Cracking the container scale problem with the Datacenter Operating System

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http://tinyurl.com/velocity-dcos

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What is the container scale problem?

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The datacenter as a form factor

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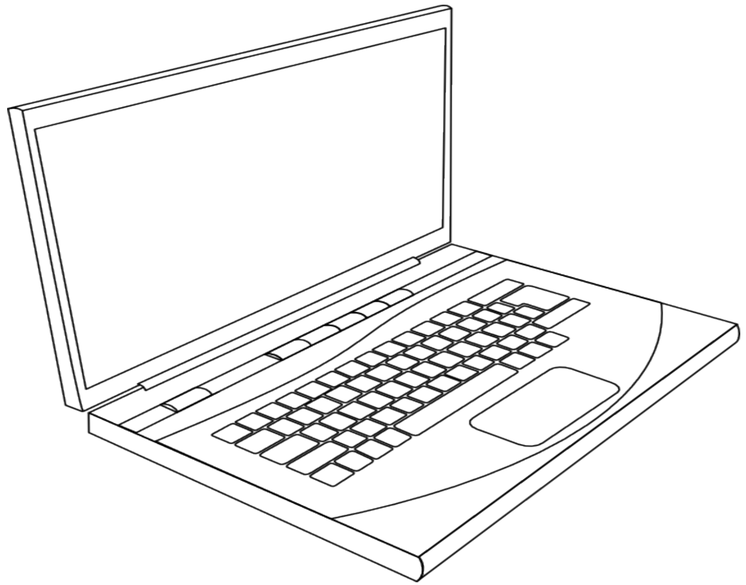

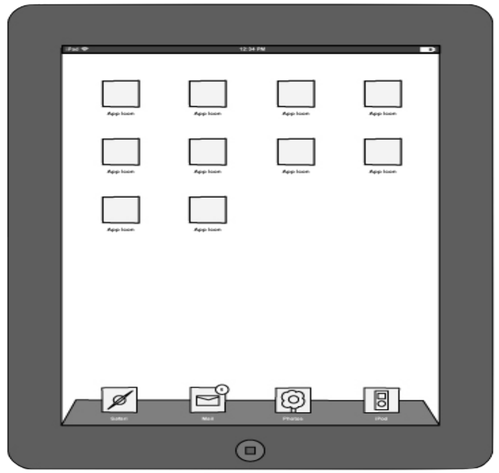

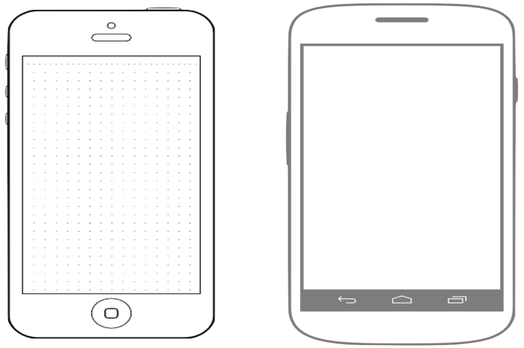

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The datacenter is just another form factor

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Why can’t we run applications on our datacenters just like we run applications on our mobile phones?

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Applications don’t fit on a single machine anymore

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Applications don’t fit on a single machine anymore

1. Lots of data

2. Lots of users

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Applications don’t fit on a single machine anymore

1. Lots of data
2. Lots of users

Today’s applications need lots of resources (CPU, memory, disk)

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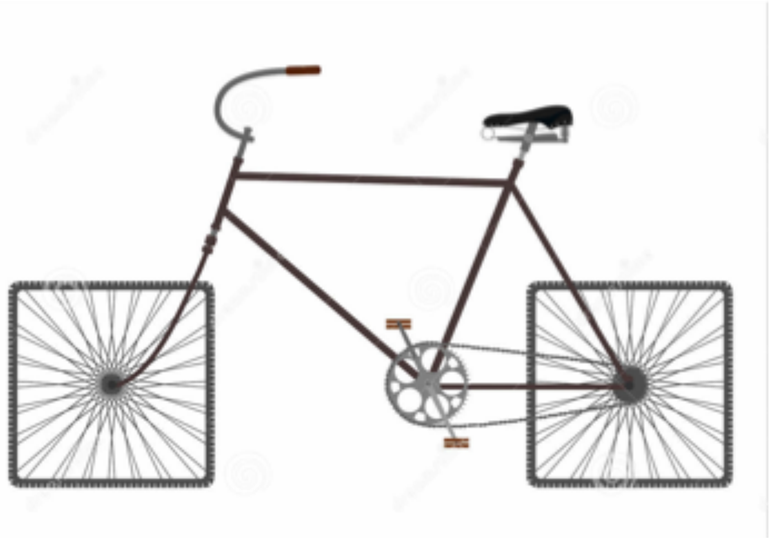
We’re all building distributed systems!



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operating system (as per Wikipedia)

"a collection of software that manages the computer hardware resources and provides common services for computer programs"

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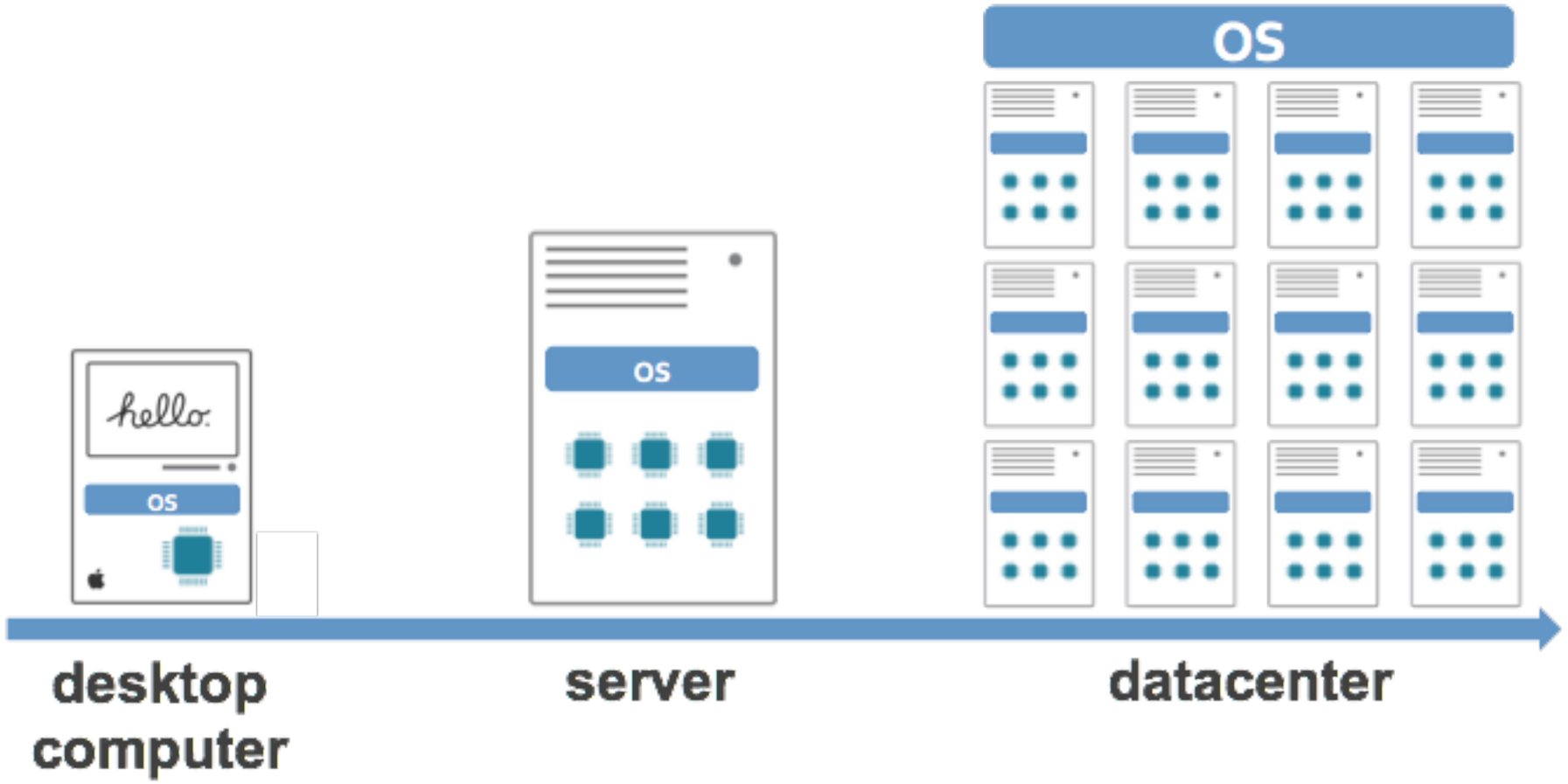
The datacenter needs an operating system



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Introducing the datacenter operating system

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Mesosphere DCOS

DCOS CLI | **DCOS GUI** | **Repository**

Frameworks
Marathon
Chronos
...

Kernel
Mesos

Modules
mesos-dns

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The CLI for the datacenter: `dcos`

- open source, Apache licensed
- tight integration with the Mesosphere universe, a package repository
- easy, Unix-consistent commands to manage running applications, services and the underlying Mesos
- extensible (e.g. `dcos spark`, `dcos kafka`, etc.)

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Apache Mesos

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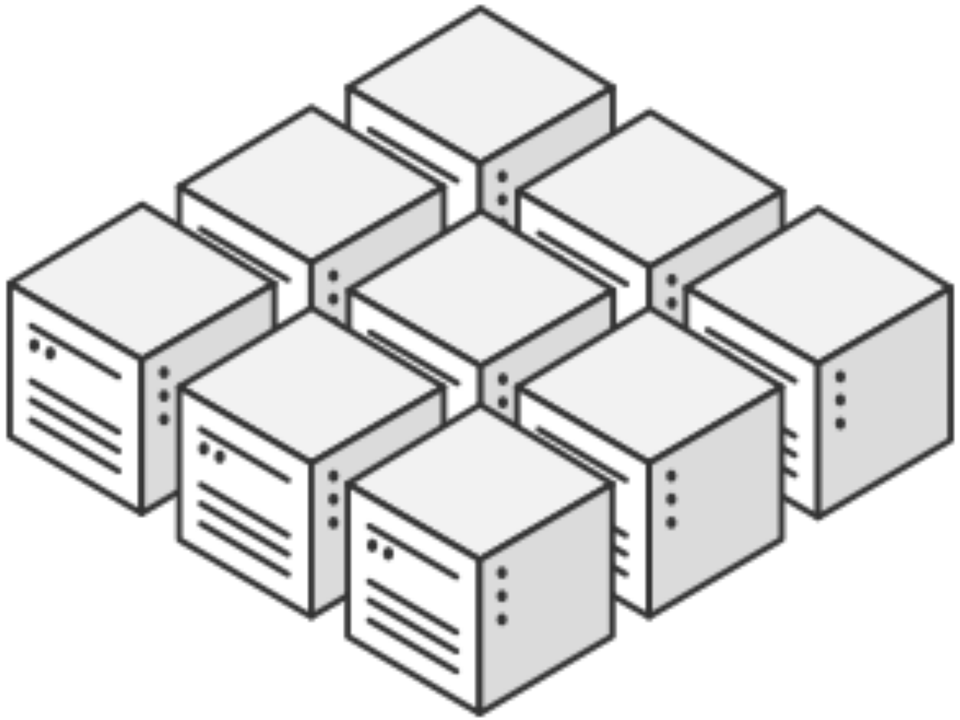

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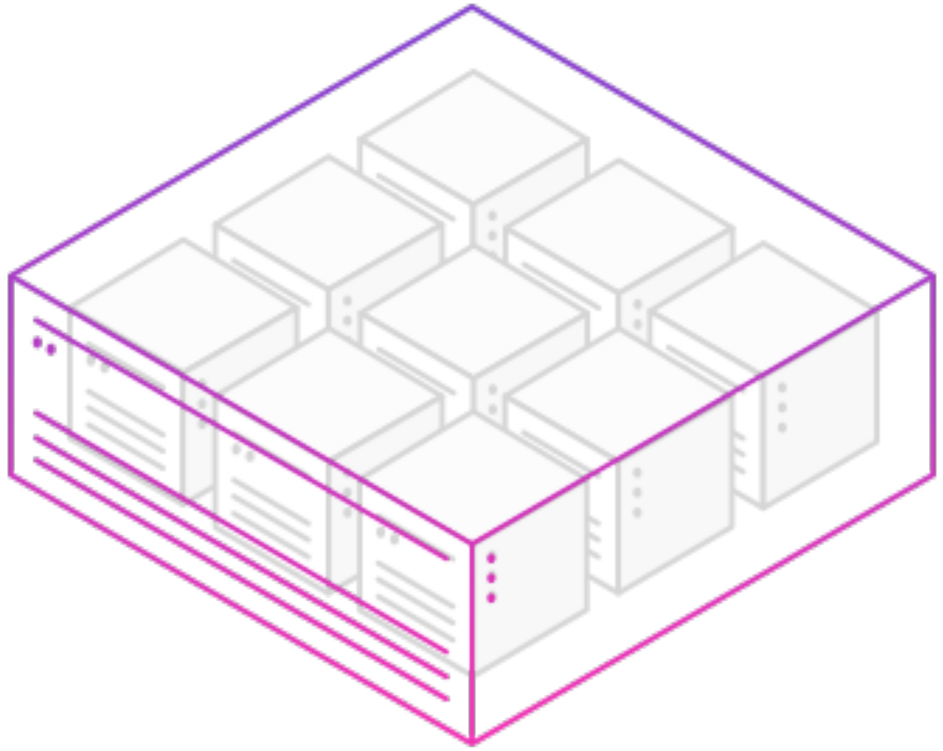

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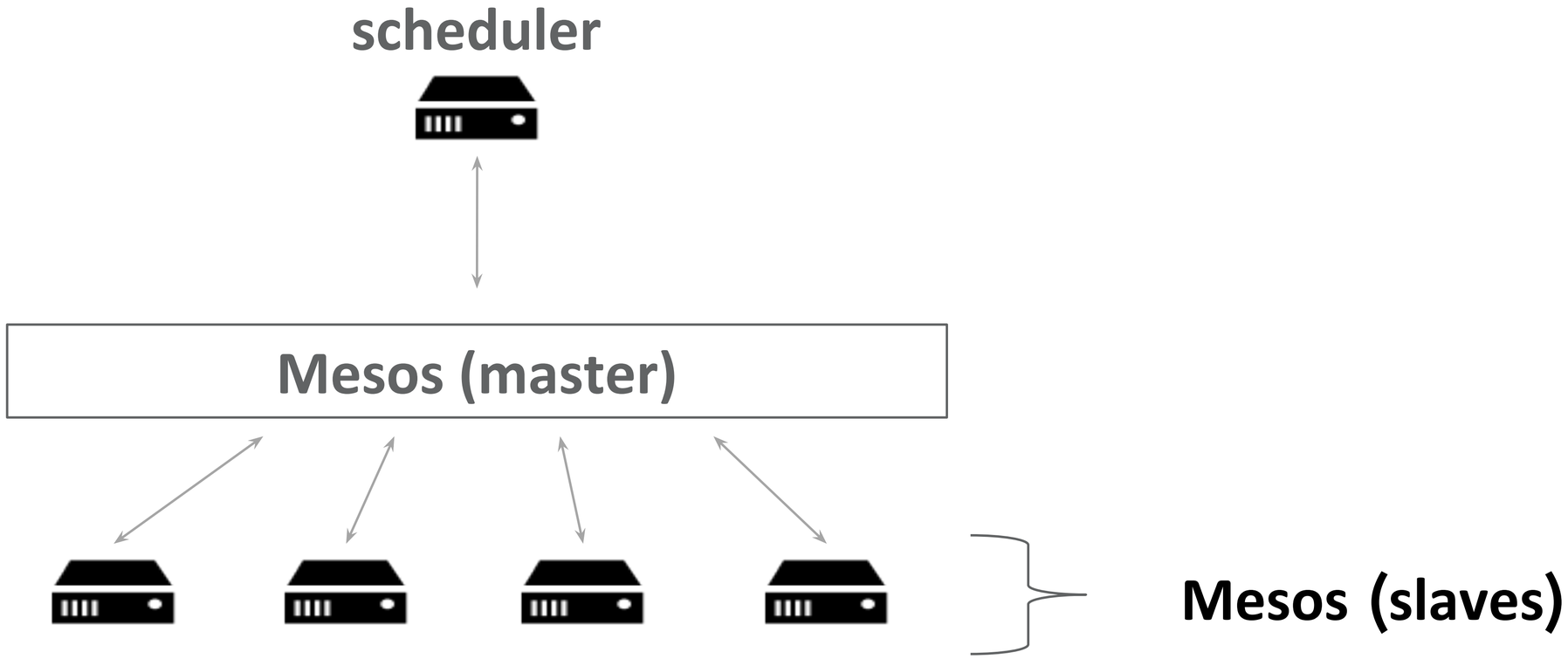
Mesos: level of indirection



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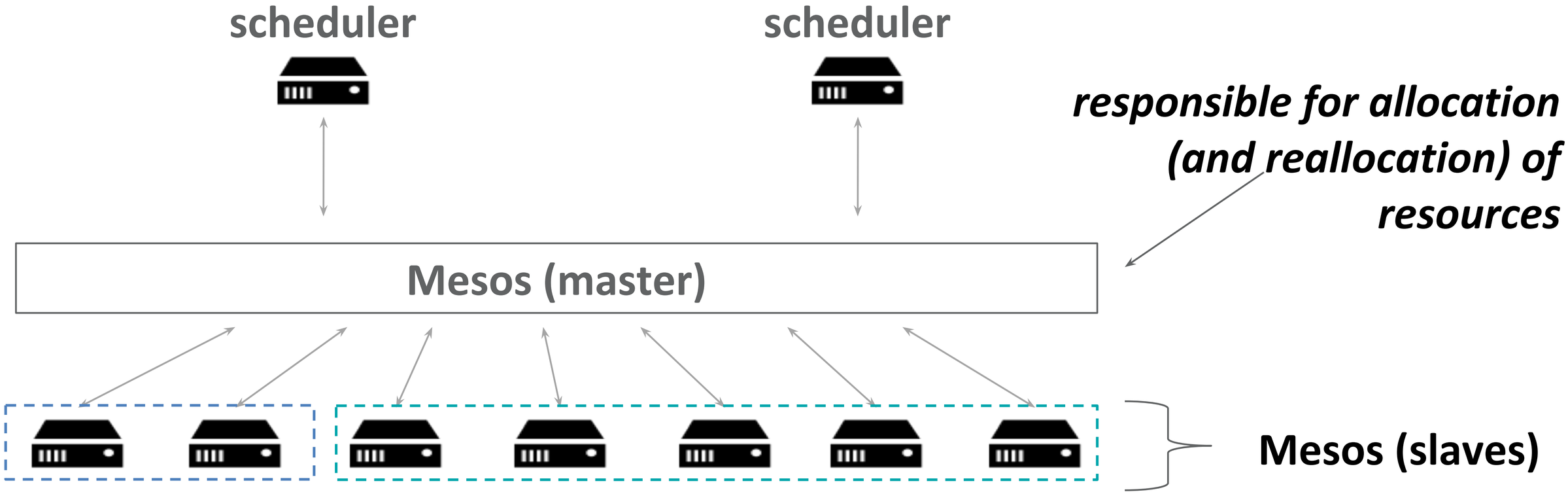
Mesos: level of indirection



