

Test Driven Infrastructure

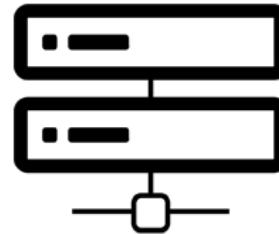
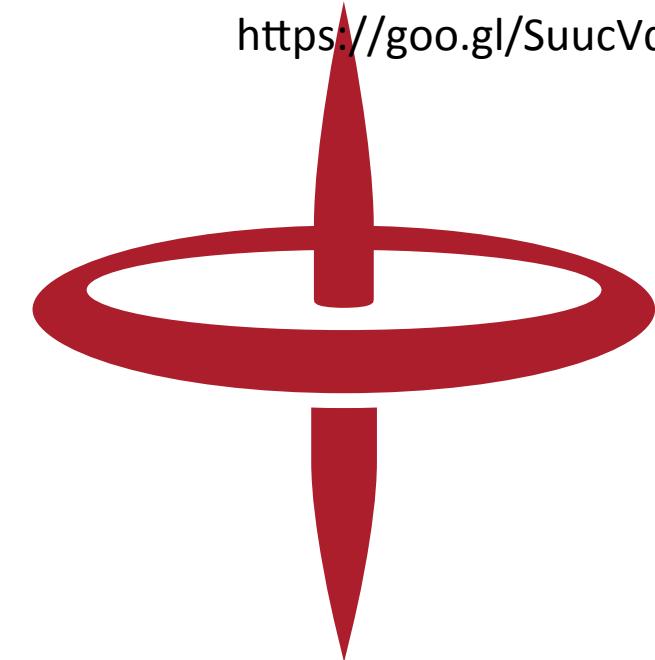
About Me

- Senior Operations Engineer – SpinDance
- Passionate about infrastructure automation
- Fascinated about by the DevOps
- 6 years at SpinDance
- Love spending time with my family and friends
- @rodrigda



SPINDANCE

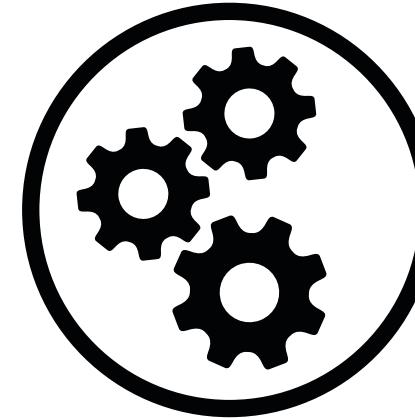
Systems engineering, software development, and solution hosting, focused on creating and delivering connected smart products.



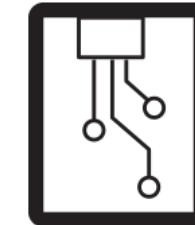
HOSTING



MOBILE



SYSTEMS



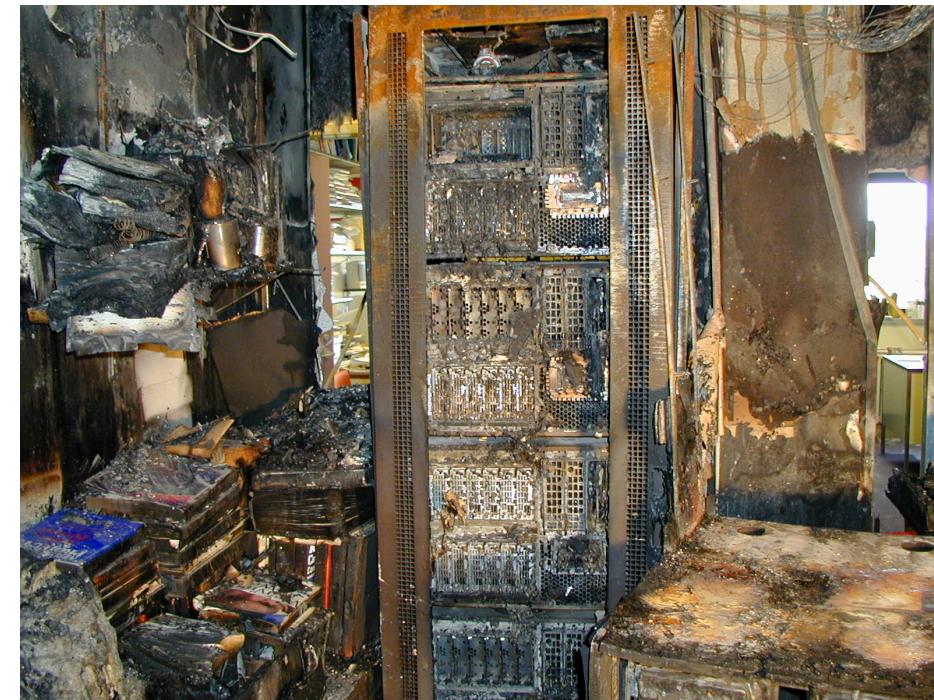
EMBEDDED



CLOUD

TDI?

