

Docker at Shopify

Simon Eskildsen, Infrastructure @ Shopify

@Sirupsen

Shopifacts

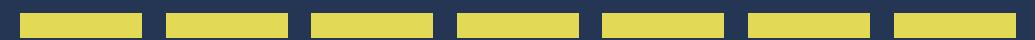
- 200-300K RPM during day, > 500K sales
- Hundreds of servers
- 100+ product developers, ~10 infrastructure, ~10 core ops
- Ruby on Rails, MySQL, Redis, Memcached, ..

**Make it easier solve
problems at Shopify**

*Ops should be a product
team, not consultants.*

– Flynn.io

Container



Ops

- **Mid 2013.** Investigated Mesos and Docker
- **Fall/Winter 2013** Team works on Kafka
- **Winter/Spring 2014** Legwork for containerization and failed attempts to deploy CoreOS/Mesos.
- **Summer 2014** Pivot to Chef, runit and Capistrano. 'ed it

*Ship Docker as the only
change*

*Everyone knows that
debugging is twice as
hard as writing a program
in the first place.*

– Brian Kernighan



Trust from Ops

Checklist before touching Docker

- Tie state to SHA
- Secrets
- Logs
- Signals
- Assets
- Roles/Procfile

Start playing with Docker

- Building images/CI
- Get familiar CLI
- Deployment
- Orchestration
- Union filesystems
- init in container, Linux namespaces, cgroups, routing, monitoring, security updates, registry..

Repos | Issues | Shopify | Shopify

Image builds

SHA

Build It!

1. Commit <sha> lands in master.

(not deployed)

2. Build server builds image for new SHA (~2m, no Dockerfile).

✓

Aug 10 23:44

(Duration: 00:03:06)

(Rebuild)

(Deploy)

Commit

json

b89acc4

json

json

✓

Aug 9 21:40

(Duration: 00:01:24)

(Rebuild)

(Deploy)

✓

Aug 9 20:17

(Duration: 00:12:55)

(Rebuild)

(Deploy)

✓

Aug 8 21:52

(Duration: 00:02:07)

(Rebuild)

(Deploy)

95ec961

json

700ada4

json

✓

Aug 8 21:15

(Duration: 00:02:10)

(Rebuild)

(Deploy)

5d22808

json

✓

Aug 8 20:24

(Duration: 00:02:14)

(Rebuild)

(Deploy)

877a2d3

json

✓

Aug 8 20:16

(Duration: 00:02:08)

(Rebuild)

(Deploy)

b4f4db4

json

✓

Aug 8 19:47

(Duration: 00:02:06)

(Rebuild)

(Deploy)

917a275

json

✓

Aug 8 19:44

(Duration: 00:02:08)

(Rebuild)

(Deploy)

e6801ce

json

✓

Aug 8 19:42

(Duration: 00:02:07)

(Rebuild)

(Deploy)

06a5c26

json

✓

Aug 8 19:36

(Duration: 00:02:09)

(Rebuild)

(Deploy)

9e24863

json

eb8a1b4

json

```
container "shopify" do
  role :web
  instances 5
  health_check true
  http_health_check "/ping/ponies"
  revision "file"
  docker_args [
    "-e RAILS_ENV=production",
    "-e UNICORN_WORKERS=#{node[:cores] / 5}"
  ]
end
```

```
simon@omg-containers98.dc1:~$ ls -d /etc/service/shopify-unicorn-*
/etc/service/shopify-web-1
/etc/service/shopify-web-3
/etc/service/shopify-web-5
/etc/service/shopify-web-2
/etc/service/shopify-web-4
```

Deploys

1. Deploy two stacks at once.
2. Capistrano updates revision in /etc/shopify/revision.
3. `ls -d /etc/sv/shopify-web* | xargs -L1 sudo sv restart`
 - New image layer (~2 MiB) is downloaded from registry.
 - Subset of containers (~20%) are restarted with new image.

 unicorn

 unicorn

 unicorn

 unicorn

nginx

newrelic

datadog

splunk

kafka

ubuntu

app server

 unicorn

 unicorn

 unicorn

 unicorn

nginx

Host Services

newrelic

datadog

splunk

kafka

ubuntu

app server

 unicorn

 unicorn

 unicorn

 unicorn

ubuntu

app server

 unicorn

 unicorn

 unicorn

 unicorn

CoreOS

app server

*Docker is the future, but
it's still hard*



Thanks

Simon Eskildsen, Infrastructure @ Shopify

@Sirupsen

- Container picture on slide 1, Izabela Reimers (<https://creativecommons.org/licenses/by-nc-sa/2.0/>)
- Other pictures used by permissions of Florian Weingarten
- Over-stuffed Walrus picture kindly provided with permission by the Horniman Museum and Gardens, U.K.
- Panama canal construction photo, World Bank Photo Collection (<https://creativecommons.org/licenses/by-nc-nd/2.0/>)
- Crane and containers, Astrid Westvang (<https://creativecommons.org/licenses/by-nc/2.0/>)