Shopify's Path to Kubernetes

Karan Thukral
@k_thukral

shopify

Overview

- Introduction about me and Shopify
- History of Development at Shopify
- Why cloud and kubernetes?
- Guiding principles for the platform
- What we built?
- What we learned?
- Where we are headed?


Excuse me, but who are you?

What is Shopify?



Shopify in 2018

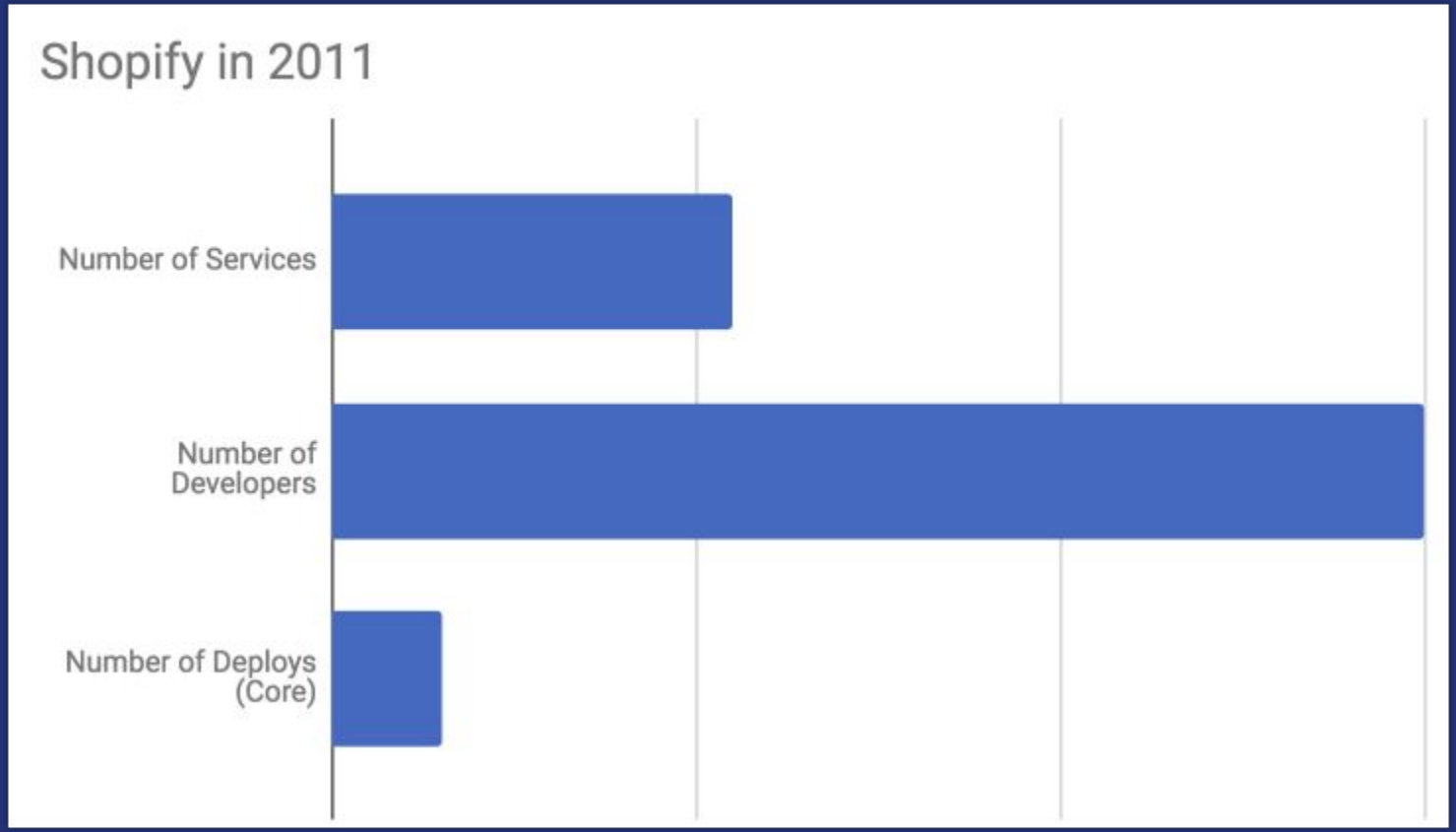
3000+
Employees

$55B+
Sales on Shopify

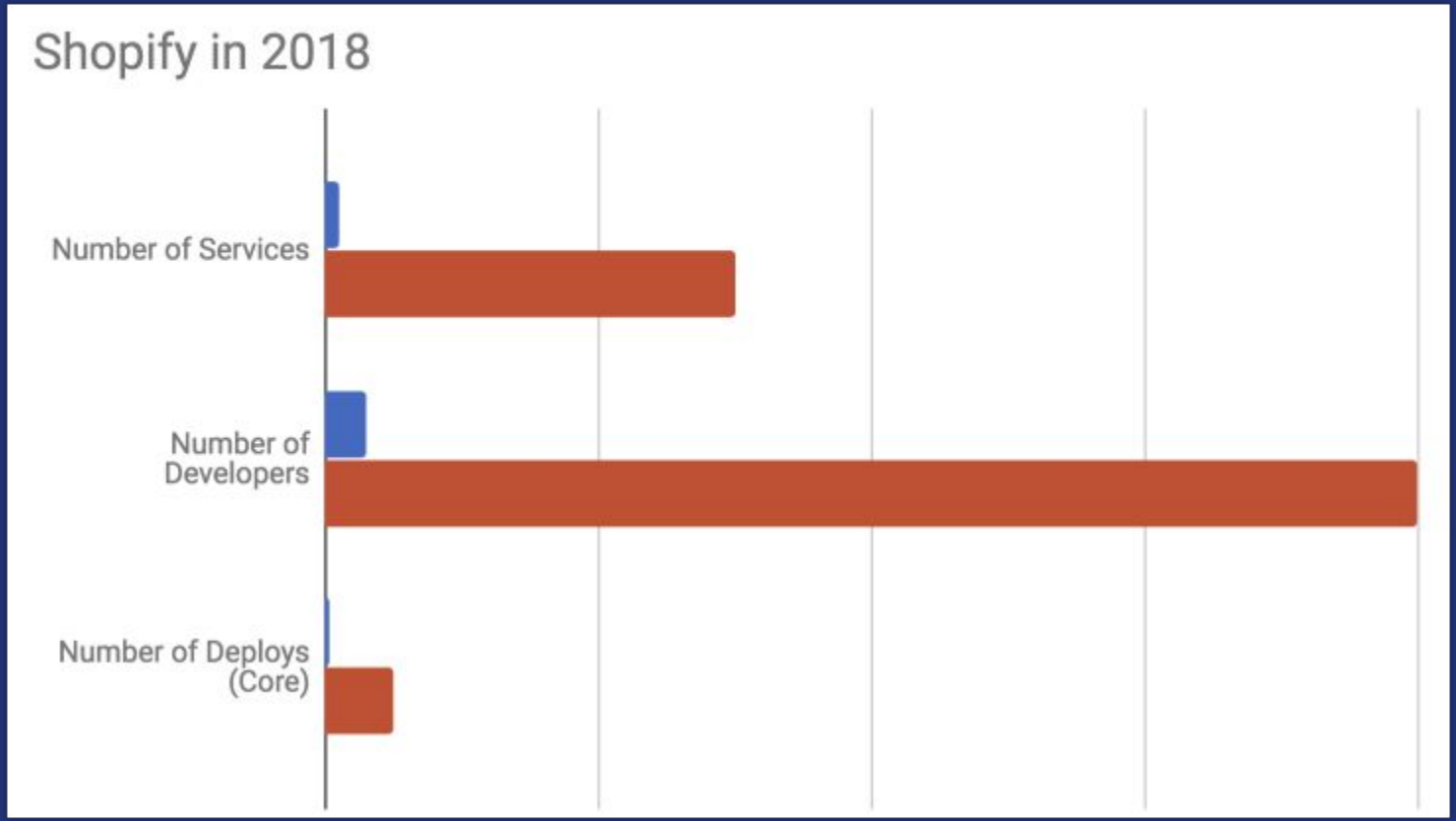
600,000+
Merchants

History of development @ Shopify

Development at Shopify in 2011

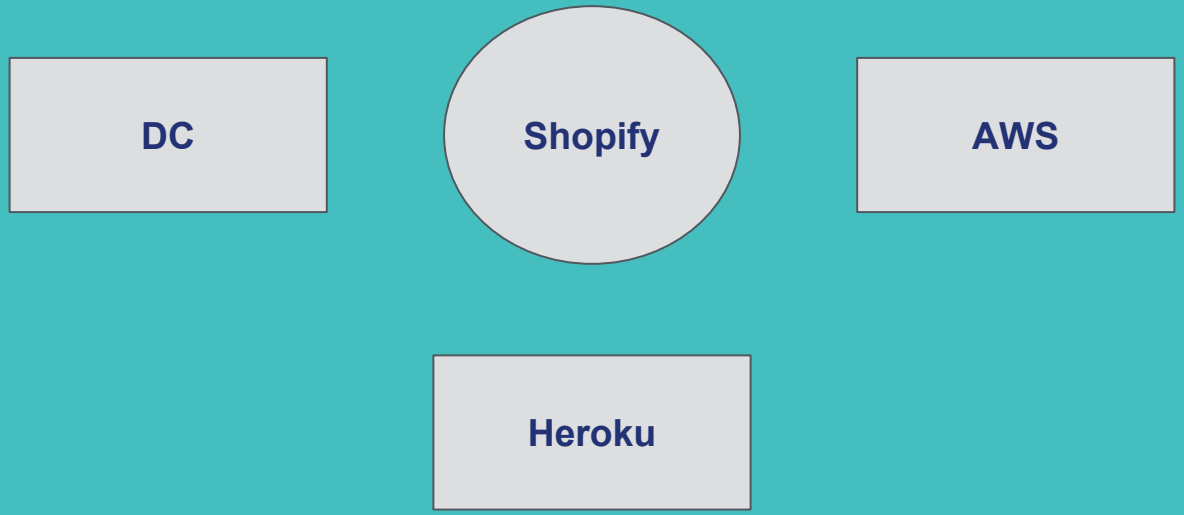


Development at Shopify in 2018

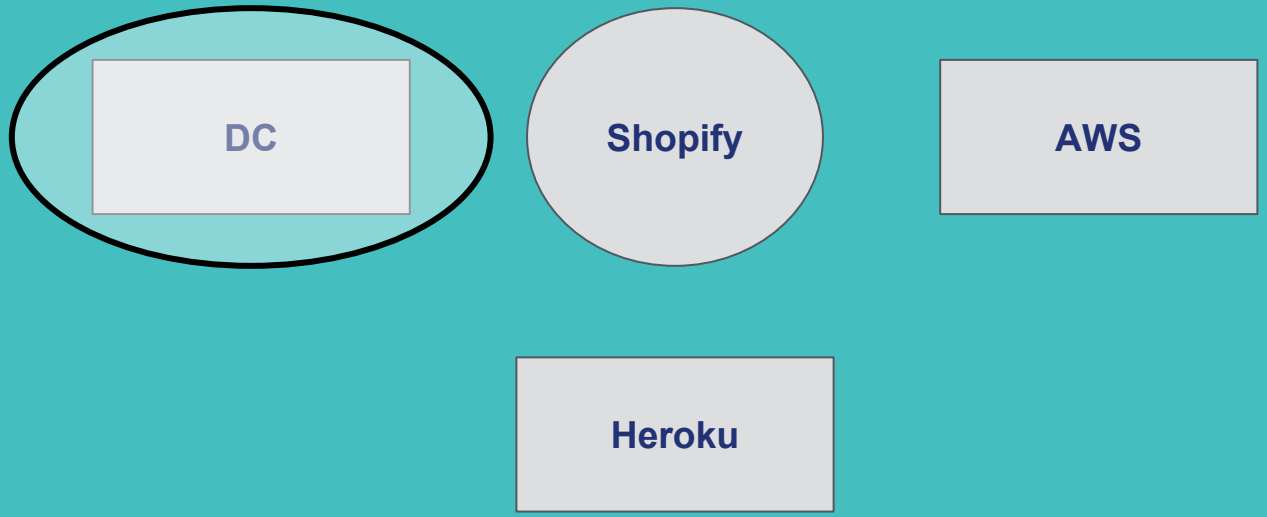


What happened with this scale?

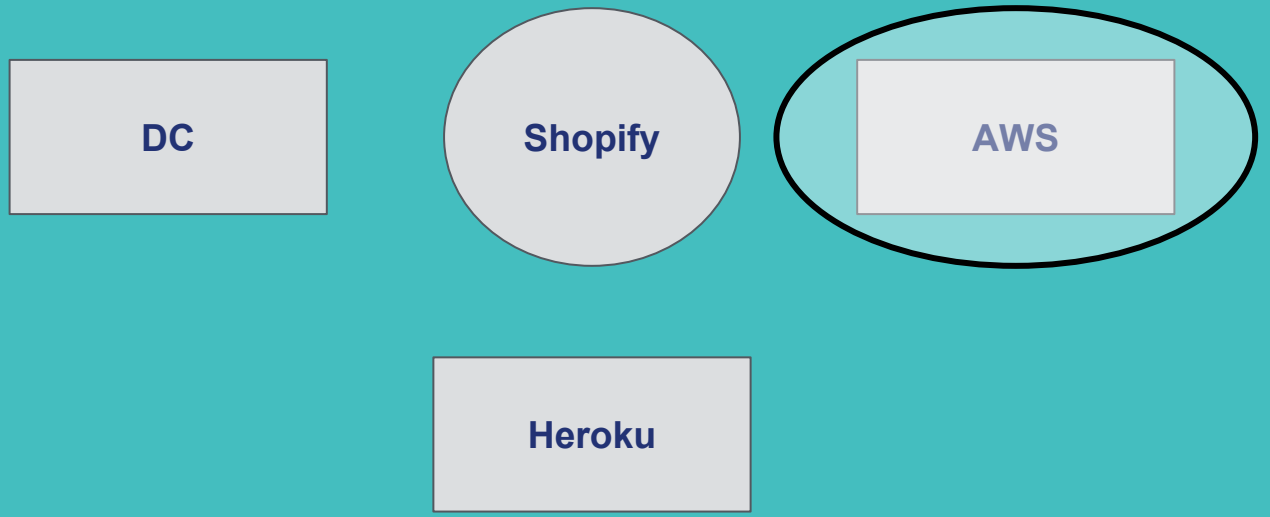
Production Environments



Production Environments: Data Centers



Production Environments: AWS



Production Environments: Heroku



Why Cloud?

- Cloud promises to be easier to scale and build PoPs around the world

Why Kubernetes?

- Existing experience with Docker
- Large community support
- Shared resources
- Platform agnostic



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What principles did we build around?



