

# Dockerizing Ansible Playbooks

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# About Docker

API to manage containers

Package and deployment (Layer FS)

# Environments

## Development

- Remove hypervisor overhead
- Consensus agreement



## Production

- New technologies
  - Mesos / Marathon
  - Kubernetes
  - Rocket
- New Design Patterns
  - Microservices

Nobody knows yet how containers will be used

# Dockerizing Ansible Playbooks

DEMO: Wordpress Ansible playbook

- Web server apache
- Database mysql
- Cache memcached

## Microservices

One container per process

- web server
  - database
  - cache
  - monitoring
- 

## Multi-process

One container with multiple process

- web server
- database
- cache
- monitoring



# Microservices

One container per process

- web server
- database
- cache
- monitoring



# Multi-process

One container with multiple process

- web server
- database
- cache
- monitoring



# Let's take the pragmatic approach

One container, multiple process

Docker friendly Ubuntu base image

<https://github.com/phusion/baseimage-docker>

# Container creation

## Dockerfile

```
FROM phusion/baseimage  
RUN apt-get install apache2  
COPY motd.template /etc/motd
```

## Registry

```
docker pull my_image
```

tk421@curiosity: ~/docker/ansible-wordpress  
tk421@curiosity: ~/docker/ansible-wordpress 169x48

```
FROM phusion/baseimage
MAINTAINER Ruben Rubio Rey "ruben.rubio@manageacloud.com"

# install and configure ansible
RUN apt-get install software-properties-common
RUN apt-add-repository ppa:ansible/ansible
RUN apt-get update
RUN apt-get install ansible python-apt -y

# install git
RUN apt-get install git -y

# clone ansible playbook
RUN cd /usr/local/src/ && git clone https://github.com/darthwade/ansible-wordpress.git

# install roles in ansible playbook
RUN ansible-galaxy install -r /usr/local/src/ansible-wordpress/ansible/requirements.txt --force
COPY files/ansible-hosts /etc/ansible/hosts

# Run the container in "privileged" mode to enable CAP_SYS_ADMIN capability
# and execute networking stuff (like firewall)
# or remove in playbook sections related with networking
COPY files/ansible-no-privilege.yml /usr/local/src/ansible-wordpress/ansible/roles/common/meta/main.yml

# RUN Ansible
RUN cd /usr/local/src/ansible-wordpress/ansible/ && ansible-playbook site.yml -c local

# Enable SSH
RUN rm -f /etc/service/sshd/down

# Change root password
RUN echo "root:mypassword" | chpasswd
```

```
$ cat files/ansible-hosts
```

```
[monitoring]
```

```
localhost
```

```
[webservers]
```

```
localhost
```

```
[dbservers]
```

```
localhost
```

```
[cacheservers]
```

```
localhost
```

```
$ cat files/ansible-no-privilege.yml
---
dependencies:
#- role: 'ANXS.hostname'
#- role: 'franklinkim.ufw'
- role: 'ANXS.git'
- role: 'yatesr.timezone'
```

# Demo: Container from Dockerfile

```
sudo docker build -t ansible-wordpress .
```



# Demo: Running a container

```
sudo docker run --name ansible-wordpress-run -p 2200:22 -p 1800:80 ansible-wordpress /sbin/my_init --enable-insecure-key
```



# Demo: Running a container

```
sudo docker run --name ansible-wordpress-run -p 2200:22 -p 1800:80 ansible-wordpress /sbin/my_init --enable-insecure-key
```



# Demo: Pushing a container to local Registry

```
sudo docker tag ansible-wordpress localhost:5000/wordpress-ansible  
sudo docker push localhost:5000/wordpress-ansible
```



# Running a container from local Registry

```
sudo docker pull localhost:5000/wordpress-ansible
```

```
sudo docker run --name ansible-wordpress-run -p 2200:22 -p 1800:80 localhost:5000/wordpress-ansible /sbin/my_init --enable-insecure-key
```