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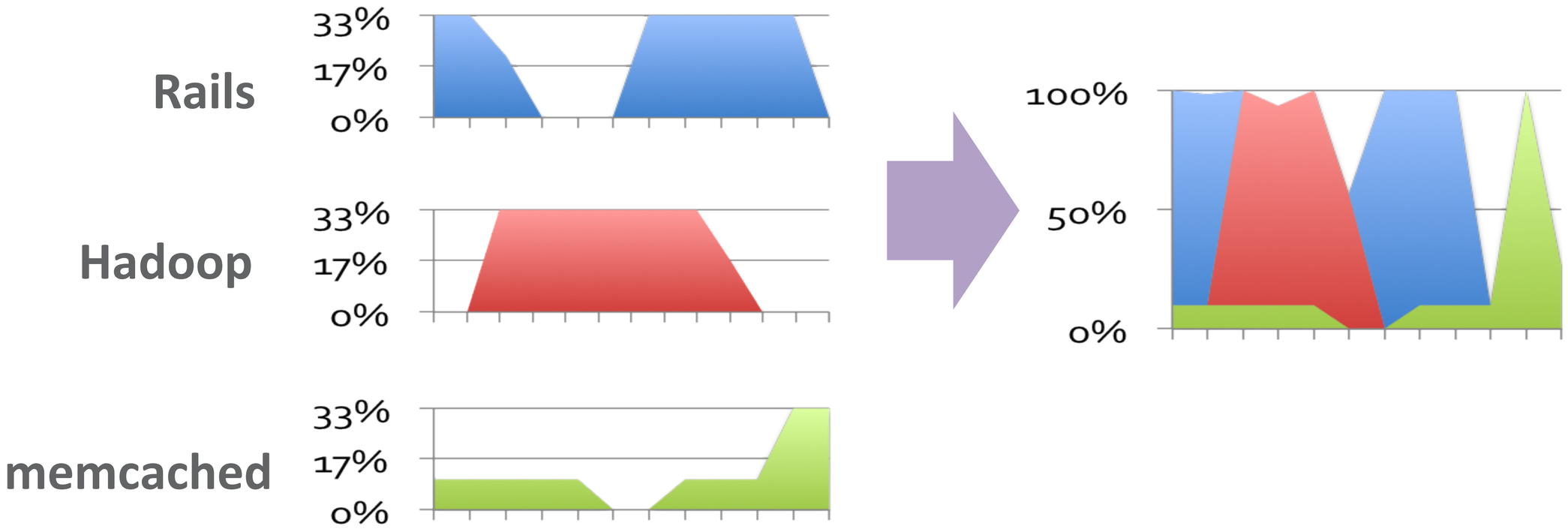
Mesos helps utilization



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Mesos: datacenter kernel

provides common functionality every new distributed system *re-implements*:

- failure detection
- package distribution
- task starting
- resource isolation
- resource monitoring
- task killing, cleanup
- …

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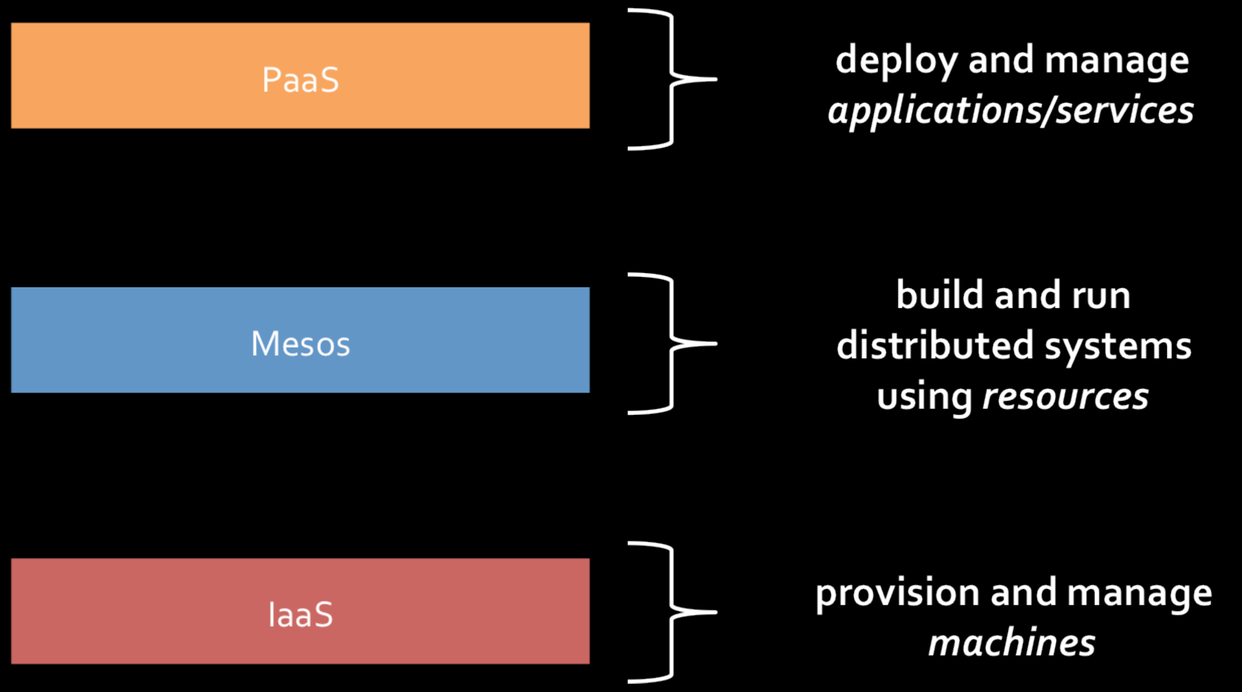

mesosphere

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- A top-level Apache project
- A cluster resource negotiator
- Scalable to 10,000s of nodes
- Fault-tolerant, battle-tested
- An SDK for distributed apps

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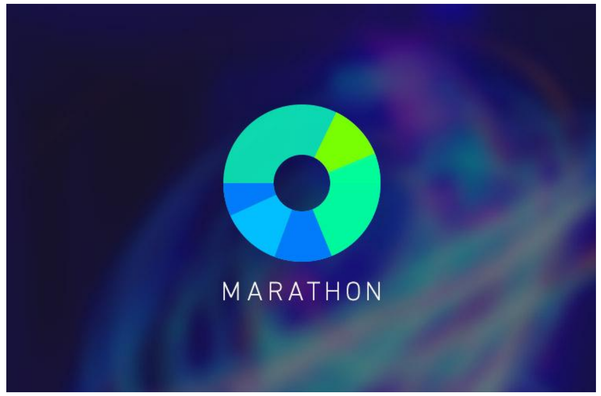
Marathon



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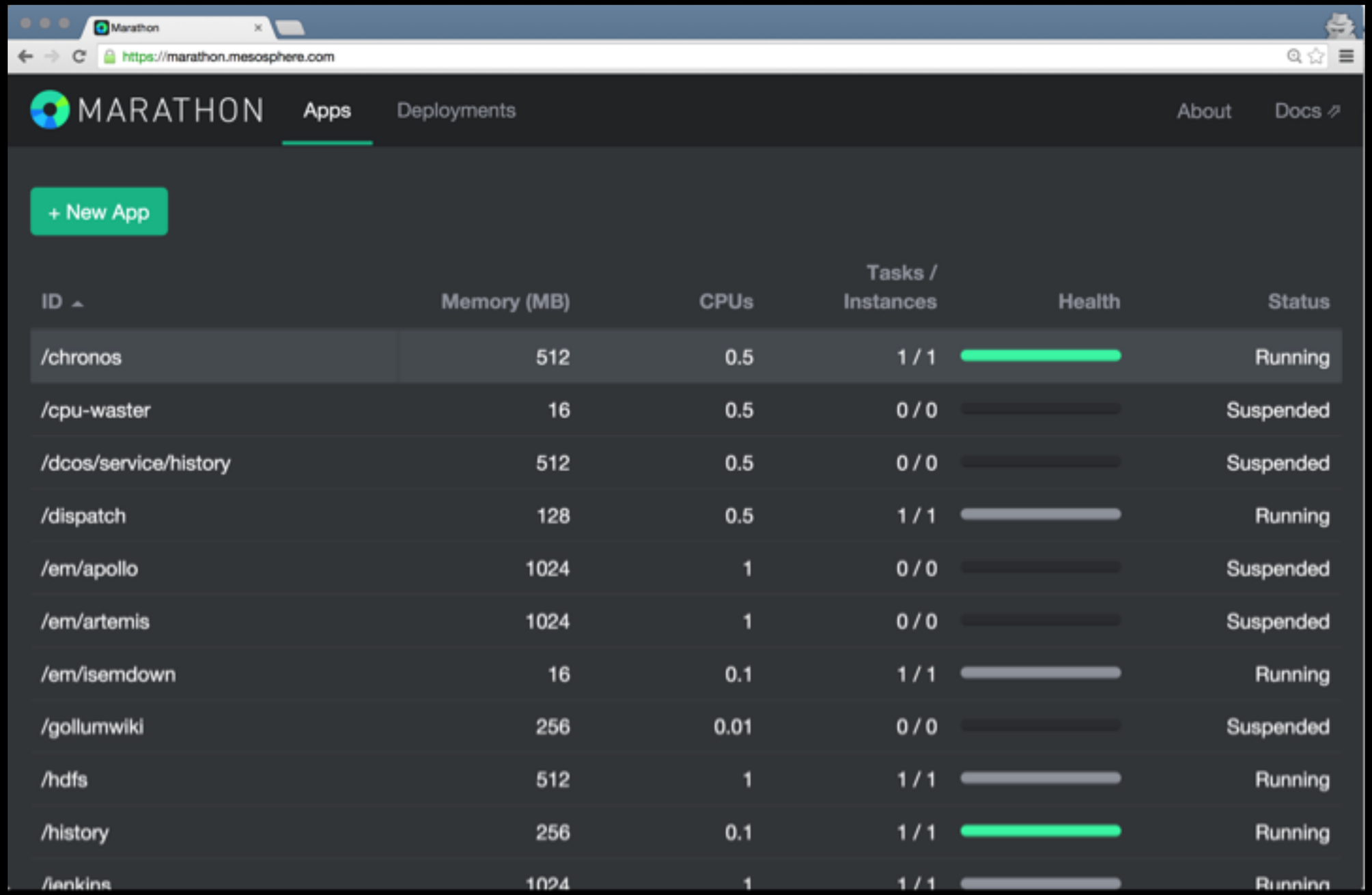

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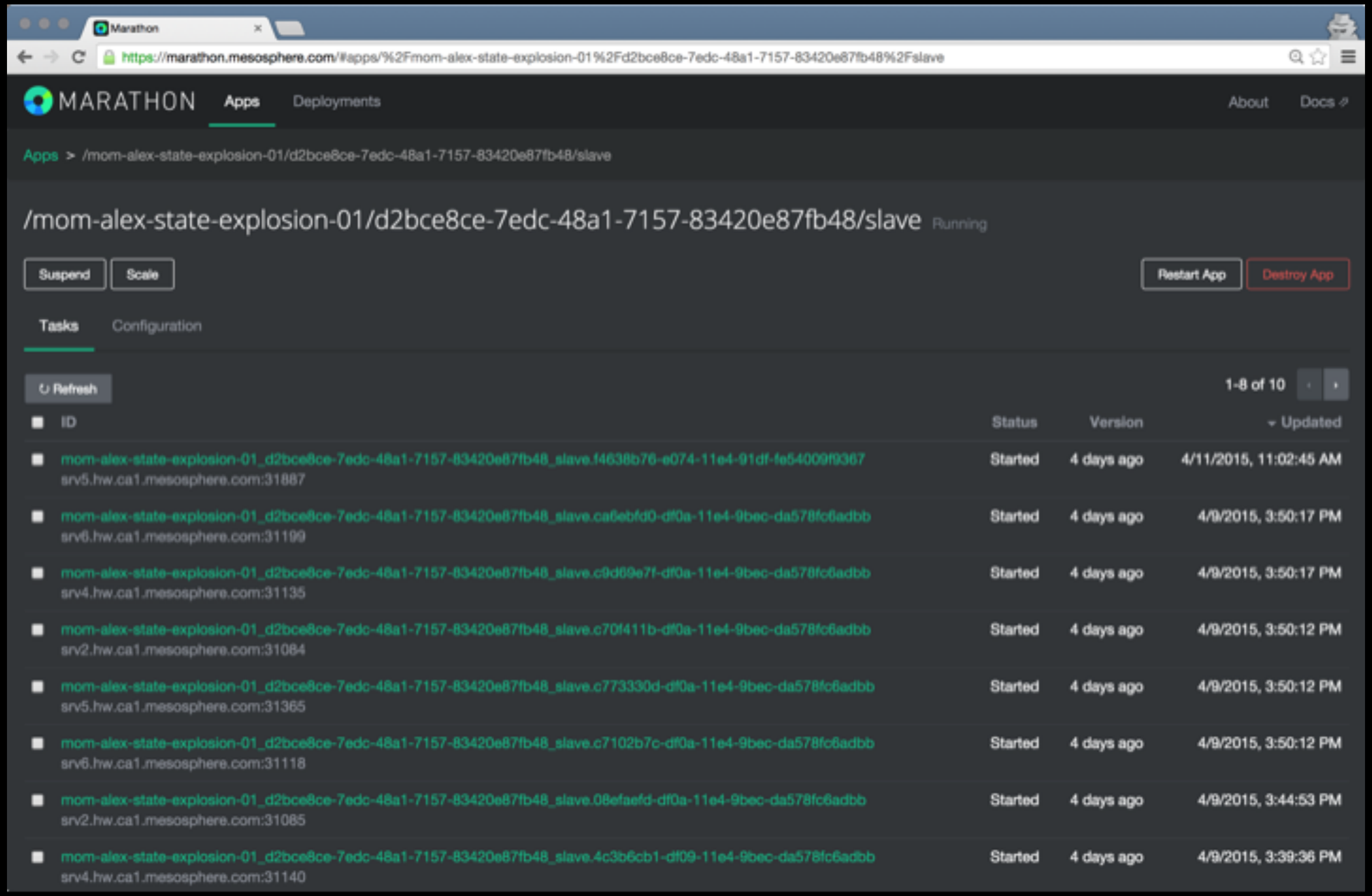

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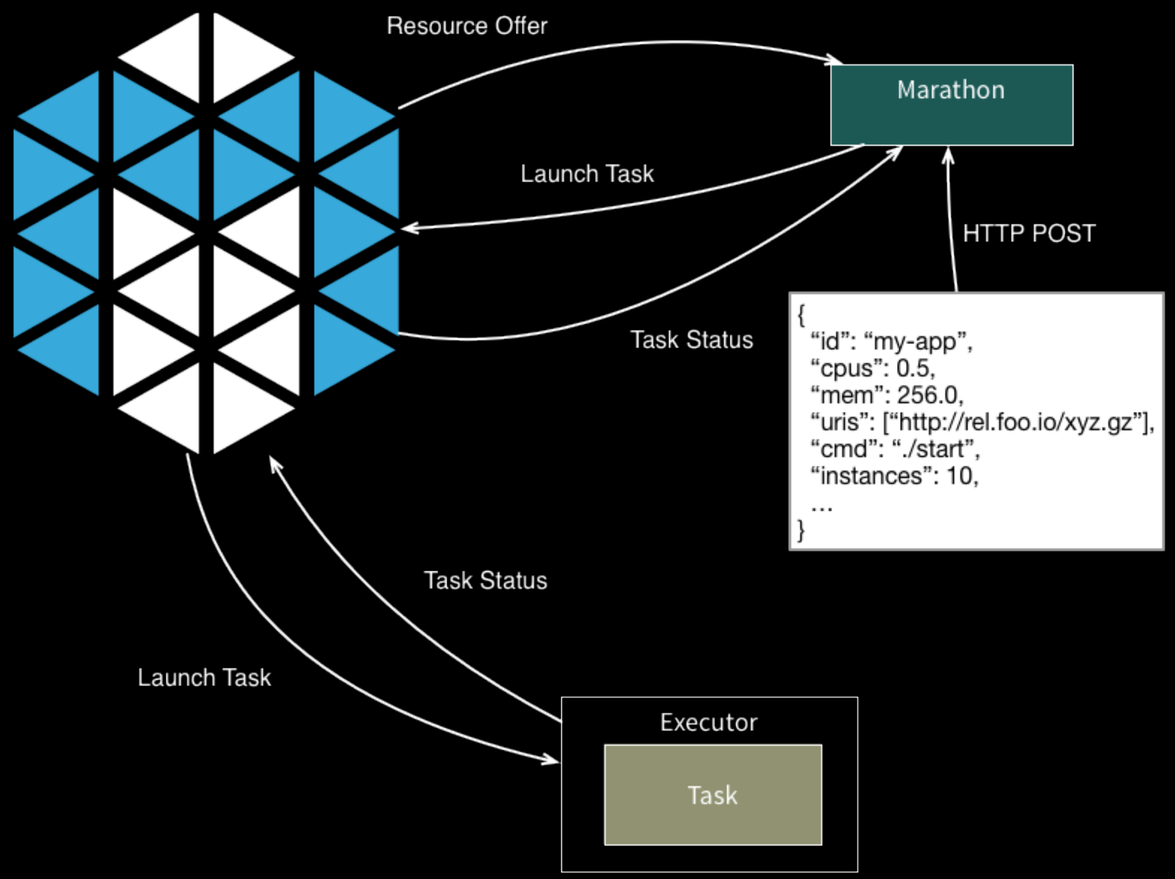

mesosphere

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- Start, stop, scale, update apps
- Nice web interface, API
- Highly available, no SPoF
- Native Docker support
- Fully featured REST API
- Pluggable event bus

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- Rolling deploy / restart
- Application health checks
- Artifact staging

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Mesos & Marathon in action

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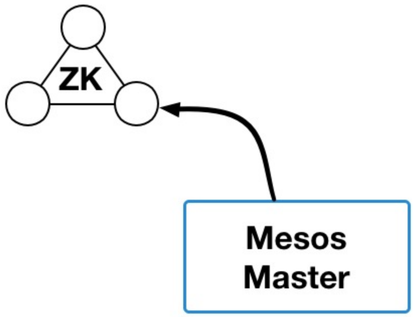

