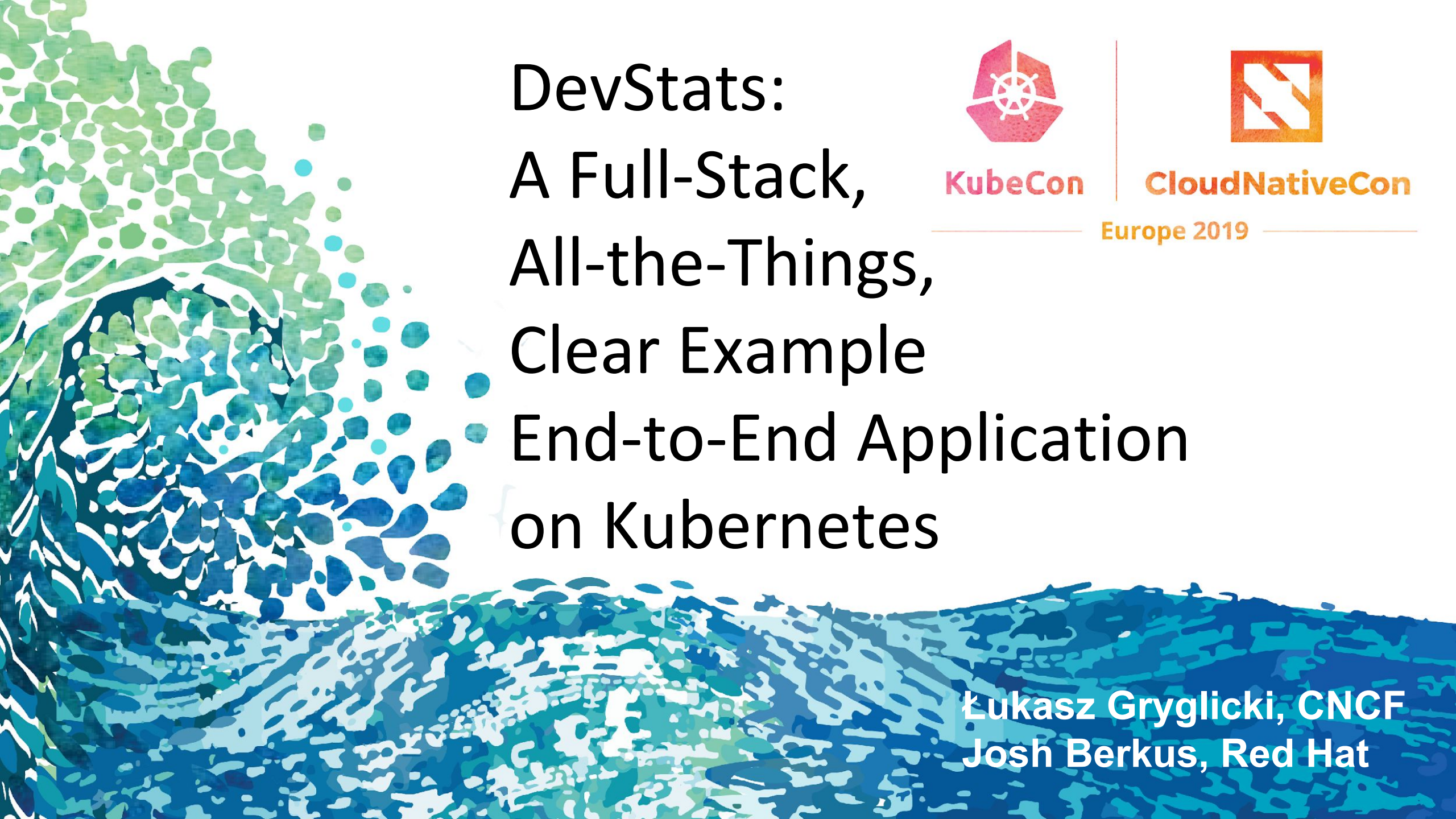


DevStats: A Full-Stack, All-the-Things, Clear Example End-to-End Application on Kubernetes

KubeCon | CloudNativeCon Europe 2019

Łukasz Gryglicki, CNCF
Josh Berkus, Red Hat

Who?

Łukasz Gryglicki
Developer for the CNCF
Primary author of
DevStats

Josh Berkus
Community Manager for
Red Hat
Contributor to
SIG-ContribEx and
Devstats

Where are all the good examples?

So, we decided to build a Kubernetes app using current practices and tools …

- *Deployment*
- *Configuration*
- *CI/CD*
- *Packaging (Helm)*
- UI
- Database
- Routing
- Jobs

Where are all the good examples?

- Guestbook
  - A couple replicasets
  - A secret
  - A couple services

Where are all the good examples?

- Guestbook
  - A couple replicasets
  - A secret
  - A couple services
  - no Ingress
  - non-persistent database
  - no Helm/Operator
  - no Jobs
  - no CI/CD
  - not current for 1.13
  - no SSL

What is Devstats?

1. A service that takes data from Git and Github and turns it into graphs reporting community activity.
2. A CNCF/LF project & service for all their supported projects and foundations.
3. And Now: an example Kubernetes application.

