The Coming Internet of Things (IoT) and Developer Challenges Using Docker

Presented by
Ali Hussain

Oct 1-2, 2014

CCA CLOUD COMPUTING ASSOCIATION & DCIA Distributed Computing Industry Association proudly present:

Today's Presenter:

Ali Hussain

Co-founder & CTO Flux7

Prev: CPU Performance Analyst at Intel and ARM

Flux7: Cloud and DevOps Solutions

Cloud and Devops for Web teams

Enterprise DevOps management

AWS Certified Team

Partners:

amazon web services Partner Network
ADVANCED CONSULTING PARTNER
CHANNEL PARTNER

CHEF

Clients:

legalzoom

cars.com

pharmacyclics

Bank of America

HORAN & BIRD
Everyday Energy Solutions

CLOUDDEVELOPERS

Mobile, Big Data & Service Models:
Critical Take-Aways for Cloud Developers

SUMMIT & EXPO 2014

Relevant Docker Projects

Example 1: Australia's 5th largest solar panel installer

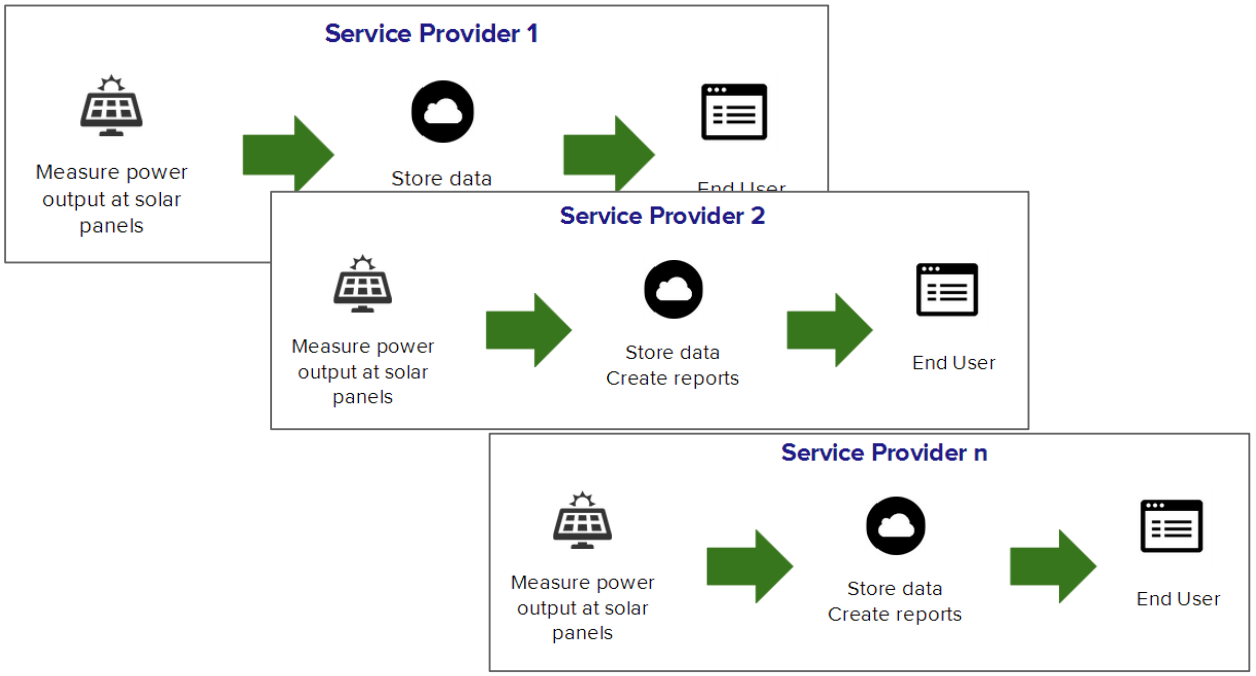
HORAN & BIRD
Everyday Energy Solutions

Application: Solar Panel Monitoring

Docker's Role: Multi-tenancy

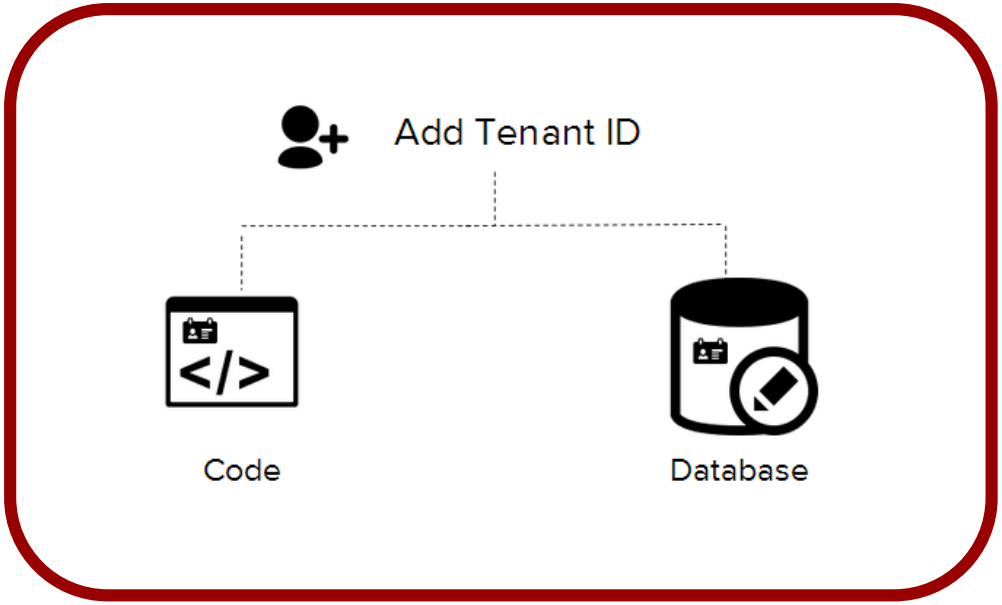
Multi-tenancy

Scenario:



The Dev Solution:

Add Tenant ID in Code and Database



Downsides

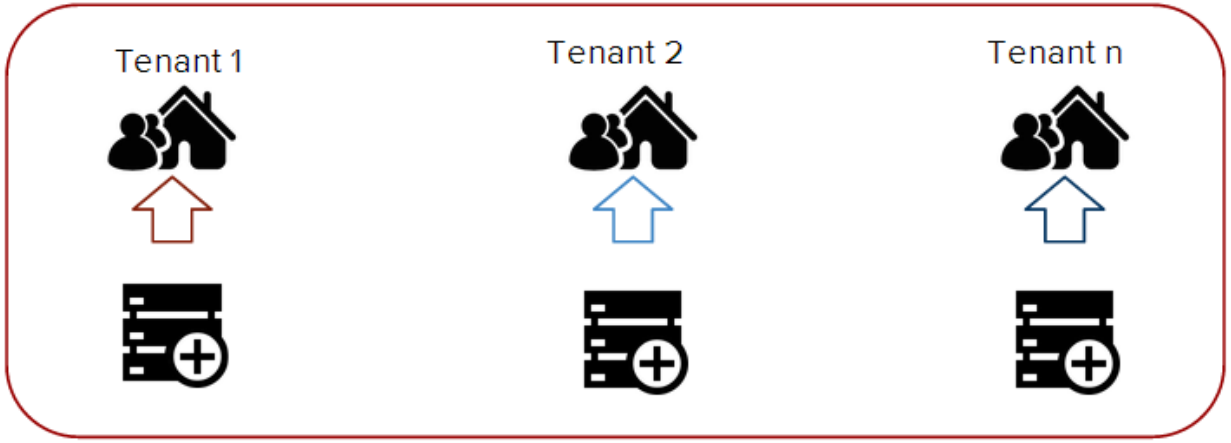
Tedious

Code changes

Error prone

The Ops Solution:

New set of servers per tenant



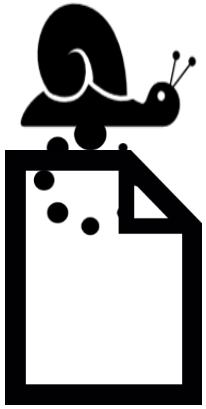
Downsides

High Cost

High Maintenance

Low Utilization

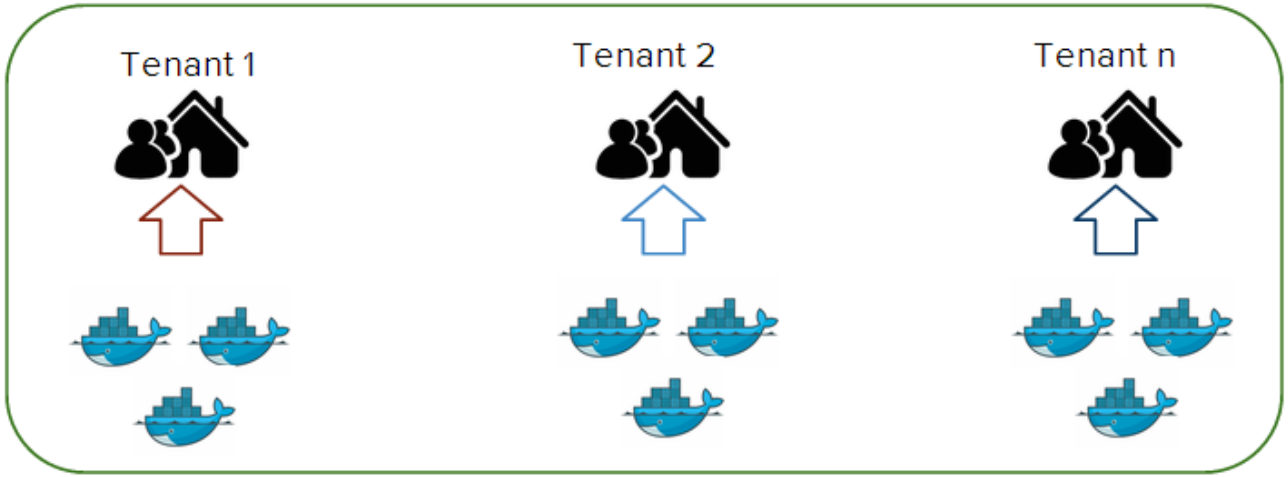
Why not Leaner Servers?



Page load time > 5 seconds

The DevOps Solution:

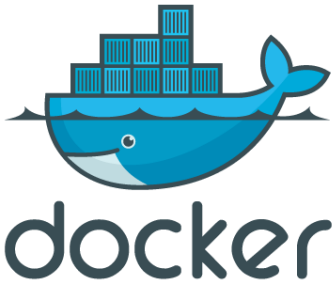
New Docker containers for every tenant



Example 2: National and International E-Commerce Website

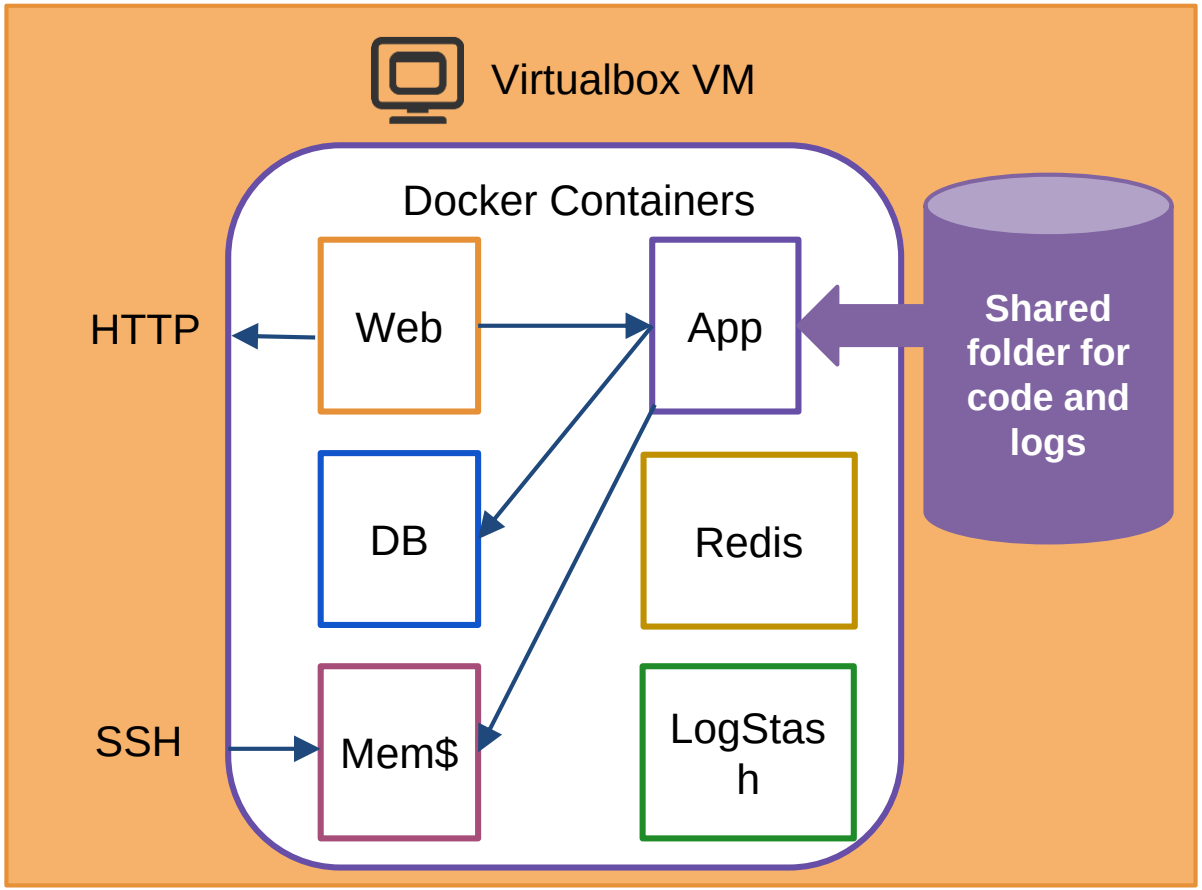
Application: Automotive Listing

Docker's Role: Developer Workflow



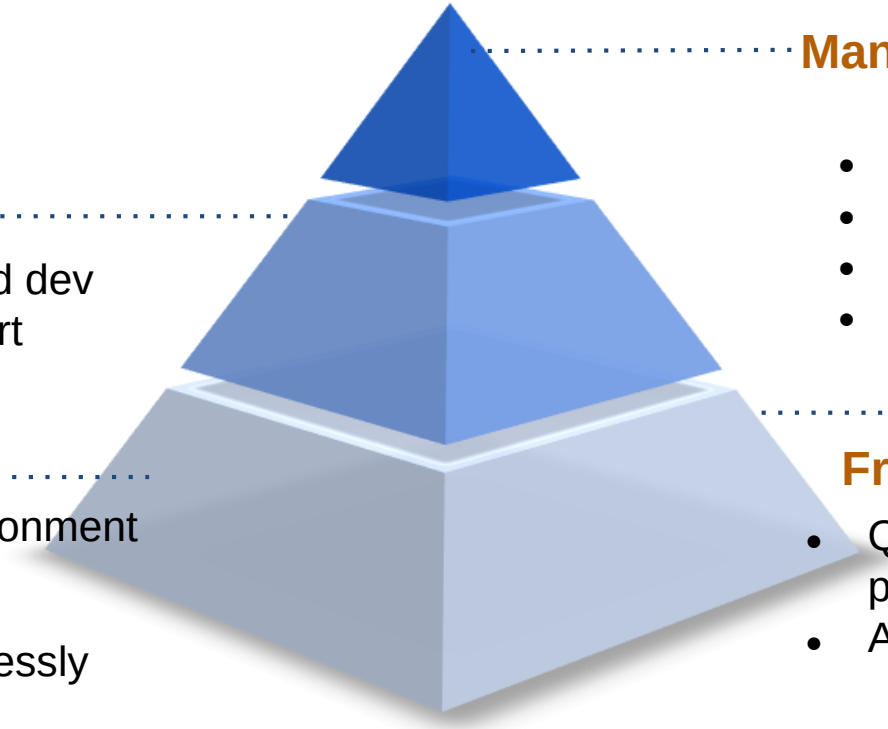
- ☑ One Docker container for each application tier
- ☑ Run a VM with folder sync and port forwarding
- ☑ Installs Docker
  Downloads containers
  (if not available)
- ☑ Used to bootstrap Docker containers in dev and AWS instances in prod