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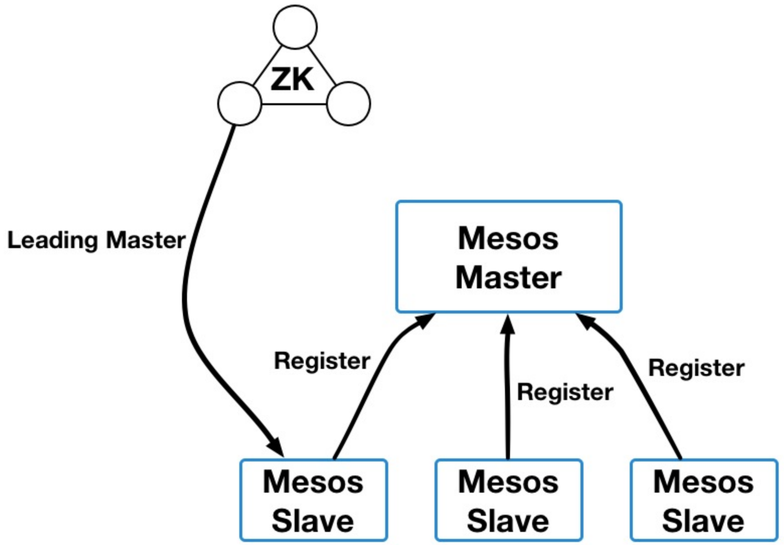

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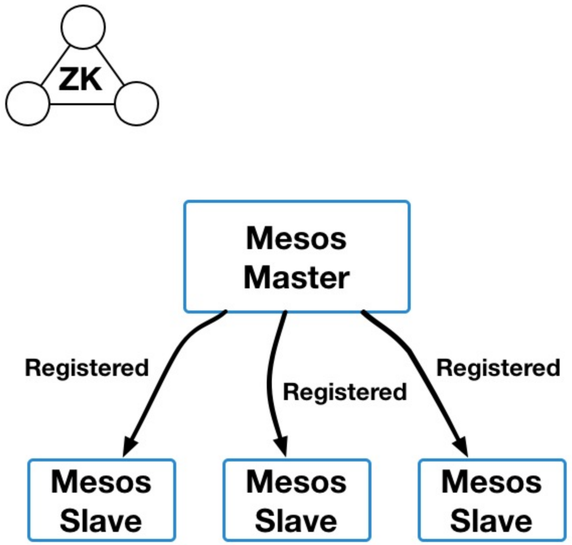

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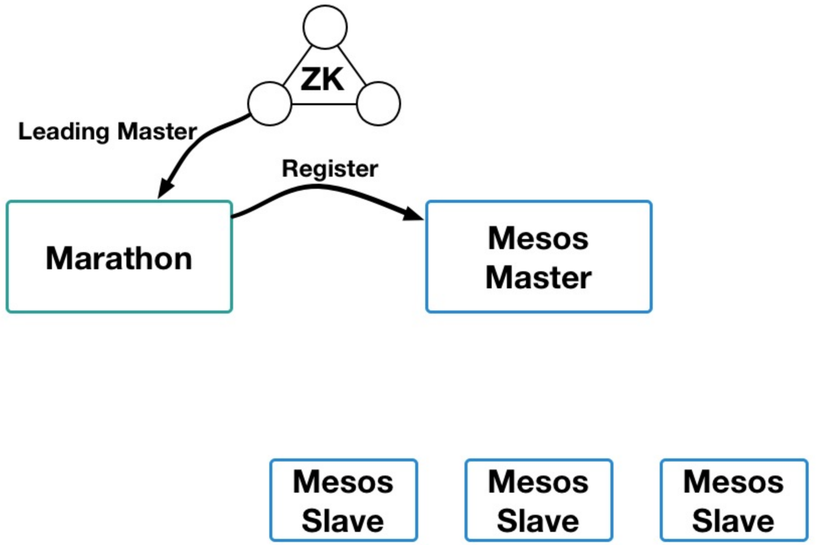

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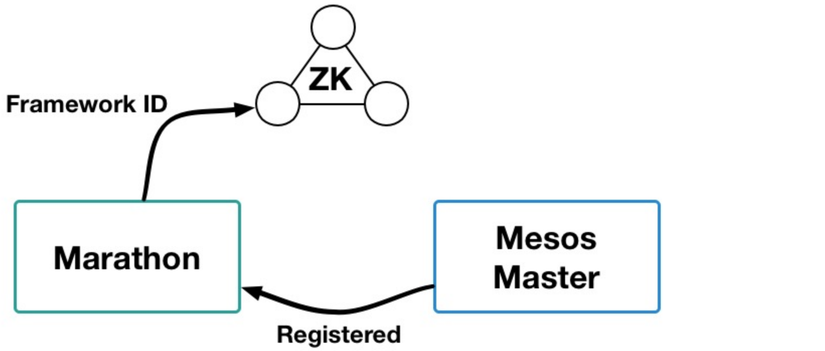

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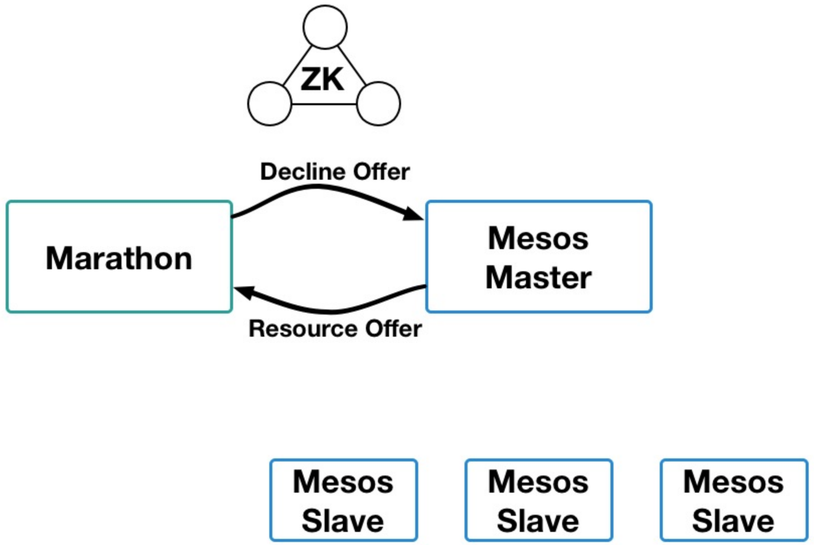

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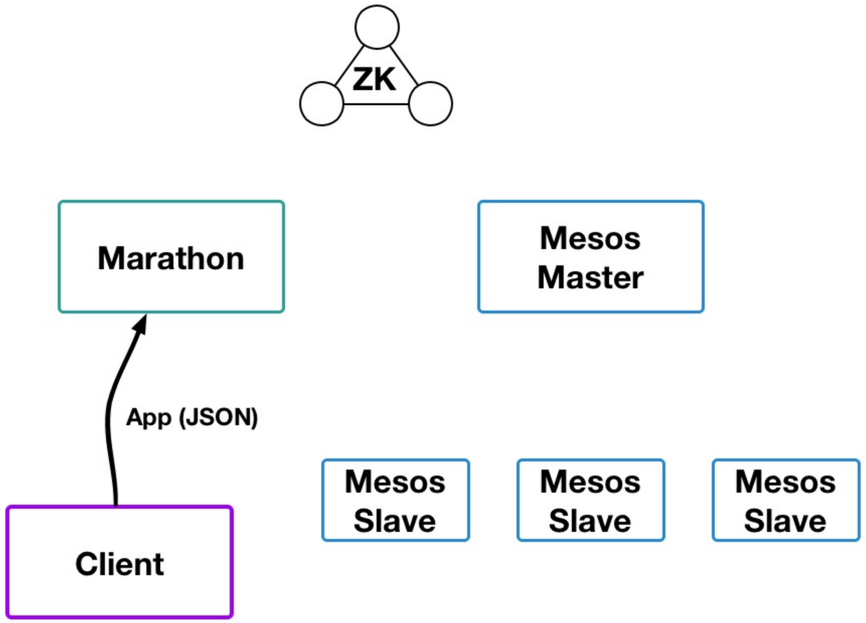

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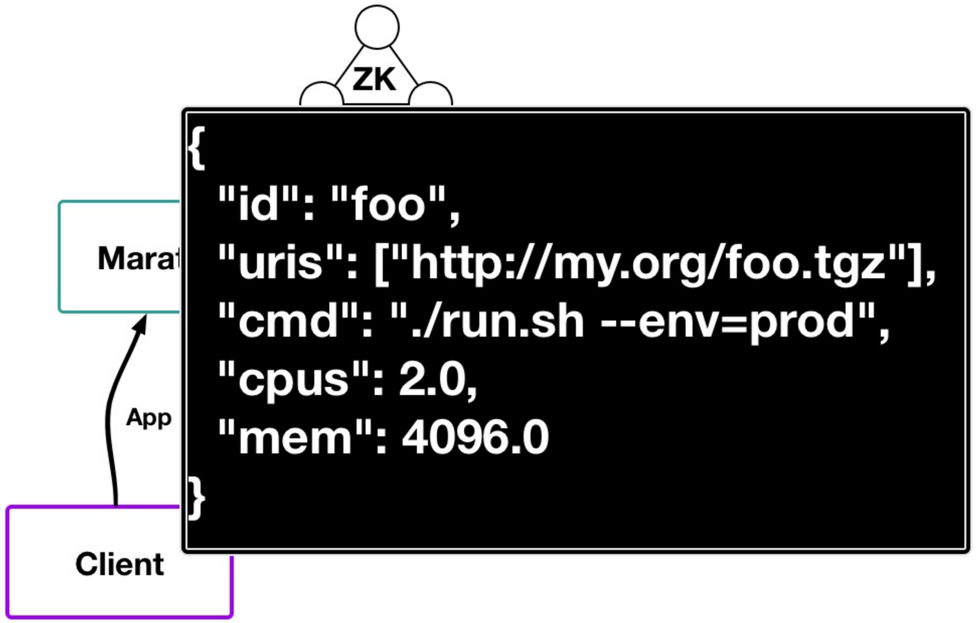

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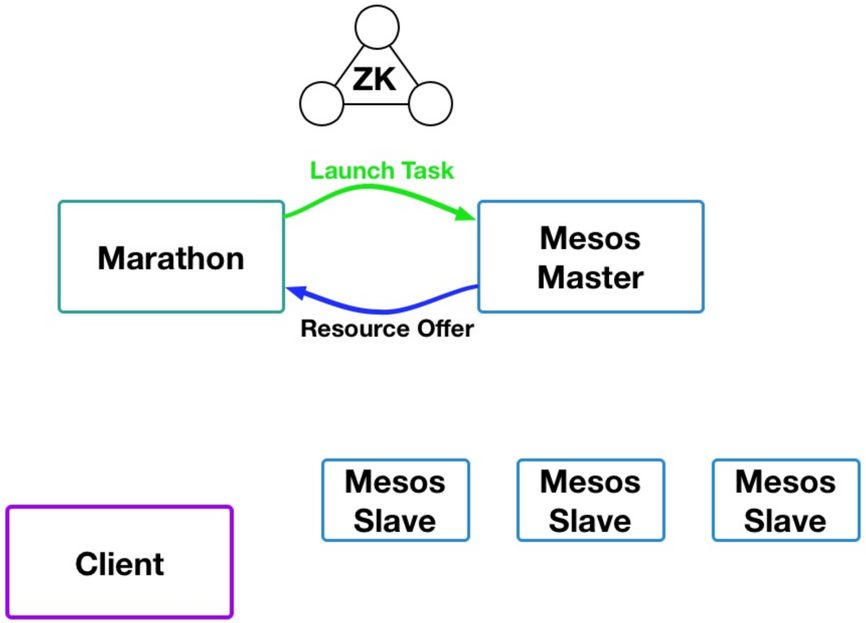

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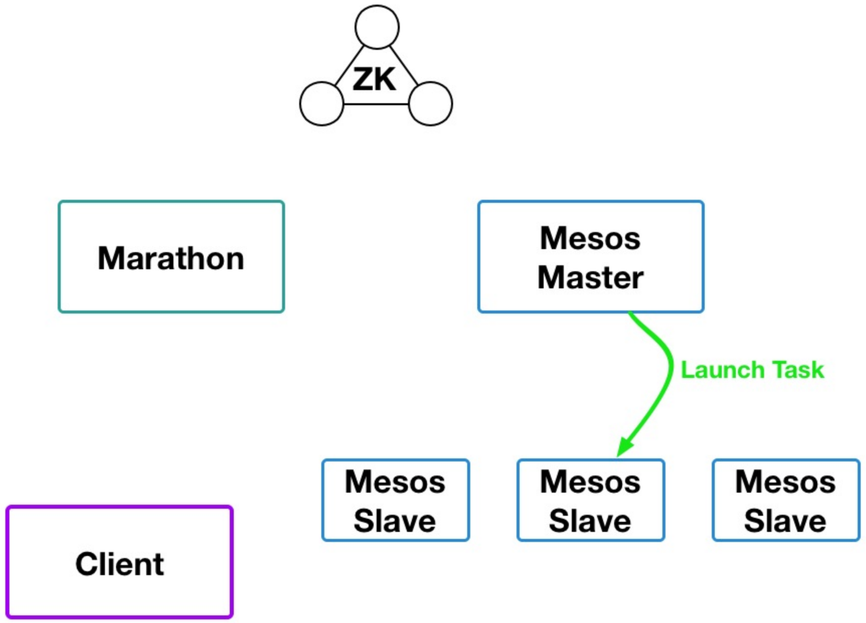

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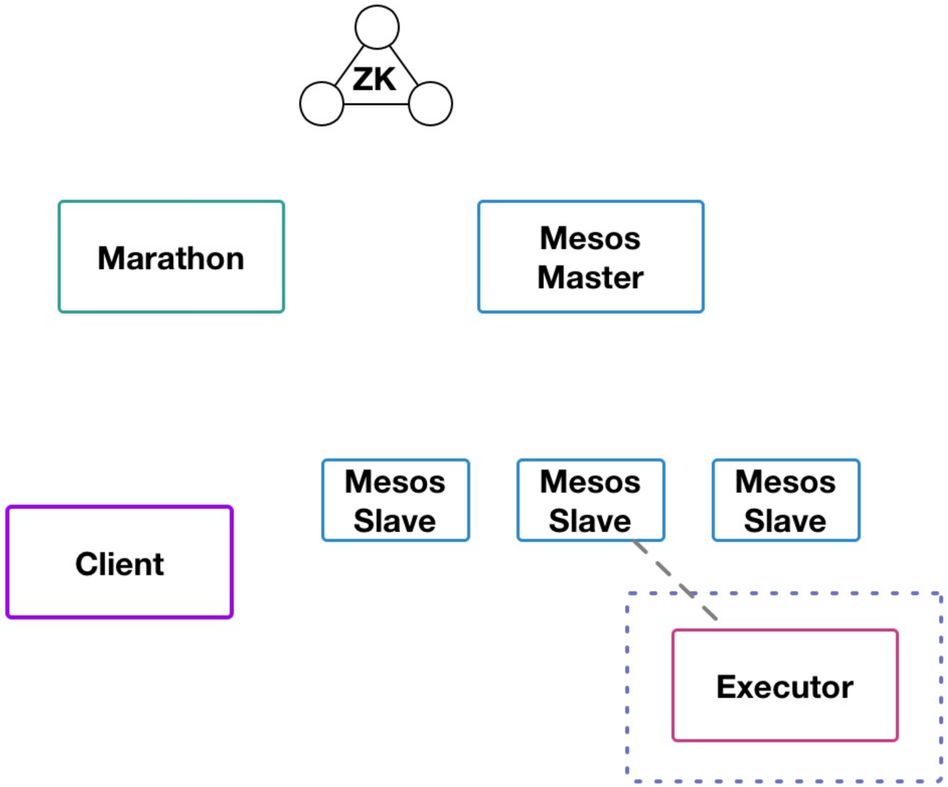

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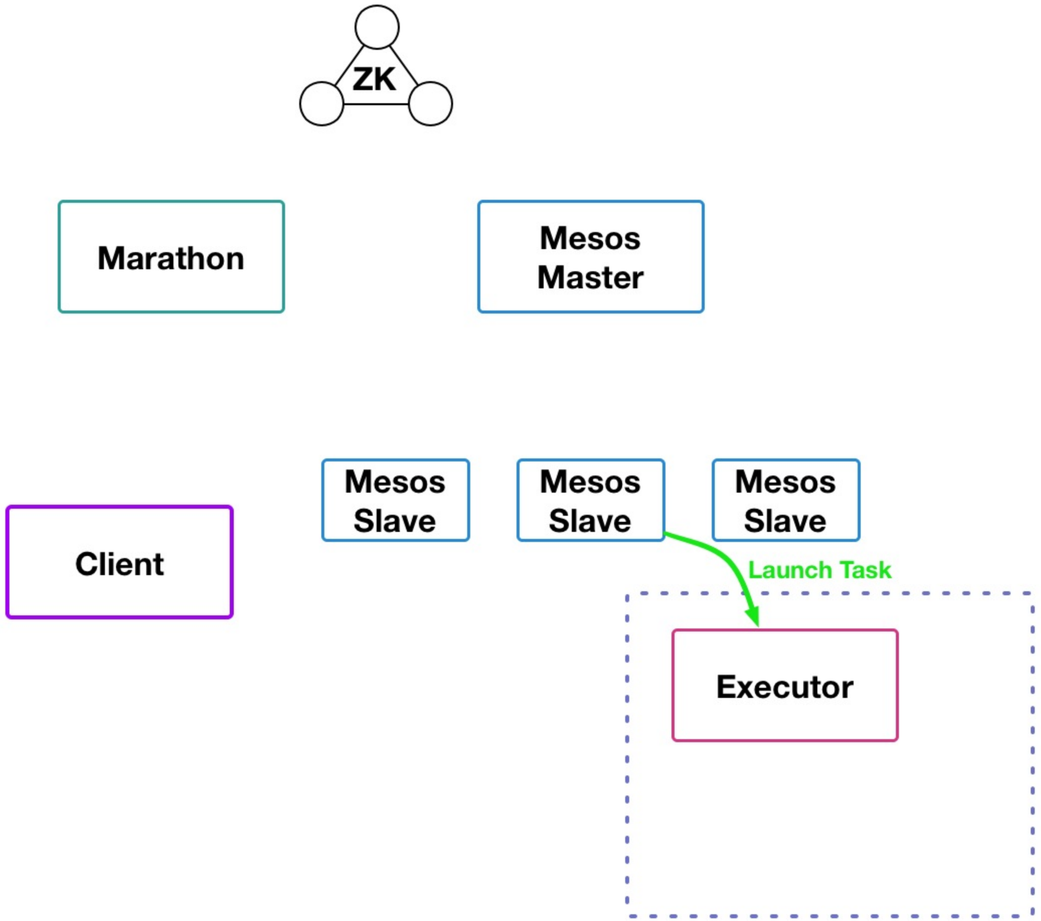