Instances, Projects, and Repos

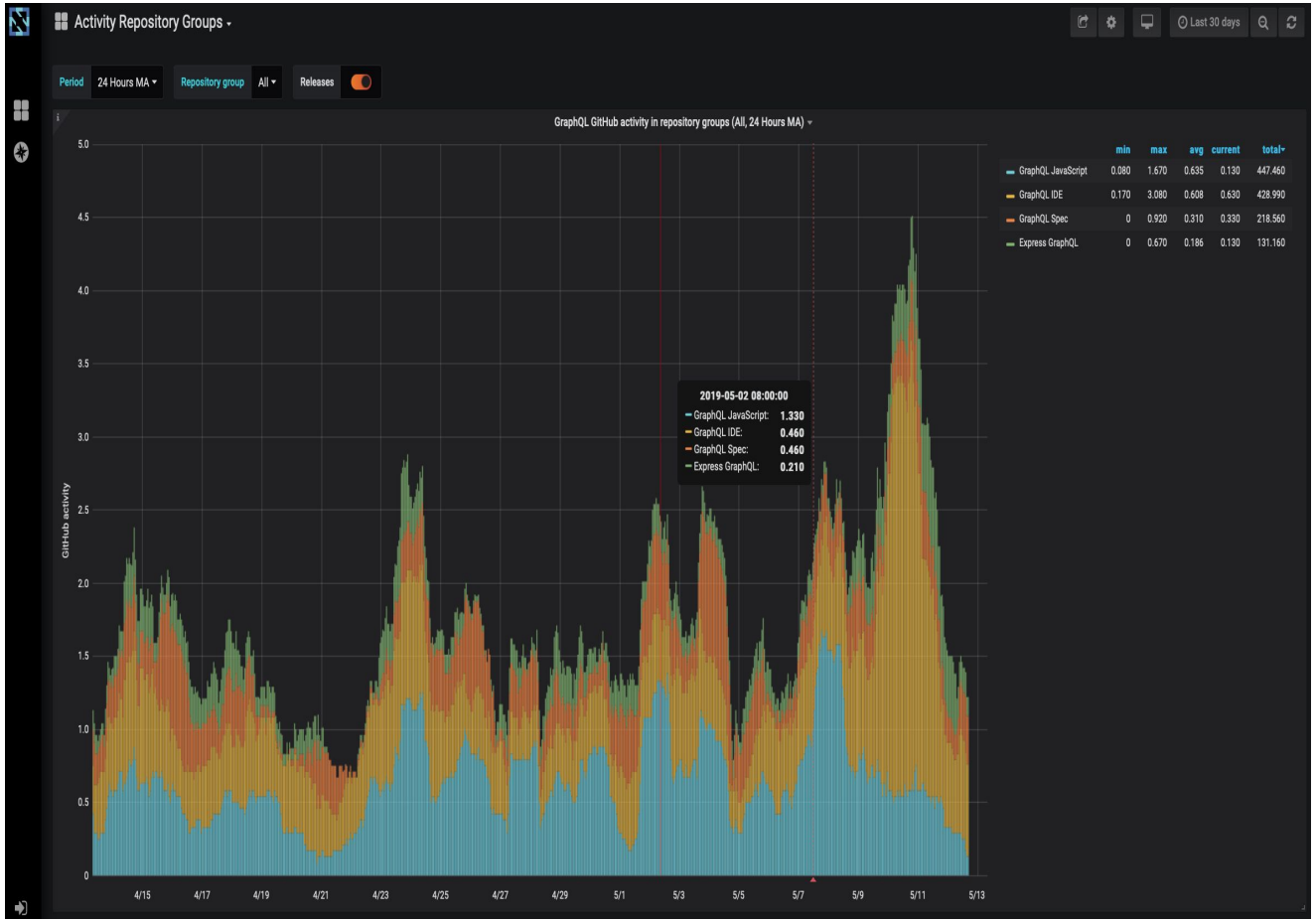
- Each Foundation has its own Instance of Devstats
- Foundations support multiple Projects that share a Devstats Instance;
- Each Project has one or more Github Repositories that are included in its stats.

