype_spec.rb
```

```
Puppet::Type::Tddtype  
  should be able to create an instance  
  Declare all parameters  
  should have a name
```

```
Finished in 0.00499 seconds  
2 examples, 0 failures
```

```
[witjoh@laptopfc18 tddmodule]$
```


A Simple TDD Session - rspec

```
describe "we have documented everything" do
  (params + properties).each do | attribute |
    it "the attribute #{attribute} should be documented" do
      described_class.attrclass(attribute).doc.strip.should_not == ""
    end
  end
end
```



A Simple TDD Session - Test

```
[witjoh@laptopfc18 tddmodule]$ rake spec  
/usr/bin/ruby -S rspec spec/type/tddtype_spec.rb
```

```
Puppet::Type::Tddtype  
  should be able to create an instance  
  Declare all parameters  
    should have a name  
  we have documented everything  
    the attribute name should be documented (FAILED - 1)
```

Failures:

```
1) Puppet::Type::Tddtype we have documented everything the attribute name should be documented  
   Failure/Error: described_class.attrclass(attribute).doc.strip.should_not == ""  
     expected not: == ""  
     got:         ""  
   # ./spec/type/tddtype_spec.rb:47:in `block (4 levels) in <top (required)>'
```

```
Finished in 0.00604 seconds  
3 examples, 1 failure
```

Failed examples:

```
rspec ./spec/type/tddtype_spec.rb:46 # Puppet::Type::Tddtype we have documented everything the attribute name should be documented  
/usr/bin/ruby -S rspec spec/type/tddtype_spec.rb failed  
[witjoh@laptopfc18 tddmodule]$
```

A Simple TDD Session - Code

```
require 'puppet'

Puppet::Type.newtype(:tddtype) do

  newparam(:name, :namevar => true) do
    desc "This is the title of my type"
  end

end

~
```

A Simple TDD Session - test

```
[witjoh@laptopfc18 tddmodule]$ rake spec  
/usr/bin/ruby -S rspec spec/type/tddtype_spec.rb
```

```
Puppet::Type::Tddtype  
  should be able to create an instance  
  Declare all parameters  
    should have a name  
  we have documented everything  
    the attribute name should be documented
```

```
Finished in 0.00609 seconds
```

```
3 examples, 0 failures
```

```
[witjoh@laptopfc18 tddmodule]$
```

A Simple TDD Session - rspec

```
it "should be able to create an instance" do
  described_class.new(:name => 'config0').should_not be_nil
end

# sum all properties/params up, for the generic testing

properties = [:loglevel]
params      = [:name]

describe "Declare all properties" do
  properties.each do |property|
    it "should have a #{property}" do
      described_class.attrclass(property).ancestor.should be_include(Puppet::Property)
    end
  end
end

describe "Declare all parameters" do
  params.each do |parameter|
    it "should have a #{parameter}" do
      described_class.attrclass(parameter).ancestors.should be_include(Puppet::Parameter)
    end
  end
end
```

A simple TDD Session - test

```
/usr/bin/ruby -S rspec spec/type/tddtype_spec.rb
```

```
Puppet::Type::Tddtype
  should be able to create an instance
  Declare all properties
    should have a loglevel (FAILED - 1)
  Declare all parameters
    should have a name
  we have documented everything
    the attribute name should be documented
    the attribute loglevel should be documented
```

Failures:

```
1) Puppet::Type::Tddtype Declare all properties should have a loglevel
   Failure/Error: described_class.attrclass(property).ancestor.should be_include(Puppet::
Property)
   NoMethodError:
     undefined method `ancestor' for Puppet::Type::MetaParamLoglevel:Class
   # ./spec/type/tddtype_spec.rb:31:in `block (4 levels) in <top (required)>'
```

Finished in 0.00837 seconds

5 examples, 1 failure

Failed examples:

```
rspec ./spec/type/tddtype_spec.rb:30 # Puppet::Type::Tddtype Declare all properties should
have a loglevel
/usr/bin/ruby -S rspec spec/type/tddtype_spec.rb failed
[witjoh@laptopfc18 tddmodule]$
```

A Simple TDD session - code

```
require 'puppet'

Puppet::Type.newtype(:tddtype) do

  newparam(:name, :namevar => true) do
    desc "This is the title of my type"
  end

  newproperty(:loglevel) do
    desc "Specify the level at which debugging statements and operation statistics should be syslogged (currently logged to the syslogd(8) LOG_LOCAL4 facility)"
  end

end

end
```

A simple TDD Session

- And we could go on ... forever

A simple TDD Session - rspec

