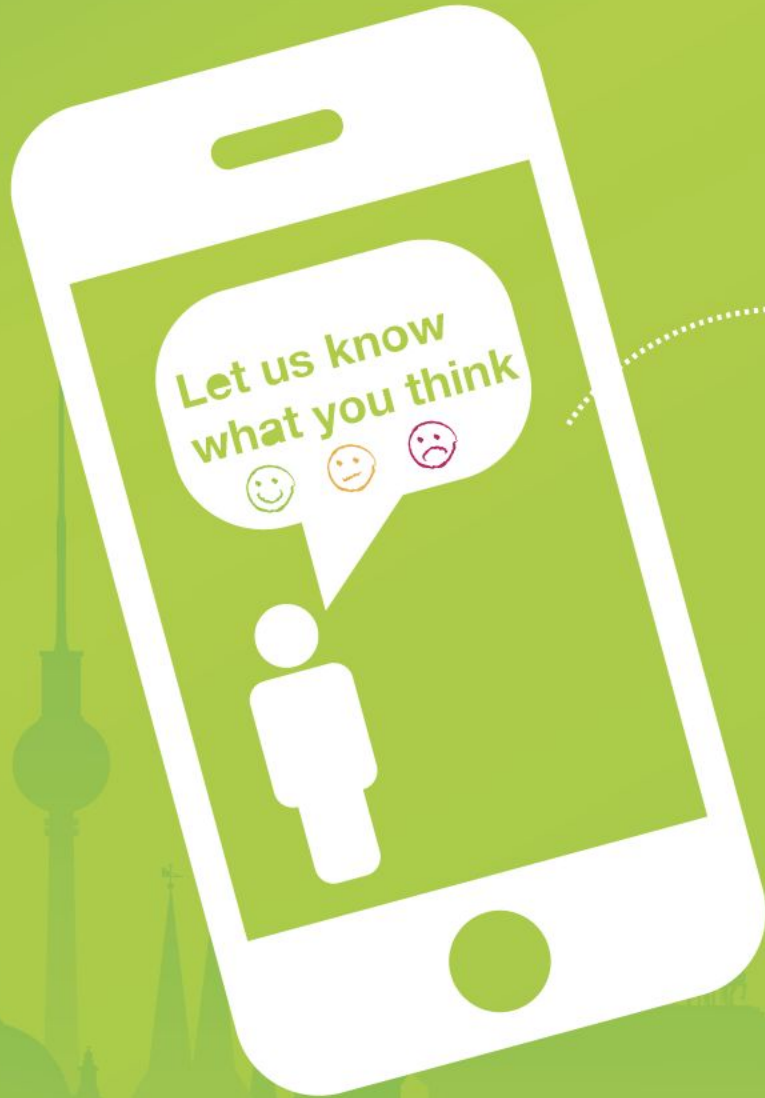


goto;

conference



**Click 'engage'
to rate sessions
and ask questions**

Kubernetes, Mesos, DCOS

Sergiusz Urbaniak, Stefan Schimanski

Who are we?

Engineers at: **Mesosphere**

Working on:

- Kubernetes-Mesos (Open Source & fully upstream)
- DCOS integration



James



Karl



Tyler



Stefan



Sergiusz

Who/What is Mesosphere?

The company behind:

- **Apache Mesos** (<https://mesos.apache.org/>)
A distributed systems kernel.
- **Marathon** (<https://mesosphere.github.io/marathon/>)
An Apache Mesos framework
for long-running applications.
- **Chronos** (<http://mesos.github.io/chronos/>)
A distributed cron replacement.

DCOS

(<https://mesosphere.com/>)

A data center operating system.

