

Docker Swarm

Engels, Wedekind, Weigand

Agenda

Docker Basics

Swarm overview

Competing products

Swarm vs Kubernetes

Quiz

Practical task

Docker Terminology



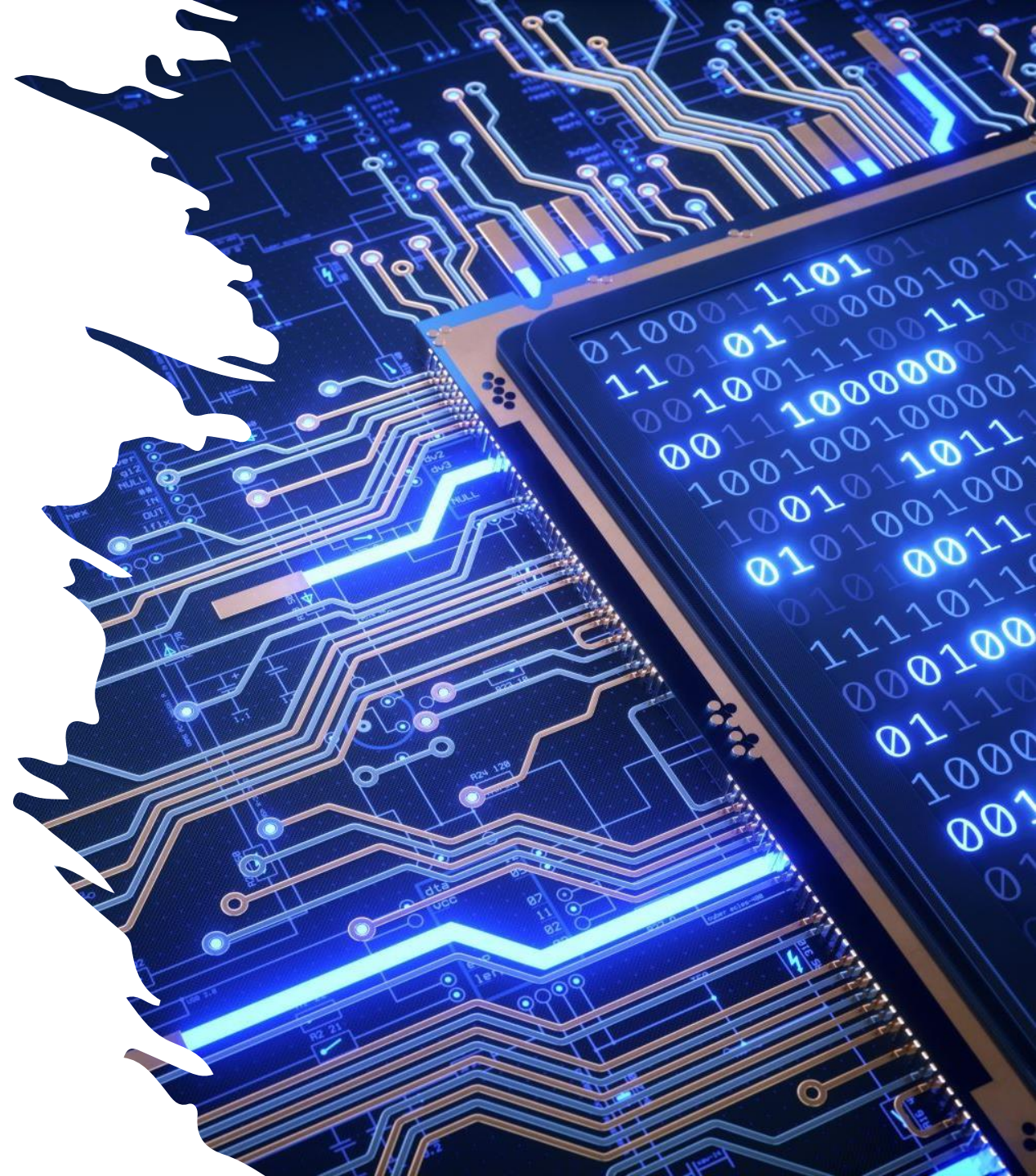
The diagram consists of two chevron-shaped boxes pointing to the right. The first box is orange and contains the text 'Environments -> container'. The second box is gray and contains the text 'Apps for the container -> image'. The two boxes are connected by a white arrow pointing from the orange box to the gray box.

