



M E S O S

Elastically
Scalable
Operations,
Simplified.

Adam Bordelon and Niklas Nielsen
ApacheCon 2014



Launch an Apache Mesos Cluster in

3

2

1

3 Choose a cluster size

<input checked="" type="radio"/> 6 instances	<input type="radio"/> 18 instances
12 vCPUs 45 GiB memory \$1.44 per hour ¹	36 vCPUs 135 GiB memory \$4.32 per hour ¹
Perfect for trying out Apache Mesos	Unleash the data-cruncher

2 Enter your credentials

1 Choose where to receive notifications

Launch

<https://elastic.mesosphere.io>

We are Mesospheroids







Our Mesos story



Our Mesos story

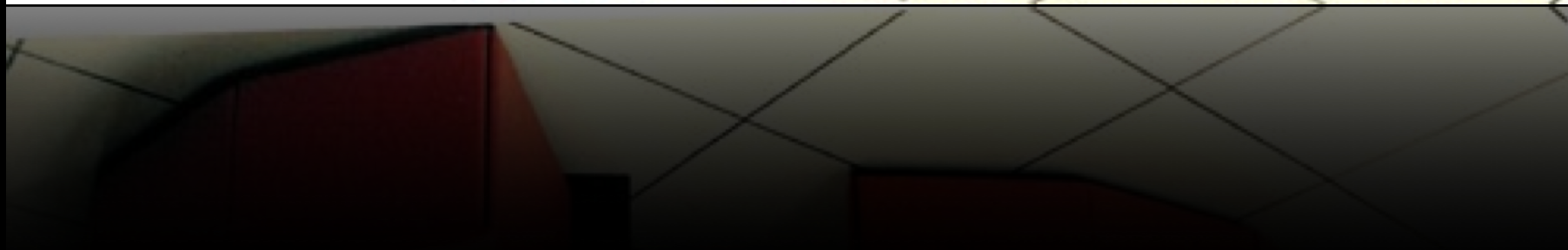
- Mesos is a distributed system to build and run distributed systems.
- Mesos provides fine-grained resource sharing and isolation.
- Mesos enables high-availability and fault-tolerance for your cluster.



Our Mesos story



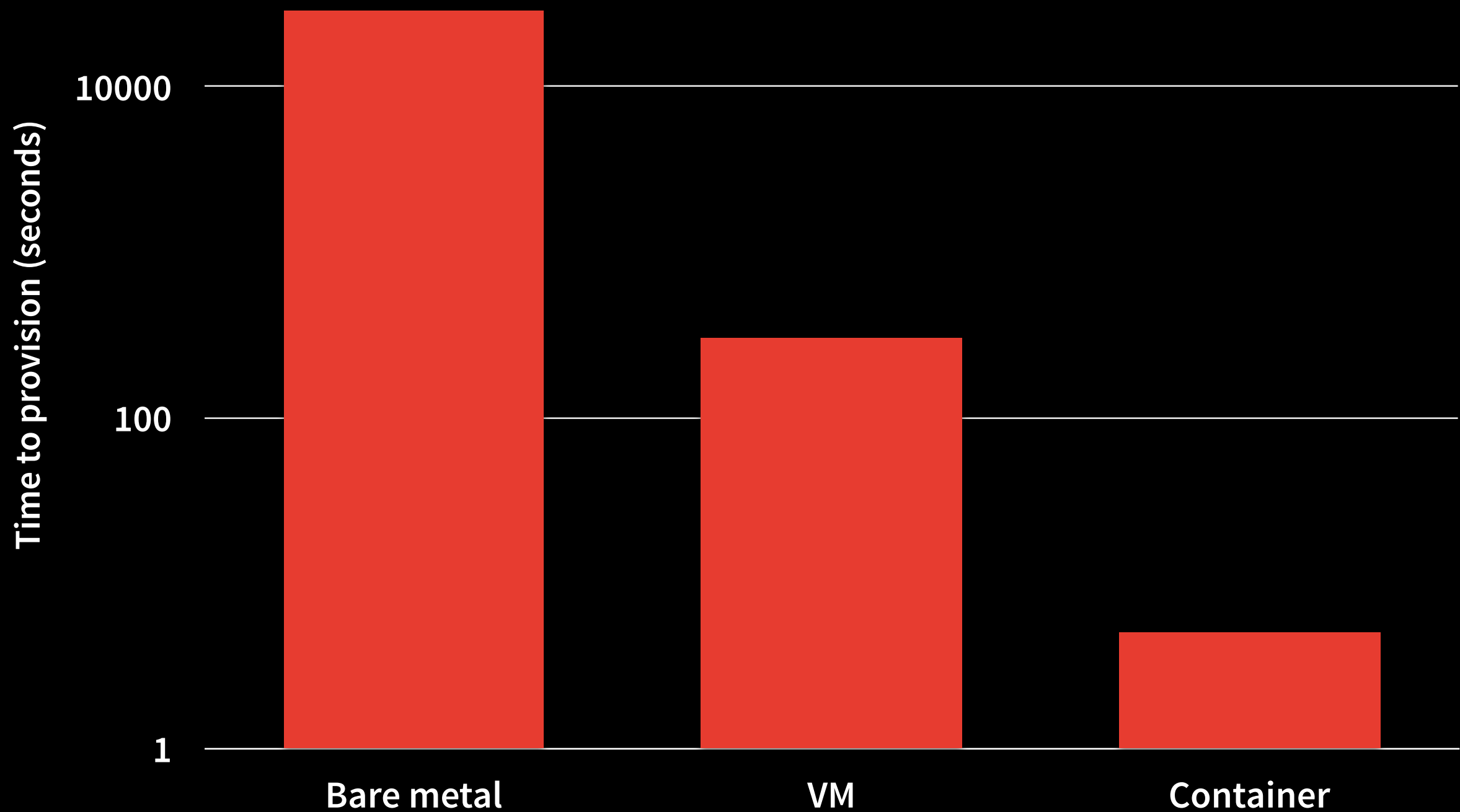
Wait a second, I have seen this before



Cluster scheduling is the secret sauce of the biggest players



Response times and overhead are significantly different



Inspired by Tomas Barton's Mesos talk at InstallFest in Prague

Where will you be when you get paged?





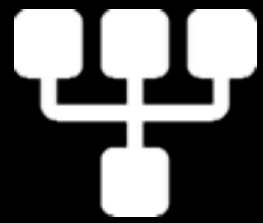
The Mesos Approach

“

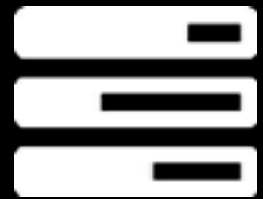
*We wanted people to be able to program
for the datacenter just like they program
for their laptop*

Benjamin Hindman, Apache Mesos PMC Chair

Make life easier for the data center operator



Multi-tenancy



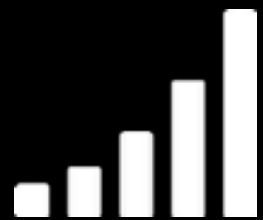
Improved resource utilization



Resource Isolation

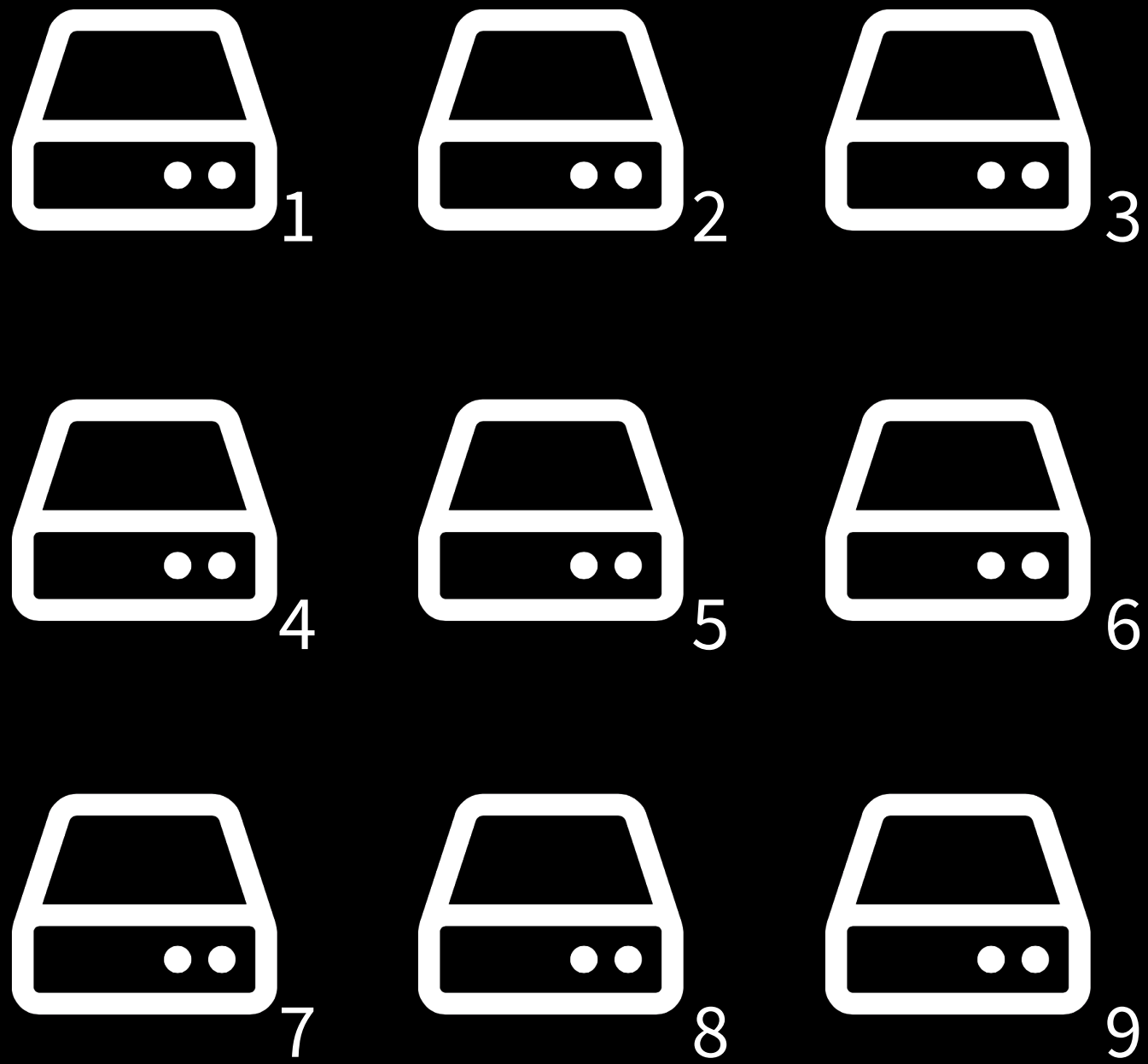


Fault-tolerance

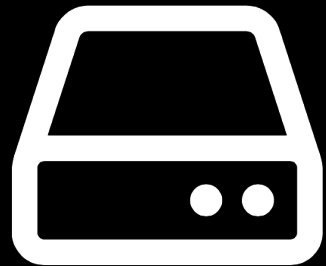


Easy scaling

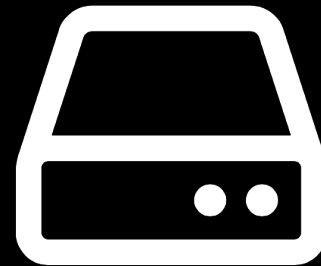
This is your data center



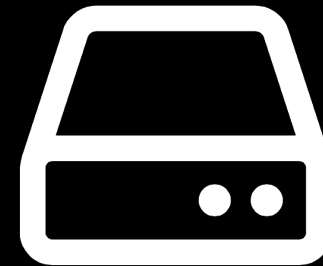
This is your data center with apps. Any questions?