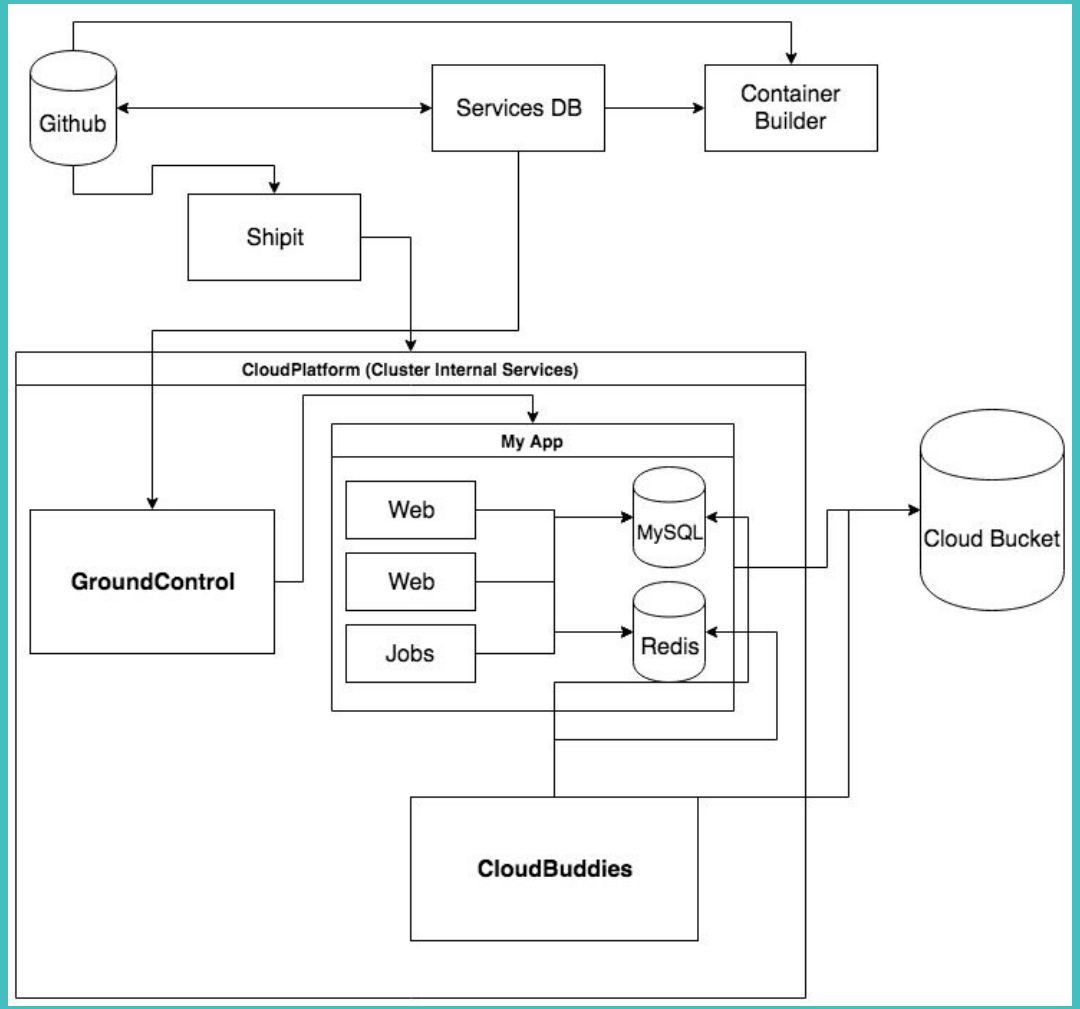
Paved Road



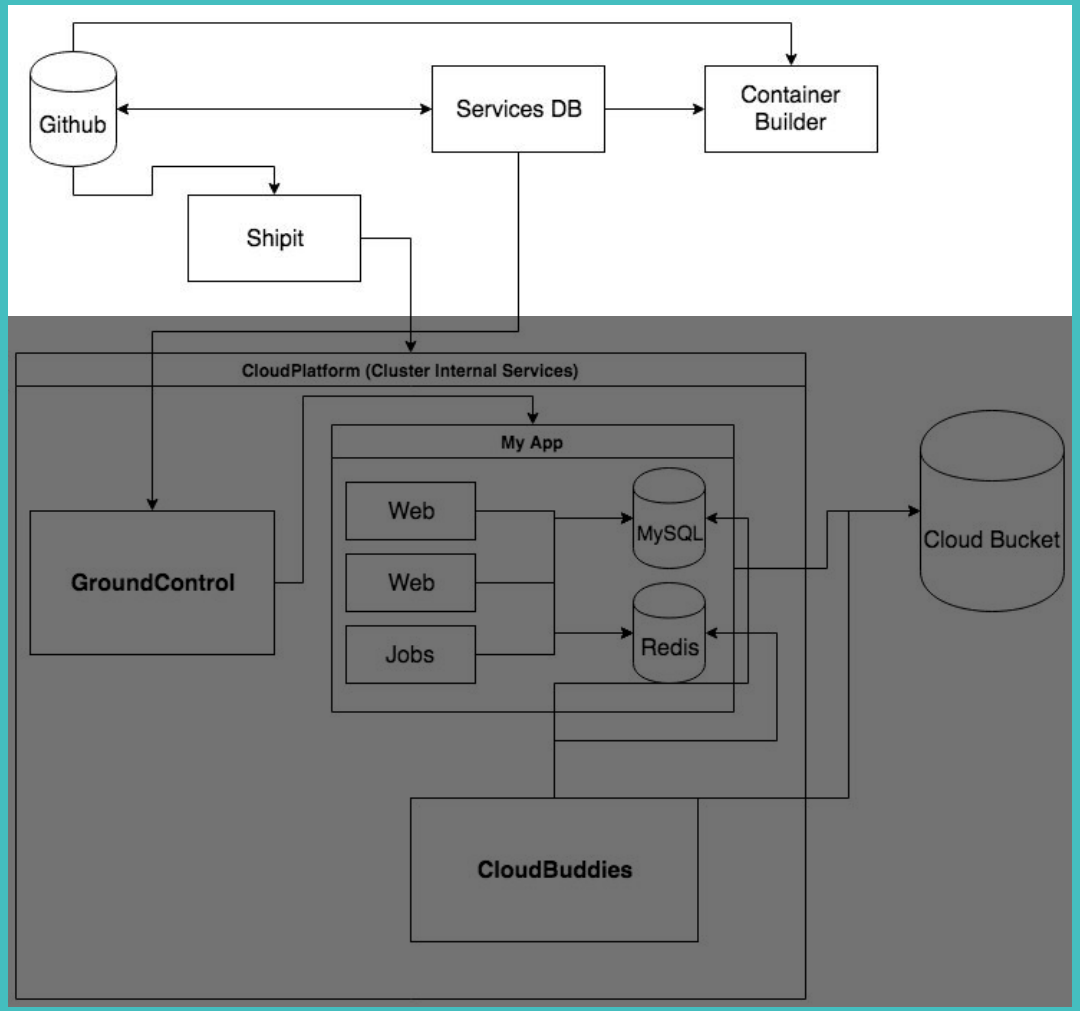
Hiding Complexity



Self Serve

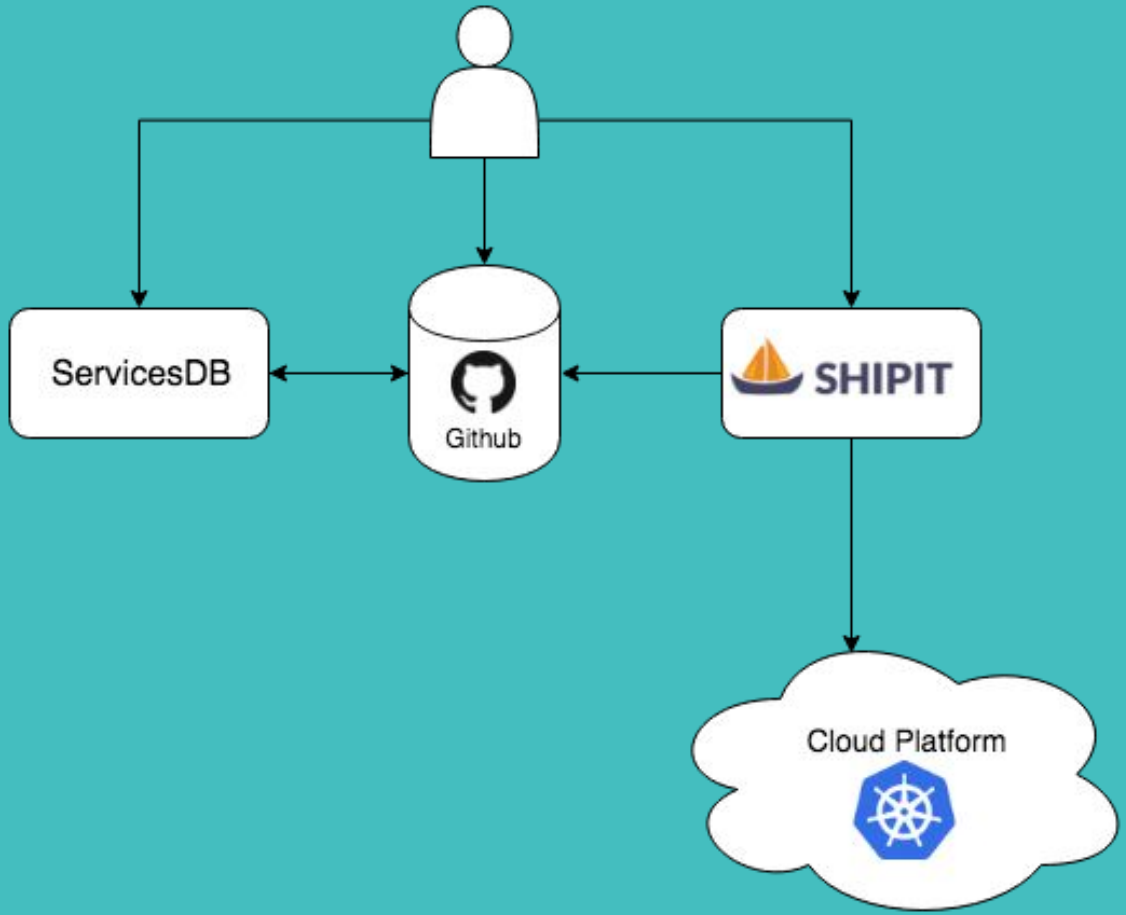


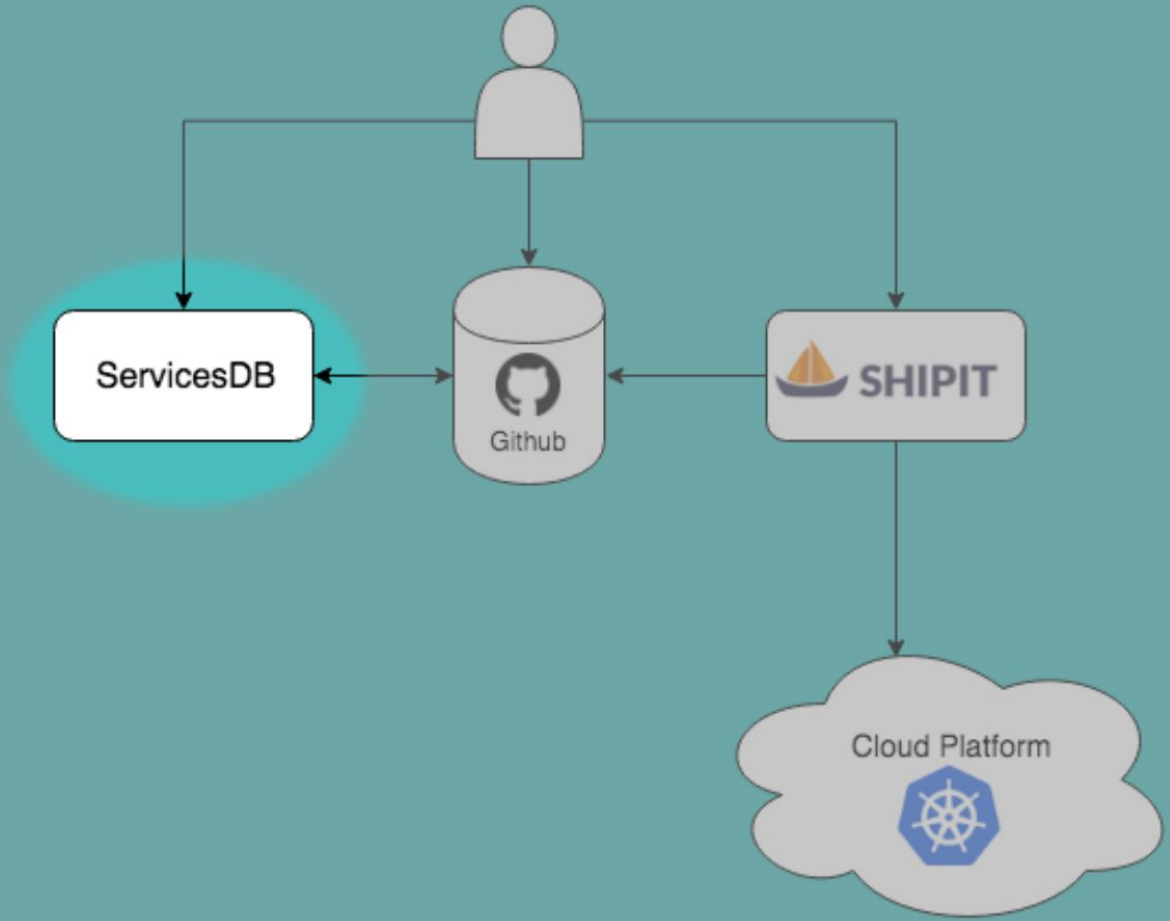
What did we build?

