Dive into

κυβερνήτης

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cat /etc/passwd

Andrii Soldatenko

- Python/Go Developer
- Speaker at many PyCons and open source contributor
- blogger at https://asoldatenko.com

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containers
microservices and
orchestrating the whole symphony

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How has app development changed?

Microservices

vs

Monolithic Architecture

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Microservices

- Modular
- Easy to deploy
- Scale independently

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Microservices Design Patterns

- Applies to any app

- Rapid deployment

- Continuos delivery

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Twelve-Factor Apps

- Codebase

- ...

- Dev/prod parity

- Dependencies

- Logs

https://12factor.net/

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JWT

RFC 7519

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Docker container

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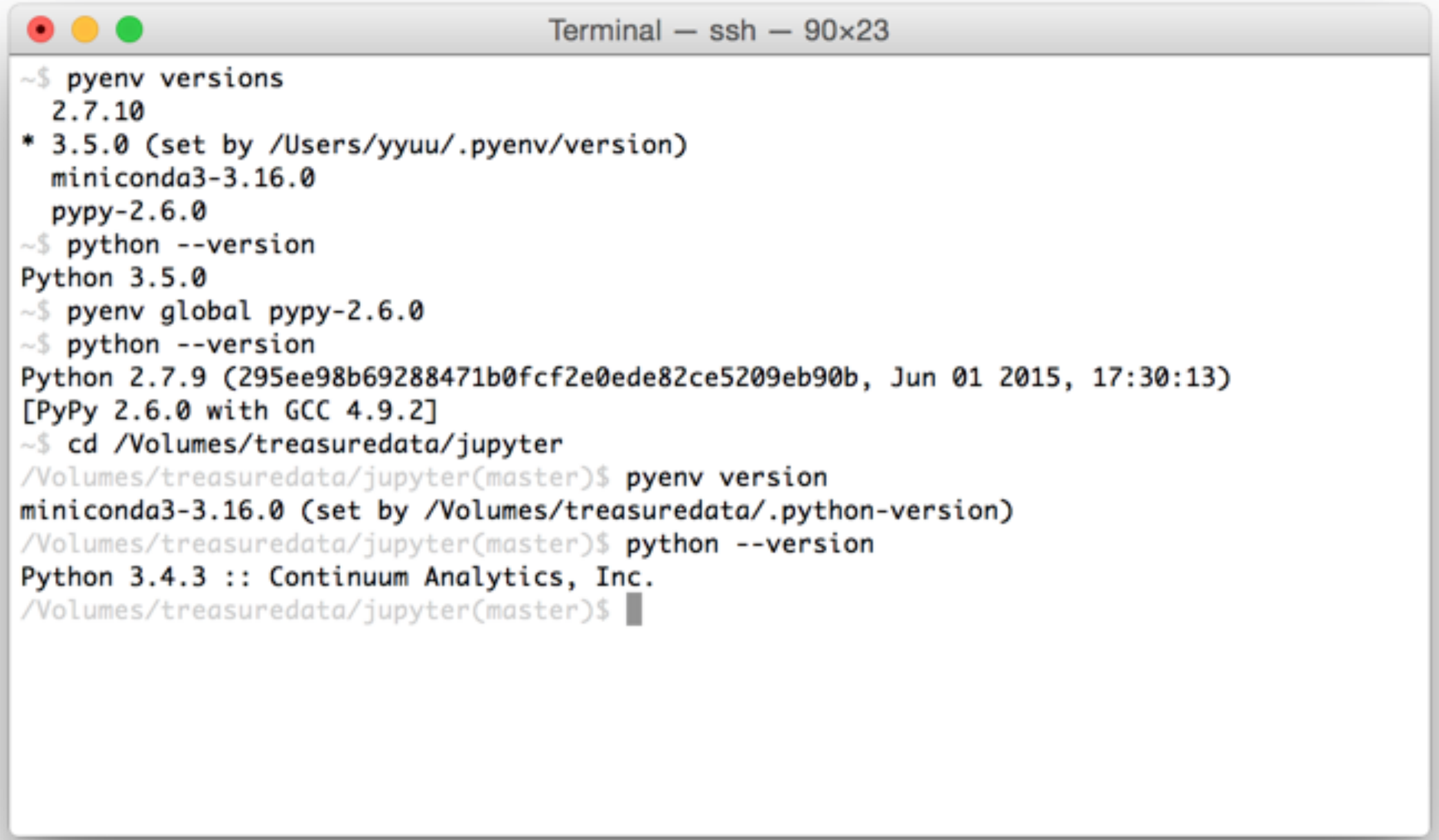
Why do we need docker?