1



2



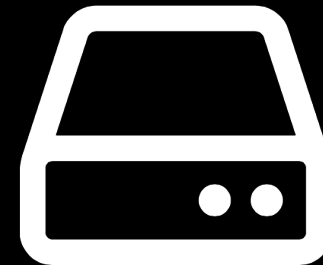
3



4



5



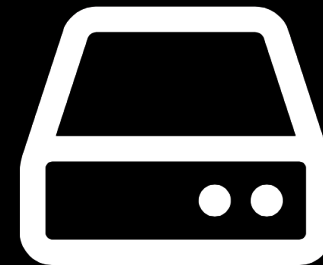
6



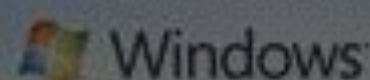
7



8



9



Home Products Buy Downloads Help and How-to

Windows Internet Explorer

IE8 -- Choose a CPU to run on

Which CPU do you want to use?

☒ CPU 1
 ☐ CPU 3

☐ CPU 2
 ☐ CPU 4

Plant a tree in the Carbon Grove

Internet Explorer has partnered with a carbon reduction reminder service to help increase awareness around one of Earth's most precious resources. Browse three endangered forests and plant your own virtual tree while learning how to become a better steward of the environment.

- Visit www.carbongrove.com, take a quiz on reducing your carbon footprint, and then plant your own tree!
- Share the site with others so that together we can impact the earth positively.

Get the Quick Reference Guide

View or download this guide to learn quick keyboard shortcuts for Internet Explorer 7.

More links

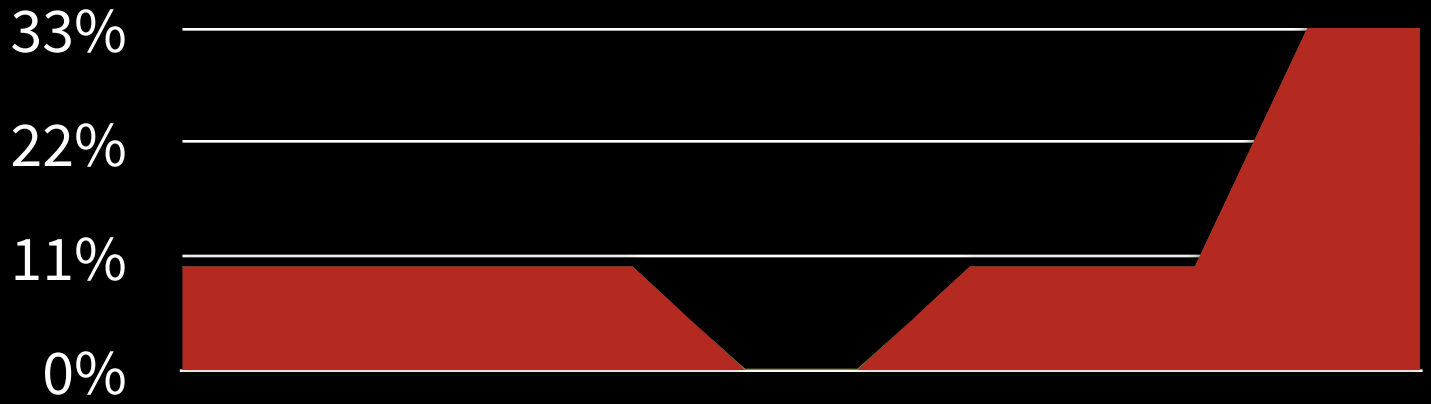
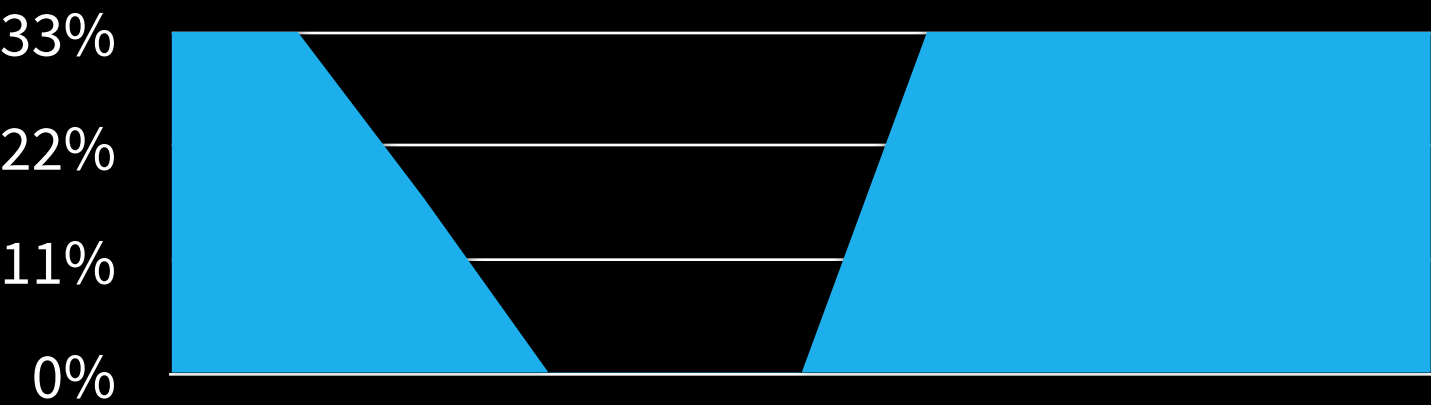
- [Internet Explorer 8 Beta 2](#)
Learn more about Internet Explorer 8 Beta 2.
- [Checklist](#)

Get Office 2007 direct from Microsoft

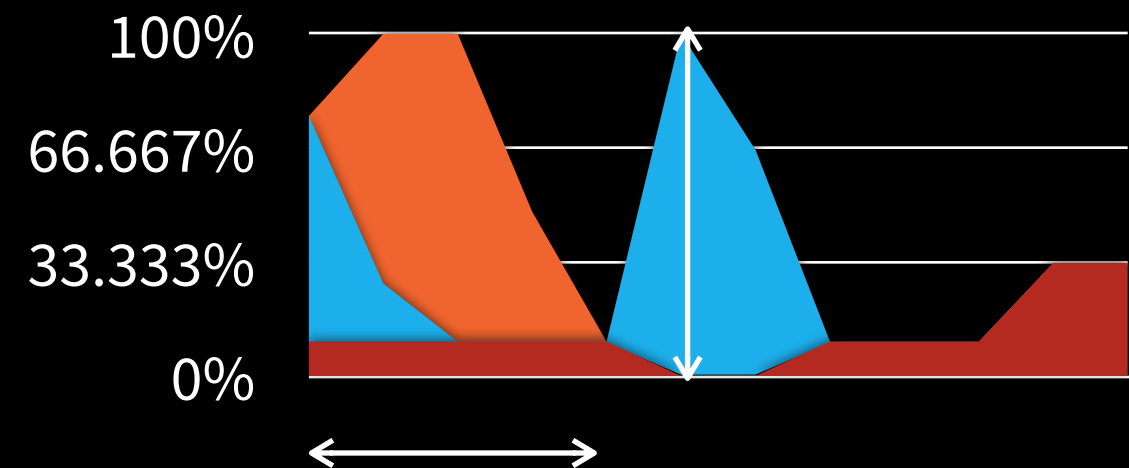
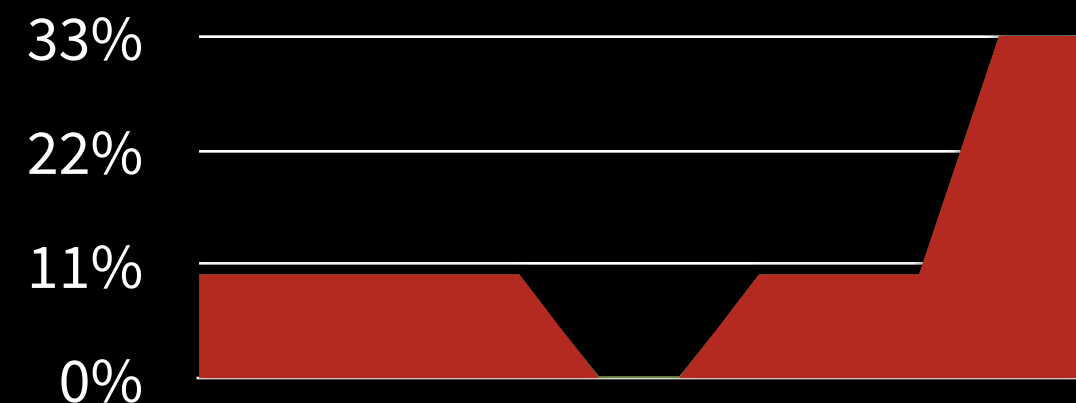
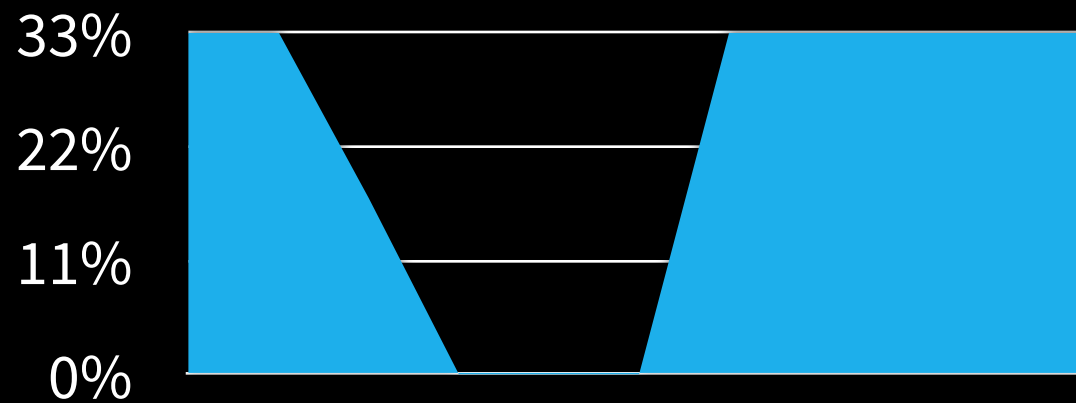
[Buy it now](#)

