



minimesos



# The experimentation and testing tool for Apache Mesos

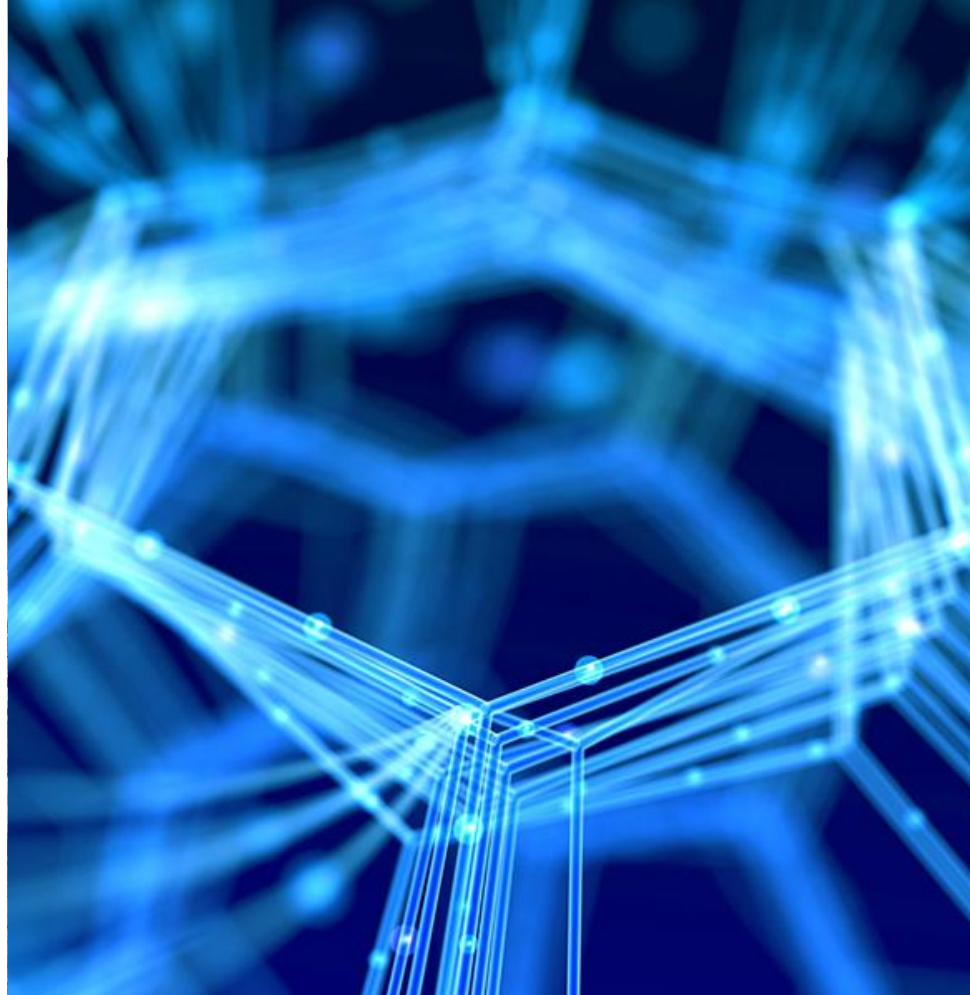
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Container Solutions



**DevOpsDays Warsaw**  
**23-11-2016**



# Outline

- What is Apache Mesos?
- What is minimesos?
- Basic Features
- Demo
- Design and Implementation
- Questions



minimesos

# What is Apache Mesos?

- Distributed Systems Kernel
- Program against your datacenter like it's a **single pool of resources**
- Created by Ben Hindman at Berkeley AMP lab
- Top level Apache project since 2013



# Why Mesos?

Run multiple technologies, AKA frameworks, on a single Mesos cluster



Blog post by Phil Winder @ CS blog 

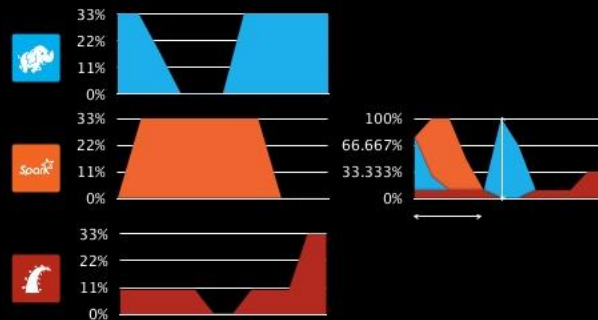
<http://container-solutions.com/reasons-use-apache-mesos-frameworks>

