Docker Introduction

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What is Docker?

- Open source project and company

- Used to create containers for software applications
- Package Once Deploy Anywhere (PODA)

Docker Contributors by employers/hackers

gistfile1.txt

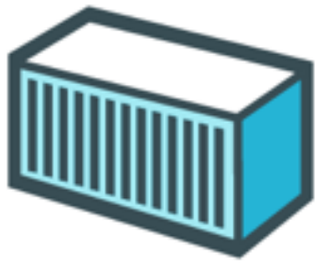
```
Top changeset contributors by employer
(Unknown)                       4520 (47.9%)
"Docker"                        3821 (40.5%)
"Red Hat"                        685 (7.3%)
"IBM"                            232 (2.5%)
"Google"                         119 (1.3%)
"Cisco"                           49 (0.5%)
"Amadeus"                          4 (0.0%)
"VMWare"                           2 (0.0%)
"CoreOS"                           1 (0.0%)
```

https://gist.github.com/arun-gupta/7d5a373099ff831d7213

http://www.infoworld.com/article/2925484/application-virtualization/look-whos-helping-build-docker-besides-docker-itself.html

Build

Develop an app using Docker containers with any language and any toolchain.

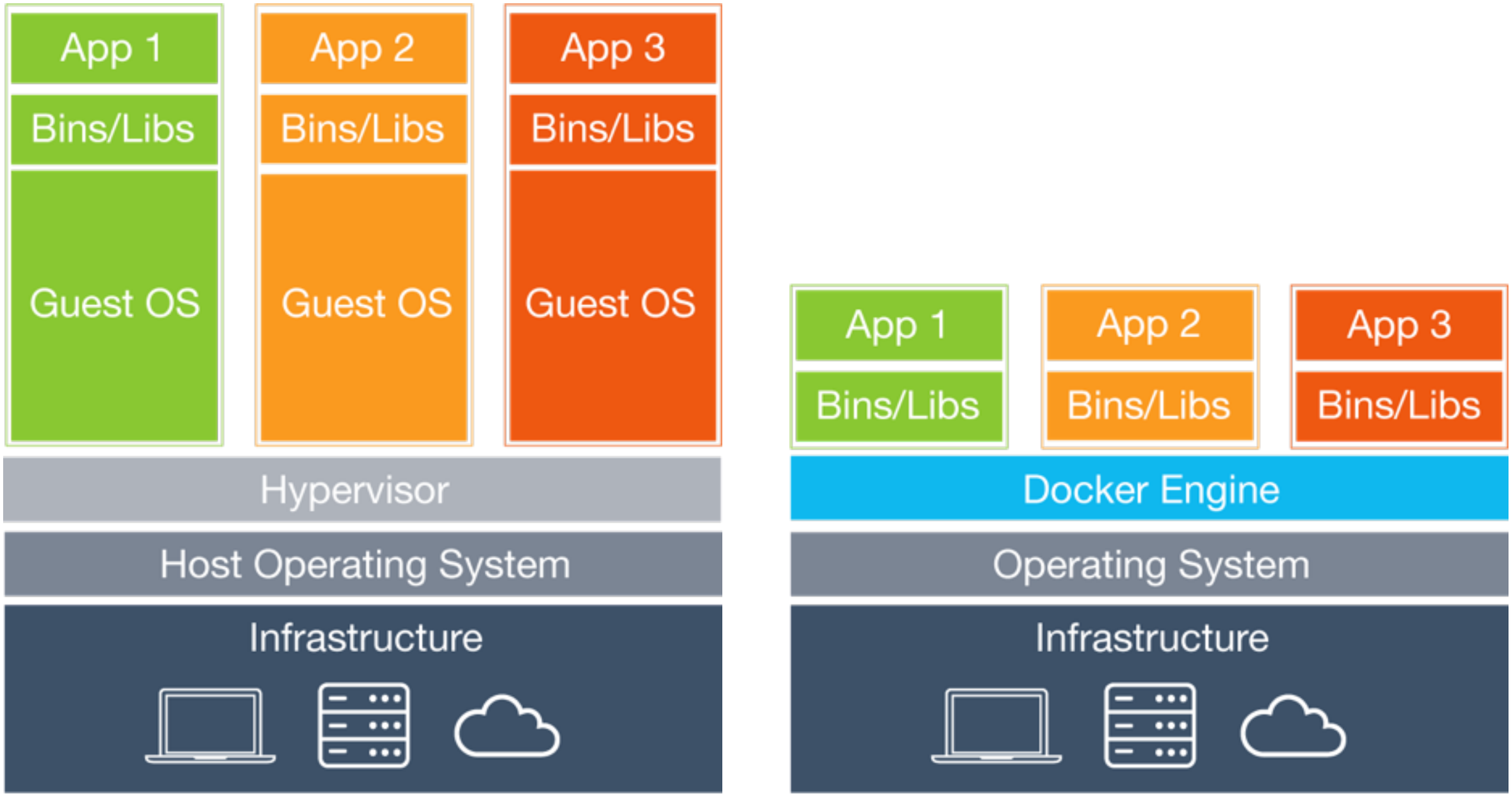


Ship

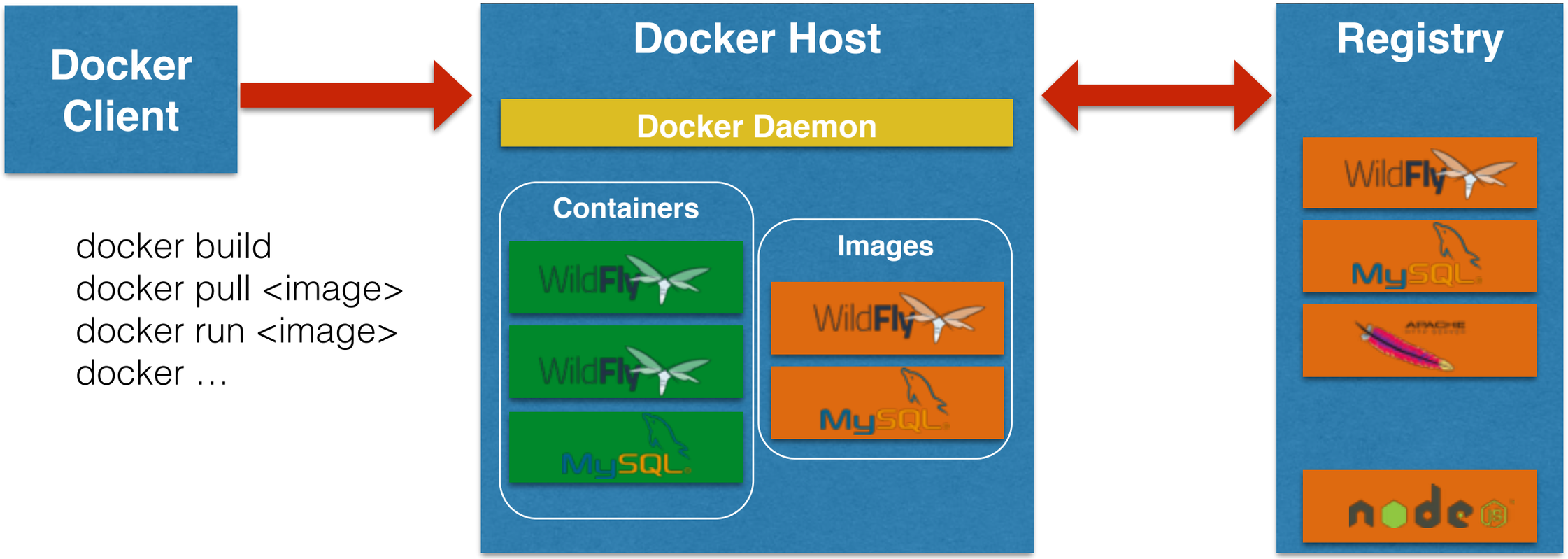
Ship the “Dockerized” app and dependencies anywhere - to QA, teammates, or the cloud - without breaking anything.

