Docker 1.12
Orchestration, containers and beyond

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- Docker Captain and early user
- Python lover and developer
- Technology lead at SourceLair

I love automating stuff and sharing knowledge around all things containers, DevOps and optimizing developer workflows.

Agenda

Orchestration, containers and beyond

- Docker: how everything started
- Anatomy of the Docker Engine
- The Docker ecosystem
- [Legacy] Docker Swarm
- SwarmKit and Docker Swarm Mode
  - Services
  - DAB Files
- Demo time!

Docker: how everything started

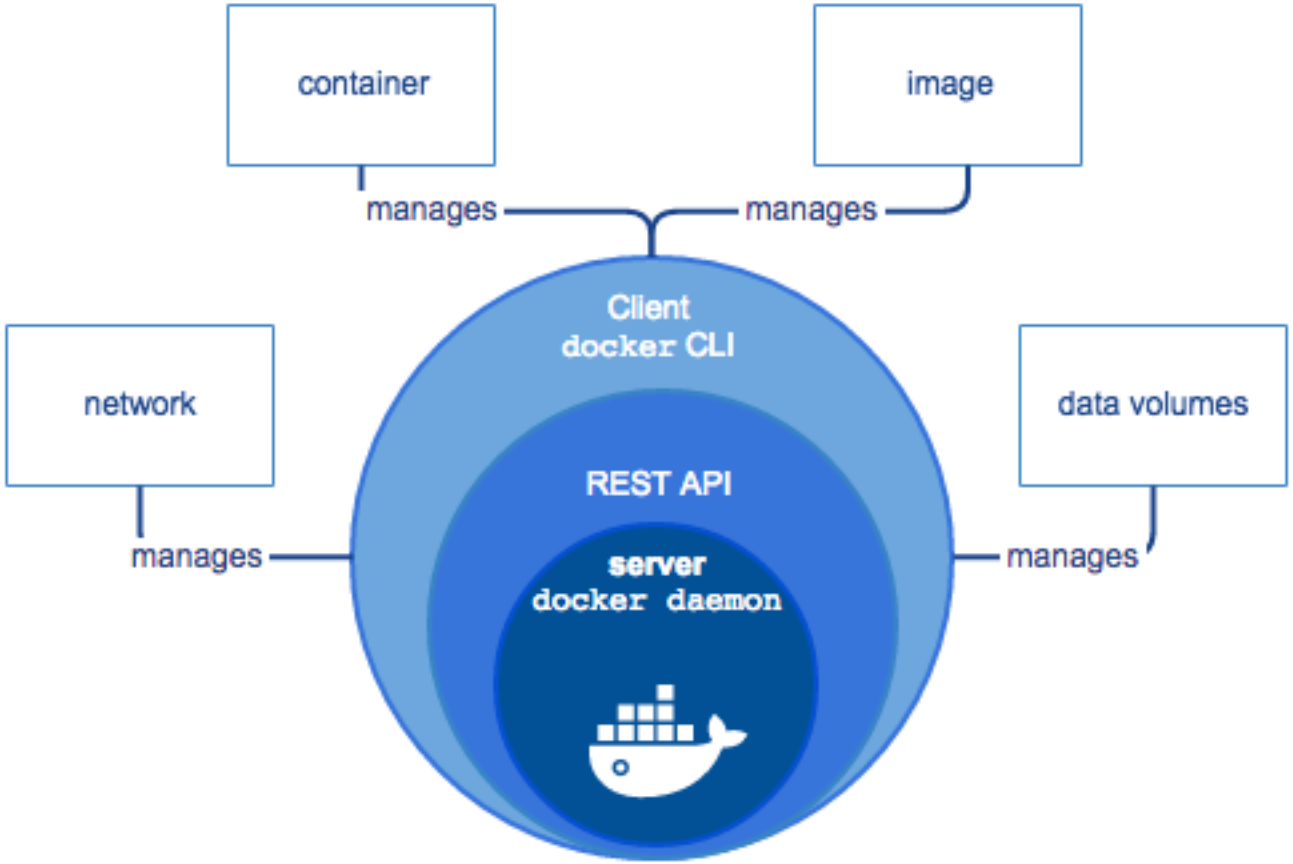
