OPENSTACK MAGNUM

Adrian Otto, Distinguished Architect

Outline

History and Overview of OpenStack
How we got here, and what OpenStack is today.

Carina: A use-case for Magnum at Rackspace
What Rackspace did with OpenStack to offer containers as a hosted service.

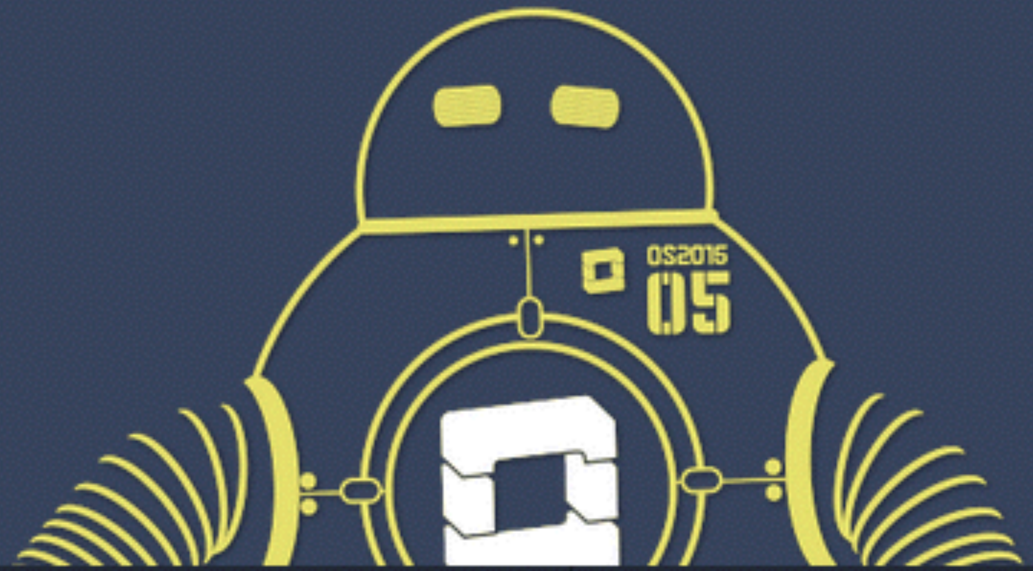
Magnum
What Magnum is all about.

Container Orchestration Engines
Why different orchestration engines exist for containers, and where they shine.

2010: OpenStack is Born

5

openstack

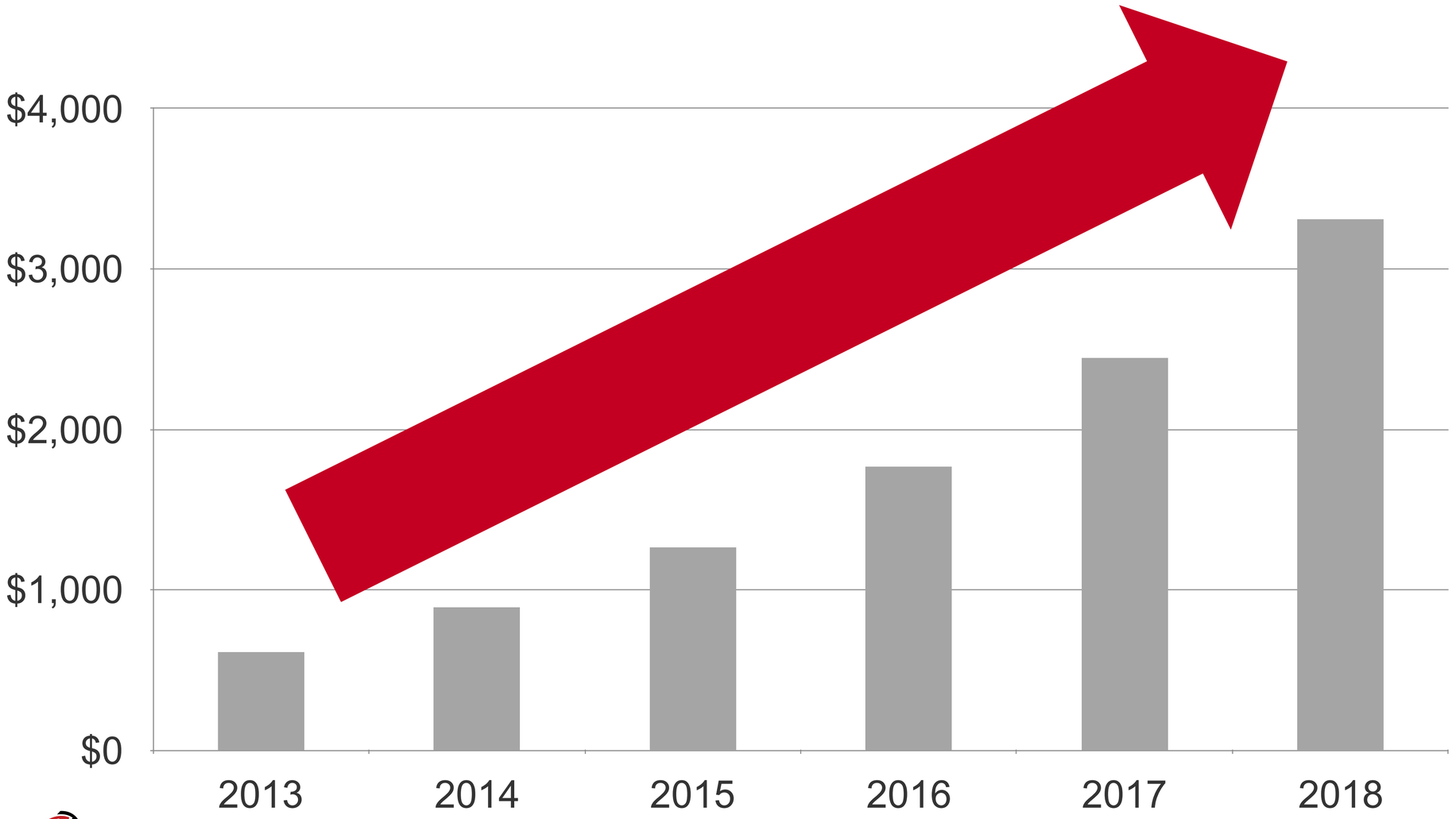


27422
openstack members

167
countries with registered community members

523
organizations involved

The OpenStack Market ($M)



40% CAGR

Rackspace #1 Market Share

Source: 451 Group, 2014

OPENSTACK SERVICES

Layer 4: Consumption Services

Heat | **Magnum** | Marconi | Murano | Trove | Sahara | Solum

Layer 3: Optional Enhancements

Cielometer | Barbican | Horizon

Layer 2: Extended Infrastructure

Cinder | Swift | Neutron | Designate | Ironic

Layer 1: Base Compute Infrastructure

Nova | Glance | Keystone

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PROPERTIES OF MATTER: LIQUIDS

LIQUIDS TAKE ON THE SHAPE OF THEIR CONTAINER. THE LIQUID STATE OF MATTER IS AN INTERMEDIATE PHASE BETWEEN SOLID AND GAS. LIKE THE PARTICLES OF A SOLID, PARTICLES IN A LIQUID ARE SUBJECT TO INTERMOLECULAR ATTRACTION; HOWEVER, LIQUID PARTICLES HAVE MORE SPACE BETWEEN THEM, SO THEY ARE NOT FIXED IN POSITION.