Laptop



run scripts on the laptop for interacting with the environment

Who sees the benefit?



Management

- Less conflict
- Faster time to market
- Happier engineers
- Easier hiring

Ops

Only one standardized dev environment to support

Backend Developers

- Homogenous environment
- Quick feedback
- Agile: break it fearlessly

Front-end HTML Devs

- Quick visual feedback with populated data
- Avoid installations

Why we used Docker?

Minimal Performance Overhead

Fast Boot and Shutdown

Smaller files sizes and ability to diff containers

Container will run in the Cloud

Docker Hands On

Basic Commands

`docker pull`	Pull pre-built image from the public repos
`docker run`	Run the container in one of 3 modes: *Background, Foreground, Interactive*
`docker logs`	View the current state of the running job
`docker commit`	Save the container state as an image
`docker images`	Obtain a list of all images

More Docker Commands

`docker diff`	List of changes in files and directories (**one of the powerful commands Docker provides**)
`docker build`	Build docker images from Dockerfiles
`docker inspect`	Low-level information about containers and images
`docker attach`	Interact with running containers
`docker kill`	Kill the main process of the container

DockerFile

- Automates Image creation process
- Set of instructions to create an image
- General DockerFile commands' syntax:

```
INSTRUCTION argument
```

Example DockerFile

```
FROM ubuntu:12.04
RUN apt-get update
RUN apt-get install -y apache2
ENV APACHE_RUN_USER www-data
ENV APACHE_RUN_GROUP www-data
ENV APACHE_LOG_DIR /var/log/apache2
EXPOSE 80
ENTRYPOINT ["/usr/sbin/apache2"]
CMD ["-D", "FOREGROUND"]
```

Running Docker locally

Windows and OSX: **boot2docker**

Create a container

boot2docker init

boot2docker up

boot2docker stop

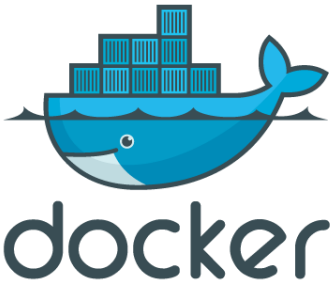
Docker & the Cloud

AWS Elastic Beanstalk's Docker Support

What is Beanstalk

Beanstalk is a PaaS on AWS

Supports:



Docker on BeanStalk

- Generic platform
- Can install any desired platform
- Can use both:
  - Pre-built Docker containers
  - Use a Dockerfile

Docker on Microcontrollers

ARM Docker is supported by ARM

Docker on Raspberry Pi

http://resin.io/blog/docker-on-raspberry-pi/

Idea: Local developer environment for a micro-controller

Idea: Deploying backend environment for processing data

Thank You!

Twitter: @Flux7Labs

Blog: blog.flux7.com