# Why Mesos?

This is your typical data center with static partitioned apps



Resource sharing increases throughput and utilization

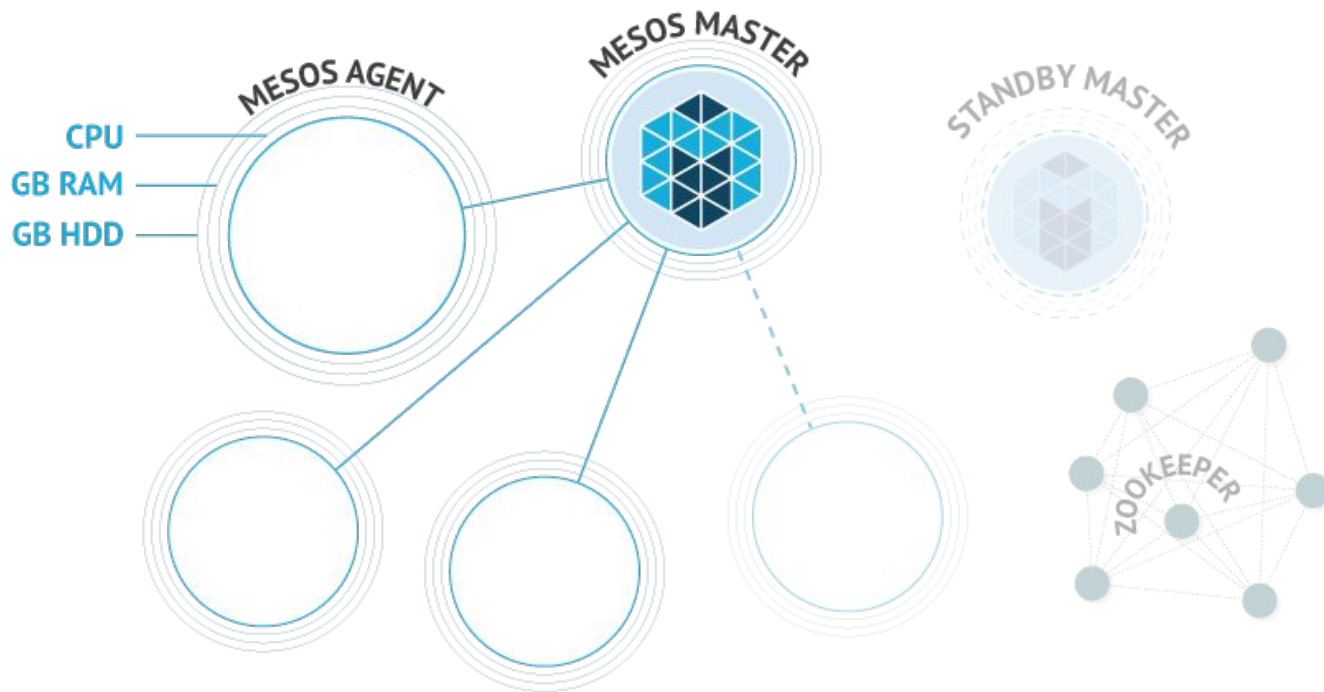


# Powered by Mesos



See <http://mesos.apache.org/documentation/latest/powered-by-mesos/>

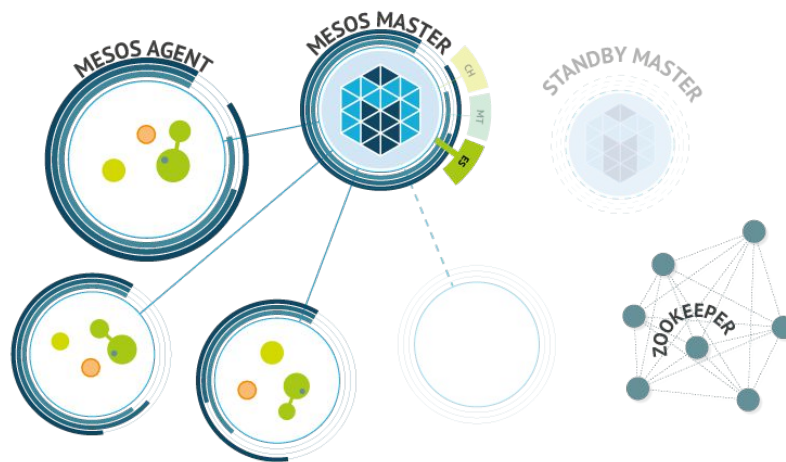
# Mesos Architecture



# Mesos Architecture

Quick run through Mesos architecture and terminology

- Mesos Master
- Mesos Agents
- ZooKeeper
- Frameworks
- Framework Scheduler
- Framework Executors
- Framework Tasks

