
Orchestration for Sysadmins
Andrea Luzzardi / Victor Vieux
Software Engineers @ docker
dockercon
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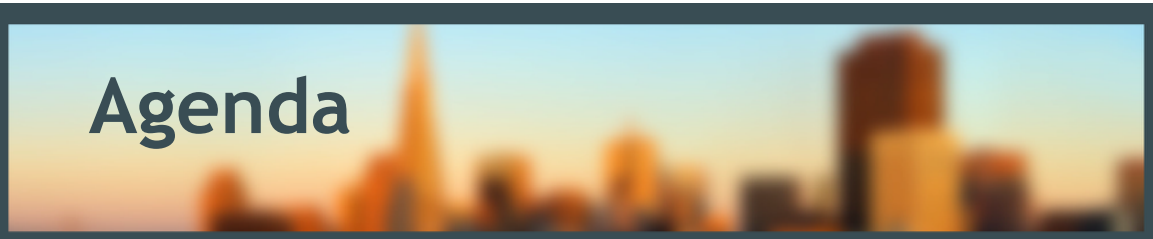
Agenda



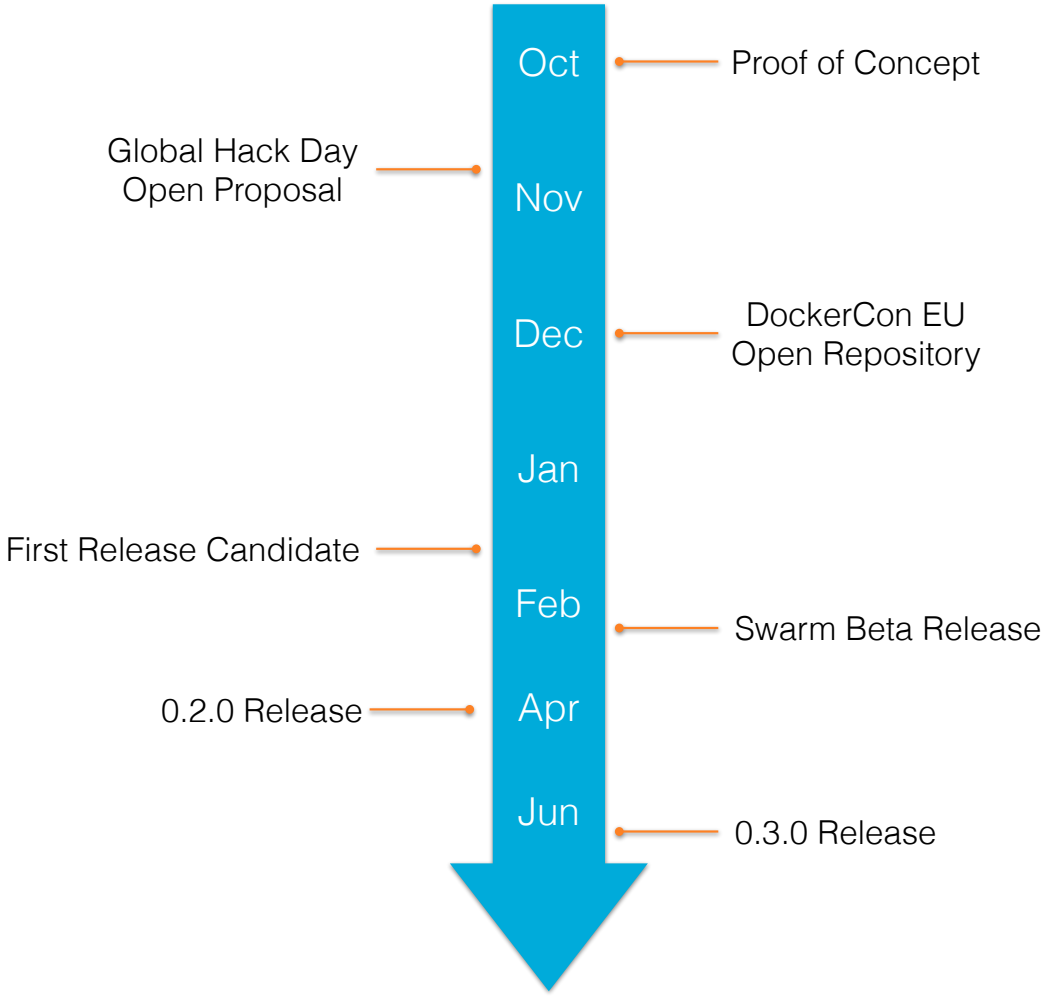
- Introduction to Docker Swarm
- Swarm Fault Tolerance: Replication
- Integrating Swarm with Mesos
- Provisioning Swarm with Docker Machine

“Running containers on multiple hosts.”

