TDD for Infrastructure

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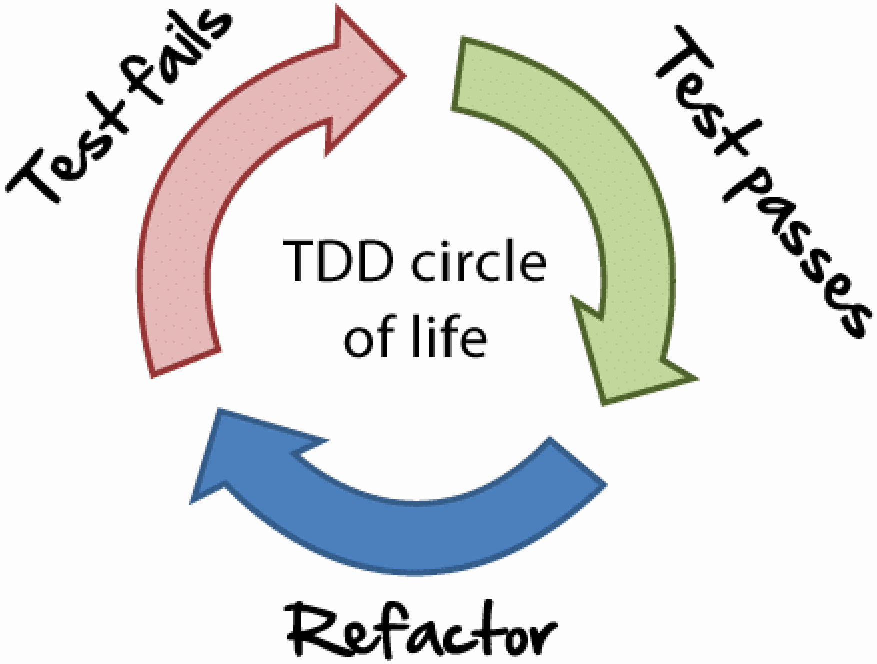
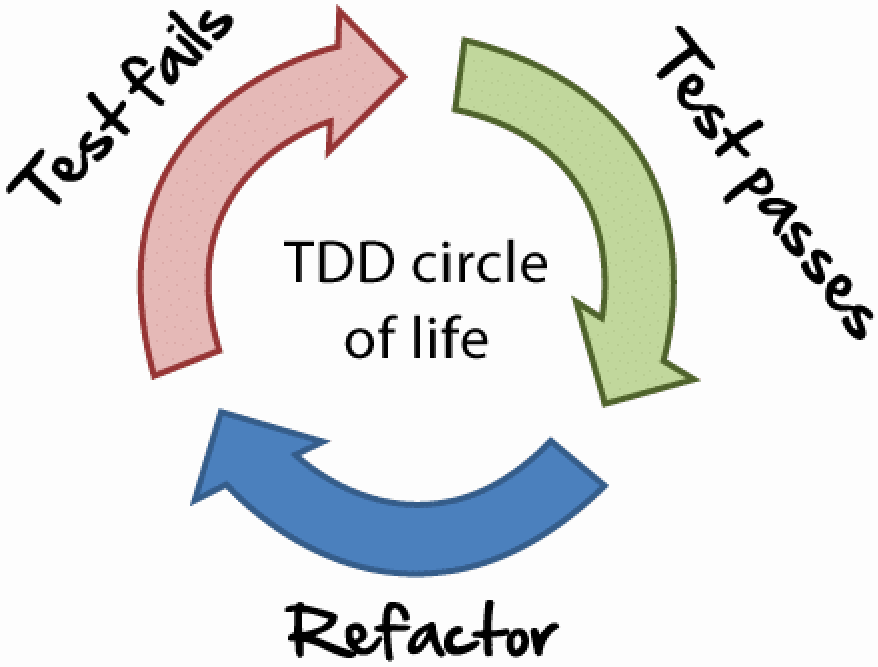
TDD

TDD: Test Driven Development

TDD in a nutshell



TDD in a nutshell

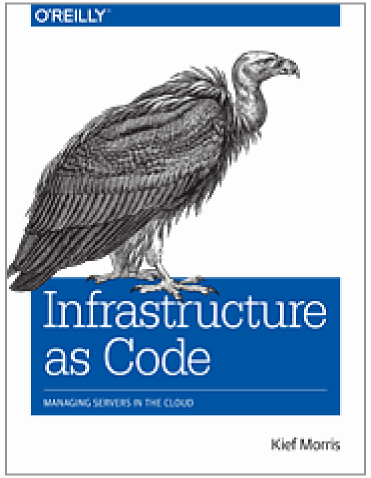


1. Write the only the code that is needed
2. Get quick feedback
3. Build a modular design

You knew that already

Infrastructure

Infrastructure as Code



Infrastructure as Code

IaC means writing code to manage configurations and automate provisioning

How do you test infrastructure?