MAKE A BIGGER CONTAINER?

rackspace

root@IBM-Power8: ~

```
top - 18:48:51 up  1:05,  2 users,  load average: 0.00, 0.01, 0.05
Tasks: 1031 total,   1 running, 1030 sleeping,   0 stopped,   0 zombie
%Cpu0  :  0.0 us,  0.0 sy,  0.0 ni,100.0 id,  0.0 wa,  0.0 hi,  0.0 si,  0.0 st
%Cpu1  :  0.0 us,  0.0 sy,  0.0 ni, 99.7 id,  0.0 wa,  0.3 hi,  0.0 si,  0.0 st
%Cpu2  :  0.0 us,  0.0 sy,  0.0 ni,100.0 id,  0.0 wa,  0.0 hi,  0.0 si,  0.0 st
%Cpu3  :  0.0 us,  0.0 sy,  0.0 ni,100.0 id,  0.0 wa,  0.0 hi,  0.0 si,  0.0 st
%Cpu4  :  0.0 us,  0.0 sy,  0.0 ni,100.0 id,  0.0 wa,  0.0 hi,  0.0 si,  0.0 st
%Cpu5  :  0.0 us,  0.0 sy,  0.0 ni,100.0 id,  0.0 wa,  0.0 hi,  0.0 si,  0.0 st
%Cpu6  :  0.0 us,  0.0 sy,  0.0 ni,100.0 id,  0.0 wa,  0.0 hi,  0.0 si,  0.0 st
%Cpu7  :  0.0 us,  0.0 sy,  0.0 ni,100.0 id,  0.0 wa,  0.0 hi,  0.0 si,  0.0 st
%Cpu8  :  0.0 us,  0.0 sy,  0.0 ni,100.0 id,  0.0 wa,  0.0 hi,  0.0 si,  0.0 st
%Cpu9  :  0.0 us,  0.0 sy,  0.0 ni,100.0 id,  0.0 wa,  0.0 hi,  0.0 si,  0.0 st
%Cpu10 :  0.0 us,  0.0 sy,  0.0 ni,100.0 id,  0.0 wa,  0.0 hi,  0.0 si,  0.0 st
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%Cpu16 :  0.0 us,  0.0 sy,  0.0 ni,100.0 id,  0.0 wa,  0.0 hi,  0.0 si,  0.0 st
%Cpu17 :  0.0 us,  0.0 sy,  0.0 ni,100.0 id,  0.0 wa,  0.0 hi,  0.0 si,  0.0 st
%Cpu18 :  0.0 us,  0.0 sy,  0.0 ni,100.0 id,  0.0 wa,  0.0 hi,  0.0 si,  0.0 st
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%Cpu24 :  0.0 us,  0.0 sy,  0.0 ni,100.0 id,  0.0 wa,  0.0 hi,  0.0 si,  0.0 st
%Cpu25 :  0.0 us,  0.0 sy,  0.0 ni,100.0 id,  0.0 wa,  0.0 hi,  0.0 si,  0.0 st
```

Bigger hardware allows for bigger software

APPLICATION CONTAINERS


APPLICATION
CONTAINERS

CONTAINERS ARE DISRUPTIVE

CARINA™

BY RACKSPACE®

An easy-to-use and instant-on native container environment.

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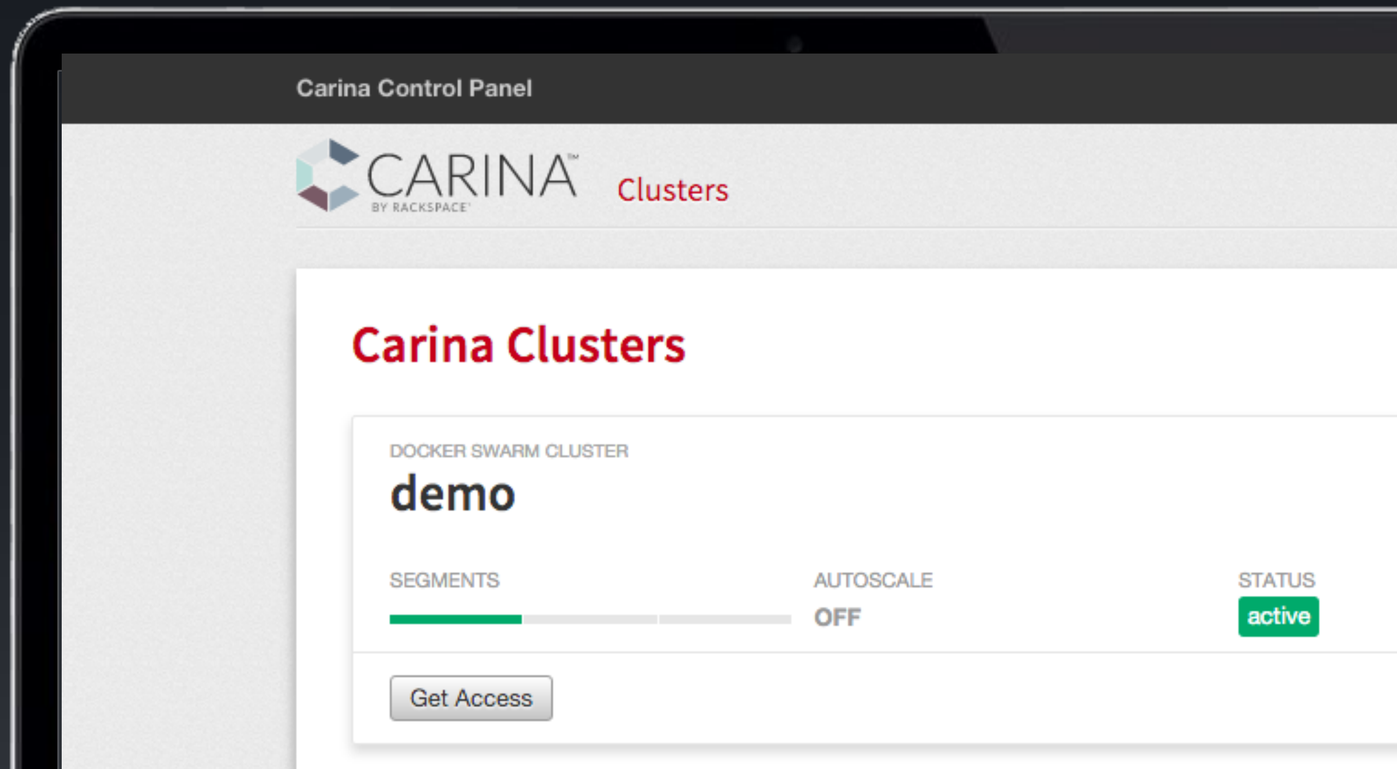