Swarm in a nutshell

- Exposes several Docker Engines as a single virtual Engine
- Serves the standard Docker API
- Extremely easy to get started
- Batteries includes but swappable

Timeline


Oct
Proof of Concept
Global Hack Day
Open Proposal
Nov
Dec
DockerCon EU
Open Repository
Jan
First Release Candidate
Feb
Swarm Beta Release
0.2.0 Release
Apr
Jun
0.3.0 Release

Setting up Swarm

- Create a cluster:
  - `$ swarm create`
- Add nodes to a cluster:
  - `$ swarm join --advertise=<node_ip> token://<token>`
- Start Swarm:
  - `$ swarm manage -H <swarm_ip> token://<token>`

Or you can use your own etcd, zookeeper or consul

Swarm Scheduler

- Resource Management
  - Memory, CPU, Network
- Fit containers
  - Apply filters to exclude nodes
  - Use a strategy to rank and pick the best node
- Scheduling Knobs
  - Constraints
  - Affinities

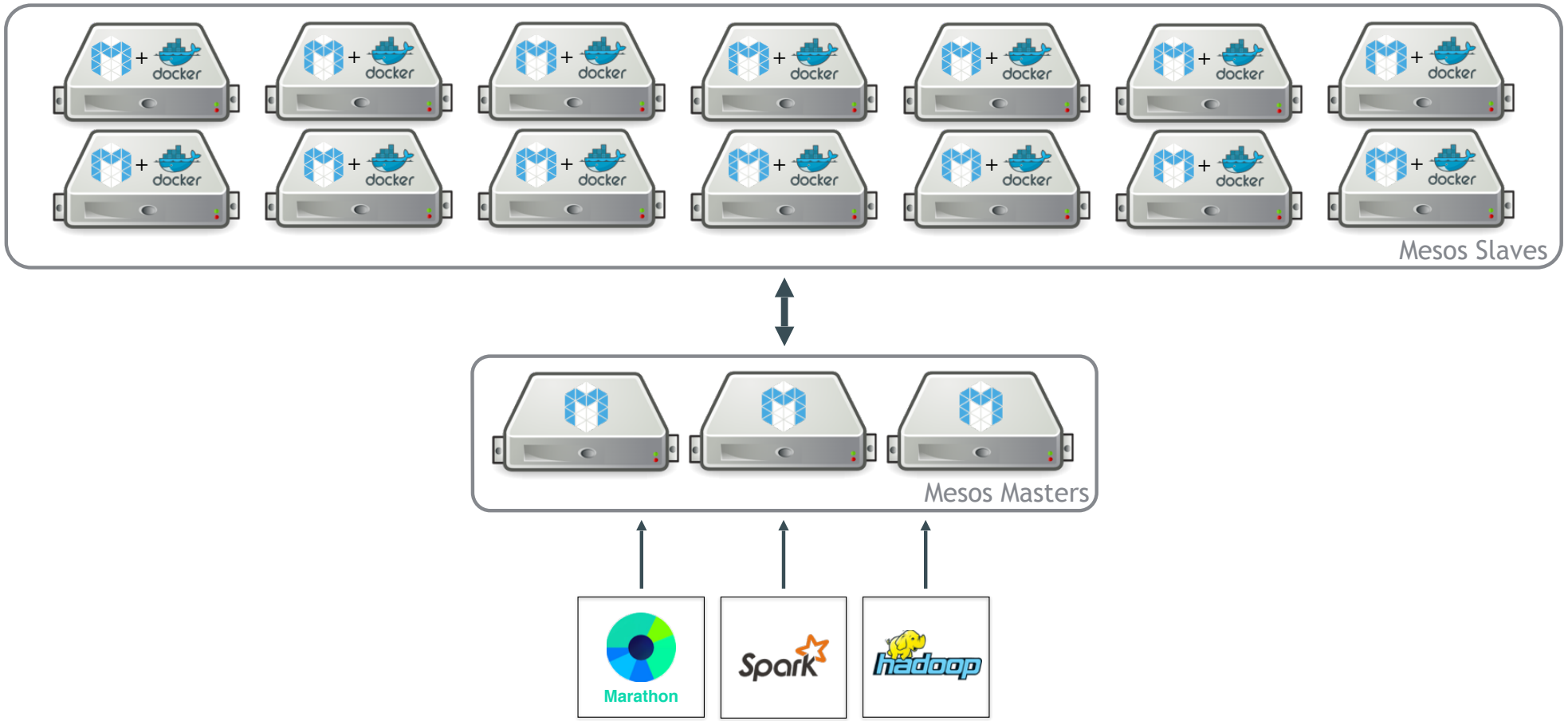
“Batteries Included but Swappable”