```
newproperty(:loglevel, :array_matching => :all) do
  desc "Specify the level at which debugging statements and operation statistics should be syslogged (currently logged to the syslogd(8) LOG_LOCAL4 facility)."
  defaultto :none

  # in ldap config, BER/ACL are uppercase, but since we will use the -or- ed value, we use case insensitive labels
  loglevels = [:off, :trace, :packets, :args, :conns, :ber, :filter, :config, :acl, :stats, :stats2, :shell, :parse, :sync, :none]

  validate do | value |
    # we can recieve input in following format :
    # As a string -> integer/hex or label
    # As an integer
    # As an hex
    # DO NOT USE value.class -> seems to evaluate to Object instead of class type
    # http://stackoverflow.com/questions/15346324/case-statement-evaluating-class-not-working-as-expected
    case value
    when Fixnum
      if value < -1 or value > 0b1111111111111111
        raise ArgumentError, "property loglevel must be between -1 and 65536/0xffff - #{value} given. See man slapd-config"
      end
    when String
      case value
      when /^0x[0-9a-fA-F]+$/
        if value.to_i(16) < -1 or value.to_i(16) > 0b1111111111111111
          raise ArgumentError, "property loglevel must be between -1 and 65536/0xffff - #{value} given. See man slapd-config"
        end
      when /^[0-9]+$/
        if value.to_i < -1 or value.to_i > 0b1111111111111111
          raise ArgumentError, "property loglevel must be between -1 and 65536/0xffff - #{value} given. See man slapd-config"
        end
      else
        if !(loglevels.include?(value.downcase.to_sym))
          raise ArgumentError, "loglevel attribute #{value} not supported. See man slapd-config"
        end
      end
    end
    # Still not clear when things are converted to symbols ... But we validate the defaultto also
    when Symbol
      if !(loglevels.include?(value))
        raise ArgumentError, "loglevel attribute #{value} not supported. See man slapd-config"
      end
    end
  end
end
```

A Simple TDD Session - test

```
the attribute loglevel should be documented
the :loglevel property
  should default to 'none'
validation testing
  should pass simple number validation
  should fail simple number validation (FAILED - 1)
  should pass label validation
  should fail label validation (FAILED - 2)
munging testing
  should accept mixed array, return array integers and labels (FAILED - 3)

Failures:

1) Puppet::Type::Tddtype the :loglevel property validation testing should fail simple number validation
   Failure/Error: expect { described_class.new(:name => 'config0', :loglevel => 755555 )}.to raise_error
     expected Exception but nothing was raised
   # ./spec/type/tddtype_spec.rb:62:in `block (4 levels) in <top (required)>'

2) Puppet::Type::Tddtype the :loglevel property validation testing should fail label validation
   Failure/Error: expect { described_class.new(:name => 'config0', :loglevel => ['ERROR', "trace", "conns", "BER", "filter", "filter"] )}.to raise_error
     expected Exception but nothing was raised
   # ./spec/type/tddtype_spec.rb:72:in `block (4 levels) in <top (required)>'

3) Puppet::Type::Tddtype the :loglevel property munging testing should accept mixed array, return array integers and labels
   Failure/Error: described_class.new(:name => 'config0', :loglevel => [0x1,'0x2',4,'64',"conns", "BER"][:loglevel]).should == [1, 2, 4, 64, "conns", "ber"]
     expected: [1, 2, 4, 64, "conns", "ber"]
     got: [1, "0x2", 4, "64", "conns", "BER"] (using ==)
   # ./spec/type/tddtype_spec.rb:77:in `block (4 levels) in <top (required)>'