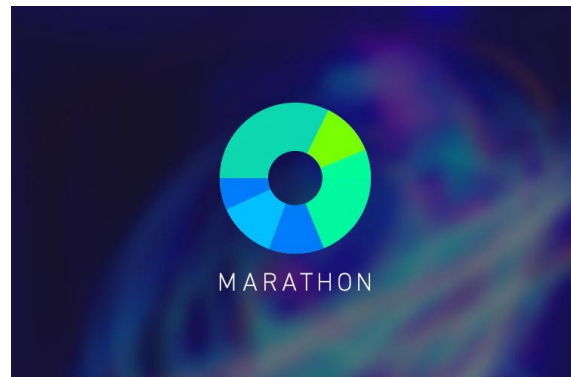




# Frameworks - Marathon

Meta-framework for deploying long running services and Docker containers

- Automatic restart
- Scaling
- Healthchecks
- Placement Constraints
- API
- Created by Mesosphere



# Frameworks - Mesos Elasticsearch

Framework for running Elasticsearch on Mesos

- Automatic restart
- Horizontal Scaling
- Web UI



mesos/**elasticsearch**

The **Cloud Native Computing Foundation** has donated cluster resources for testing the framework at scale!

<https://github.com/cncf/cluster/issues/13>

# What is minimesos?



# What is minimesos?

- Experimentation and testing tool for Apache Mesos
- Instant Mesos cluster on your laptop
- CLI and Java API
- Runs in Docker
- Sponsored by