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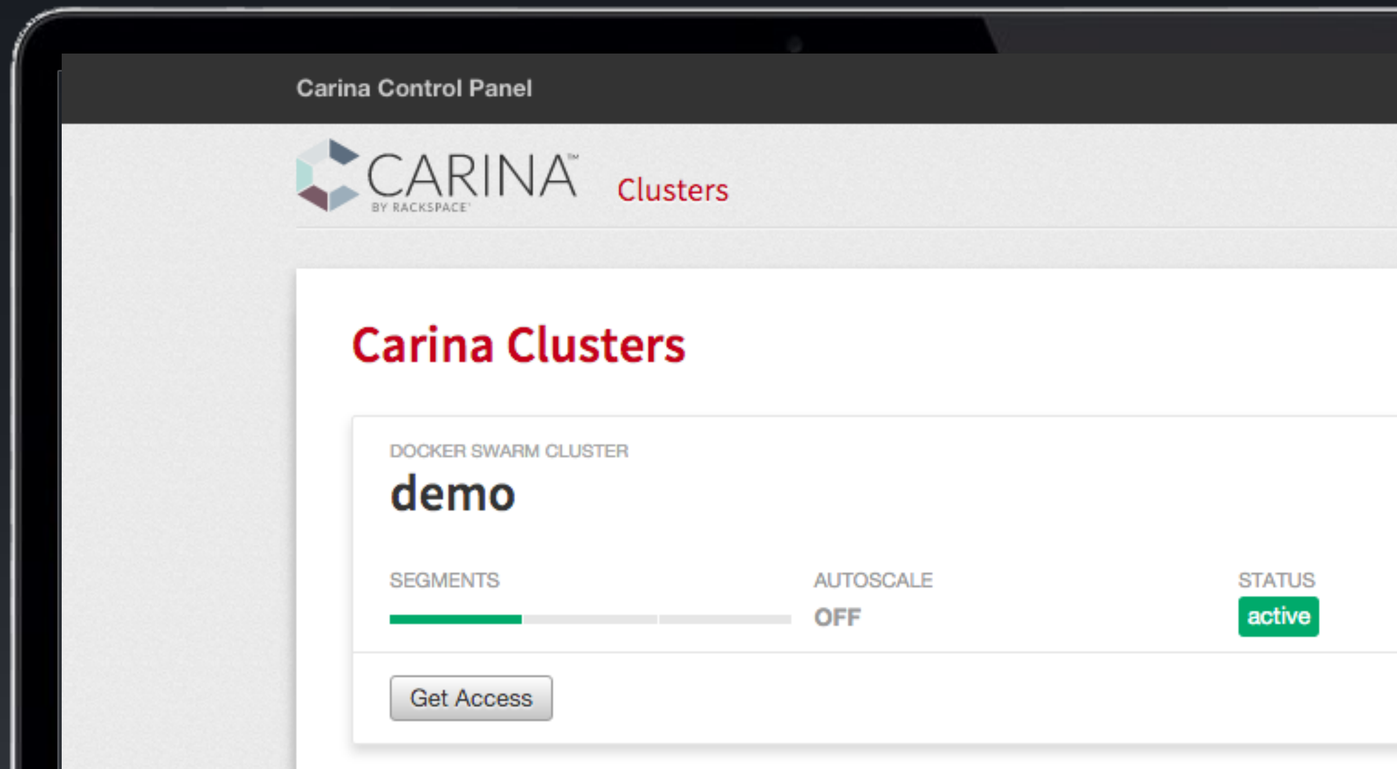


