

Deploy Nodejs with Docker & CoreOS

Edwin Fuquen

edwin@somespider.com

@efuquen



- A tool to conveniently manage containers.
- Containers share the same kernel of the host, but have different filesystems.
- Like lightweight VMs.
- The power of docker is the creation of lightweight, consistent, and easily shareable environments for running applications.

Dockerfile

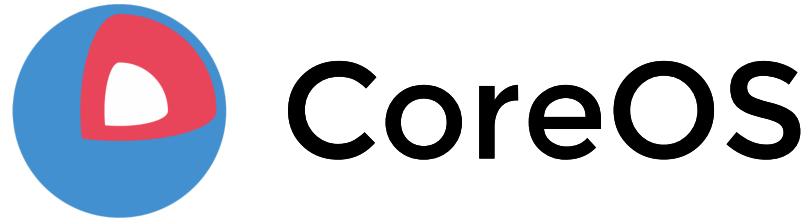
- Is a build scripts
- Each line is a layer
- Layers build on top of each other successively
- Similar to git commits

quay.io/org/app-base

```
1 FROM    dockerfile/nodejs
2
3 # Install global NPM modules
4 RUN      npm install --quiet -g bower jscs
5
6 # Install npm dependencies
7 ADD      ./package.json /app/package.json
8 RUN      cd /app && npm install --quiet
```

quay.io/org/app

```
1 FROM    quay.io/org/app-base
2
3 # Set ENV defaults
4 ENV      MODE      dev
5 ENV      LOGLEVEL   DEBUG
6
7 # Install bower dependencies
8 RUN      bower install --allow-root
9
10 # Setup app dir
11 ADD      . /app/src
12 WORKDIR  /app/src
13
14 EXPOSE   80
15
16 CMD      ["./bin/start"]
```



- Linux OS based on Chrome OS, which itself is based on Gentoo.
- There is no package manager, and only a few preinstalled tools.
- The most essential being docker, etcd, & fleetd.
- An OS fully built around managing containers in a distributed, fault tolerant cluster of machines.



- A distributed key/value store.
- Meant for config data, not high latency/throughput.
- Strongly consistent, very reliable.
- Think zookeeper replacement.

Fleetd

- Uses etcd to make a distributed init system.
- Essential runs systemd services on nodes.
- Feed in standard systemd unit files.
- But with some optional Fleet metadata.

