Exploring Orchestration with Docker Swarm

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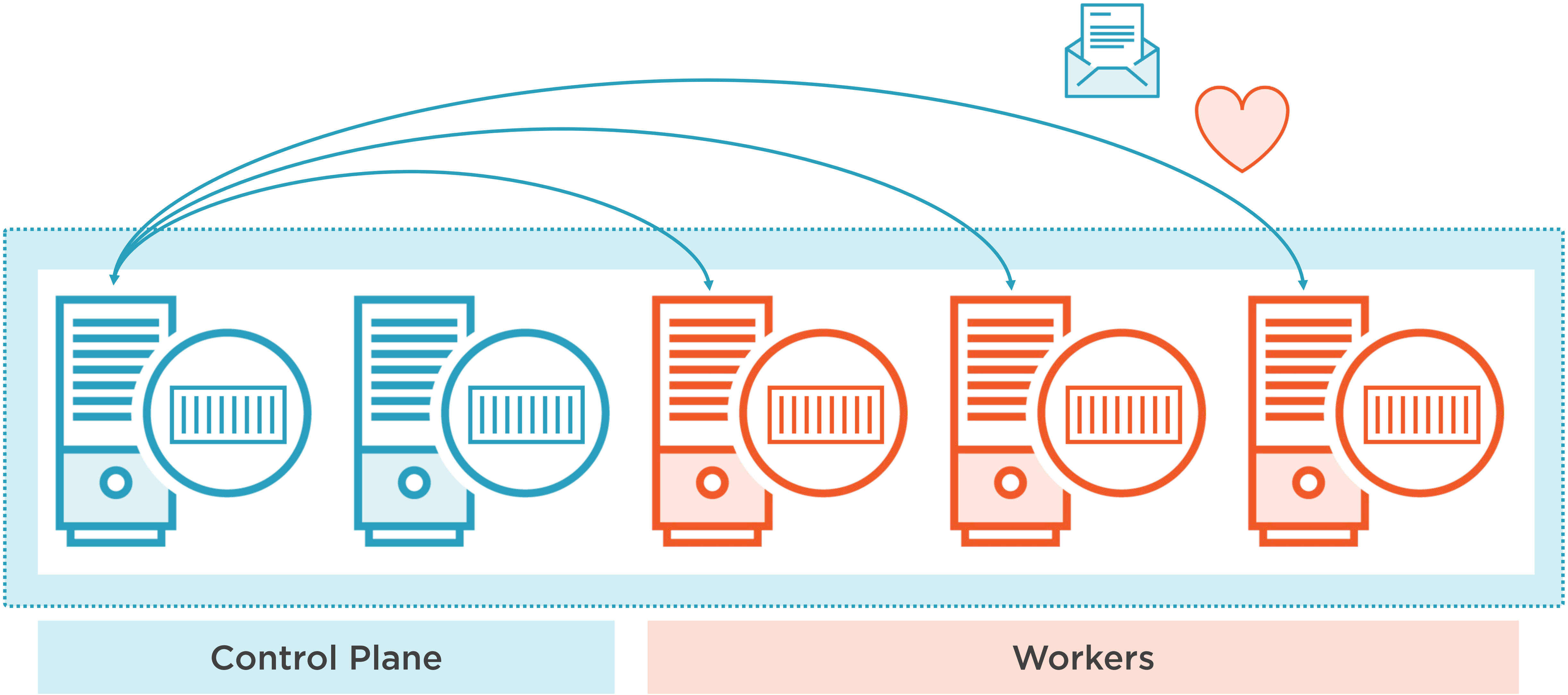
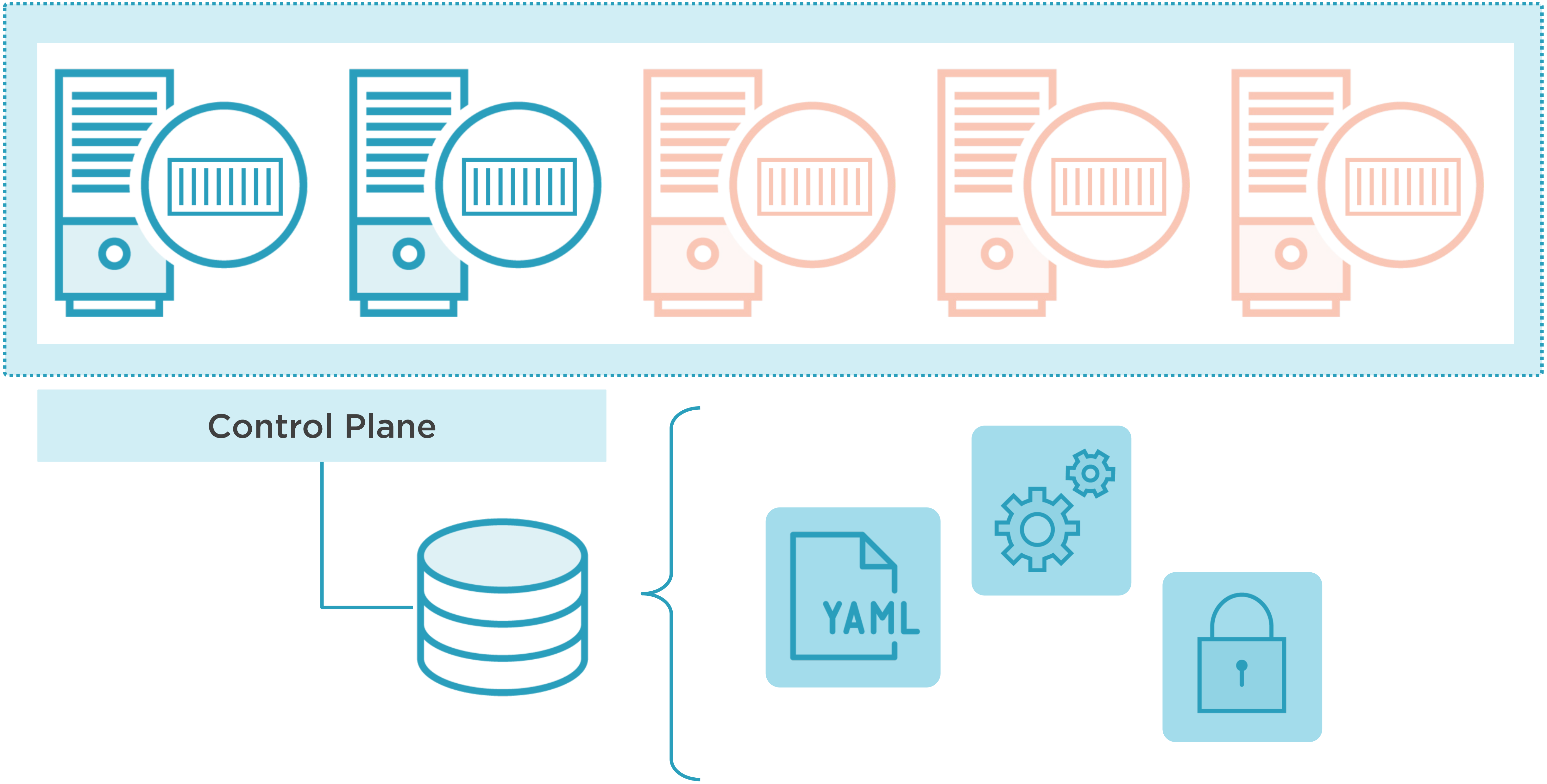