The challenge: Warehouse Computing



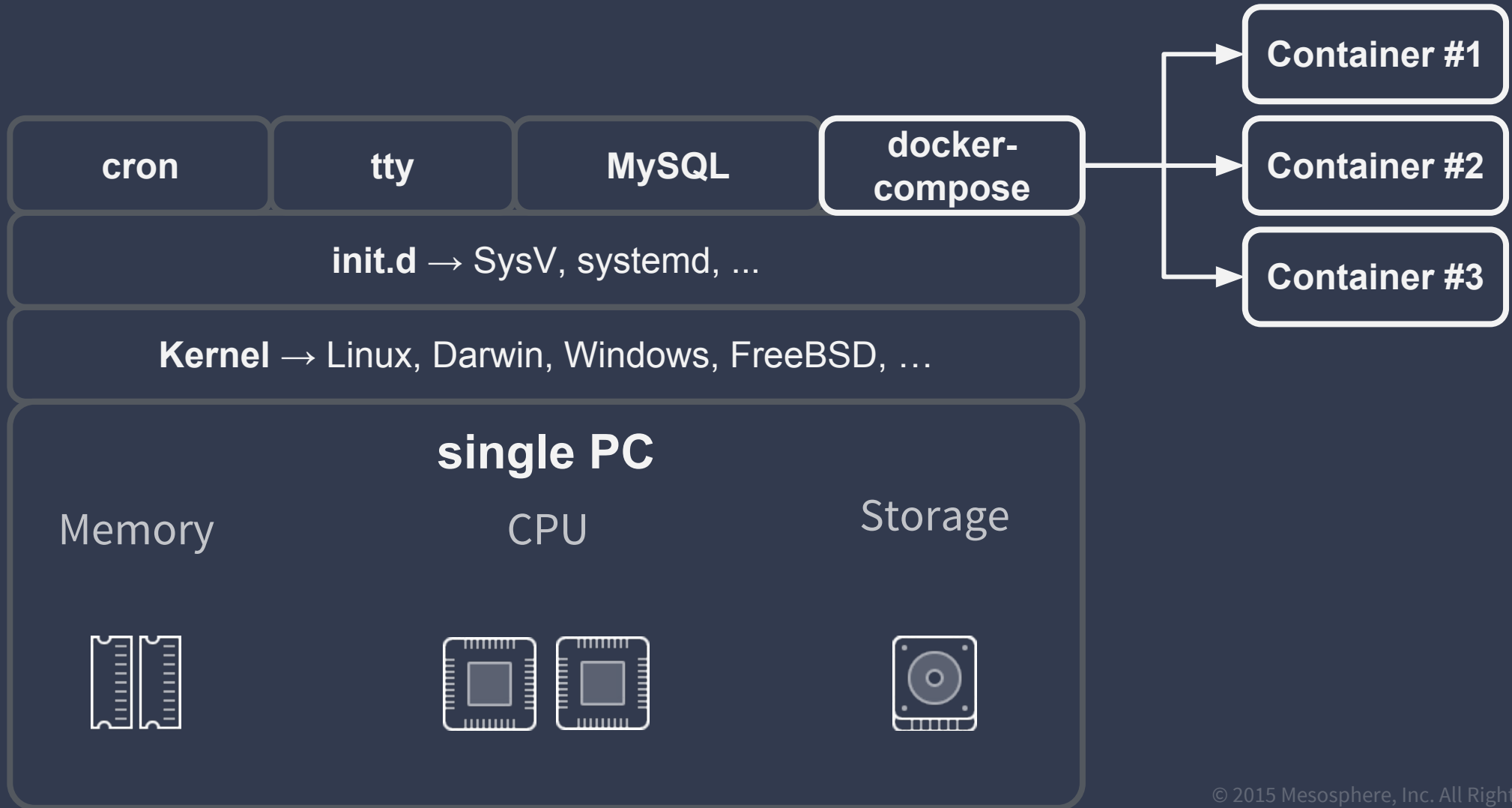
Source: <https://www.google.com/about/careers/teams/ops-support/data-center/>

