

# Docker and Python



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# Agenda

Running Python apps under Docker

The Docker API

Docker-machine from Python

docker-py: Controlling Docker from Python

Other Modules

Ansible Container

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# Running Python apps under Docker

Of course we can run any app under Docker - Python or not.

This can be a very useful alternative to virtualenv

- complete filesystem isolation allowing to have complex dependancies beyond Python itself

- launch multiple instances of a Python process in isolation

  - isolated filesystem, process space, ports

- pull existing images of applications, frameworks

- build upon existing images and push the results to share

- can compose complex applications from multiple containers

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# Running Python apps under Docker -2

What "standard" images exist on the Docker Hub? [hub.docker.com](https://hub.docker.com)

Python : "python"

- small, large base images
- based on Debian, Alpine (& even WindowsServerCore !)
- Python 2.x [2.7.13], 3.x [3.3.6, 3.4.6, 3.5.3, 3.6.1, 3.6.2rc1]

Frameworks:

- Flask
- Cherrypy
- Django
- ...

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# The Docker API

Let's take a look at how the docker command-line client makes use of the docker API to perform requests

Can we make our own command-line requests using curl?

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# Docker-machine from Python

There are many docker-related modules available in Python.

Let's first look at "docker-machine" which provides a simple-\* encapsulation around the docker-machine executable.

\* - a bit too simple: if docker-machine issues a prompt you will not be informed (problem with Azure login).

Nevertheless it provides a nice wrapper enabling to simply fire up Docker hosts and pass their config to the docker-py client.

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# Docker-machine from Python - 2

Installing the module:

From local repo (modified to work with docker-py v2)

```
git clone https://github.com/mjbright/python-docker-machine
```

```
python setup.py install
```

Initializing the module:

```
import machine
```

```
import docker
```

```
m = machine.Machine(path="/usr/local/bin/docker-machine")
```

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# Docker-machine from Python - 3

Using the module:

```
m.create('test-machine', driver='virtualbox', blocking=True)
```

```
m.ls()
```

```
client = docker.DockerClient(**m.config(machine='test-machine'))
```

```
m.rm(machine='test-machine')
```

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# docker-py: Controlling Docker from Python

This module, [github.com/docker/docker-py](https://github.com/docker/docker-py) is maintained by the Docker team.

NOTE: Now called "docker", use "pip install docker", not docker-py.

Currently at the 2.4.2 release it has 2 apis

a low-level 'docker.APIClient' api

- with operations corresponding to the Docker api
  - e.g. "create\_container", "inspect\_container", ...

a higher-level 'docker.Client' object-oriented api

- objects similar to new (> 1.13) "docker" client commands
  - e.g. "docker.containers.create", "docker.images.list"

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# Other Modules

There are many docker related Python modules, "pip3 search docker" gives 443 entries of which 217 have docker in the title, including:

## build tools

- e.g. docker-build-tool, whalelinter, grocker

## alternative API clients

- e.g. aiocoderpy, docker-map, python-dockercloud

## Docker based utilities

- e.g. docker-cleaner, docker-scripts, dockermanalyser

## Monitoring tools

- e.g. check\_docker, dockerman

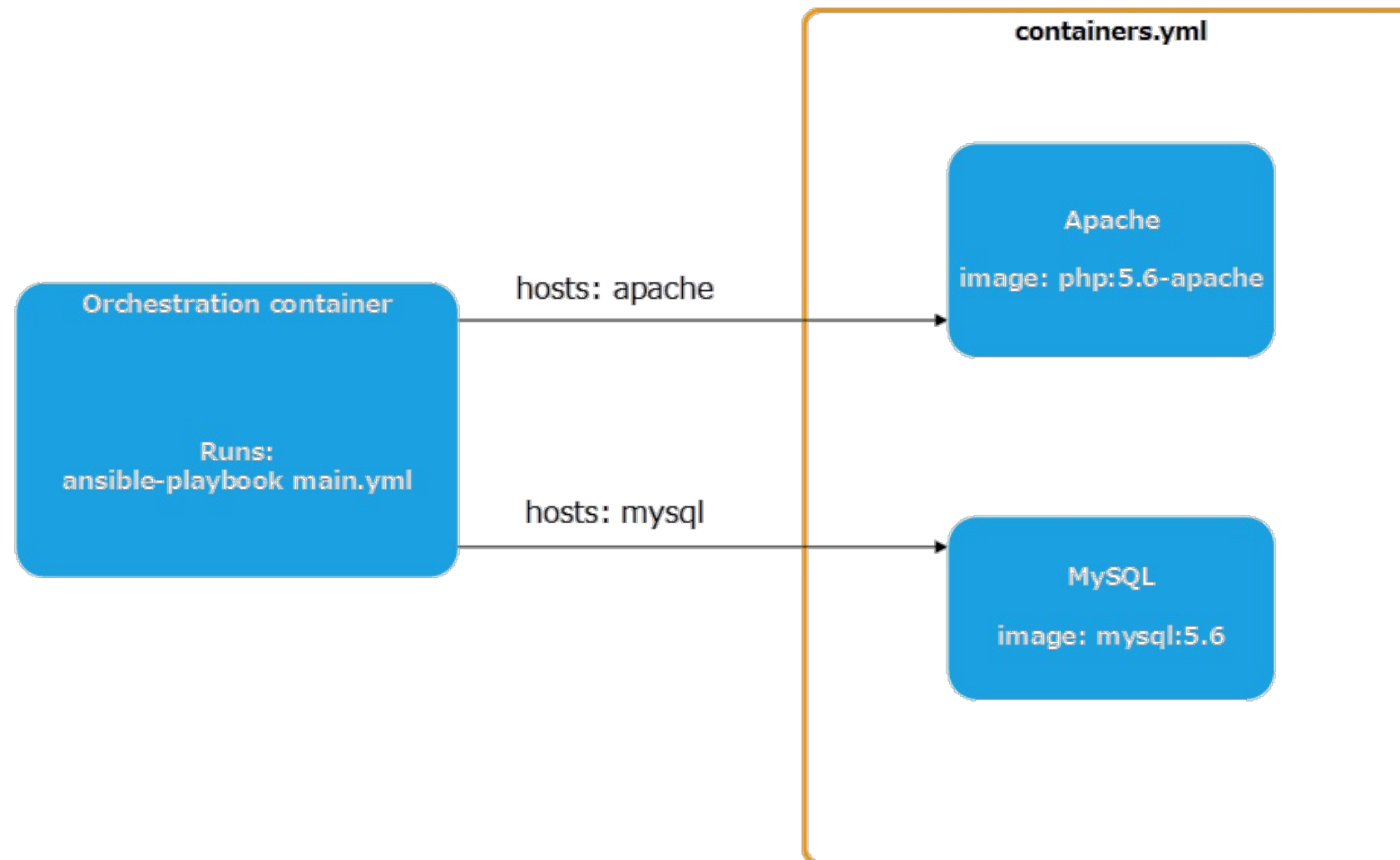
## CI tools

- e.g. travis2docker,

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# Ansible Container

Provides a useful abstraction for building and running containers using the Ansible Configuration Management tool.



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Image from: <https://tech.napsty.com>

# Ansible Container

Install: - `pip install ansible-container`

Initialize a new project: generates yaml template files

```
ansible-container init
```

Modify yaml files as needed for your project, then build:

```
ansible-container --debug build
```

Run:

```
ansible-container run
```

When ready upload container images to your configured registry:

```
ansible-container shipit
```

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# Questions?



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# Resources

Resource	Docs	Github
Running Python under Docker		
Docker-py	<a href="http://docker-py.readthedocs.io">docker-py.readthedocs.io</a>	<a href="https://github.com/docker/docker-py">docker/docker-py</a>
Docker Maps		
Ansible Container	<a href="http://ansible.com/ansible-container">ansible.com/ansible-container</a>	<a href="https://github.com/ansible/ansible-container">ansible/ansible-container</a>

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