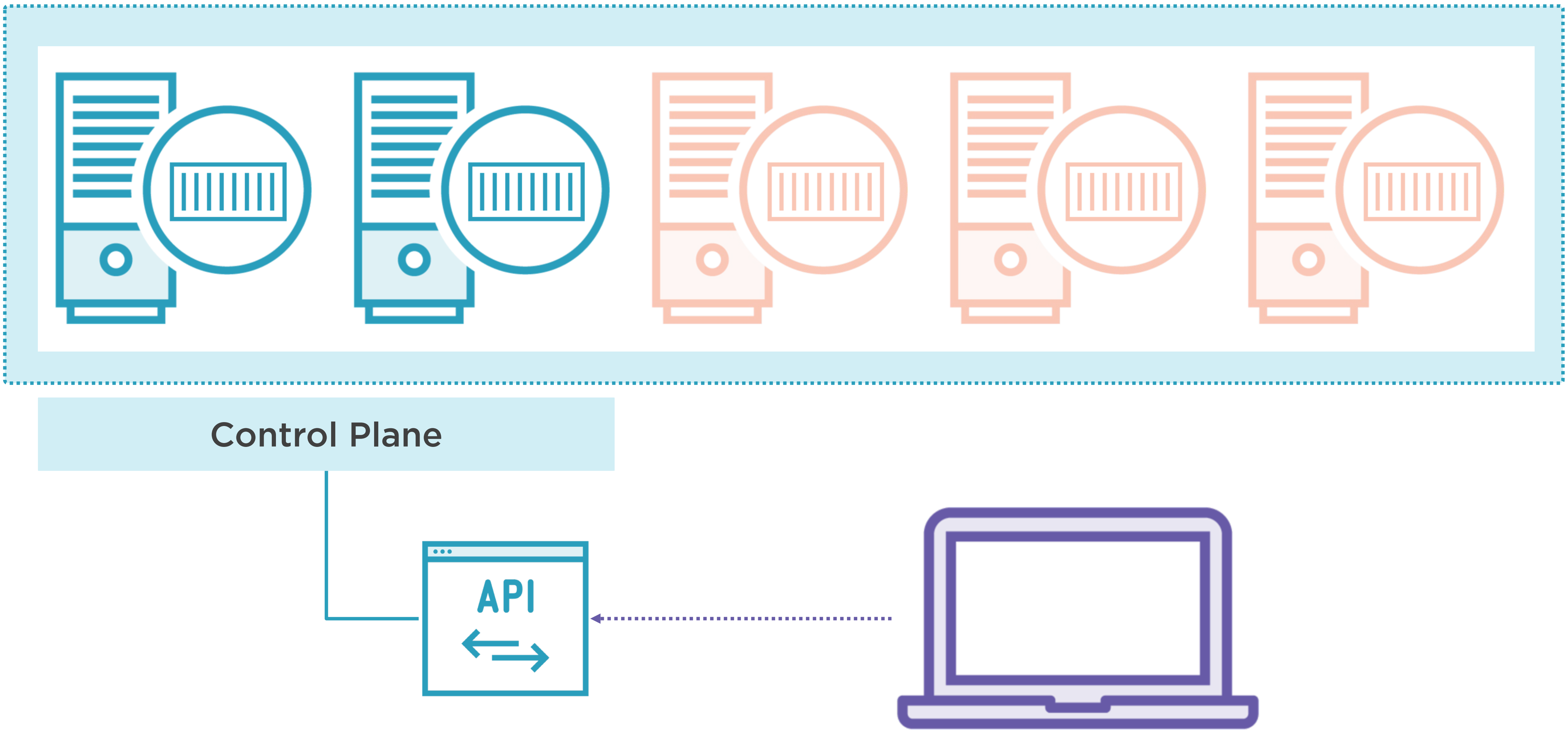
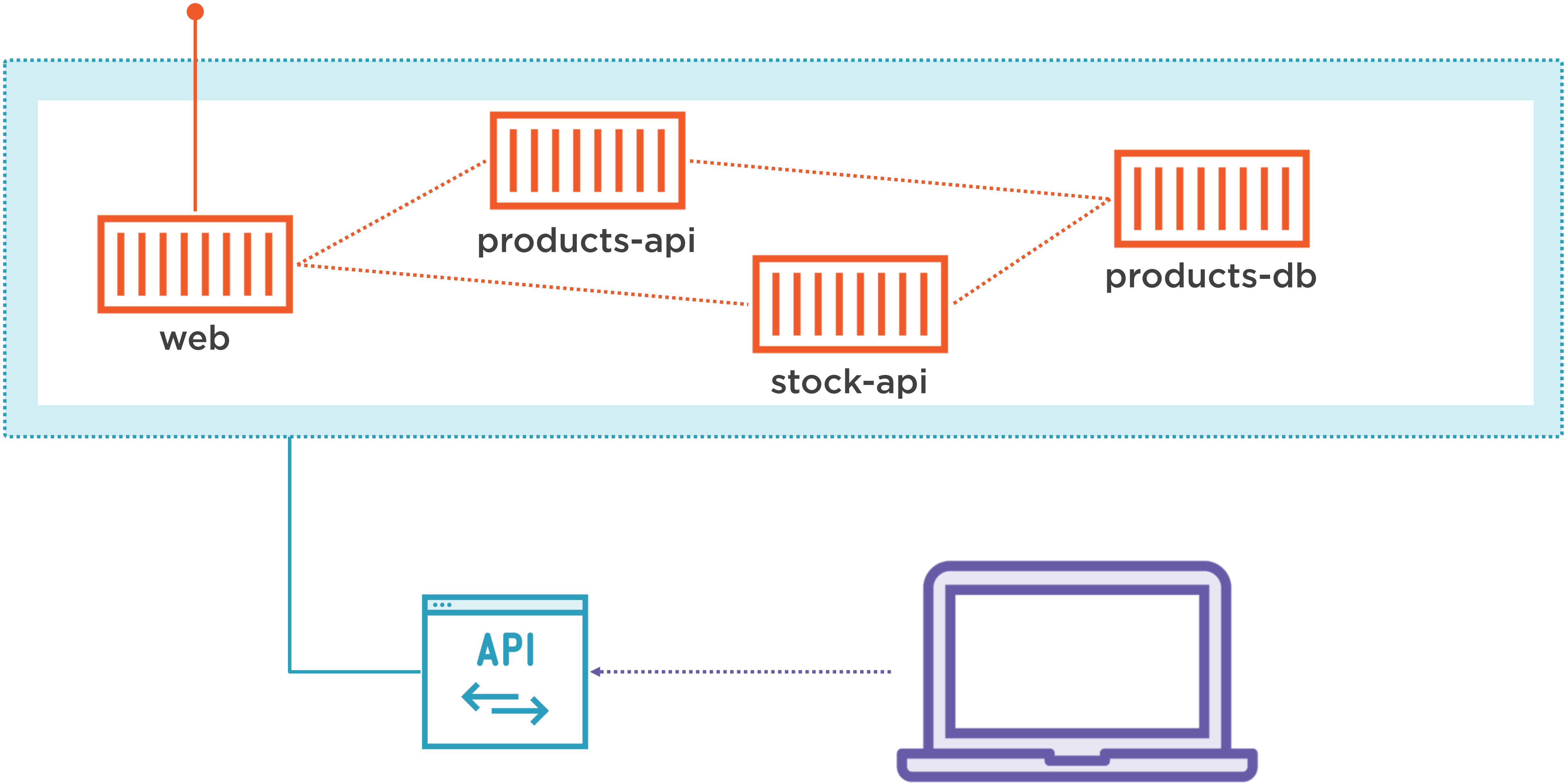

