

Docker Review

Basic Commands

`docker image ls` # list images currently present locally

`docker container ls` # list running containers

`docker run <image_name>` # run an image as a container

`docker exec <container> <command>` # run a command in an existing container

-it is useful for running something interactive (e.g. `/bin/bash`)

`docker build <dir>` # compile an image

Use `-t <name>` to assign a name to the image

Making Docker Images

Core of specifying an image is the Dockerfile which gives:

The base image (FROM)

Commands to install software, etc. (RUN)

Files to be copied into the image (COPY)

Environment variables to set (ENV)

The program to be run when the container starts (CMD)

Dockerfile Example

```
# Use an official Python runtime as a parent image
FROM python:2.7-slim

# Set the working directory to /app
WORKDIR /app

# Copy the current directory contents into the container at /app
COPY . /app

# Install any needed packages specified in requirements.txt
RUN pip install --trusted-host pypi.python.org -r requirements.txt

# Make port 80 available to the world outside this container
EXPOSE 80

# Define environment variable
ENV NAME World

# Run app.py when the container launches
CMD ["python", "app.py"]
```

Image Registries

In practice this means `hub.docker.com`

Name scheme is `username/repository:tag`

'repository' basically means name (has nothing to do with SCM)

Username is omitted for official images (e.g. `python:2.7-slim`)

Given an account on a registry, one can

`docker login #` to associate with the account

`docker tag image username/repository:tag #` to create an alias

`docker push username/repository:tag #` to upload the image

Higher Level Organization

Docker-Compose - Used to construct 'services' with load balancing and replication, can specify resource limits

Swarms/Swarm Clusters - Clusters of machines running docker, used for distributed services

Stacks - Collections of co-operating services

These features are all largely redundant when using Kubernetes, which is also designed to do these types of organizational tasks