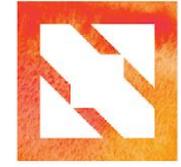


DevStats: A Full-Stack, All-the-Things, Clear Example End-to-End Application on Kubernetes



KubeCon



CloudNativeCon

Europe 2019

Lukasz Gryglicki, CNCF
Josh Berkus, Red Hat

Who?



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Łukasz Gryglicki
Developer for the CNCF
Primary author of
DevStats

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



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?



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- Guestbook

- A couple replicaset
- A secret
- A couple services



• Guestbook

- A couple replicaset
- 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.



- 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



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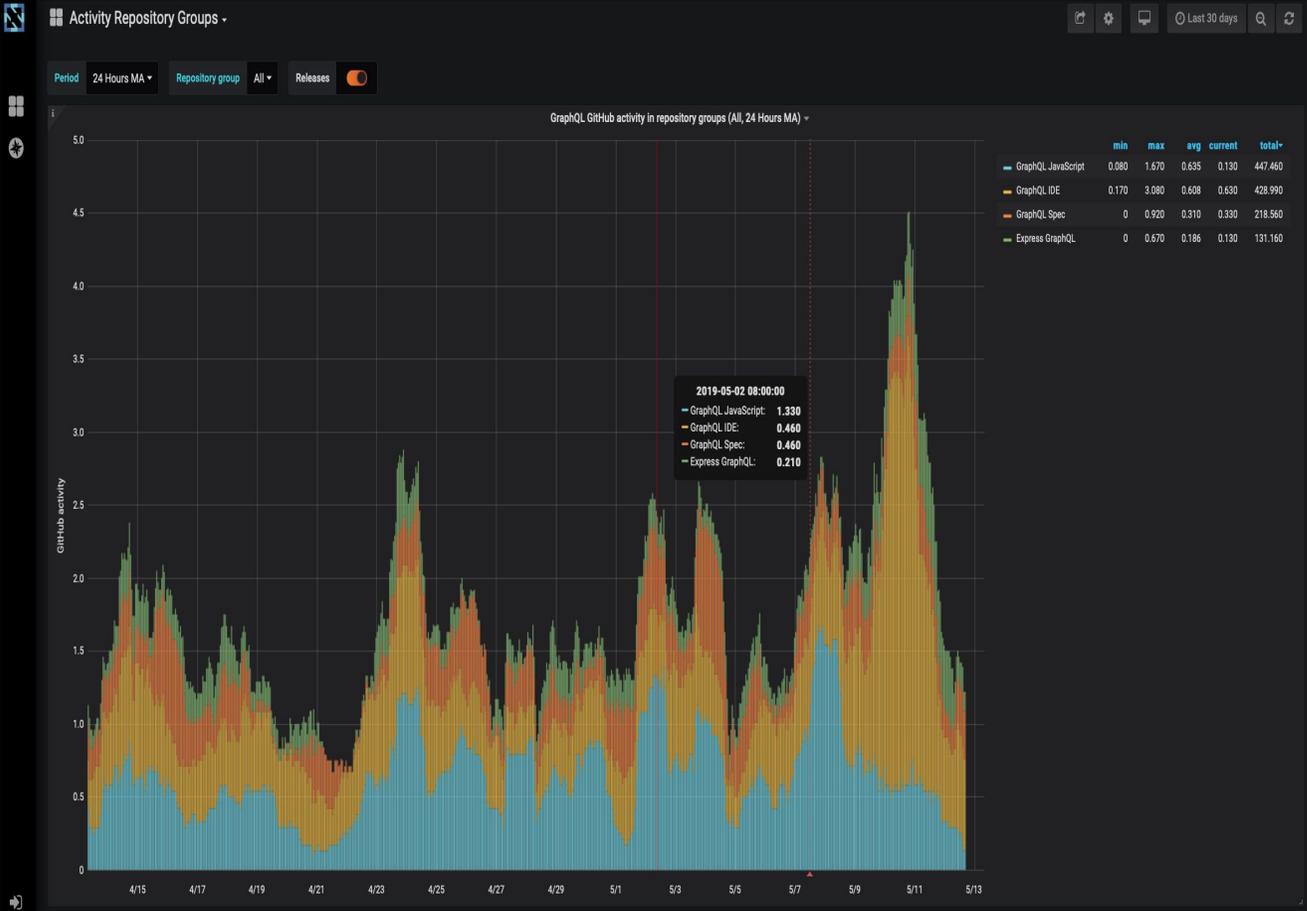


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Fake photo of Mike's inquiry here

Screenshot of GraphQL Foundation Devstats



Projects Health Table

DevStats Projects

Metric	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



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Architecture and Details



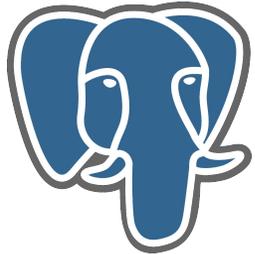
- Ingress
- Services
- StatefulSet
- ReplicaSets
- Volumes
- CronJobs
- Secrets
- Certificates
- Helm
- Tests
- RBAC