Docker Swarm + Mesos

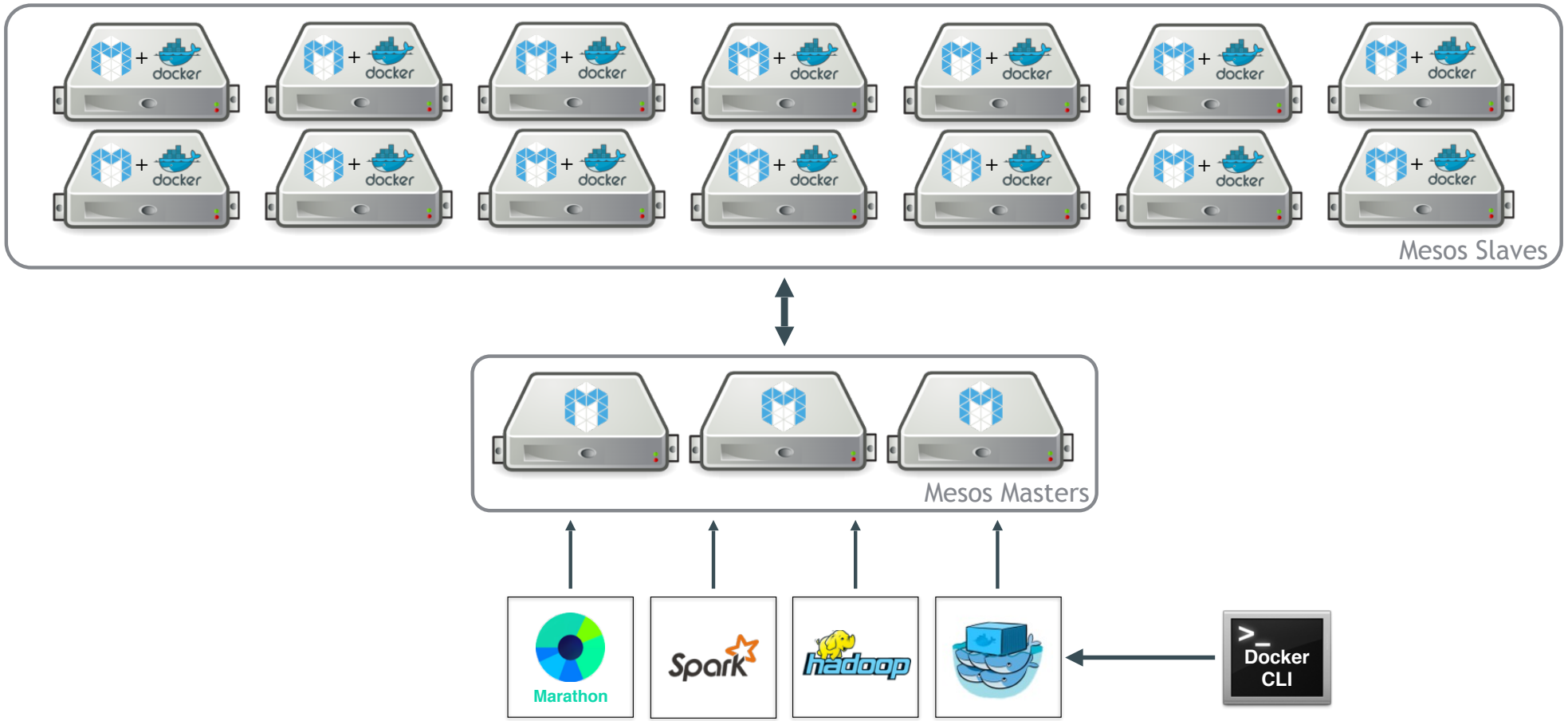
- Experimental
- Docker Swarm act as a Mesos Framework
- In collaboration with MESOSPHERE

```
$> swarm manage --cluster mesos-experimental <mesos_master_url>
```

