

# Infrastructure as Code

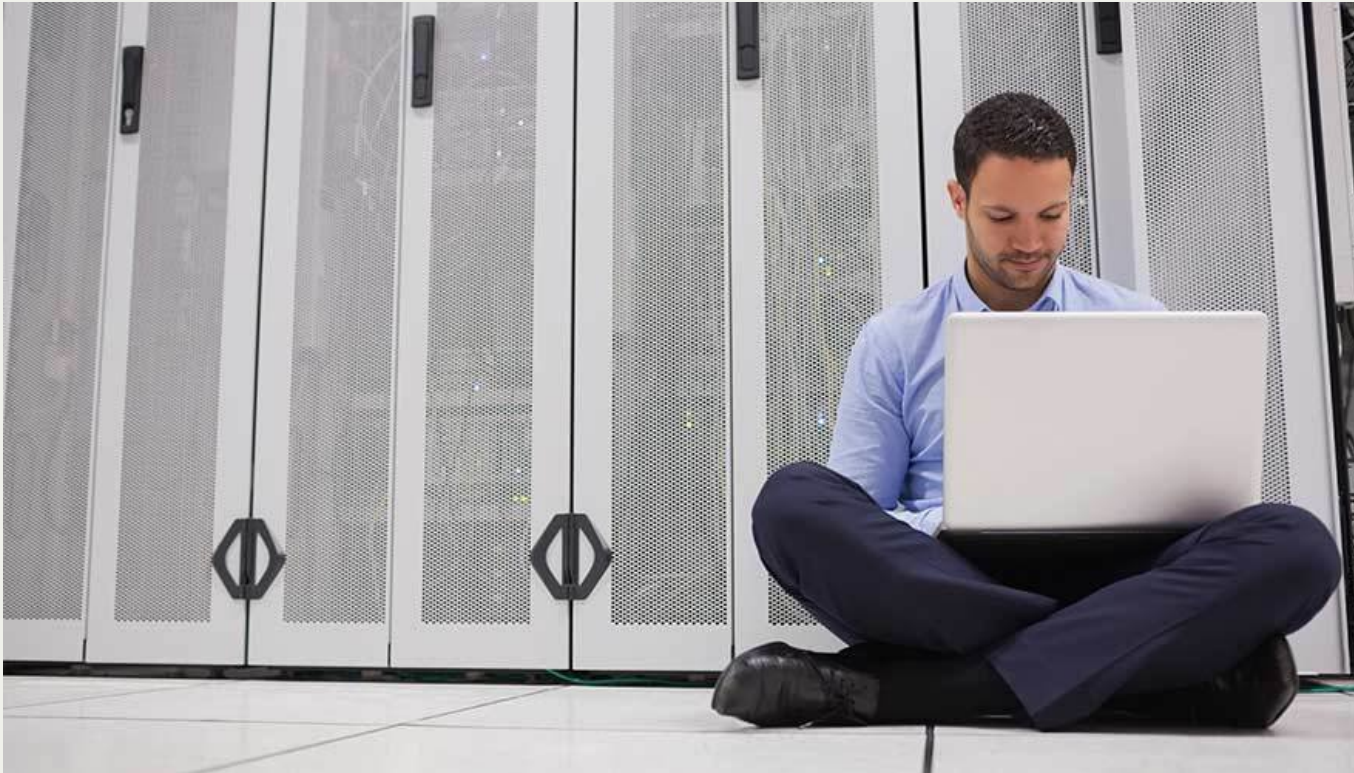
# Angel Núñez

@snahider

Agile Developer,  
Consultant & Trainer



# IT Ops es un trabajo complicado



# Snowflake Servers



# Problemas



- Difícil replicar un nuevo servidor con las mismas funciones.
- Difícil de escalar.
- Desfases entre ambientes.
- Muy frágiles y cambios con efectos secundarios.
- Baja confianza al realizar cambios.
- Sin versionamiento y seguimiento a los cambios.

# ¿Qué es Infrastructure as Code?

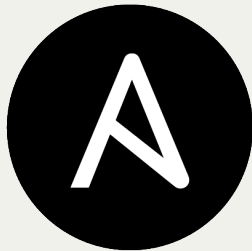
Es una práctica donde se describe y maneja la infraestructura de la misma manera que el código.