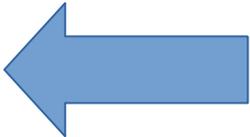
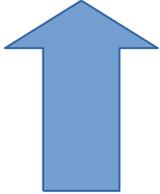
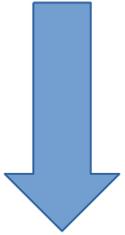
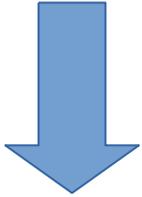
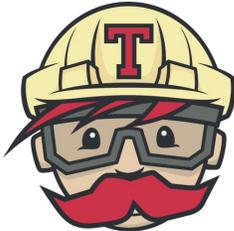
- Ingress-ELB, Ingress Nginx
- AWS Cloud Provider
- Grafana
- Patroni Postgres HA
- Travis CI
- GitHub
- Docker Hub
- AWS
- LetsEncrypt

Contributors

Users



Ingress



cncf / [devstats-docker-images](#) Unwatch 4 ★ Star 2 Fork 3

[Code](#) [Issues 0](#) [Pull requests 0](#) [Projects 0](#) [Wiki](#) [Insights](#) [Settings](#)

Branch: [master](#) [devstats-docker-images / README.md](#) Find file Copy path

 [lukaszgrylicki](#) Update README.md ad9c650 just now

[1 contributor](#)

31 lines (16 sloc) | 1.05 KB Raw Blame History   

devstats-docker-images

DevStats docker images: minimal (hourly cron job sync), full (provisioning/bootstrapping), Grafana (UI endpoint), Patroni (database), tests.

Create and test images

Create and remove docker images:

- To create DevStats docker container images and publish them, use: `DOCKER_USER=... ./images/build_images.sh`.
- To drop local DevStats docker container images use: `DOCKER_USER=... ./images/remove_images.sh`.

Containers Repo



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

Branch: master devstats / README.md

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lukaszgryglicki Update README.md 7c3ceab just now
2 contributors

135 lines (74 sloc) 6.82 KB

Raw Blame History

build passing ci best practices passing

GitHub archives and git Grafana visualization dashboards

Authors: Łukasz Gryglicki lgryglicki@cncf.io, Justyna Gryglicka lgryglicka@cncf.io.

This is a toolset to visualize GitHub [archives](#) using Grafana dashboards.

GHA2DB stands for GitHub Archives to DashBoards.

More information about Kubernetes dashboards [here](#).

Kubernetes and Helm

Please see [example Helm chart](#) for an example Helm deployment.

Please see [LF Helm chart](#) for the LF Helm deployment (it is a data deployment, has no Grafana and uses Elasticsearch in addition to Postgres to store data).

Please see [GraphQL Helm chart](#) for GraphQL foundation DevStats deployment.

Please see [bare metal example](#) to see example bare metal deployment.

Presentations

- Presentations are available [here](#).

Branch: master devstatscode / README.md

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lukaszgryglicki Updated docs [wip] 1797f0b a minute ago
1 contributor

19 lines (12 sloc) 1.43 KB

Raw Blame History

build passing ci best practices passing

DevStats code

This is a code repository for DevStats used to display [CNCF projects dashboards](#), [CDF projects dashboards](#), [GraphQL projects dashboards](#) and [example Kubernetes/helm deployment](#).

Authors: Łukasz Gryglicki lgryglicki@cncf.io, Justyna Gryglicka lgryglicka@cncf.io, Josh Berkus jberkus@redhat.com.

Building and installing

- Follow [this guide](#) to see how to deploy on Kubernetes using Helm.
- Follow [this guide](#) to see GraphQL deployment using Kubernetes & Helm.
- Follow [this guide](#) for installing on bare metal.
- Follow [this guide](#) to deploy your own project on bare metal (this example deploys Homebrew statistics).
- Fetch dependency libraries.
- `make` then `make test` finally `make install`.

DevStats Repo

A bit complicated:

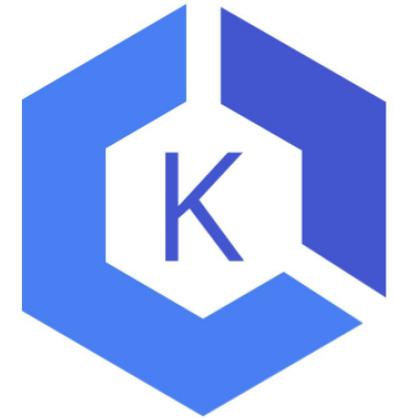
- variables to omit components (such as DB)
- loop for deploying variable numbers of projects

