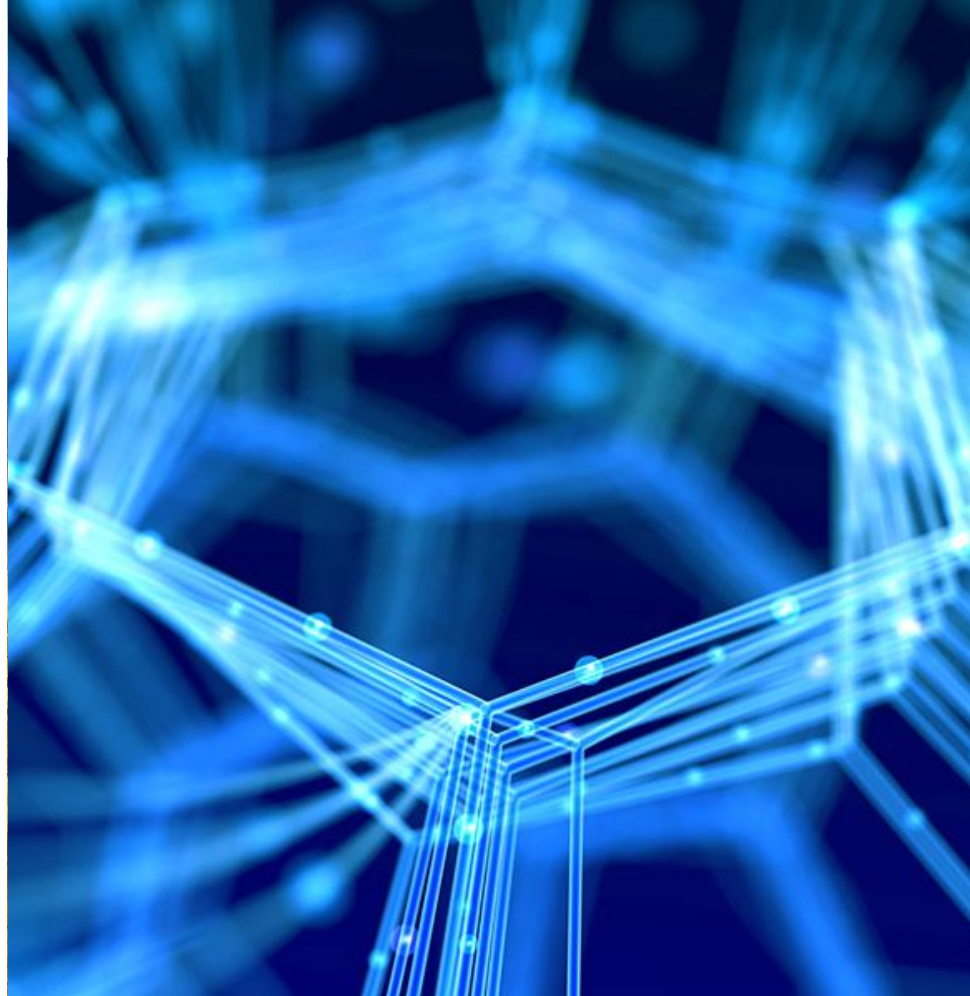




# The experimentation and testing tool for Apache Mesos

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# Bio

- Senior software engineer at Container Solutions Amsterdam
- R&D in the Docker, Mesos and Programmable infrastructure ecosystem
- Creator of minimesos



@Frank\_Scholten



frankscholten

# Outline

- What is minimesos?
- Basic Features
- Limitations
- Demo
- Advanced Features
- Wrap up



# 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
- Version 0.10.2 out now which supports Mesos 1.0.0
- Sponsored by