CONTAINER ADOPTION
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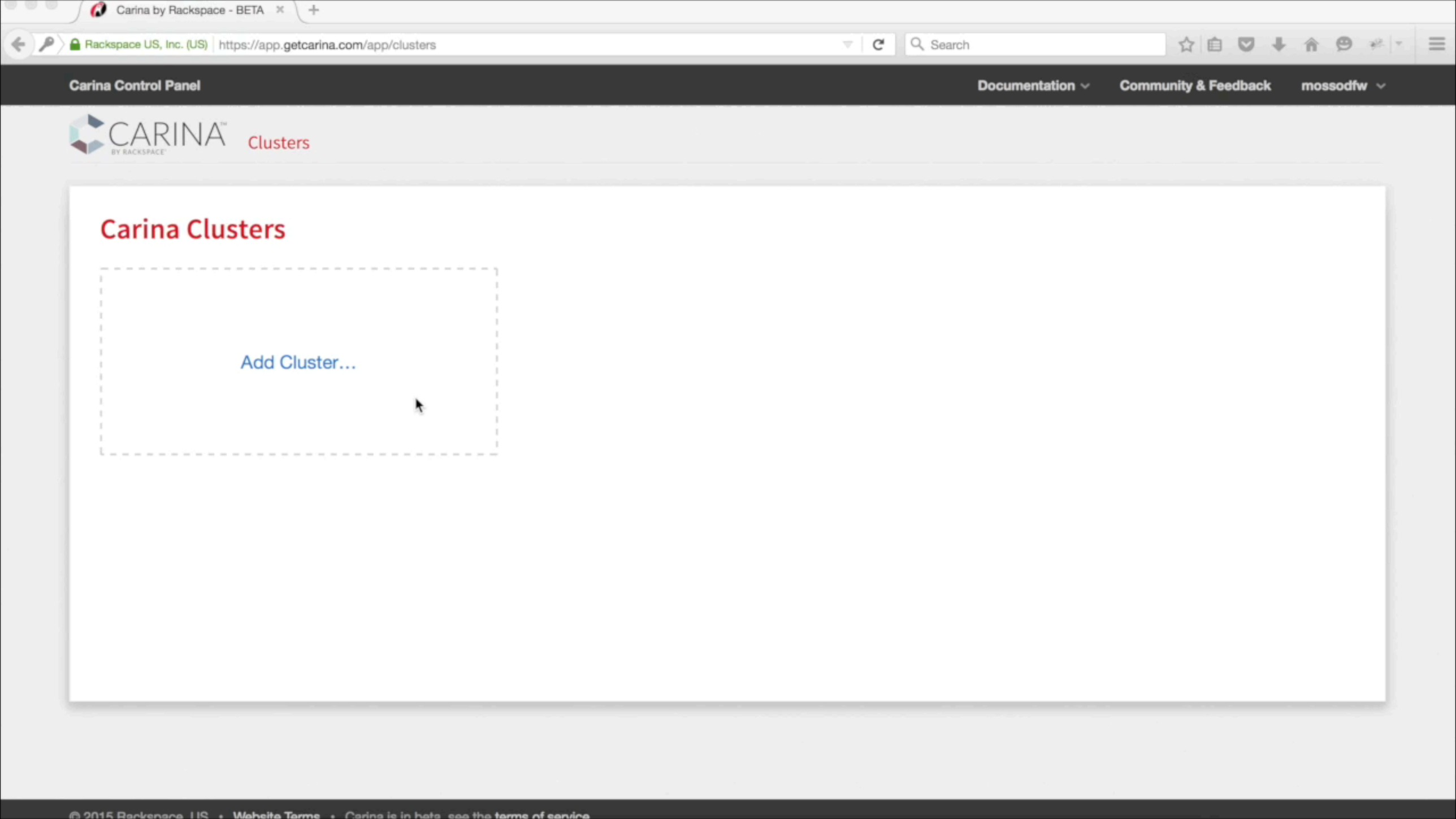
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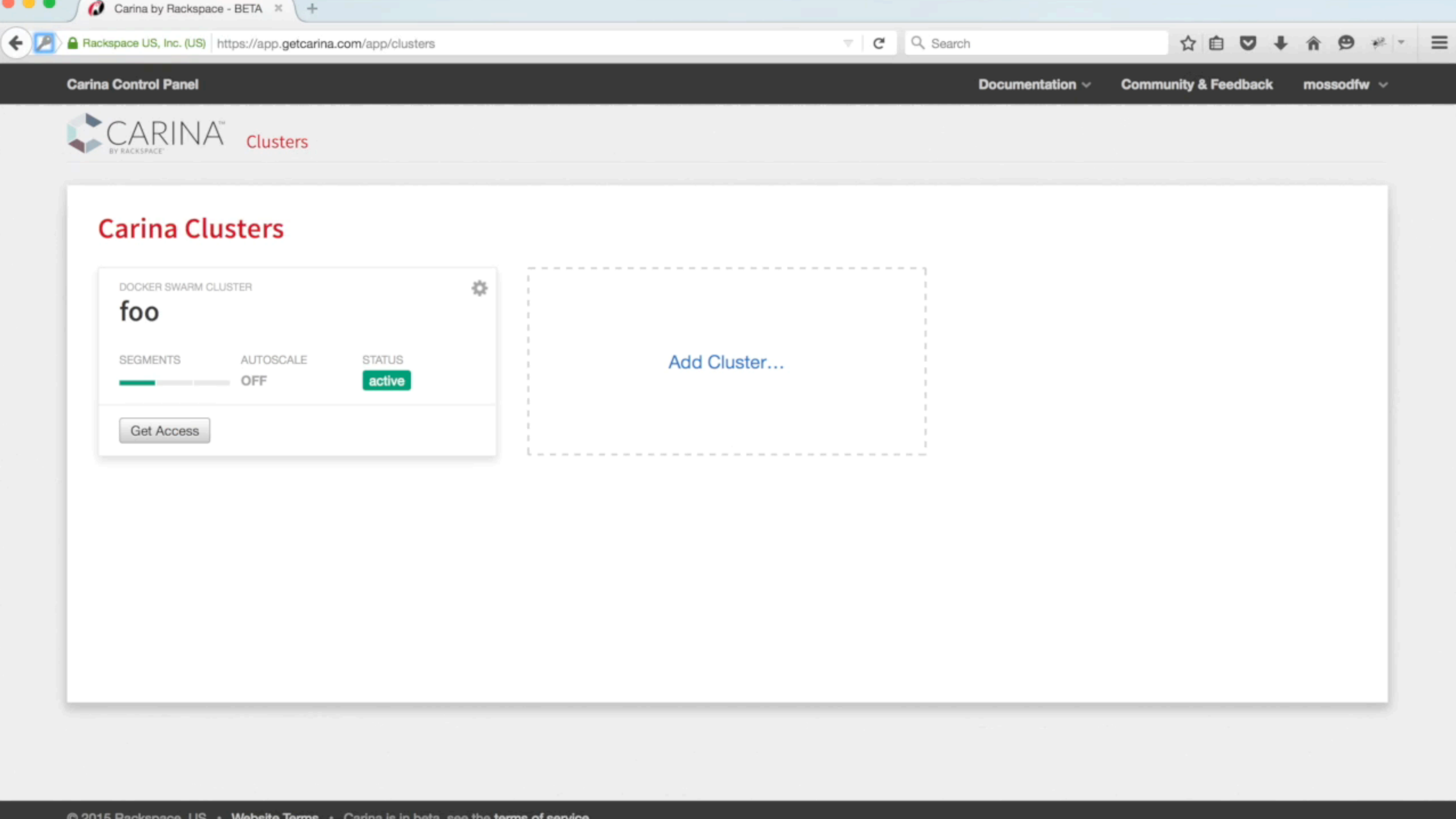
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Carina Clusters
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foo
SEGMENTS
AUTOSCALE
OFF
STATUS
active
Get Access
Add Cluster...