The reality today: Static Partitioning

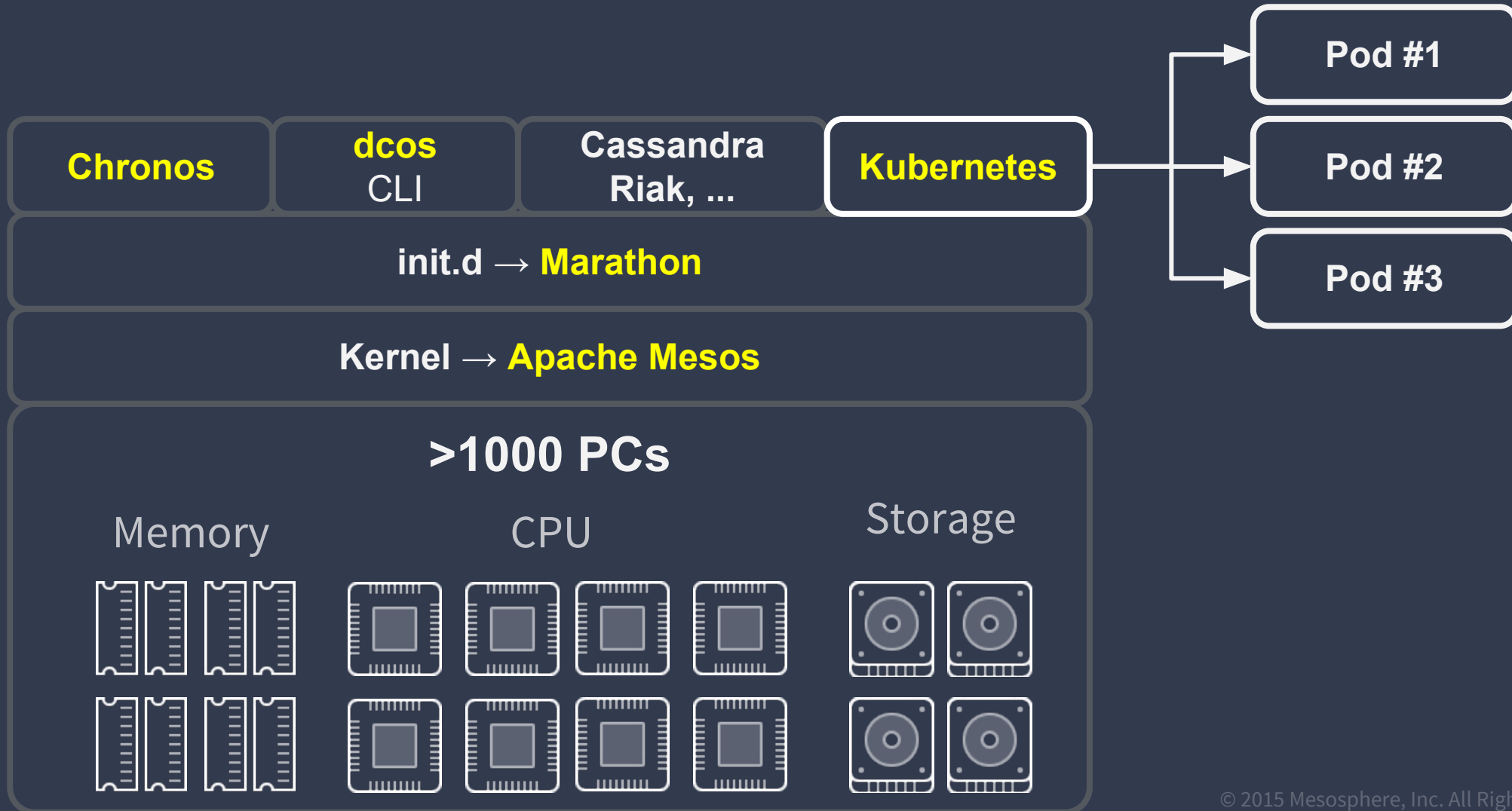


Source: https://commons.wikimedia.org/wiki/File:Cern_datacenter.jpg

Single Computer



DCOS - Data Center Operating System



Kubernetes - the Data Center Userland API

Pod

```
apiVersion: v1
kind: Pod
metadata:
  name: nginx
spec:
  containers:
  - name: nginx
    image: nginx
    ports:
    - containerPort: 80
```

Service

```
apiVersion: v1
kind: Service
metadata:
  name: nginx-service
spec:
  ports:
  - port: 8000
    targetPort: 80
    protocol: TCP
  selector:
    app: nginx
```