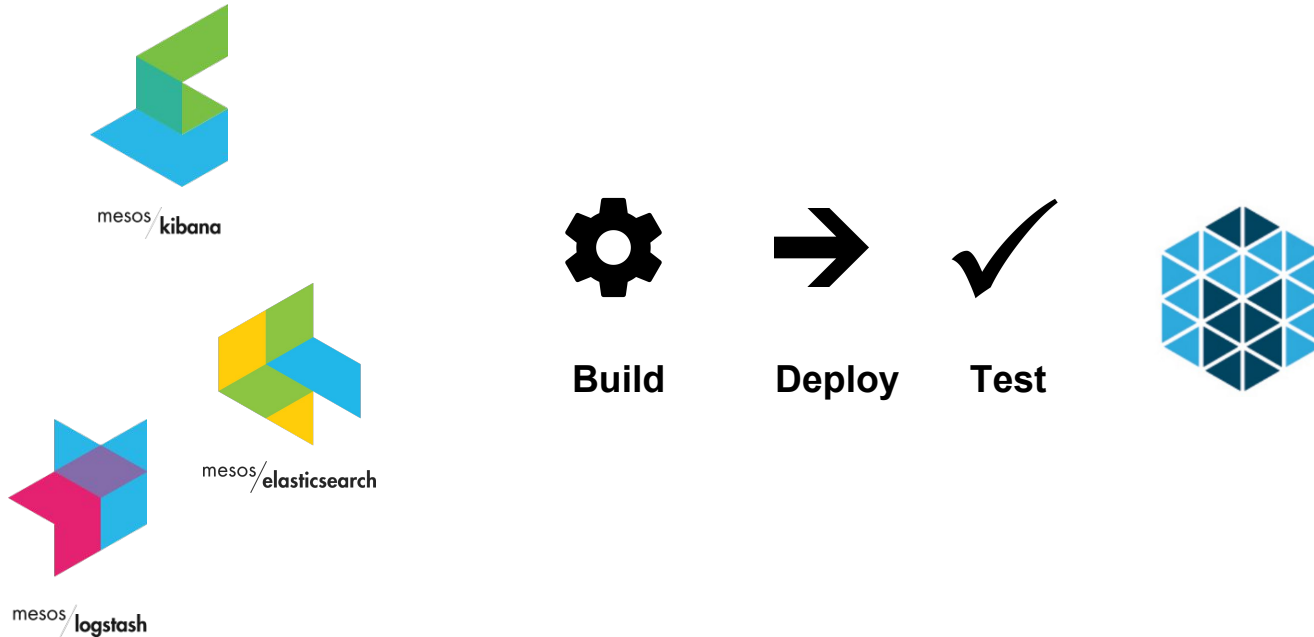
# The story behind minimesos

- CS contributed to  MANTL by 
- The Mesos ELK stack on Mesos is a core piece
- Developing & testing distributed systems is hard...