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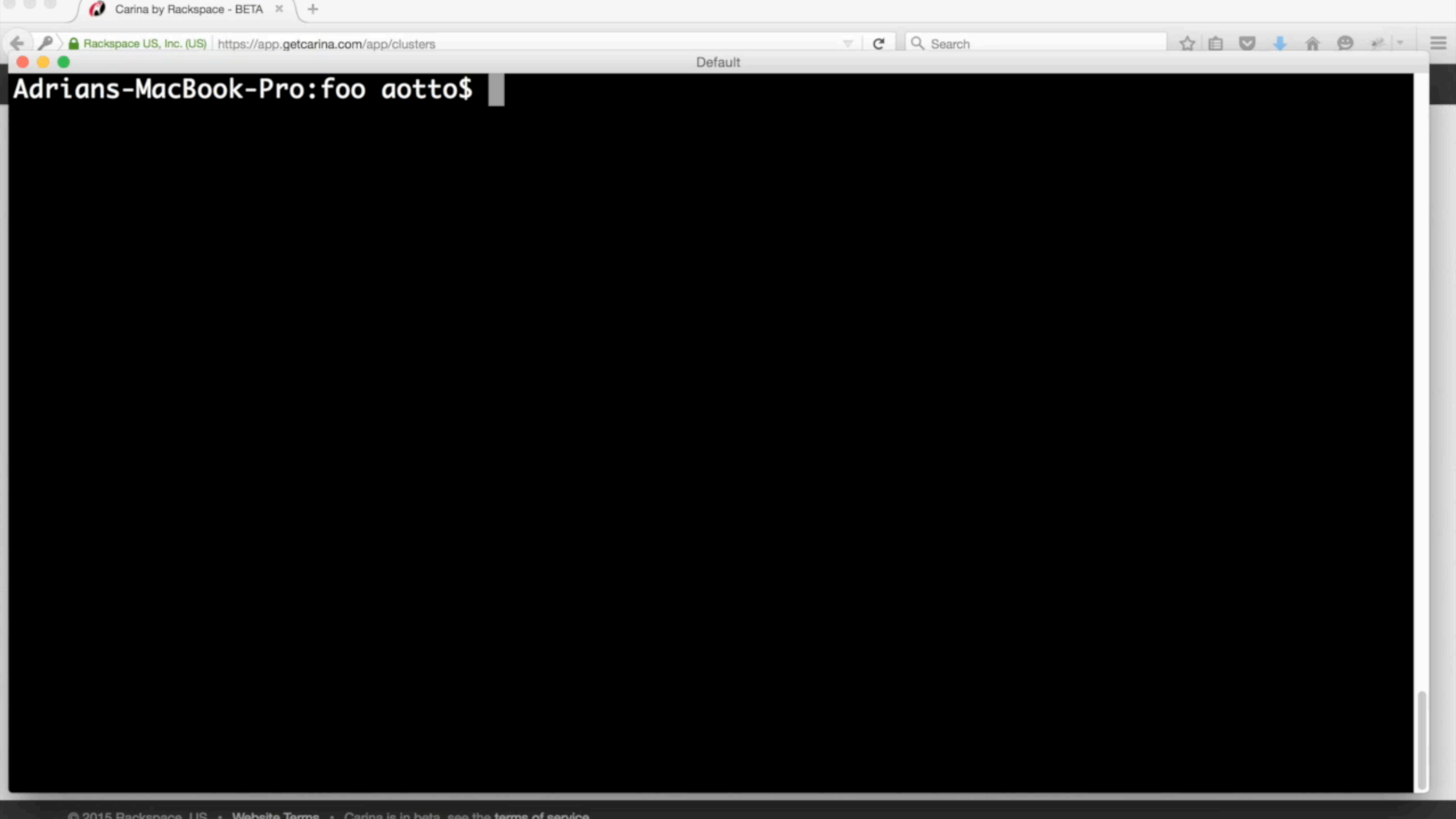
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NATIVE API EXPERIENCE
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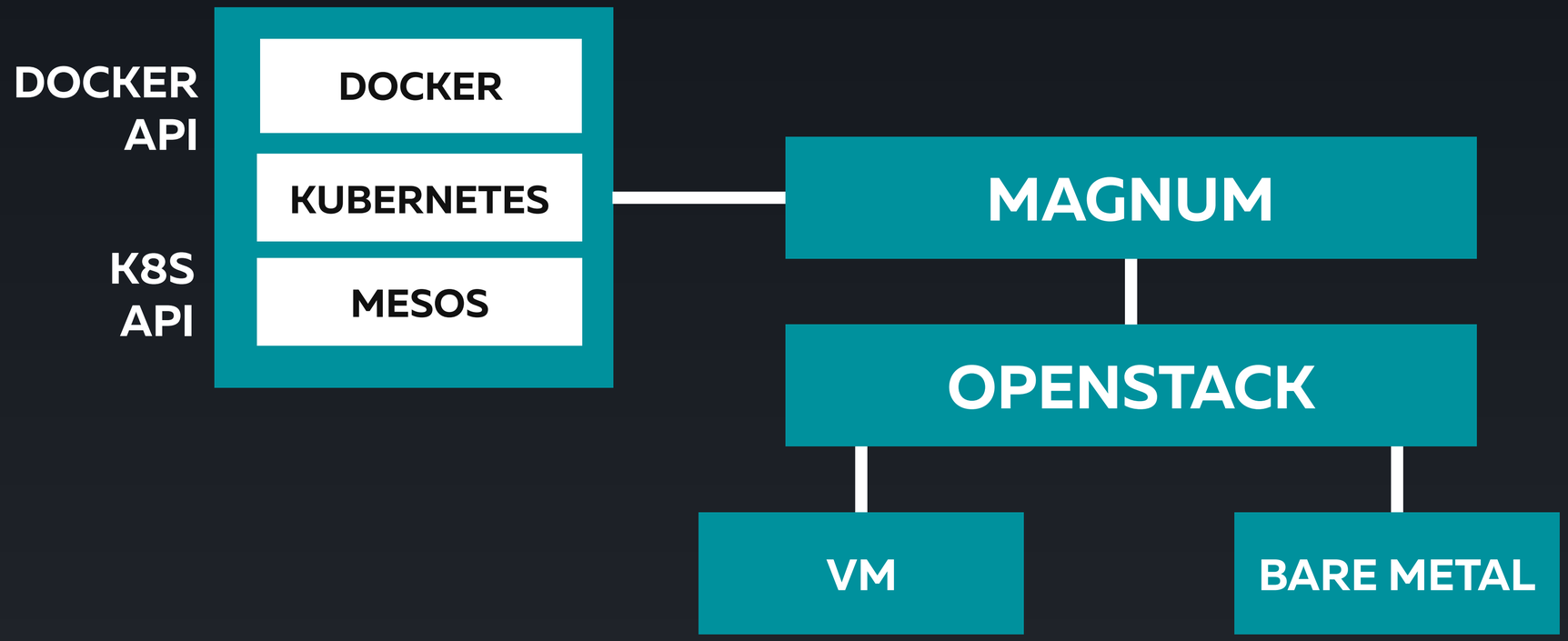
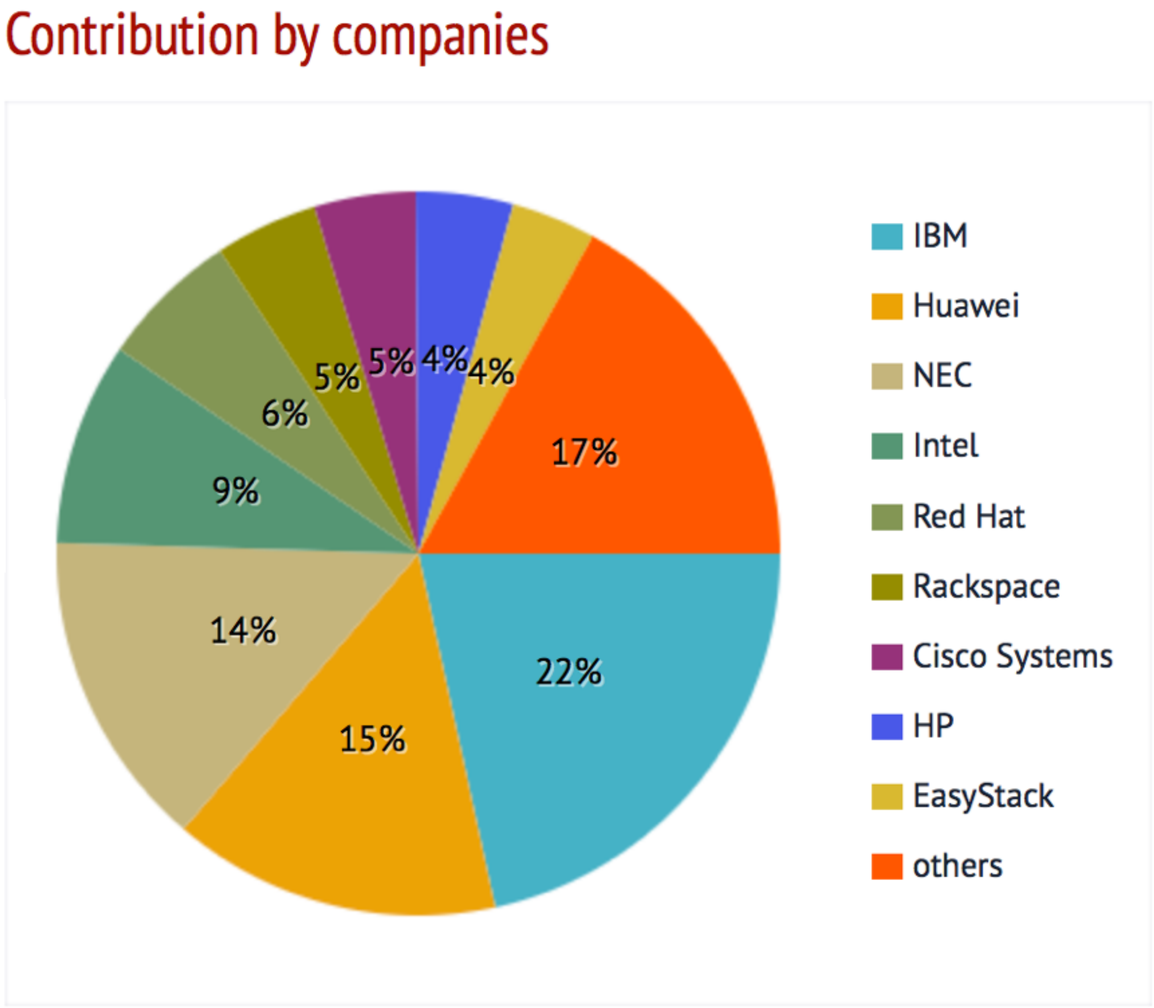
Why different orchestration engines exist for containers, and where they shine.