Run

Scale to 1000s of nodes, move between data centers and clouds, update with zero downtime and more.


App 1
Bins/Libs
Guest OS
App 2
Bins/Libs
Guest OS
App 3
Bins/Libs
Guest OS
Hypervisor
Host Operating System
Infrastructure
App 1
Bins/Libs
App 2
Bins/Libs
App 3
Bins/Libs
Docker Engine
Operating System
Infrastructure

Docker Workflow



docker build
docker pull <image>
docker run <image>
docker …

Docker Machine

- Create Docker Host on computer or cloud provider

  ```
  docker-machine create --driver=virtualbox
  myhost
  ```

  - Configure Docker client to talk to host
  - Create and pull images
  - Start, stop, restart containers
  - Upgrade Docker
- Not recommended for production yet

Docker Compose

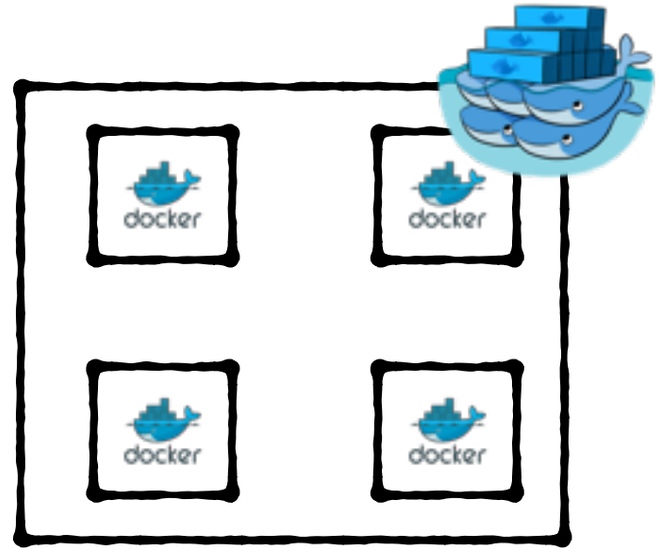
- Defining and running multi-container applications
- Configuration defined in a single file
- Great for dev, staging, and CI
- Not recommended for production yet