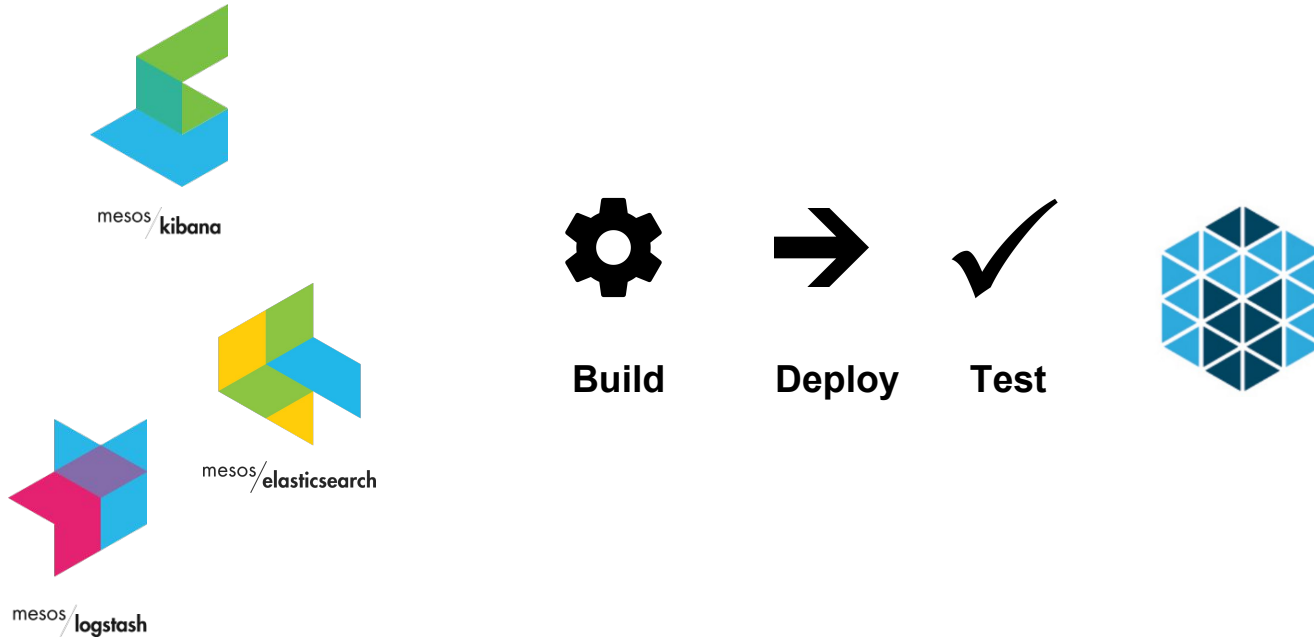


# The story behind minimesos

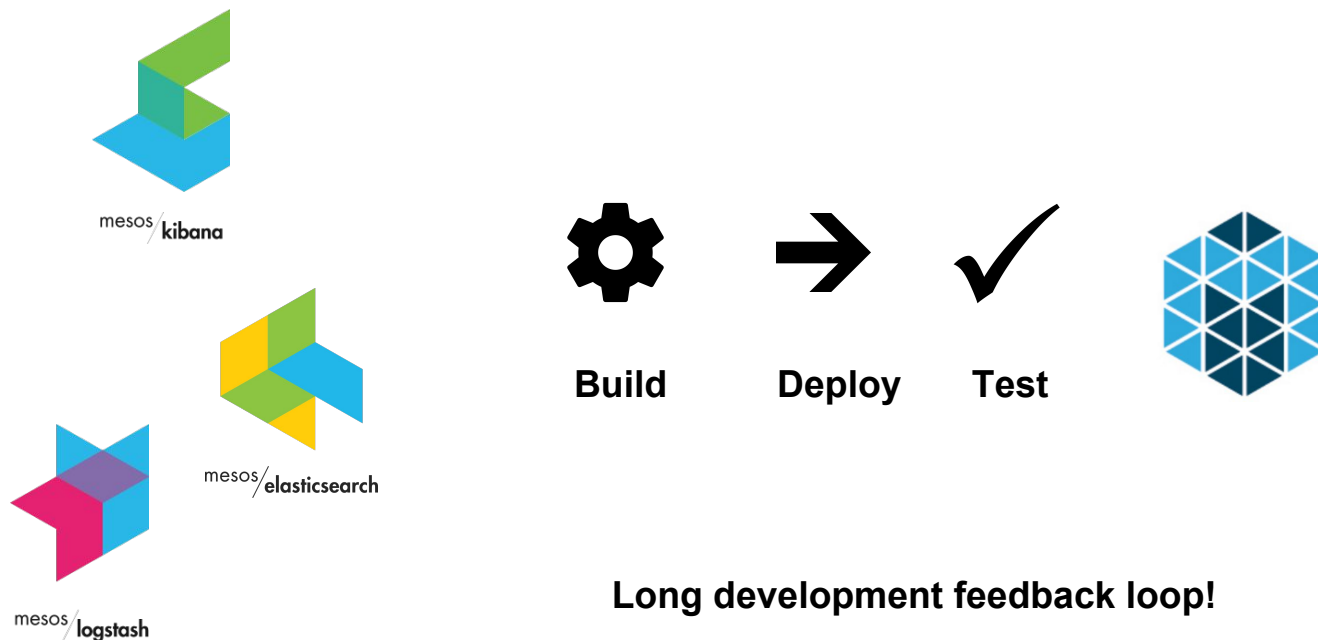
- CS contributed to the Mesos ELK stack sponsored by
- Developing & testing distributed systems is hard...



# Mesos framework development



# Mesos framework development



# Mesos framework development





# Basic Features



# minimesos CLI

- **Initialize** minimesosFile

```
$ minimesos init
```

- **Start the cluster**

```
$ minimesos up
```

```
Minimesos cluster is running: 2329145689
```

```
...
```



# minimesos CLI

- Print tasks

```
$ minimesos ps
```

- Print cluster info

```
$ minimesos info
```

- Print state

```
$ minimesos state
```

- Installing an app on Marathon

```
$ minimesos install --marathonFile apps/app.json
```



# minimesosFile

- Cluster-wide properties

```
minimesos {  
    clusterName = "test"  
    loggingLevel = "INFO"  
    mapAgentSandboxVolume = true  
    mesosVersion = "1.0.0"  
    timeout = 60  
    ...  
}
```



# minimesosFile

- Configure agent resources and other processes

```
agent {  
  resources {  
    cpu {  
      role = "*"   
      value = 2  
    }  
    disk {  
      role = "*"   
      value = 20000  
    }  
    ...  
  }  
}
```



# minimesos Java API

@ClassRule

```
public static final MesosClusterTestRule RULE = MesosClusterTestRule.fromFile("src/test/resources/configFiles/minimesosFile-mesosClusterTest");
```

```
public static MesosCluster CLUSTER = RULE.getMesosCluster();
```

@Test

```
public void mesosClusterCanBeStarted() throws Exception {
```

```
    MesosMaster master = CLUSTER.getMaster();
```

```
    JSONObject stateInfo = master.getStateInfoJSON();
```

```
    assertEquals(3, stateInfo.getInt("activated_slaves"));
```

```
}
```



# Weave Scope

- Visualize containers
- Launched via Marathon  
on startup in `minimesosFile`
- Runs at <http://localhost:4040>