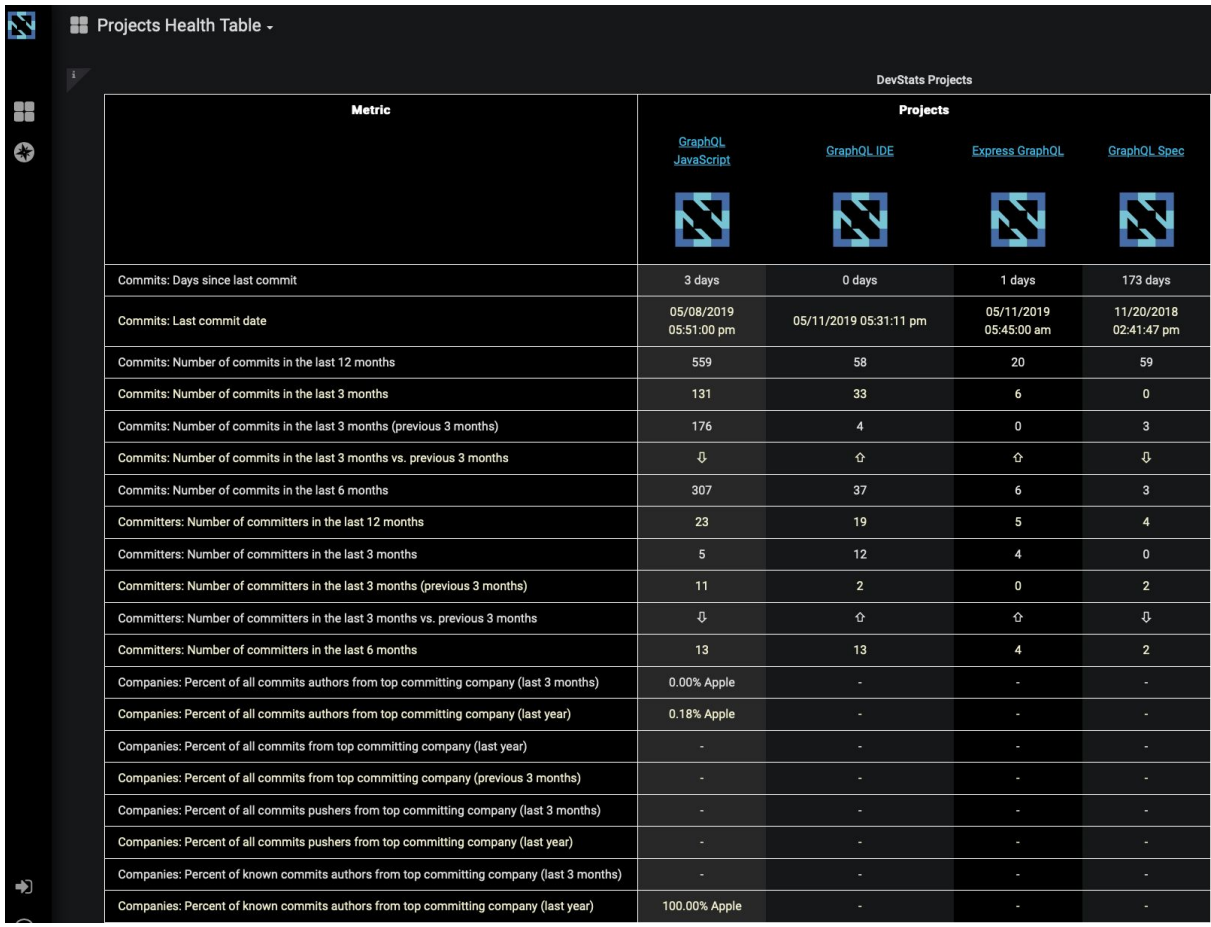
Moving to Microservices

Devstats Bare Metal

Fake photo of Mike’s inquiry here

Screenshot of GraphQL Foundation Devstats





Projects Health Table

DevStats Projects

Metric	Projects			
	GraphQL JavaScript	GraphQL IDE	Express GraphQL	GraphQL Spec
Commits: Days since last commit	3 days	0 days	1 days	173 days
Commits: Last commit date	05/08/2019 05:51:00 pm	05/11/2019 05:31:11 pm	05/11/2019 05:45:00 am	11/20/2018 02:41:47 pm
Commits: Number of commits in the last 12 months	559	58	20	59
Commits: Number of commits in the last 3 months	131	33	6	0
Commits: Number of commits in the last 3 months (previous 3 months)	176	4	0	3
Commits: Number of commits in the last 3 months vs. previous 3 months	⇩	⇧	⇧	⇩
Commits: Number of commits in the last 6 months	307	37	6	3
Committers: Number of committers in the last 12 months	23	19	5	4
Committers: Number of committers in the last 3 months	5	12	4	0
Committers: Number of committers in the last 3 months (previous 3 months)	11	2	0	2
Committers: Number of committers in the last 3 months vs. previous 3 months	⇩	⇧	⇧	⇩
Committers: Number of committers in the last 6 months	13	13	4	2
Companies: Percent of all commits authors from top committing company (last 3 months)	0.00% Apple	-	-	-
Companies: Percent of all commits authors from top committing company (last year)	0.18% Apple	-	-	-
Companies: Percent of all commits from top committing company (last year)	-	-	-	-
Companies: Percent of all commits from top committing company (previous 3 months)	-	-	-	-
Companies: Percent of all commits pushers from top committing company (last 3 months)	-	-	-	-
Companies: Percent of all commits pushers from top committing company (last year)	-	-	-	-
Companies: Percent of known commits authors from top committing company (last 3 months)	-	-	-	-
Companies: Percent of known commits authors from top committing company (last year)	100.00% Apple	-	-	-