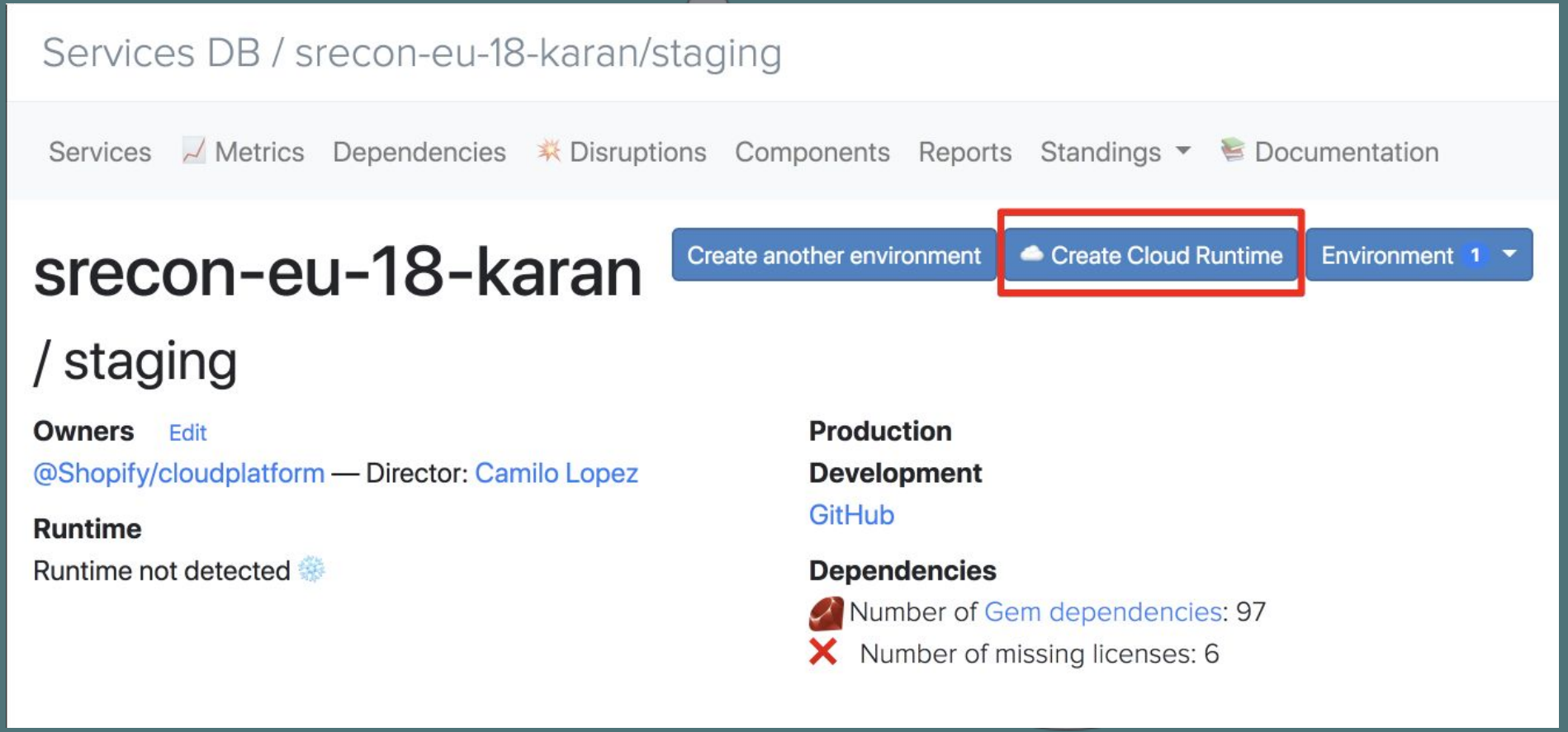


User Domain

(Cluster External)


ServicesDB
Github
SHIPIT
Cloud Platform


ServicesDB
Github
SHIPIT
Cloud Platform


Services DB / srecon-eu-18-karan/staging
Services
Metrics
Dependencies
Disruptions
Components
Reports
Standings
Documentation
srecon-eu-18-karan
Create another environment
Create Cloud Runtime
Environment 1
/ staging
Owners
Edit
@Shopify/cloudplatform — Director: Camilo Lopez
Runtime
Runtime not detected
Production
Development
GitHub
Dependencies
Number of Gem dependencies: 97
Number of missing licenses: 6