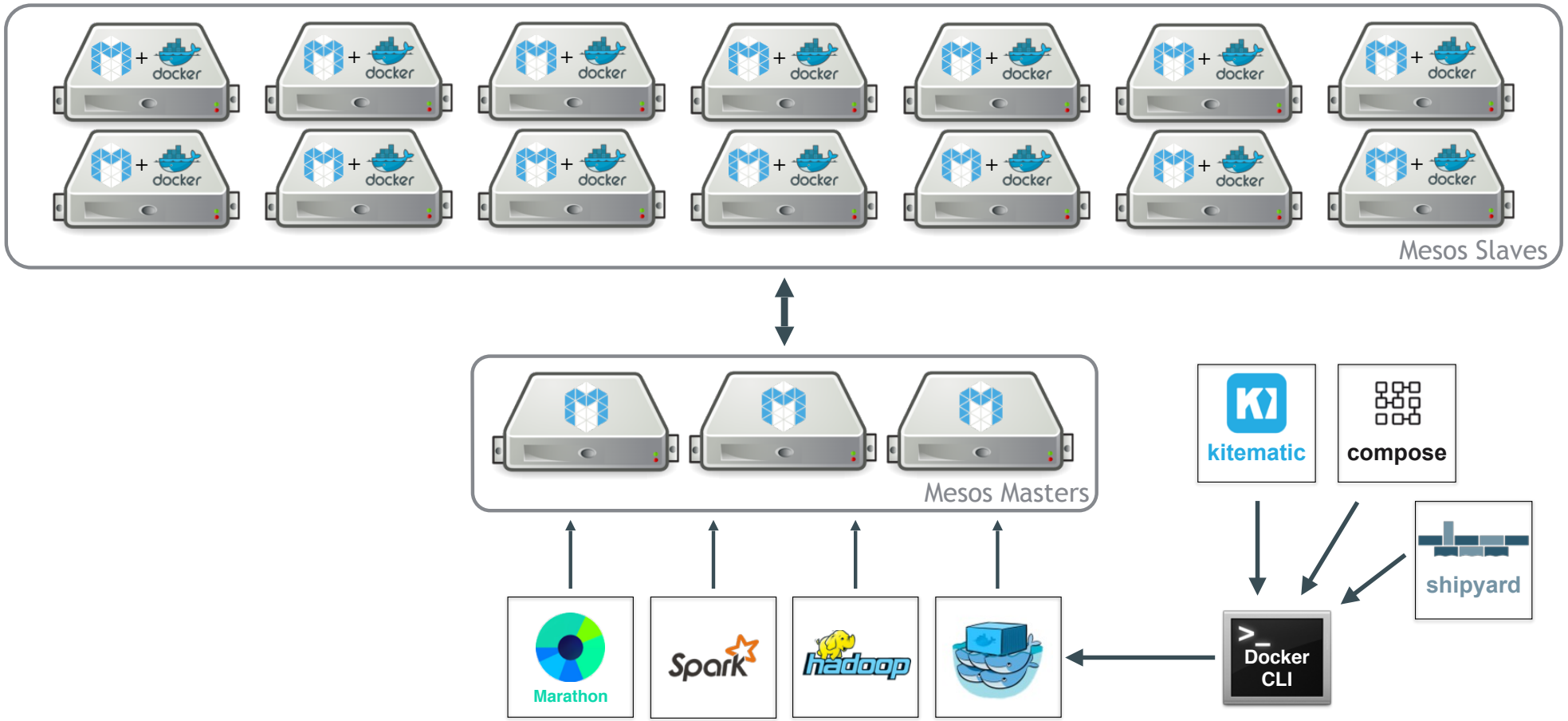
Mesos Cluster

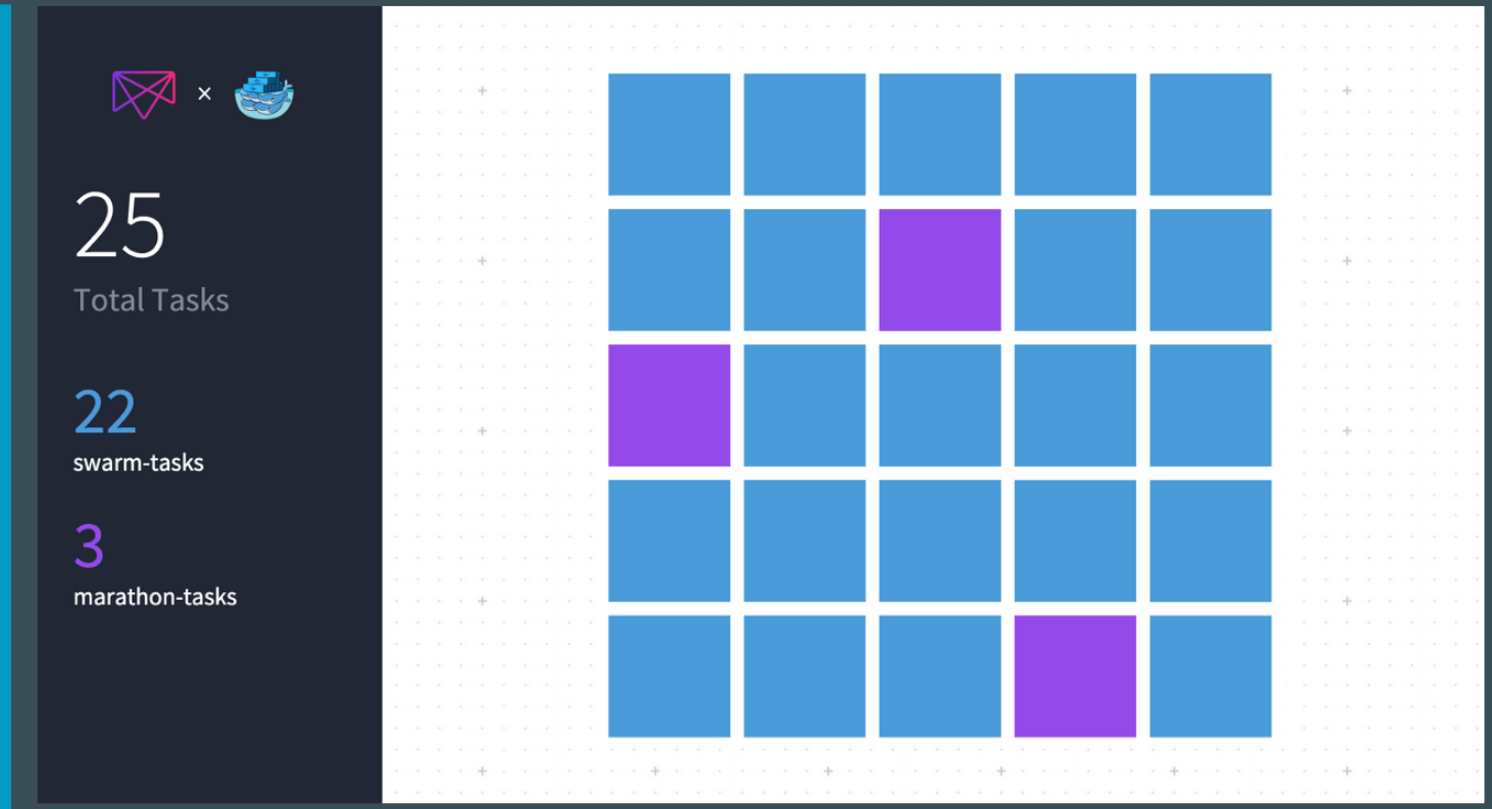


Mesos Cluster + Docker Swarm



Mesos Cluster + Docker Swarm



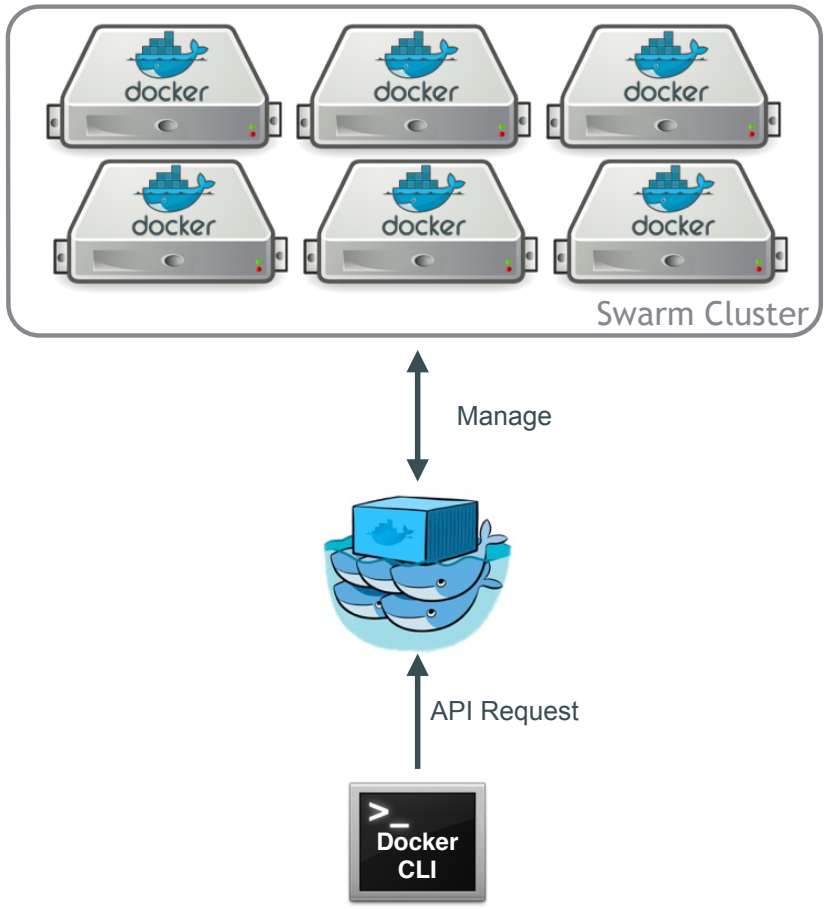