Solomon Hykes at a PyCon sprint talk

Anatomy of Docker

The components that make up Docker today

docker

Docker Engine Architecture



docker

Docker Engine

Deep diving into the components

docker - Docker Client

dockerd - Docker Daemon

runc - low level plumbing

The Docker ecosystem

Not just a container runtime

docker

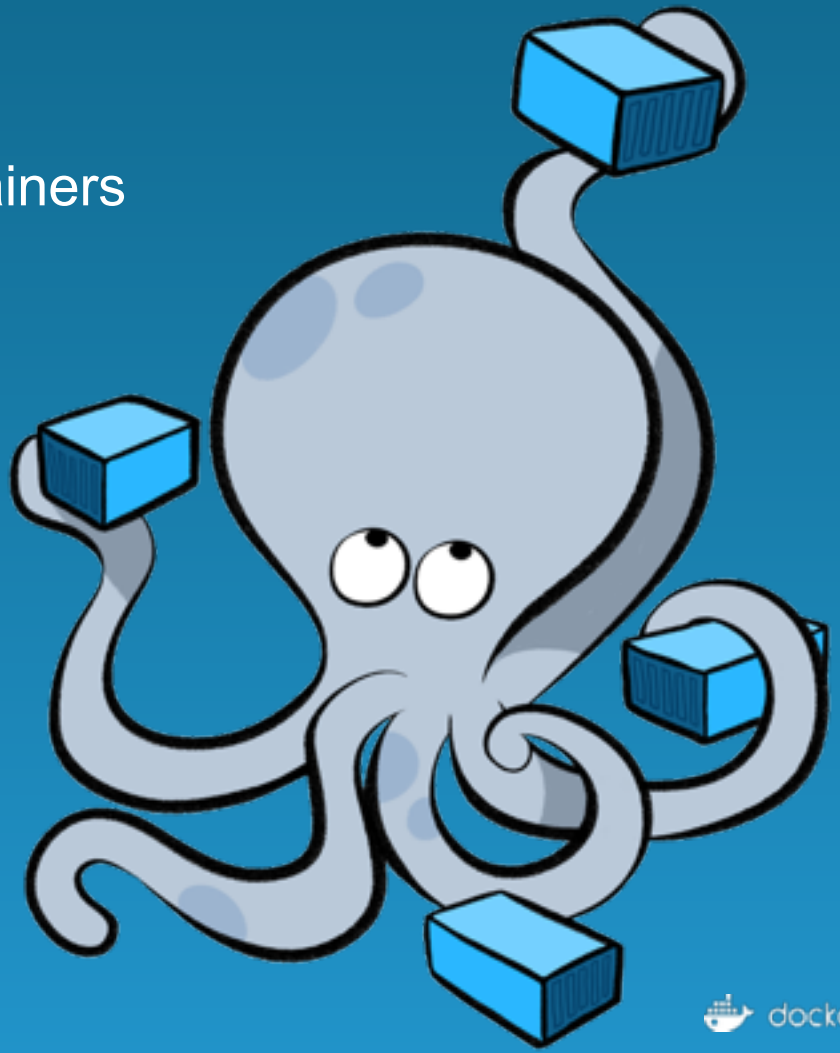
Things built on top of and around Docker

- Orchestrators
  - Kubernetes
  - Mesos
  - Nomad
- Plugins
  - Volumes
  - Networking
  - Authorization and Authentication*
- Cluster metrics and insights
  - cAdvisor
  - Prometheus