# Demo





# minimesos online demo

- Try out minimesos in a browser. Powered by @teamkatacoda
- Go to <https://minimesos.org/try>
- **NOTE** does not work with ad-blockers



# minimesos installation

- `curl -sSL https://minimesos.org/install | sh`
- Initial pull of Docker images may take a few minutes
- For more info see <http://www.minimesos.org>



# minimesos demo

- See  [containersolutions/devopsdays-warsaw-2016-minimesos](https://github.com/containersolutions/devopsdays-warsaw-2016-minimesos)
- The `minimesosFile` contains a reference to `es.json` Marathon file
- Deploys on startup

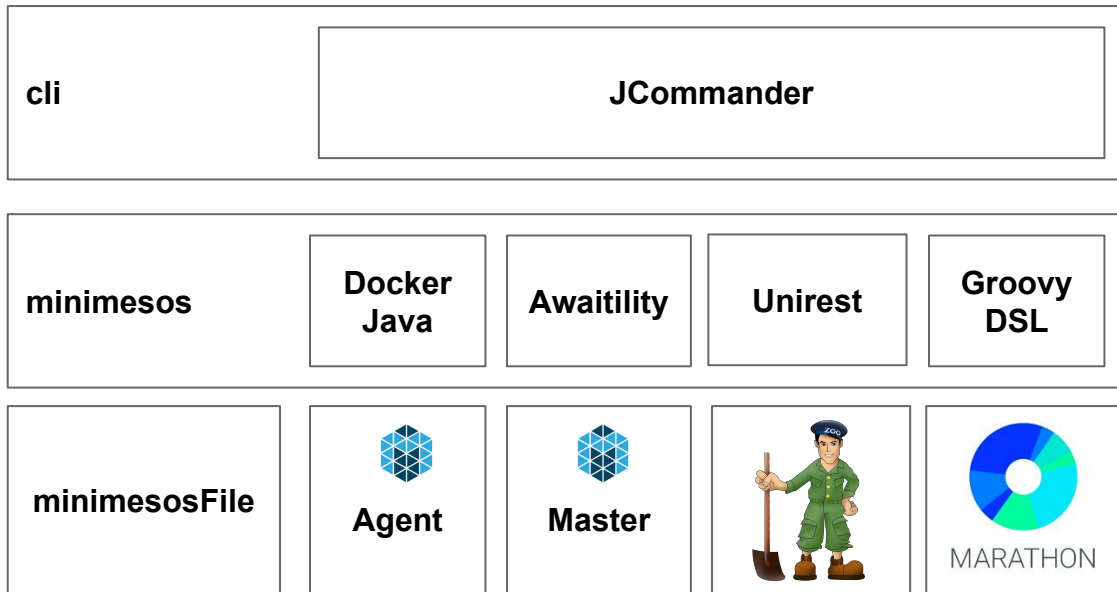


# Design & Implementation

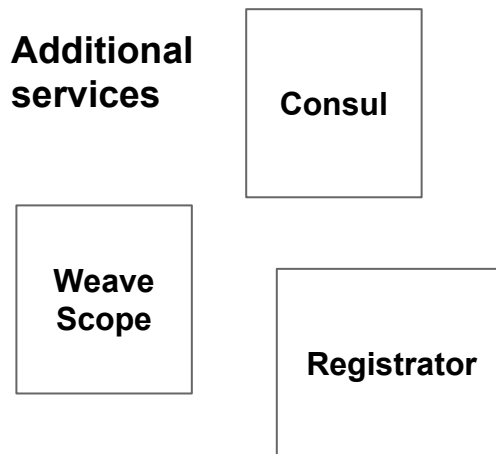


# minimesos architecture

## Linux box or Docker Machine VM



## Additional services



# Limitations

- **Networking**

- Executors do not use Agent ports. Different network interface!

- **Isolation**

- minimesos containers write files as `root` on host instead of `$USER`

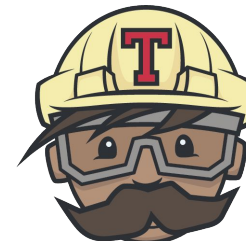
- **Service Discovery**

- Copy pasting IP addresses is tedious

# How to contribute to minimesos



- Found a bug or issue? Let us know
- PRs are appreciated!
- Your PR is auto built by Travis CI



# Let's stay in touch!

**GitHub**  **containersolutions/minimesos**



<https://minimesos.org>



<https://www.container-solutions.com>



**minimesos contributors**

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<https://minimesos.slack.com>



# Thank you!