Why do we need docker?

Dockerfile 717 Bytes

```
1  FROM python:3.6.2
```

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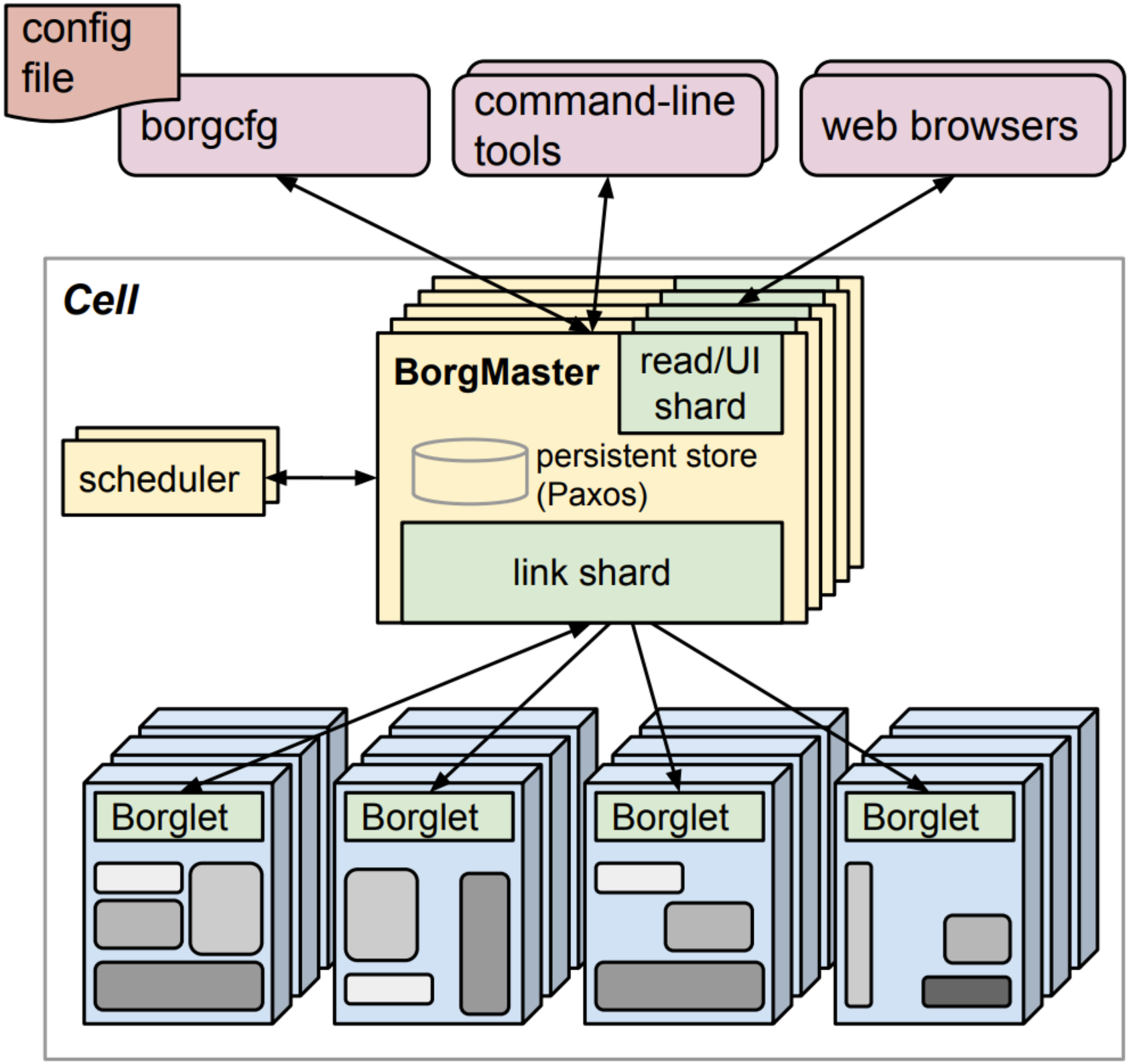

