Let us know what you think

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

**DCOS** ([https://mesosphere.com/](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

- cron
- tty
- MySQL

init.d → SysV, systemd, ...

Kernel → Linux, Darwin, Windows, FreeBSD, ...

single PC

- Memory
- CPU
- Storage

- Container #1
- Container #2
- Container #3

docker-compose

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DCOS - Data Center Operating System

- Chronos
- dcos CLI
- Cassandra
- Riak, ...

init.d → Marathon

Kernel → Apache Mesos

>1000 PCs

Memory

CPU

Storage

Pod #1

Pod #2

Pod #3

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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/
21 Nodes

Filter by Service

Show Services by Share

- kubernetes
- cassandra.dcos
- hdfs
- marathon

CPU usage percentages:
- 35%
- 15%
- 49%
- 15%
- 21%
- 15%
- 15%
- 15%
- 15%
- 40%
- 43%
- 23%
- 16%
- 15%
- 15%
- 20%
- 0%
- 16%
- 15%
- 15%
- 40%
$ dcos package install kubernetes

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

$ dcos kubectl get pods

<table>
<thead>
<tr>
<th>NAME</th>
<th>READY</th>
<th>STATUS</th>
<th>RESTARTS</th>
<th>AGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>nginx</td>
<td>1/1</td>
<td>Running</td>
<td>0</td>
<td>1m</td>
</tr>
</tbody>
</table>

nginx.yml:

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

ZooKeeper

Mesos

Framework

Node
Agent
Executors
Tasks

Node
Agent
Executors
Tasks

Node
Agent
Executors
Tasks

SDK for Mesos: HTTP/Protobuf API
Kubernetes
Userland API and System Services

- High Level Application Abstractions
- Cluster Containers Orchestration
Behind the scenes ...

K8s Master

API Server

Scheduler

Controllers

$ dcos kubectl get pods

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</table>

GET /service/kubernetes/api/v1/pods

```json
{
  "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/

RUN THE DCOS FOR FREE ON AMAZON WEB SERVICES

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.

Get Started on AWS For Free

Standard AWS Usage Fees Apply.
Need commercial support or want to run DCOS locally? Check out our product offerings or call us.
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
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

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

... 

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!
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
Please Remember to rate session

Thank you!

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