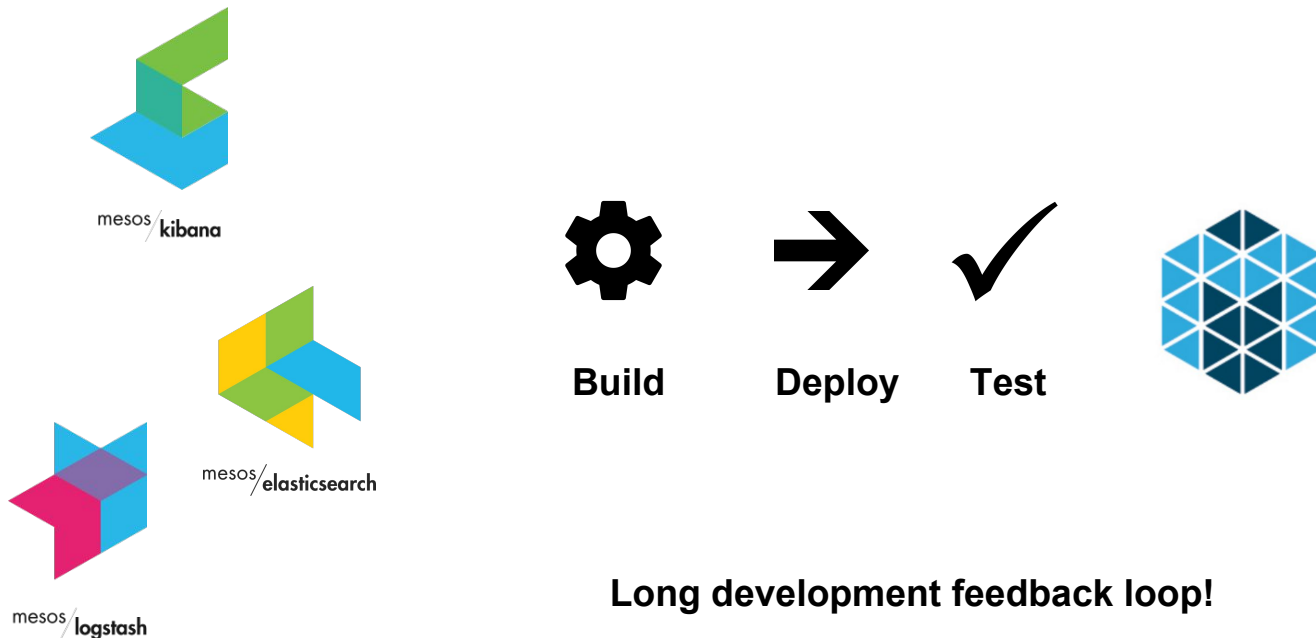


<http://container-solutions.com/orchestrated-machine-containerpilot-minimesos-travelling-orchestration>

# Mesos framework development



# Mesos framework development



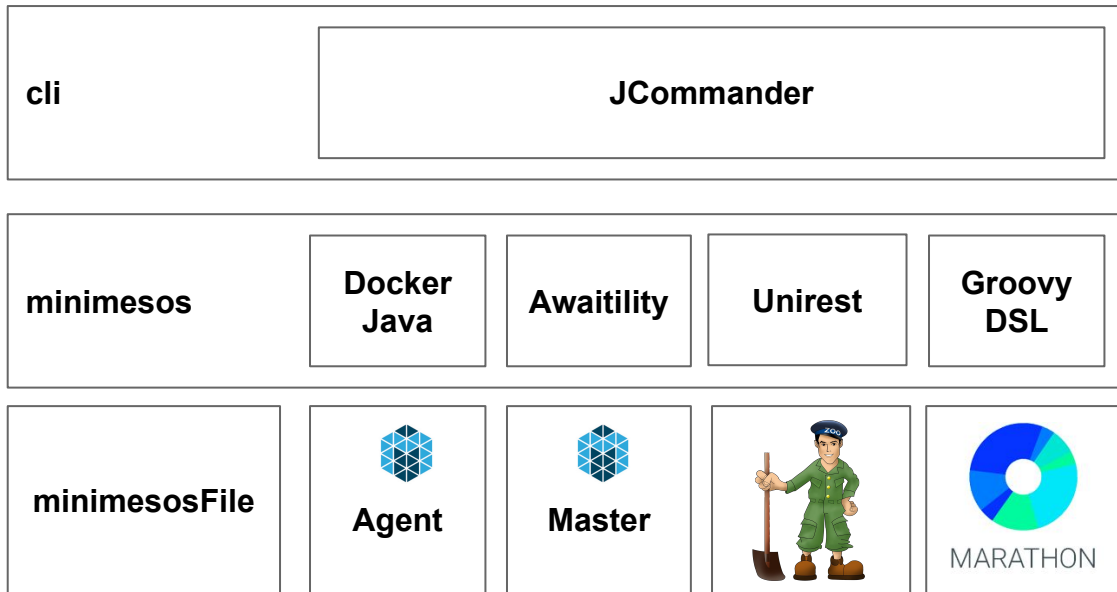


# Mesos framework development



# minimesos architecture

## Linux box or Docker Machine VM



## Additional services

Consul

Weave  
Scope

Registrar

# Basic Features



# minimesos CLI



- **Initialize** minimesosFile

```
$ minimesos init
```

- **Start the cluster**

```
$ minimesos up
```

- **Print Mesos state**

```
$ minimesos state
```

# minimesos CLI



- Print tasks

```
$ minimesos ps
```

- Installing a Marathon app

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

- Print cluster info

```
$ minimesos info
```

- Destroy the cluster

```
$ minimesos destroy
```

# minimesosFile



- Cluster-wide properties

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



- 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"));
```

```
}
```



# minimesos Java API

```
@BeforeClass
public static void startScheduler() throws Exception {

    String ipAddress = CLUSTER.getMasterContainer().getIpAddress();

    LOGGER.info("Starting Scheduler, connected to " + ipAddress);
    SchedulerContainer scheduler = new SchedulerContainer(CONFIG.dockerClient, ipAddress);

    // Cluster now has responsibility to shut down container
    CLUSTER.addAndStartContainer(scheduler);