BY MESOSPHERE

Swarm Manager Replication

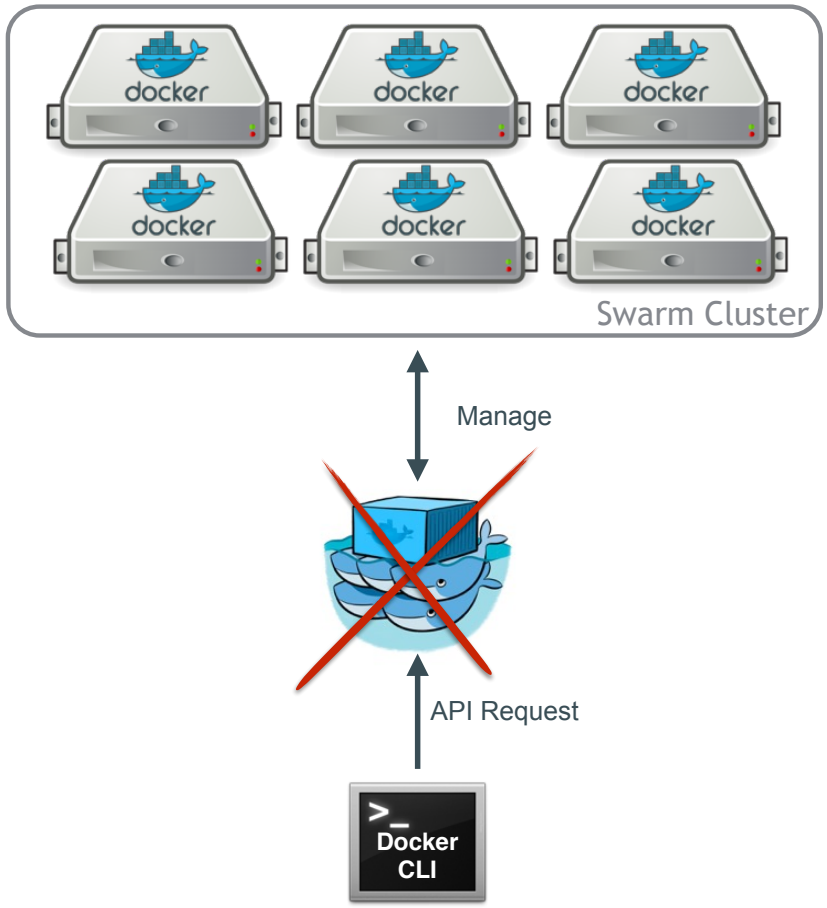
Replication

- Swarm Manager is a Single Point of Failure



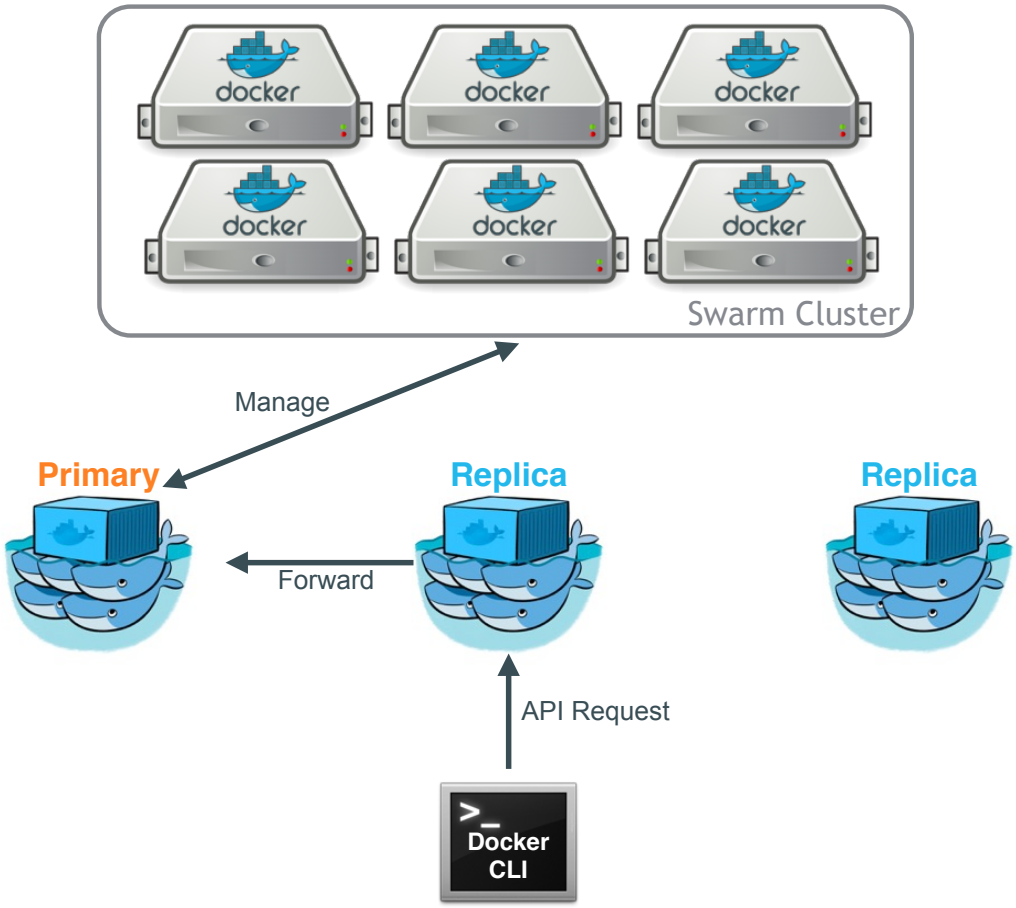