MAGNUM OVERVIEW



Magnum Statistics, Status, and Diversity

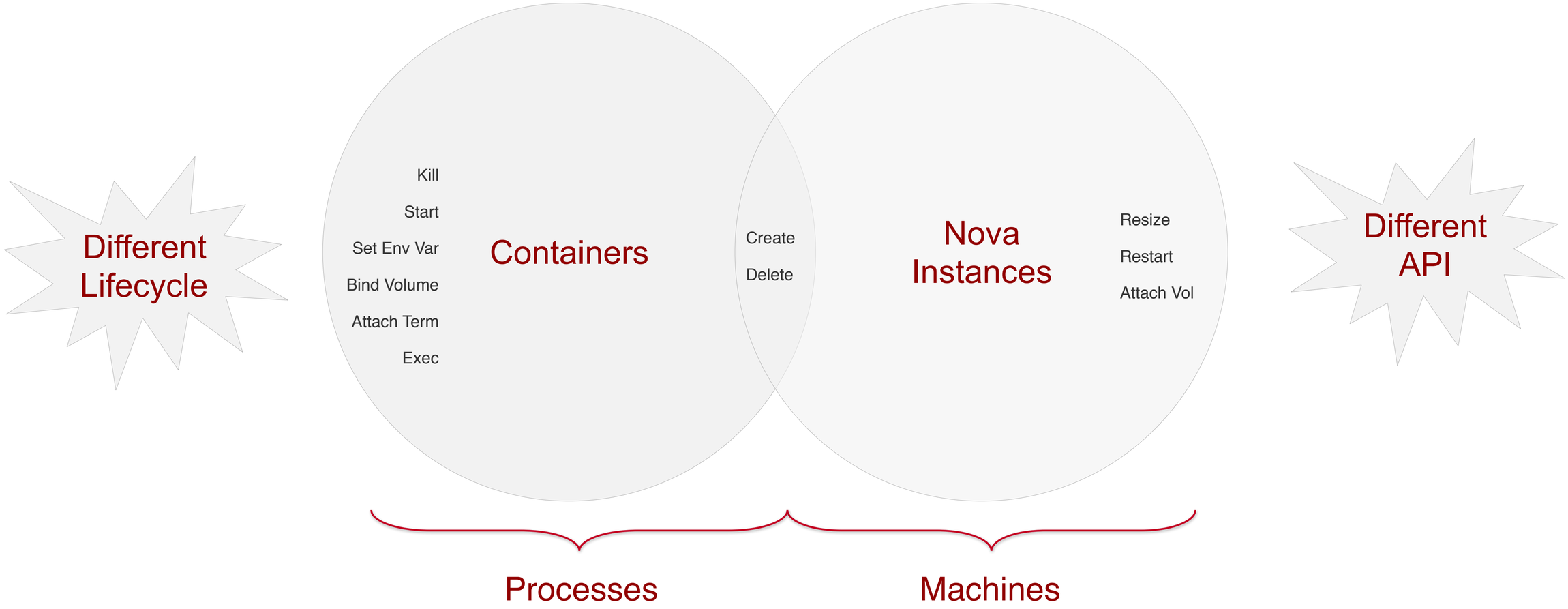
OpenStack Magnum's Top Contributors



Prior Art

- libvirt/LXC virt driver for Nova
- Nova-Docker virt driver for Nova
- Heat Resource for Docker

Magnum Rationale



“Cloud operators assume a risk when selecting a single cloud technology today… but OpenStack is different.”

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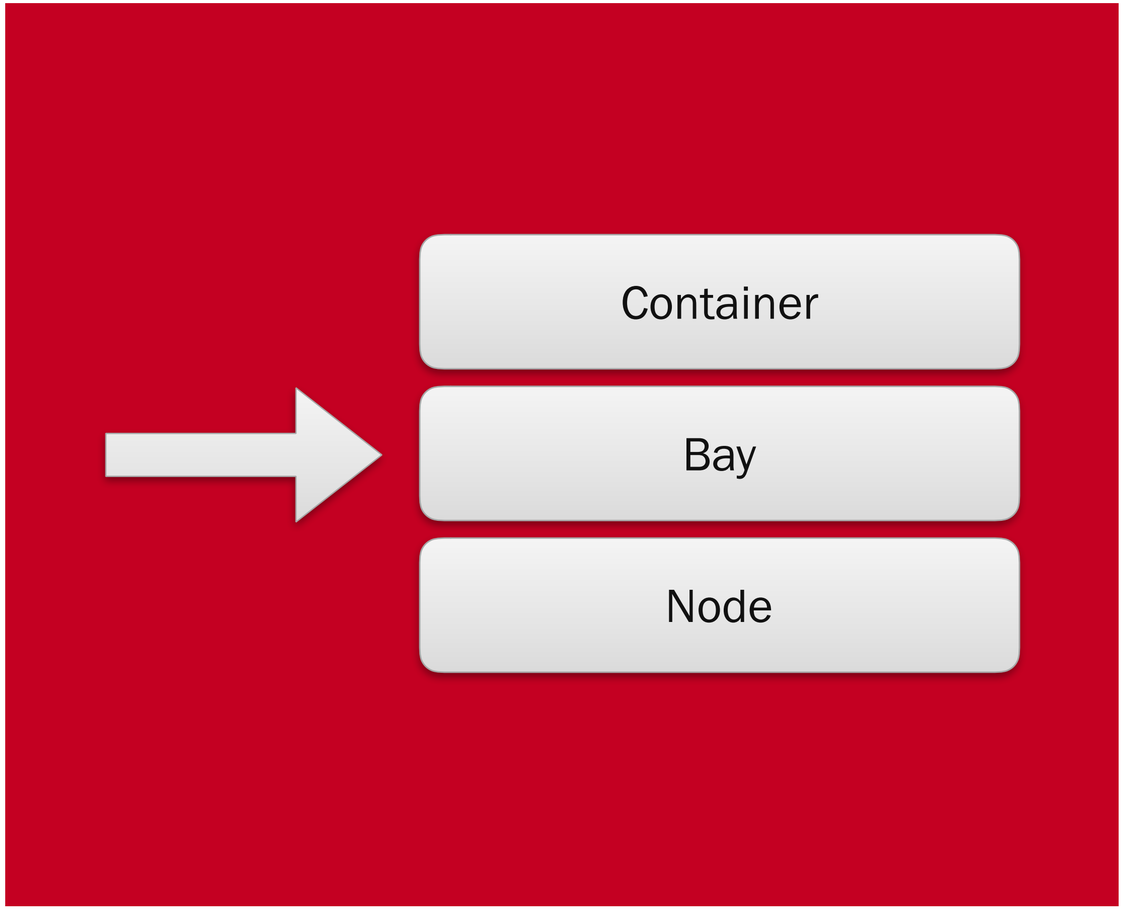
“

Native APIs are not just a good idea, they are ESSENTIAL.

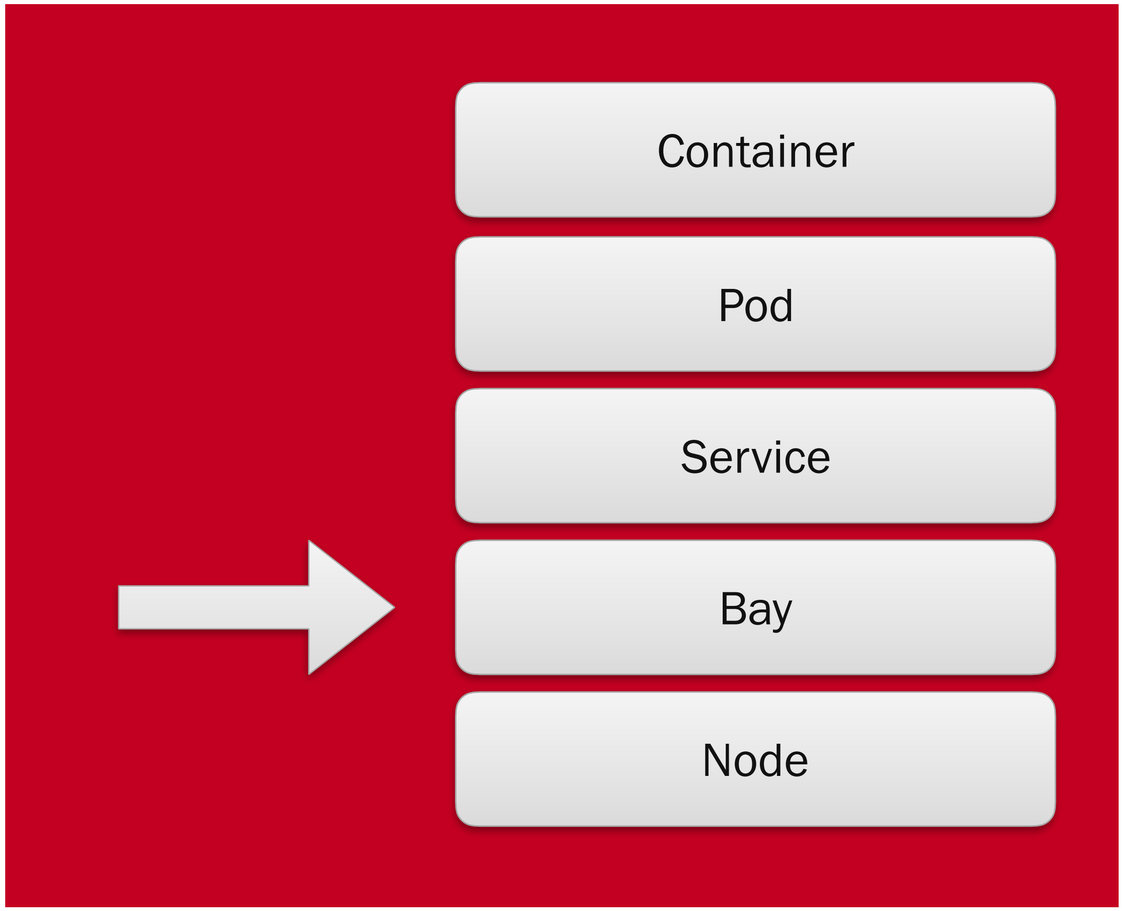
”

rackspace

Understanding Magnum Resources (1/2)