    LOGGER.info("Started Scheduler on " + scheduler.getIpAddress());
}

@Test
public void testNodeDiscoveryRest() {

    long timeout = 120;
    DockerContainersUtil util = new DockerContainersUtil(CONFIG.dockerClient);

    final Set<String> ipAddresses = new HashSet<>();
    Awaitility.await("9 expected executors did not come up").atMost(timeout, TimeUnit.SECONDS).until(() -> {
        ipAddresses.clear();
        ipAddresses.addAll(util.getContainers(false).filterByImage(Configuration.DEFAULT_EXECUTOR_IMAGE).getIpAddresses());
        return ipAddresses.size() == 9;
    });

    HelloWorldResponse helloWorldResponse = new HelloWorldResponse( ipAddresses, Arrays.asList(8080, 8081, 8082), timeout );
    assertTrue("Executors did not come up within " + timeout + " seconds", helloWorldResponse.isDiscoverySuccessful());
}
```

# 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 @teamkatakoda

- 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/devops-utrecht-25-08-2016-minimesos](https://github.com/containersolutions/devops-utrecht-25-08-2016-minimesos)
- The `minimesosFile` contains a reference to `es.json` Marathon file
- Deploys on startup

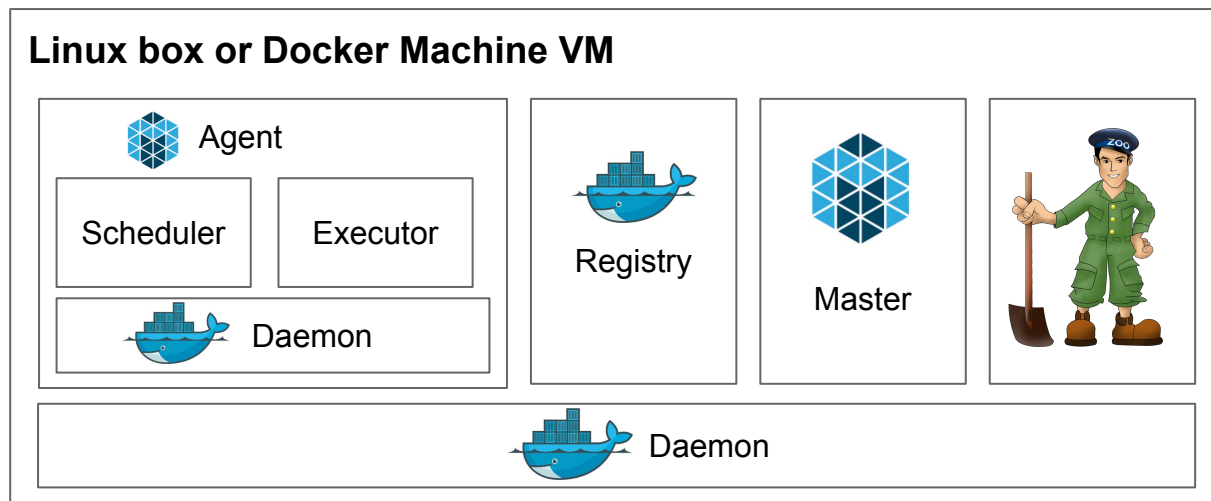


# Limitations



# Limitations

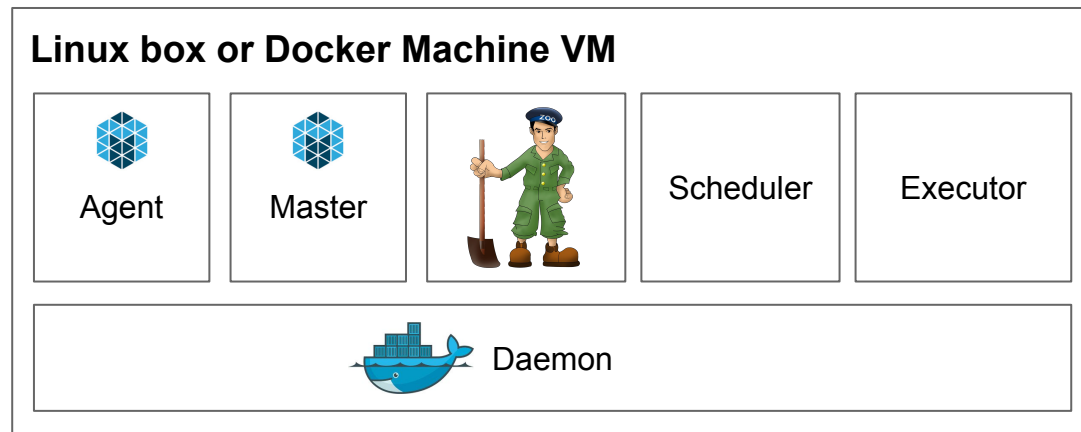
- minimesos started out running Docker-inside-of-Docker
- But, sharing images between Docker daemons requires a registry





# Limitations

- We now use run Docker-outside-of-Docker



- But this created a *different* problem...

# Limitations

- Executors do not use Agent ports. Different network interface!
- 'Mesos Agents not routable' (from Marathon UI)  
<https://github.com/ContainerSolutions/minimesos/issues/401>
- minimesos containers write files as `root` on host instead of `$USER`  
<https://github.com/ContainerSolutions/minimesos/issues/426>
- Docker on Mac not yet supported  
<https://github.com/ContainerSolutions/minimesos/issues/431>

# Limitations

- Only supports single Mesos Master and single Zookeeper
- 'Support Zookeeper ensemble'  
<https://github.com/ContainerSolutions/minimesos/issues/16>
- Only supports Java as testing API
- 'Support Python client'  
<https://github.com/ContainerSolutions/minimesos/issues/264>

# Improvements

- 'Support IP per container' - CNI

<https://github.com/ContainerSolutions/minimesos/issues/420>

- 'Add user namespace requirement'

<https://github.com/ContainerSolutions/minimesos/issues/332>

- 'REST API'

<https://github.com/ContainerSolutions/minimesos/issues/452>

# Advanced Features



# Consul



- DNS service discovery
- Add Consul container to the `minimesosFile`

