Software Development Done Right

Start unit testing your infrastructure now!

Eric Nieuwenhuijsen

This presentation

- Testing practices applied to Infrastructure as Code

- What?
- Why?
- How?

About you

About me

- Eric Nieuwenhuijsen, 27, IT Architect @ Xebia
- Worked in various development and operation roles before and now as a consultant for Xebia

What?

Testing practices applied to infrastructure? Blasphemy!

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Datacenter automation

- Describing infrastructure as code
- Increasing velocity of infrastructure deployments by automating many previously manual steps
- A virtual machine might look like this

```
resource "virtual_machine" "vm"
{
  name = "eric-test"
  cpu = 2
  mem = 4
  image = "Centos7.2.1511"
}
```

Infrastructure testing

- So how do you test these things? Some example artifacts:

puppet

ANSIBLE

amazon web services

PACKER

Microsoft Azure

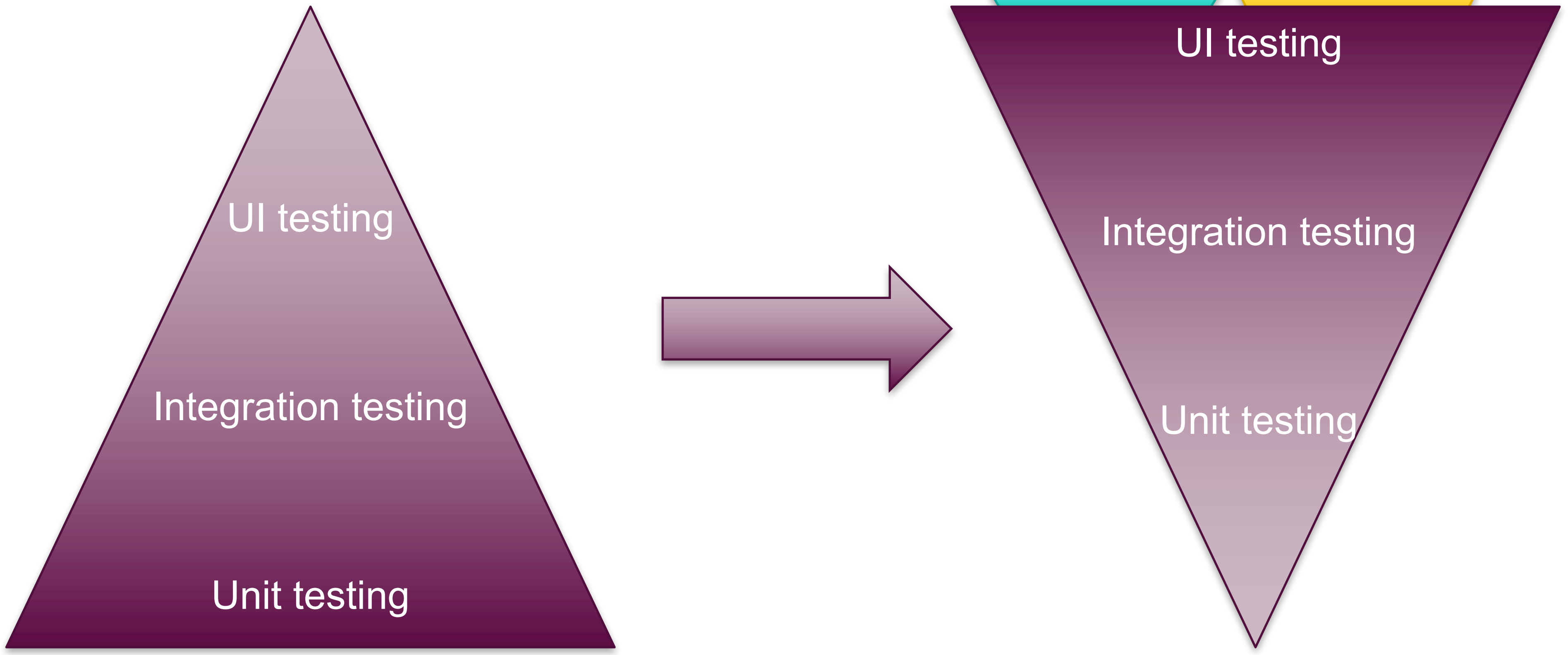
CHEF™

SALTSTACK

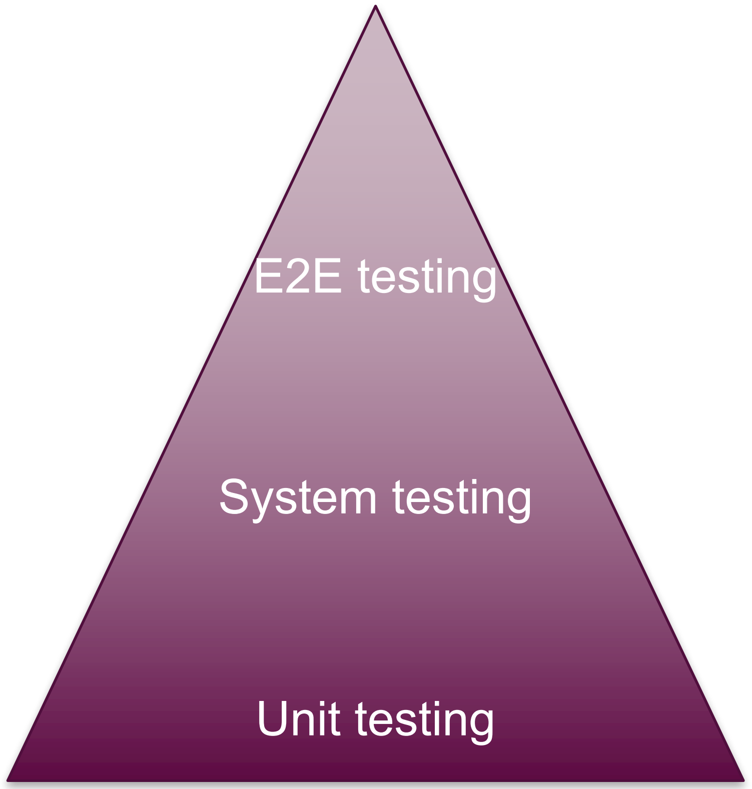
Google Cloud Platform

Xebia

We’ve all seen this



The same applies to IaC testing

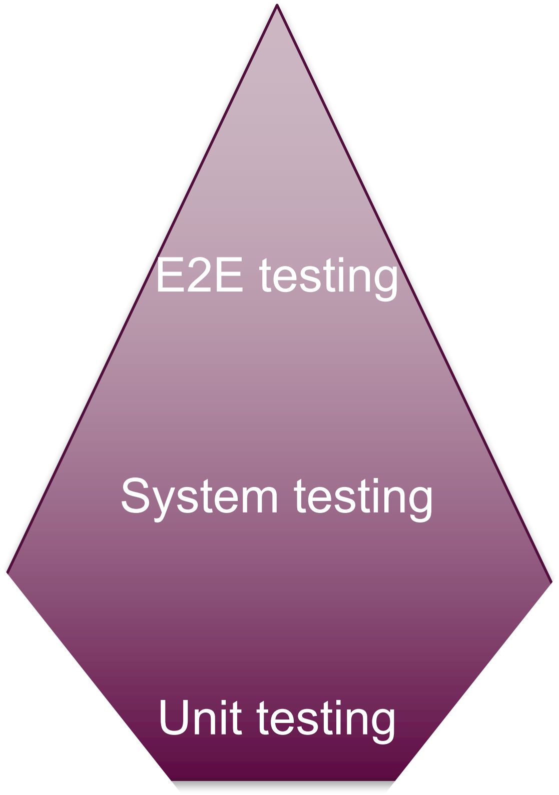


Testing of infrastructure

- Effective testing of infrastructure units is notoriously hard
- You hardly have any conditionals to validate

- The merged ‘stack’ as an integration test is much more interesting as this often interleaves multiple layers into one ‘unit’
- E.g. combining a Packer image template with Terraform files to spin up the instances.