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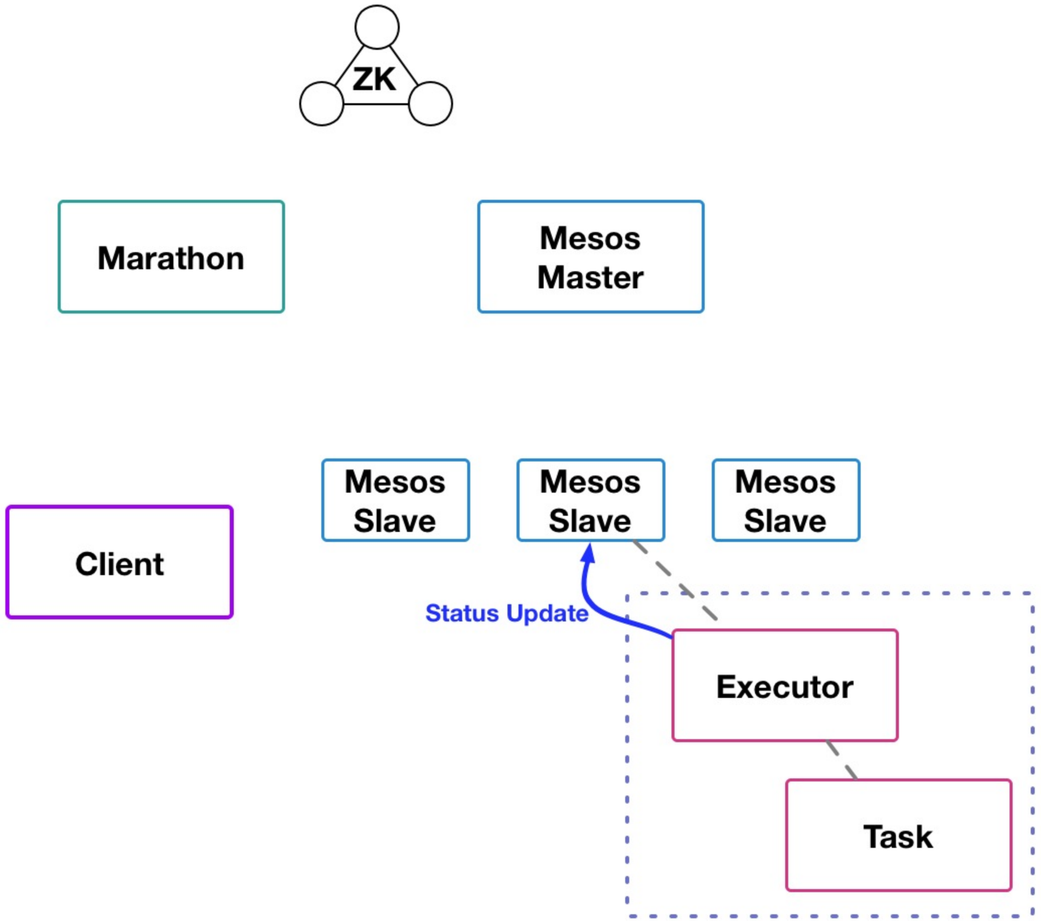

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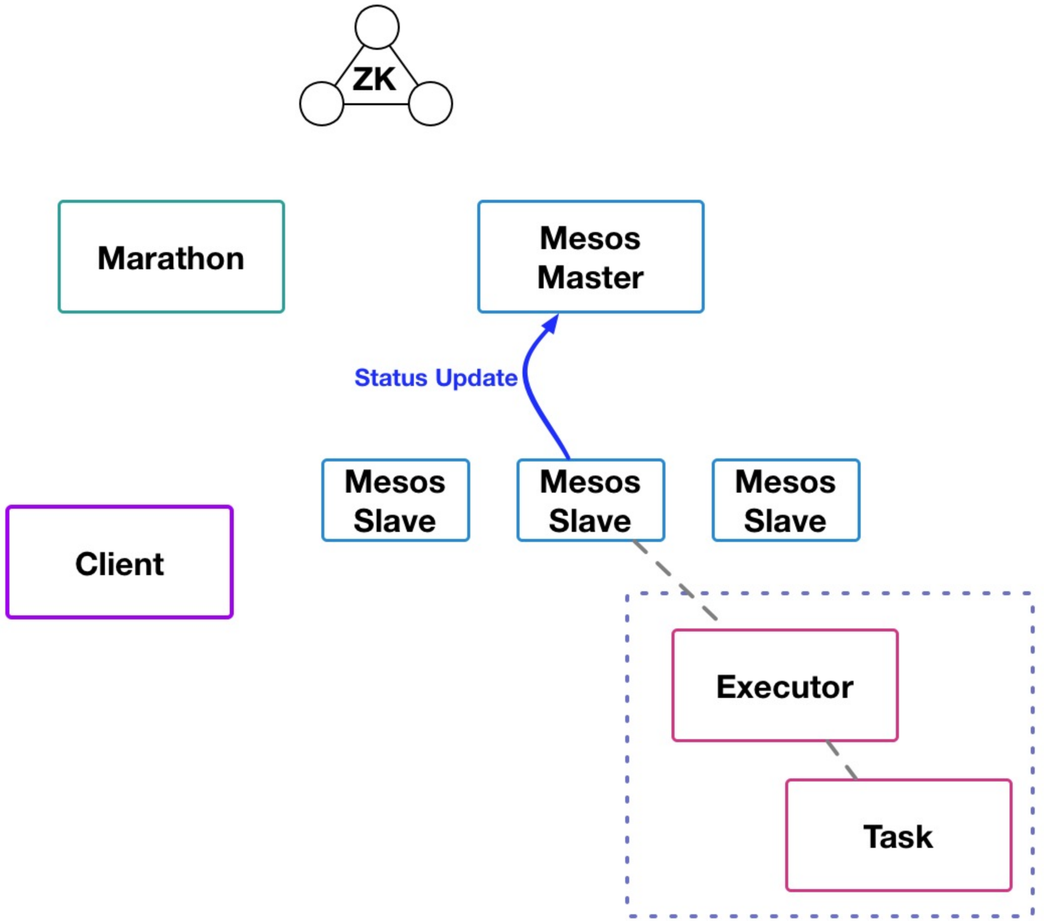

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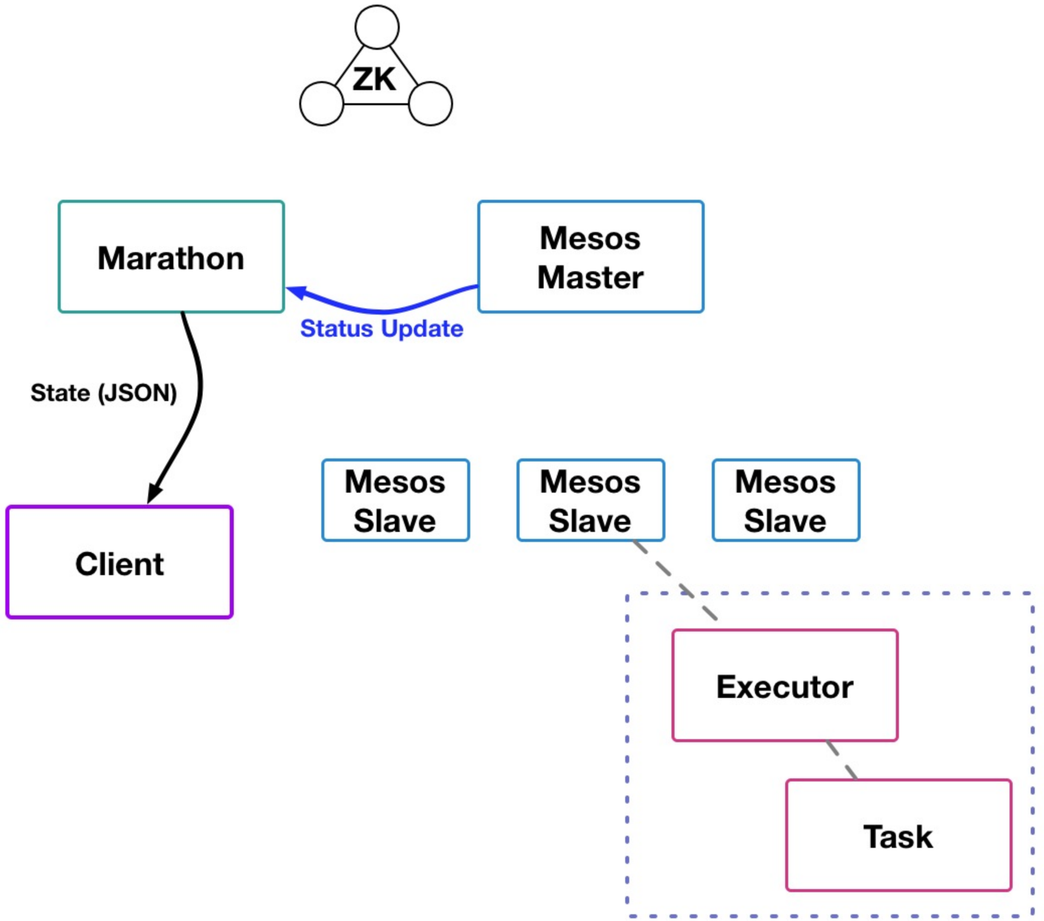

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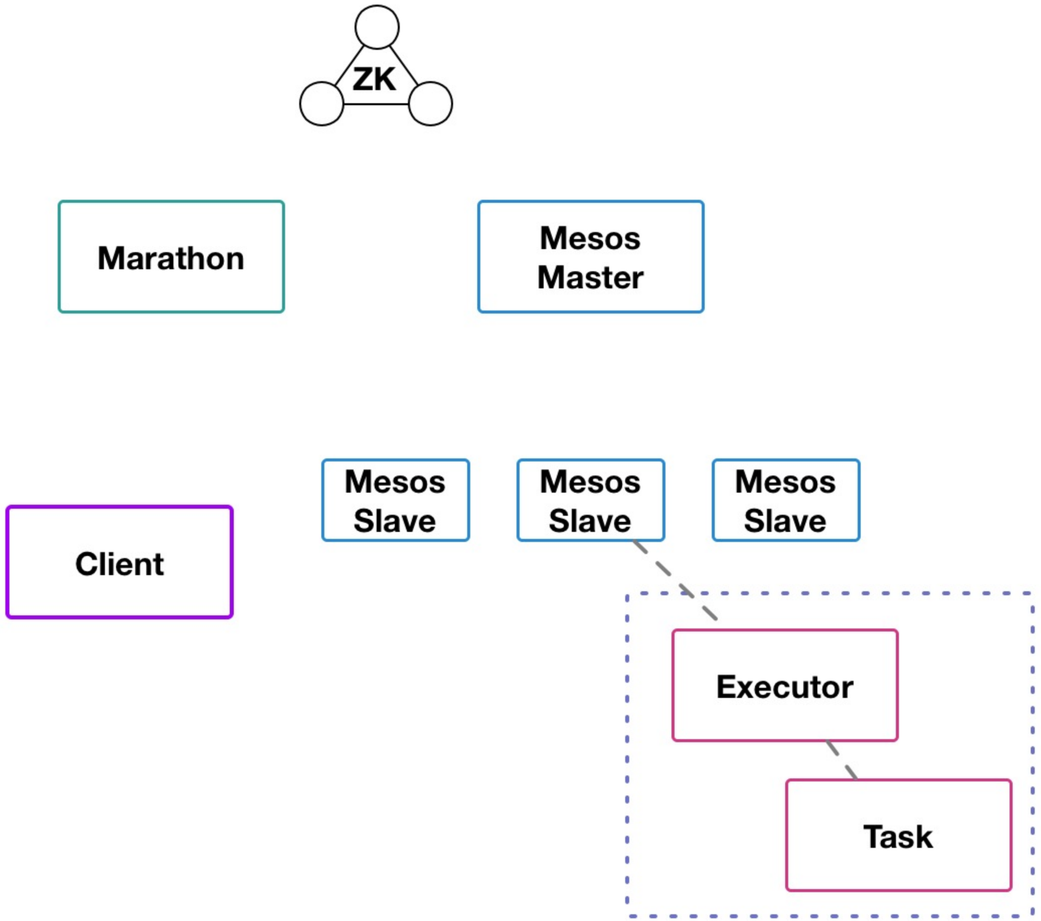

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Task failure

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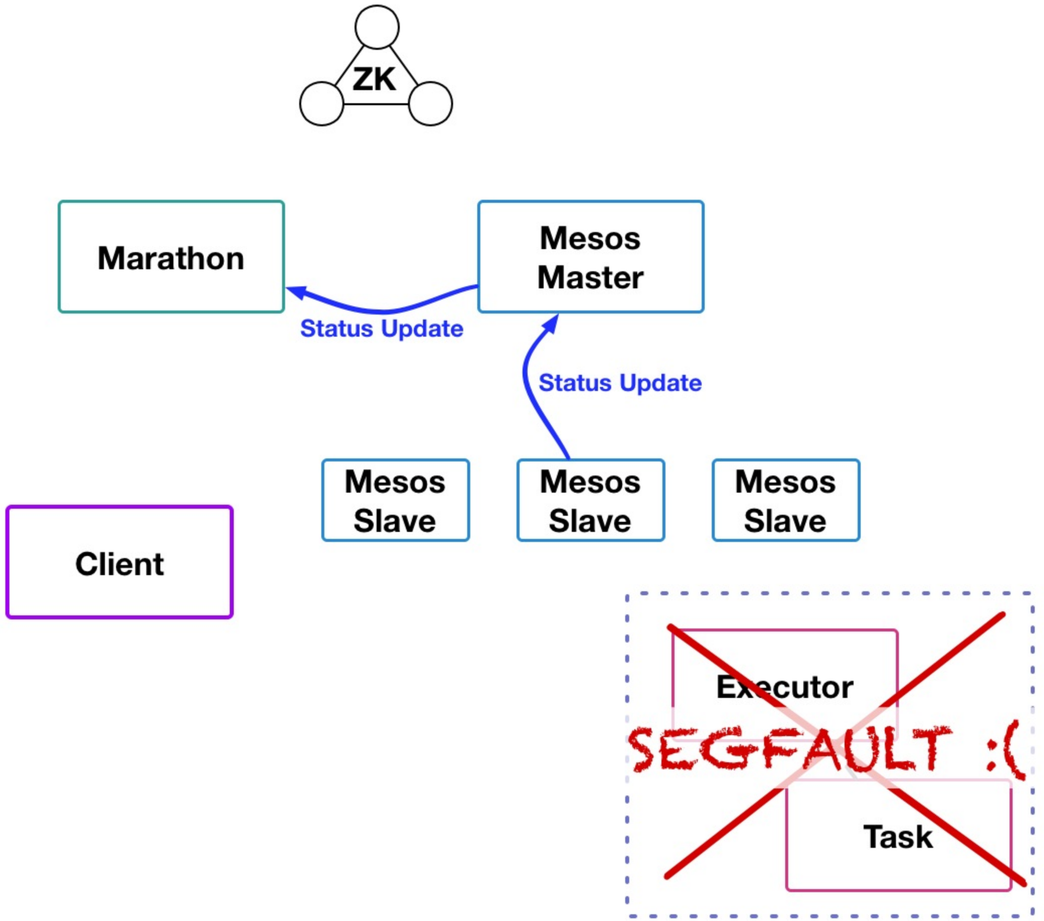

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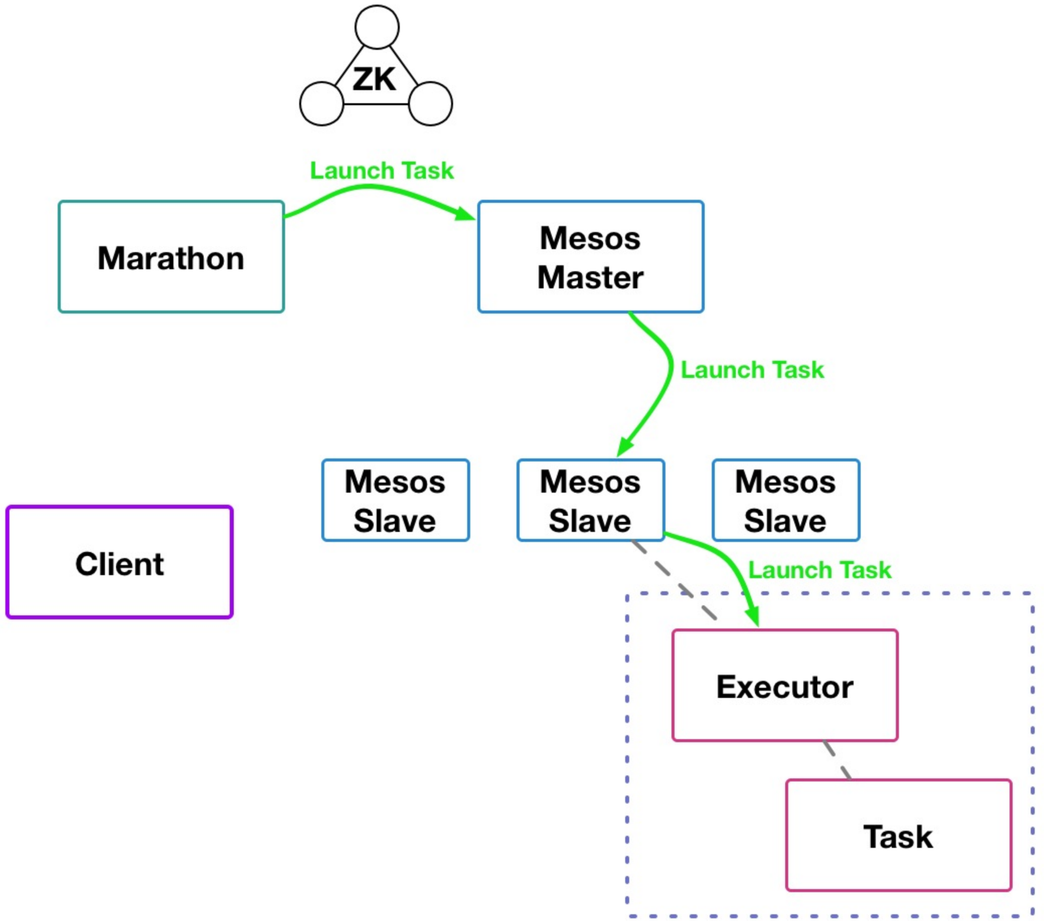