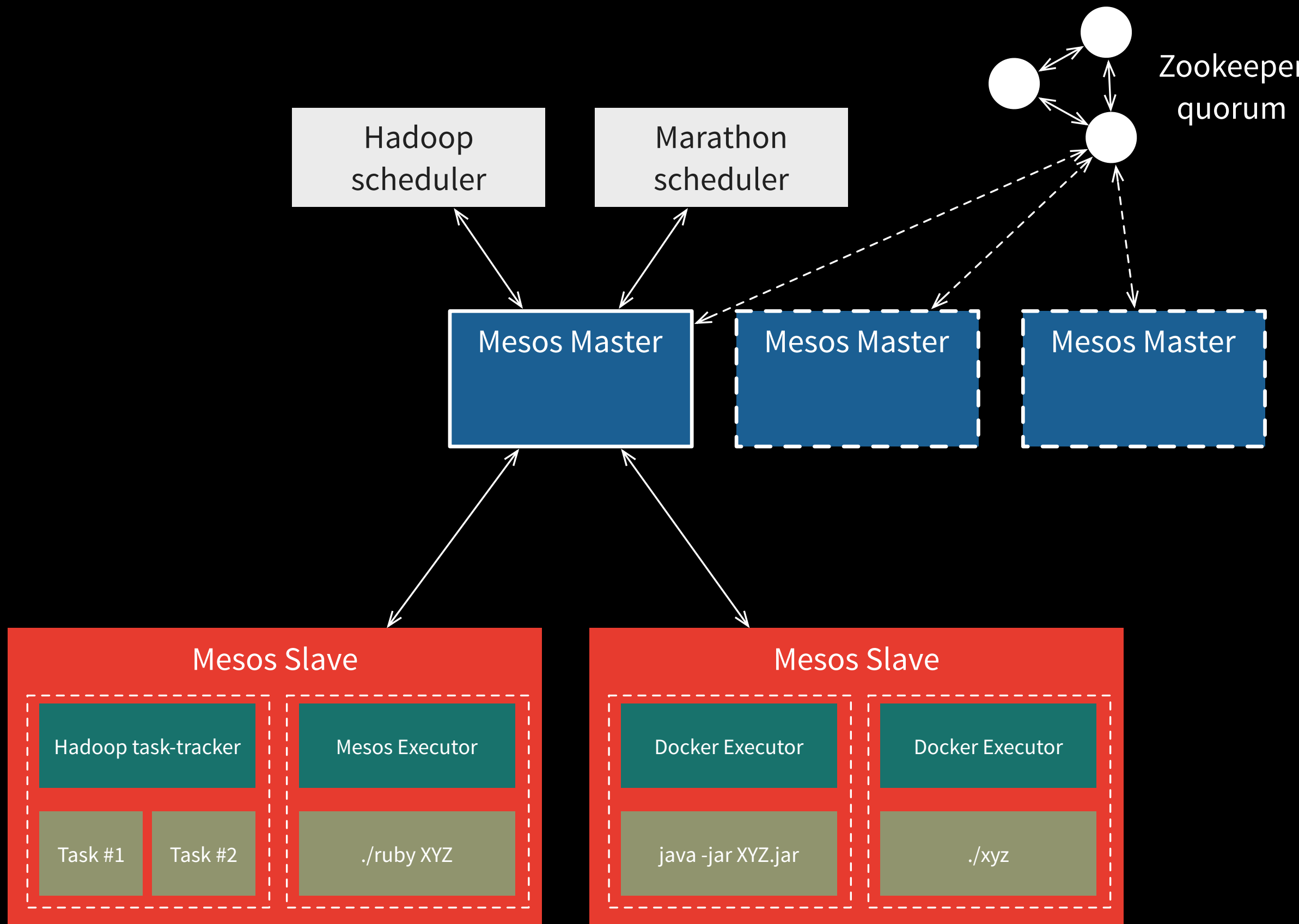
Office Home and Student 2007
Realize the power of Office