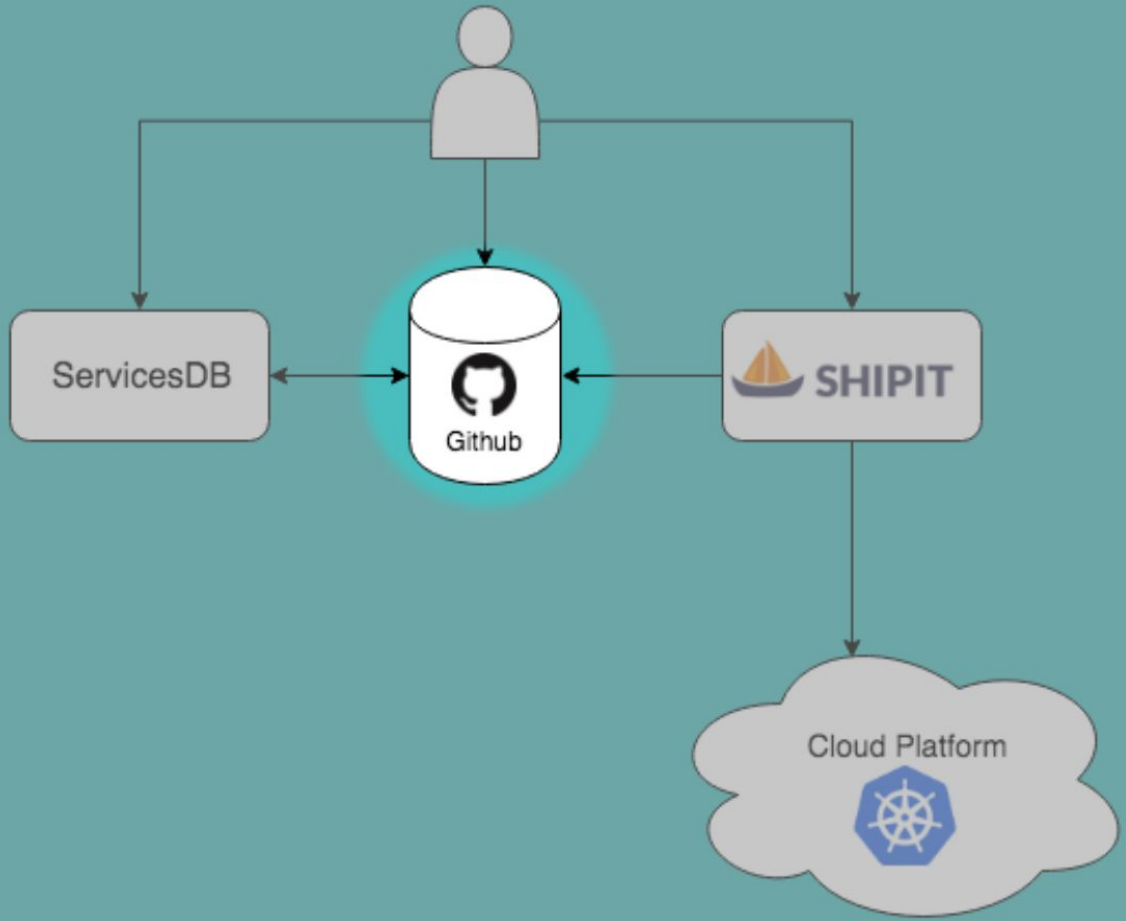
Stack

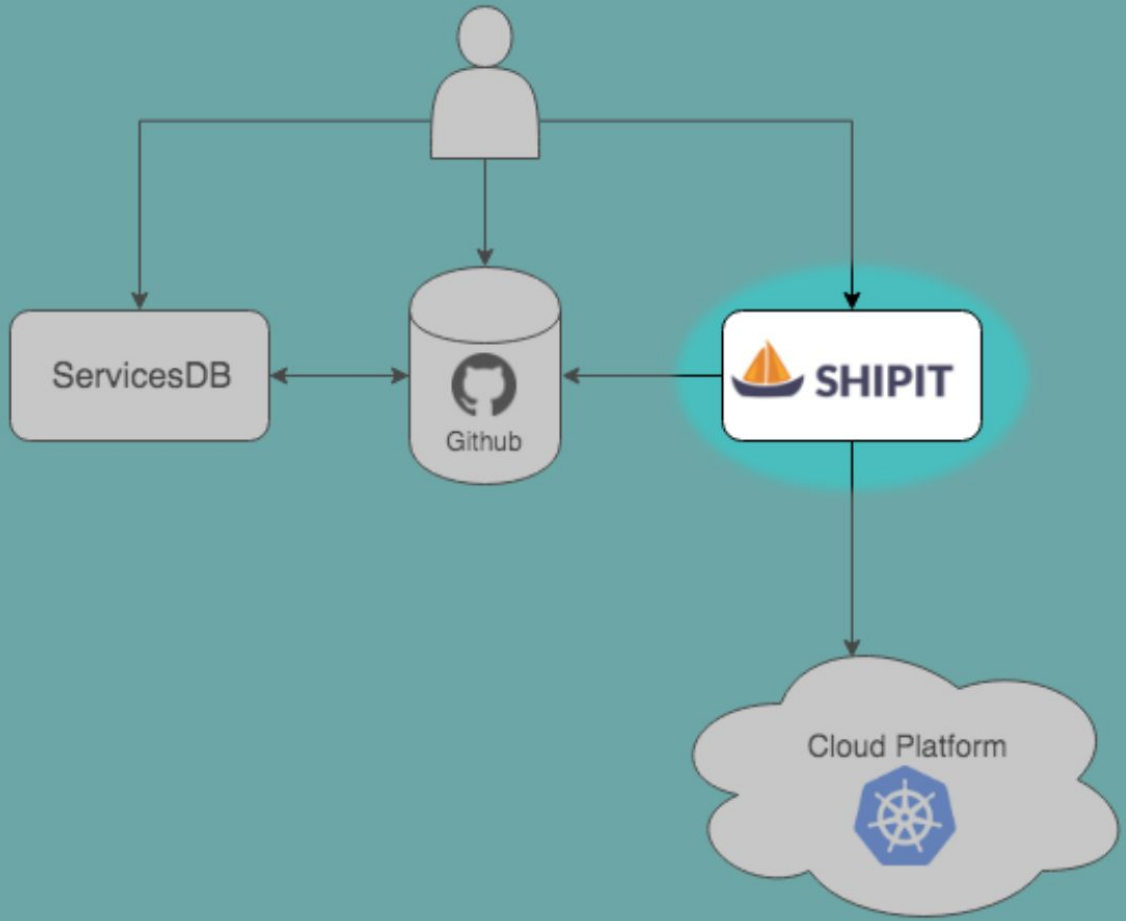
- (•) Rails (default)
- ( ) Other

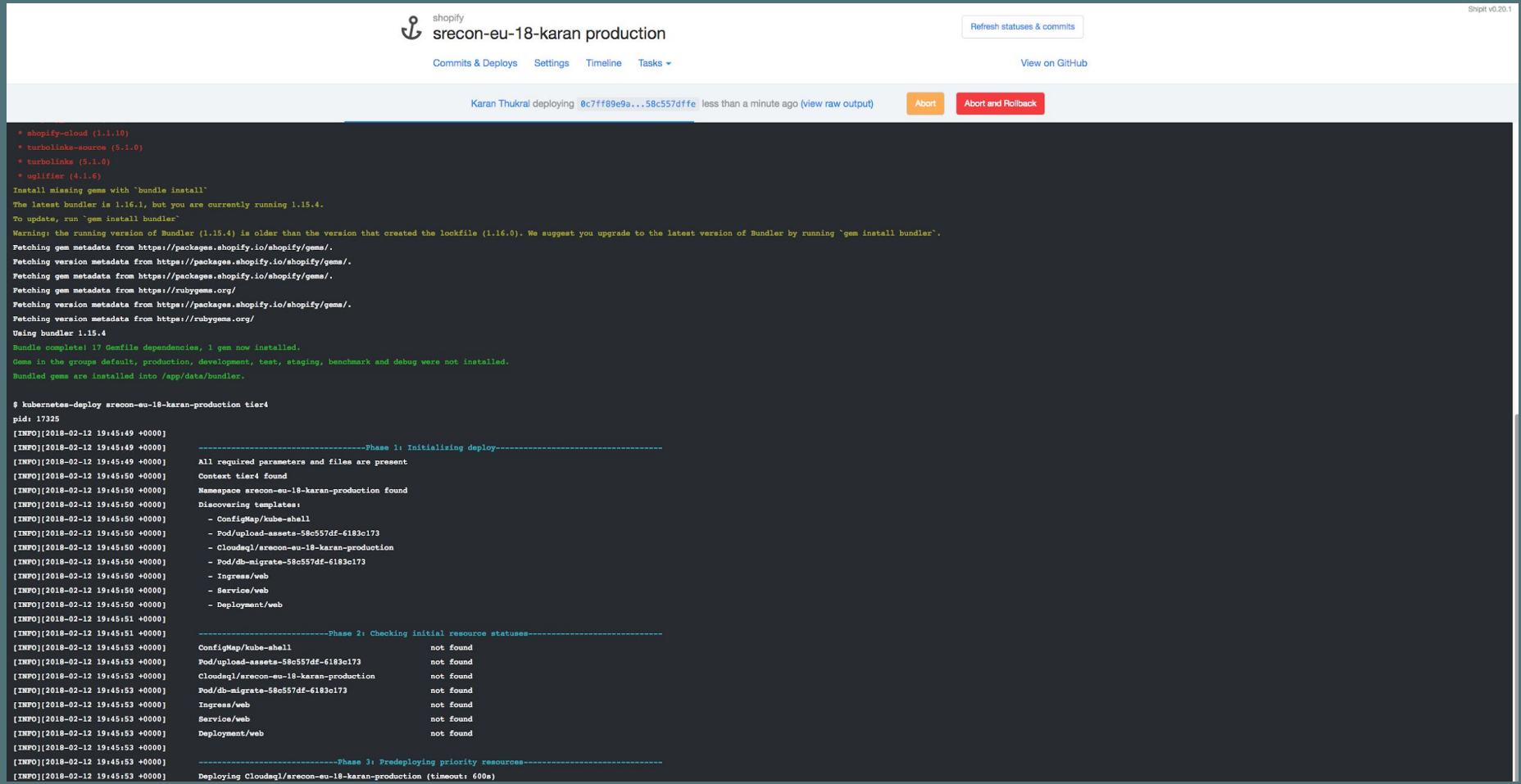


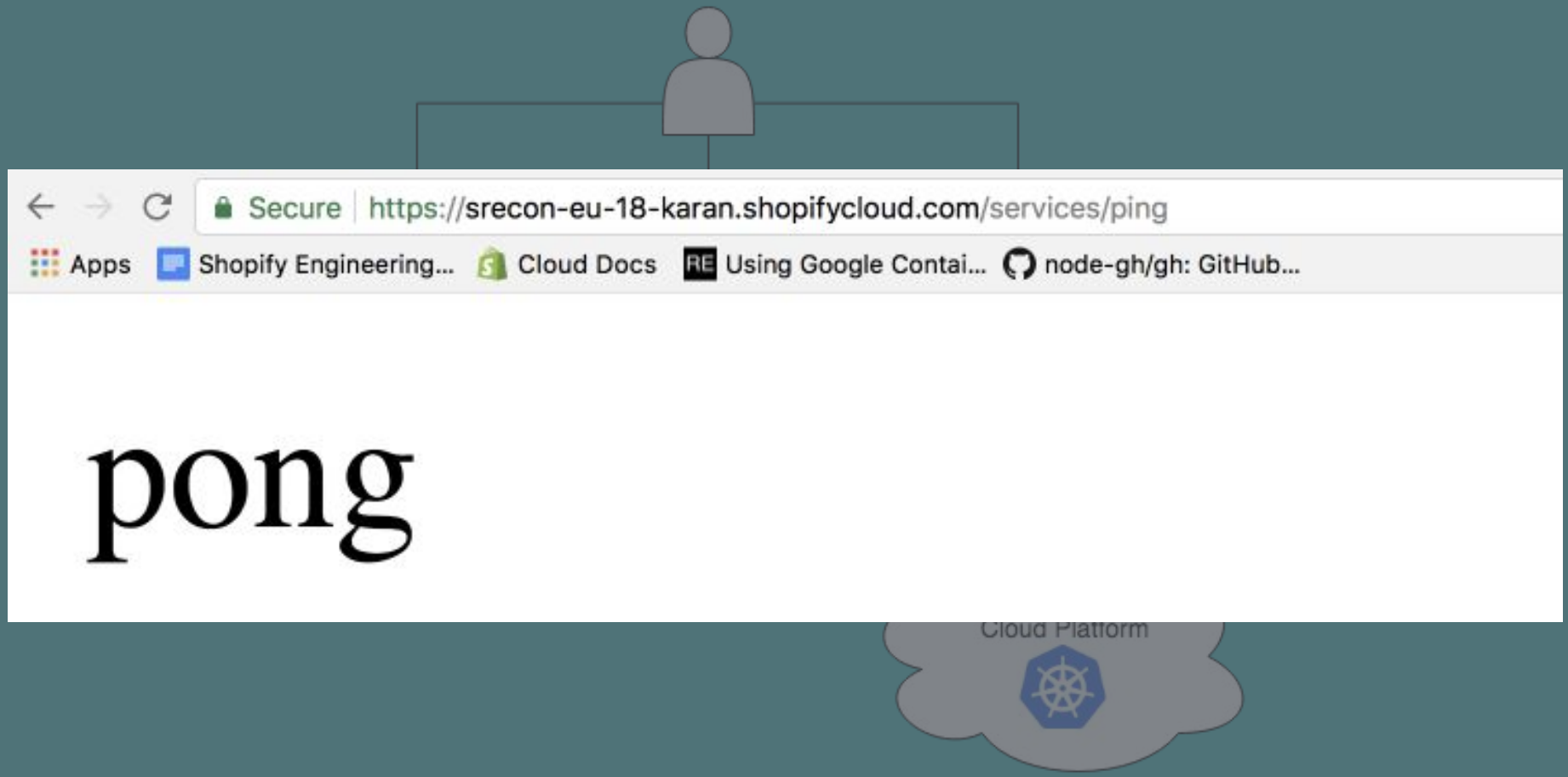
☑	kube-shell	This will give you under-the-hood access to help debug failed deploys, figure out what is actually running, and get you a shell.(automatically included for all non tier1 apps)
☐	elasticsearch	Configure an Elasticsearch instance.
☑	web	This is so that you can actually run a web server.
☑	db-migrate	So that you can run your migrations.
☑	asset-uploading	So that you can have fast assets on a CDN. Rails apps need to add the 'shopify-cloud' gem to use this.
☐	jobs	So you can run background job workers.
☐	redis	Configure a redis instance.
☑	cloudsql	So that you have a database for your models.
☐	memcached	Configure a memcached instance.