Control Plane
Workers

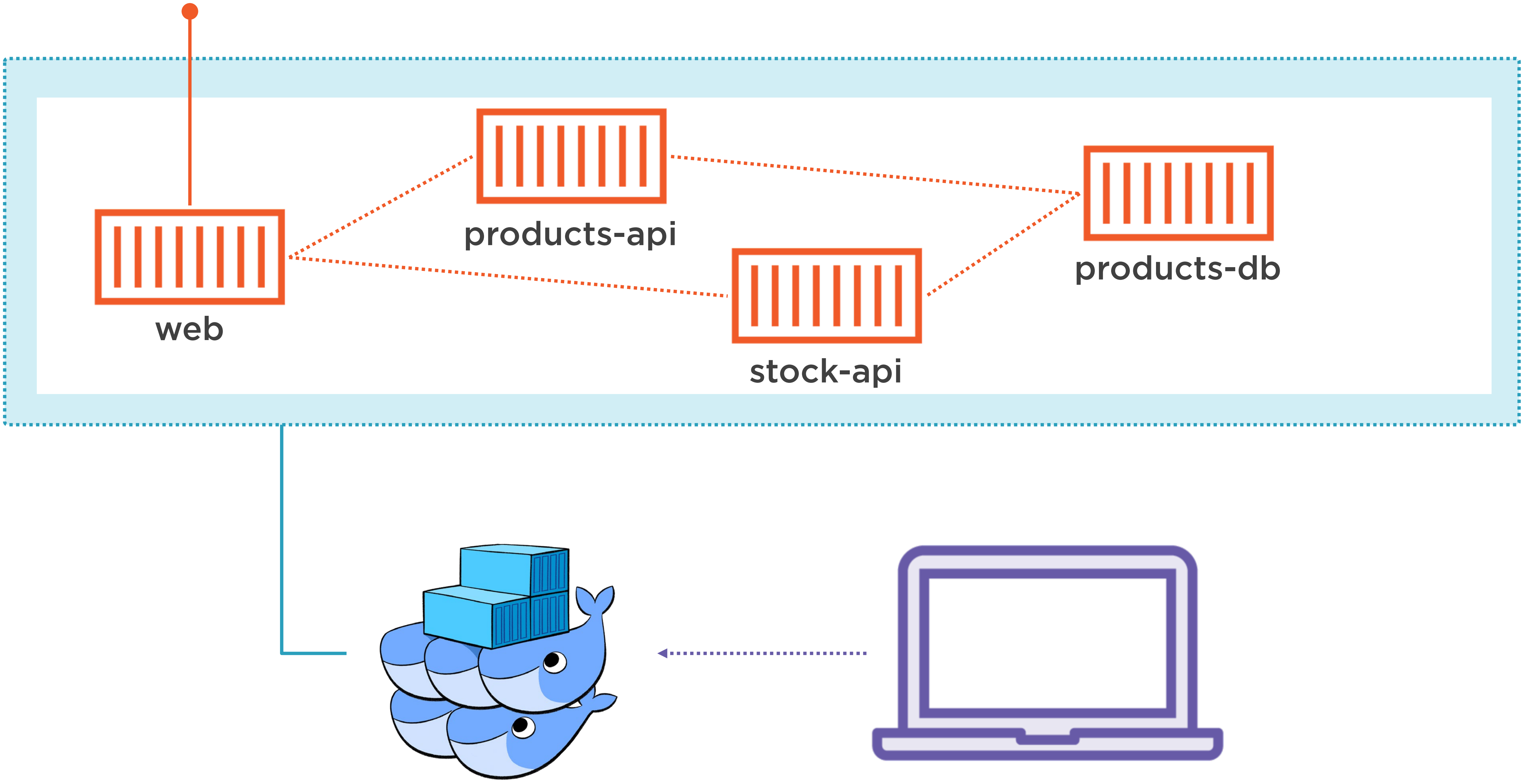


Control Plane



Control Plane

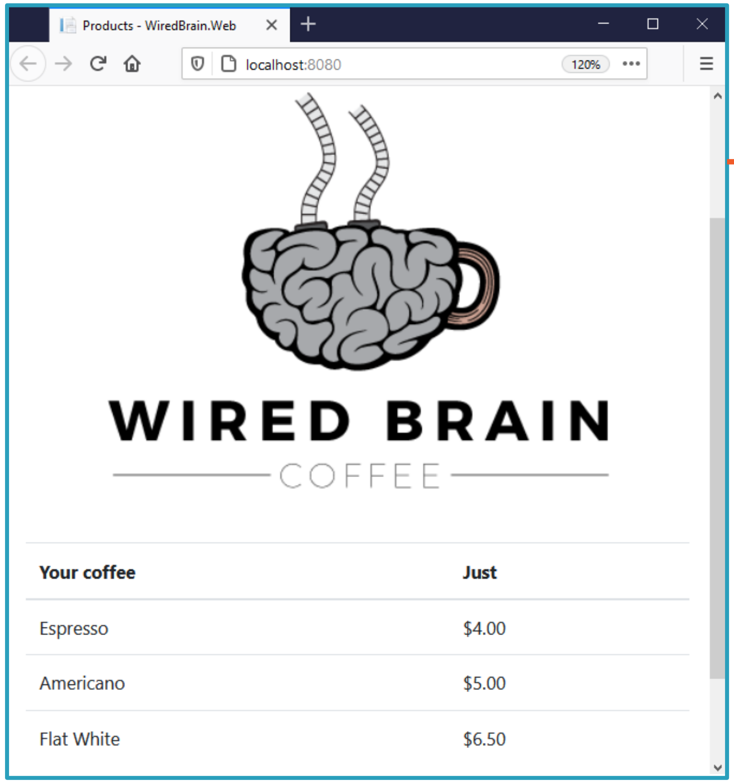

web
products-api
stock-api
products-db
API


products-api
web
stock-api
products-db

Demo

Deploying apps to Docker Swarm

- Initializing the Swarm
- Deploying Docker Compose specs
- Managing Swarm resources