Borg

https://static.googleusercontent.com/media/research.google.com/en//pubs/archive/43438.pdf

What’s k8s?

- automating deployment
- scaling
- management of containerized applications

History?

Joe Beda

Brendan Burns

Craig McLuckie

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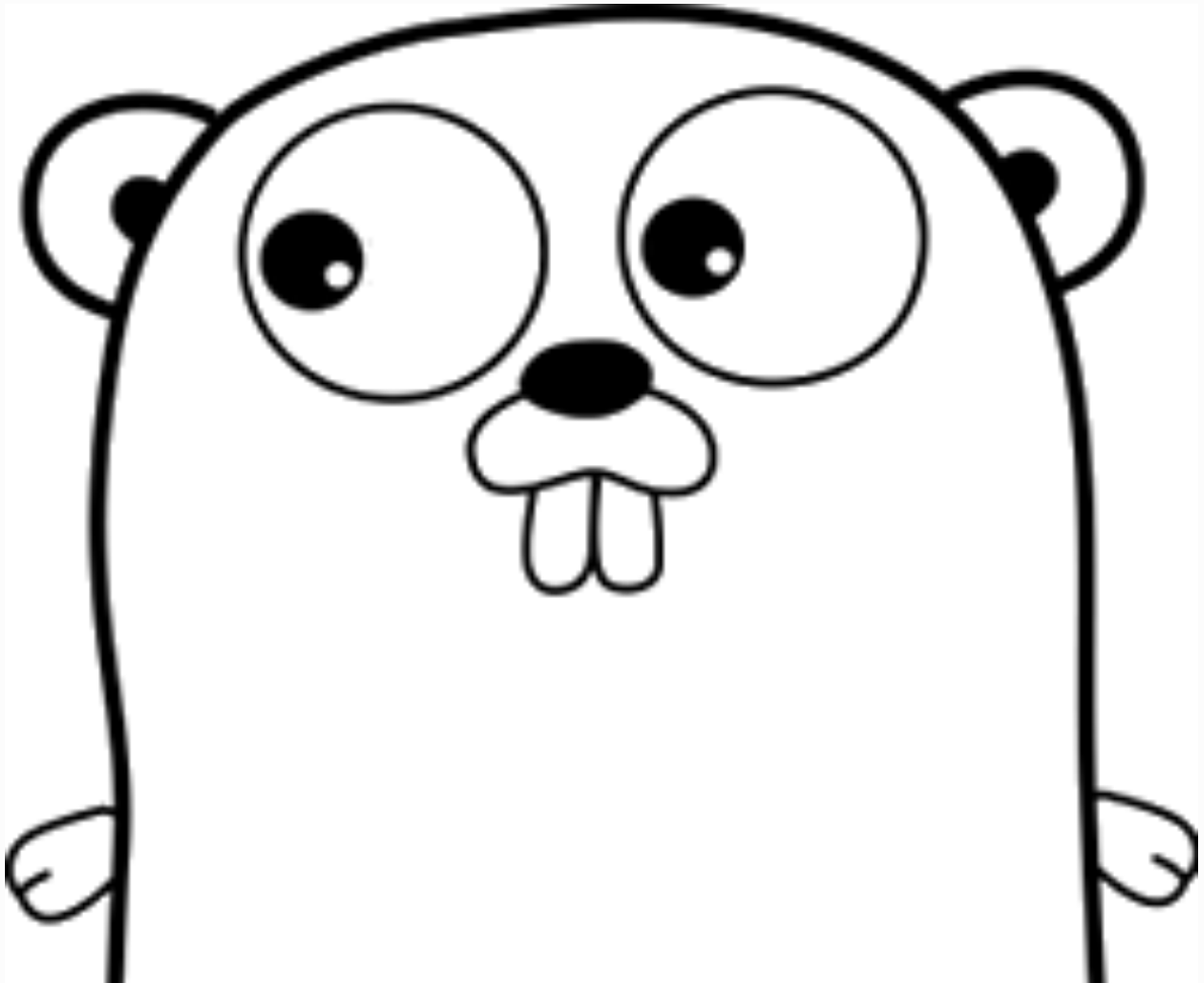
Written in Go