Understanding Magnum Resources (2/2)



Magnum Differentiators

Multi-Tenant Control and Data Planes	Magnum is First
Asynchronous API	HTTP/1.1 201 Created
Uses OpenStack Orchestration (Heat)	Not Re-Implementing Orchestration
Uses OpenStack Identity (Keystone)	SSO Experience for Cloud Users

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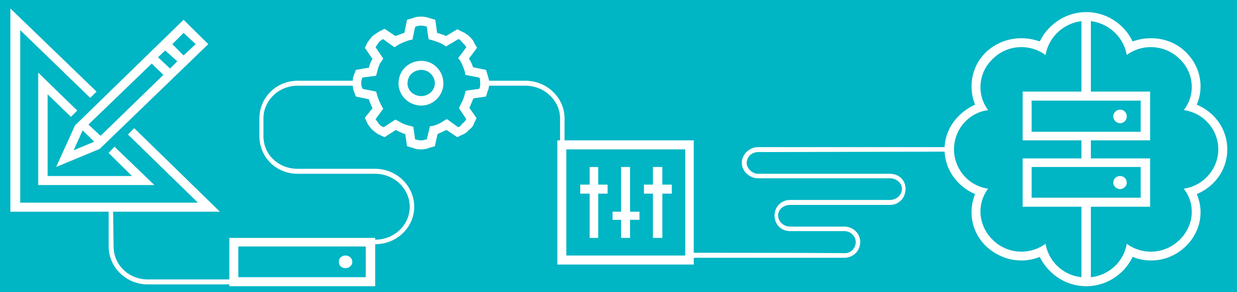
WHAT'S NEW

Features added in Liberty



New Features in Liberty Release

Mesos Bay Type (Multi-Tenancy)

- Apache Mesos
- Marathon Framework
  - REST API

Secure Bays (TLS)

- TLS Between Client and Magnum API
- TLS Between Bay Master and Minion/ Slave/Worker
- Certificate generation/signing
- docker / kubectl TLS interoperability

External Load Balancer Support

- Neutron LBaaS Integration
- Automatically add or remove nodes from Neutron LB when Kubernetes bay is scaled

Multi-Master Kubernetes

- Easy setup of multi-master configuration for Kubernetes
- Suitable for HA configurations

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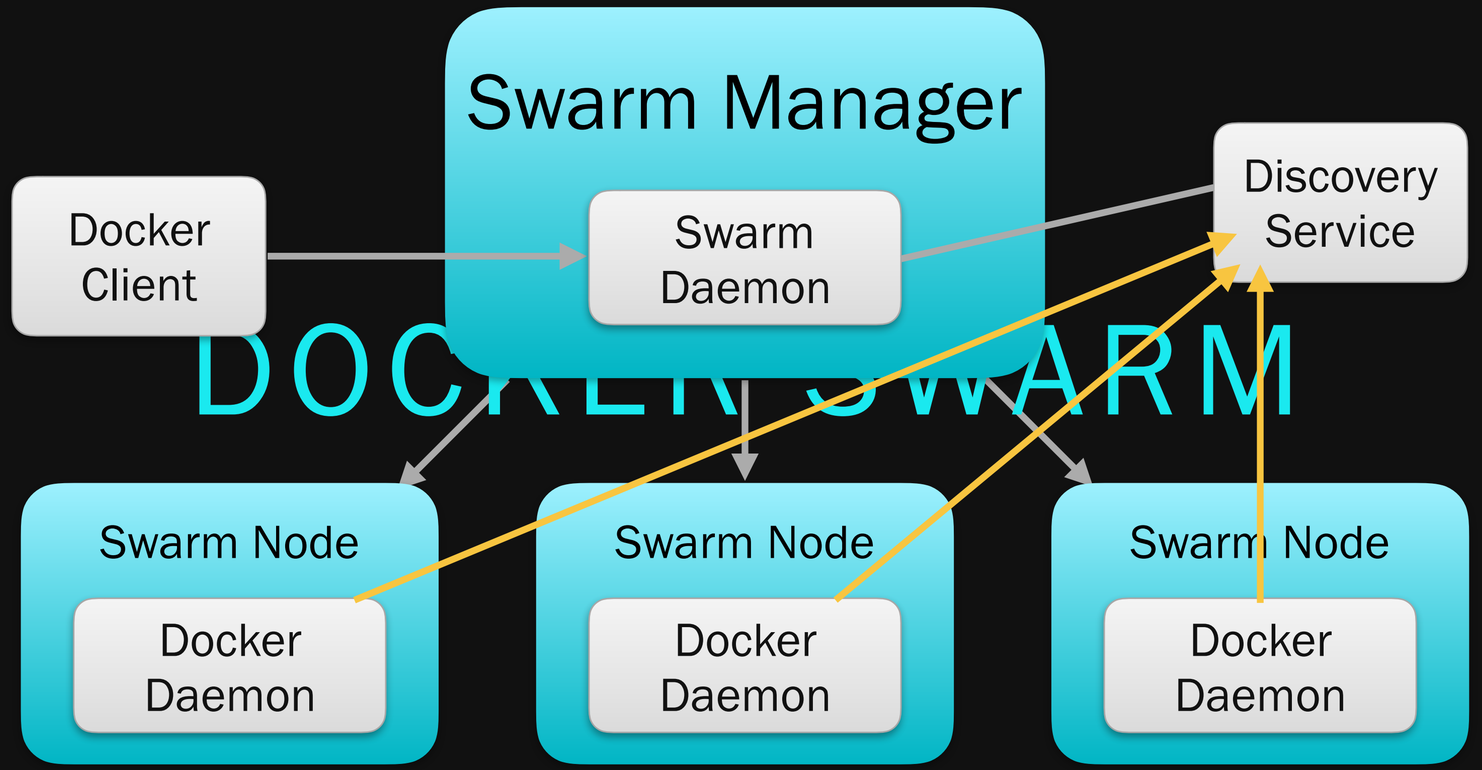
Swarm Manager
Docker Client
Swarm Daemon
Discovery Service
DOCKER SWARM
Swarm Node
Docker Daemon
Swarm Node
Docker Daemon
Swarm Node
Docker Daemon