Products - WiredBrain.Web

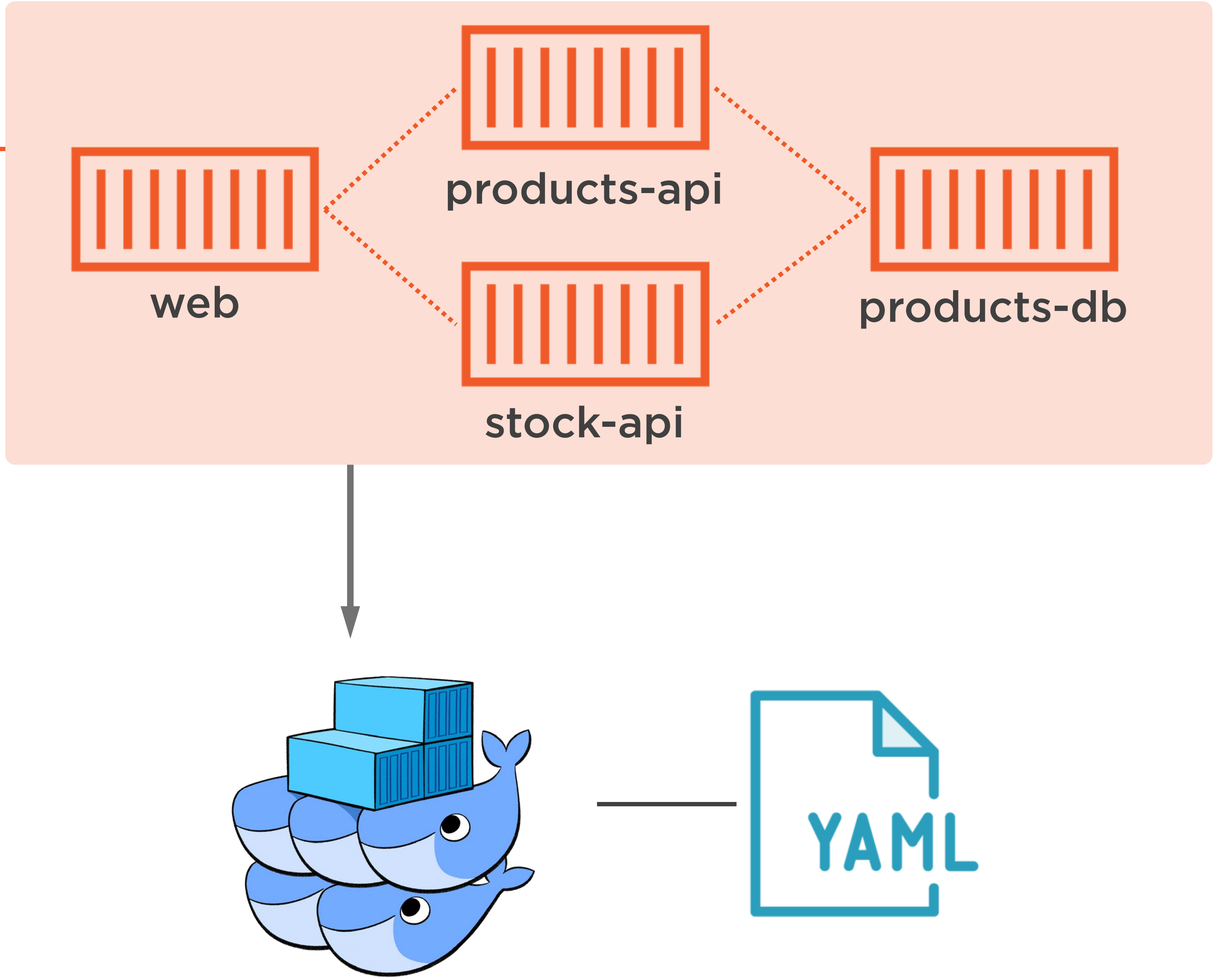
localhost:8080

120%

WIRED BRAIN

COFFEE

Your coffee	Just
Espresso	$4.00
Americano	$5.00
Flat White	$6.50



```
docker swarm init
```

Initializing the Cluster

Sets up the manager node

docker-compose.yml

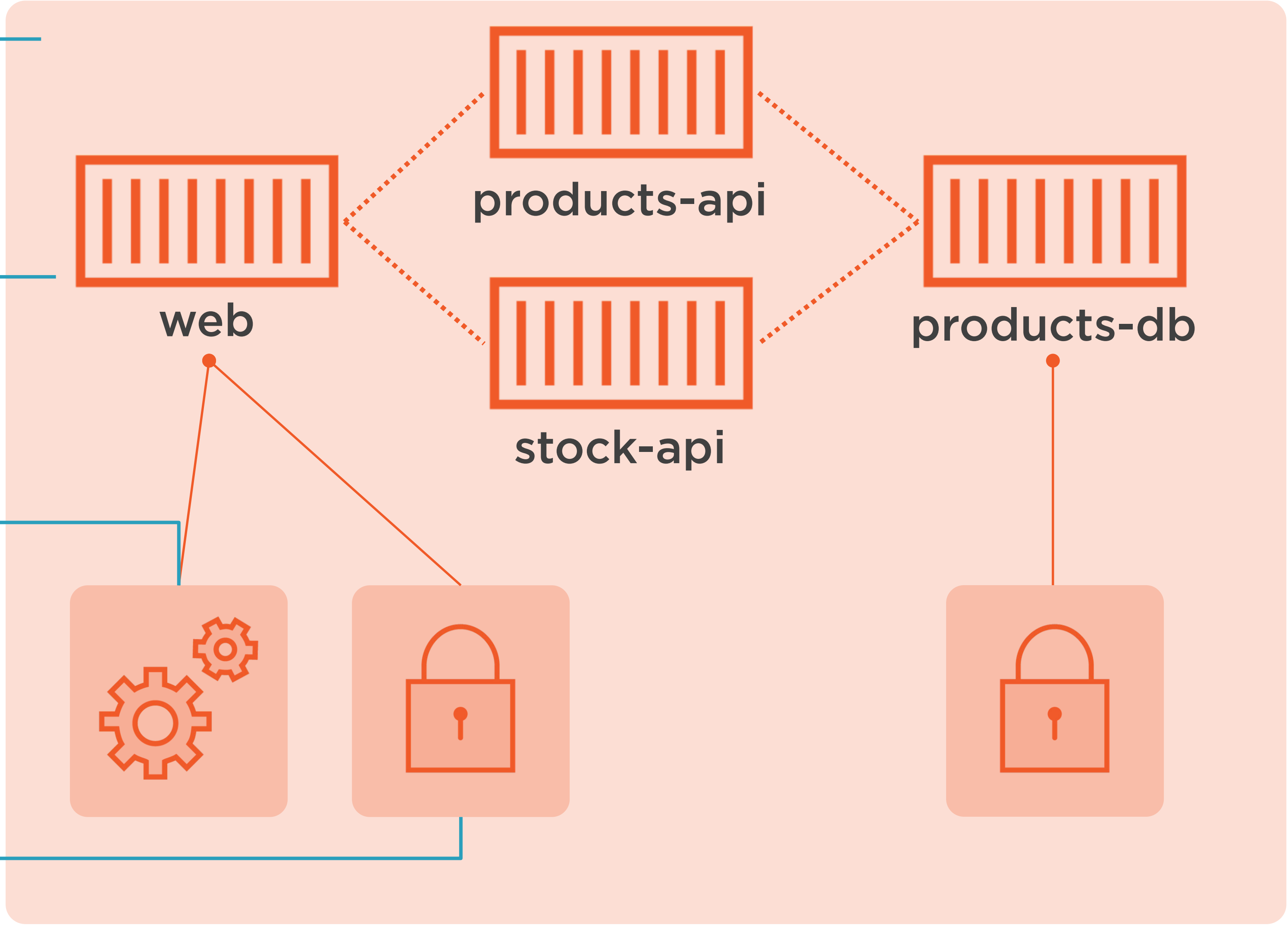
```yaml
services:

  products-db:
    image: psdockerrun/products-db
    ports:
      - "5432:5432"  # publishes to every server in the cluster
    environment:
      - POSTGRES_PASSWORD=wired
    networks:
      - wb-net
```

```
docker stack deploy

docker service ls

docker service ps
```