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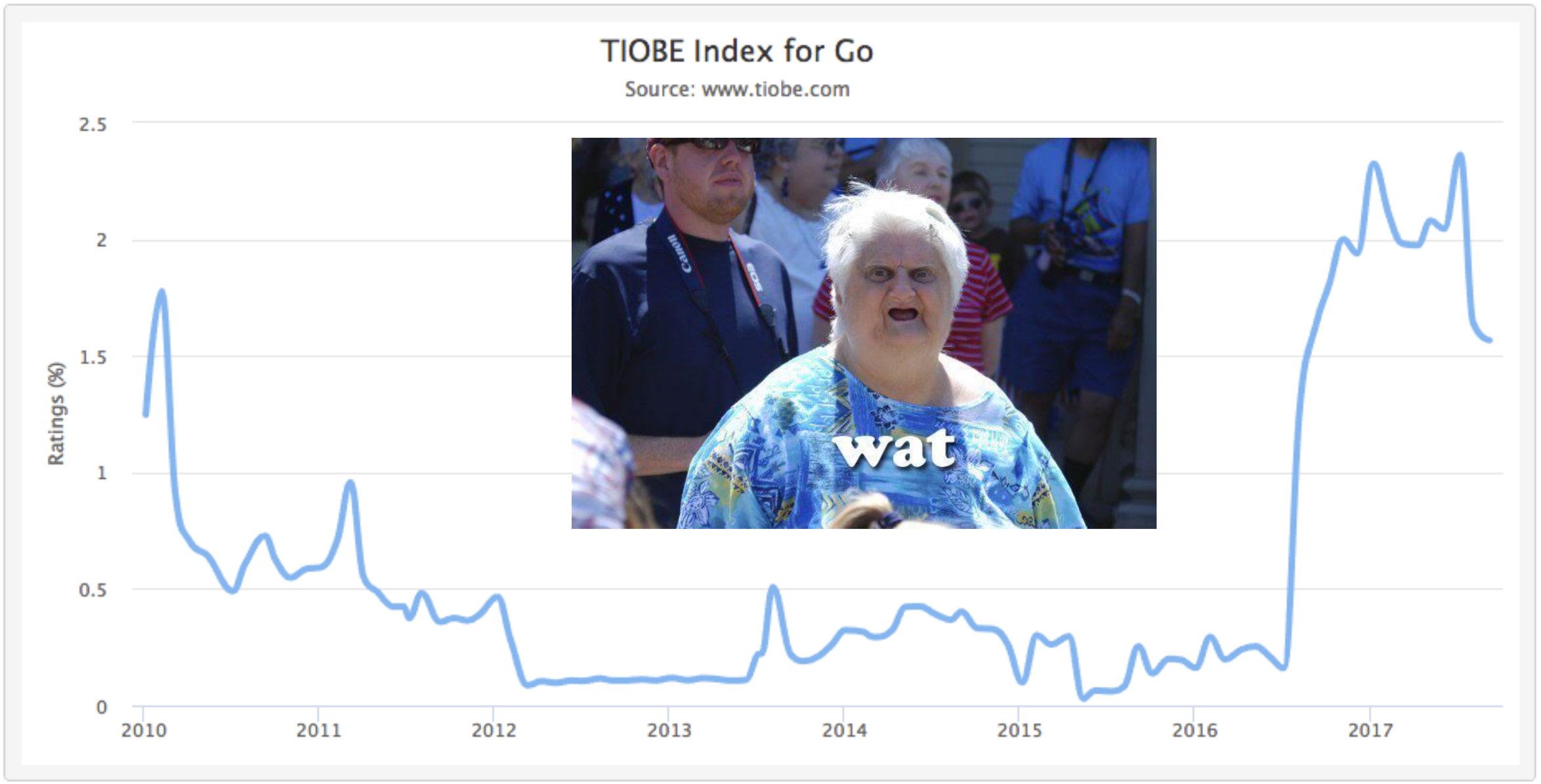
Language of the Year: 2016