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Enter **ServerSpec**

SERVERSPEC

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ServerSpec is a tool to write tests for infrastructure based on RSpec

Show me the code

Straightforward configuration

```
spec/spec_helper.rb
```

```ruby
require 'serverspec'
require 'net/ssh'

set :backend, :ssh
host = ENV['TARGET_HOST']

options = Net::SSH::Config.for(host)
set :host,        options[:host_name] || host
set :ssh_options, options
```

Users & Groups

```
spec/hostname/users_spec.rb
```

```ruby
describe user('travis') do
  it { is_expected.to exist }
  it { is_expected.to belong_to_group 'docker' }
end

describe group('docker') do
  it { is_expected.to exist }
end
```

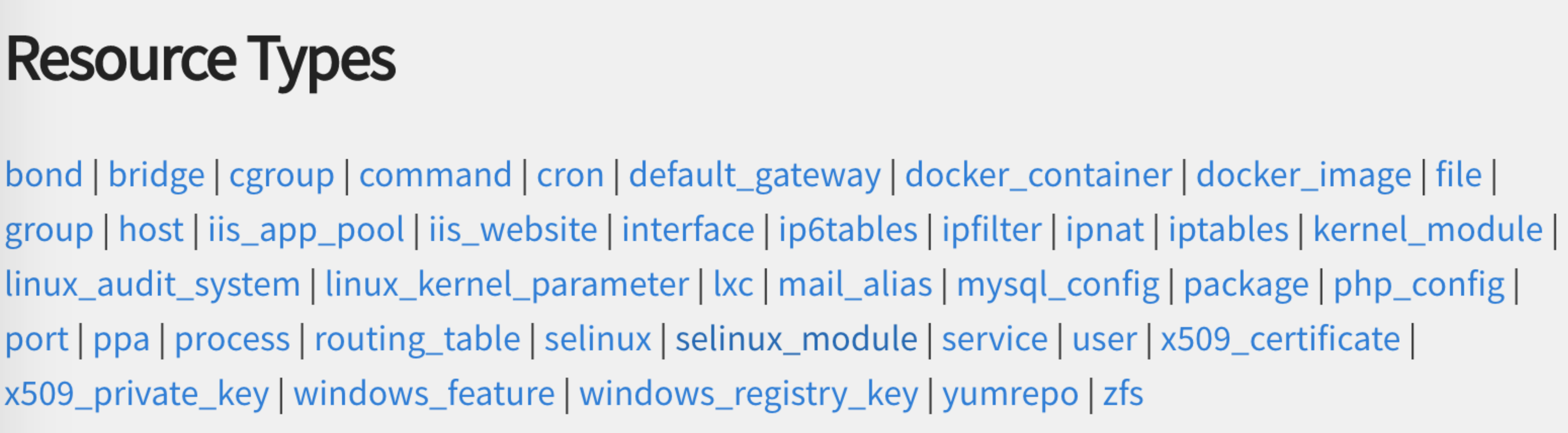
Files

```
spec/hostname/files_spec.rb
```

```ruby
describe file('/vault/file') do
  it { is_expected.to be_directory }
  it { is_expected.to be_owned_by 'vault' }
end

describe file('/bin/vault') do
  it { is_expected.to be_executable }
  it { is_expected.to be_owned_by 'root' }
end
```