Docker Compose

The need for managing multiple containers

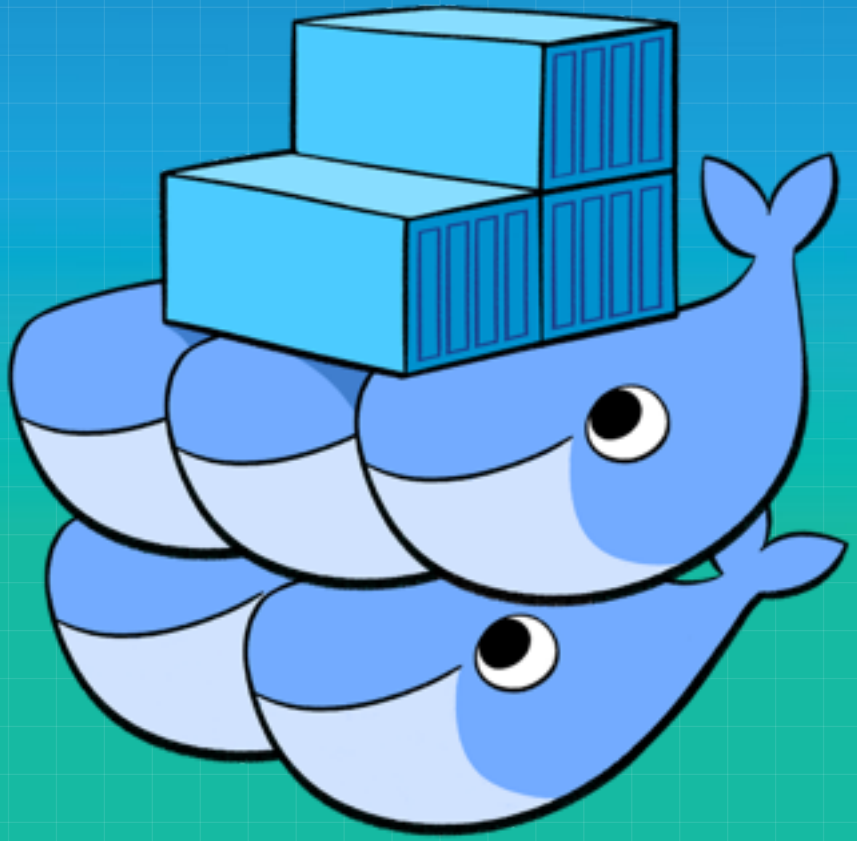
- Containers need special configuration, depending on the actual application
- Containers need to connect with each other in a semantic way
- Containers have dependencies