Deploying Applications as Stacks

Services abstract containers running on nodes

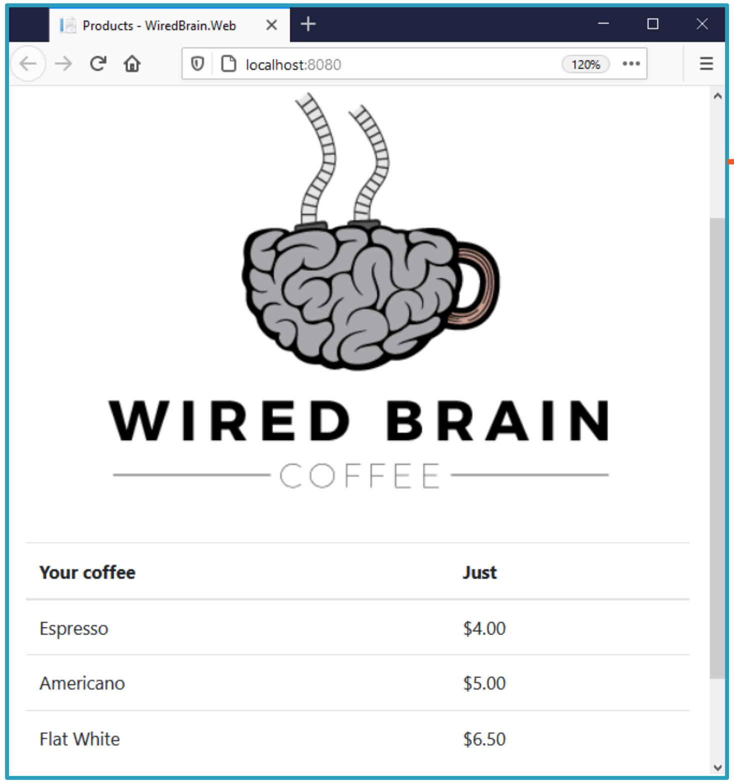
```
networks:
  # ...

services:
  # ...

configs:
  # ...

secrets:
  # ...
```



Demo

Configuring apps with Docker Swarm

- Storing configuration settings
- Storing sensitive config data
- Modelling app configuration



Products - WiredBrain.Web

localhost:8080

120%

WIRED BRAIN

COFFEE

Your coffee	Just
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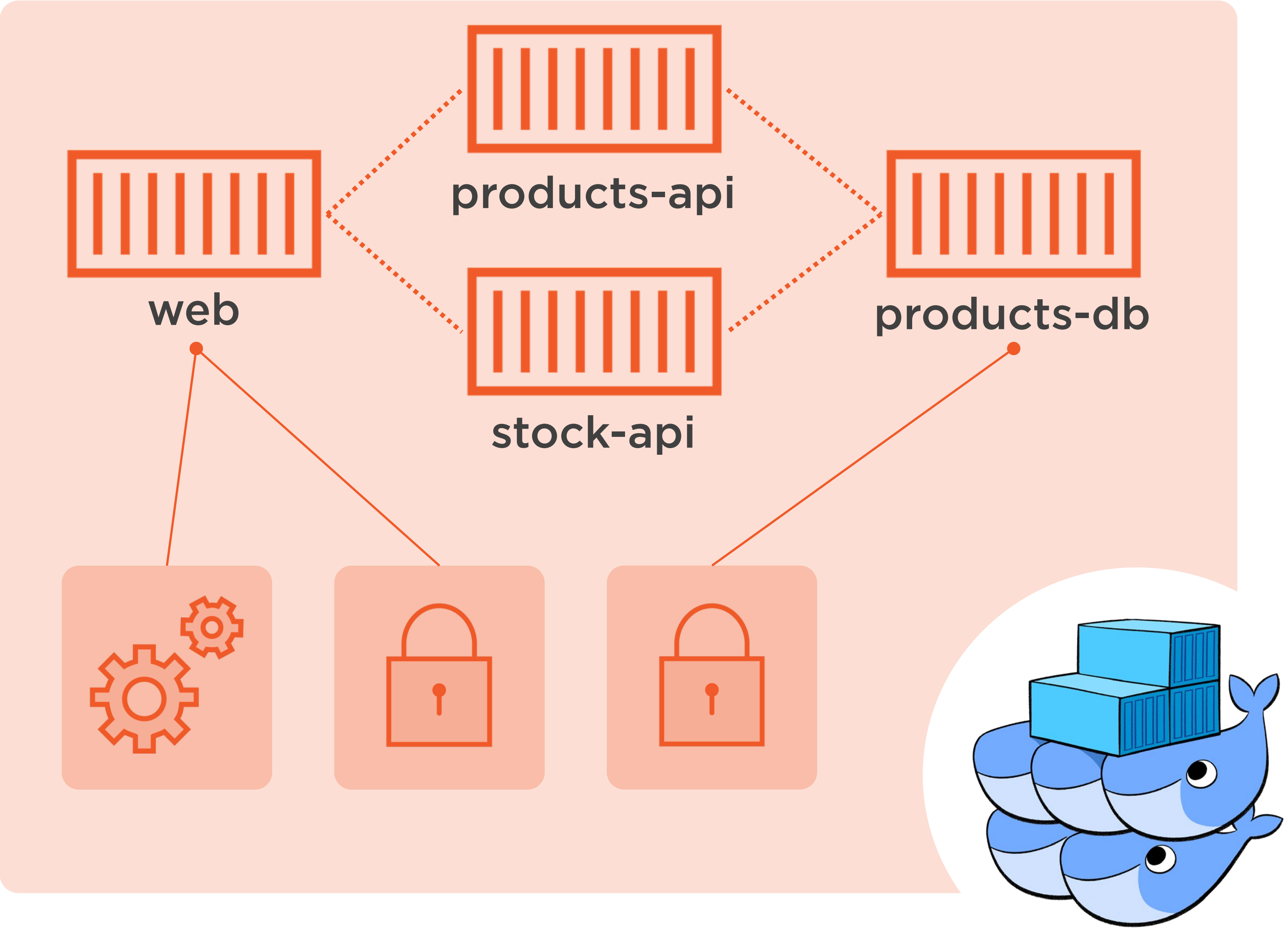


```
docker secret create

docker config create
```