Maybe should use an operator





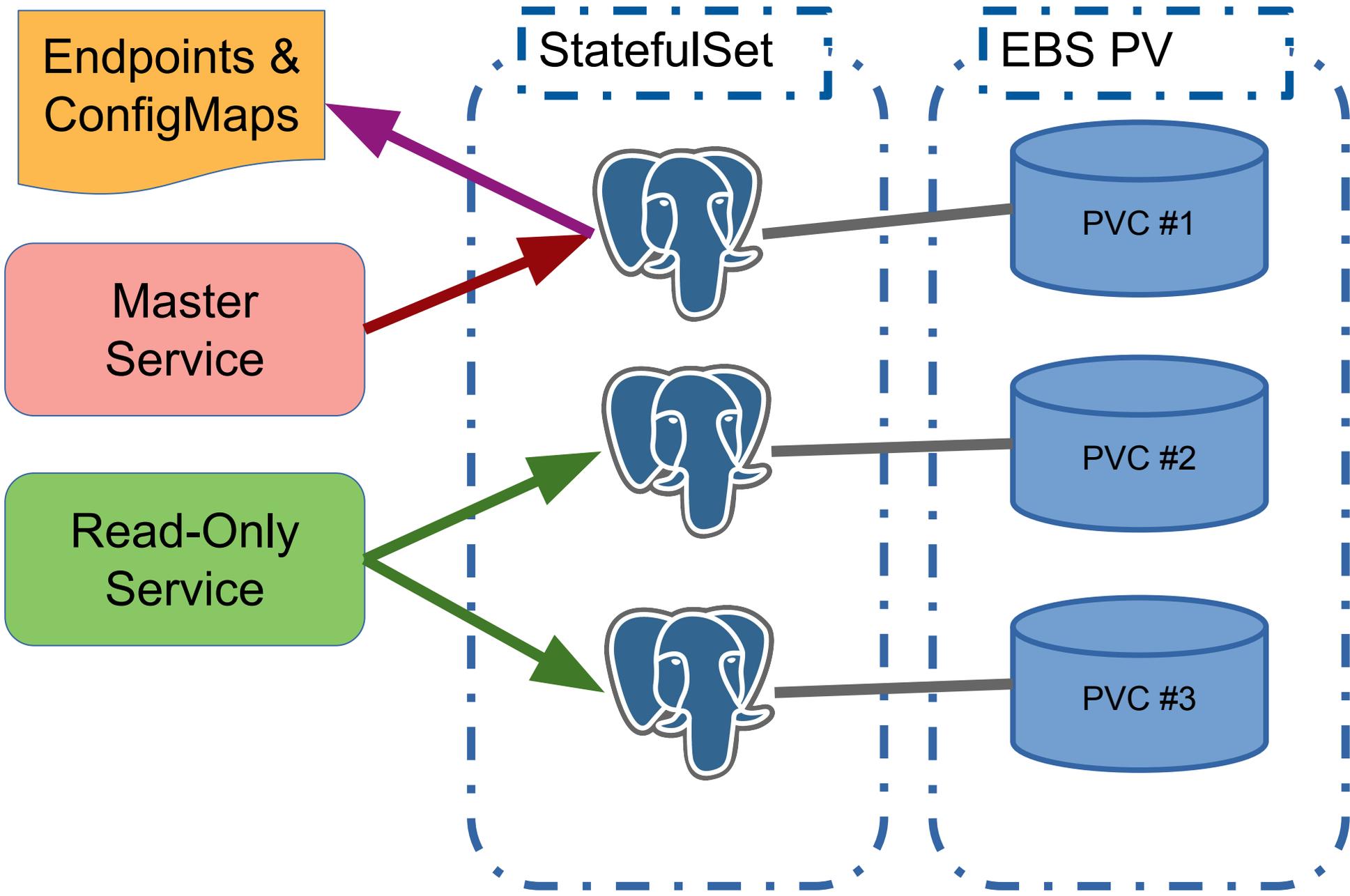
- Kubernetes 1.12
- Amazon EKS
 - Fully portable though
- Advantages:
 - Experience with AWS
 - Easy handling of storage, Ingress
- Move to bare metal?





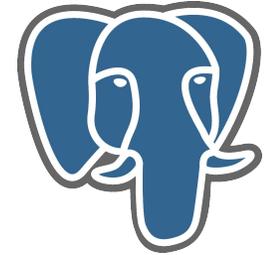
3 Volumes

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





- 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





- 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

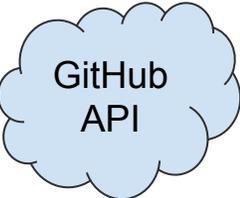


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- One job per Project
- Pulls data from GitHub/Archives, API and from git
- Pushes data into Postgres
- Runs timeseries-building go programs



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



- Secrets are loaded from Helm Charts
- Multiple DB connections



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



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

Running In Production



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

Things Devstats Doesn't Do (on purpose)



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- Continuous deployment
- Archival DB backups
- Robust encrypted secrets

Future Plans



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



Get more users and contributors!



- 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