- First write tests for your infrastructure then infrastructure code
- Ensure that our infrastructure code behaves as expected
- Increases confidence in infrastructure code
- Avoid failures in production



Why?

- As the team grew we had concerns about quality
- Moving our Chef environment 2 major versions
- We want to improve our infrastructure code quality
- Complexity of systems grew



Tools

- FoodCritic (<http://acrmp.github.io/foodcritic/>)
- ChefSpec (<https://github.com/sethvargo/chefspec>)
- ServerSpec (<http://serverspec.org/>)
- Test Kitchen (<http://kitchen.ci/>)



Foodcritic

- Linting tool
- Catch issues sooner.

```
davidrs-MacBook-Pro:spindance davidr$ foodcritic -t correctness .
```

```
davidrs-MacBook-Pro:spindance davidr$ foodcritic .  
FC004: Use a service resource to start and stop services: ./recipes/default.rb:23  
FC004: Use a service resource to start and stop services: ./recipes/holland.rb:16  
FC005: Avoid repetition of resource declarations: ./recipes/default.rb:152  
FC005: Avoid repetition of resource declarations: ./recipes/holland.rb:78  
FC015: Consider converting definition to a LWRP: ./definitions/append_to_hosts_file.rb:1  
FC015: Consider converting definition to a LWRP: ./definitions/cap_deploy_setup.rb:1  
FC015: Consider converting definition to a LWRP: ./definitions/check_ruby_gems_version.rb:1  
FC015: Consider converting definition to a LWRP: ./definitions/deploy_build_number.rb:1  
FC015: Consider converting definition to a LWRP: ./definitions/install_bundler.rb:1  
FC015: Consider converting definition to a LWRP: ./definitions/mysql_create_db.rb:1  
FC015: Consider converting definition to a LWRP: ./definitions/mysql_development_libs.rb:1  
FC015: Consider converting definition to a LWRP: ./definitions/mysql_secure_install.rb:1  
FC015: Consider converting definition to a LWRP: ./definitions/obtain_revision_number.rb:1  
FC015: Consider converting definition to a LWRP: ./definitions/update_sysctl.rb:1  
FC019: Access node attributes in a consistent manner: ./recipes/mysql_monitoring.rb:3  
FC019: Access node attributes in a consistent manner: ./recipes/mysql_monitoring.rb:4  
FC023: Prefer conditional attributes: ./definitions/deploy_build_number.rb:9  
FC023: Prefer conditional attributes: ./definitions/obtain_revision_number.rb:4  
FC023: Prefer conditional attributes: ./recipes/default.rb:22  
FC023: Prefer conditional attributes: ./recipes/default.rb:30  
FC023: Prefer conditional attributes: ./recipes/default.rb:56  
FC023: Prefer conditional attributes: ./recipes/holland.rb:23  
FC023: Prefer conditional attributes: ./recipes/iptables.rb:18  
FC023: Prefer conditional attributes: ./recipes/snmp.rb:45  
FC043: Prefer new notification syntax: ./recipes/default.rb:203  
FC043: Prefer new notification syntax: ./recipes/default.rb:214  
FC048: Prefer Mixlib::ShellOut: ./definitions/check_ruby_gems_version.rb:25  
FC048: Prefer Mixlib::ShellOut: ./definitions/mysql_create_db.rb:13  
FC048: Prefer Mixlib::ShellOut: ./libraries/spin_utils.rb:6  
FC048: Prefer Mixlib::ShellOut: ./libraries/spin_utils.rb:7  
FC048: Prefer Mixlib::ShellOut: ./libraries/spin_utils.rb:8  
FC048: Prefer Mixlib::ShellOut: ./recipes/default.rb:18  
FC048: Prefer Mixlib::ShellOut: ./recipes/default.rb:56  
FC048: Prefer Mixlib::ShellOut: ./recipes/holland.rb:14  
FC048: Prefer Mixlib::ShellOut: ./recipes/holland.rb:23  
davidrs-MacBook-Pro:spindance davidr$
```



ChefSpec

- Unit testing
- Run cookbooks in memory (Fast)
- Rspec
- Fauxhai (<https://github.com/customink/fauxhai>)
 - Mock ohai data