EYODF

Moving to Microservices

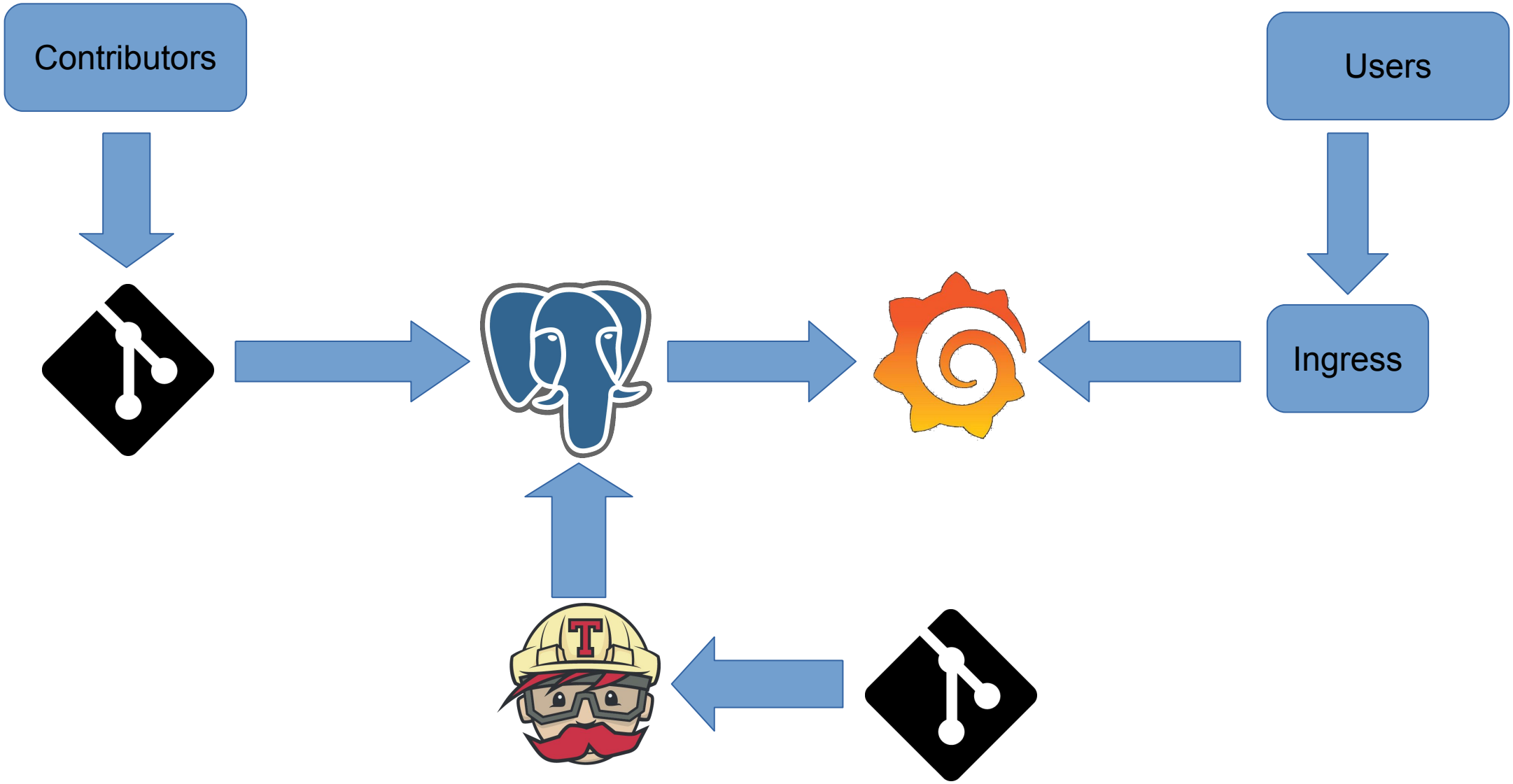
Architecture and Details

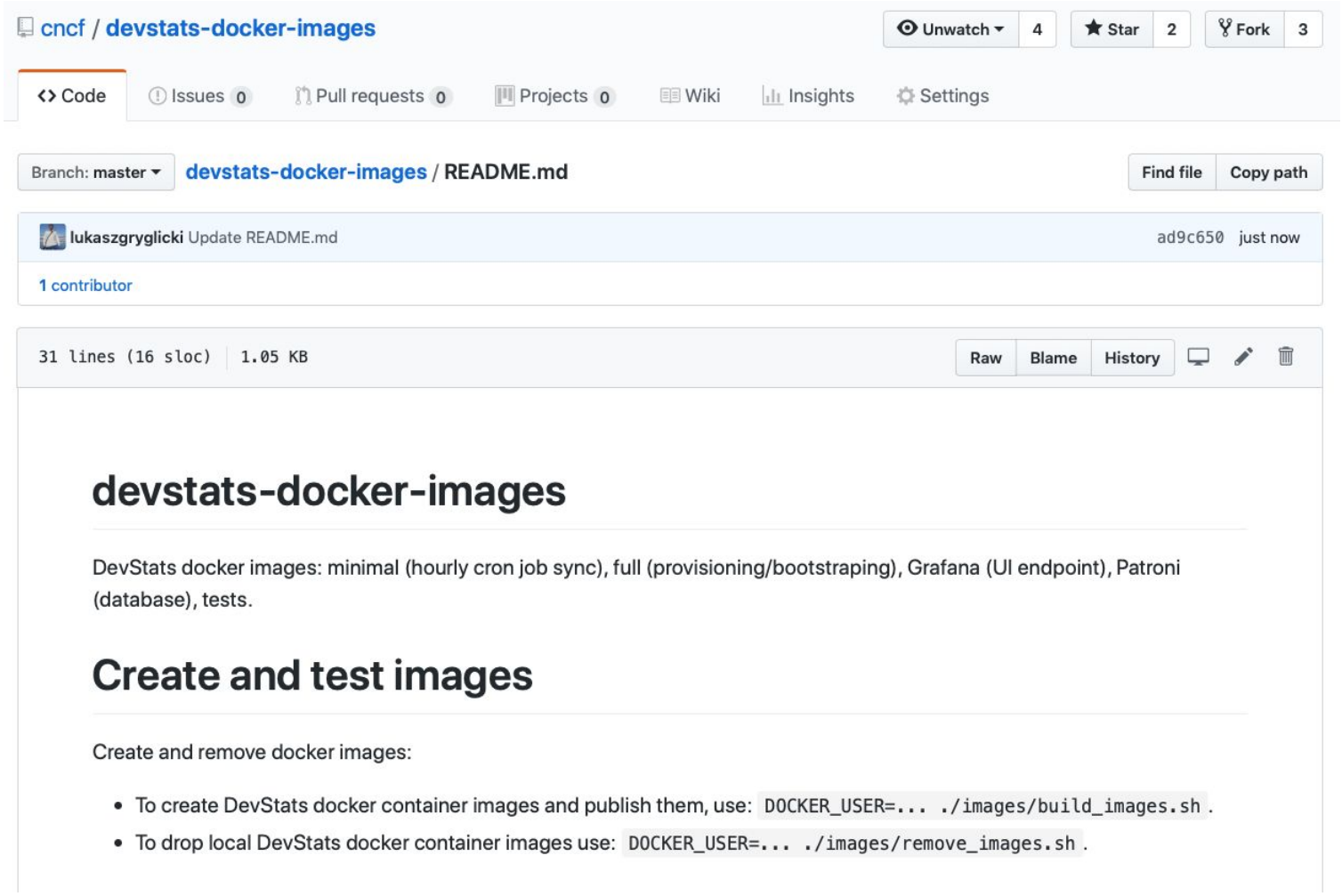
Kubernetes Components

- Ingress
- Services
- StatefulSet
- ReplicaSets
- Volumes
- CronJobs
