Getting Started with Mesos

Arun Gupta, @arungupta
VP Developer Advocacy, Couchbase

Couchbase

O'REILLY®

Minecraft Modding with Forge

A FAMILY-FRIENDLY GUIDE TO BUILDING FUN MODS IN JAVA
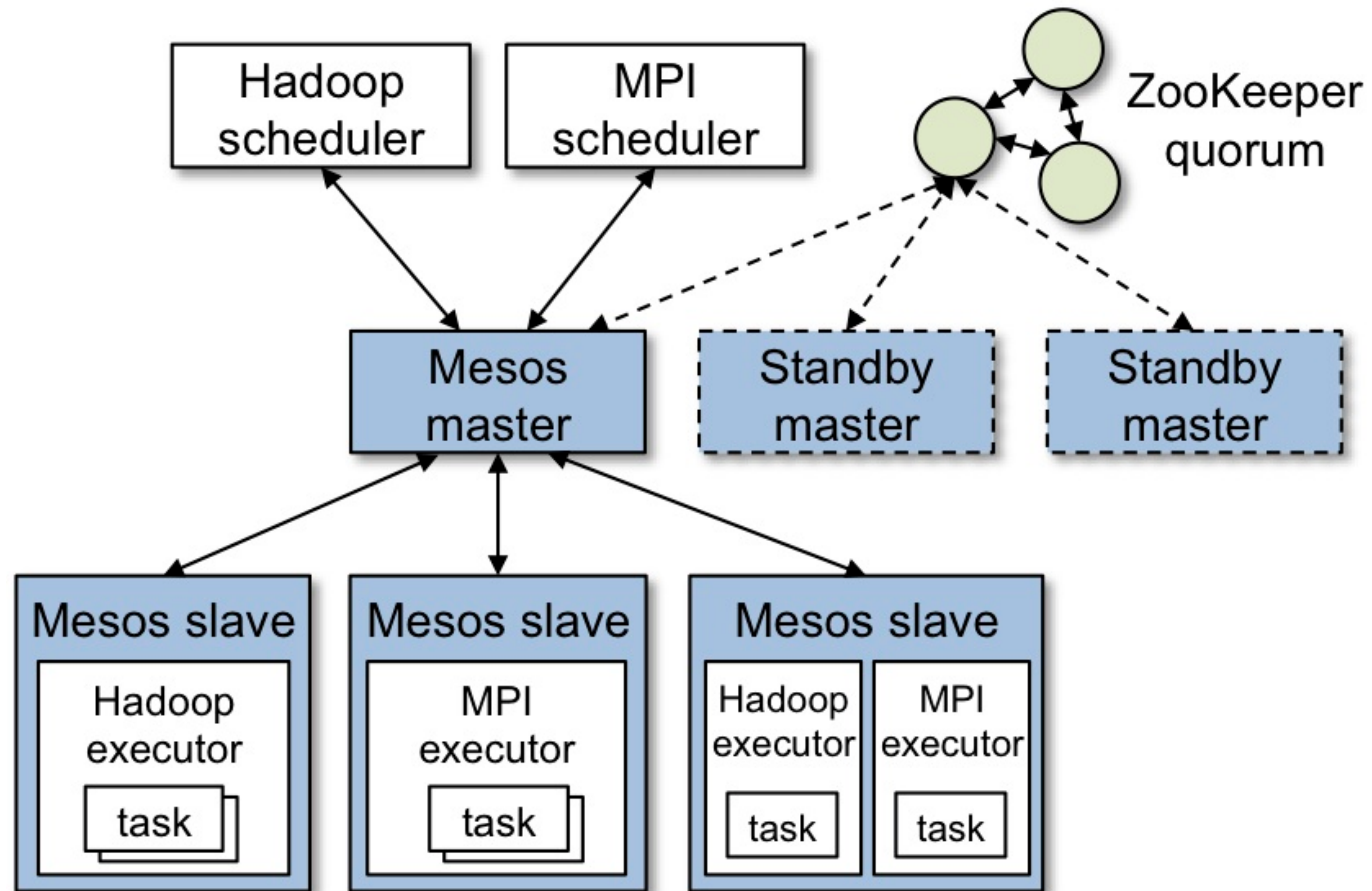