Finished in 0.01873 seconds
1 examples, 3 failures

Failed examples:
```

A Simple TDD Session - code

```
validate do | value |
  # we can receive input in following format :
  # As a string -> integer/hex or label
  # As an integer
  # As an hex
  # DO NOT USE value.class -> seems to evaluate to Object instead of class type
  # http://stackoverflow.com/questions/15346324/case-statement-evaluating-class-not-working-as-expected
  case value
  when Fixnum
    if value < -1 or value > 0b1111111111111111
      raise ArgumentError, "property loglevel must be between -1 and 65536/0xffff - #{value} given. See man slapd-config"
    end
  when String
    case value
    when /^0x[0-9a-fA-F]+$/
      if value.to_i(16) < -1 or value.to_i(16) > 0b1111111111111111
        raise ArgumentError, "property loglevel must be between -1 and 65536/0xffff - #{value} given. See man slapd-config"
      end
    when /^[0-9]+$/
      if value.to_i < -1 or value.to_i > 0b1111111111111111
        raise ArgumentError, "property loglevel must be between -1 and 65536/0xffff - #{value} given. See man slapd-config"
      end
    else
      if !(loglevels.include?(value.downcase.to_sym))
        raise ArgumentError, "loglevel attribute #{value} not supported. See man slapd-config"
      end
    end
  end
  # Still not clear when things are converted to symbols ... But we validate the default to also
  when Symbol
    if !(loglevels.include?(value))
      raise ArgumentError, "loglevel attribute #{value} not supported. See man slapd-config"
    end
  end
end

# we represent all in symbols if labels are given, else we translate everything in decimal integers
munge do | value |
  case value
  when String
    case value
    when /^0x[0-9a-fA-F]+$/
      when /^[0-9]+$/
```

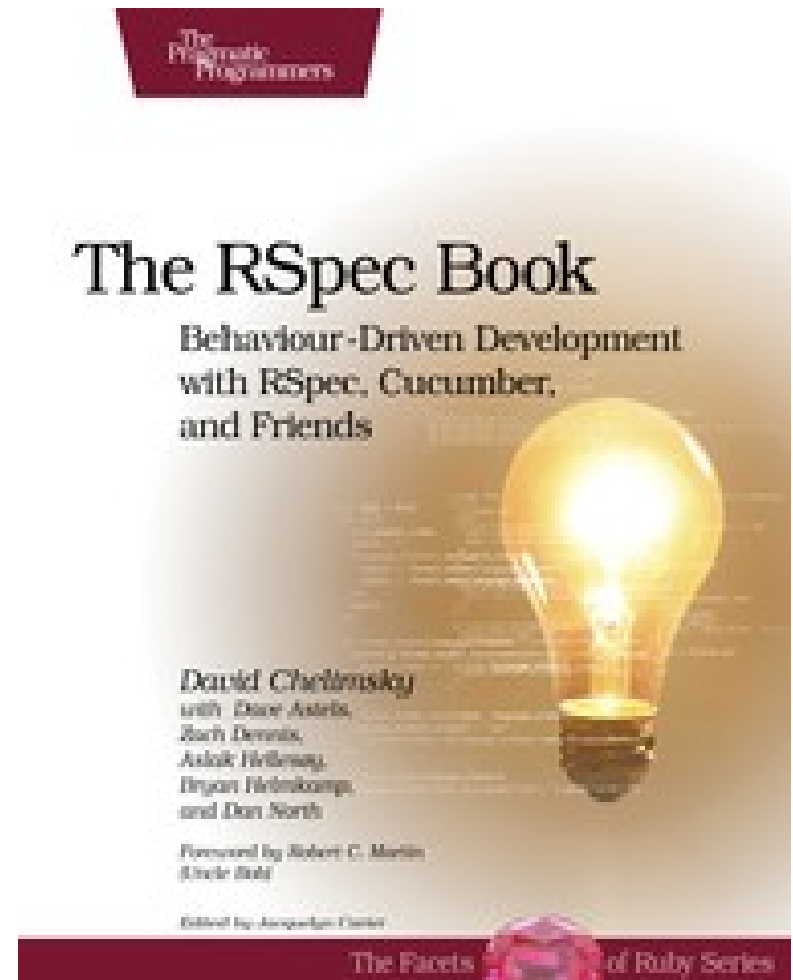
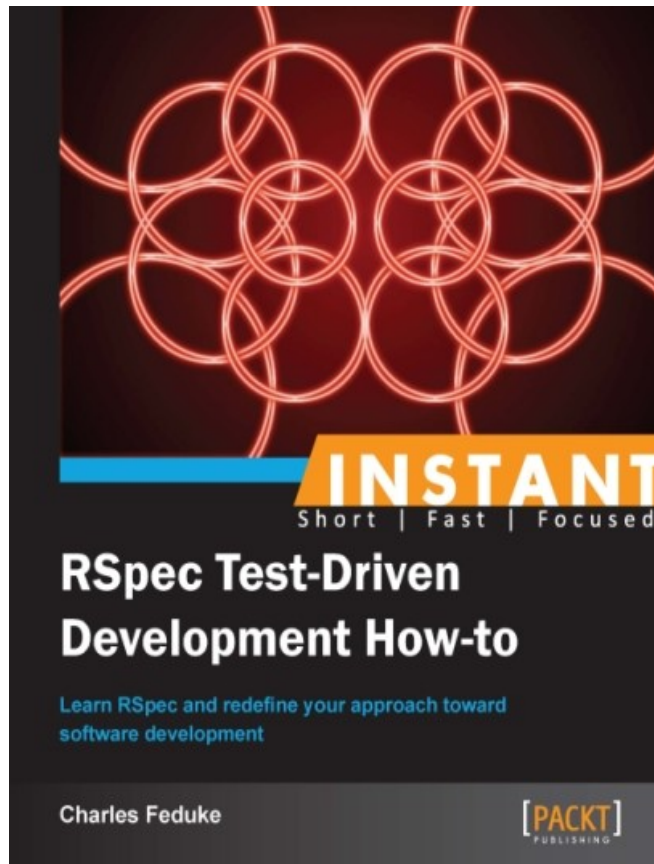
A Simple TDD Session - test

