Secrets of Infrastructure as Code

QCon SF - 2013

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Why this workshop?

- Reduce friction when adopting Continuous Delivery by
  - Growing awareness & interest among delivery teams in understanding and solving IT Ops challenges
  - Increasing skills in infrastructure automation and user/operations intelligence

What do you want to get out of this workshop?

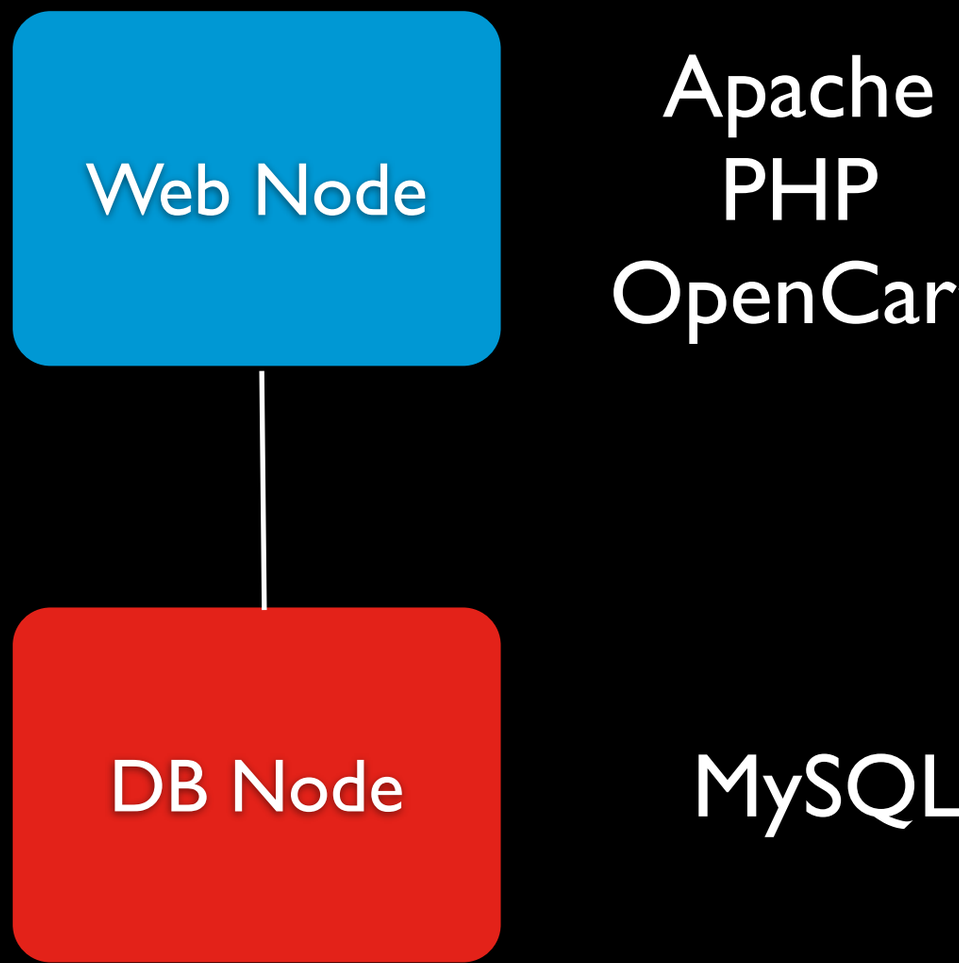
Agenda

- Traditional Configuration
- Automated Configuration Management
- Deployment Pipeline

- 15m breaks at 10:15AM, 2:30PM
- 55m lunch break at 12:00

Part 1
Traditional Configuration
[aka let's do everything manually...]

The “production” stack



Infrastructure

We will be using Ubuntu 12.04 LTS in VMs, via Vagrant 1.3.5.

We will be running approximately 3 virtual machines concurrently. A minimum of 4GB of RAM is suggested.

Quick Setup

- Do you have Vagrant, Virtualbox, and Git installed?
  - **http://*cache-server*/student** for copies
- Ensure you have the necessary vagrant plugins installed
  - *vagrant plugin install vagrant-vbguest*
  - *vagrant plugin install vagrant-hostmanager*
    - ***Use the version from the URL above! Windows fixes.***
  - *vagrant plugin install vagrant-proxyconf*

Quick Setup

- Create a new working directory for the workshop activities
- Extract http://*cache-server*/student/setup.zip into it

Quick Setup

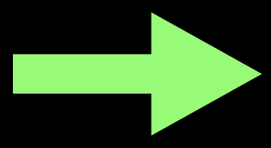
- Boot your DB vm and log into it
  - *vagrant up db*
  - *vagrant ssh db*

Install MySQL

```
sudo apt-get install mysql-server
```

Pick a password for the root user and remember it!

This is a visual cue of where you should be working



db

Allow external access

/etc/mysql/conf.d/allow_external.cnf

```
[mysqld]
    bind-address = 0.0.0.0
```

```
sudo service mysql restart
```

db

Create database

```
mysqladmin -u root -p create opencart
```

db

Create user

```
GRANT ALL ON opencart.*
TO 'opencart'@'%'
IDENTIFIED BY 'openpass';
```

```
mysql -u root -p -e “GRANT...”
```

db

Switch to Web Node

vagrant up web
vagrant ssh web

Verify the Web node can reach the DB node

ping db

Install Apache + PHP

```
sudo apt-get install apache2 php5 mysql-client
```

- Install OpenCart dependencies

```
sudo apt-get install php5-mysql php5-gd php5-curl
```

- Restart Apache

```
sudo service apache2 restart
```

web

Download OpenCart

```
sudo apt-get install unzip
wget http://bit.ly/opencart-pkg
unzip opencart-pkg
sudo rm -rf /var/www/*
cd opencart_v1.5.0.4
sudo mv upload/* /var/www
sudo chown -R www-data /var/www
```

web

Configure OpenCart on Web Node

- Browse to http://web
- Agree to the license & Continue
- Verify all dependencies are met & Continue

- Enter database information
  *host:*db, *user:*opencart, *pass:*openpass, *database:*opencart
- Enter your email and a password for admin

host

Verify the site works

browse to http://web

if everything works delete the install directory

```
sudo rm -rf /var/www/install
```

What else would you find in a real production setup?

Challenges with manual configuration?

Needs of IT Ops?

Why care about automation and/or source control?

Automation + Source Control

- Is never out of date (unlike documentation)
- Provides traceability of what is in every environment
- Enables auditing of changes
- Repeatable across environments
  - which means it can be tested in dev, qa, etc

Automation approaches

- Scripting (bash, python, perl, ruby, etc)
- Cloning images
- Vendor solutions such as BladeLogic
- Open source declarative solutions

Scripting Pros / Cons

Cloning Pros / Cons

Vendor Pros / Cons

OSS Declarative Tools
Pros / Cons

OSS Declarative Tools

- cfengine
- puppet
- chef
- ...

cfengine

- around since 1993
- largest installed user-base
  - including Facebook
- not as much noise in community
- Promise Theory

puppet

- creators frustrated with cfengine
- written in Ruby
- originally external DSL
- viewed as more sysadmin friendly than chef

chef

- creators came from Amazon AWS
- written in Ruby
- internal DSL
- viewed as more developer friendly
- better reusable recipe community
  - but Puppet is improving

Exercises in this course will use Puppet.