Environments
-> container

Apps for the
container ->
image

Docker Basics

- What is Docker
- Workflow
- Docker files
- Docker Compose
- Docker vs VM



What is Docker



Allows to run apps in
isolated container



Easy share of images



Easy share of containers



Can run multiple
containers on one
environment

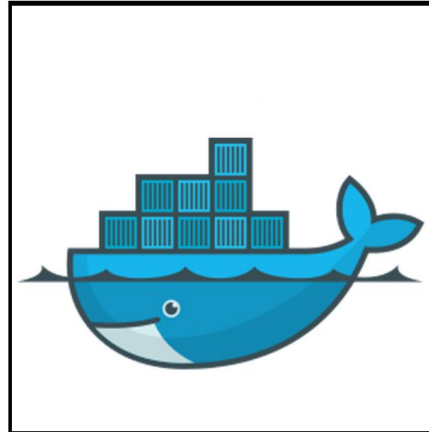
Workflow

```
FROM golang:1.7.3
WORKDIR /go/src/github.com/alexellis/href-counter/
RUN go get -d -v golang.org/x/net/html
COPY app.go .
RUN CGO_ENABLED=0 GOOS=linux go build -a -installsuffix cgo -o app .

FROM alpine:latest
RUN apk --no-cache add ca-certificates
WORKDIR /root/
--from=0 /go/src/github.com/alexellis/href-counter/app .
COPY --from=0 /go/src/github.com/alexellis/href-counter/app .
CMD ["/app"]
```

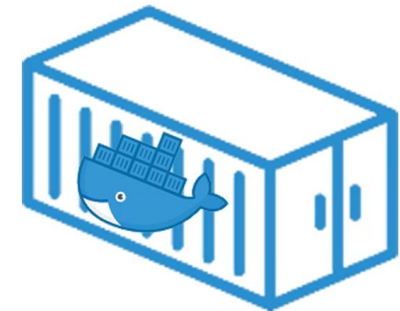
Dockerfile

build



Docker Image

run



Docker Container

Docker Files

```
# Use an official Python runtime as a parent image
FROM docker
```

```
RUN apk add python3 && apk add py3-pip
```

```
# Set the working directory in the container
```

```
WORKDIR /usr/src/web
```

```
# Copy the current directory contents into the container at
```

```
COPY /web /usr/src/web
```

```
# Install any needed packages specified in requirements.txt
```

```
RUN pip install --no-cache-dir -r requirements.txt
```

```
EXPOSE 5000
```

```
# Define environment variable
```

```
ENV NAME World
```

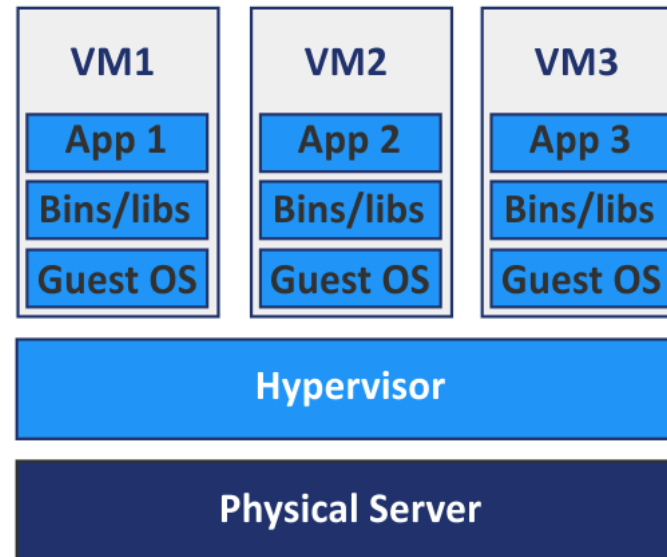
Docker compose

```
13     worker_one_container:  
14         image: "docker:latest"  
15         container_name: worker_one_container  
16         tty: true  
17         privileged: true  
18         networks:  
19             - harvy
```

