Building a PaaS at HubSpot

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Blogging
SEO
Social Media
CMS
Lead Management
Landing Pages
Calls-to-Action
Marketing Automation
Email
Analytics
CRM Sync
Over 100 engineers

Over 1,600 deployables

~300 daily deploys

*From git push to Production in about 10 minutes*
Engineers own the end-to-end success of their products. They make most tech decisions; they wear the pagers.

We don’t have an “ops” team.
1. Develop locally
2. Provision QA hardware
3. Deploy via local Python script
4. Provision PROD hardware
5. Deploy via local Python script
...
6. Replace hardware at 4am
PaaS is all about empowering engineers. Give them good tools and a solid foundation so they can focus on what they do best.
First Mesos cluster
Sept 2013
Abstracts away machines.

Promotes homogenous environment.

Ability to scale out specific processes.

Centralized service registry.
Web services
Background workers
Cron jobs
One-off tasks
See something, take action
Baragon
Load Balancer API
Nov 2013
QA Migration
Dec 2013 to June 2014
Hello! This PR migrates profile projects in this repository over to Mesos QA.

What this does

1. Replaces the QA host(s) with `mesos`, which causes subsequent deploys to go to our default Mesos cluster.
2. Sets Java processes' `-Xmx (max heap) to `$DEPLOY_MEM` , which is an environment variable set to the amount of memory allocated.
3. If Java’s max heap is set in production, the production `DEPLOY_MEM` env var will be set to this value.

Resources

Each service in Mesos will be allocated 1 instance with 1 CPU + 512 MB memory by default. This probably seems small to you -- we're experimenting with running services on the leaner side. We're also not running multiple QA instances since HA isn't as much a priority in that environment, and Mesos will automatically restart/rebalance tasks when machines become impaired.
Local filesystem state

singleProcessRunning

Stationary hosts

Memory isolation
graph movingAverage(q("closedtsdb.monit.prod.stethoscope.web.baggledges.memory"), 5), from: "-4w"
Biggest fear: Inconsistency
“My service will be the last to move to Mesos PROD.”
Singularity

“Add host(s) to hubapi.com”

“Request XX is WAITING”

“Status of request XX?”

“Request XX is WAITING”

“Status of request XX?”

“Request XX is SUCCESS”

Baragon

“Update config”

hubapi.com Agents

“Applied successfully”
PROD
QA
TEST
Rebranding with “v2”
PROD Migration
Feb 2015
Migrate the majority of production services into mesos

#339

wsorenson opened this issue on Sep 4, 2014 · 1 comment

wsorenson commented on Sep 4, 2014

- Make mesos the default for new production services, providing the same increase in developer productivity as people get in QA

wsorenson added the Big Win label on Sep 4, 2014

tpetr self-assigned this on Dec 23, 2014

janky referenced this issue in Big Win on Jan 30

Update prod to use mesos

Merged

janky referenced this issue in HubSpotProtected/Mothra on Jan 30

Migrate to Mesos Prod #25

Merged

janky referenced this issue in HubSpotProtected/Login on Jan 30

Migrate to Mesos Prod #116

Merged

janky referenced this issue in HubSpotProtected/Portals on Jan 30

Migrate to Mesos Prod #72

Merged

janky referenced this issue in HubSpotProtected/SkyNet on Jan 30

Migrate to Mesos Prod #14

Merged

janky referenced this issue in HubSpotProtected/HubAuth on Jan 30
“But does this all work?”
Yes, it powers the HubSpot product.

(and other companies too!)
8,000,000 tasks launched in 2015
No critical situations caused by infrastructure.
Avg PROD deploys / user

Singularity first deploy

PROD migrated

QA migrated

PROD migrated

QA migrated
PROD Machines

- App Servers
- Mesos Slaves

- Singularity first deploy
- PROD migrated

May 2013, Dec 2013, Jul 2014, Feb 2015
Ghidorah
Mesos-based Load Balancers
Jan 2015
NGINX + Baragon Agent in a Docker image

Managed by Singularity

Absorbed 40 standalone instances in QA
Blazar
A Modern Build System

July 2015
GitHub Webhooks

Singularity

Heroku-like buildpacks
TL;DR

We run our product on Mesos, and you should too.
We had to invest in a custom scheduler because we started early.

There are many good options now.
CTA!
Stand on the shoulders of giants!

Try Singularity today.

github.com/HubSpot/Singularity