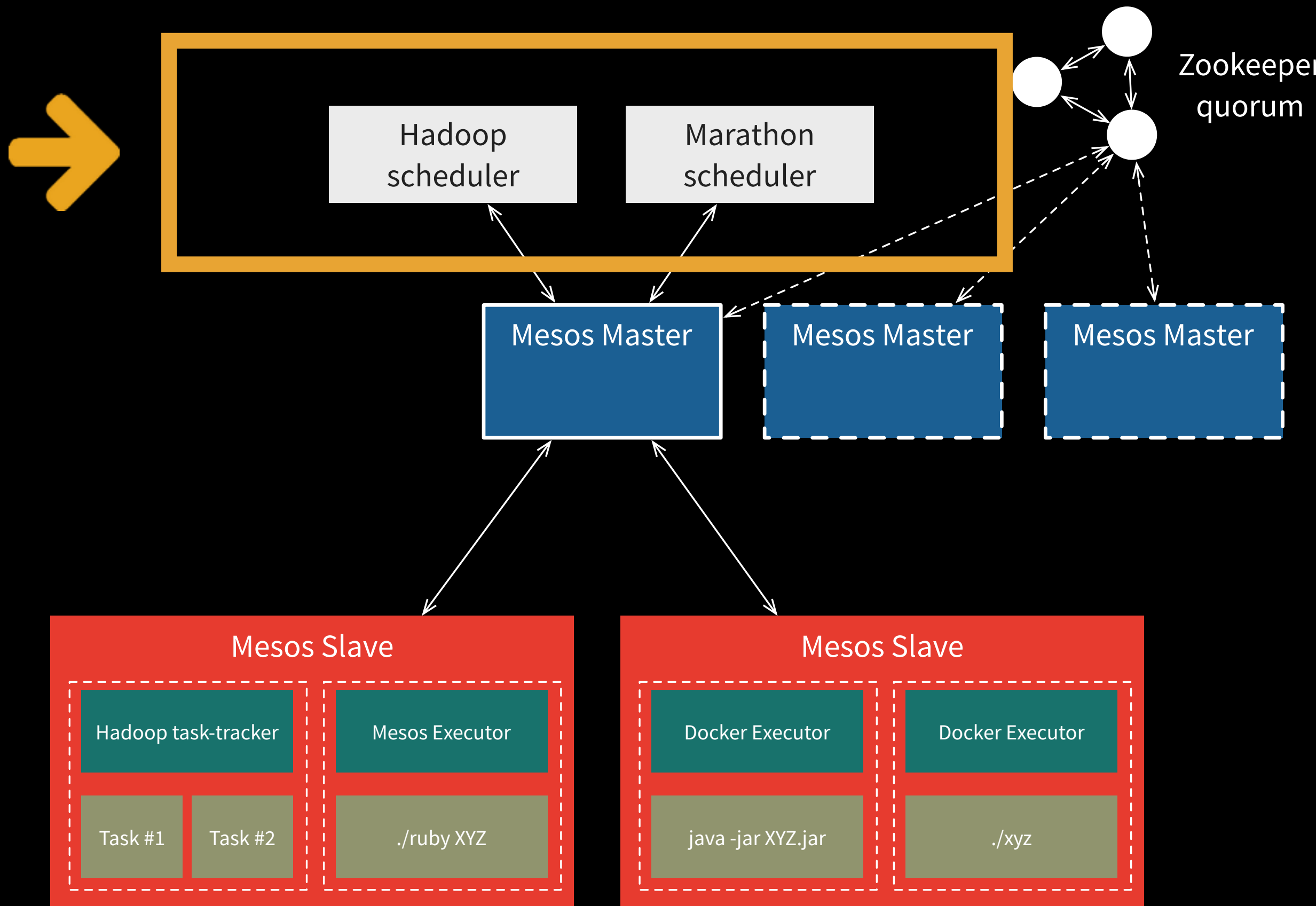
Not sharing wastes resource

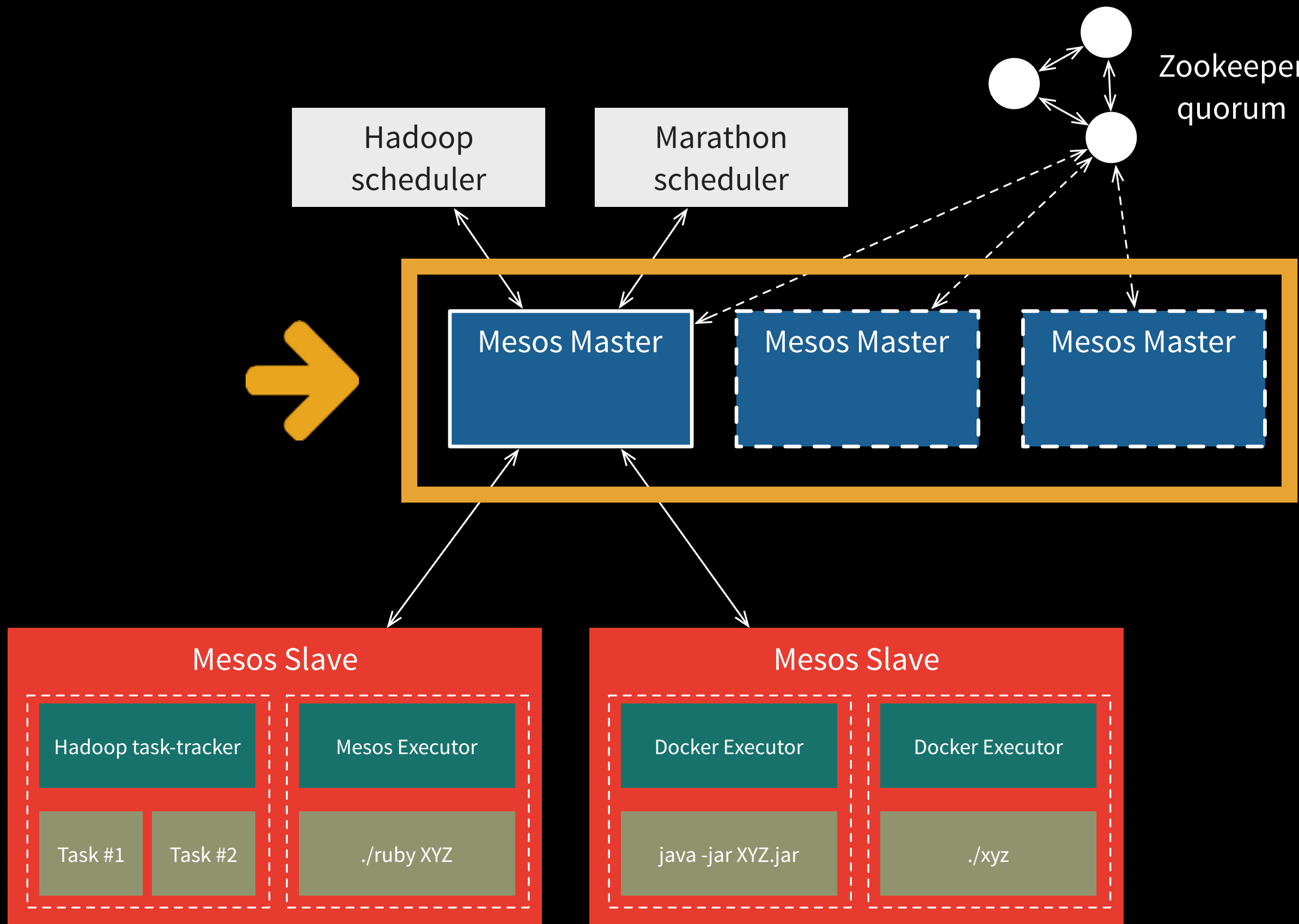


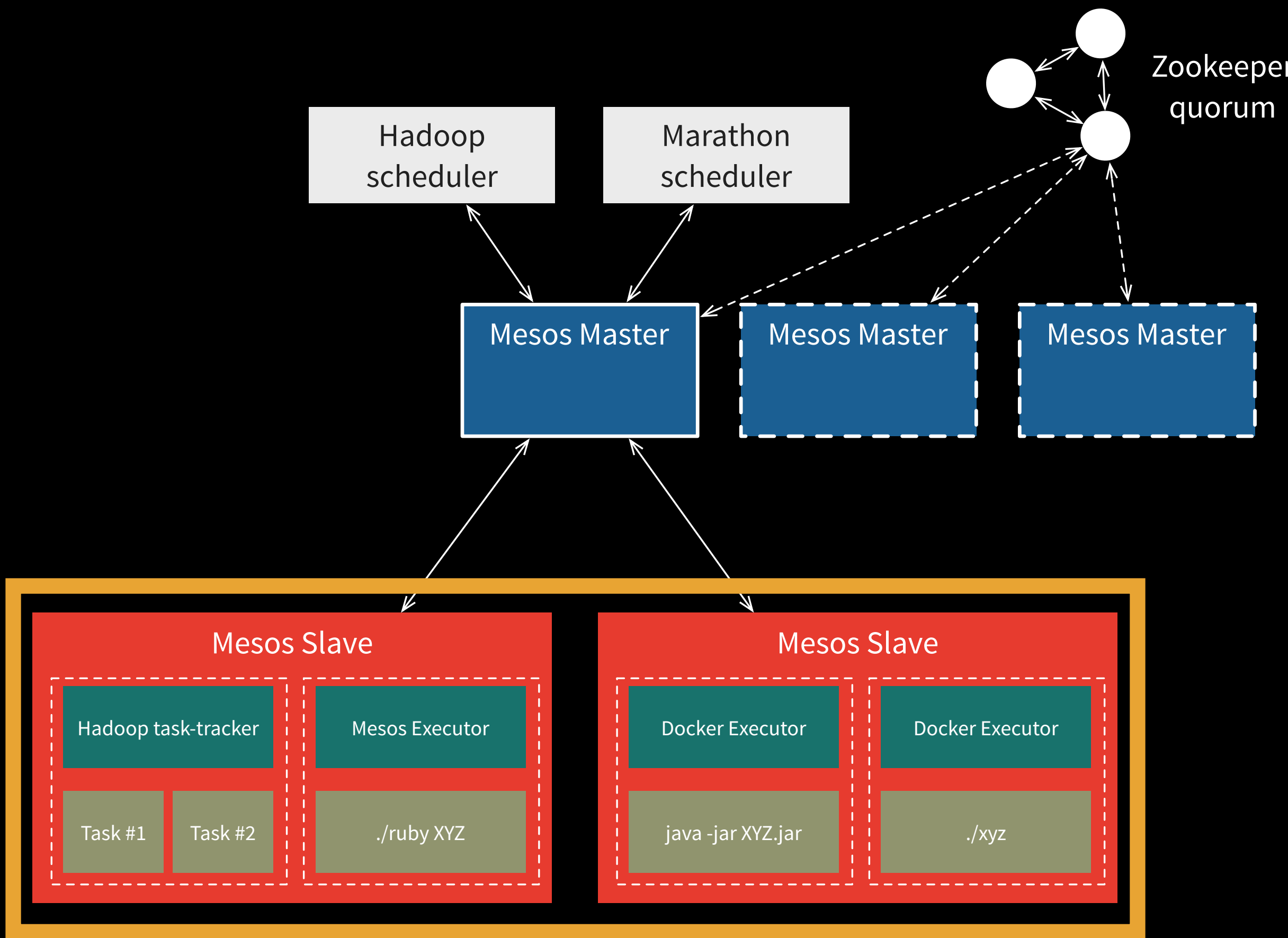
Resource sharing increases throughput and utilization