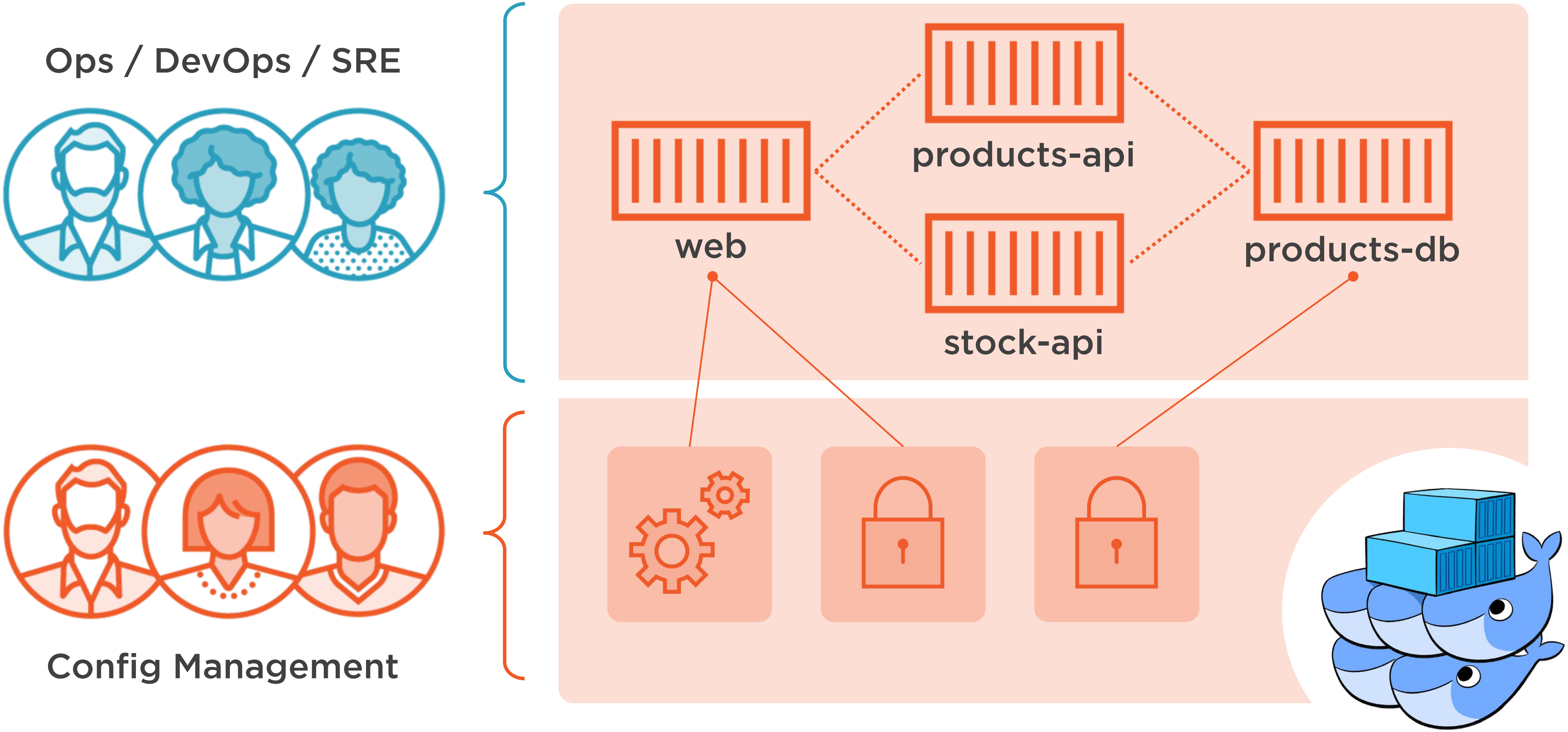
Storing App Config in the Cluster

For sensitive and non-sensitive data

docker-compose.yml

```yaml
services:
  products-api:
    image: psdockerrun/products-api
    configs:
      - source: products-api-config
        target: /app/config/application.properties
    secrets:
      - source: products-api-dbconfig
        target: /app/config/db/application.properties

configs:
  products-api-config:
    external: true
```