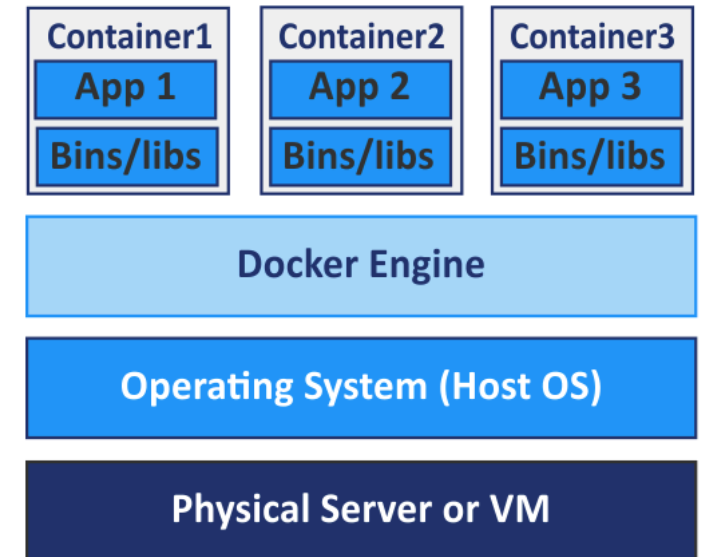
```
1     version: "3.9"  
2     services:  
3         manager_container:  
4             image: "docker:latest"  
5             container_name: manager_container  
6             privileged: true  
7             networks:  
8                 - harvy  
9             ports:  
10                 - "1000:1000"  
11                 - "9000:9000"  
12             tty: true
```