```
[witjoh@laptopfc18 tddmodule]$ rake spec
/usr/bin/ruby -S rspec spec/type/tddtype_spec.rb

Puppet::Type::Tddtype
  should be able to create an instance
  Declare all properties
    should have a loglevel
  Declare all parameters
    should have a name
  we have documented everything
    the attribute name should be documented
    the attribute loglevel should be documented
  the :loglevel property
    should default to 'none'
  validation testing
    should pass simple number validation
    should fail simple number validation
    should pass label validation
    should fail label validation
  munging testing
    should accept mixed array, return array integers and labels

Finished in 0.01991 seconds
11 examples, 0 failures
[witjoh@laptopfc18 tddmodule]$
```

Rspec books





Learning to write a puppet custom type/provider, starting with the rspec definitions, and then step by step coding everything to pass the test. — Edit

40 commits

1 branch

22 releases

1 contributor



branch: master ▾

puppet_rspec_demo / +

added rspec tests defaults and validation



johan-open-future authored a month ago

latest commit c459989f2c



ldap

added rspec tests defaults and validation

a month ago



README.md

added rspec tests defaults and validation

a month ago

README.md

puppet_rspec_demo

Interesting blog : <http://garylarizza.com/blog/2013/11/25/fun-with-providers/>

Learning to write a puppet custom type/provider, starting with the rspec definitions, and then step by step coding everything to pass the test.

We are writing an openldap type to setup and reconfigure an openldap server using cn=condig (dynamic config)

All tools should be installed, and initially we setup our module dir tree with 'puppet module generate' and issue in the .../modules/ldap

Different steps will be tagged, so one can follow the steps I did in my learning process of all of this.

<> Code

🔔 Issues 0

🔗 Pull Requests 0

📖 Wiki

📡 Pulse

📊 Graphs

🔗 Network

⚙ Settings

HTTPS clone URL

<https://github.com>

You can clone with [HTTPS](#), [SSH](#),
or [Subversion](#). ⓘ

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Home

Posts

PuppetCamp Amsterdam

Jan 28, 2014 puppet camp

It seems I did miss a great and interesting part of the interesting session. And I will have to catch up when the videos are released. I also got the Belgian Puppet Users Group T-shirt, and with success. There is only one drawback on visiting such events an every grow

Here is a nice [blog by Dawn Foster](#)

Now waiting for FOSDEM and CfgMgmt.eu

- by

New Years Meeting

Jan 09, 2014 meeting

This time we held our meeting in a boat, 'De Planck' in Ghent. This was not a regular meetup, but just a meeting to discuss the Puppet Users Group will be taken part in or organize

- by Johan De Wit

Something about augeas

Nov 26, 2013 meetups

Two new faces showed up at this meetup. I did prepare some slides about puppet and augeas, but there was nothing much to part was not at all going about augeas.

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**Brussels,
Belgium**

Welcome!

[+ SCHEDULE A NEW MEETUP](#)[Upcoming 1](#)[Suggested 0](#)[Past](#)[Calendar](#)

FEATURED MEETUP

Round Table Puppet Infrastructure Setup

Combelle NV

Skaldenstraat 121, Gent (map)



Tue Feb 25

7:00 PM

[I'M ATTENDING](#)

What's

NEW MEMBER

Stefan
joined

Yesterday

NEW COMMENT

Martin
commented
Fosden
group s

2 days

NEW COMMENT

Bram L
commented