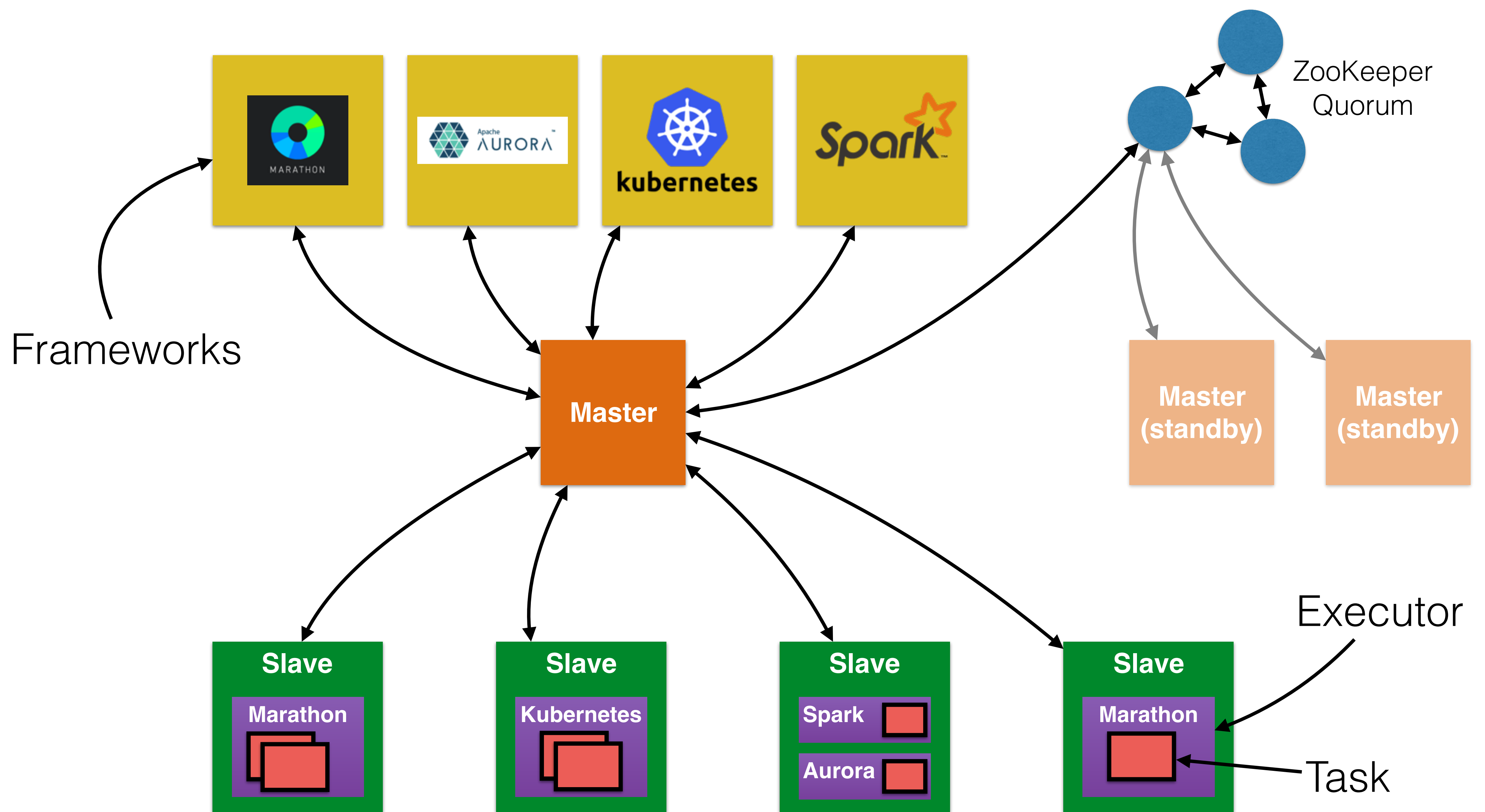
Arun Gupta & Aditya Gupta
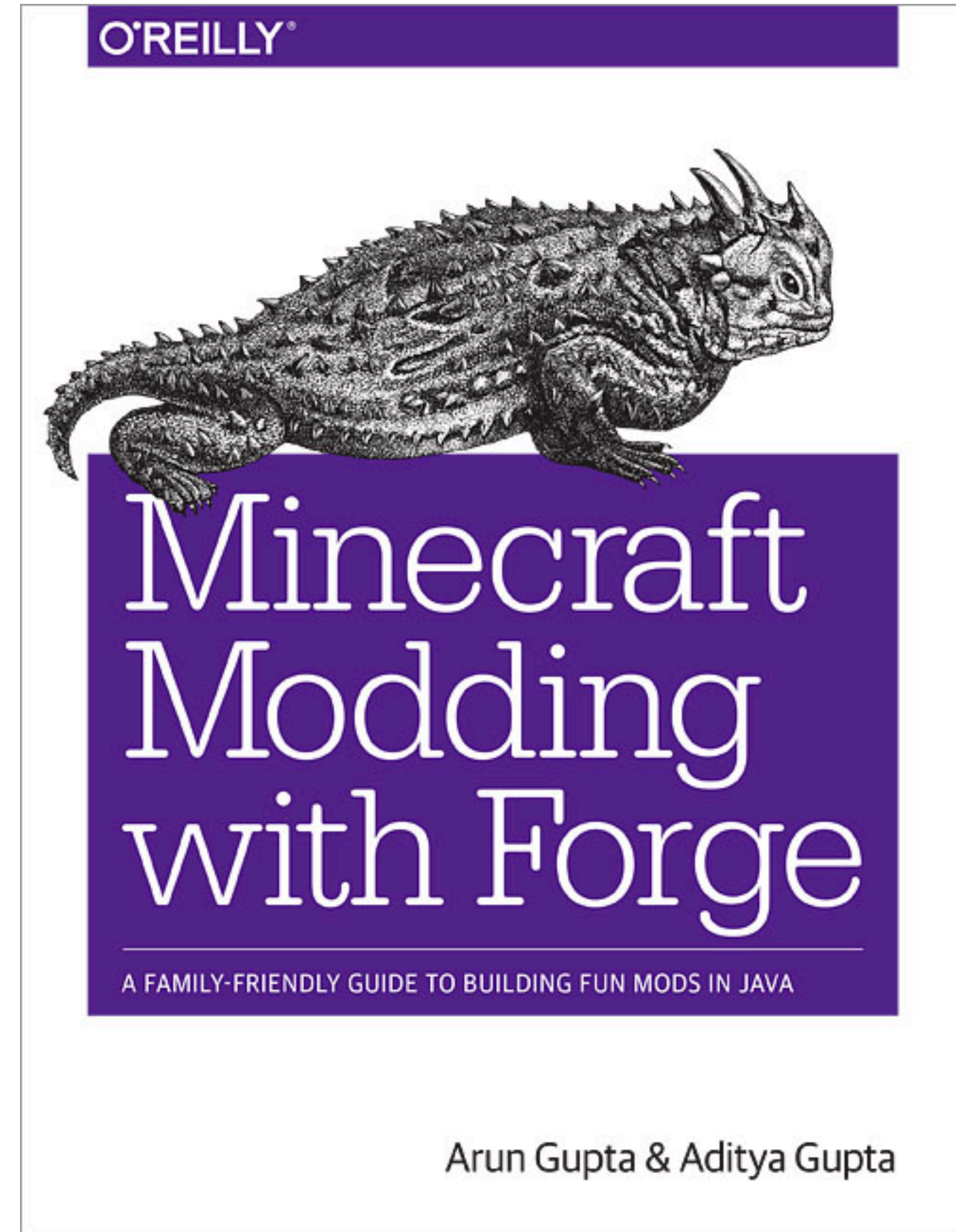
Mesos