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Exploring architecture

- Kubernets master
- Kubernetes nodes
- etcd (key-value store)
- overlay network

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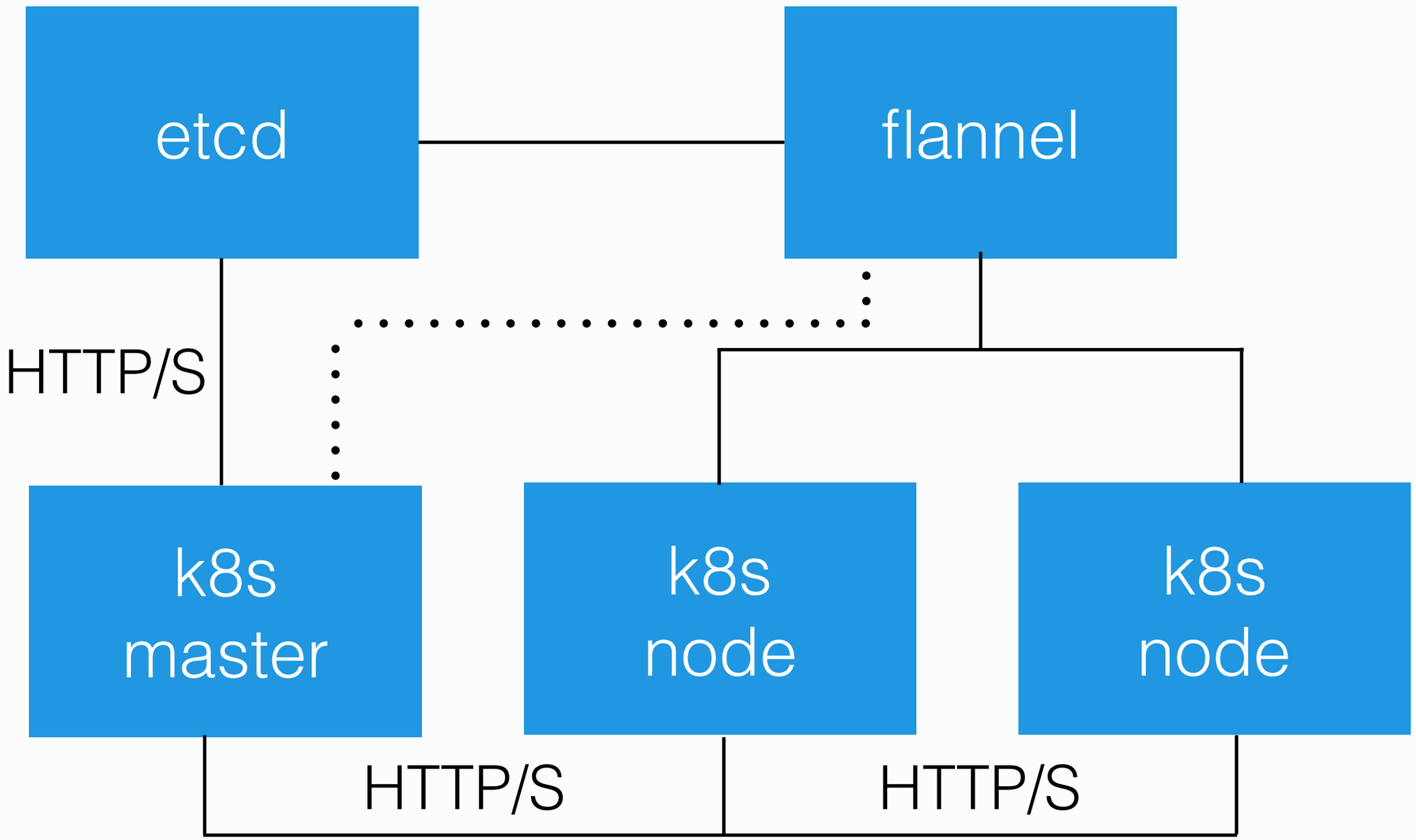
Exploring architecture