And many others

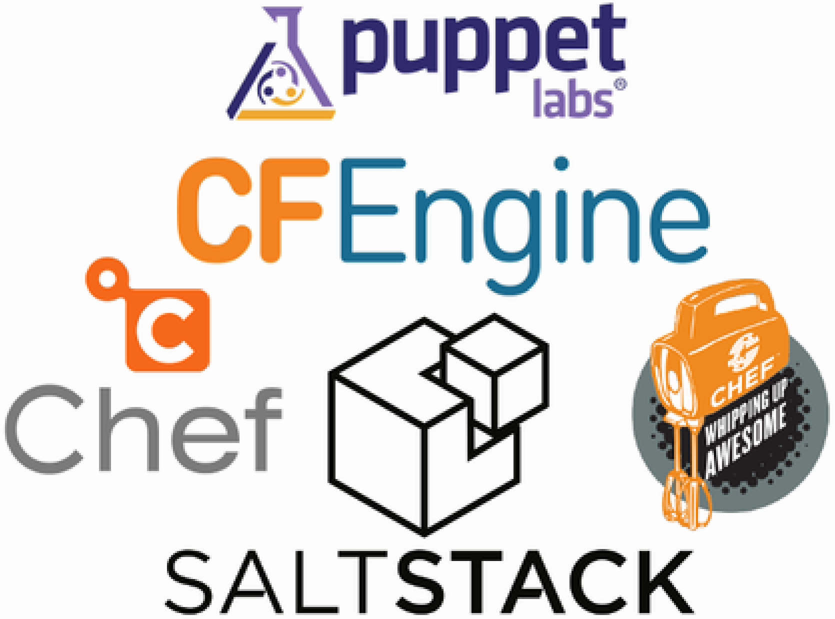


Resource Types

bond | bridge | cgroup | command | cron | default_gateway | docker_container | docker_image | file | group | host | iis_app_pool | iis_website | interface | ip6tables | ipfilter | ipnat | iptables | kernel_module | linux_audit_system | linux_kernel_parameter | lxc | mail_alias | mysql_config | package | php_config | port | ppa | process | routing_table | selinux | selinux_module | service | user | x509_certificate | x509_private_key | windows_feature | windows_registry_key | yumrepo | zfs

But wait ...

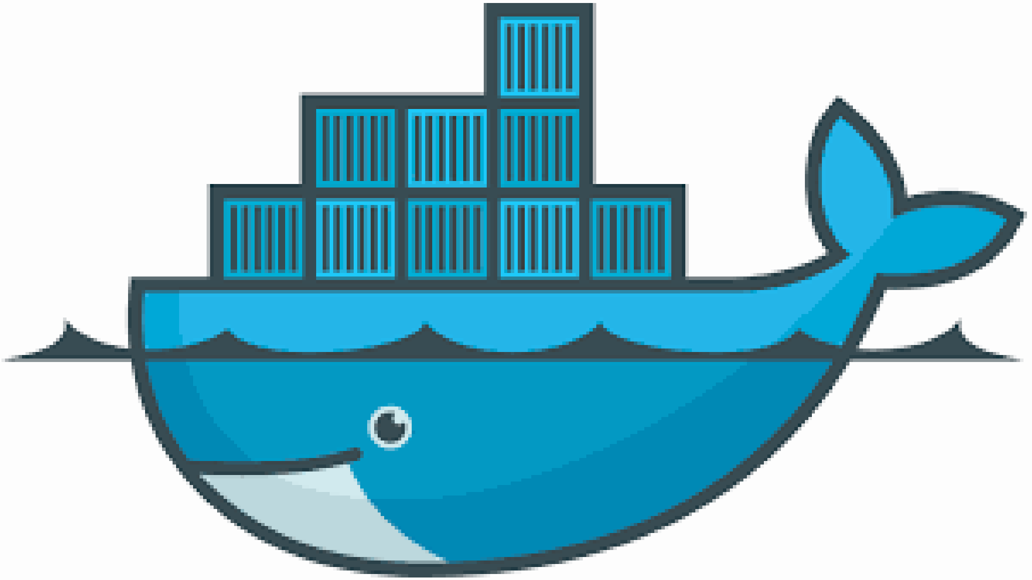
Isn't this covered by provisioning tools?



Isn't this covered by provisioning tools?

HashiCorp
Terraform

Containers



A sample Dockerfile

```
FROM java-openjdk-build-image as builder

WORKDIR /app
COPY . /app/

RUN gradle assemble

FROM java-openjdk-base-image

ENV PROFILE="in-memory"
COPY --from=builder /app/build/libs/*.jar .
EXPOSE 8080

CMD java -jar -Dspring.profiles.active=${PROFILE} app.jar
```

Basic packages

```
describe 'OpenJDK Image' do
  describe package(:openjdk) do
    it { is_expected.to be_installed }
  end

  describe file("/usr/bin/java") do
    it { is_expected.to be_executable }
  end

  describe command("java -version") do
    its(:stderr) { is_expected.to match(/8.151.12/) }
  end
end
```

Running Application

```
describe 'SpringBoot Applicationn' do
  describe file('/app/application.jar') do
    it { is_expected.to be_file }
  end

  describe process('java') do
    it { is_expected.to be_running }
    its(:args) { is_expected.to match(%r{/app/application.jar}) }
  end

  describe 'port of the app' do
    it { wait_for(port(8080)).to be_listening.with('tcp') }
  end
end
```