Replication

- Upon failure it becomes impossible to manage the cluster
- Cluster continues to run un-managed



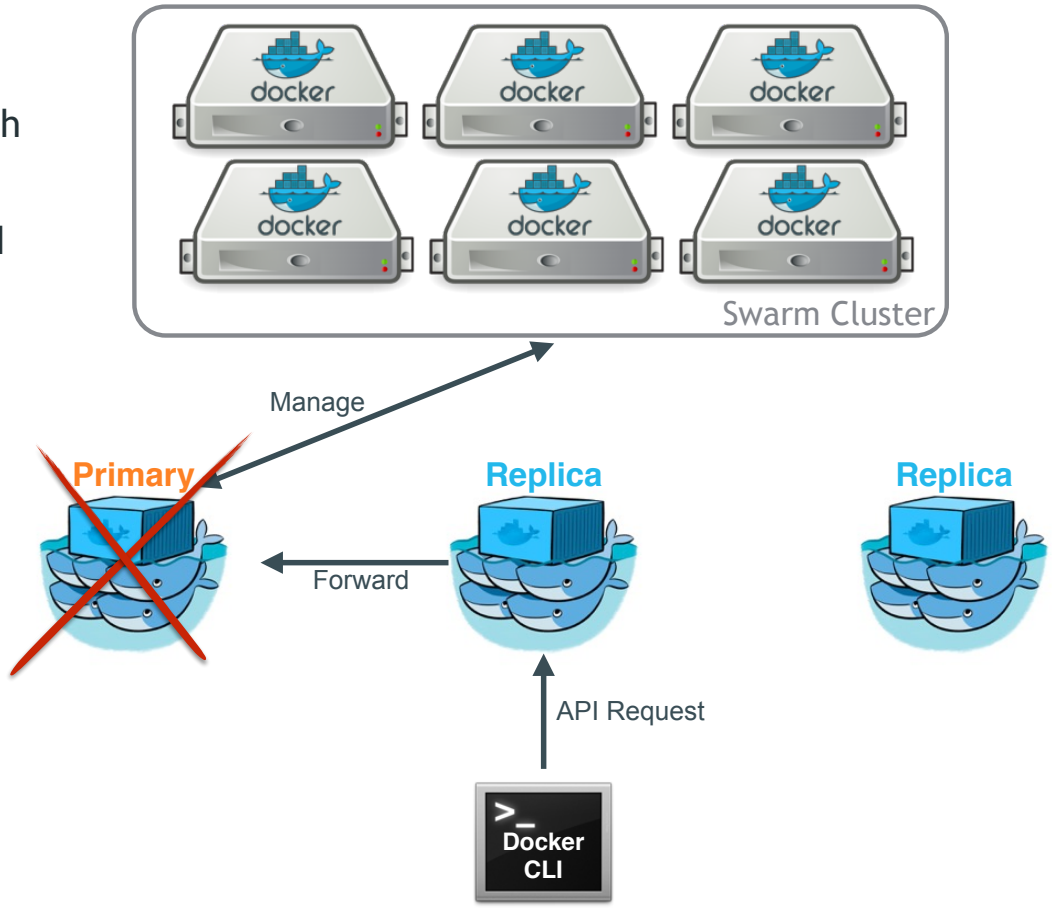
Replication

- One **primary**, many **replicas**
- **Leader Election** built on top of **Consul**, **etcd**, **ZooKeeper**
- **Replicas forward** API calls to primary
- CLI can talk to **any** instance