Docker vs VM

Virtual Machines

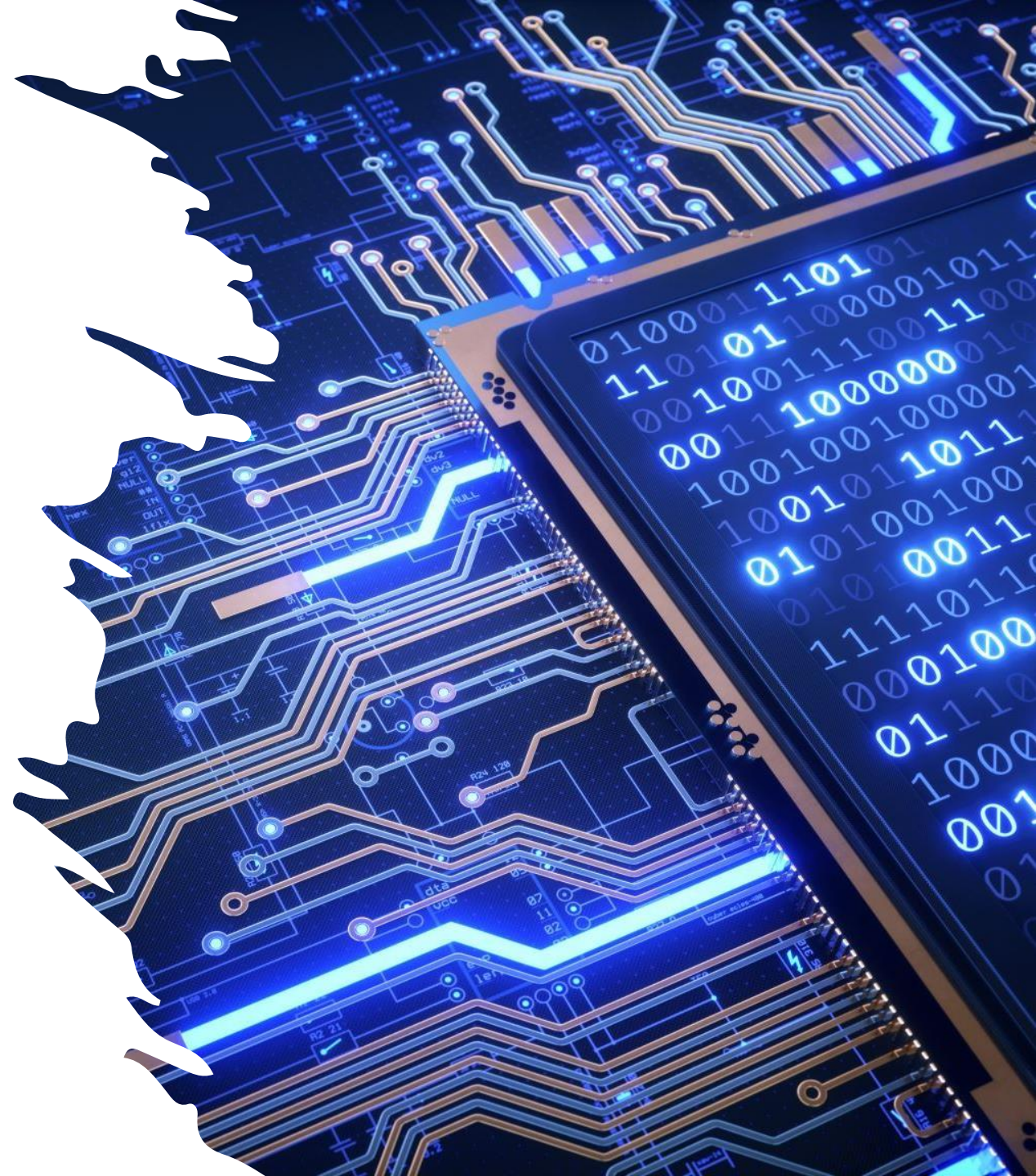


Containers

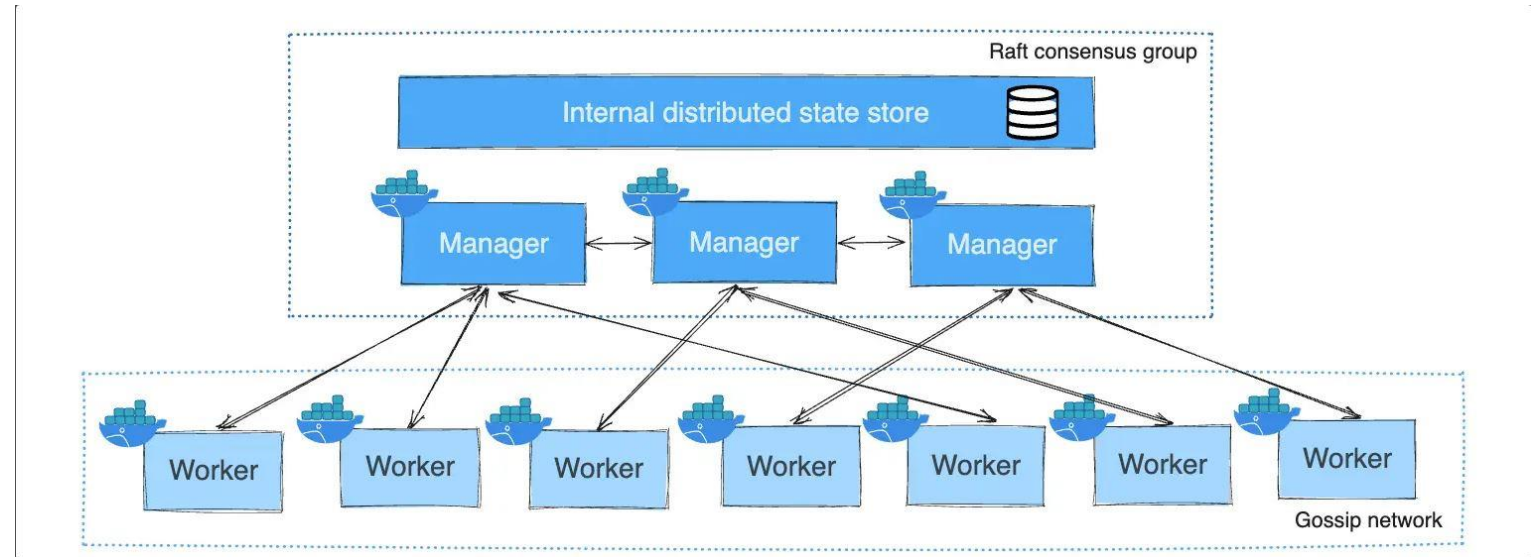