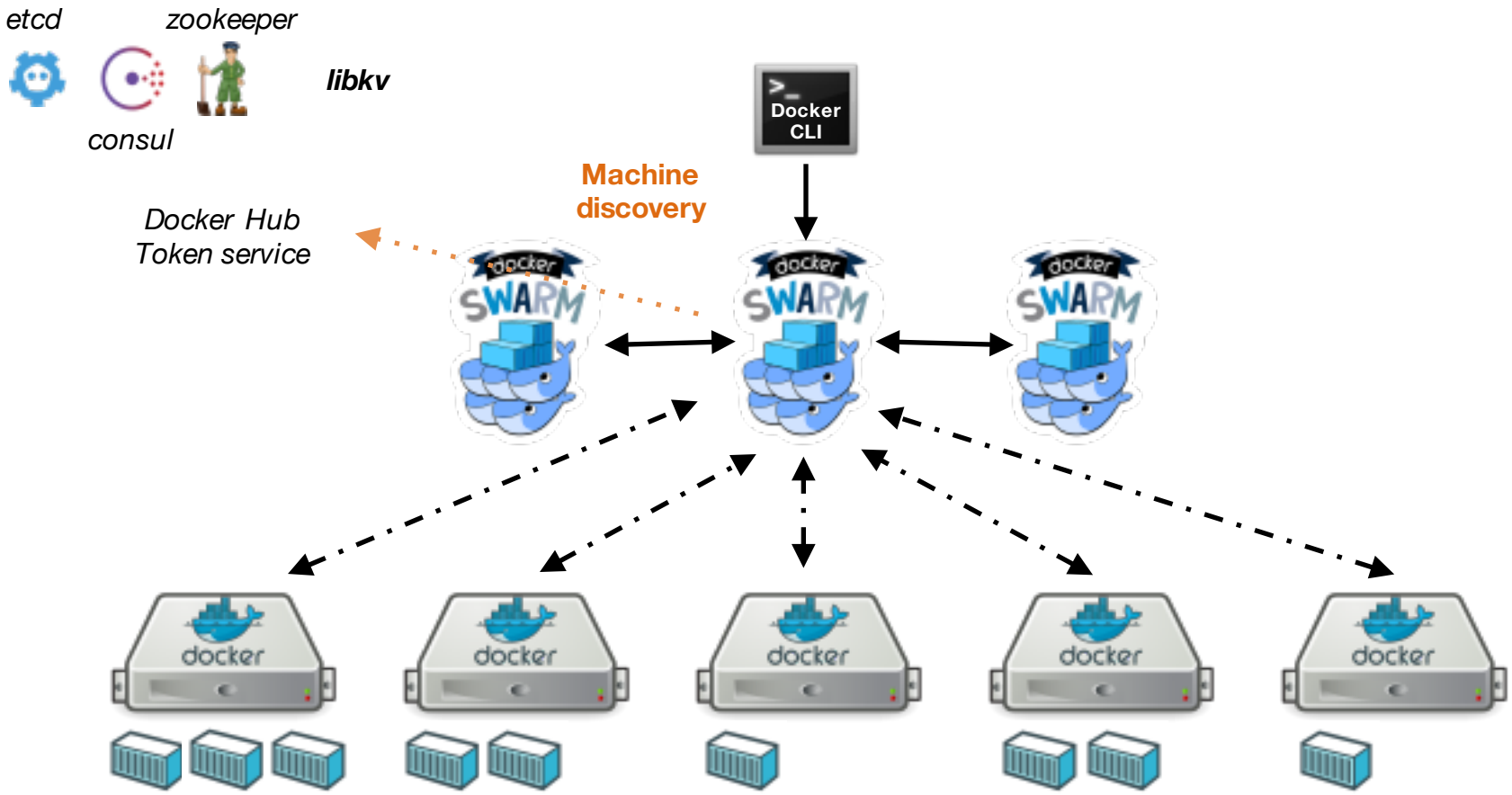
docker

[Legacy] Docker Swarm

The first step towards orchestration



docker


etcd
zookeeper
consul
libkv
Docker CLI
Machine discovery
Docker Hub Token service
docker SWARM
docker SWARM
docker SWARM
docker
docker
docker
docker
docker

Container Networking Model (CNM)

Goals:

- Distributed application portability
- Simple for users & flexible for operations
- Built-in multi-host networking
- Pluggable networking stack
- Simple and application focussed APIs

Volumes plugins

- Pluggable backends
- Easy to install
- Custom logic for different use cases

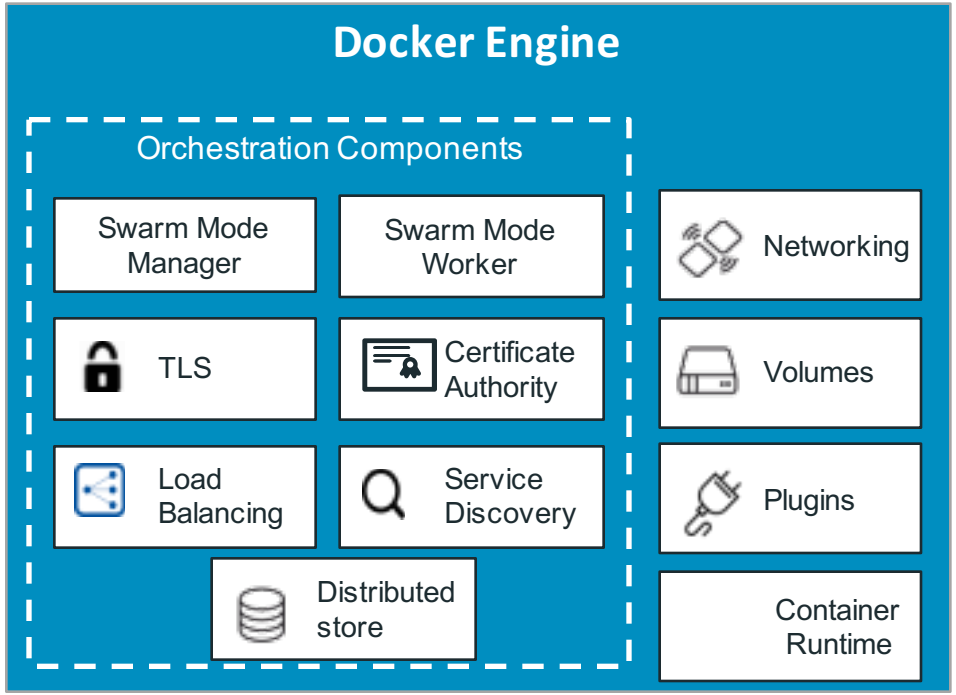
Say hello to Docker native orchestration