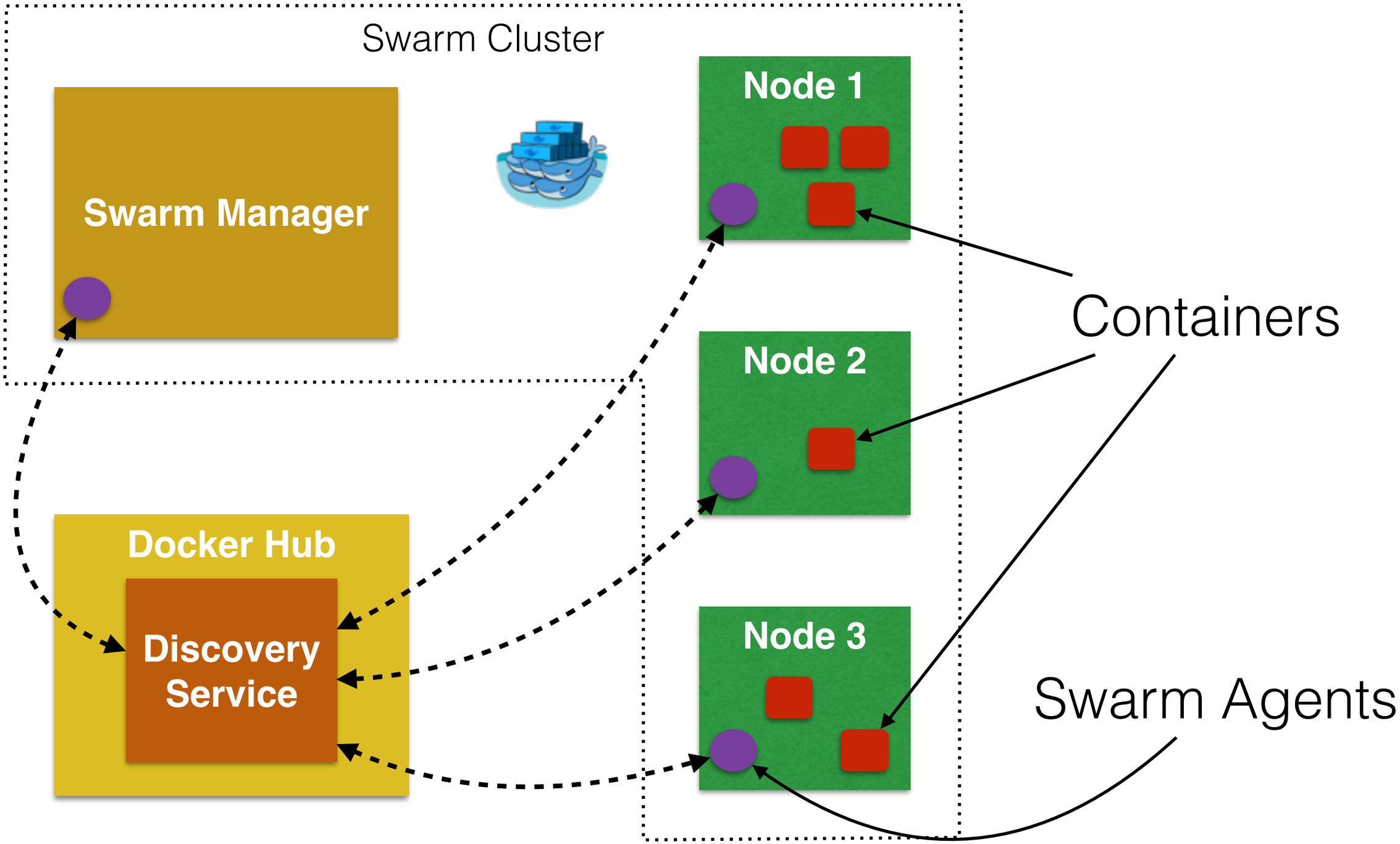
docker-compose.yml

```
mysqldb:
  image: mysql
  environment:
    MYSQL_DATABASE: sample
    MYSQL_USER: mysql
    MYSQL_PASSWORD: mysql
    MYSQL_ROOT_PASSWORD: supersecret
mywildfly:
  image: arungupta/wildfly-mysql-javaee7
  links:
    - mysqldb:db
```