- Secrets
- Certificates
- Helm
- Tests
- RBAC

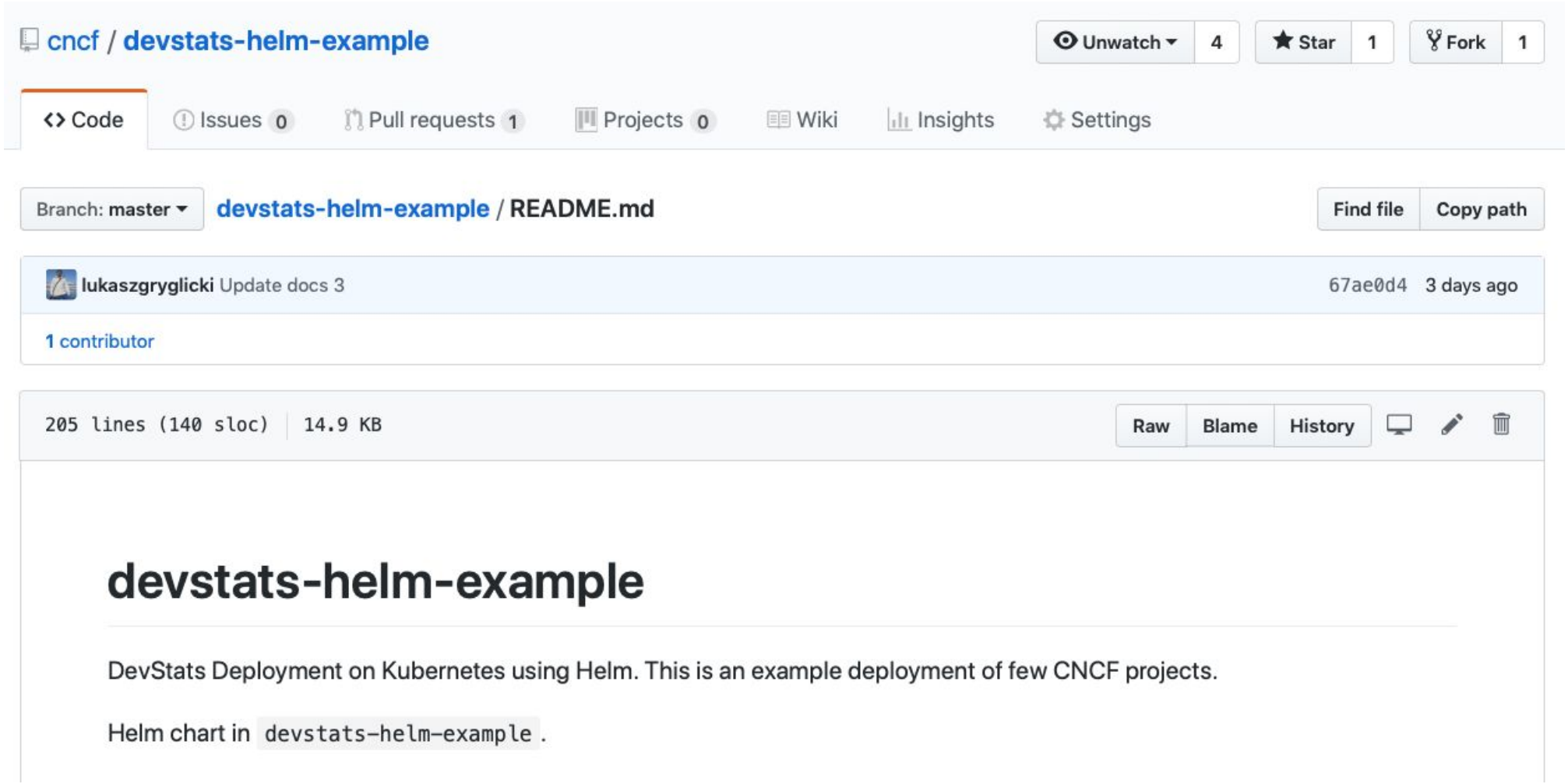
Technologies

- Ingress-ELB, Ingress Nginx
- AWS Cloud Provider
- Grafana
- Patroni Postgres HA
- Travis CI
- GitHub
- Docker Hub
- AWS
- LetsEncrypt