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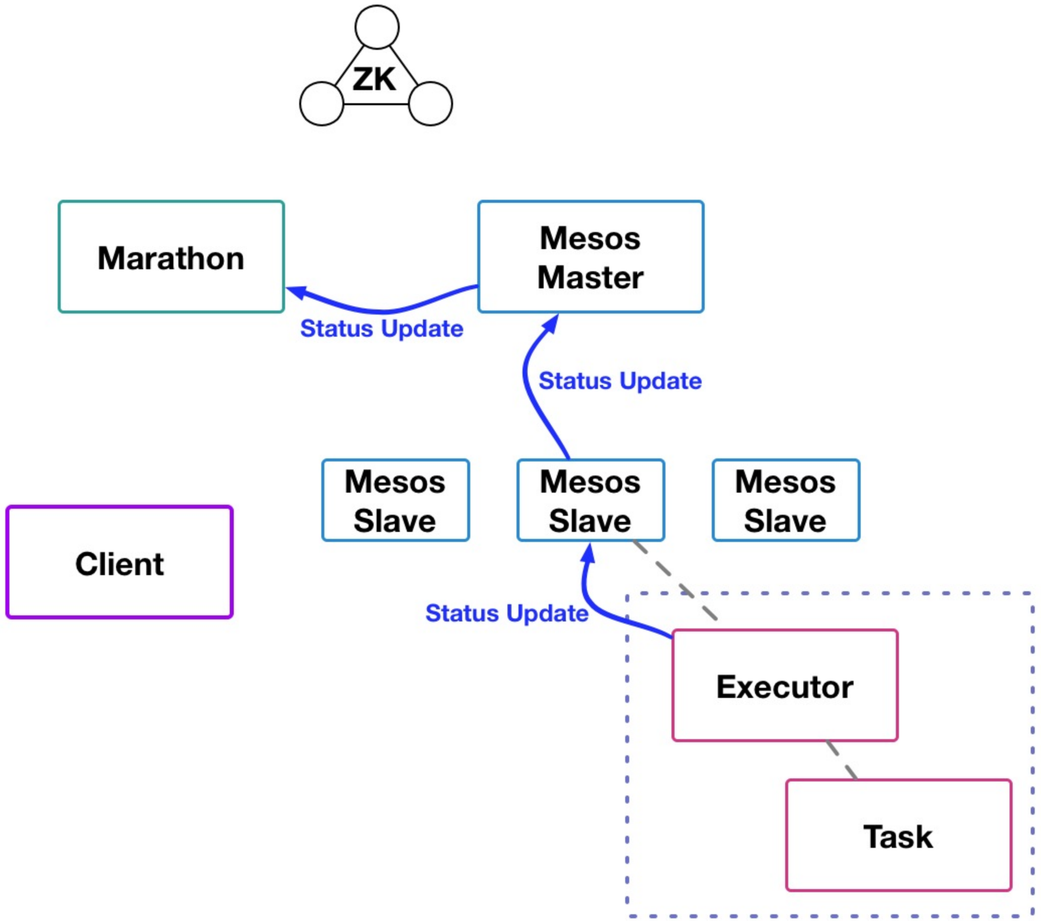

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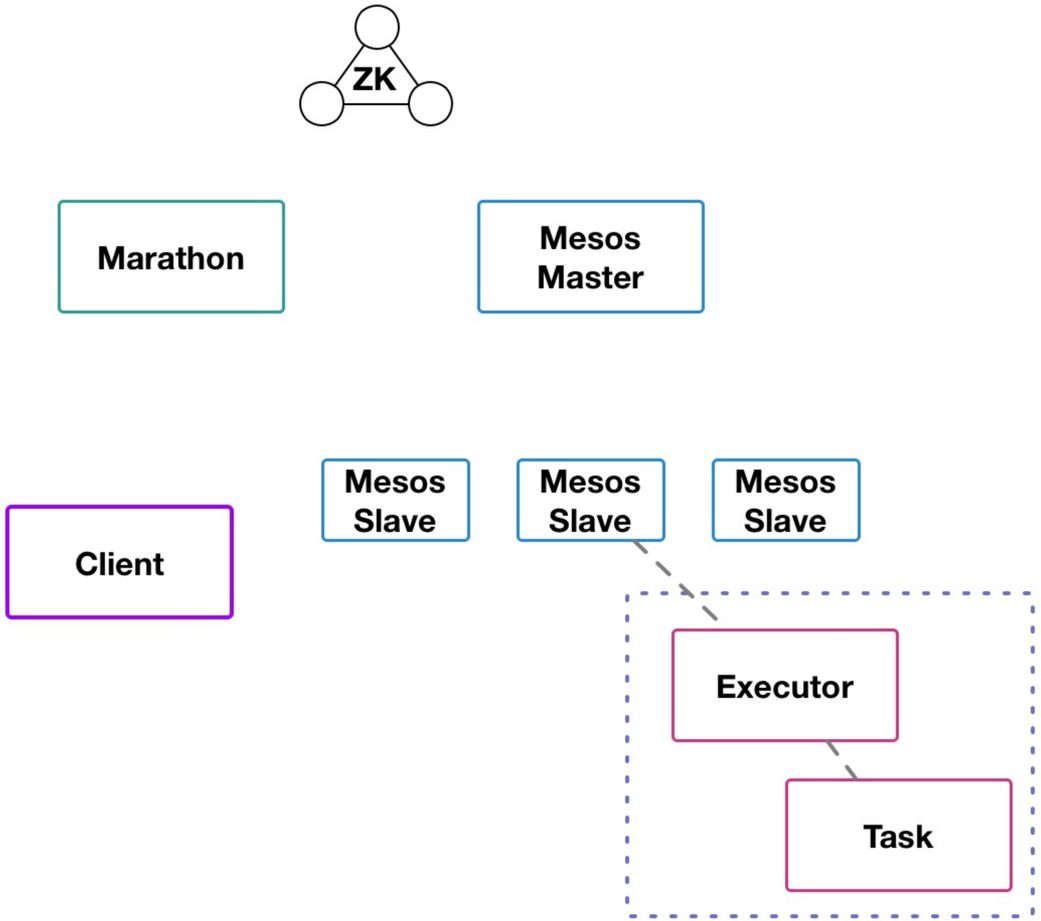

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Agent process failure

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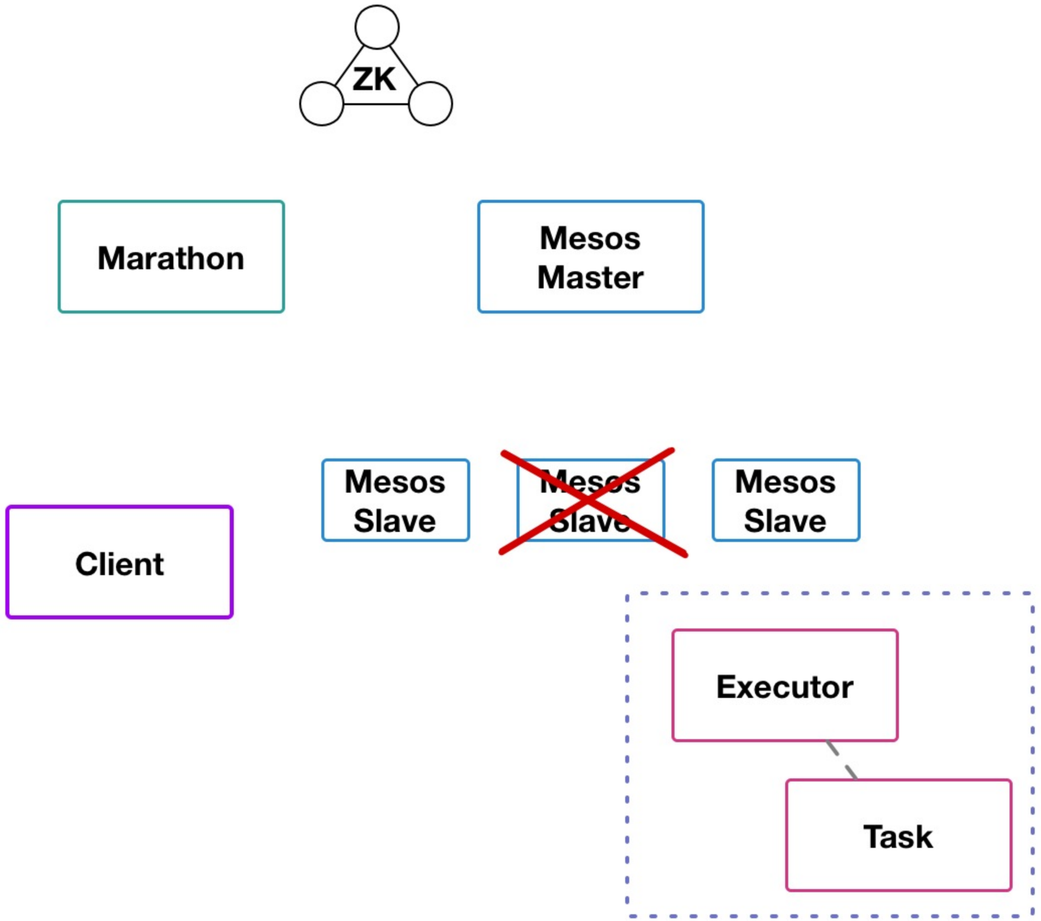

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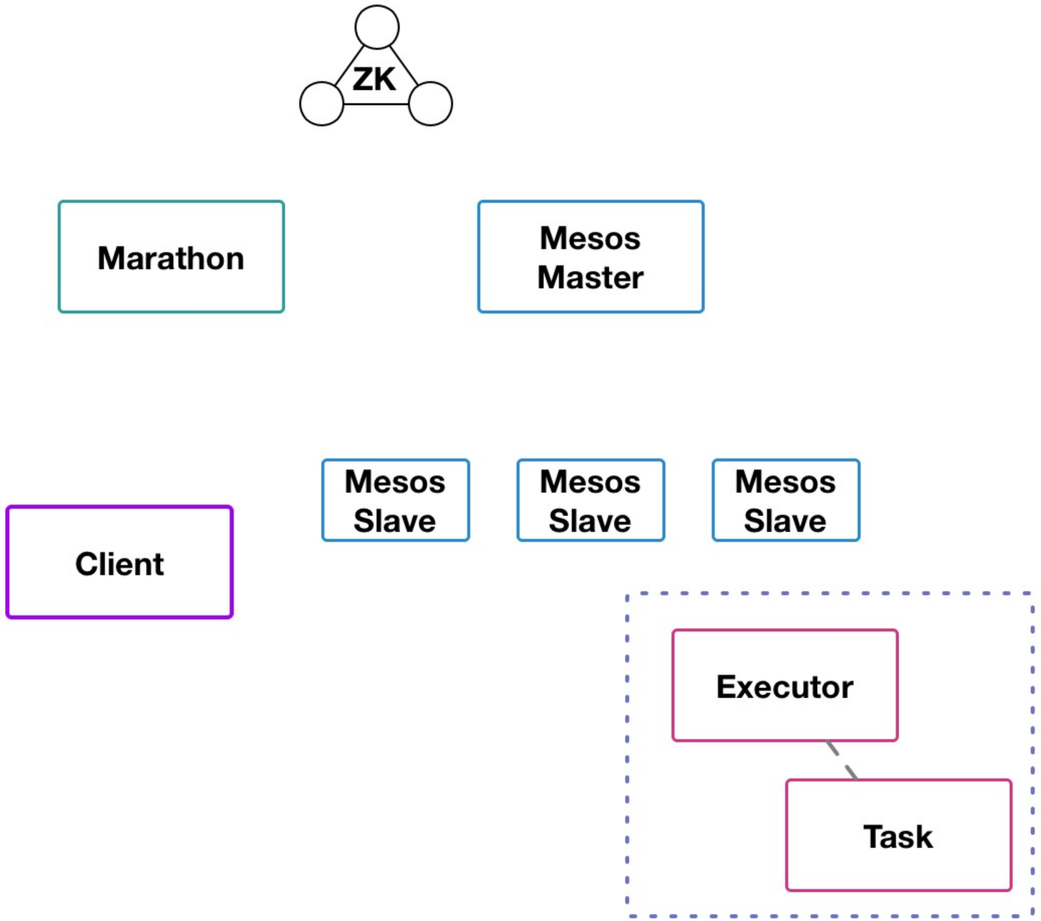

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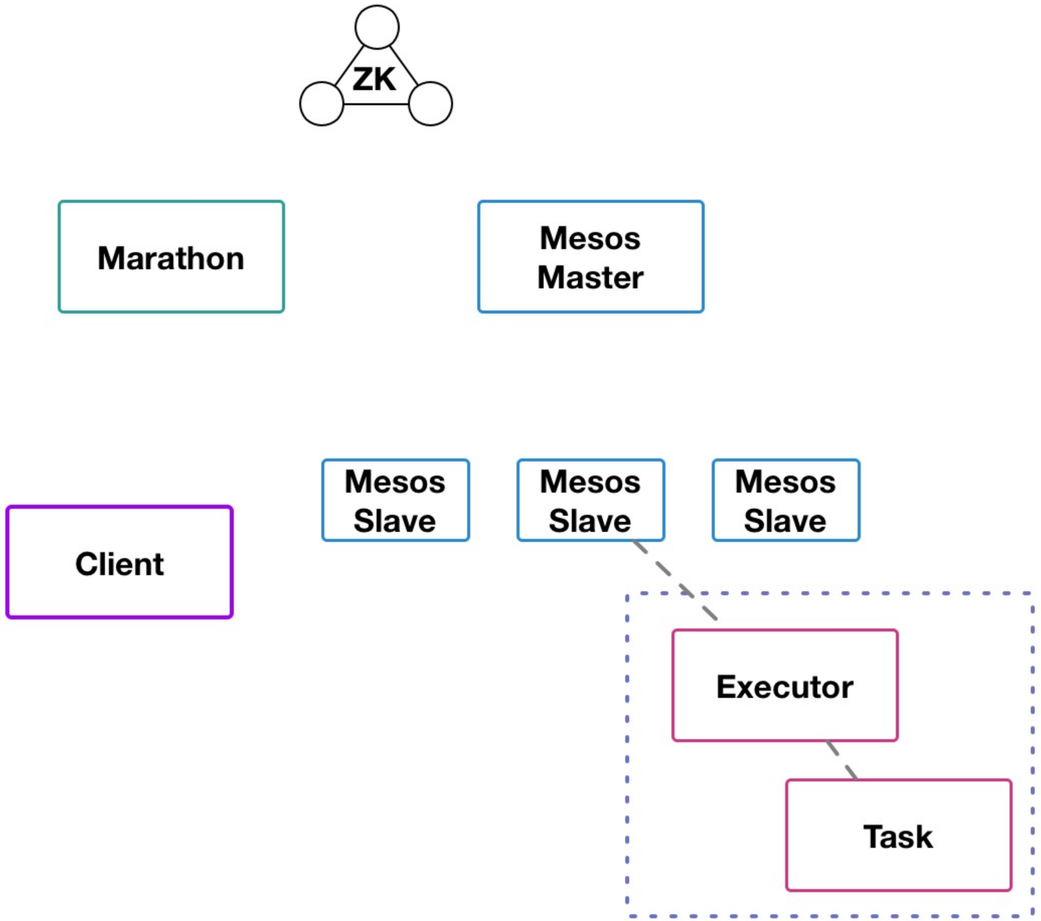

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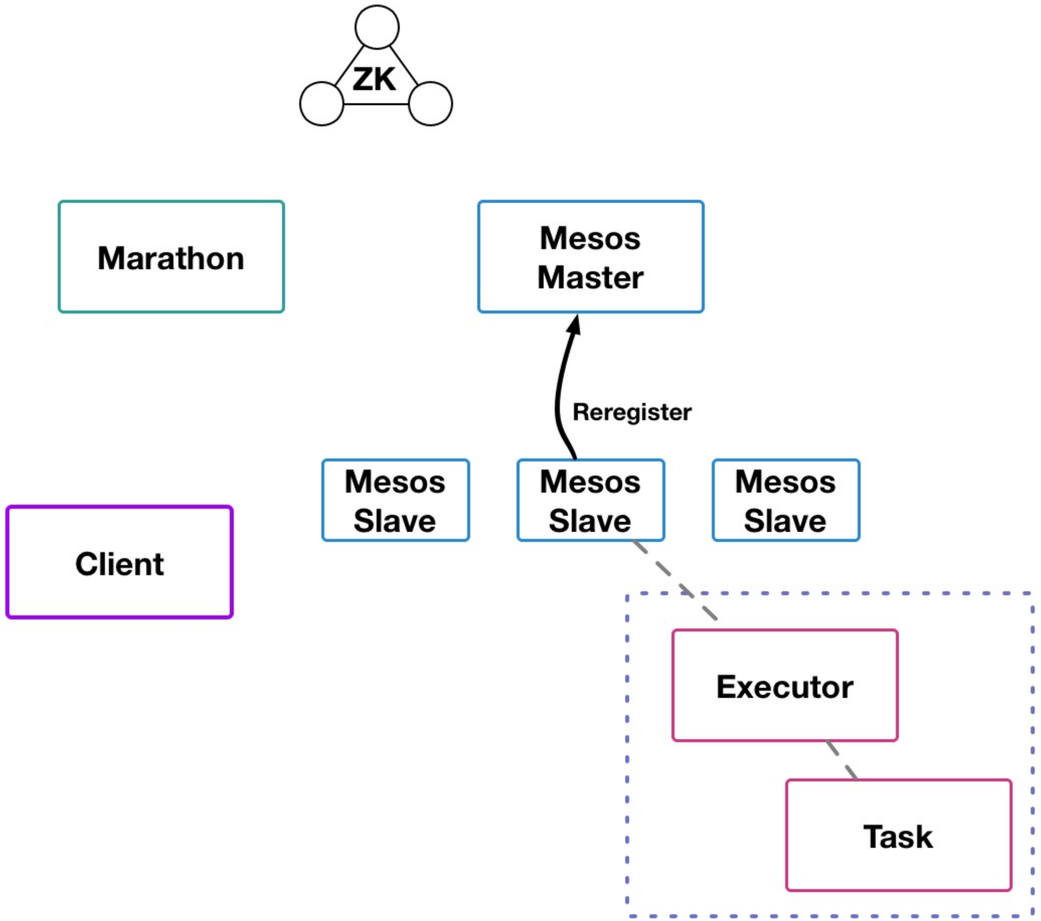