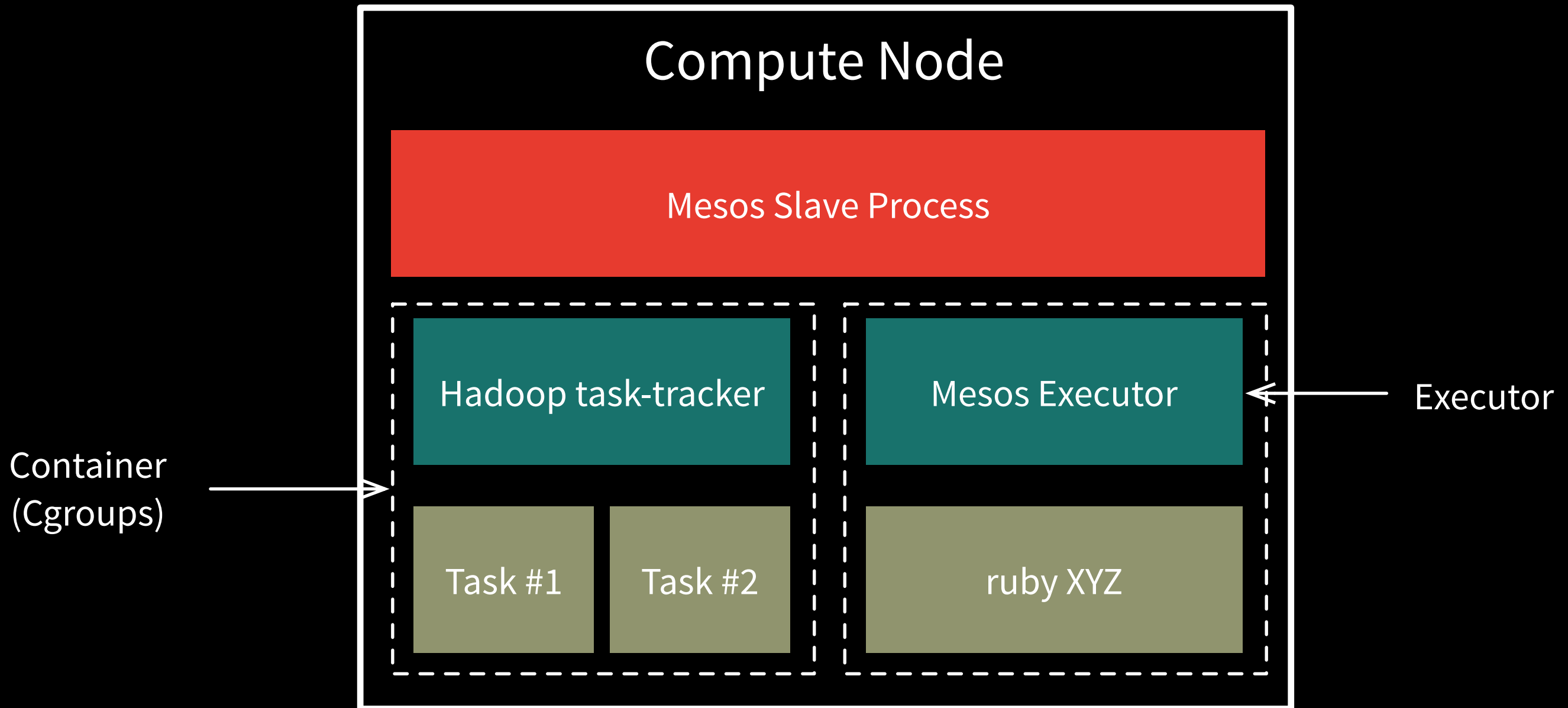




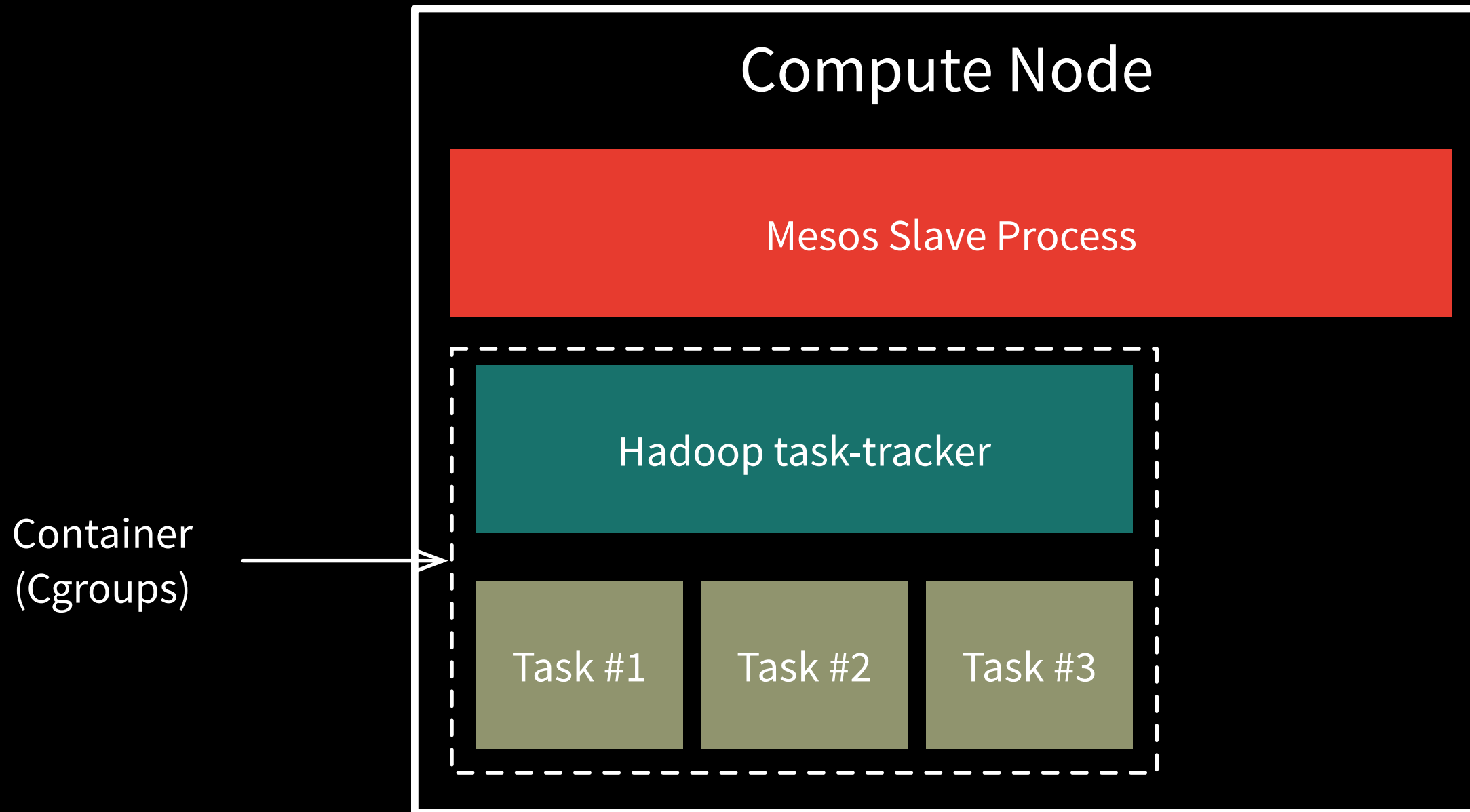




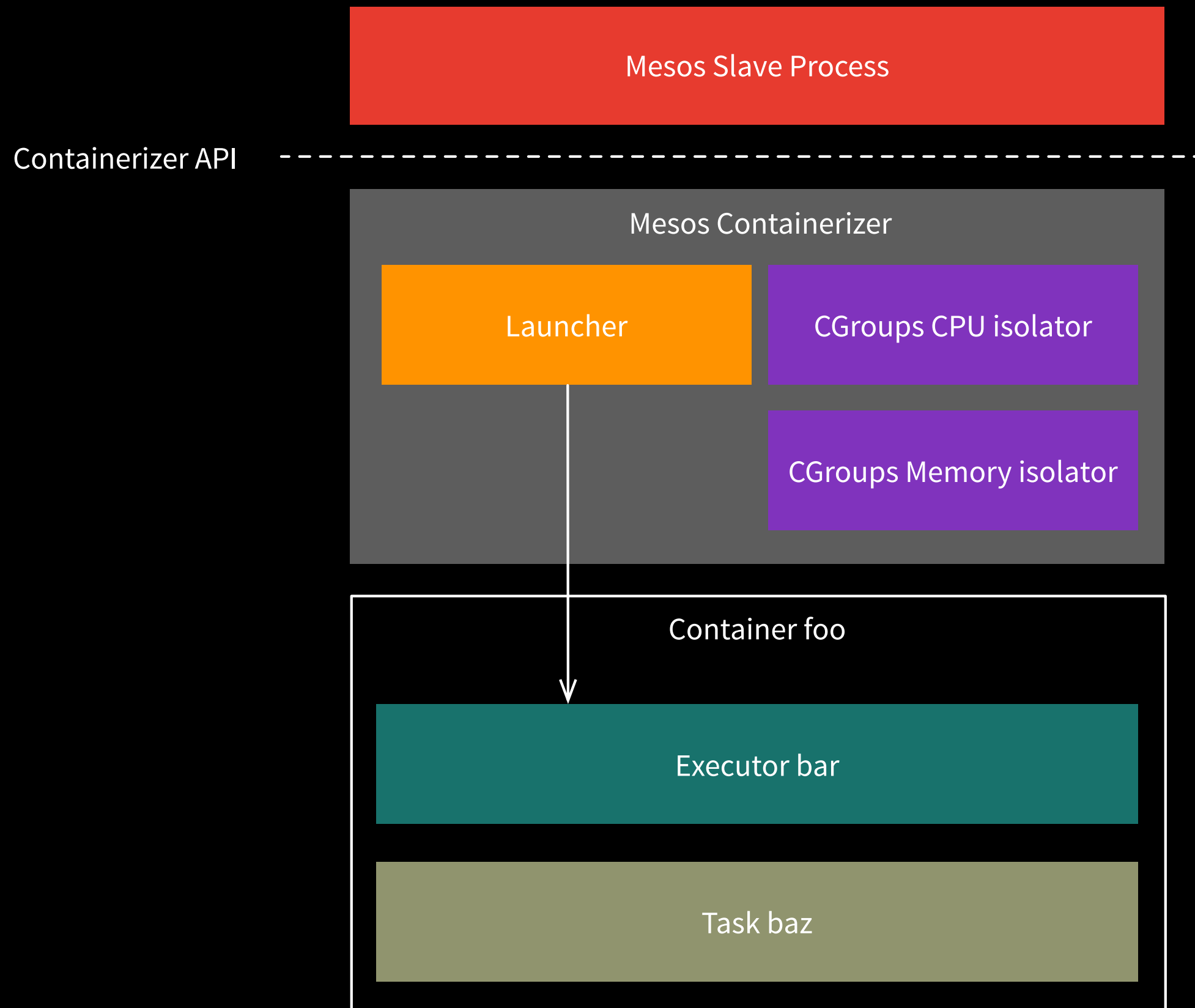
Mesos provides fine-grained resource *isolation*



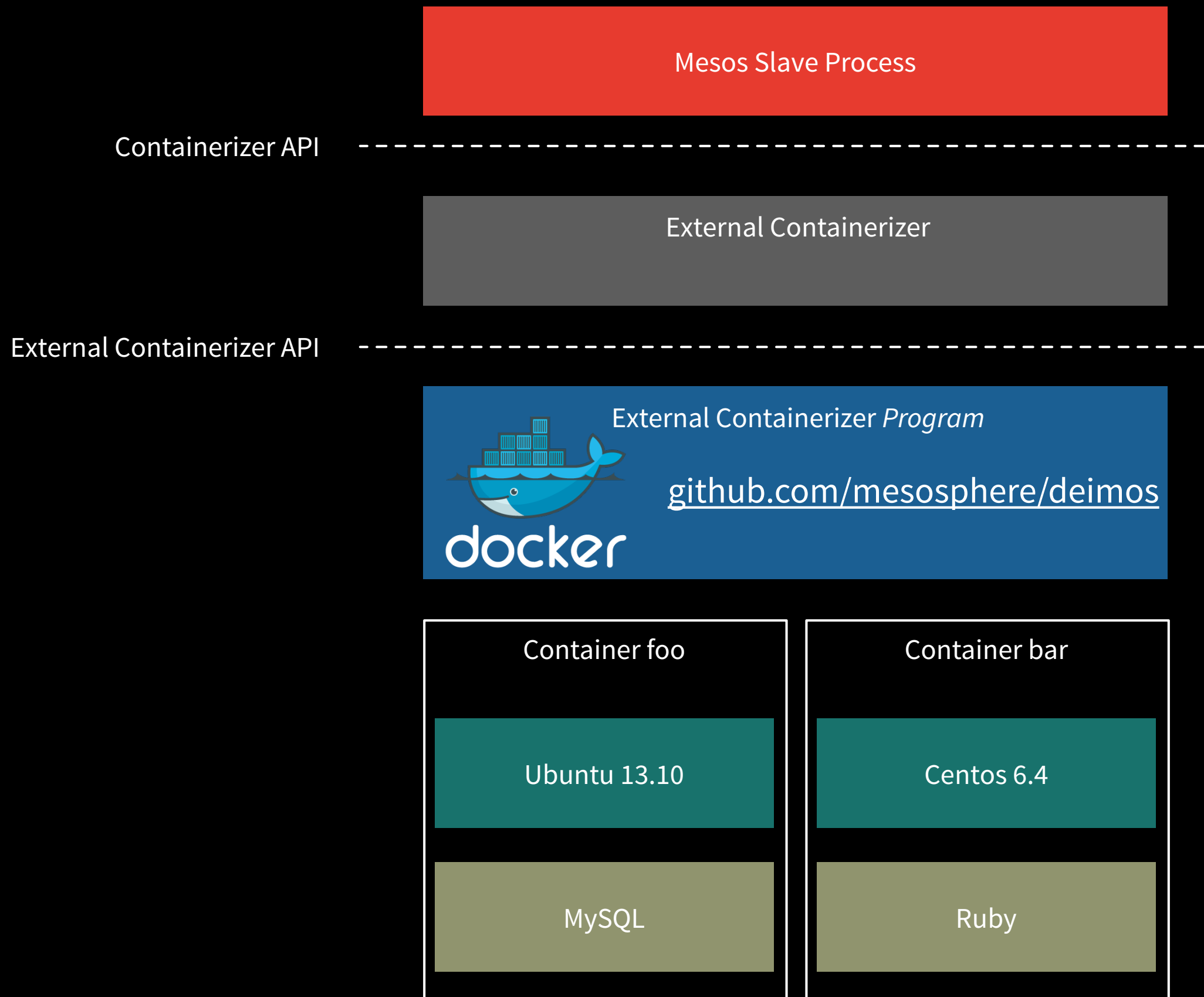
Mesos provides fine-grained resource *isolation*



Mesos provides componentized resource *isolation*



Mesos provides *pluggable* resource *isolation*



Memememmeme!?!#%!