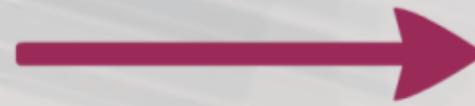
# Let's take the Microservices approach

One process per container

**Apache2**



**MySQL**



tk421@curiosity: ~/docker/ansible-wordpress-m

```
FROM ubuntu
MAINTAINER Ruben Rubio Rey "ruben.rubio@manageacloud.com"

RUN apt-get update

# install and configure ansible
RUN apt-get install software-properties-common -y
RUN apt-add-repository ppa:ansible/ansible
RUN apt-get update
RUN apt-get install ansible python-apt -y

# install git
RUN apt-get install git -y

# clone ansible playbook
RUN cd /usr/local/src/ && git clone https://github.com/darthwade/ansible-wordpress.git

# install roles in ansible playbook
RUN ansible-galaxy install -r /usr/local/src/ansible-wordpress/ansible/requirements.txt --force
COPY files/ansible-hosts /etc/ansible/hosts

# Run the container in "privileged" mode to enable CAP_SYS_ADMIN capability
# and execute networking stuff (like firewall)
# or remove in playbook sections related with networking
COPY files/ansible-no-privilege.yml /usr/local/src/ansible-wordpress/ansible/roles/common/meta/main.yml

# RUN Ansible
RUN cd /usr/local/src/ansible-wordpress/ansible/ && ansible-playbook site.yml -c local

EXPOSE 3306
```

```
$ cat files/ansible-hosts  
[dbservers]  
localhost
```

```
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MAINTAINER Ruben Rubio Rey "ruben.rubio@manageacloud.com"

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# install and configure ansible
RUN apt-get install software-properties-common -y
RUN apt-add-repository ppa:ansible/ansible
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# or remove in playbook sections related with networking
COPY files/ansible-no-privilege.yml /usr/local/src/ansible-wordpress/ansible/roles/common/meta/main.yml

# RUN Ansible
RUN cd /usr/local/src/ansible-wordpress/ansible/ && ansible-playbook site.yml -c local

# Apply Patch to link with Container
COPY files/90-env.ini /etc/php5/apache2/conf.d/90-env.ini
COPY files/wordpress-db.patch /var/sites/awesome_wordpress_site/wordpress-db.patch
RUN cd /var/sites/awesome_wordpress_site && patch wp-config.php < wordpress-db.patch
```

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FROM ubuntu
MAINTAINER Ruben Rubio Rey "ruben.rubio@manageacloud.com"

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COPY files/90-env.ini /etc/php5/apache2/conf.d/90-env.ini
COPY files/wordpress-db.patch /var/sites/awesome_wordpress_site/wordpress-db.patch
RUN cd /var/sites/awesome_wordpress_site && patch wp-config.php < wordpress-db.patch
~
```

```
$ cat files/ansible-hosts  
[webservers]  
localhost
```

```
sudo docker run --name web -p 1800:80 --link db:db ansible-ms-webserver env  
PATH=/usr/local/sbin:/usr/local/bin:/usr/sbin:/usr/bin:/sbin:/bin  
HOSTNAME=82903f186e90  
DB_PORT=tcp://172.17.0.57:3306  
DB_PORT_3306_TCP=tcp://172.17.0.57:3306  
DB_PORT_3306_TCP_ADDR=172.17.0.57  
DB_PORT_3306_TCP_PORT=3306  
DB_PORT_3306_TCP_PROTO=tcp  
DB_NAME=/web/db  
HOME=/root
```

```
$ cat files/90-env.ini
variables_order = "EGPCS"

-- wp-config.php      2015-01-26 22:13:46.000000000 +0000
++ wp-config.new    2015-01-26 23:06:49.469560491 +0000
@ -21,7 +21,7 @@
/** MySQL database password */
```

```
--- wp-config.php      2015-01-26 22:13:46.000000000 +0000
+++ wp-config.new     2015-01-26 23:06:49.469560491 +0000
@@ -21,7 +21,7 @@
/** MySQL database password */
define('DB_PASSWORD', 'awesome_wp_pass');
/** MySQL hostname */
-delimit('DB_HOST', 'localhost');
+define('DB_HOST', ${ENV['DB_PORT_3306_TCP_ADDR']});
/** Database Charset to use in creating database tables. */
define('DB_CHARSET', 'utf8');
/** The Database Collate type. Don't change this if in doubt. */
@@ -64,4 +64,4 @@
if ( !defined('ABSPATH') )
    define('ABSPATH', dirname(__FILE__) . '/');
/** Sets up WordPress vars and included files. */
-require_once(ABSPATH . 'wp-settings.php');
\ No newline at end of file
+require_once(ABSPATH . 'wp-settings.php');
```

# Contact Information



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<https://manageacloud.com>

## Biography

I have played a prominent role in several startup software companies, taking them from their early stages to leaders in their respective marketplaces. I have more than 14 years experience working in different roles that required leadership, strategic thinking, project management, development, devops and system administration. I currently CTO at Manaeacloud.com and member of the Advisory Panel of the CreativIT Sydney Innovation Hub at University of Sydney.