The challenge: Warehouse Computing



Source: <https://www.google.com/about/careers/teams/ops-support/data-center/>



karl-5h2yokd



Dashboard



Services



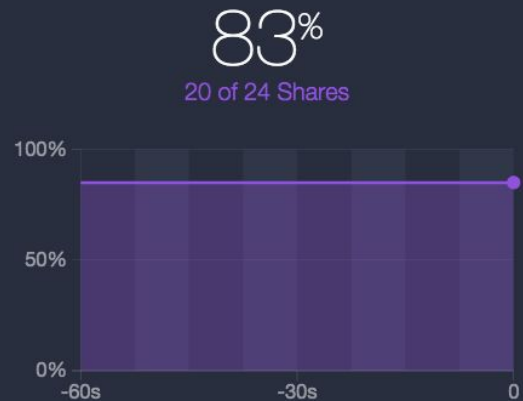
Nodes



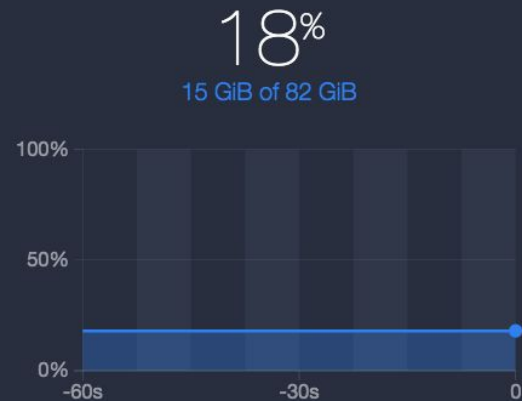
Mesosphere DCOS v.1.3

Dashboard

CPU Allocation



Memory Allocation



Task Failure Rate



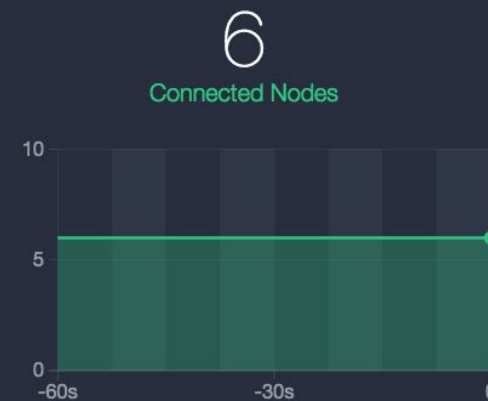
Services Health

kubernetes	Healthy
cassandra.dcos	Healthy
etcd	Healthy
marathon	Healthy

Tasks



Nodes



21 Nodes

Filter by Service ▾

List

Grid

Show Services by Share

● kubernetes

● cassandra.dcos

● hdfs

● marathon



Demo: Install Kubernetes on DCOS

nginx.yml:

apiVersion: v1

kind: Pod

metadata:

name: nginx

spec:

containers:

- name: nginx

image: nginx

ports:

- containerPort: 80

```
$ dcos package install kubernetes
```

```
$ dcos kubectl create -f nginx.yml  
pods/nginx
```

```
$ dcos kubectl get pods
```