Service Unit File

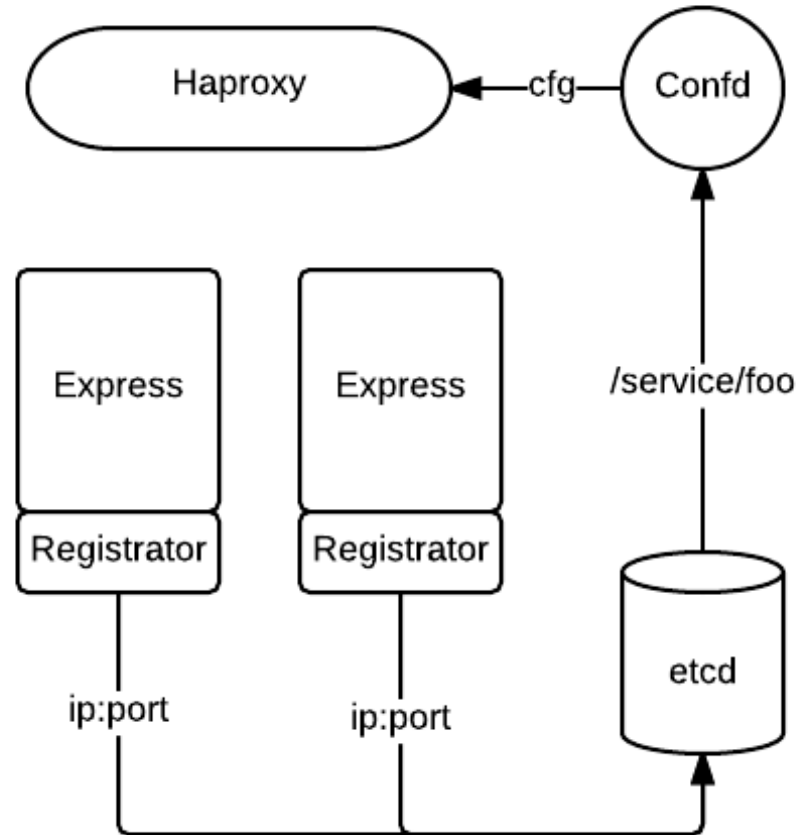
```
[Unit]
Description=registrator
Documentation=https://github.com/progrum/registrator
X-Image=progrum/registrator:master

[Service]
EnvironmentFile=/etc/environment
ExecStartPre=/usr/bin/docker pull progrum/registrator:master
ExecStart=/bin/sh -c "docker run \
    --name %p.%i \
    -v /var/run/docker.sock:/tmp/docker.sock \
    progrum/registrator:master -ip $COREOS_PRIVATE_IPV4 \
    etcd://$COREOS_PRIVATE_IPV4:4001/services"
ExecStop=/usr/bin/docker rm -f %p.%i
TimeoutStartSec=180s
TimeoutStopSec=30s
RestartSec=30s
Restart=on-failure

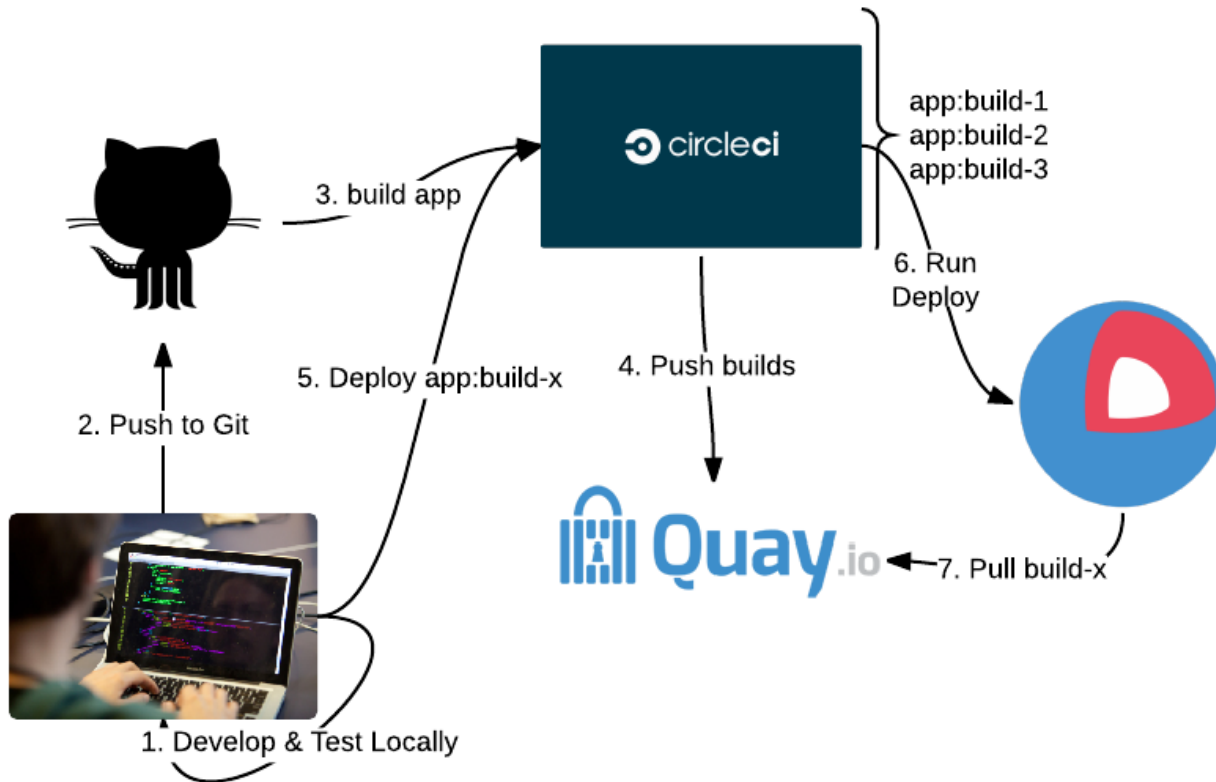
[X-Fleet]
X-Conflicts=%p@*.service
MachineMetadata=role=web
```

Service Discovery

- App ip & port are registered in etcd.
- confd gets notified when certain keys in etcd are modified
- Then haproxy.cfg templates get updated with added or removed app ip & port.



Build & Deploy



[https://github.com/efuquen
/docoreos-express-demo](https://github.com/efuquen/docoreos-express-demo)

Docker Issues

- Daemon can leak memory.
- Docker builds can take a long time, lots of data.
- Docker pulls not verified.
- Containers don't persist.

Mitigation

- Don't log lots of data to stdout & stderr.
- Use smaller base images (i.e. debian & busybox).
- Follow image building best practices.
- Use an internal registry.
- Use data only containers for db's (still annoying).

CoreOS Issues Mitigation

- Hard to install custom tools on the host.
 - BTRFS has many maintenance issues.
 - Docker has issues playing nice with systemd (mostly an issue with the docker daemon).
- Use privileged throwaway containers for ops work.
 - Automate BTRFS cleanup/maintenance (and ext4 is in Alpha).
 - [systemd-docker](#): good writeup on the issue [here](#).
 - Rocket ... ?

Thanks!

TheMid

- New media site, establishing publishing platform.
- We're Hiring!
- Software Developer & Data Science roles
- jobs@themid.com
- themid.com/careers

ScriptEd >_

- Nonprofit puts developers in NYC high schools and provides paid summer internships.
- March 4 - NYC Tech Community Engagement Event.
- Contact sue@scripted.org

Script Event RSVP:

<http://scriptedinternships.splashthat.com>