In practice

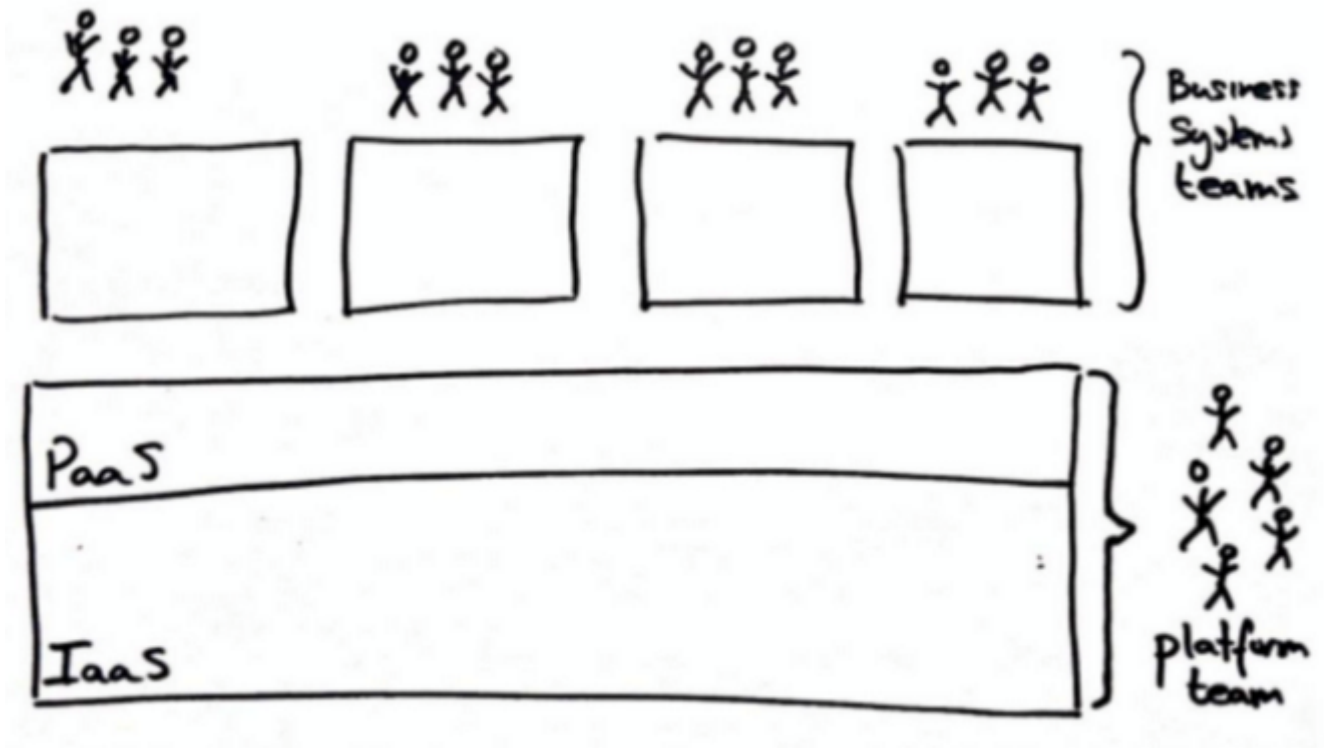


Why?