NAME	READY	STATUS	RESTARTS	AGE
nginx	1/1	Running	0	1m



The Stack



Kubernetes by Google
- Great for backend developers



DCOS by Mesosphere
- Great for datacenter operators



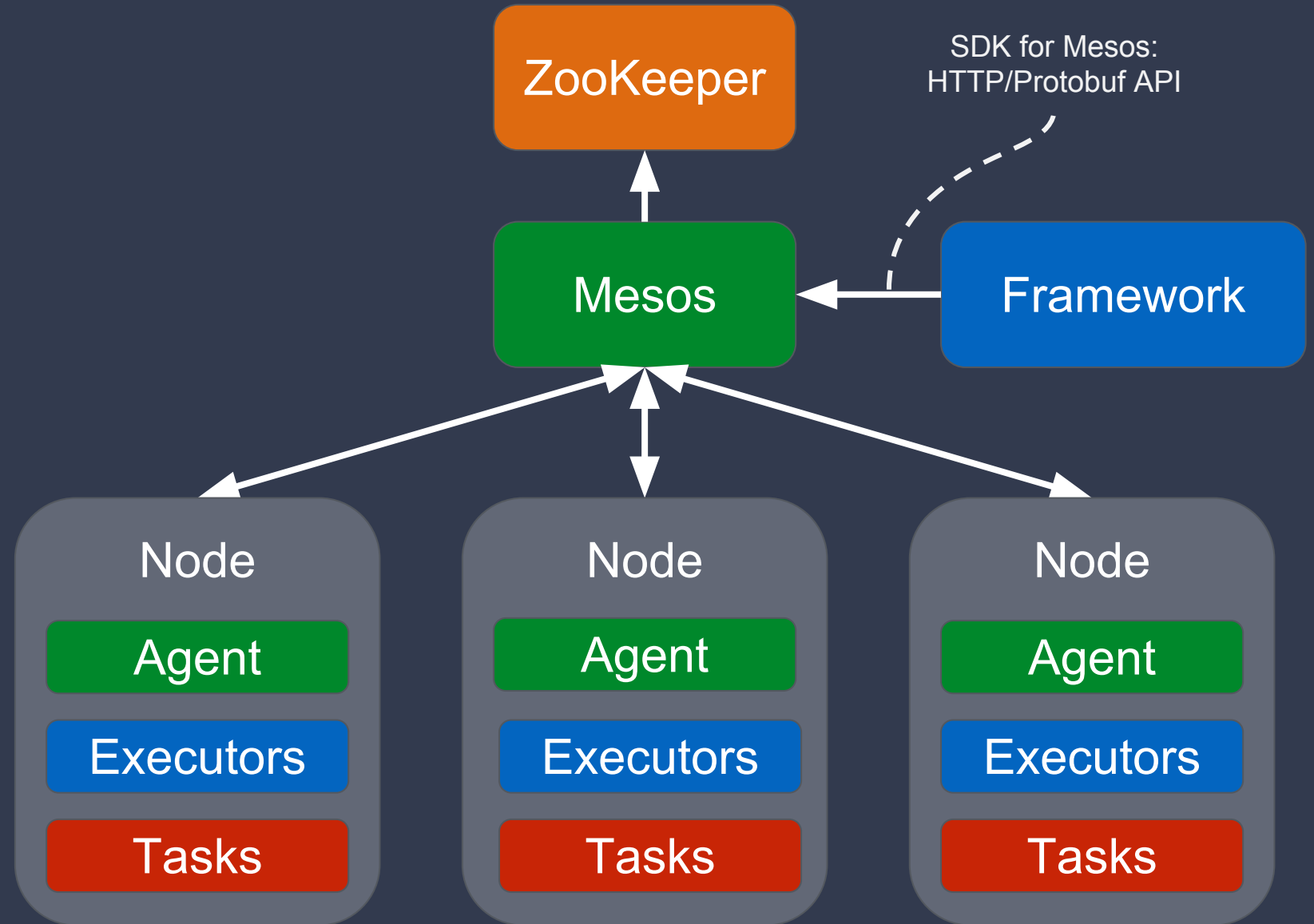
Mesos by Apache
- Great for low-level framework developers

Mesos

Datacenter Kernel

- Cluster Resource Management
- Scheduling
- Process Isolation
- Task/Container Execution