ChefSpec

```
davidrs-MacBook-Pro:sd_users davidsr$ bundle exec rspec spec/unit/recipes/default_spec.rb --format=documentation --color

sd_users::default
ubuntu
  should install the ruby shadow gem
  should create users with sudo group
  should create users with www-data group
centos
  should install the ruby shadow gem
  should create users with wheel group
  should create users with www-data group

Finished in 2.62 seconds (files took 1.45 seconds to load)
6 examples, 0 failures

ChefSpec Coverage report generated...

  Total Resources: 4
  Touched Resources: 4
  Touch Coverage: 100.0%

You are awesome and so is your test coverage! Have a fantastic day!
```

```
1 require 'spec_helper.rb'
2
3 describe "sd_users::default" do
4   context "ubuntu" do
5     before do
6       Fauxhai.mock(platform: "ubuntu", version: '14.04')
7     end
8
9     let(:chef_run) do
10       runner = ChefSpec::ServerRunner.new do |node, server|
11         server.create_data_bag('users', {
12           'test' => {
13             'id' => 'test',
14             'password' => 'test',
15             'groups' => ['wheel', 'www-data', 'sudo'],
16             'ssh_keys' => 'superawesomekey'
17           }
18         })
19       end
20       runner.node.automatic_attrs['platform_family'] = 'debian'
21       runner.node.automatic_attrs['platform_version'] = '14.04'
22       runner.node.set['users']['databag'] = 'users'
23       runner.converge(described_recipe)
24     end
25
26     it "should install the ruby shadow gem" do
27       expect(chef_run).to install_chef_gem('ruby-shadow')
28     end
29
30     it "should create users with sudo group" do
31       expect(chef_run).to create_users_manage('sudo')
32     end
33
34     it "should create users with www-data group" do
35       expect(chef_run).to create_users_manage('www-data')
36     end
37   end
38 end
```



ServerSpec

- Integration Testing
- Rspec tests to check servers
- Checks actual state

```
require_relative File.expand_path(' '../../../../../kitchen/data/spec_helper.rb', __FILE__)

set :os, :family => 'redhat'

describe "Cron Daemon" do
  it "should have cron installed" do
    expect(package('cronie-anacron')).to be_installed
  end

  it "should have the cron daemon running and enabled" do
    expect(service('crond')).to be_running
    expect(service('crond')).to be_enabled
  end
end
```



Test Kitchen

- Integration tool for developing and testing infrastructure code and software on isolated target platforms.
- Test harness



Test Kitchen

```
1  ---  
2  driver:  
3    name: vagrant  
4  
5  provisioner:  
6    name: chef_zero  
7    data_path: "test/shared"  
8  
9  platforms:  
10   - name: centos-6.5  
11     driver:  
12       provider: parallels  
13       box: parallels/centos-6.5  
14  
15  suites:  
16   - name: default  
17     data_bags_path: "test/integration/data_bags"  
18     run_list:  
19       - recipe[spindance::default]  
20     attributes:  
21       { "spindance": {  
22           "set_password_rules": true,  
23           "timezone": "UTC"  
24         },  
25           "virtualization": {  
26             "system": "xen"  
27           }  
28       }  
29   - name: logstash_cleanup  
30     data_bags_path: "test/integration/data_bags"  
31     run_list:  
32       - recipe[spindance::logstash_cleanup]  
33     attributes:  
34       { "spindance": {  
35           "set_password_rules": true,  
36           "timezone": "UTC",  
37           "logging": {  
38             "cleanup_script_location": "/opt/zenoss/bin"  
39           }  
40       },  
41           "spindance_logging": {  
42             "log_retain_days": 60  
43           }  
44       }  
45   - name: iptables  
46     data_bags_path: "test/integration/data_bags"  
47     run_list:  
48       - recipe[spindance::iptables]  
49     attributes:  
50       { "spindance": {  
51           "enable_iptables": true  
52         },  
53           "spindance_logging": {  
54             "log_retain_days": 60  
55           }  
56       }
```



Test Kitchen

```
davidrs-MacBook-Pro:spindance davidr$ kitchen list
Instance           Driver   Provisioner  Last Action
default-centos-65 Vagrant  ChefZero    <Not Created>
logstash-cleanup-centos-65 Vagrant  ChefZero    <Not Created>
iptables-centos-65     Vagrant  ChefZero    <Not Created>
davidrs-MacBook-Pro:spindance davidr$ █
```

Iptables

```
should allow port 22
should allow port snmp from prod-sd-monitor1
should allow port snmp from cumbia
should allow mysql access from zenoss server
show allow rackspace monitoring
```

```
Finished in 0.1272 seconds (files took 0.27267 seconds to load)
5 examples, 0 failures
```



<https://goo.gl/SuucVd>

Demo



Closing Thoughts

- Infrastructure code quality has improved
- Facilitated peer reviews
- Tests can be time consuming
 - Kitchen-docker
 - Can't really test recipes with service calls
- Can target Windows
- Multi-node testing
 - <http://www.hurryupandwait.io/blog/multi-node-test-kitchen-tests-and-working-with-vagrant-nat-addressing-with-virtualbox>
- Non Chef
 - <https://github.com/neillturner/kitchen-ansible>
- Questions?