Ok this looks neat, but why would I spend time on it?

grillburger
100% rundvlees, sla en grillsaus
100% beef patty, lettuce and grillsauce
FEBO de lekkerste..!
grillburger
100% rundvlees, sla en grillsaus
100% beef patty, lettuce and grillsauce
FEBO de lekkerste..!
dubbele grillburger
twee grillburgers van 100% hollands rundvlees met grillsaus en ijsbergsla
FEBO de lekkerste..!
kalfsvleeskroket
fijne blanke roomboterragoût
croquette with ragoût from veal
FEBO de lekkerste..!
satékroket
pittige satékroket, 100% rundvlees
spicy ragoût from peanut and beef
...something special!
FEBO de lekkerste..!
kipburger
hickenburger with sauce
FEBO de lekkerste..!
kipcorn
speciaaltje
spiced beef/pork with
FEBO
FEBO
FEBO
FEBO
FEBO
FEBO
Image from: www.coolinary.nl

Providers & consumers



Use cases

- Validating promises of supplying party
- Consumer driven contract testing
- Validating merged configuration artifacts

How?

I can has moar code? ❯

Describing infrastructure

- Three main categories of artifacts
  - Configuration definitions (Puppet, Ansible, etc.)
  - Machine images (AWS AMI’s, Docker images, etc.)
  - Resource specifications (Terraform, AWS CloudFormation, etc.)

Pitfall: Restating definitions

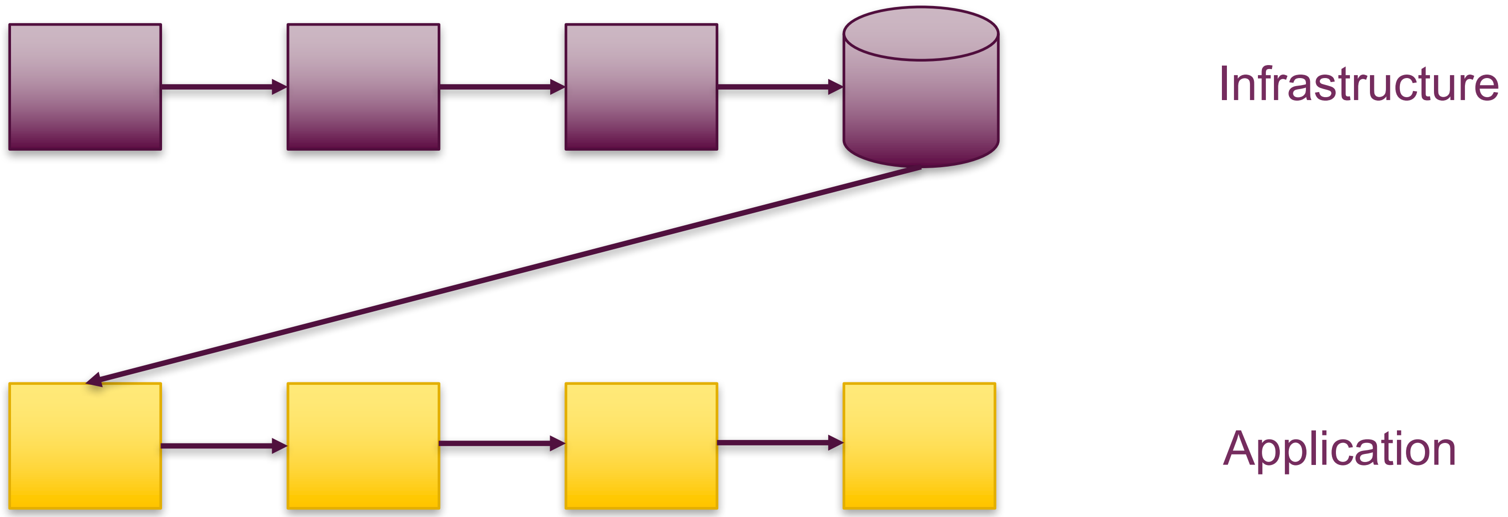
- Consider the following Dockerfile

```
FROM centos:centos7.2.1511
RUN yum install -y epel-release \
 && yum install -y nginx
```

- What added benefit does the following spec have?