Mesos Architecture

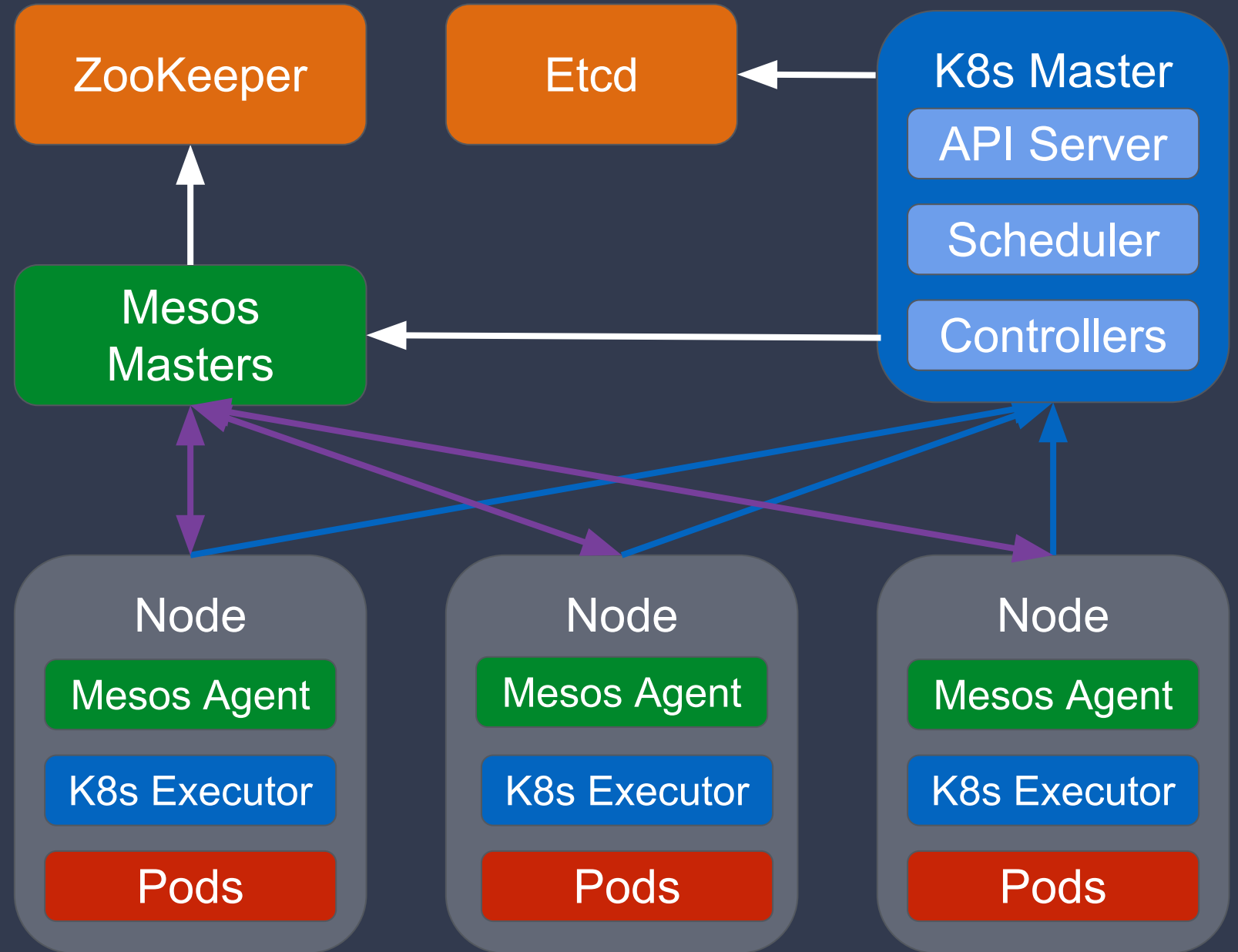


Kubernetes

Userland API and System Services

- High Level Application Abstractions
- Cluster Containers Orchestration

Kubernetes on Mesos Architecture



Behind the scenes ...



```
$ dcos kubectl get pods
```

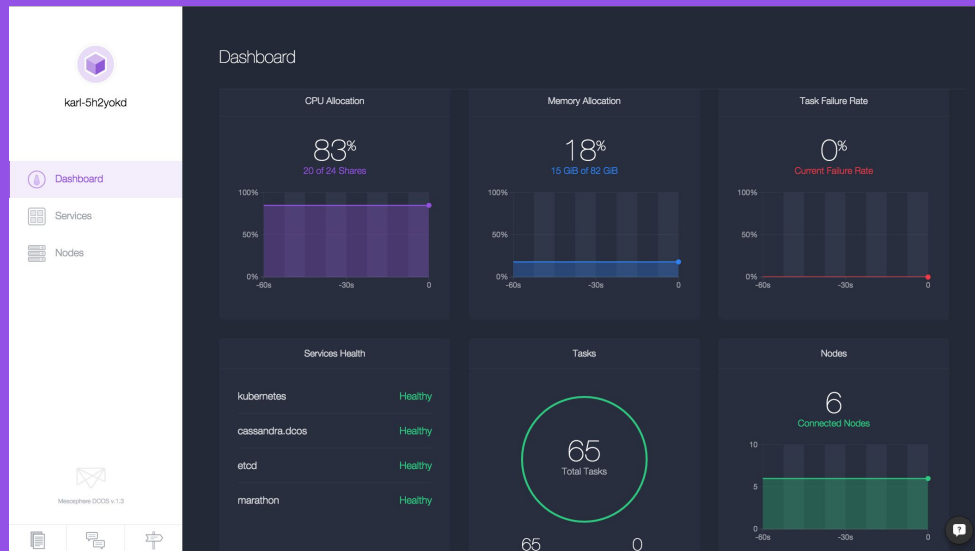
NAME	READY	STATUS	RESTARTS
nginx	1/1	Running	0

```
GET /service/kubernetes/api/v1/pods
```

```
{
  "kind": "List",
  "apiVersion": "v1",
  "metadata": {},
  "items": [
    {
      "kind": "Pod",
      "apiVersion": "v1",
      "metadata": {
        "name": "kube-dns-v9-ejq02",
        "generateName": "kube-dns-v9-",
        ...
      }
    }
  ]
}
```