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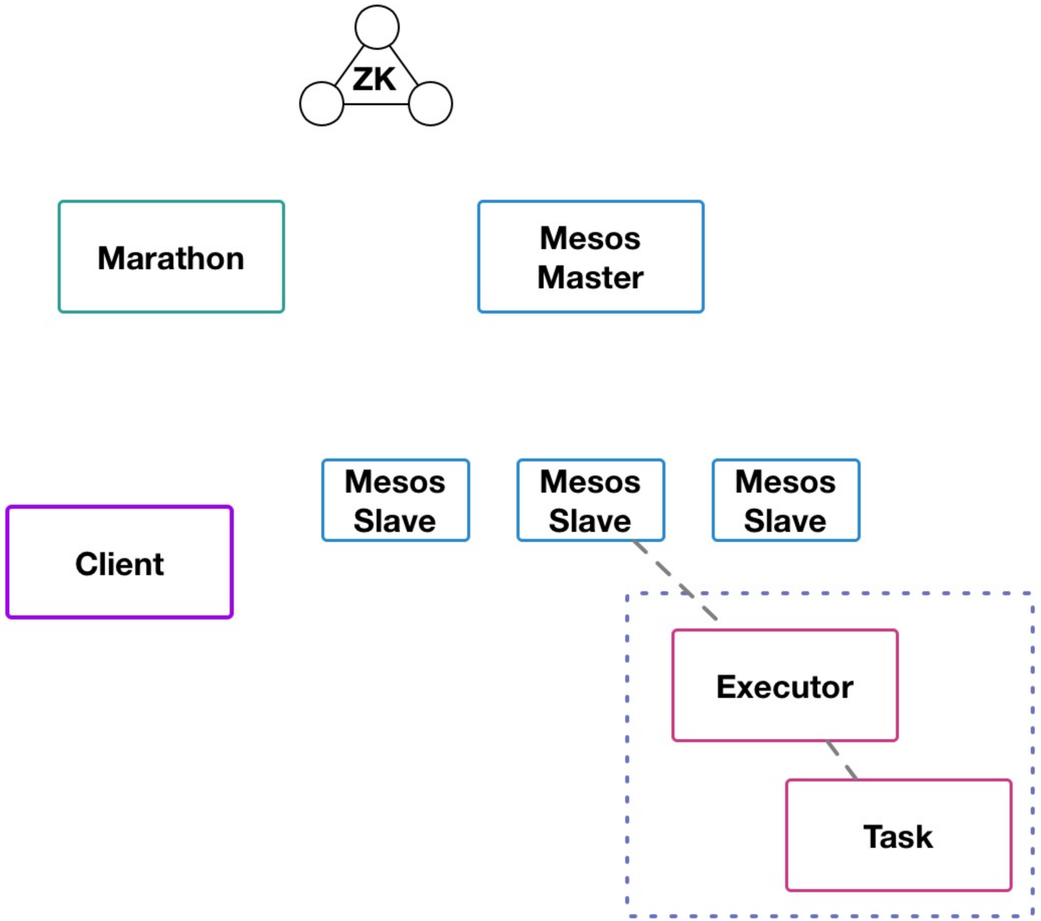

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Worker node failure

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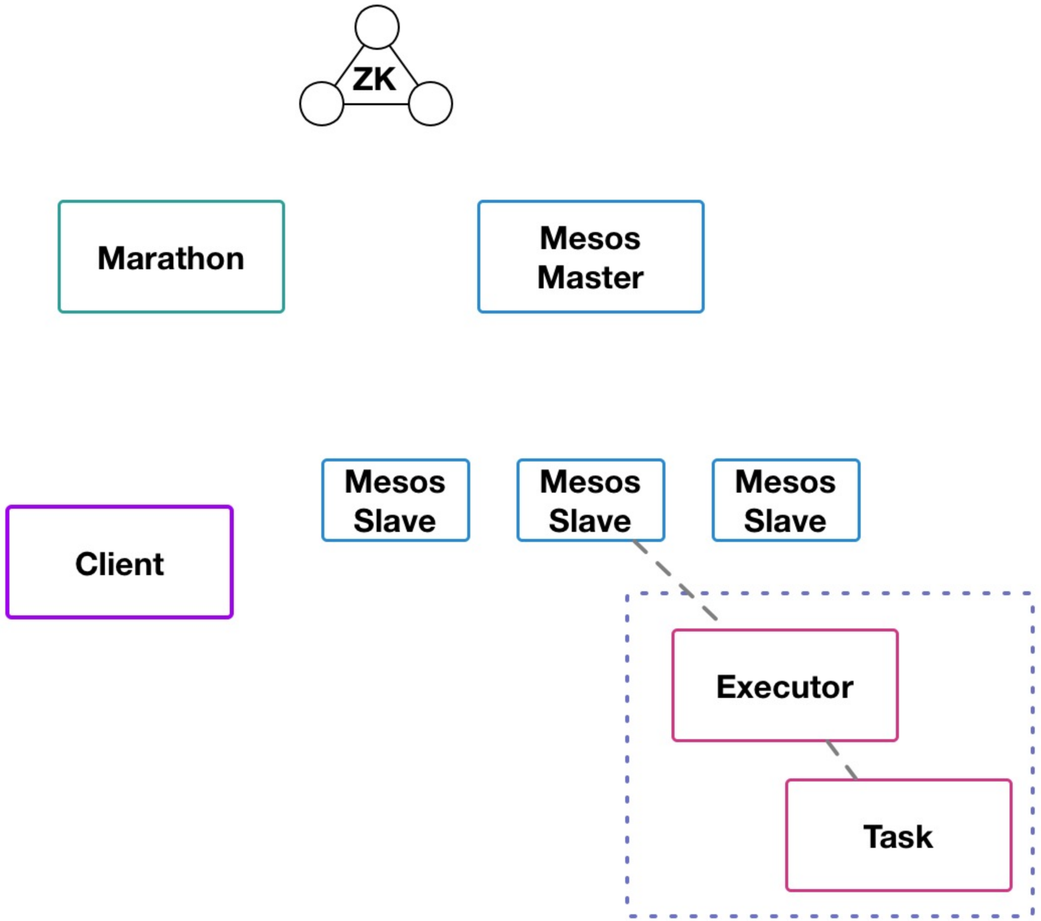

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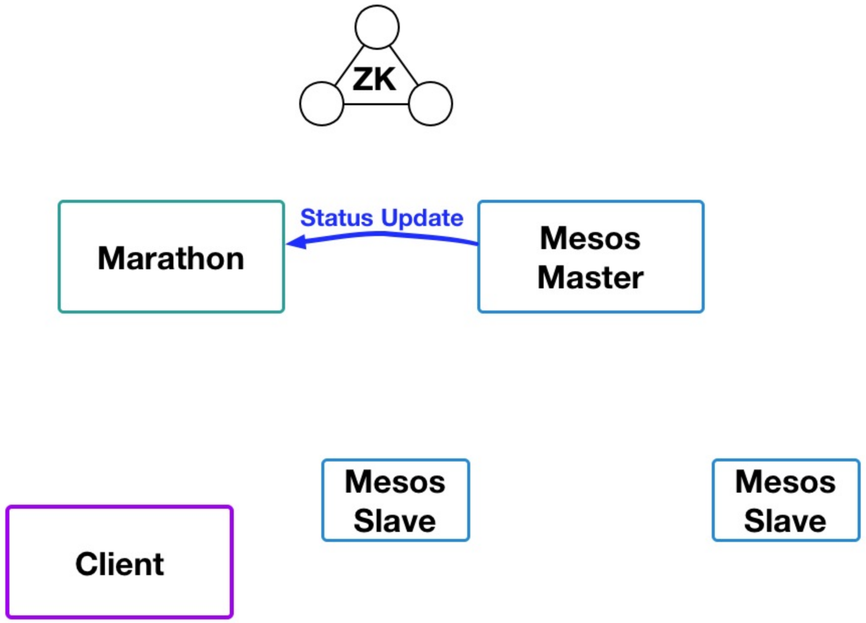

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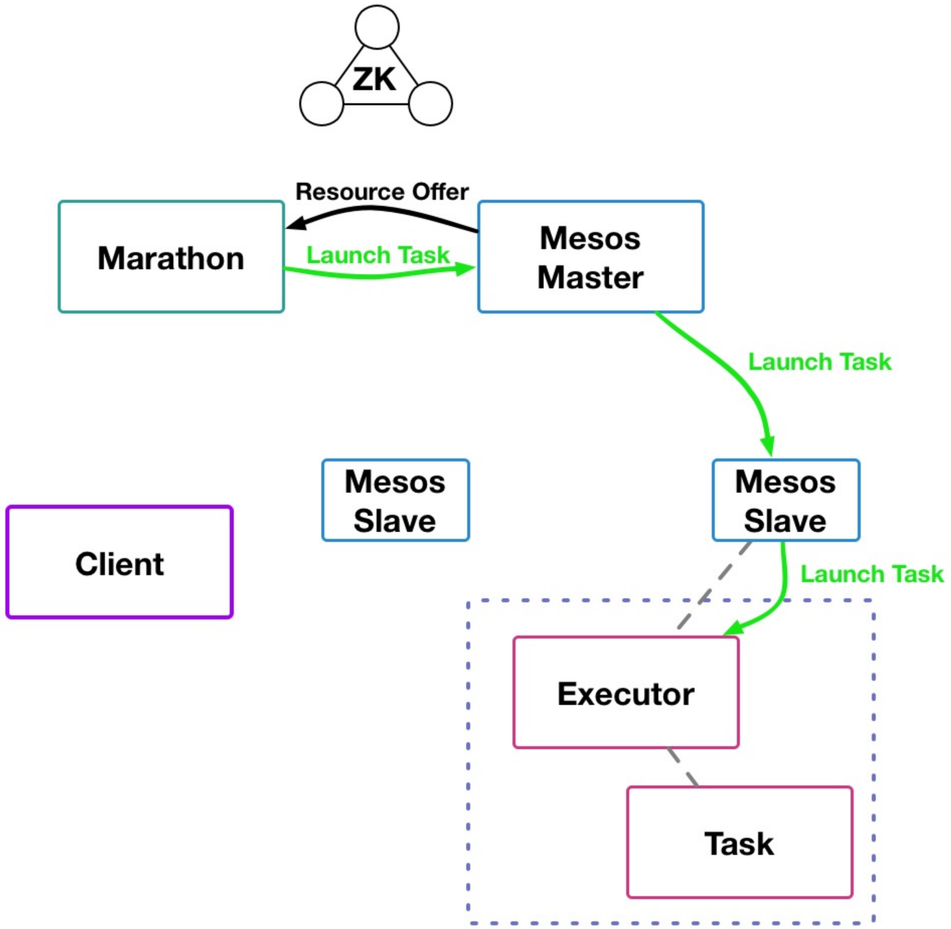

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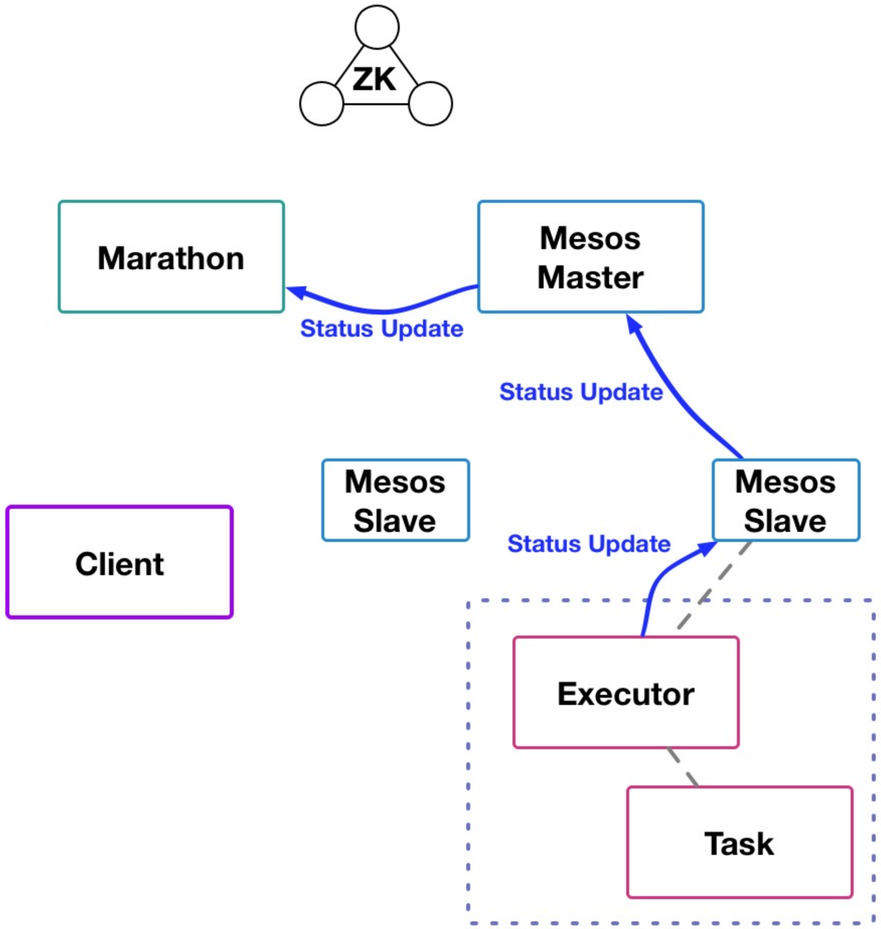

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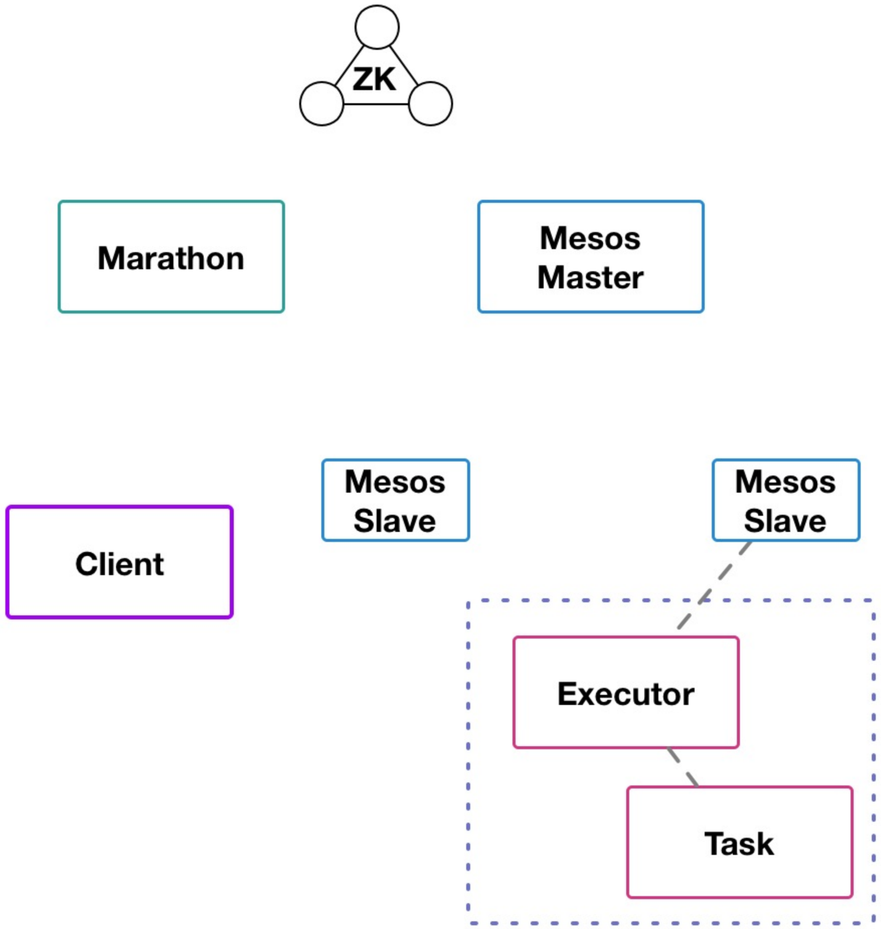

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Master failure

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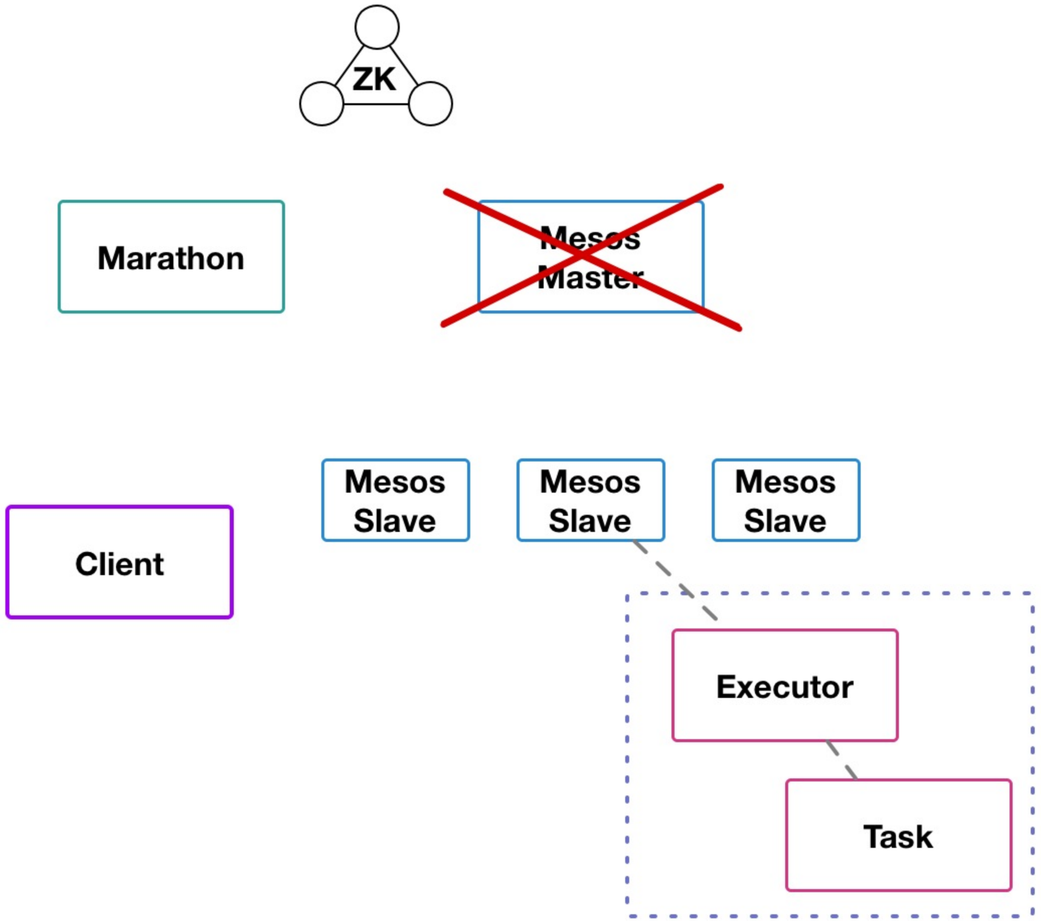