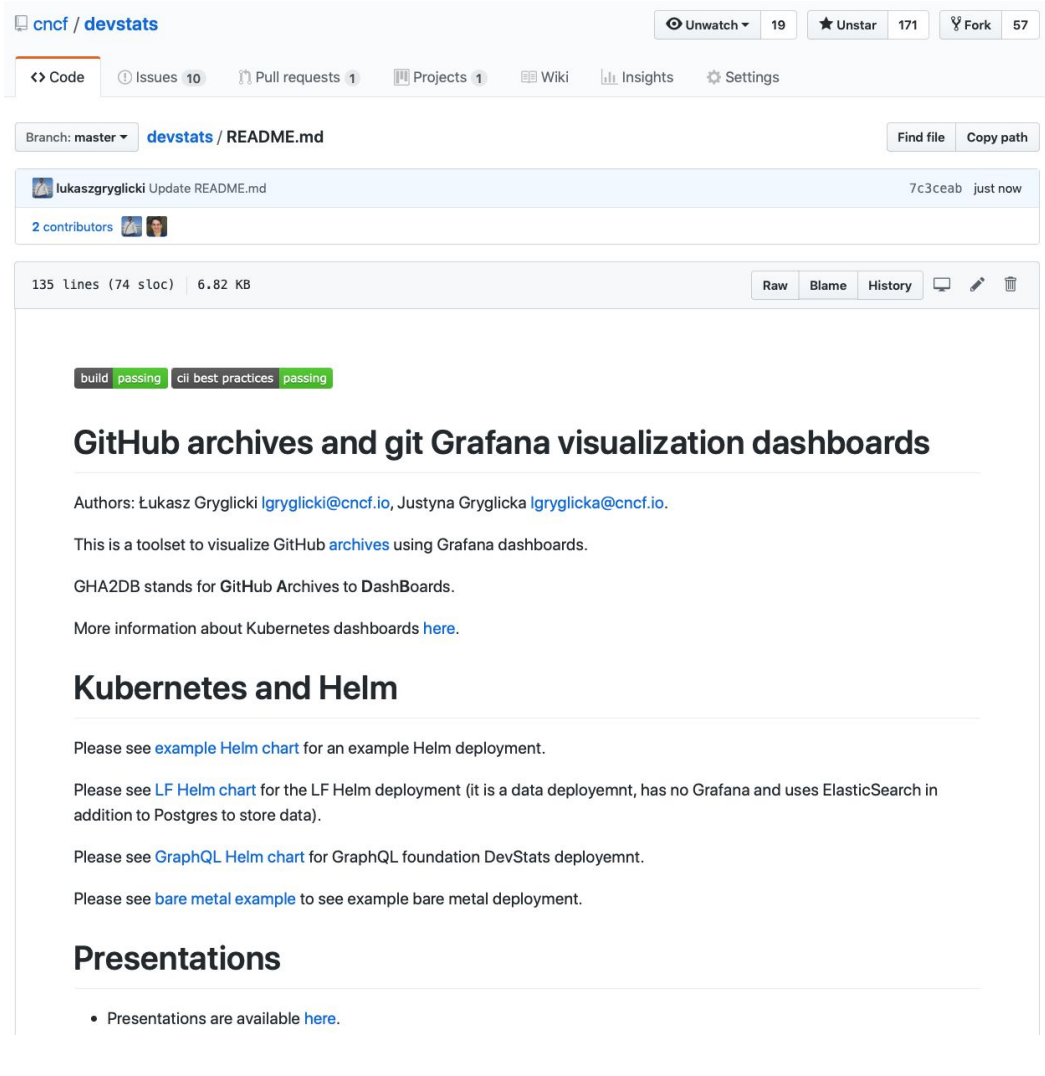

Contributors
Users
Ingress

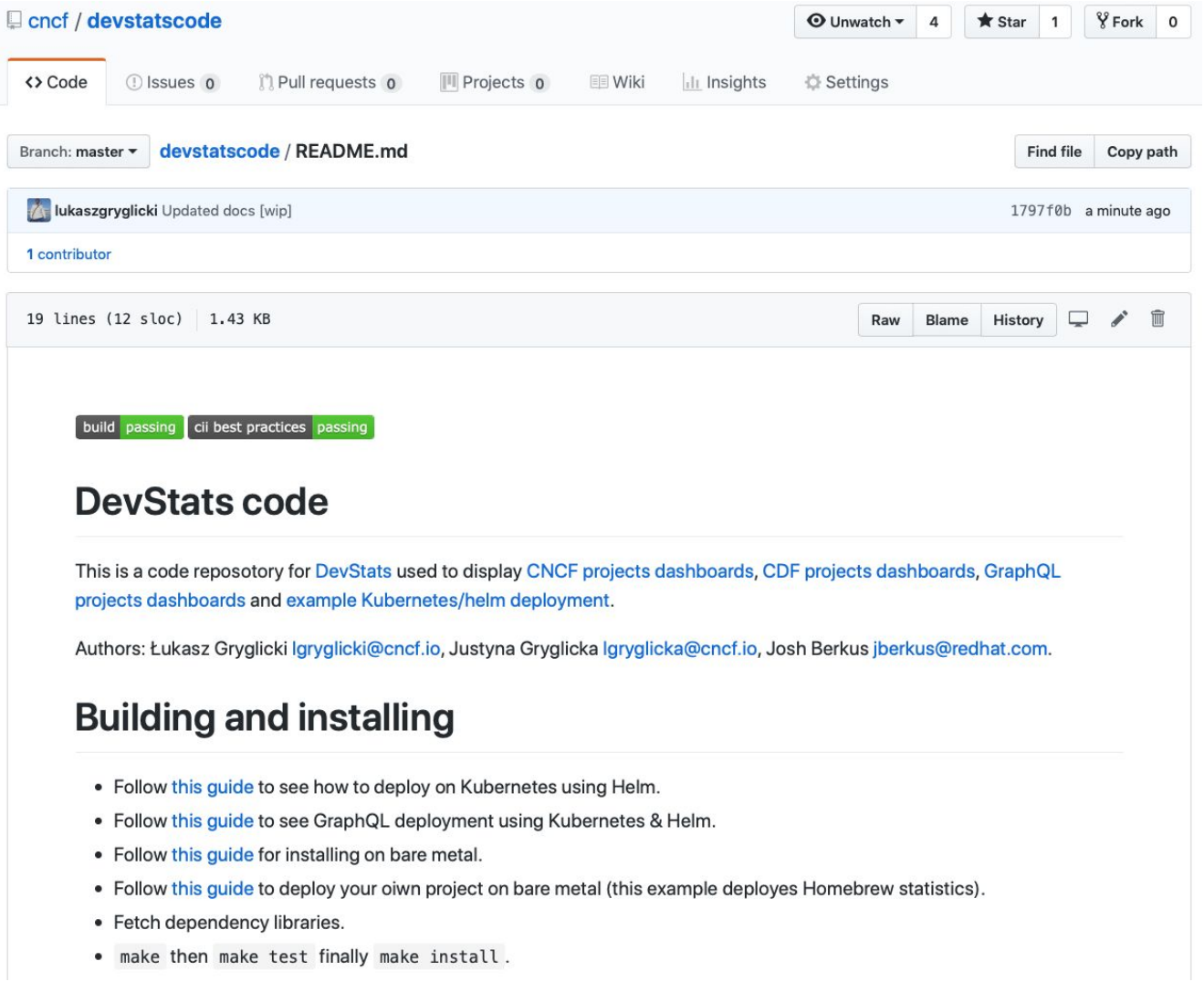


Containers Repo


cncf / devstats-helm-example
Unwatch 4
Star 1
Fork 1
Code
Issues 0
Pull requests 1
Projects 0
Wiki
Insights
Settings
Branch: master
devstats-helm-example / README.md
Find file
Copy path
lukaszgryglicki Update docs 3
67ae0d4 3 days ago
1 contributor
205 lines (140 sloc) 14.9 KB
Raw
Blame
History
devstats-helm-example
DevStats Deployment on Kubernetes using Helm. This is an example deployment of few CNCF projects.
Helm chart in devstats-helm-example .

Charts Repo





DevStats Repo

A bit complicated:

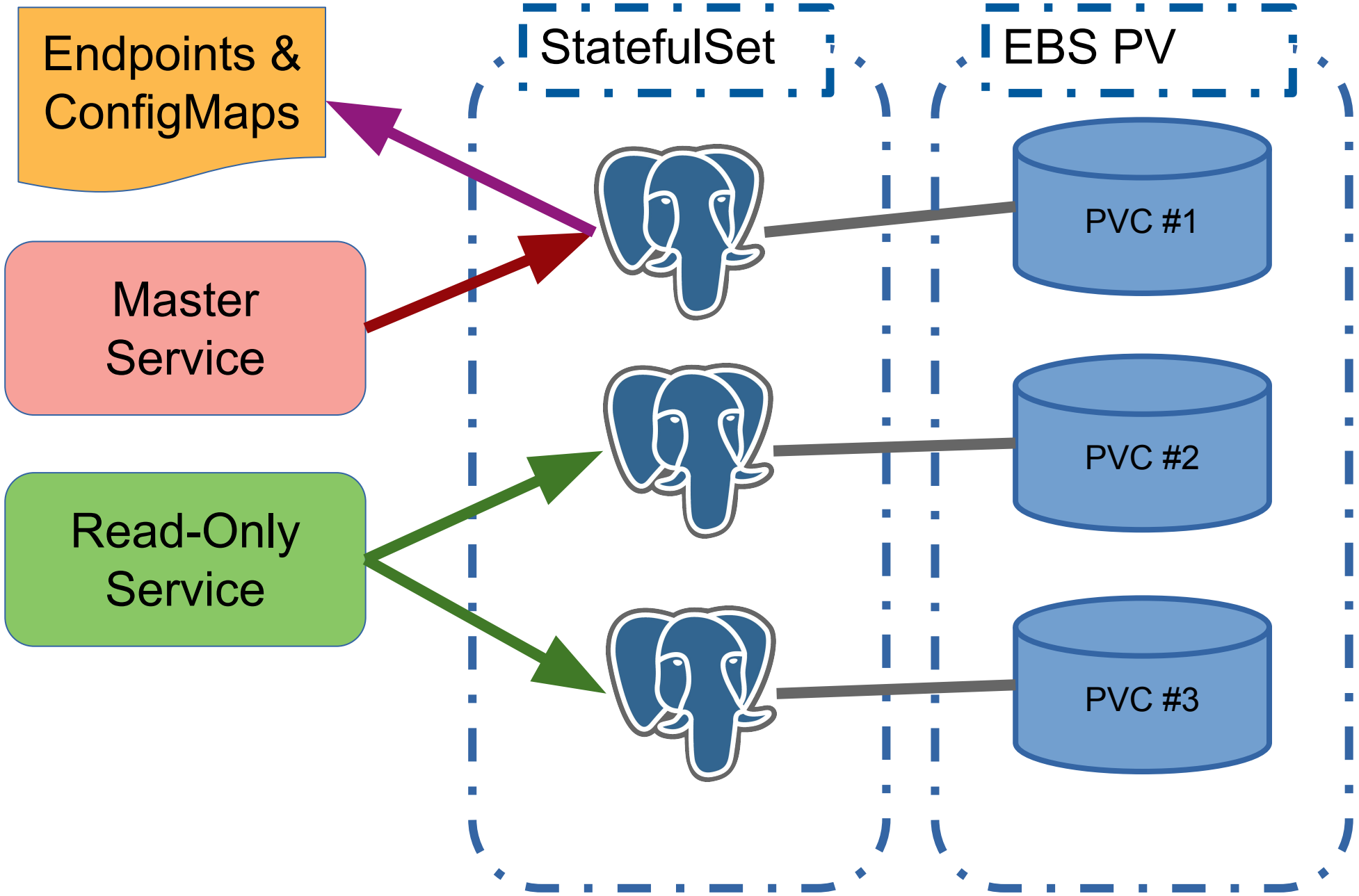
- variables to omit components (such as DB)
- loop for deploying variable numbers of projects

Maybe should use an operator

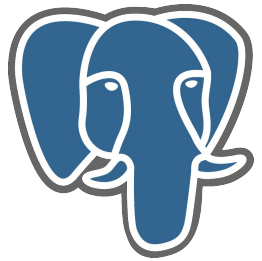
- Kubernetes 1.12
- Amazon EKS
  - Fully portable though
- Advantages:
  - Experience with AWS
  - Easy handling of storage, Ingress
- Move to bare metal?

3 Volumes

- 1 for provisioning
  - temporary
    - for **each** project git clones storage
- 1 for hourly sync, temporary
- 1 for Database nodes, permanent


Endpoints &
ConfigMaps
Master
Service
Read-Only
Service
StatefulSet
EBS PV
PVC #1
PVC #2
PVC #3

Storage: Postgres StatefulSet

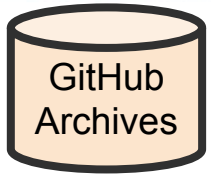


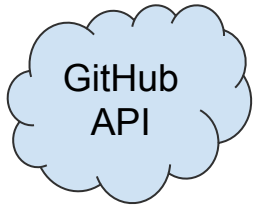
- StatefulSet
- Uses Patroni for automated HA
  - (current example includes Anti-Affinity to make sure each patroni pod runs on a different node)
- 1 database instance shared by all Projects
- Uses PVT

Storage: Postgres Dependencies

- RBAC
  - Patroni needs special roles to work HA magic
- Services
  - 1 Master Service for Read-Write
  - 1 general Service for Read-Only load balancing

How Data Gets Into the System





CronJobs: Updating Data

- One job per Project
- Pulls data from GitHub/Archives, API and from git
- Pushes data into Postgres
- Runs timeseries-building go programs

- One per hosted project
  - Use loop in Helm template to create sets
- Graph designs from Git
  - add a graph by _____

Secrets: Postgres and Graphana

- Secrets are loaded from Helm Charts
- Multiple DB connections

Accessing the App: Ingress

- Nginx Ingress provider
- LetsEncrypt service for certs
- Generates subdomain of “devstats-demo.net” per Project

Keeping It Updated: Travis CI

- Builds Code from Devstats Repos
- Builds Images from Images Repo
- Manual triggering required for deployment

Running In Production

Production Deployment Notes

- register a domain
- use ingress
  - with a cloud provider
- re-generate certificates
  - should attach to domain

Things Devstats Doesn’t Do (on purpose)

- Continuous deployment
- Archival DB backups
- Robust encrypted secrets

Future Plans

Further Development

- Documentation!
- Register the Helm chart
- Create an operator
- Argo CI/CD?

Further Development

Get more users and contributors!

Questions?

- DevStats Repos:
  - gh/cncf/devstats
  - gh/cncf/devstatscode
  - gh/cncf/devstats-helm-example
  - gh/cncf/devstats-docker-images
  - gh/cncf/devstats-kubernetes-dashboard
- #devstats on k8s.slack.com

- Lukasz:
  - lgryglicki@cncf.io
  - lukaszgryglicki@o2.pl
  - @lukaszgryglicki
- Josh:
  - jberkus@redhat.com
  - @fuzzychef