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Node or slave?

kubectl

```
➜ ✗ kubectl get componentstatuses
NAME                 STATUS    MESSAGE
controller-manager   Healthy   ok
scheduler            Healthy   ok
etcd-0               Healthy   {"health": "true"}
```

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kubectl

```
➜  ✗ kubectl get nodes
NAME       STATUS    AGE       VERSION
minikube   Ready     45d       v1.7.0
```

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kubectl

```
➜ ✗ kubectl run nginx --image=nginx
deployment "nginx" created
```

```
➜ ✗ kubectl get deployments
NAME           DESIRED   CURRENT   UP-TO-DATE
AVAILABLE   AGE
nginx          1         1         1            1           11m
```

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to access this UI

```
$ kubectl proxy
Starting to serve on 127.0.0.1:8001
```

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to access this UI

127.0.0.1:8001/api/v1/namespaces/kube-system/services/kubernetes-dashboard/proxy/#!/workload?namespace=default

kubernetes

Search

+ CREATE

Workloads

Cluster

- Namespaces
- Nodes
- Persistent Volumes
- Roles
- Storage Classes

Namespace

default

Workloads

- Daemon Sets
- Deployments
- Jobs
- Pods
- Replica Sets

Deployments

Name	Labels	Pods	Age	Images
nginx	run: nginx	1 / 1	20 minutes	nginx
my-first-nginx	run: my-first-nginx	2 / 2	4 hours	nginx
hello-minikube	run: hello-minikube	1 / 1	a month	gcr.io/google_containers/echos...

Pods

Name	Status	Restarts	Age
nginx-4217019353-5ldzf	Running	0	20 minutes
my-first-nginx-1678510070-9qr3c	Running	0	4 hours
my-first-nginx-1678510070-rrkpk	Running	0	4 hours
hello-minikube-180744149-tw653	Running	1	a month

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kubectl help

kubectl help command-name

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Pods in Kubernetes

Sometimes people see Pods and think,
“Aha! A WordPress container and a MySQL database container should be in the same Pod.”

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Creating a Pod Manifest

```
$ docker run -d --name nginx \
--publish 8080:8080 \
nginx
```

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Creating a Pod Manifest

```
apiVersion: v1
kind: Pod
metadata:
  name: nginx
spec:
  containers:
    - image: nginx
      name: nginx
      ports:
        - containerPort: 8080
          name: http
          protocol: TCP
```

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Running pods

```
$ kubectl apply -f nginx-pod.yaml
```

```
$ kubectl get pods
NAME      READY     STATUS    RESTARTS   AGE
nginx     1/1       Running   0          44s
```

Instead of Conclusions

How to run MySQL in k8s>

Instead of Conclusions

```
apiVersion: v1
kind: PersistentVolume
metadata:
  name: database
  labels:
    volume: my-volume
spec:
  capacity:
    storage: 1Gi
  ...
```

https://github.com/kubernetes-up-and-running/examples/blob/master/13-6-mysql-replicaset.yaml

Useful links

https://github.com/kubernetes/kubernetes/tree/master/examples/mysql-wordpress-pd

https://kubernetes.io/

https://github.com/kubernetes/kubernetes

Kubernetes: Up and Running by Brendan Burns, Kelsey Hightower, Joe Beda

Thank You

https://asoldatenko.com

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Questions

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