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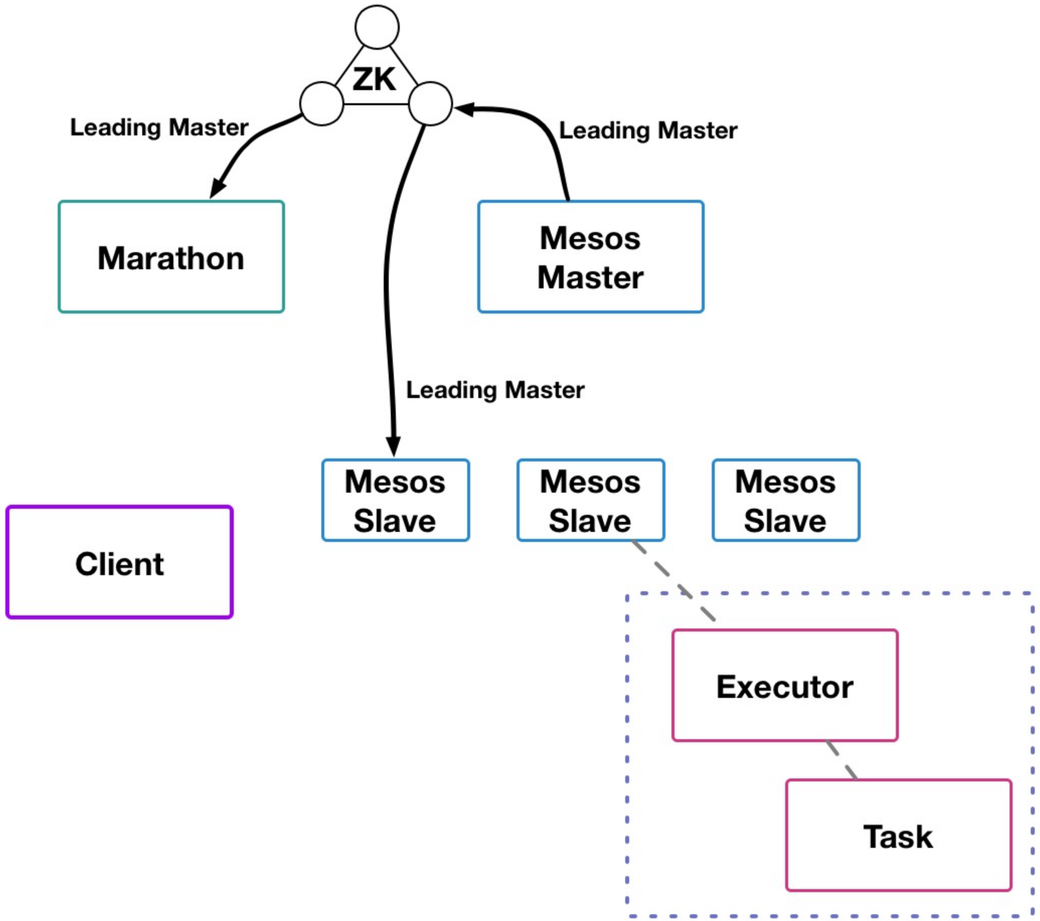

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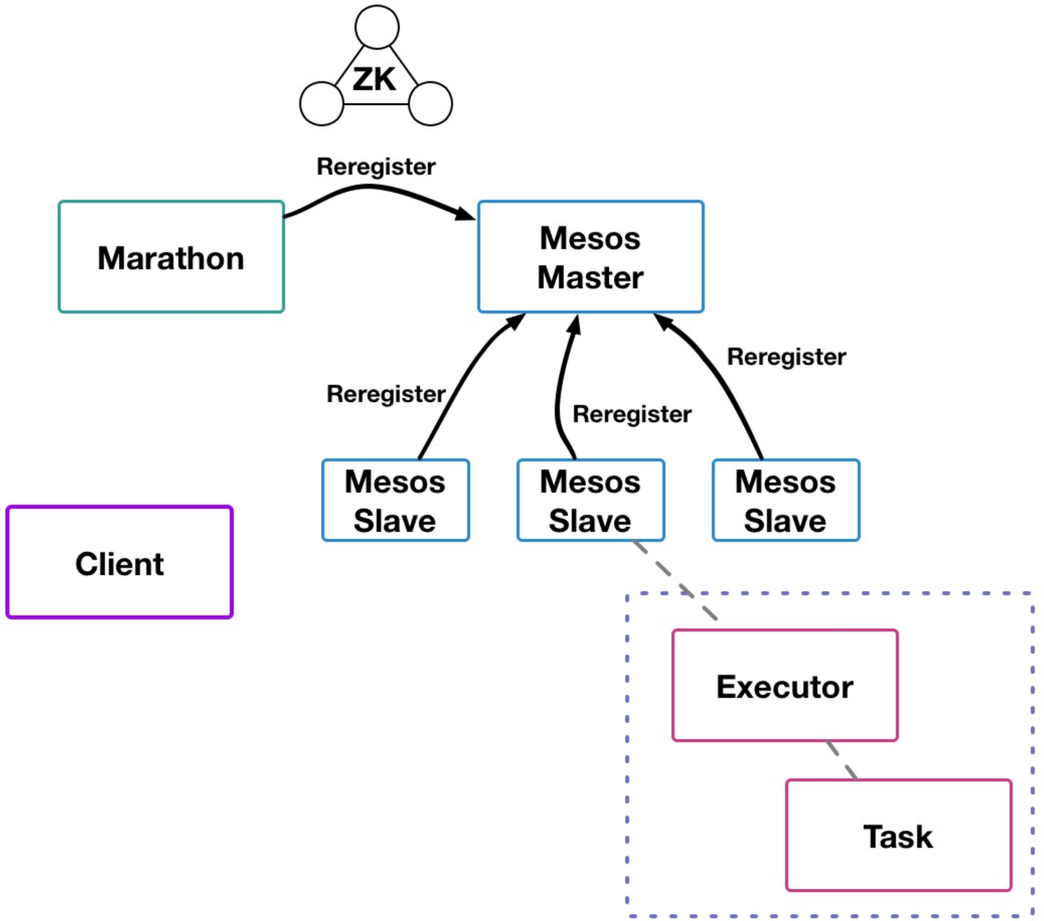

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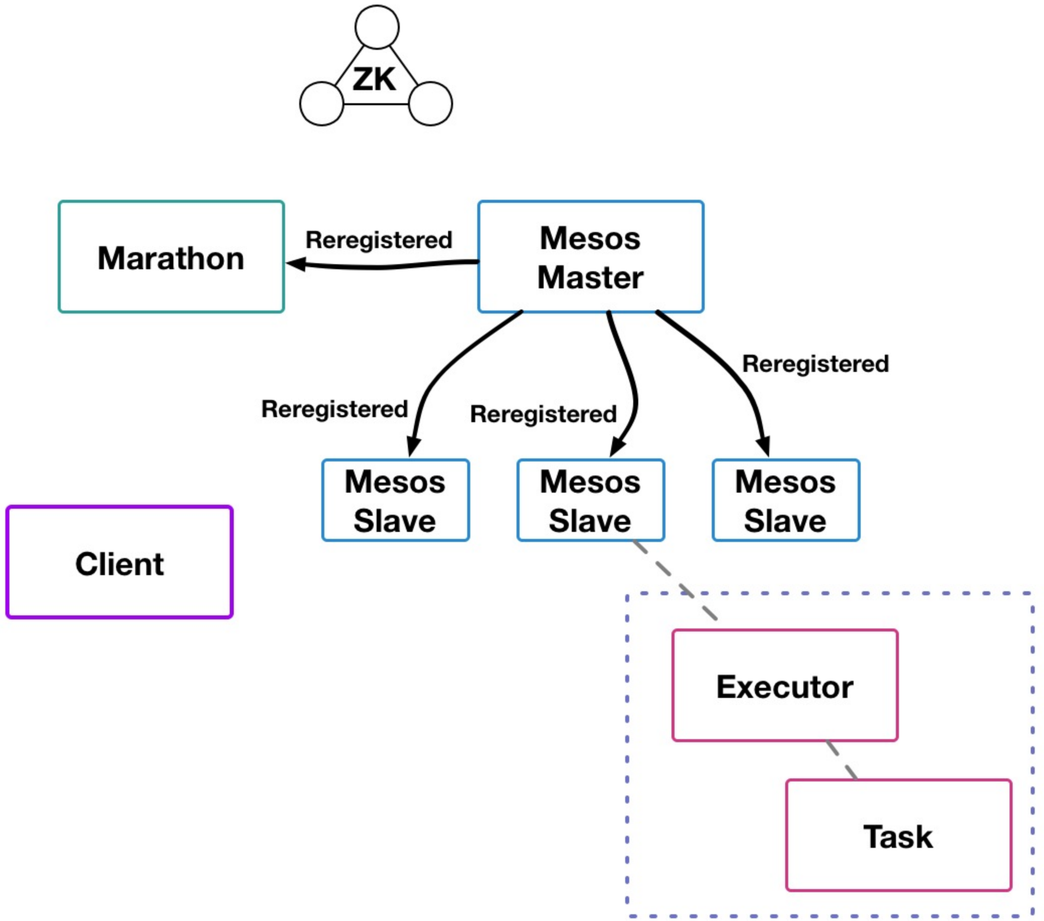

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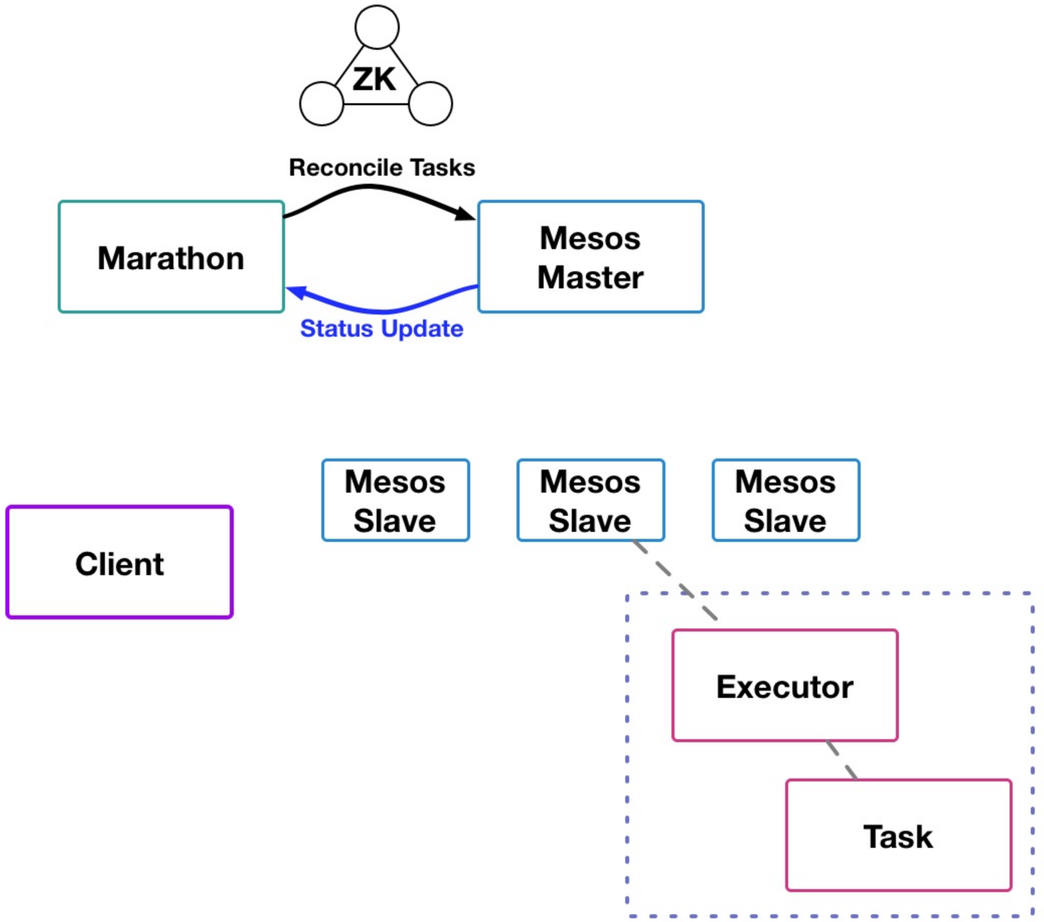

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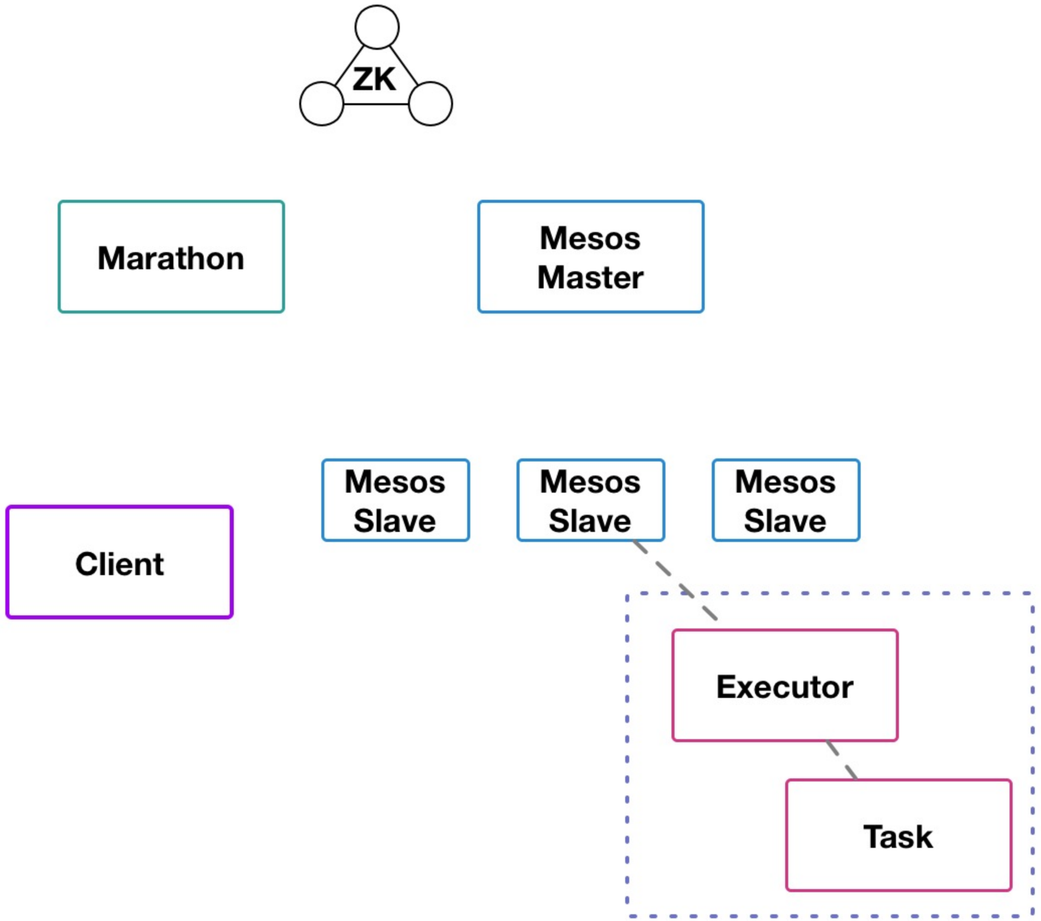

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Framework failure

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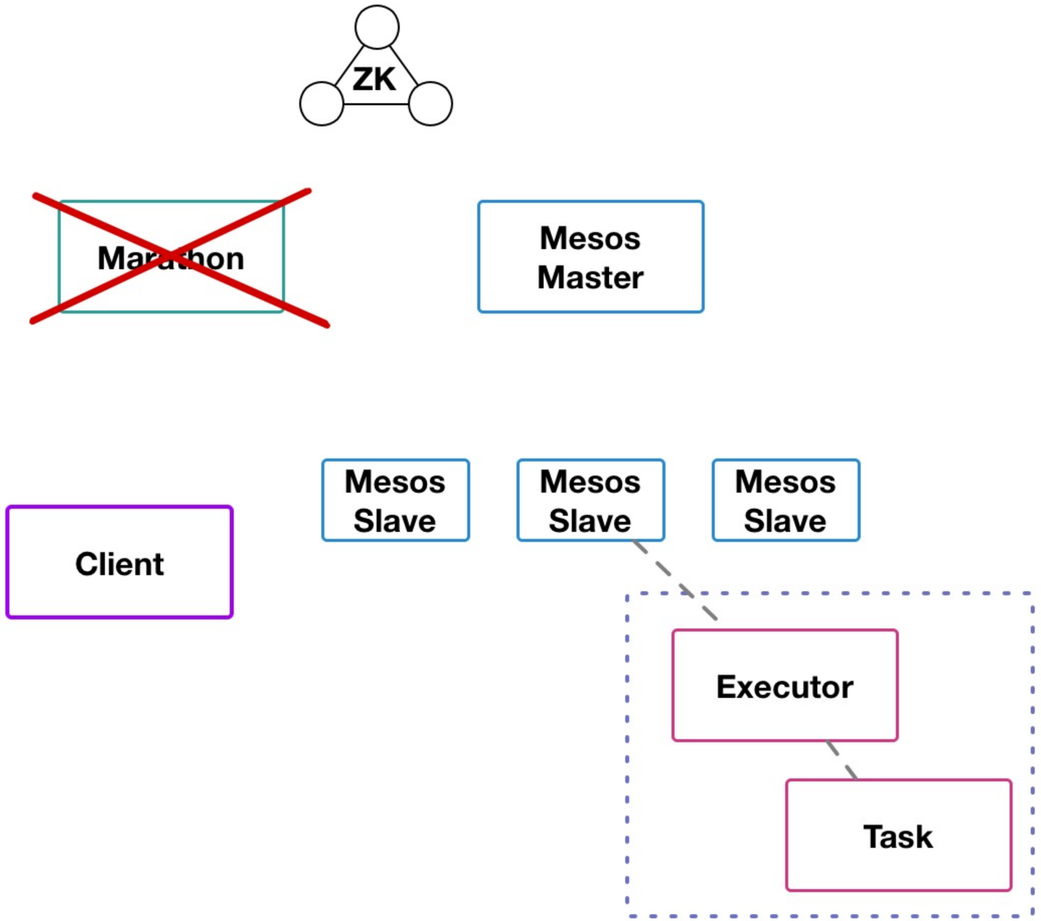

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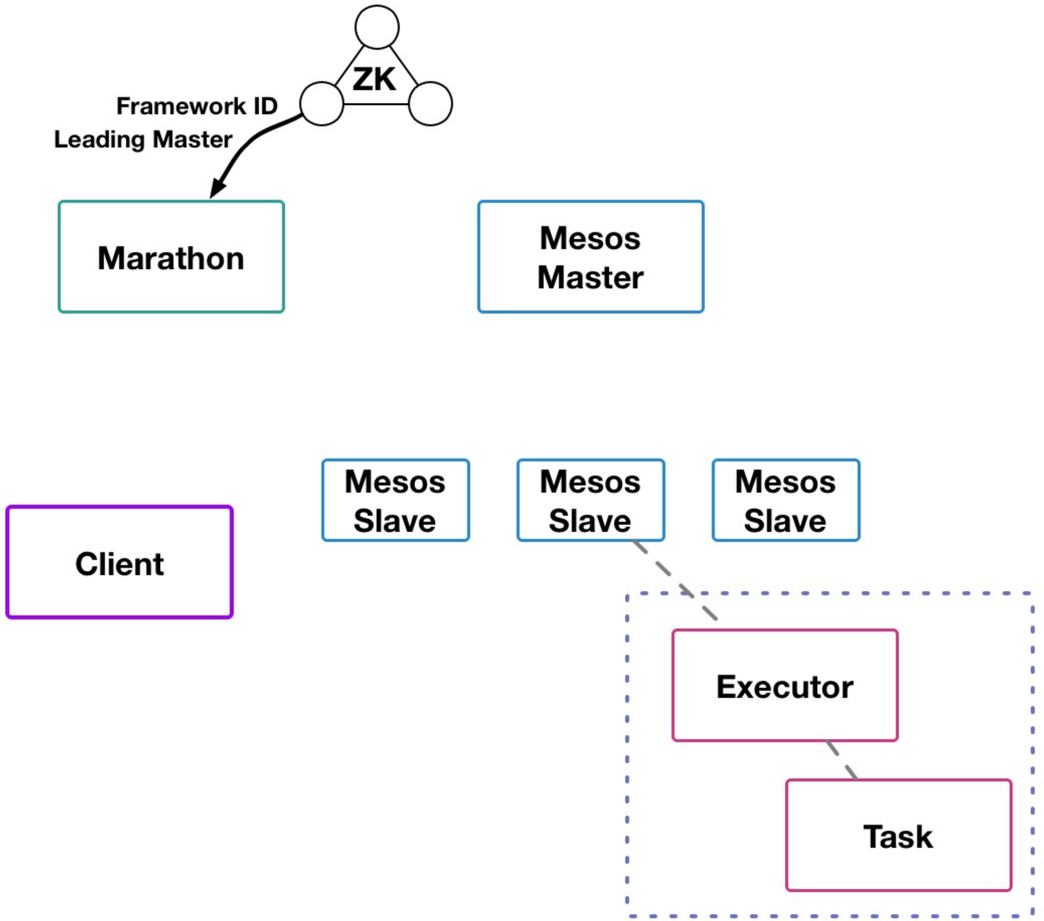