DCOS

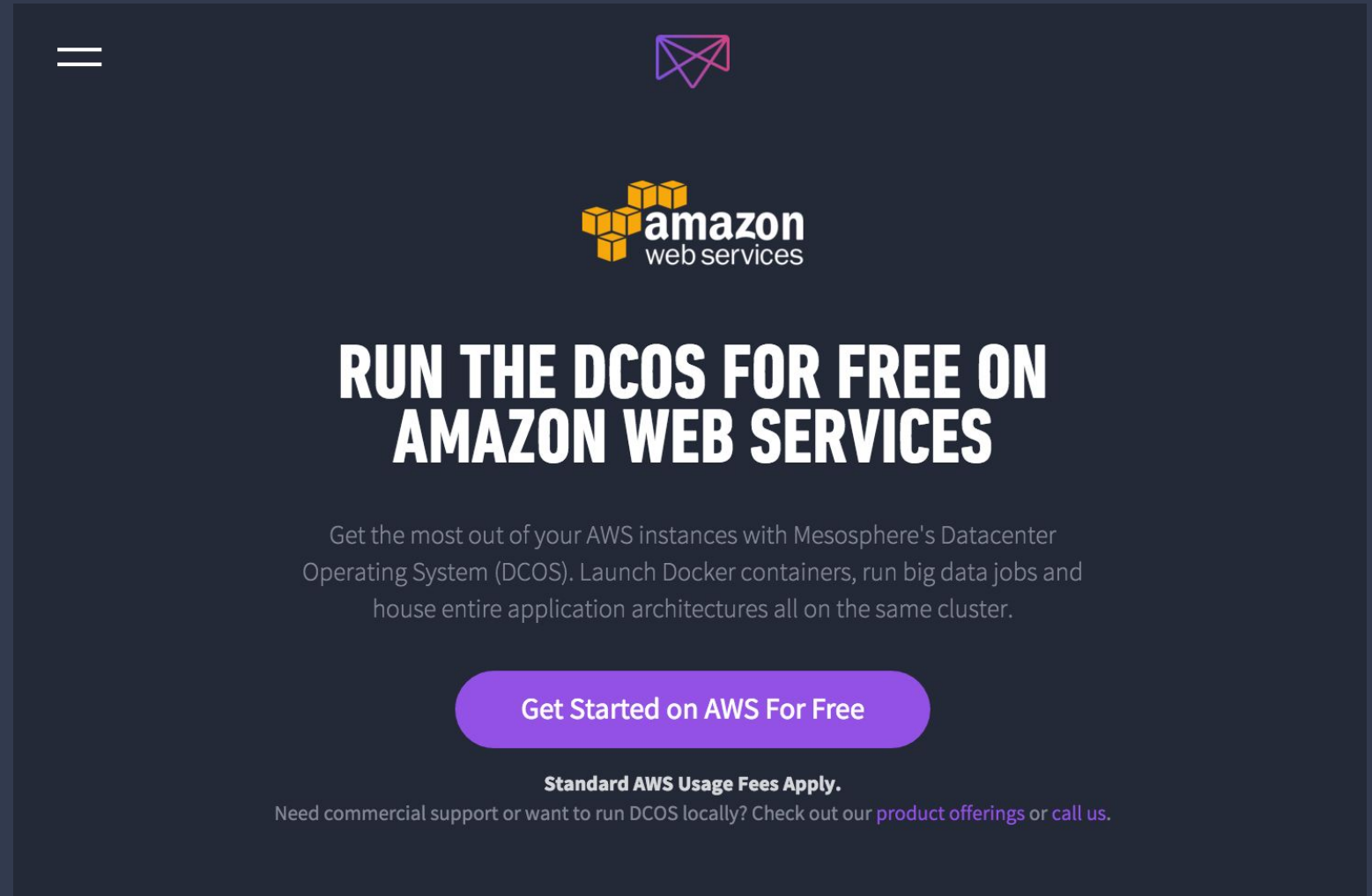
Datacenter Operating System



- Package Repo
- Terminal Client
- Config Service
- Kernel
- Init System
- Dashboard
- Service Discovery
- Control Plane
- Public & Private Zones

Try it yourself

<https://mesosphere.com/amazon/>



The screenshot shows a dark-themed landing page for Mesosphere's DCOS on Amazon Web Services. At the top left is a white hamburger menu icon. At the top right is a purple envelope icon. In the center is the Amazon Web Services logo, consisting of a yellow cube icon and the text "amazon web services". Below the logo is the main headline in large, bold, white capital letters: "RUN THE DCOS FOR FREE ON AMAZON WEB SERVICES". Underneath the headline is a paragraph of white text: "Get the most out of your AWS instances with Mesosphere's Datacenter Operating System (DCOS). Launch Docker containers, run big data jobs and house entire application architectures all on the same cluster." Below this text is a prominent purple rounded rectangular button with white text that says "Get Started on AWS For Free". Under the button, there is a line of white text: "Standard AWS Usage Fees Apply." At the bottom of the page, there is a line of white text: "Need commercial support or want to run DCOS locally? Check out our [product offerings](#) or [call us](#)."



Pre-release

v0.7.0-v1.1.1
7d8c03f

Kubernetes on Mesos v0.7.0-v1.1.1-alpha

sttts released this 2 days ago · 0 commits to master since this release

First Kubernetes on Mesos based on Kubernetes v1.1.

This is the first Kubernetes on Mesos release which is officially **Kubernetes 1.1 conformant** using the cluster/mesos/docker cluster scripts.

Changes Since v0.6.7

- versioning:
 - kubernetes-mesos integration version number now precedes the upstream Kubernetes release version number, to avoid ambiguity about project maturity
 - the "-alpha" suffix has been added (in the release title only) to indicate project maturity
- docs:
 - add DCOS getting-started guide <http://github.com/kubernetes/kubernetes/pull/17198>
 - add scheduler label documentation <http://github.com/kubernetes/kubernetes/pull/17368>
- scheduler:
 - add label based scheduling <http://github.com/kubernetes/kubernetes/pull/13857>
 - make slave attributes available as `k8s_mesosphere_io/label-<attribute>` label available

Links

Kubernetes on DCOS:

<http://kubernetes.io/v1.1/docs/getting-started-guides/dcos.html>

Kubernetes-Mesos on your Laptop:

<http://kubernetes.io/v1.1/docs/getting-started-guides/mesos-docker.html>

DCOS:

<https://mesosphere.com/product/>

Github:

<https://github.com/kubernetes/kubernetes/tree/master/contrib/mesos>

Roadmap

v0.7.0-v1.1.1 today

- **Kubernetes 1.1**
- 100% conformant docker-compose cluster
- major scheduler & executor refactoring
- lots of bugfixes

α

v0.7.1-v1.1.x Dec'ish

- resource roles ⇒ **slave_public support**

MVP v0.8.0-v1.1.x Feb'ish

- upgrade story, TLS support, no container leaks
- known and documented deficiencies

β

...

Prod Ready v1.0.0-v1.x.y

- **proven scaling** to e.g. 1000 nodes, at least as good as upstream
- **conformant DCOS package**

Of course: we are hiring!

Links

Kubernetes on DCOS:

<http://kubernetes.io/v1.1/docs/getting-started-guides/dcos.html>

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DCOS:

<https://mesosphere.com/product/>

Github:

<https://github.com/kubernetes/kubernetes/tree/master/contrib/mesos>



Please

Remember to rate session

Thank you!