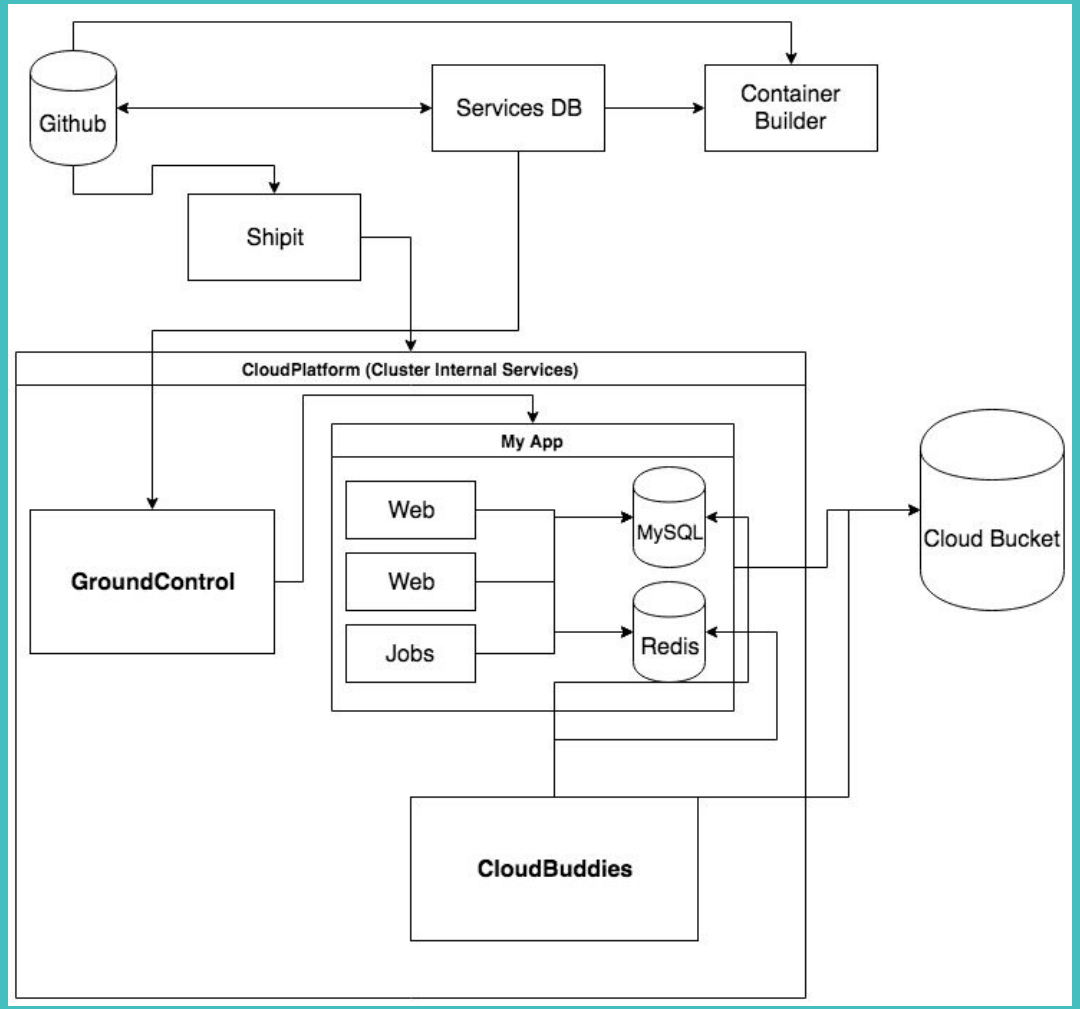
Build runtime Cancel


ServicesDB
Github
SHIPIT
Cloud Platform

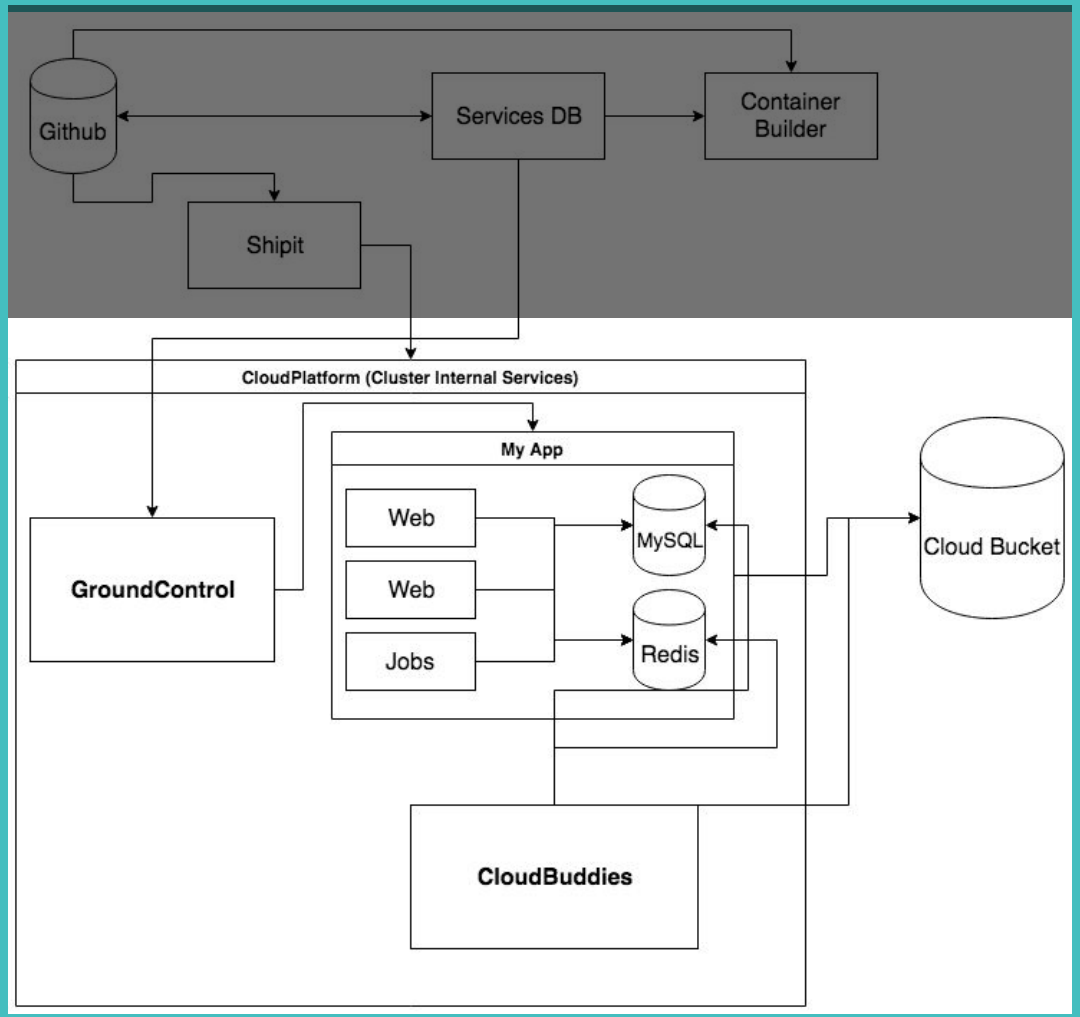

ServicesDB
Github
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Cloud Platform


Shipit v0.20.1
shopify
srecon-eu-18-karan production
Refresh statuses & commits
Commits & Deploys
Settings
Timeline
Tasks
View on GitHub
Karan Thukral deploying 0c7ff89e9a...58c557dffe less than a minute ago (view raw output)
Abort
Abort and Rollback
* shopify-cloud (1.1.10)
* turbolinks-source (5.1.0)
* turbolinks (5.1.0)
* uglifier (4.1.6)
Install missing gems with `bundle install`
The latest bundler is 1.16.1, but you are currently running 1.15.4.
To update, run `gem install bundler`
Warning: the running version of Bundler (1.15.4) is older than the version that created the lockfile (1.16.0). We suggest you upgrade to the latest version of Bundler by running `gem install bundler`.
Fetching gem metadata from https://packages.shopify.io/shopify/gems/.
Fetching version metadata from https://packages.shopify.io/shopify/gems/.
Fetching gem metadata from https://packages.shopify.io/shopify/gems/.
Fetching gem metadata from https://rubygems.org/
Fetching version metadata from https://packages.shopify.io/shopify/gems/.
Fetching version metadata from https://rubygems.org/
Using bundler 1.15.4
Bundle complete! 17 Gemfile dependencies, 1 gem now installed.
Gems in the groups default, production, development, test, staging, benchmark and debug were not installed.
Bundled gems are installed into /app/data/bundler.
$ kubernetes-deploy srecon-eu-18-karan-production tier4
pid: 17325
[INFO][2018-02-12 19:45:49 +0000]
[INFO][2018-02-12 19:45:49 +0000] ----------Phase 1: Initializing deploy----------
[INFO][2018-02-12 19:45:49 +0000] All required parameters and files are present
[INFO][2018-02-12 19:45:50 +0000] Context tier4 found
[INFO][2018-02-12 19:45:50 +0000] Namespace srecon-eu-18-karan-production found
[INFO][2018-02-12 19:45:50 +0000] Discovering templates:
[INFO][2018-02-12 19:45:50 +0000] - ConfigMap/kube-shell
[INFO][2018-02-12 19:45:50 +0000] - Pod/upload-assets-58c557df-6183c173
[INFO][2018-02-12 19:45:50 +0000] - Cloudsql/srecon-eu-18-karan-production
[INFO][2018-02-12 19:45:50 +0000] - Pod/db-migrate-58c557df-6183c173
[INFO][2018-02-12 19:45:50 +0000] - Ingress/web
[INFO][2018-02-12 19:45:50 +0000] - Service/web
[INFO][2018-02-12 19:45:50 +0000] - Deployment/web
[INFO][2018-02-12 19:45:51 +0000]
[INFO][2018-02-12 19:45:51 +0000] ----------Phase 2: Checking initial resource statuses----------
[INFO][2018-02-12 19:45:53 +0000] ConfigMap/kube-shell not found
[INFO][2018-02-12 19:45:53 +0000] Pod/upload-assets-58c557df-6183c173 not found
[INFO][2018-02-12 19:45:53 +0000] Cloudsql/srecon-eu-18-karan-production not found
[INFO][2018-02-12 19:45:53 +0000] Pod/db-migrate-58c557df-6183c173 not found
[INFO][2018-02-12 19:45:53 +0000] Ingress/web not found
[INFO][2018-02-12 19:45:53 +0000] Service/web not found
[INFO][2018-02-12 19:45:53 +0000] Deployment/web not found
[INFO][2018-02-12 19:45:53 +0000]
[INFO][2018-02-12 19:45:53 +0000] ----------Phase 3: Predeploying priority resources----------
[INFO][2018-02-12 19:45:53 +0000] Deploying Cloudsql/srecon-eu-18-karan-production (timeout: 600s)