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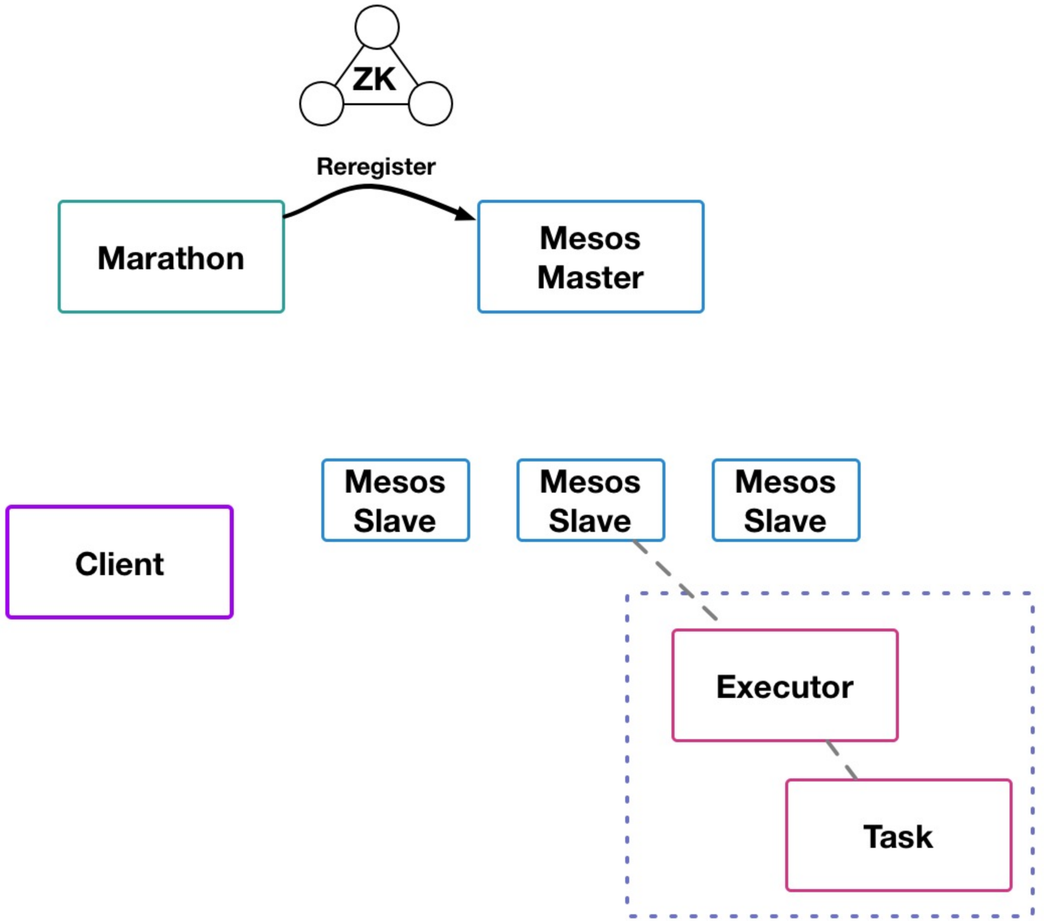

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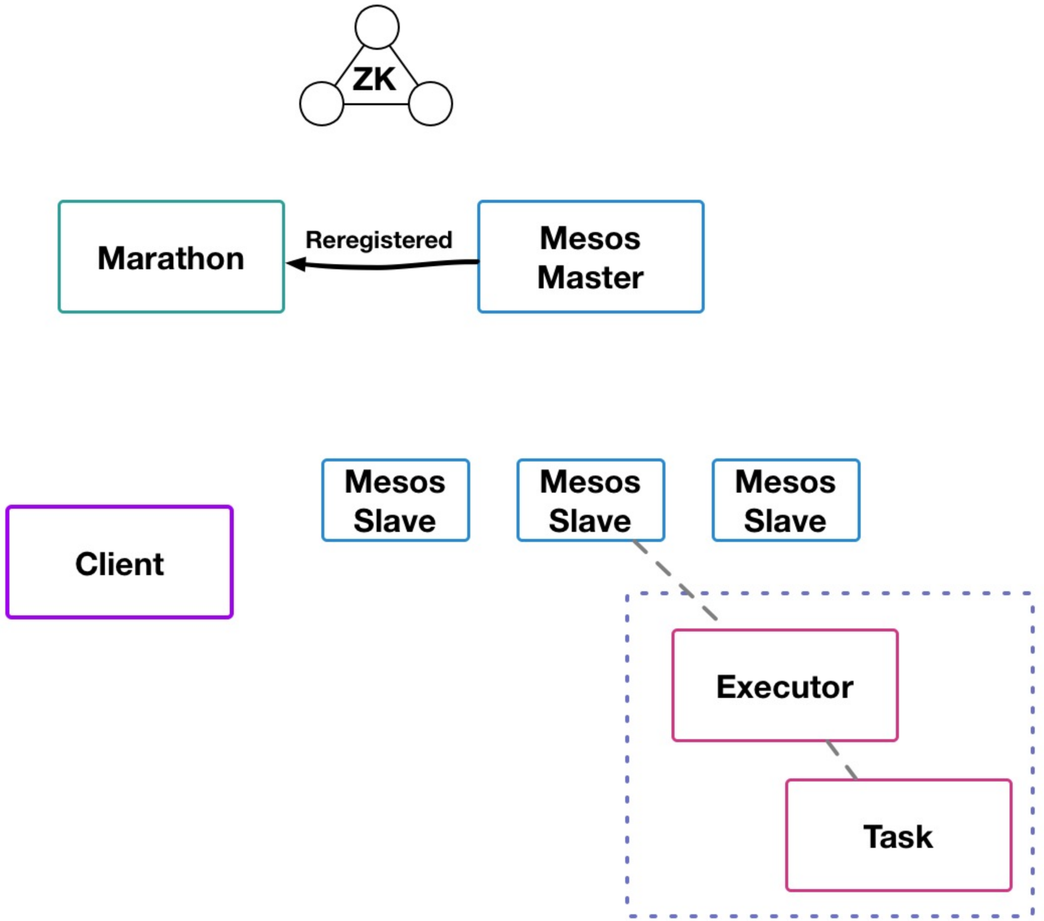

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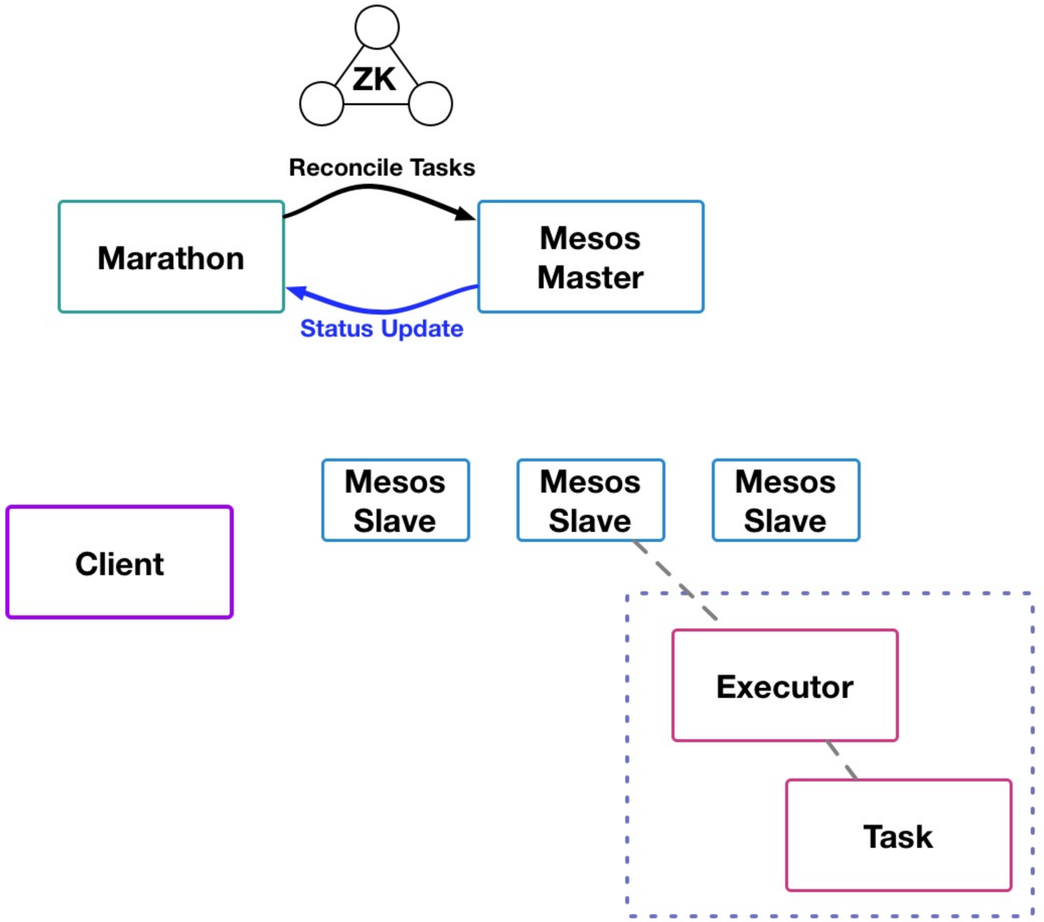

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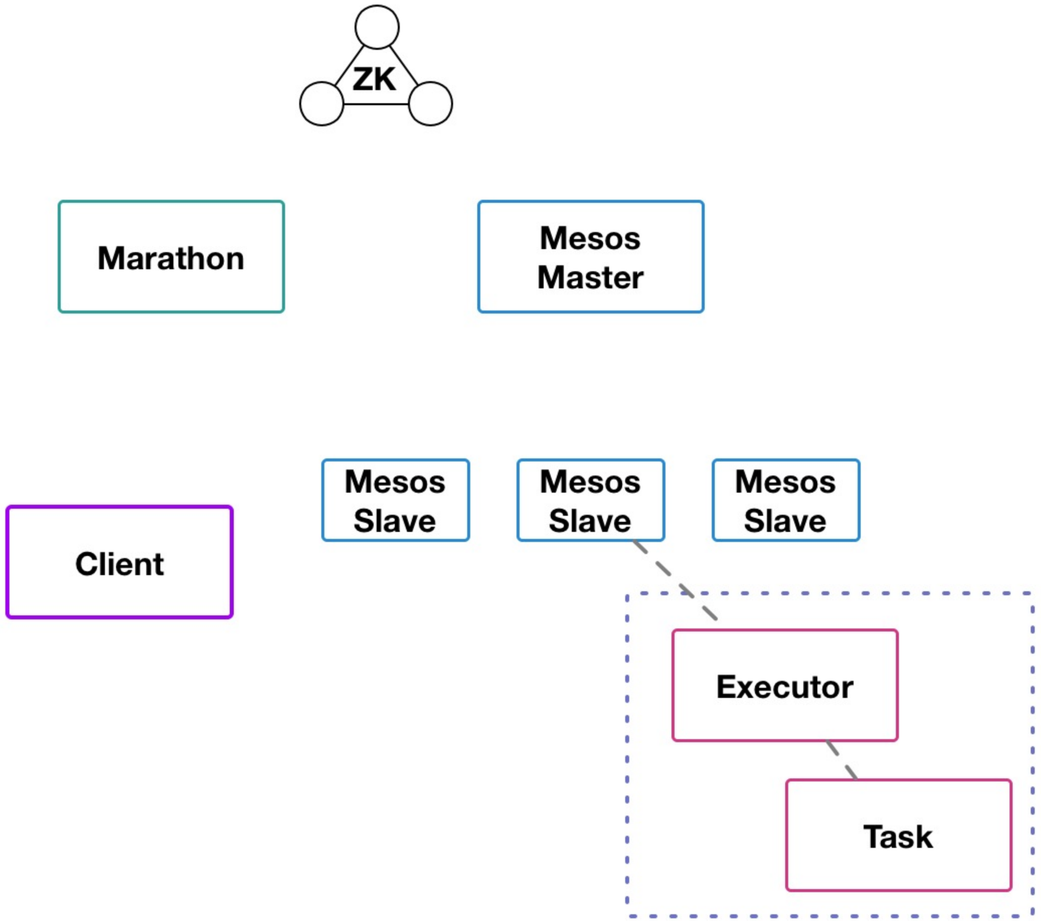

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Demo’ing the DCOS

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Get early access to the Mesosphere DCOS

Sign up at http://mesosphere.com/product and Mesosphere will send you an email with instructions

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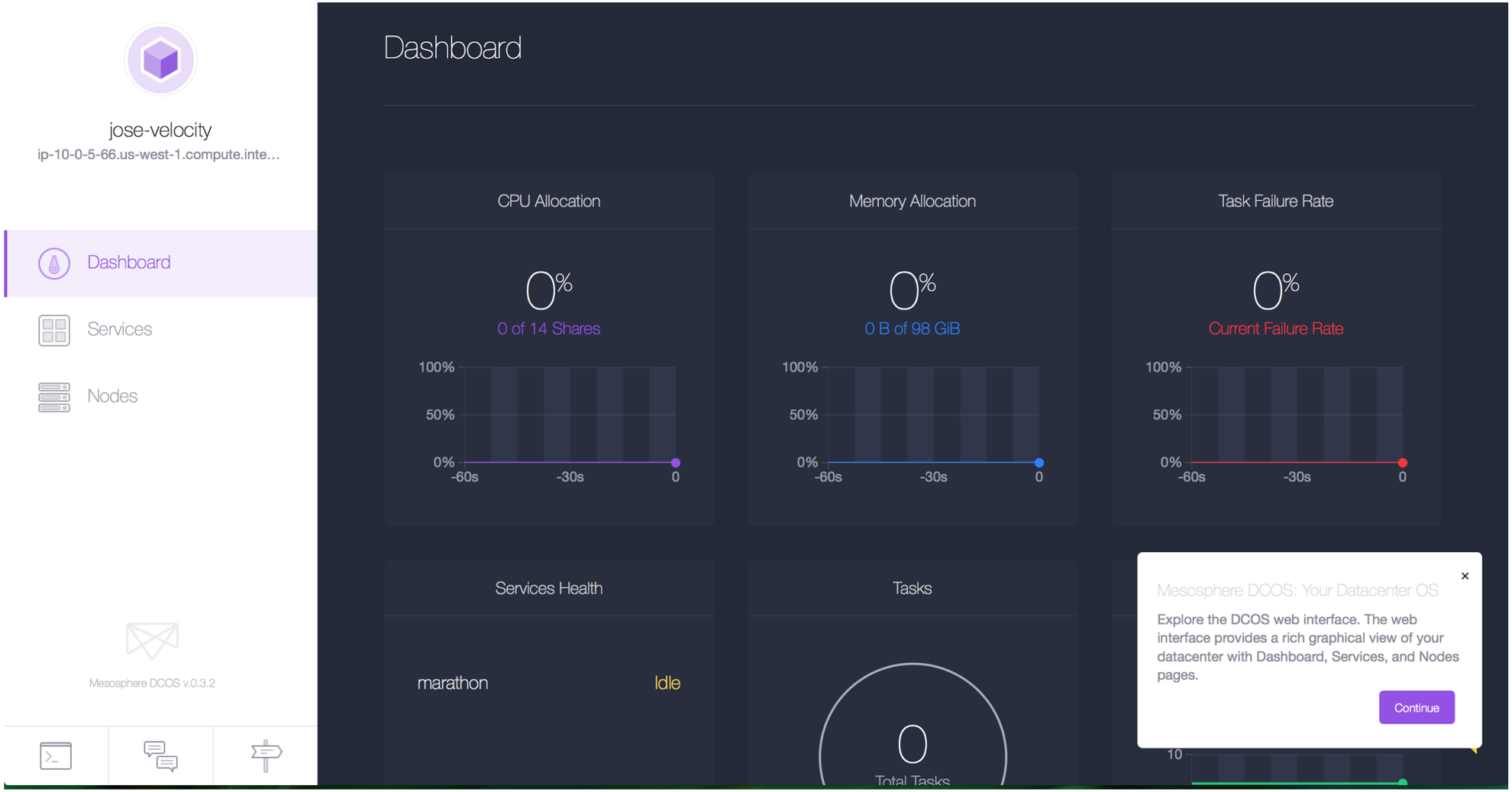
DCOS UI



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Install and Configure the DCOS CLI

```
mkdir -p dcos && \
cd dcos && \
curl -O https://downloads.mesosphere.io/dcos-cli/install.sh && \
bash ./install.sh . http://<dcos-hostname> && \
source ./bin/env-setup
```


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Install the Cassandra DCOS Service

```
dcos package install cassandra
```


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Install Spark and extend the CLI

```
dcos package install spark


dcos spark --help
```


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List all install package and running tasks

```
dcos package list-installed | jq '.[].name'

dcos tasks
```


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Increase the number of instances

```
dcos package install helloworld

dcos marathon app update helloworld instances=5
```


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http://tinyurl.com/velocity-dcos

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Hands on with Mesos & Marathon

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Copy USB data to local hard drive

```
cp -R mesos-usb ~/workspace/mesos-usb
```


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Start VM

```
cd ~/workspace/mesos-usb
vagrant box add mesos mesos.box
vagrant up
```


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Access the local Mesos console

Access the local Marathon console

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Download the install script:

```
wget https://downloads.mesosphere.io/dcos-cli/install.sh
```


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Create an empty directory and install into it:

```
mkdir dcos-cli

bash install.sh dcos-cli http://10.141.141.10:8080
```


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Set OSS Mesos & Marathon configuration:

```
dcos config set core.mesos_master_url http://10.141.141.10:
5050
dcos config set marathon.url http://10.141.141.10:8080
```


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Thanks!

Come and talk to us!
P.S., we're hiring!

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