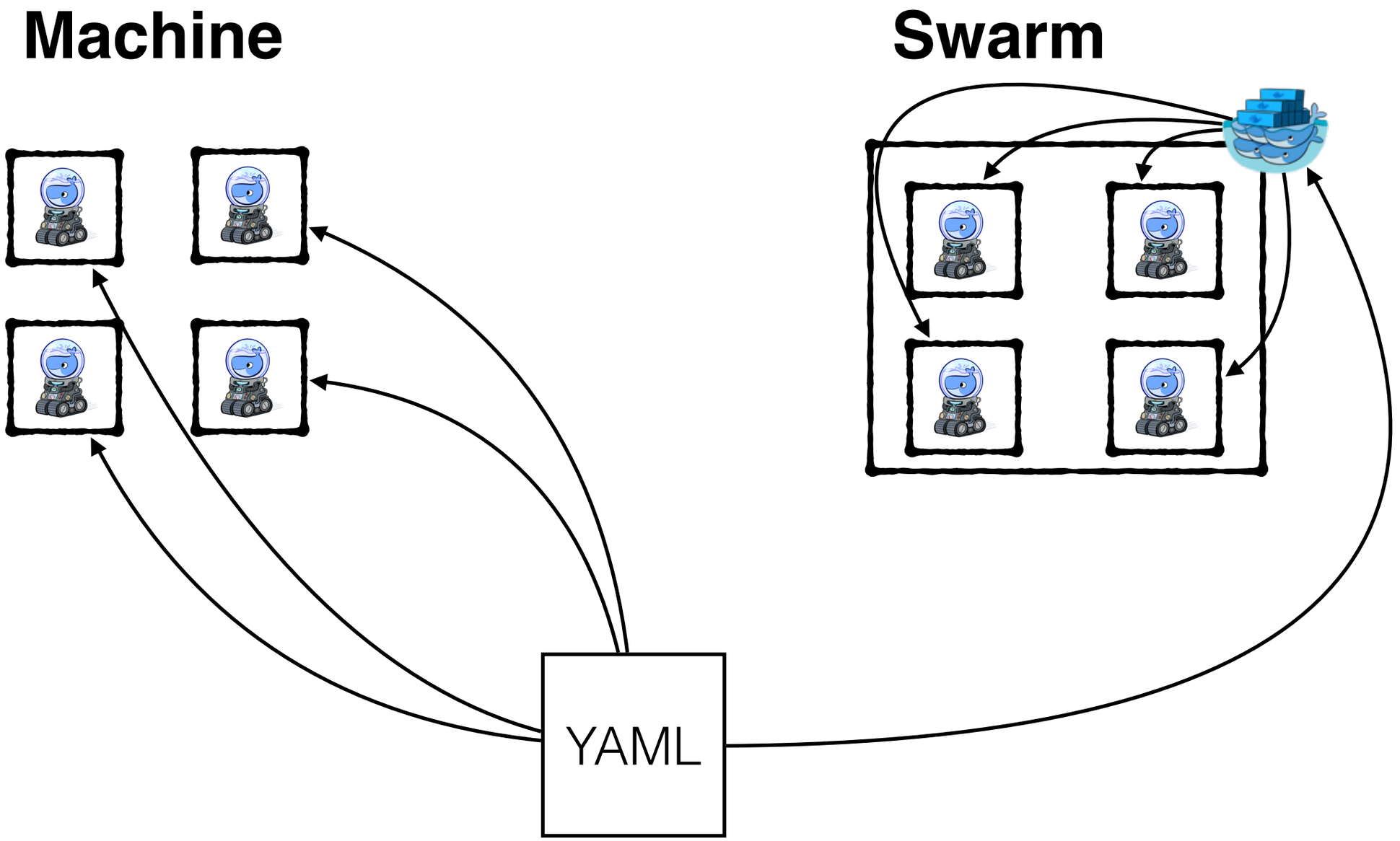
Docker Swarm

- Native clustering for Docker
- Provides a unified interface to a pool of Docker hosts
- Fully integrated with Machine
- Serves the standard Docker API
- Partially integrated with Compose
- Not recommended for production yet