Welcome SwarmKit and Docker Swarm mode

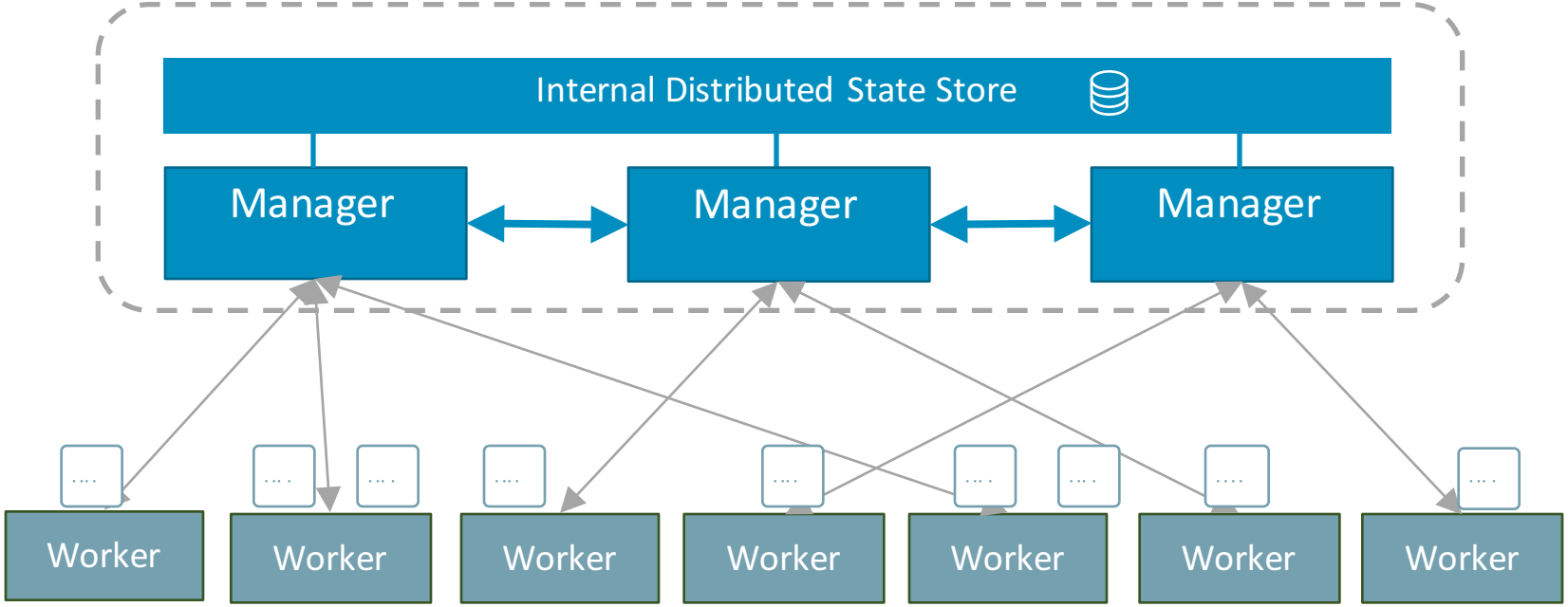
Docker Swarm mode key concepts

- Node
- Services
  - Tasks
- Load balancing built-in

Swarm mode enabled Docker Engine



Docker Swarm mode cluster architecture



Docker Swarm mode services

- Declarative definition
  - Replicas
  - Global vs replicated
  - Deploy / restart strategies
  - Health checks
- Tasks
  - Created from services
  - Scheduled to nodes

```
docker service create [OPTIONS] IMAGE [COMMAND] [ARG...]
```

[Experimental] Docker Stacks and Distributed Application Bundles

- Create from existing Docker Compose files
- Verify image checksums
  - Perfect for production parity safety
- Create bundle file
- Deploy bundle file
  - Rolling updates of services

docker deploy [OPTIONS] STACK

Manage DAB files: https://github.com/mantika/whaleprint

Demo time!

https://github.com/akalipetis/swarm-demo

THANK YOU

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