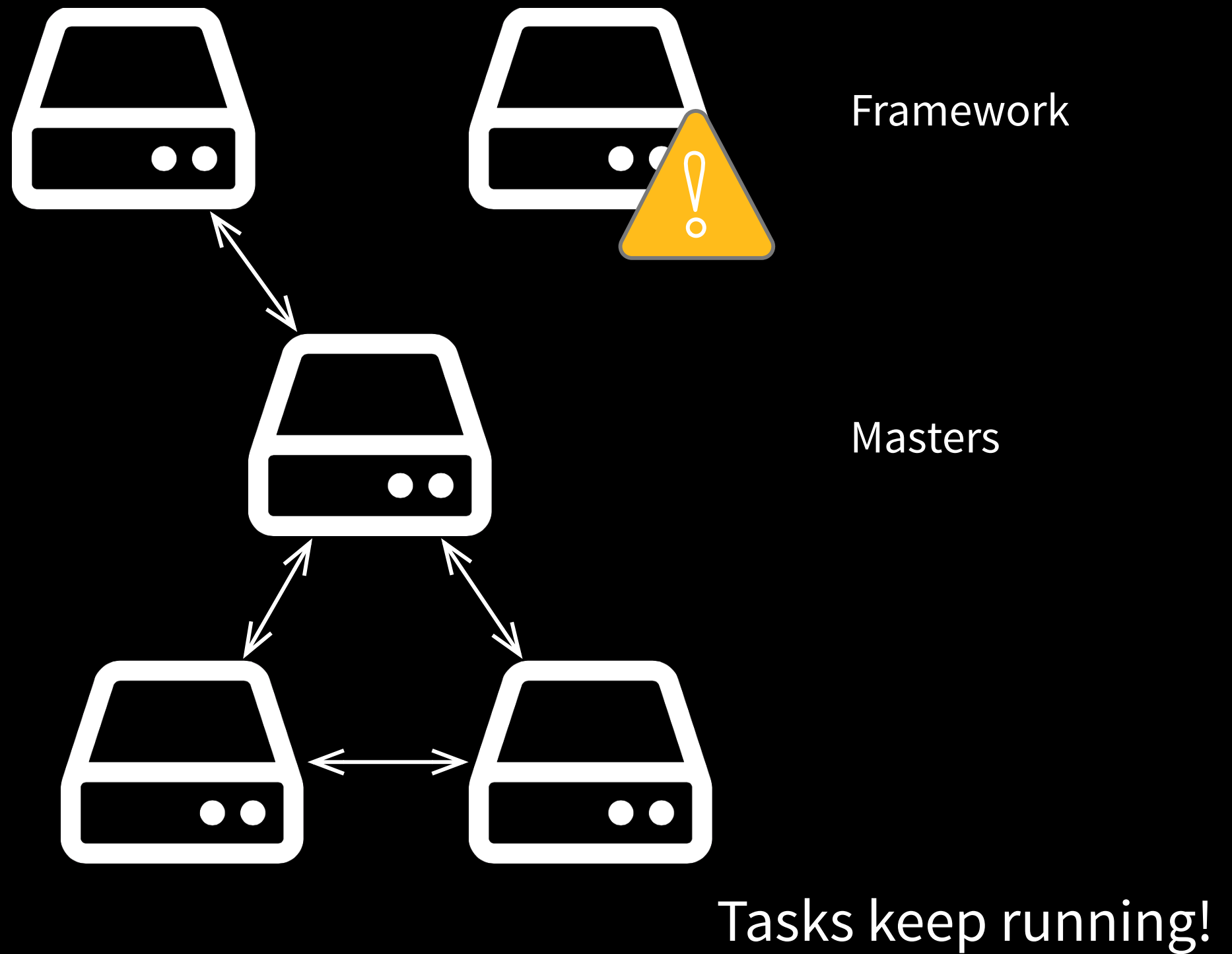
“

Everything fails all the time

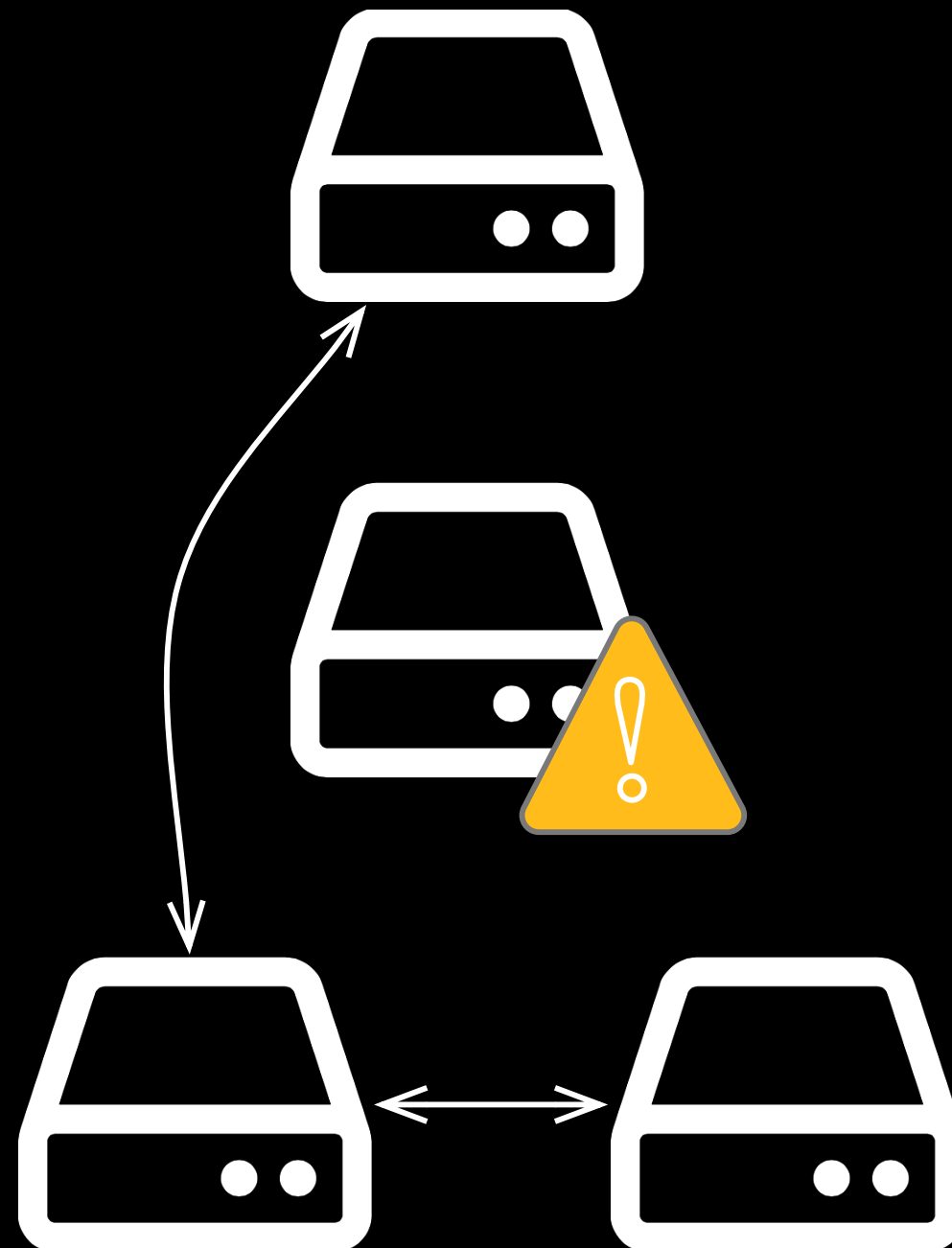
Werner Vogels (Amazon CTO)

”