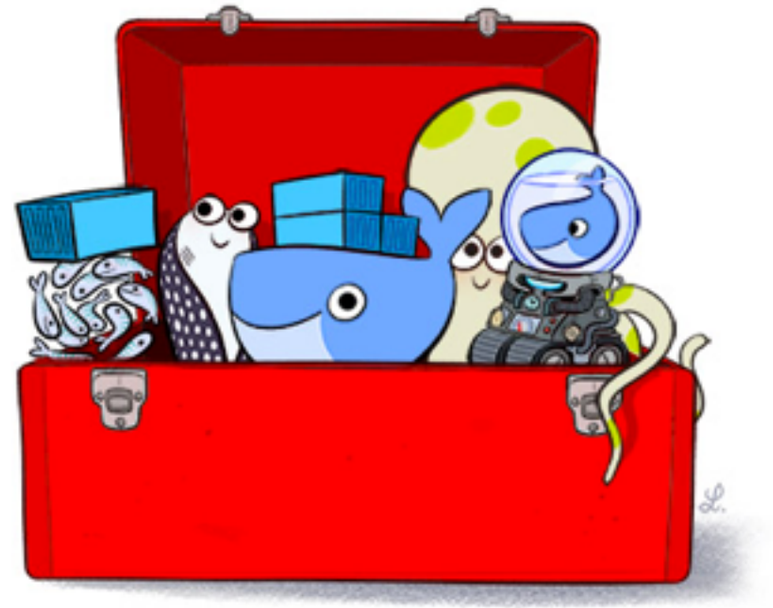
http://blog.arungupta.me/clustering-docker-swarm-techtip85/



Compose

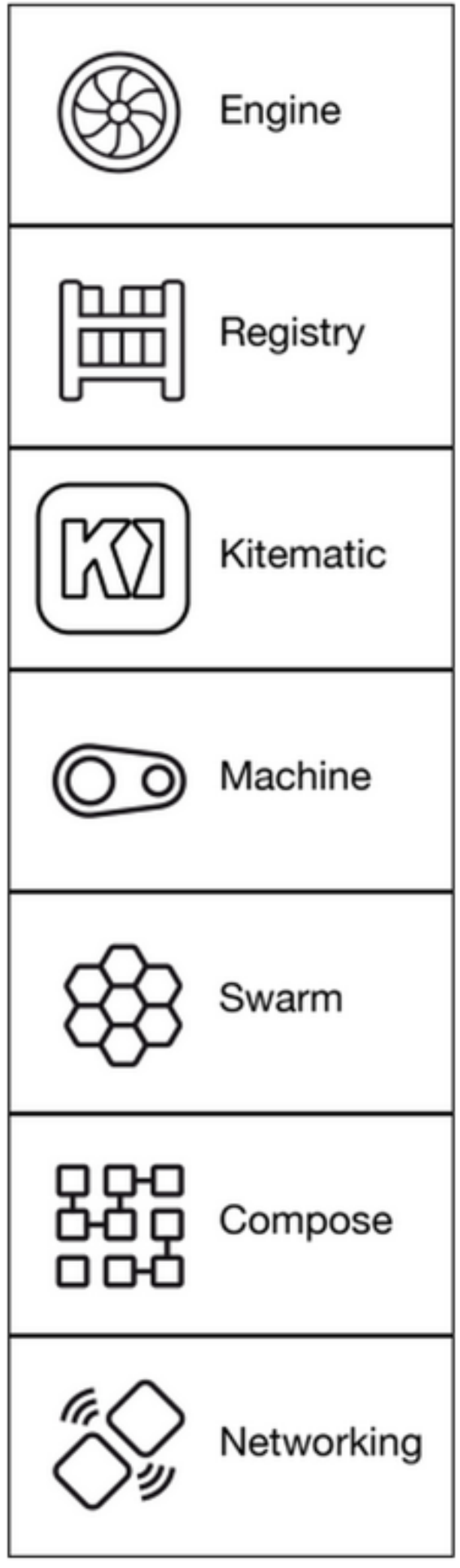
Docker Toolbox

- Docker Client 1.8.0
- Docker Machine 0.4.0
- Docker Compose 1.4.0 (Mac only)
- Docker Kitematic 0.8.1
- Virtualbox 5.0.0



https://www.docker.com/toolbox

redhat


Engine
Registry
Kitematic
Machine
Swarm
Compose
Networking

Advantages of Containers

- Immutability
- Reproducibility
- Isolation
- Faster deployments
- Portability - “it works on my machine”
- Snapshotting
- Security sandbox
- Limit resource usage
- Simplified dependency
- Sharing