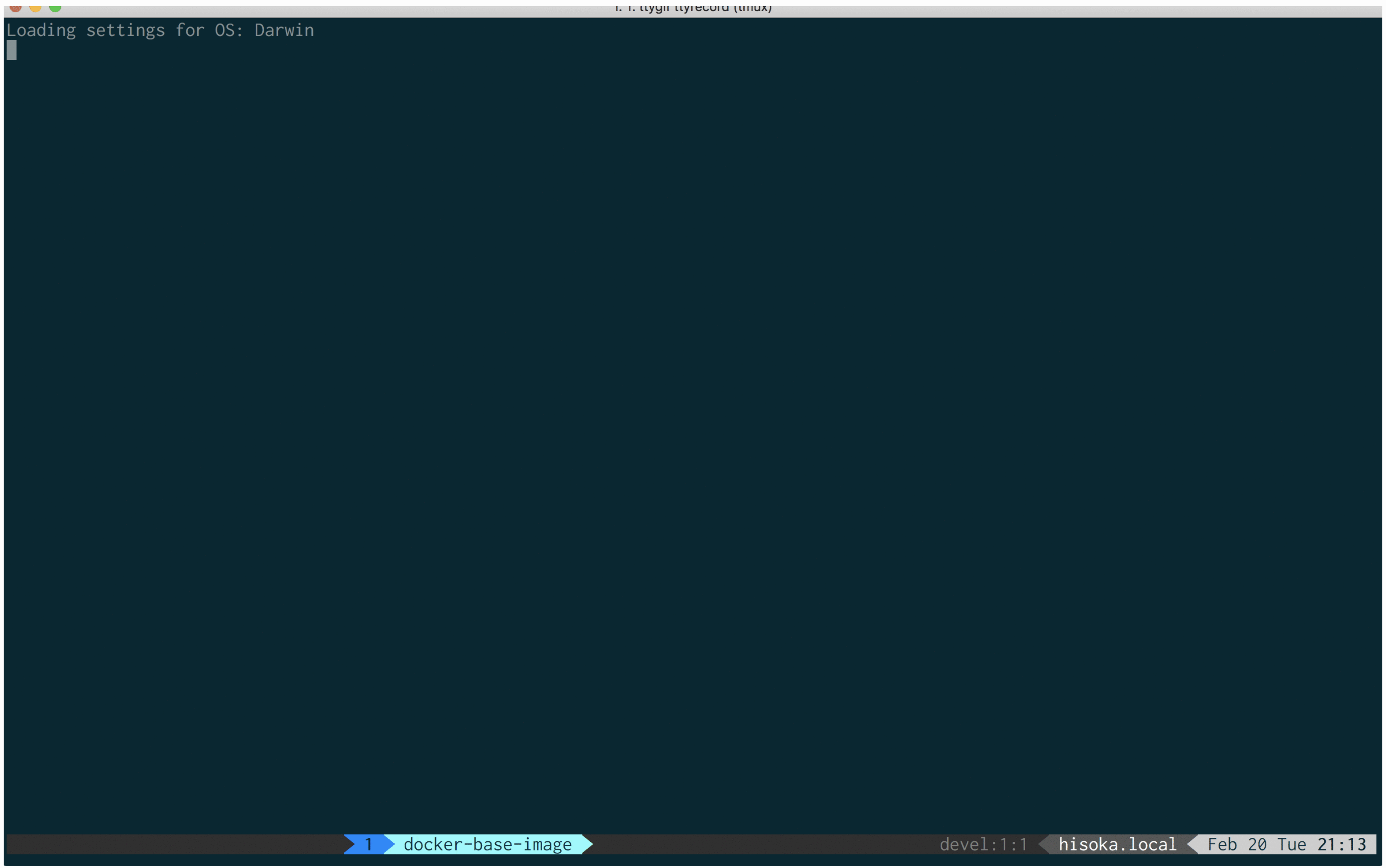
You can go crazy with this stuff

External dependencies via docker-compose

```
describe 'SpringBoot Application' do
  set :docker_container, 'app-springboot'

  before(:all) do
    compose.up(VAULT_CONTAINER_NAME, detached: true)
    vault.logical.write('secret/app/worspace', foo: :bar)
    compose.up('app-springboot', detached: true)
  end

  describe process('java') do
    it { is_expected.to be_running }
  end
end
```



```
Loading settings for OS: Darwin
```

```
 1  docker-base-image                     devel:1:1  hisoka.local  Feb 20 Tue 21:13
```

Summary

ServerSpec

ServerSpec is a good way to automate the process of testing infrastructure

Available backends

- local
- ssh
- Docker
- Even *Windows*

Links

- http://infrastructure-as-code.com/
- http://serverspec.org
- Alternative: https://github.com/aelsabbahy/goss

Thank you

Questions?