- Open source cluster manager

- Developed at UC Berkeley

- Provides resource isolation and sharing across distributed applications

- Run distributed systems on the same pool of nodes
  - Hadoop, Spark, Jenkins, Couchbase, …

- Cluster monitoring

- Tasks isolated via Linux containers

Mesos

- Master Slave architecture

- Fault tolerant
  - Leader election via ZooKeeper

- Multi platform
  - Ubuntu, Mac OS, CentOS

Mesos Architecture

http://mesos.apache.org/documentation/latest/architecture/

Frameworks

Master

ZooKeeper Quorum

Master (standby)

Master (standby)

Slave
Marathon

Slave
Kubernetes
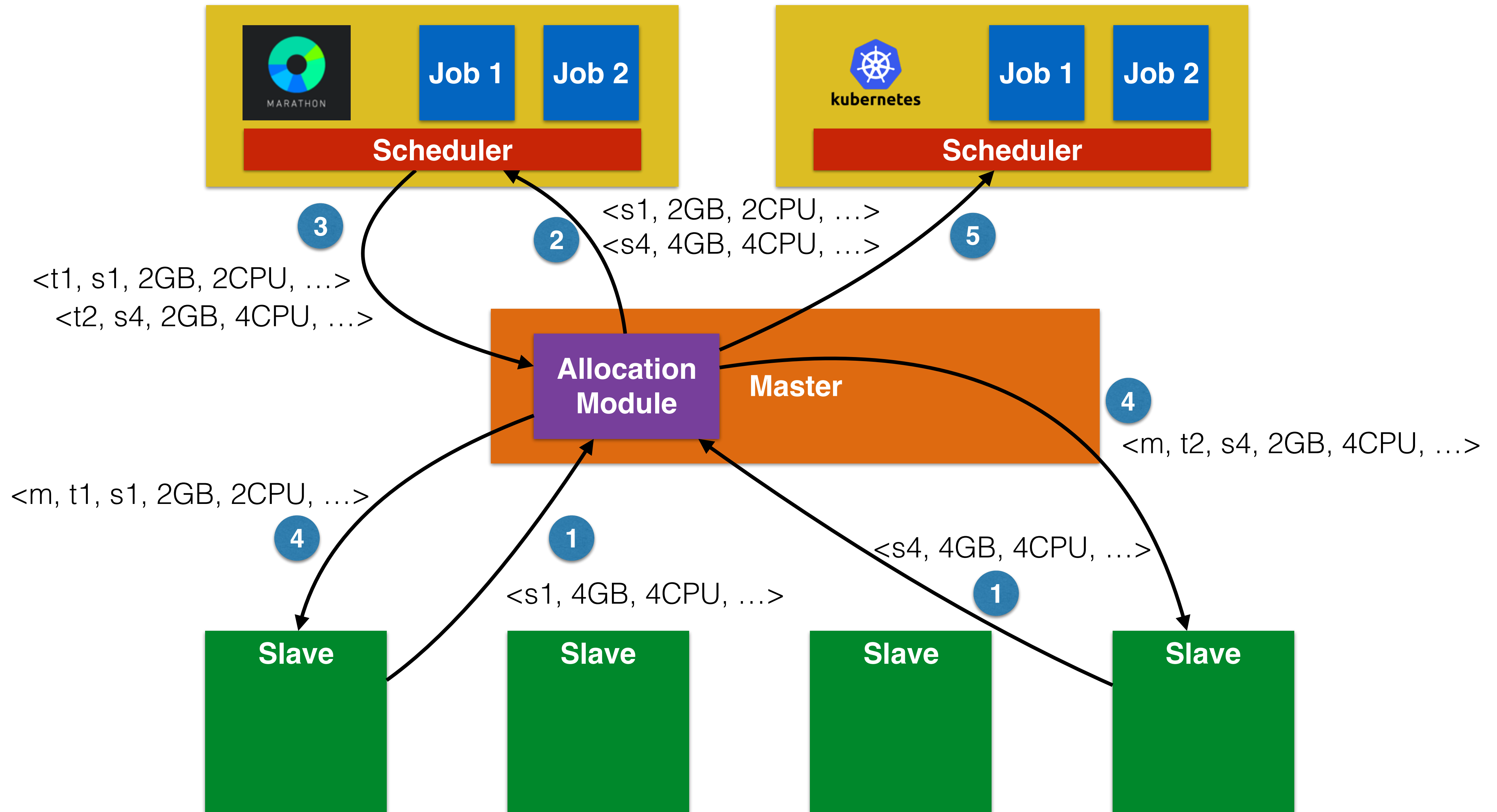
Slave
Spark
Aurora

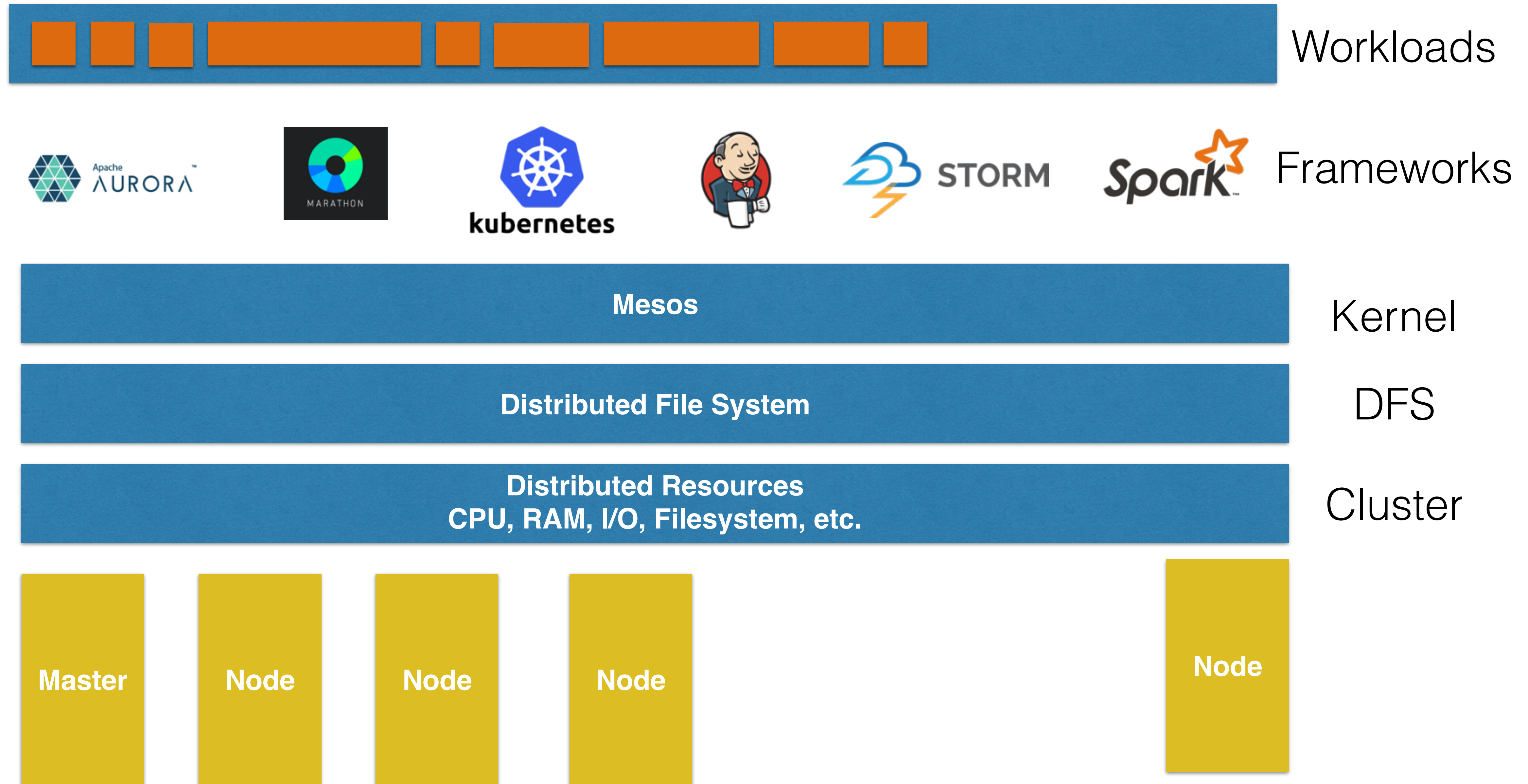Slave