Swarm overview

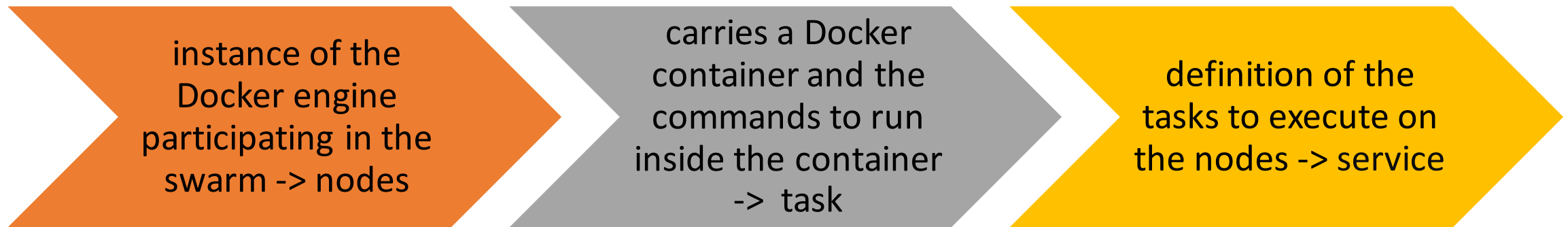
- Mode for Docker
- Based Nodes
- Services
- Tasks