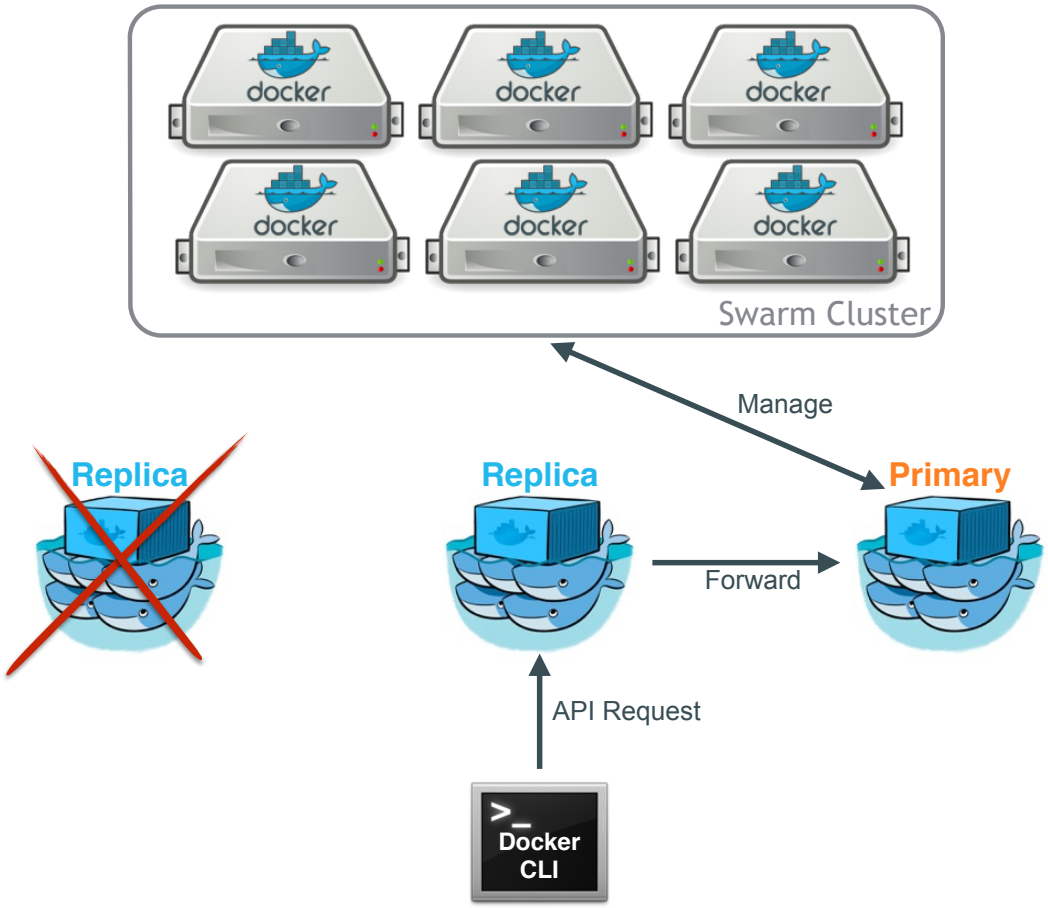
Replication

- Replicas monitor health of primary instance
- Leader gets re-elected upon primary failure



Replication

- One replica promoted to primary
- Other replicas notified of leadership update
- CLI can continue talking to same instance



Demo

“From Zero to Docker”

Machine in a nutshell

- Host management for a container centric world
- Provisions Virtual Machines
- Installs & Manages Docker Engine
- Swarm Cluster Provisioning

Machine Provisioning

7 Operating Systems

9 Cloud Providers

5 Local Providers

Machine Management

- Install, Configure & Upgrade Docker Engine
  - docker-machine upgrade node-{1,2,3}
- PKI Management
  - TLS Encryption & Authentication by default
  - CA generation, Key signing and Re-keying
  - Seamless integration: Auto-configure the CLI
- Bring Your Own Machine - Generic Driver

Machine Operations

- Operate
  - List, Start, Stop and Kill machines
- Debug
  - docker-machine ssh node-2
- Script
  - docker-machine toolkit: ip, url, …

Machine Clustering

- Integration with Docker Swarm
- Provision Swarm management nodes
- Pre-configure machines to join a Swarm cluster
- Tweak Swarm options

Demo

Thank you, Questions?

Andrea Luzzardi - @aluzzardi

Victor Vieux - @vieux

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