Mesos has no single point of failure



Master node can fail-over

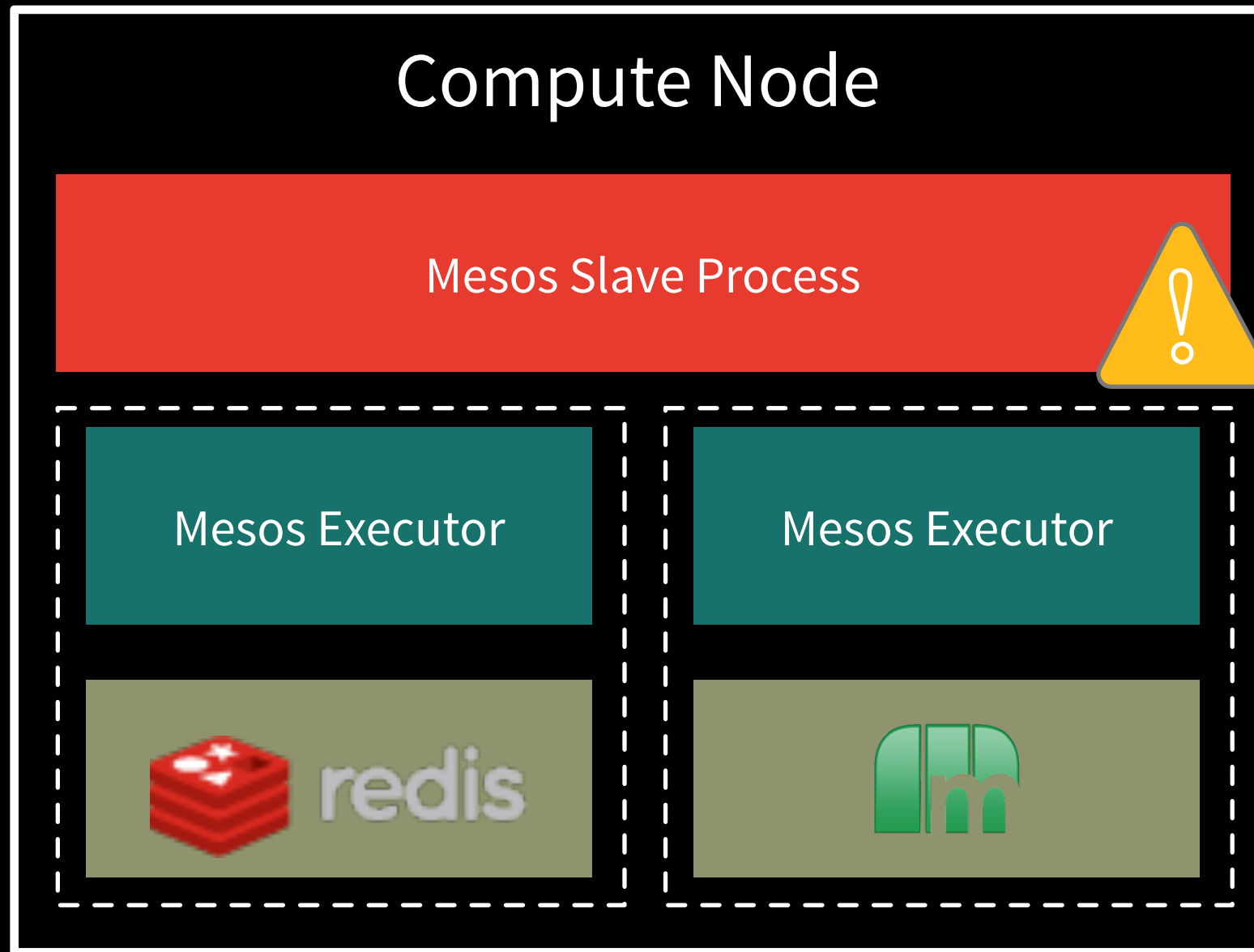


Framework

Masters

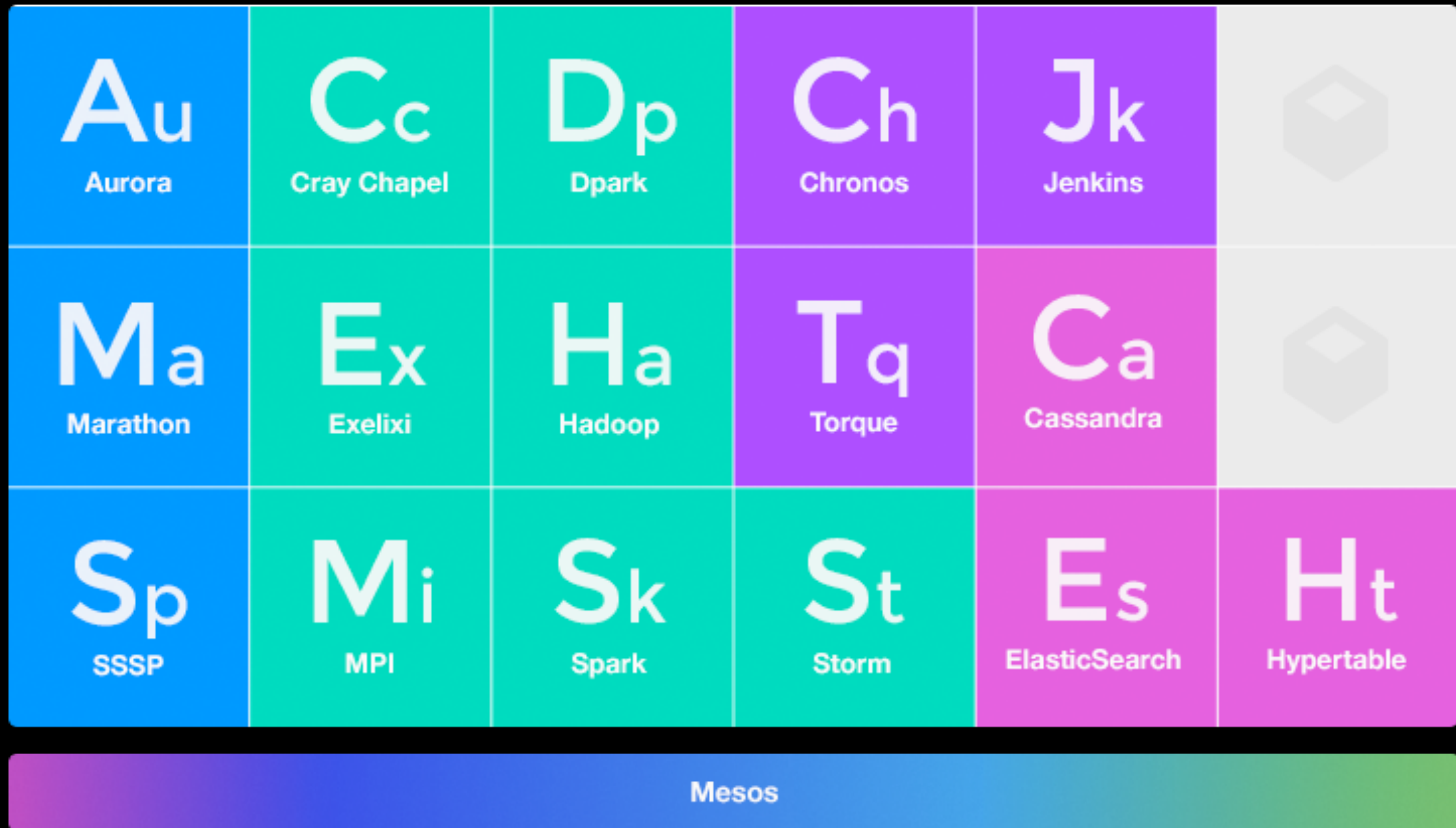
Tasks keep running!

Slave processes can fail-over



Tasks keep running!

The Mesos ecosystem is growing



Chronos: Distributed cron with dependencies

CHRONOS

hostings

256
TOTAL JOBS

16
FAILED JOBS

Dependency Graph

New Job

NAME	GRAPH	LAST
create_airbed_dump_table_hostings		success
create_airbed3_dump_table-hostings_first...		success
create_airbed_dump_table_hostings_with_...		success
create_airbed_dump_table_collection_host...		success
create_omg_table-affiliate_events_hostings		success
hostings_summary		success
daily_gibson-import_airbed3_hostings		success
db_export-airbed_hostings		success
hostings_summary_2_quality_score		success
hostings_summary_1_pre		success
hostings_impressions_normalize		success
hostings_impressions_normalize_prepare		success
daily-update_hostings_summary_history		success
hostings_earnings_summary#async		success
daily-create_hostings_history		success
daily-update_hostings_history		success
daily-create hostings summary history		success

Create Cancel

NAME
Steve_Jobs

COMMAND
echo 'F00' >> /tmp/steve.txt

PARENTS
Choose parents...

OWNER
ateam@airbnb.com

SCHEDULE
R / 2013-03-15 T 11:44:03 Z/ P T24H

EPSILON
PT15M

EXECUTOR
/custom/execut

NAME
daily_gibson-default_data_cooked_table_import

COMMAND

March 2013

Sun	Mon	Tue	Wed	Thu	Fri	Sat
24	25	26	27	28	1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
31	1	2	3	4	5	6

Today Clear

Marathon: init.d for your data center

MARATHON /

ID ▼

+ NEW

CPU's Instances

New Application

ID	<input type="text" value="Hello"/>	
COMMAND	<input type="text" value="/Hello-*/bin/hello -Dhttp.port=\$PORT"/>	
CPU'S	<input type="text" value="1"/>	
MEMORY (MB)	<input type="text" value="512"/>	
INSTANCES	<input type="text" value="1"/>	
URIS	<input type="text" value="http://downloads.mesosphere.io/tutorials/PlayHello.zip"/>	

CANCEL CREATE

Build your own framework



Mesos-related Github projects





Great, but who is
using Mesos?



airbnb™

ebay

vimeo



HubSpot



shopify

ignidata
igniting business with data

xogito
...radical thinking...

PayPal™

DueDil

Atlassian

CLOUD
PHYSICS

device
scape

mesosphere

HubSpot



“

HubSpot deploys 300 times a day on a minimal number of server instances by using Apache Mesos.

Elias Torres, HubSpot VP of Engineering

”



Developers get immediate access to cluster resources



Hardware failures are more transparent



Scheduled tasks are not tied to a single server



Improved utilization

airbnb™



“

Ideally, [the idea is to] make it so a smaller number of engineers can have higher impact through automation on Mesos

Mike Curtis, Airbnb VP Engineering

”