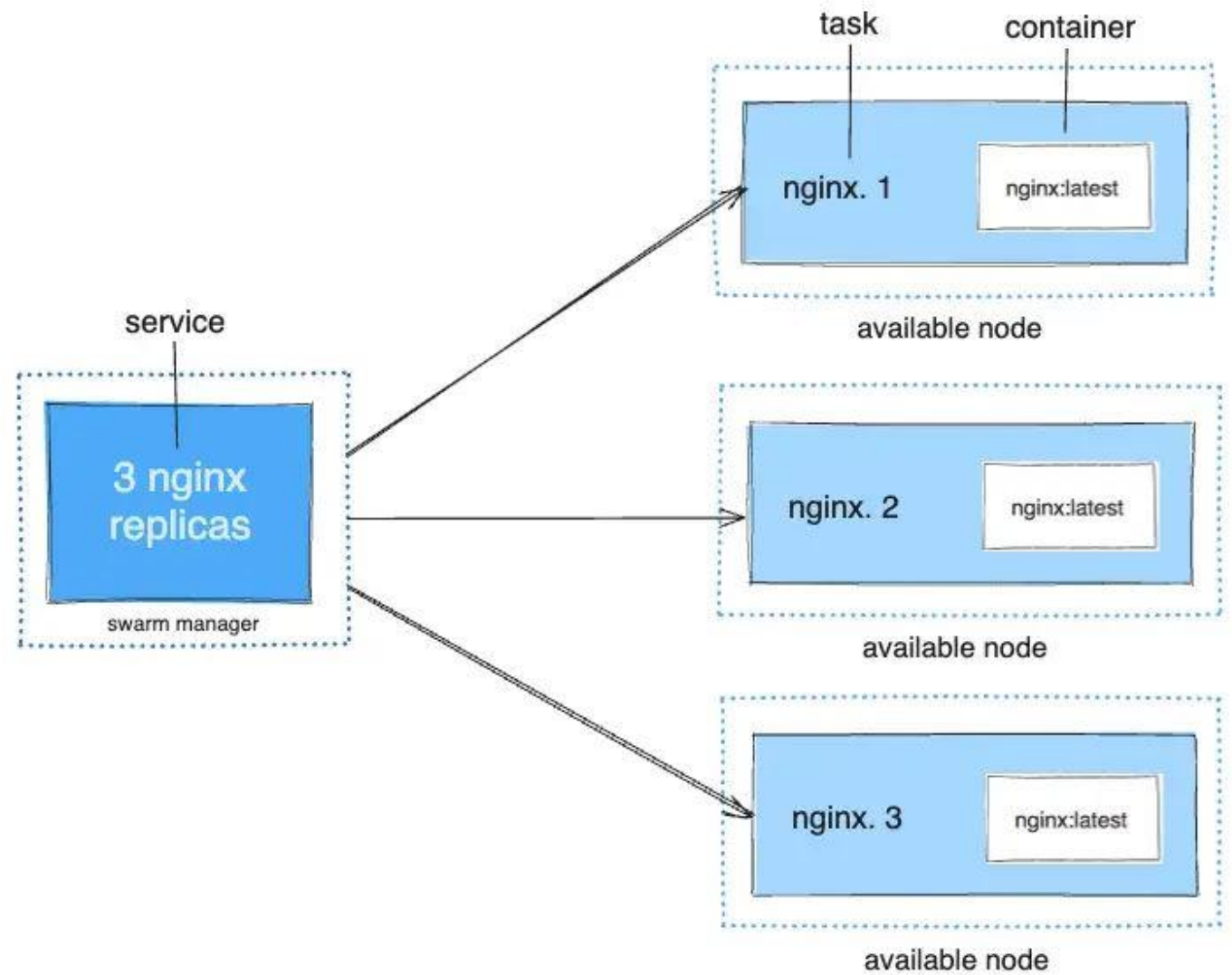
Nodes



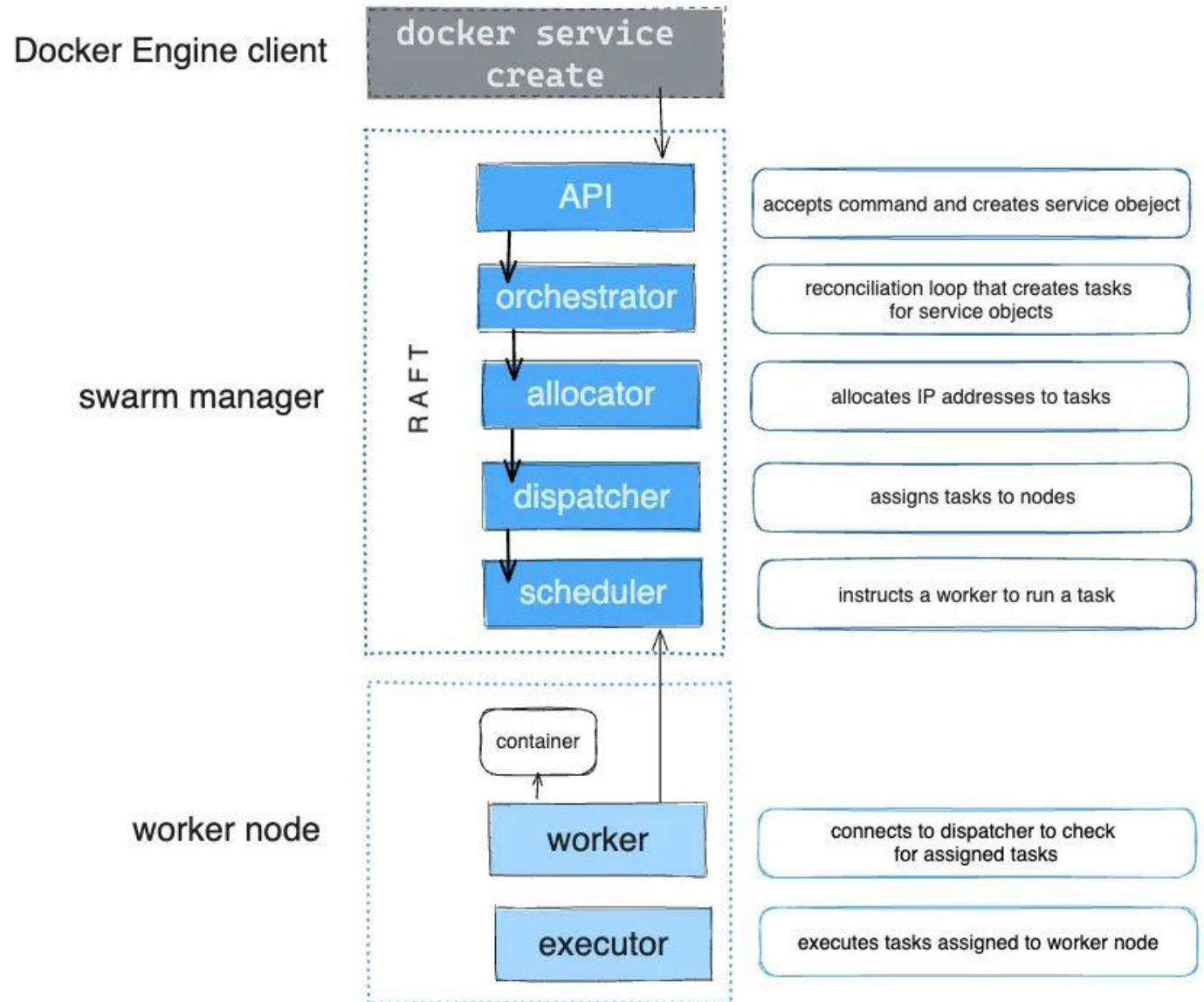
Docker Terminology



Services, tasks and container



Task and scheduling



Competing Products

Kubernetes

Most popular next to Docker Swarm

Apache Mesos

Flexible and complex; hard to start

Amazon ECS
(Elastic Container Service)

Integration with AWS services; Hard to move to other Platforms

Redux for Java Script

Highest Marketshare for Container and Microservices in JavaScript

Used with React

Swarm vs Kubernetes

Docker Swarm

- Designed for ease of use
- Manual scaling
- Easy deployments through swarm files
- Creates a network over all nodes
- Optimal for quick and easy deployment of simple apps

Kubernetes Cluster

- Complex processes and high learning curve
- Automated scaling
- Declarative and detailed definition for desired state
- Flat network model for peer to peer communication
- Optimal for high demand apps



Quiz

[Quiz Link](#)



Sources

<https://docs.docker.com/engine/swarm/>

<https://docs.docker.com/engine/reference/builder/>

<https://docs.docker.com/>

<https://mesos.apache.org/documentation/latest/architecture/>

<https://docs.aws.amazon.com/AmazonECS/latest/developerguide/Welcome.html>

<https://redux.js.org/>

<https://phoenixnap.com/blog/kubernetes-vs-docker-swarm>

<https://www.freecodecamp.org/news/kubernetes-vs-docker-swarm-what-is-the-difference/#:~:text=The%20major%20difference%20between%20the,and%20Kubernetes%3A%20Installation%20and%20setup>

<https://www.sumologic.com/blog/kubernetes-vs-mesos-vs-swarm/>

<https://www.oodlestechnologies.com/dev-blog/ecs-vs-docker-swarm/>