Marathon

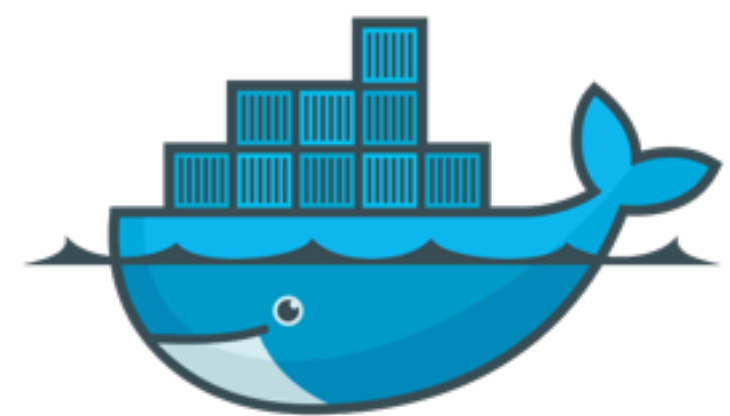Executor

Task

6

Frameworks

- Frameworks are targeted at a use case and domain-specific
  - Master node "offers" resources to each framework
  - Framework "accepts" the offer and execute applications
- Framework has "scheduler" and "executor"
  - Scheduler registers with the master for "offer"
  - Executor launched on slave nodes to run the task
    - Passes a description of the task to run

MARATHON

Job 1 **Job 2**

Scheduler

kubernetes

Job 1 **Job 2**

Scheduler

<s1, 2GB, 2CPU, …>
<s4, 4GB, 4CPU, …>

(3)

(2)

(5)

<t1, s1, 2GB, 2CPU, …>
<t2, s4, 2GB, 4CPU, …>

Allocation Module **Master**

(4)

<m, t2, s4, 2GB, 4CPU, …>

<m, t1, s1, 2GB, 2CPU, …>

(4)

(1)

<s4, 4GB, 4CPU, …>

(1)

<s1, 4GB, 4CPU, …>

Slave **Slave** **Slave** **Slave**

http://mesos.apache.org/documentation/latest/architecture/

- Built using the same principles as the Linux kernel, at a different level of abstraction
  - Computer: Data center
  - Kernel: Mesos
  - Application: Distributed application
  - Operating system: Mesos + Framework + Ecosystem

Workloads

Frameworks

Mesos

Kernel

Distributed File System

DFS

Distributed Resources
CPU, RAM, I/O, Filesystem, etc.

Cluster

Master **Node** **Node** **Node** **Node**

References

- github.com/javaee-samples/docker-java

- mesos.apache.org/

- Containers recipe: couchbase.com/containers