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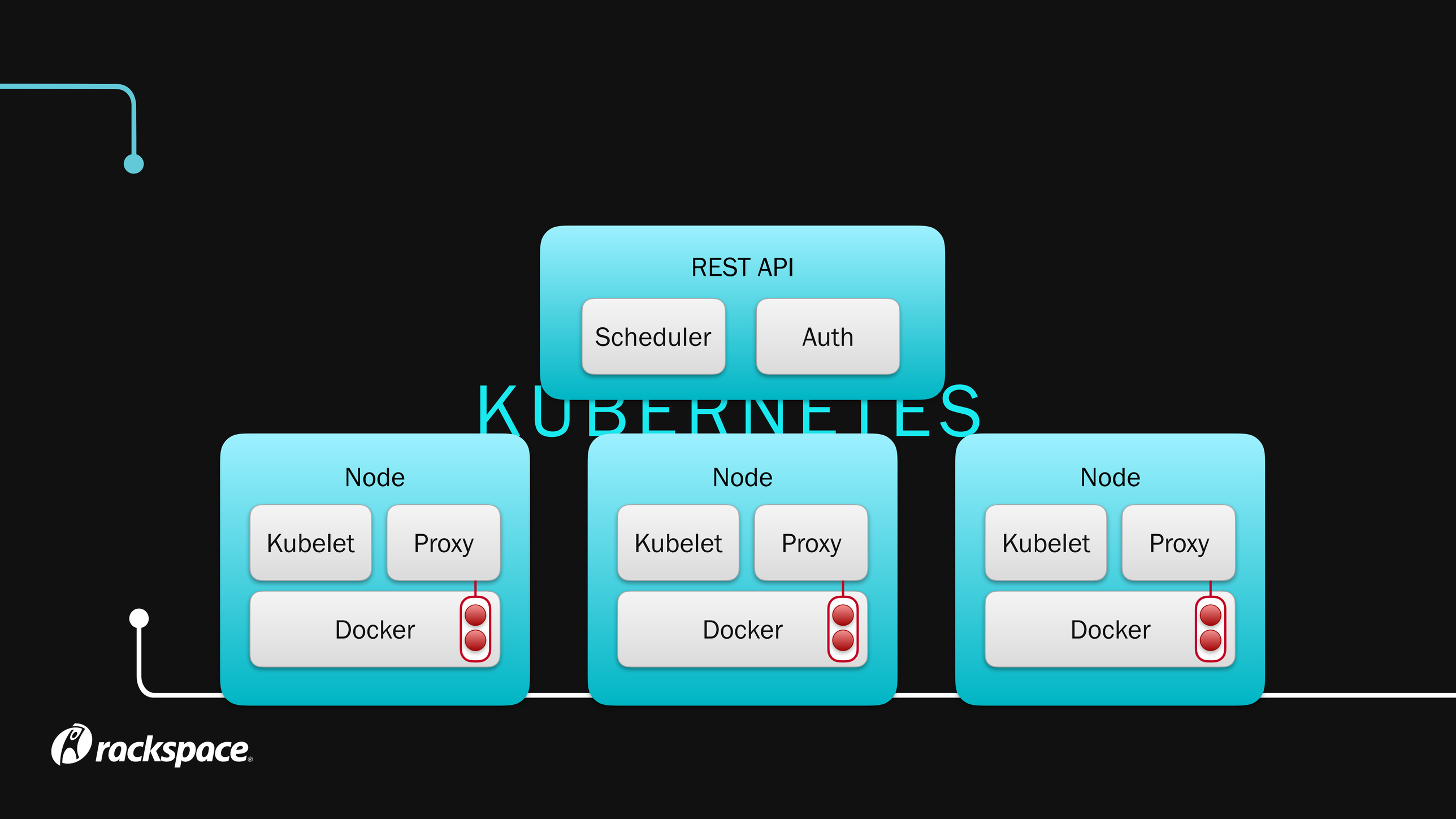
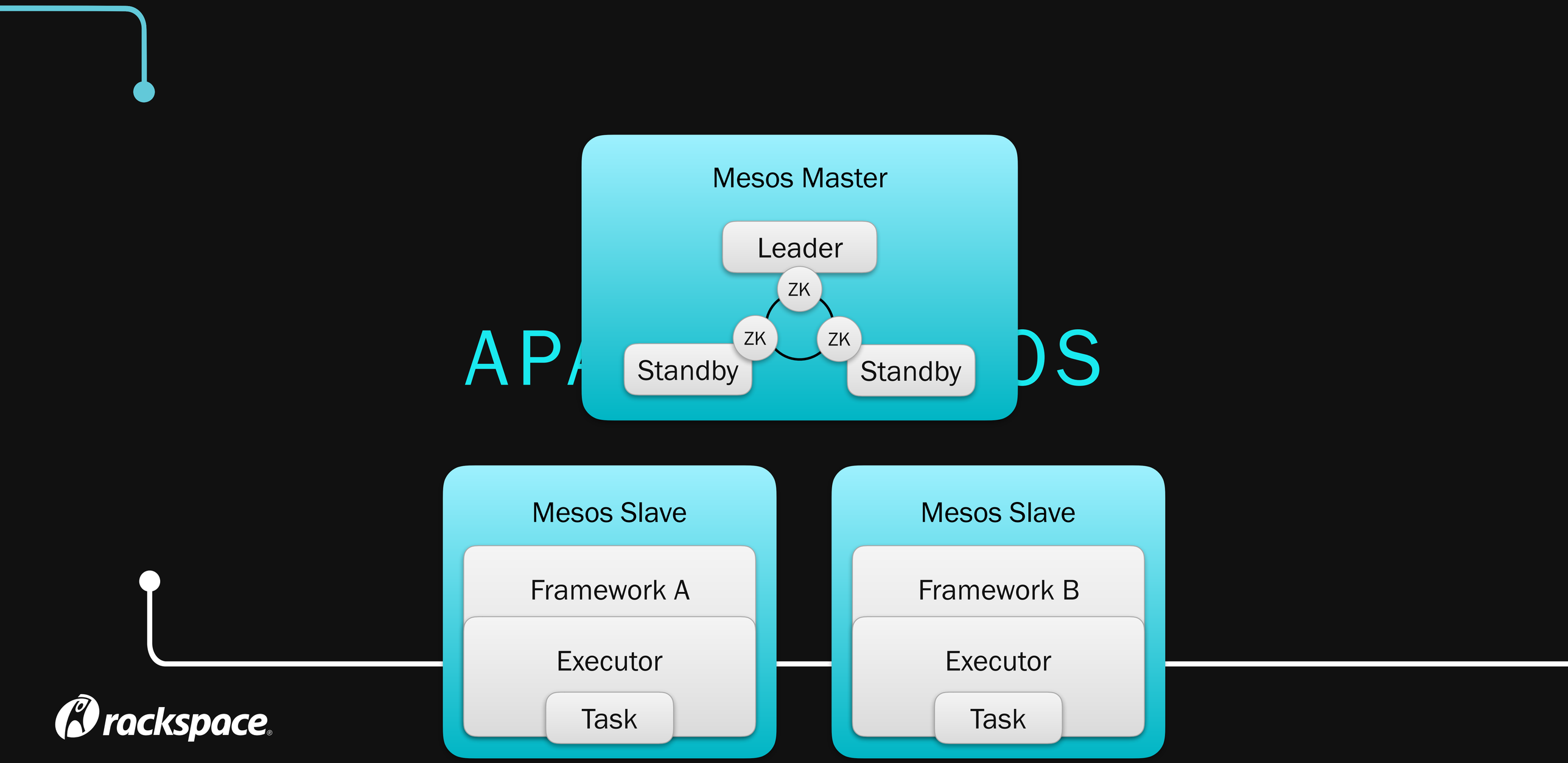

REST API
Scheduler
Auth
KUBERNETES
Node
Kubelet
Proxy
Docker
Node
Kubelet
Proxy
Docker
Node
Kubelet
Proxy
Docker
rackspace


Mesos Master
Leader
ZK
ZK
ZK
Standby
Standby
Mesos Slave
Framework A
Executor
Task
Mesos Slave
Framework B
Executor
Task

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We're Hiring

Python
C, C++
Ruby
C#, .NET
Java
JavaScript, CSS, HTML
Angular.JS, Ember.js, Node.js
Restful/JSON/XML
Closure, Scala, Erlang
Hadoop, MongoDB, MySQL

OpenStack Engineers
Linux Systems Engineers
DevOps Engineers
Full Stack Developers
Web Developers
Software Developer in Test
Security Engineers
Data Scientist
Solutions Architects
Software Dev. Managers
Strategic Account Executive
Field Sales Specialist
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Thank you

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