Secure
https://srecon-eu-18-karan.shopifycloud.com/services/ping
Apps
Shopify Engineering...
Cloud Docs
Using Google Contai...
node-gh/gh: GitHub...
pong
Cloud Platform

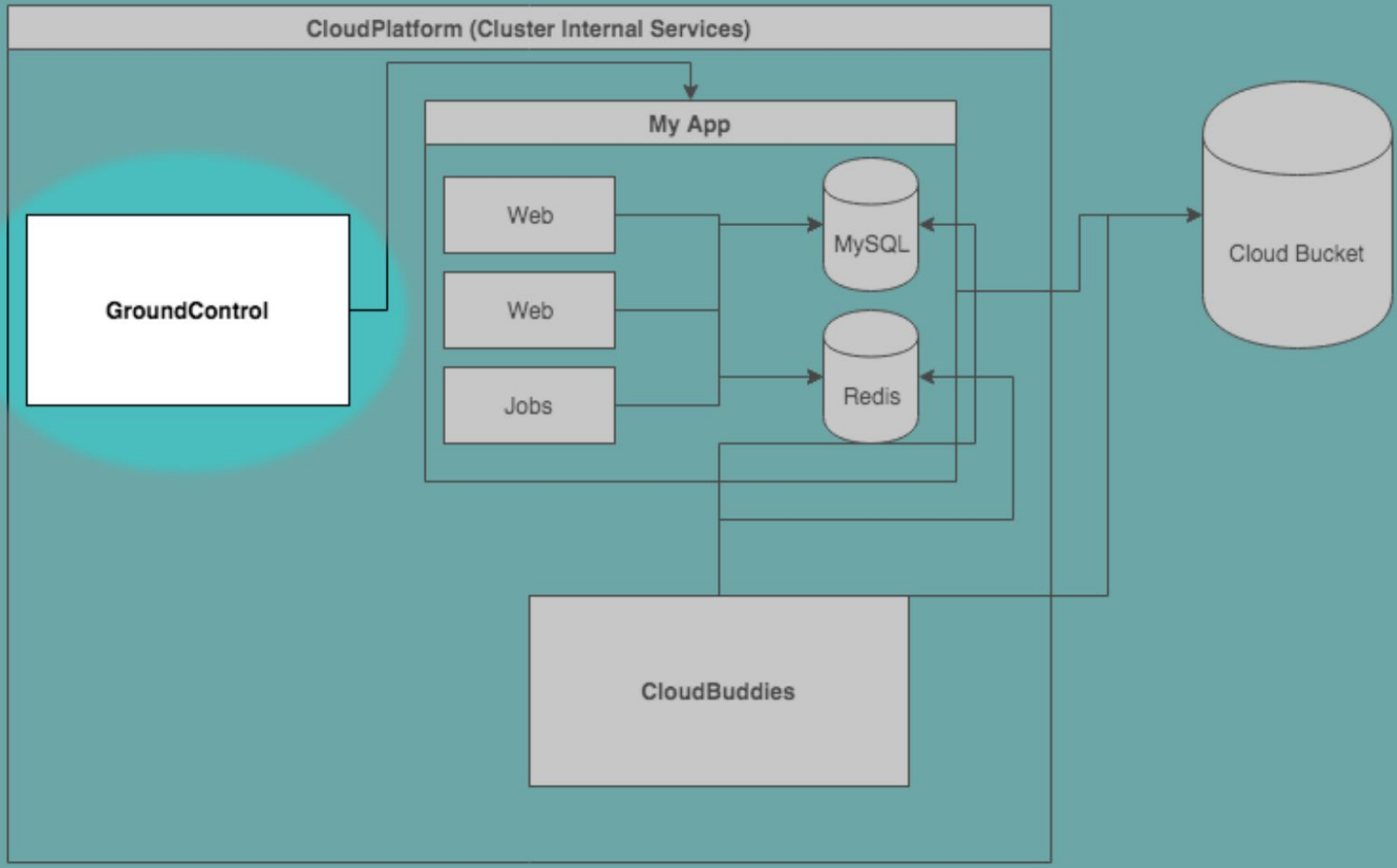


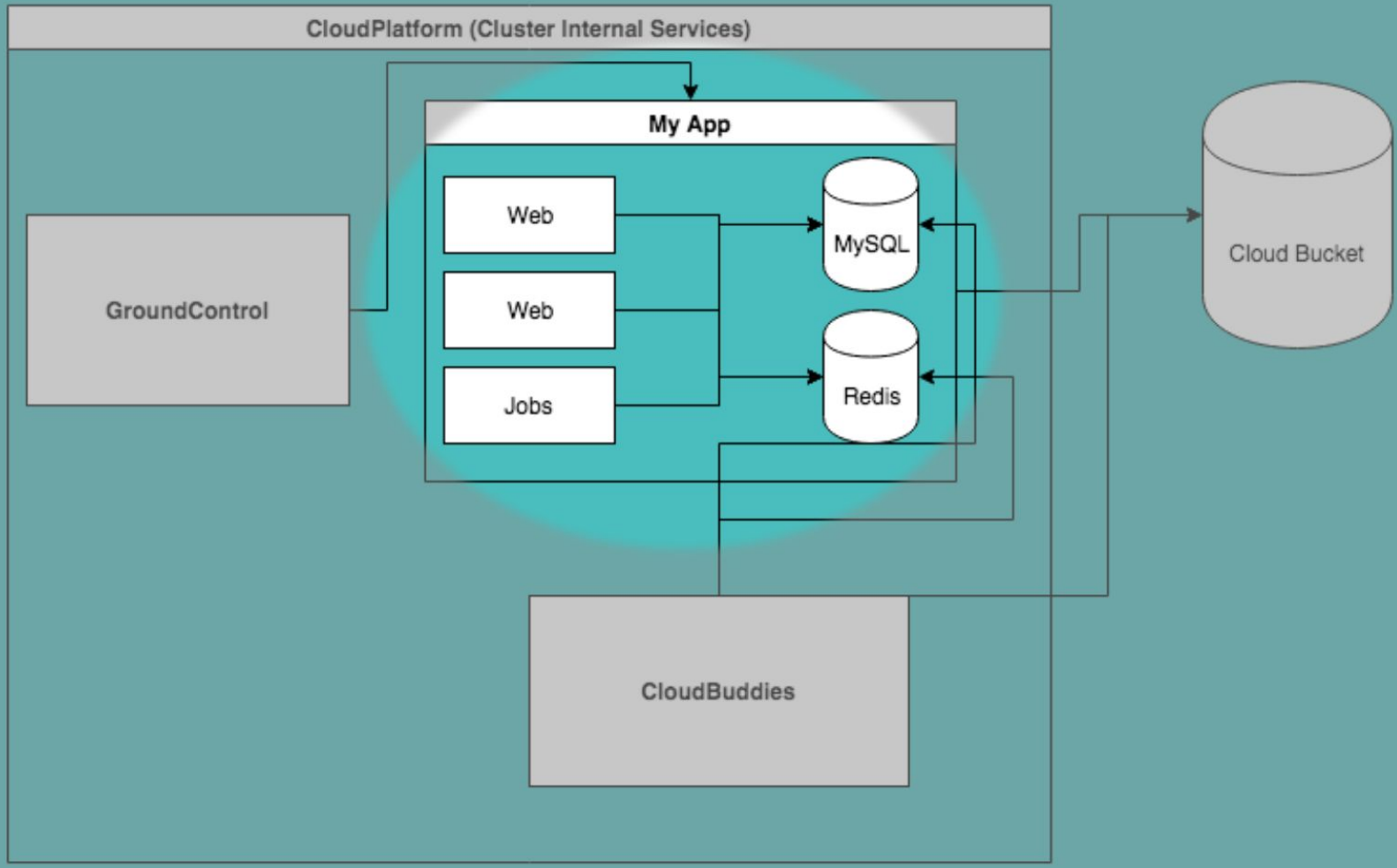
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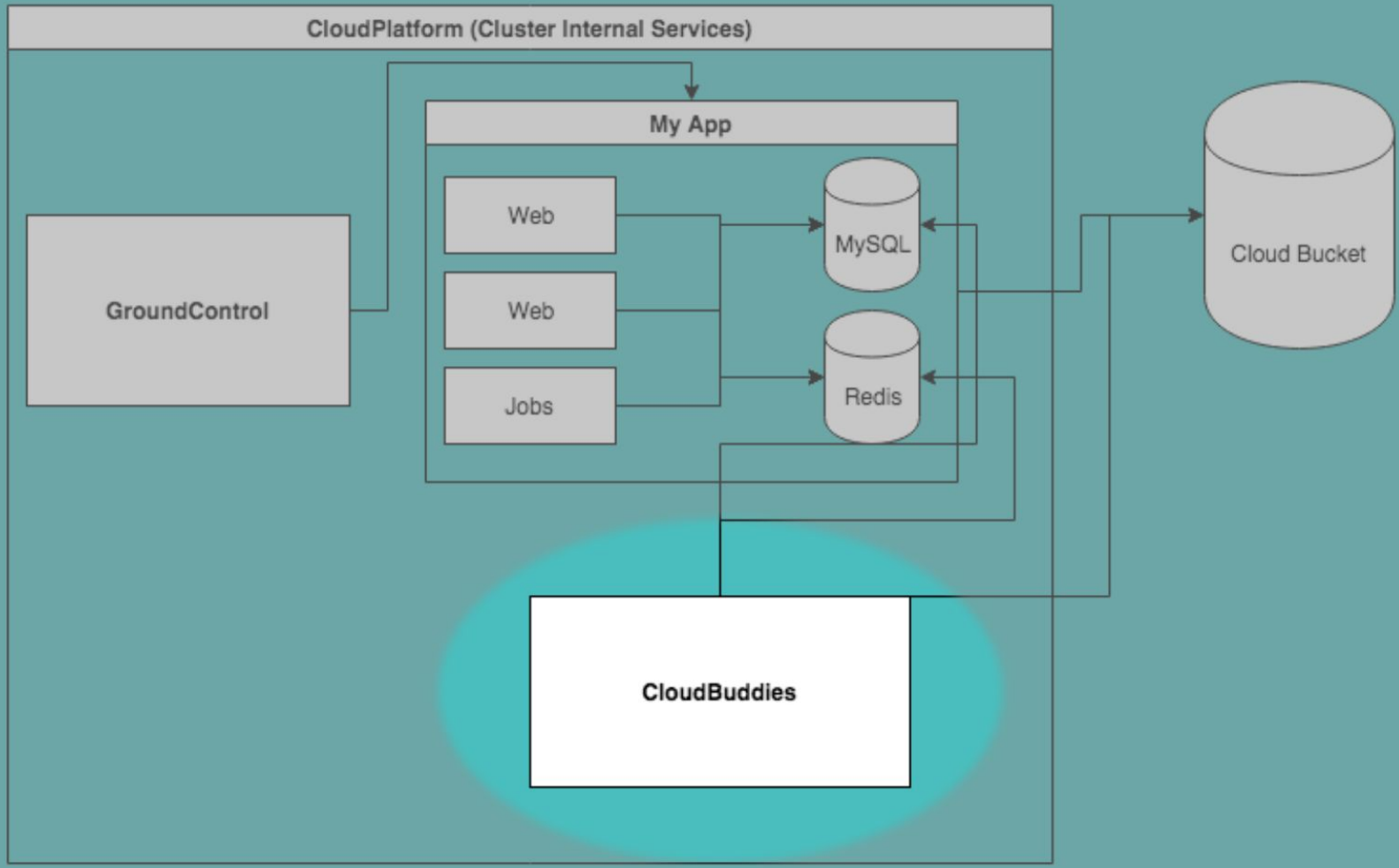