- Utilizando un lenguaje de alto nivel  
(DSL para infraestructura).
- Utilizando buenas prácticas de desarrollo de software  
(ejm: subir los cambios a un repositorio).

# Herramientas



CHEF™



ANSIBLE

CFEngine

# ¿Cómo es el código de infraestructura?

## Puppet

```
package { 'apache2':  
  ensure => installed,  
}  
  
service { 'apache2':  
  ensure => running,  
  require => Package['apache2'],  
}  
  
file { ['/var/www/html/index.html':  
  content => '<html>hello world</html>',  
  owner => 'root',  
  mode => '640',  
  ensure => present,  
}]
```

## Chef

```
package 'apache2' do  
  action :install  
end  
  
service 'apache2' do  
  action [:enable, :start]  
end  
  
file '/var/www/html/index.html' do  
  content '<html>hello world</html>'  
  owner 'root'  
  mode '640'  
  action :create  
end
```

Características: Abstracción e Idempotencia



# Beneficios

## (Utilizar un script automatizado idempotente)

- Crear una nueva máquina automatizadamente desde 0.
- Asegurar que los ambientes son consistentes.
- Agregar un cambio y que se actualice en todos los servidores.
- Generar el ambiente de trabajo al equipo de desarrollo.

# Beneficios

(Utilizar código mediante una DSL de infraestructura)

- Probar todos los cambios.
- Versionado y seguimiento de los cambios.
- Integración y entrega continua de la infraestructura.
- Infraestructura auto-documentada.
- Herencia, composición, reusabilidad, encapsulamiento, etc.

# **Demostración**

## **"Instalando y Configurando Apache"**

# **Probando Infrastructure Code**

# Tipos de Pruebas

## Unit Test

Probar unitariamente el código sin provisionar (alterar) un nodo real.

## Integration Tests

Verificar que el código provisiona un nodo real de la manera esperada.


# Integration Testing




# Desafíos al Realizar Integration Testing

- Crear ambientes de pruebas de manera fácil y repetible.
- Interrogar el estado real del servidor.
- Un Test Harness que combine lo anterior.

# RSpec-Puppet





<https://github.com/rodjek/rspec-puppet>



 **rodjek / rspec-puppet**


 Watch  Star  Fork












36293128

RSpec tests for your Puppet manifests <http://rspec-puppet.com>


 445 commits  8 branches  20 releases  42 contributors


 Branch: master **rspec-puppet / +** 


 **DavidS** Merge pull request #326 from DavidS/cleanups Latest commit 2b09cd 13 days ago


 bin	Add helper script to configure a module for rspec-puppet testing	4 years ago
 lib	Autorequires: make sure resource exists	15 days ago
 spec	Autorequires: make sure resource exists	15 days ago
 .gitignore	Ignore .ruby-version	2 years ago
 .travis.yml	Enable coveralls.io integration	4 months ago
 CHANGELOG.md	Issue 295: Allows structured facts to work in 'let :facts' block	2 months ago
 Gemfile	Enable coveralls.io integration	4 months ago
 LICENSE	MIT License	4 years ago
 README.md	Explain the resource matcher syntax	14 days ago
 Rakefile	(maint) Add gem build and release rake tasks	11 months ago
 rspec-puppet.gemspec	Revert version number to a development version	4 months ago