```
consul {  
  
    imageName = "containersol/consul-server"  
  
    imageTag = "0.6-1"  
  
}
```

- Use `MINIMESOS_CONSUL_IP` as ENV or Marathon token

# Registrar



- Auto registers containers to Consul
- Add Registrar container to the `minimesosFile`

```
registrator {  
  
    imageName = "containersol/consul-server"  
  
    imageTag = "0.6-1"  
  
}
```

- Use `MINIMESOS_REGISTRATOR_IP` as ENV or Marathon token

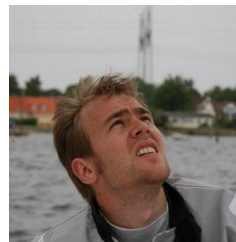
# Related tools



- Mesos Starter - Spring boot starter for Mesos frameworks

<https://github.com/ContainerSolutions/mesos-starter>

- Created and maintained by @mwldk

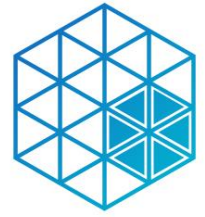


- Used by





# Related tools



- Mesos Framework - Write a framework with a config file  
<https://github.com/ContainerSolutions/mesosframework>

- Created and maintained by **@drphilwinder**



- Used by



# Related tools



- Mesos Maven plugin - Start & destroy minimesos from Maven

- Created and maintained by **@drphilwinder**



- See **@drphilwinder's** blog on all these tools

<http://container-solutions.com/mesos-framework-overview/>

# How to contribute to minimesos

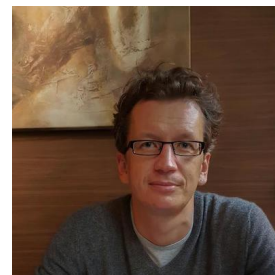


- Found a bug or issue? Let us know
- PRs are appreciated!
- Your PR is auto built by Travis CI



**Blog post by @sadovnikov at the CS blog**

<http://container-solutions.com/moved-ci-jenkins-travis>



# Wrap up



# Let's stay in touch

**GitHub**  **minimesos**



<http://minimesos.org>



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



**minimesos contributors**

@minimesos @Frank\_Scholten @AdamSandor2 @sadovnikov @mwldk @DrPhilWinder  
@alex\_glv @blijblijblij @remmelt @containersoluti

# Join us next week at Software Circus!

- Because of our generous sponsors the conference tickets are FREE!  
**First come, first serve**
- Extra money will be donated to the Wikipedia foundation
- Location: Pakhuis West Amsterdam



# Thank you!