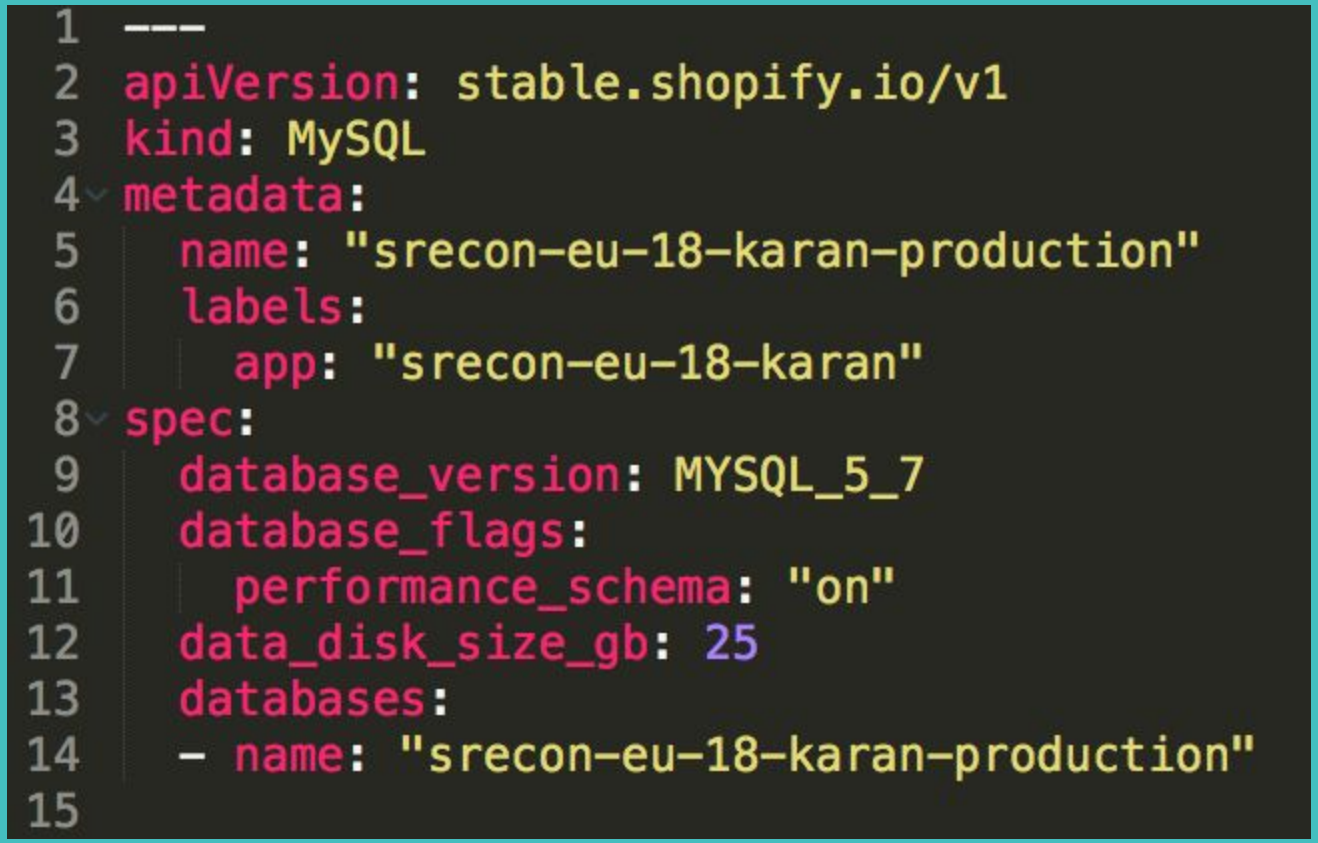
Cloud Platform

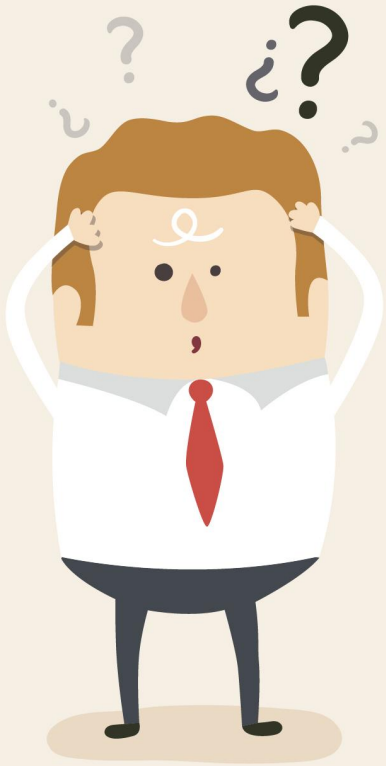
(Cluster Internal)


CloudPlatform (Cluster Internal Services)
My App
Web
Web
Jobs
MySQL
Redis
GroundControl
Cloud Bucket
CloudBuddies


CloudPlatform (Cluster Internal Services)
My App
Web
Web
Jobs
MySQL
Redis
GroundControl
Cloud Bucket
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My App
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Web
Jobs
MySQL
Redis
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Cloud Bucket
CloudBuddies


---
apiVersion: stable.shopify.io/v1
kind: MySQL
metadata:
  name: "srecon-eu-18-karan-production"
  labels:
    app: "srecon-eu-18-karan"
spec:
  database_version: MYSQL_5_7
  database_flags:
    performance_schema: "on"
  data_disk_size_gb: 25
  databases:
  - name: "srecon-eu-18-karan-production"



You have a platform/product, now what?

Overview
Help improve the documentation
Getting started
Introduction
Help
Prerequisites
Walkthroughs
Rails walkthrough
Other apps walkthrough
Migration from Heroku
Static app walkthrough
Add-ons
Using add-ons
Web
Elasticsearch
MySQL
Redis and Memcached
Kafka
Job workers
Kube Shell
Google Cloud Storage
Bugsnag exception tracking
Security
Secrets
Authorization
Permissions
Ssl and ingress
Ingress
SSL
Common tasks
Deploying and staging
Viewing Logs
Viewing Metrics
Scaling your app
Troubleshooting
Deleting an app
Technical details
Google Cloud
Cluster services
Controllers and buddies
References
Glossary
Changelog

Overview

The CloudPlatform runtime is a unified deployment stack for Shopify applications backed by Kubernetes that strives to provide an out-of-the-box experience when possible (see Project Brief).

To use this documentation:

- Browse the categories in the sidebar or enter key terms in the search bar at the top right.
- Read the introduction for a primer if you're just getting started.
- Check out the glossary for clarification on any terms. You may also mouse over terms with a hatched underline to see a quick description.
- If you have read through the docs and still need help (or have an emergency) check out the guidelines on how to get help

Note

This documentation is intended to help make CloudPlatform self-service, without your needing to know too much about how the platform itself works. For knowledge sharing, and to better understand the platform, however, details about how things work are often provided to demystify some of the magic.

Help improve the documentation

This documentation site is powered by Jekyll, and the source code is on GitHub. If you have suggestions or find an error, then please see the README.

Documentation


Karan Thukral 9:01 AM
oncall cloud help
spy APP 9:01 AM
Currently on call for Cloud-Help:
Cloud help (primary): Until: 2018-02-13T22:00:00Z UTC
Cloud help (secondary):) Until: 2018-02-13T22:00:00Z UTC

Support



Teach

Challenges during our migration

- Giving up control over the infrastructure
- Learning curve from running mostly in DCs
- Migration of services took significant engineering effort
- Educating developers at Shopify about the platform

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TL;DR

- Build for the paved path but support other use cases
- Hide away the complexity
- Build the tool to be as self serve as possible
- Document everything
- Focus on teaching people and providing support

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Where are we headed?

Thanks!

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