**<> Code**

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# Vagrant

<https://www.vagrantup.com/>

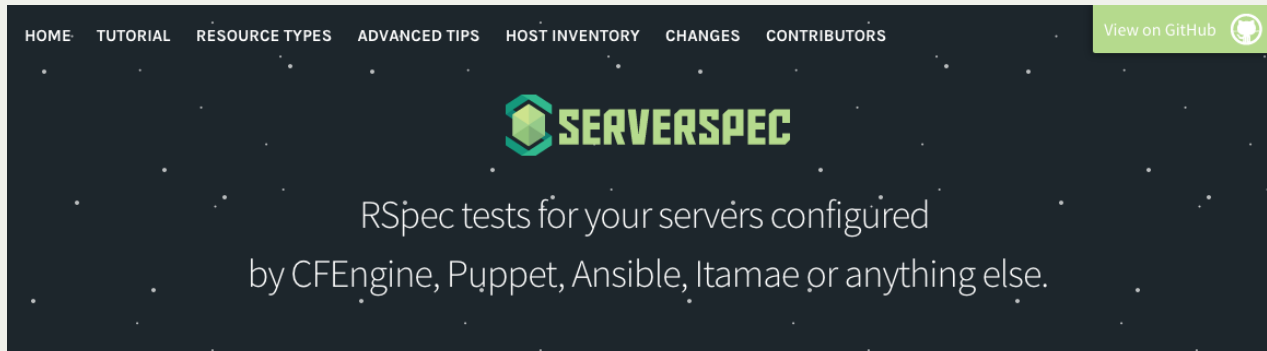


**Development  
environments  
made easy.**

Create and configure lightweight, reproducible,  
and portable development environments.

# Serverspec

<http://serverspec.org/>



## About V2

Serverspec/Specinfra v2 has been just released. [See the document about v2.](#)

## About


With Serverspec, you can write RSpec tests for checking your servers are configured correctly.

Serverspec tests your servers' **actual state** by **executing command locally**, **via SSH**, **via WinRM**, **via Docker API** and **so on**. So you don't need to install any agent softwares on your servers and can use any configuration management tools, [Puppet](#), [Ansible](#), [CFEngine](#), [Itamae](#) and so on.

**But the true aim of Serverspec is to help refactoring infrastructure code.**

# Beaker

<https://github.com/puppetlabs/beaker>

 puppetlabs / beaker

Watch 148

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Puppet Acceptance Testing Harness <https://groups.google.com/forum/#!forum/puppet-beaker>


3,892 commits

8 branches

98 releases


107 contributors


Branch: master **beaker / +**


 **kevpl** Merge pull request #984 from ferventcoder/ticket/master/BKR-582 Latest commit 45cca4 3 hours ago


acceptance	(BKR-535) Regression: confine_block does not skip tests...	28 days ago
bin	(QENG-310) move various host configuration steps together	2 years ago
ext/completion	(QENG-1758) beaker bash completion script should not prevent filename...	9 months ago
lib	Merge pull request #984 from ferventcoder/ticket/master/BKR-582	3 hours ago
spec	Merge pull request #984 from ferventcoder/ticket/master/BKR-582	3 hours ago
.gitignore	Fix #519 Unable to ssh to docker container based on Ubuntu Trusty	11 months ago
.rspec	(MAINT) fix broken spec test	11 months ago
.simplecov	(BKR-183) simplecov busted in beaker	6 months ago
.travis.yml	(MAINT) travis failing on ruby 1.8	2 years ago

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# Integration Tests

## Ambiente de Prueba

```
# spec/acceptance/nodesets/default.yml
```

```
HOSTS:
```

```
  ubuntu-1404-x86:
```

```
    roles:
```

```
      - masterless
```

```
    platform: ubuntu-1404-x86_64
```

```
    hypervisor: vagrant
```

```
    box: ubuntu14.04-x86
```

## Prueba

```
# spec/acceptance/jenkins_spec.rb
```

```
describe 'jenkins class' do
```

```
  it 'should work with no errors' do
```

```
    pp = "include jenkins"
```

```
    expect(apply_manifest(pp).exit_code).to eq(0)
```

```
  end
```

```
#Serverspec
```

```
describe service('jenkins') do
```

```
  it { should be_enabled }
```

```
end
```

```
end
```

# Configuración del Ambiente

```
# spec/spec_helper_acceptance.rb

RSpec.configure do |c|
  # Configure all nodes in nodeset
  c.before :suite do
    hosts.each do |host|
      # Install this module
      copy_module_to(host, :source => module_root,
                     :module_name => 'jenkins')

      # copies all the module dependencies
      rsync_to(host, fixture_modules, '/etc/puppet/modules/')
    end
  end
end
```

# **Demostración**

## **"Agregando Pruebas al módulo de Apache"**

# Porqué CD y Devops necesitan Infrastructure as Code

Infrastructure as Code es un habilitador:

- Permite agregar la infraestructura al pipeline de Continuous Delivery.
- Permite que Operaciones pueda utilizar prácticas ágiles para gestionar la infraestructura.
- Rompe barreras entre Dev y OPS.

# Preguntas





# Referencias

Presentación (código y slides):

<https://github.com/snahider/test-driven-infrastructure>

