Devops Zen

Injecting Automated Tests into Infrastructure

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What's a Devops?

- Collaboration of Dev and Ops
- Automate changes
- Operate a consistent infrastructure
- Make all changes auditable
- Get feedback from production

What's not to Zen about that?

- More changes
- More releases
- Go faster
- More stability
- Expanded portfolio of deployed services
- Probably not more people

One person's configuration is another person's code...

- More Changes = VCS

- More Deployments = Pipelines

- More Stability = Testing

What all Good Code Needs

- Tests
- What a test does:
  - Define expected use
  - Verify expected behavior
  - Safe environment for refactoring

What a test doesn't do.

- Find bugs.

- Guarantee no problems.

- Speed up pipeline.

Areas to Test

- Machine Build out
- Containers
- Networking.

Testing Build-out

- Usually used with automated provisioning
- Chef
  - Test Kitchen and Inspec
- Puppet
  - Rspec and Cucumber

Testing a Container

- Easier because of immutability.
- Done in the pipeline
- New Testing framework from Google:
- https://github.com/GoogleCloudPlatform/container-structure-test

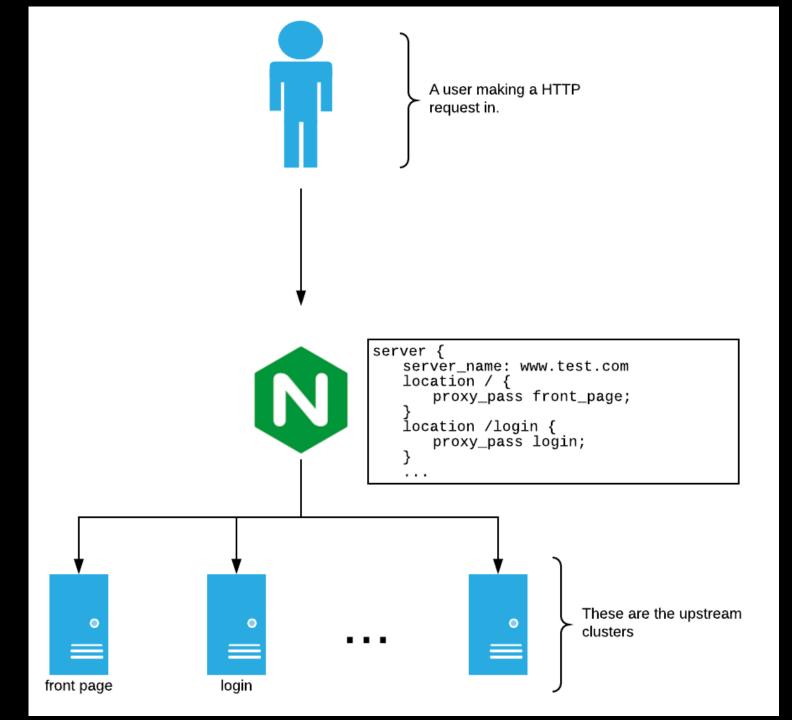- Other examples in "docker-library" group under "official-images"

  https://github.com/docker-library/official-images

Testing the Network

- Candidates:
  - Nginx
  - Httpd
  - HAProxy
- There isn't much out there
- We wrote one: Snow-Globe

Snow-Globe Overview

- Out on Github
  - Kroger-Technology/Snow-Globe
- Works for Nginx
- Uses Java/Junit
- Test Nginx with your configuration
- Is an integration test
  - Test setup declares upstreams and config
  - Test makes a call to Nginx
  - Assertions are based on the response

A user making a HTTP
request in.

```
server {
    server_name: www.test.com
    location / {
        proxy_pass front_page;
    }
    location /login {
        proxy_pass login;
    }
    ...
```

These are the upstream
clusters

front page   login

How does this work?

- Docker
- It makes a custom Request:
- It resolves DNS
- It also has "fake" upstream
  - NodeJS bounces the request in the response body.

What can be validated

- Response http code
- Upstream cluster
- Upstream path
- Header in request
- Header in response
- Upstream URL
- Upstream query parameter

- Missing response header
- File contents response.

Live Demo!

Kroger's Use of Nginx

- Dozens of domains.
- 5 Different environments
- Thousands of lines of configuration
- PR from 30+ teams.
- 7,000+ tests.
- Full pipeline
- Full test run takes 10 minutes

Benefits

- Visibility
- Auditing
- Stability
- Ops learns about dev.

Thank you.

- Please provide feedback: rate the talk.
- Get in contact!
- We want to help you do this too!

- Questions?

Questions?

Please provide feedback: rate the talk.