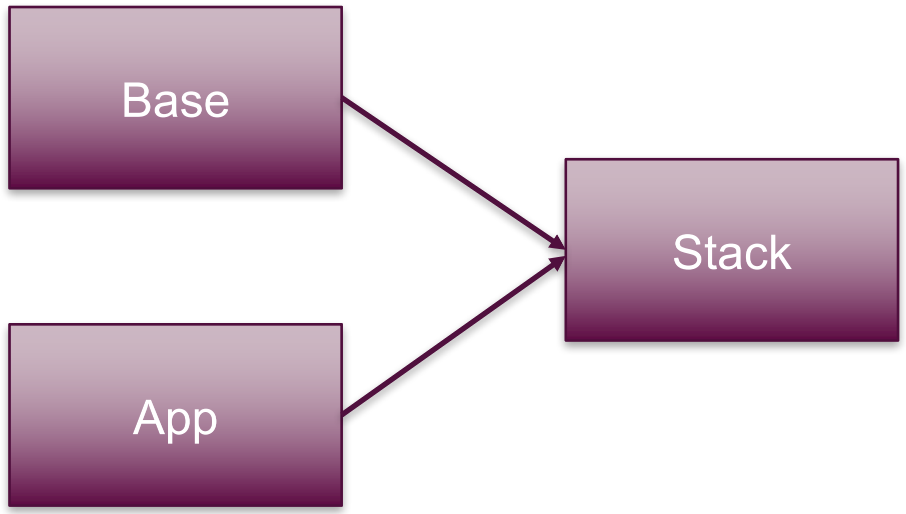
```
describe "Dockerfile" do
  describe package('nginx') do
    it { should be_installed }
  end
end
```

Library pattern

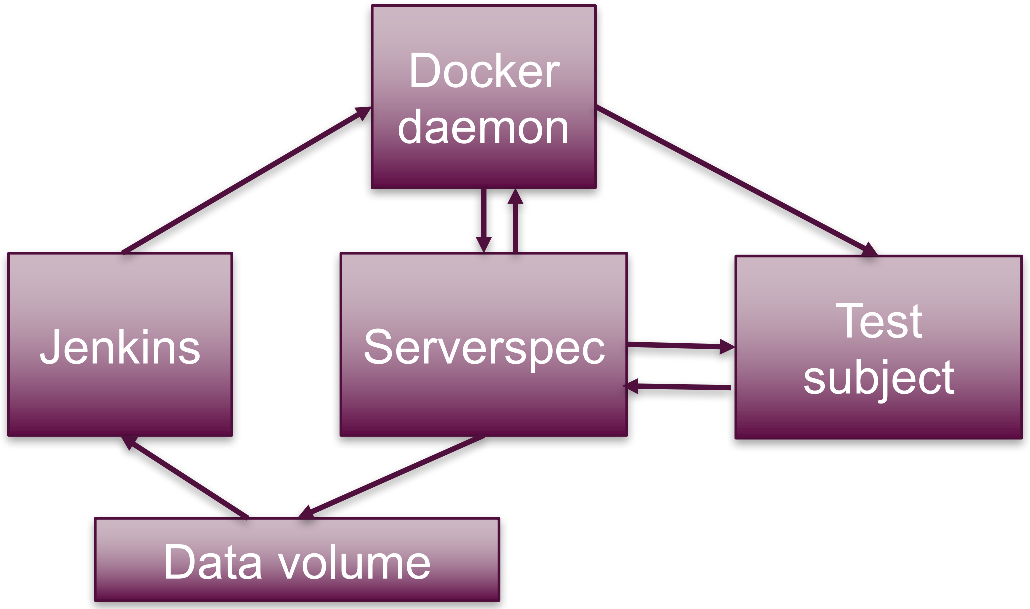


Demo time!

Pipeline


$$\begin{tikzcd}
\text{Base} \arrow[dr] & \\
& \text{Stack} \\
\text{App} \arrow[ur] &
\end{tikzcd}$$

Setup


Docker daemon
Jenkins
Serverspec
Test subject
Data volume

Xebia

Software Development Done Right

Any questions?

The code is available on Github
https://github.com/enieuw/twc-demo-pipeline

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