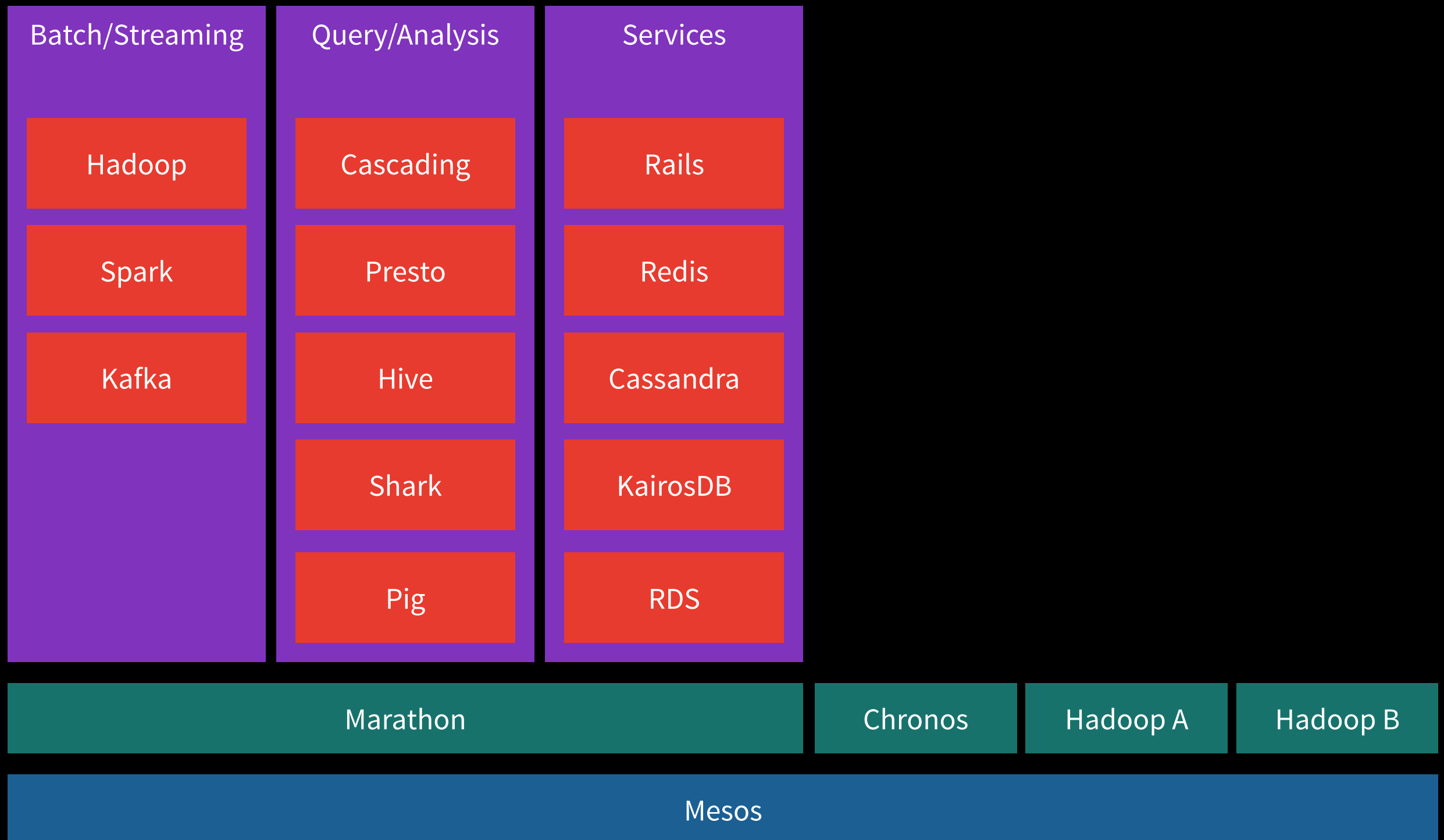
Mesos enables multi-tenant clusters

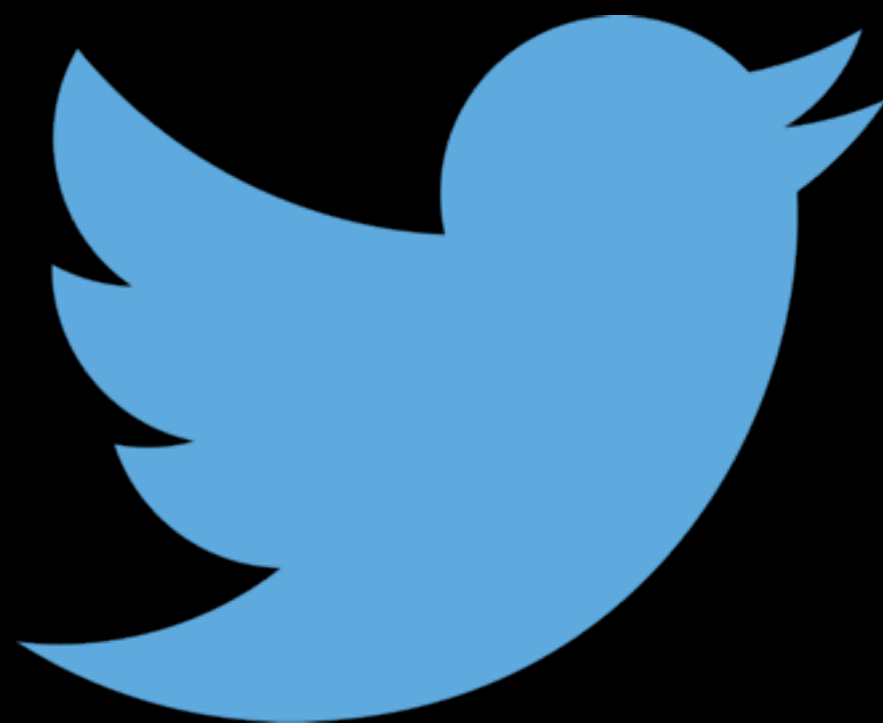


Small teams can move fast



AWS-based infrastructure
beyond just Hadoop







240 million monthly active users

500 million tweets per day

Up to 150k tweets per second

More than 100TB per day of compressed data

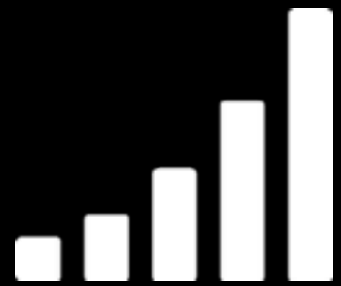


“

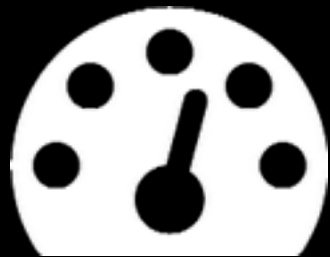
Mesos is the cornerstone of our elastic compute infrastructure -- it's how we build all our new services and is critical for Twitter's continued success at scale. It's one of the primary keys to our data center efficiency.

Chris Fry, SVP of Engineering at Twitter

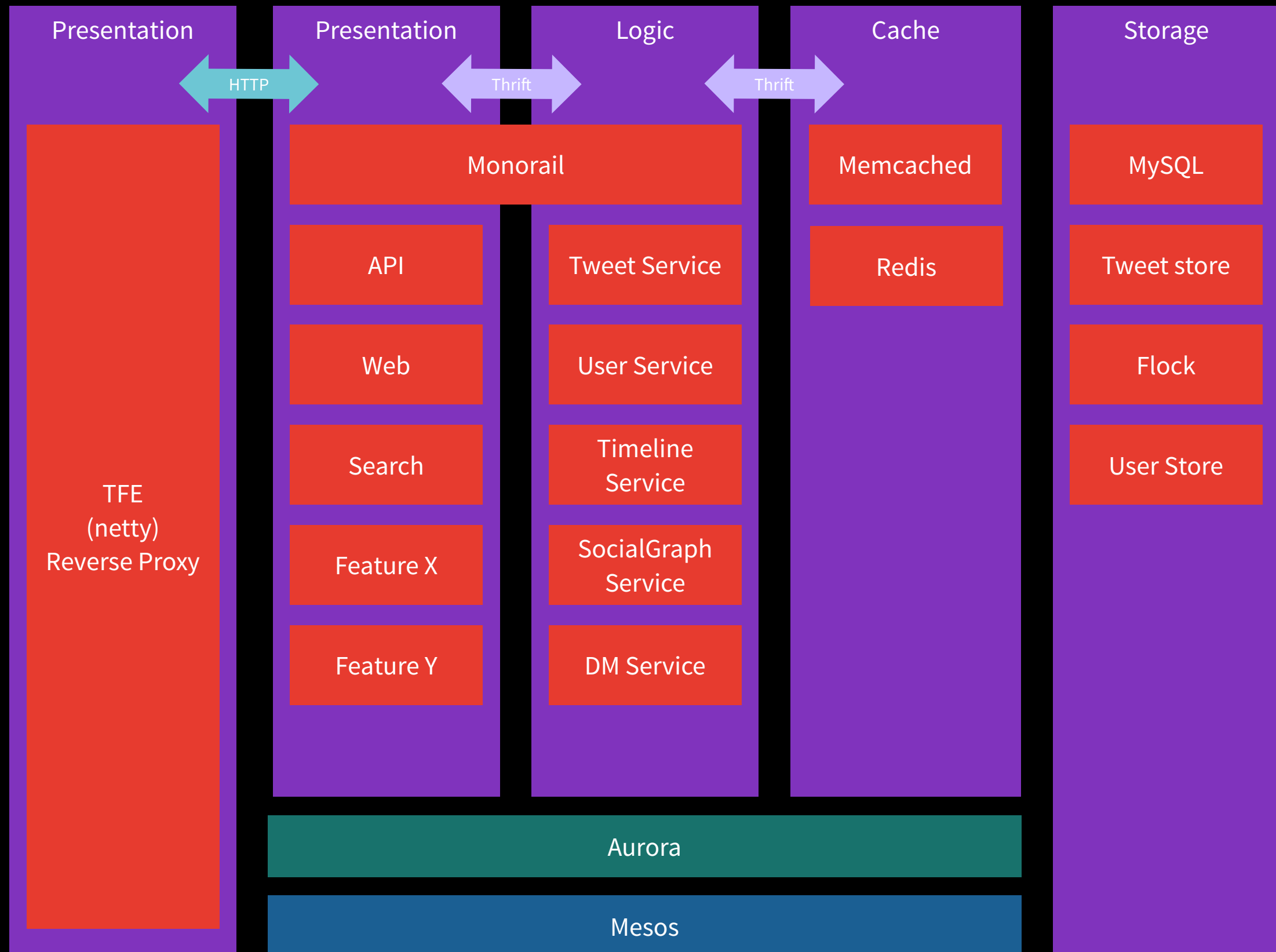
”



Mesos allow services to scale



Engineers think about resources, not machines



Fin



Come talk to us!



<http://mesos.apache.org>

user@, dev@mesos.apache.org

<https://github.com/apache/mesos/>

Get Mesos packages: <http://mesosphere.io/downloads>



Get Started

Tutorials

Apps

Tools

Developer Resources

Start using Apache Mesos

1. Install pre-reqs



2. Install Mesos Package



3. Reboot!

Choose an OS



Get Started

The screenshot shows the Mesos Dashboard with a navigation bar at the top containing 'Mesos', 'Dashboard', 'Frameworks', and 'Slaves'. Below the navigation bar, there's a section for the current cluster with the following details:

- Master:** 201311011754-1593144330-5050-787
- Cluster:** (Unnamed)
- Server:** 10.116.245.94:5050
- Built:** a week ago by root
- Started:** 38 minutes ago

Below this information, there's a 'LOG' link. To the right, there's a section titled 'Active Frameworks' with a '(see all)' link. Below this, there's a table with the following columns: ID, User, Name, and Active Tasks. The table is currently empty. Below the table, there's a section titled 'Terminated Frameworks'.



Apache Spark on Mesos

⌚ 30 minutes 📋 17 steps

Spark is a fast and general-purpose cluster computing system which makes parallel jobs easy to write. This tutorial shows you how to run Spark on Mesos.

You'll need:

[A Mesos Cluster](#) [Spark](#) [Apache Mesos](#)

Come talk to us!



<http://mesos.apache.org>

user@, dev@mesos.apache.org

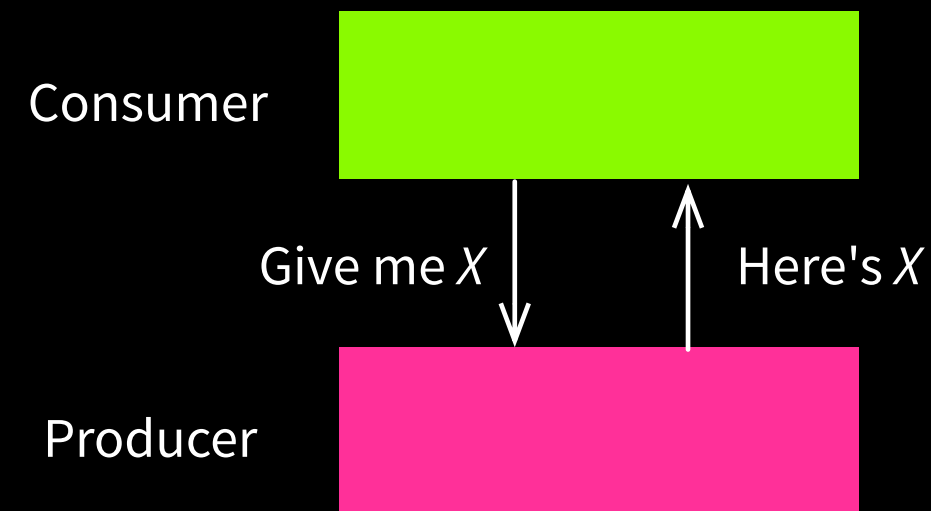
<https://github.com/apache/mesos/>

Get Mesos packages: <http://mesosphere.io/downloads>



Mesos provides resource sharing with *resource offers*

Request based allocation



2-step allocation