Ops / DevOps / SRE

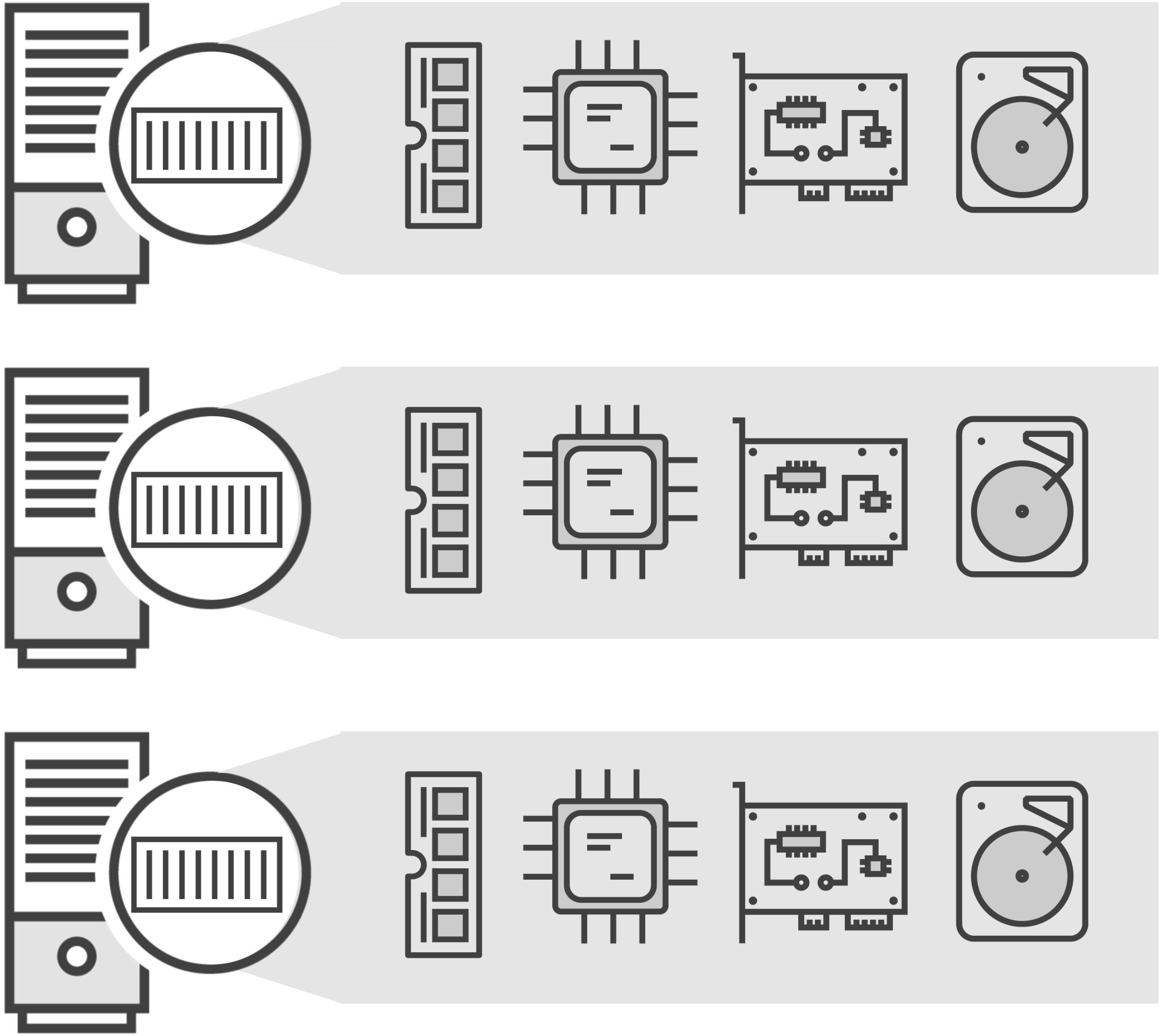
web

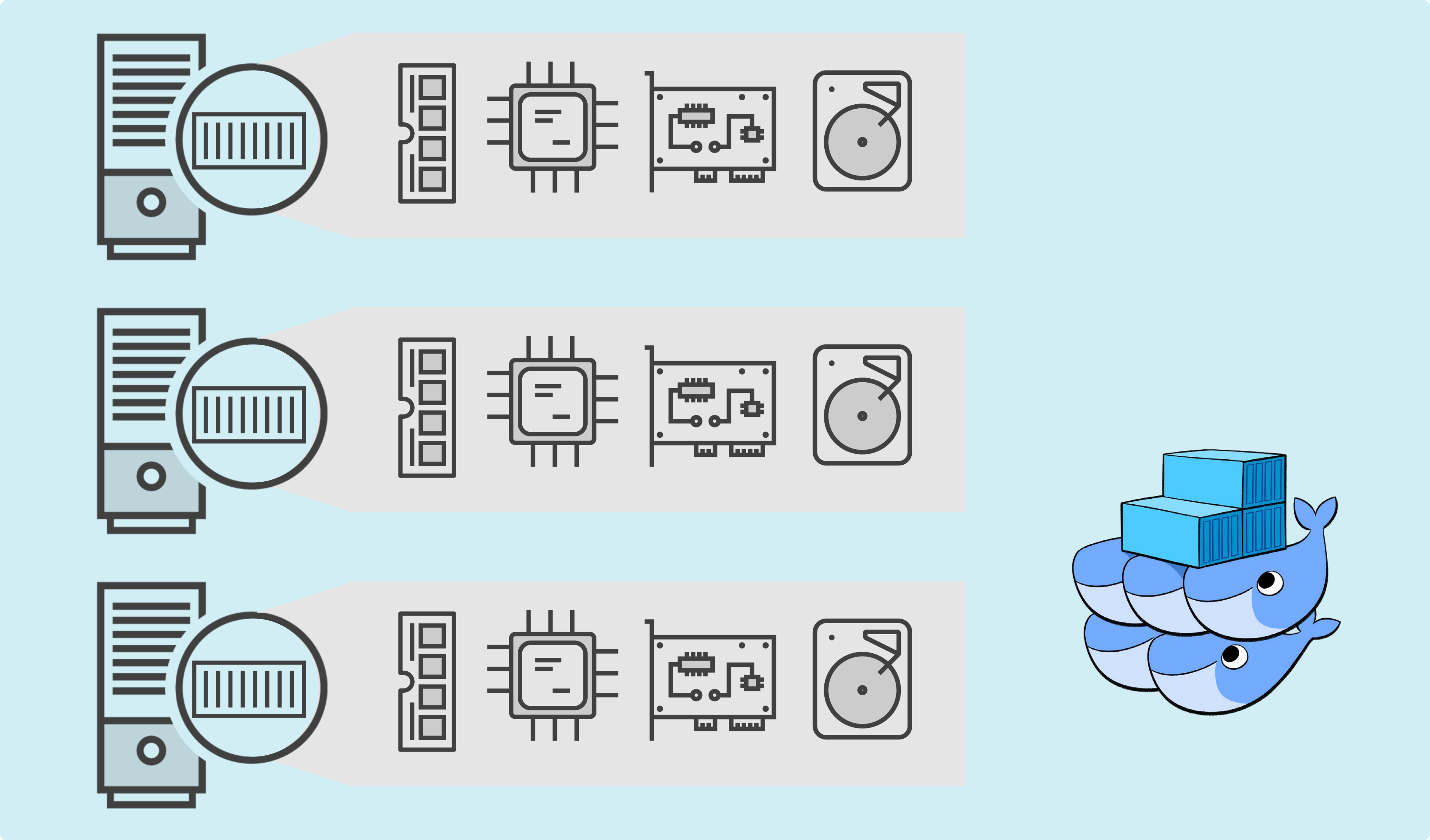
products-api

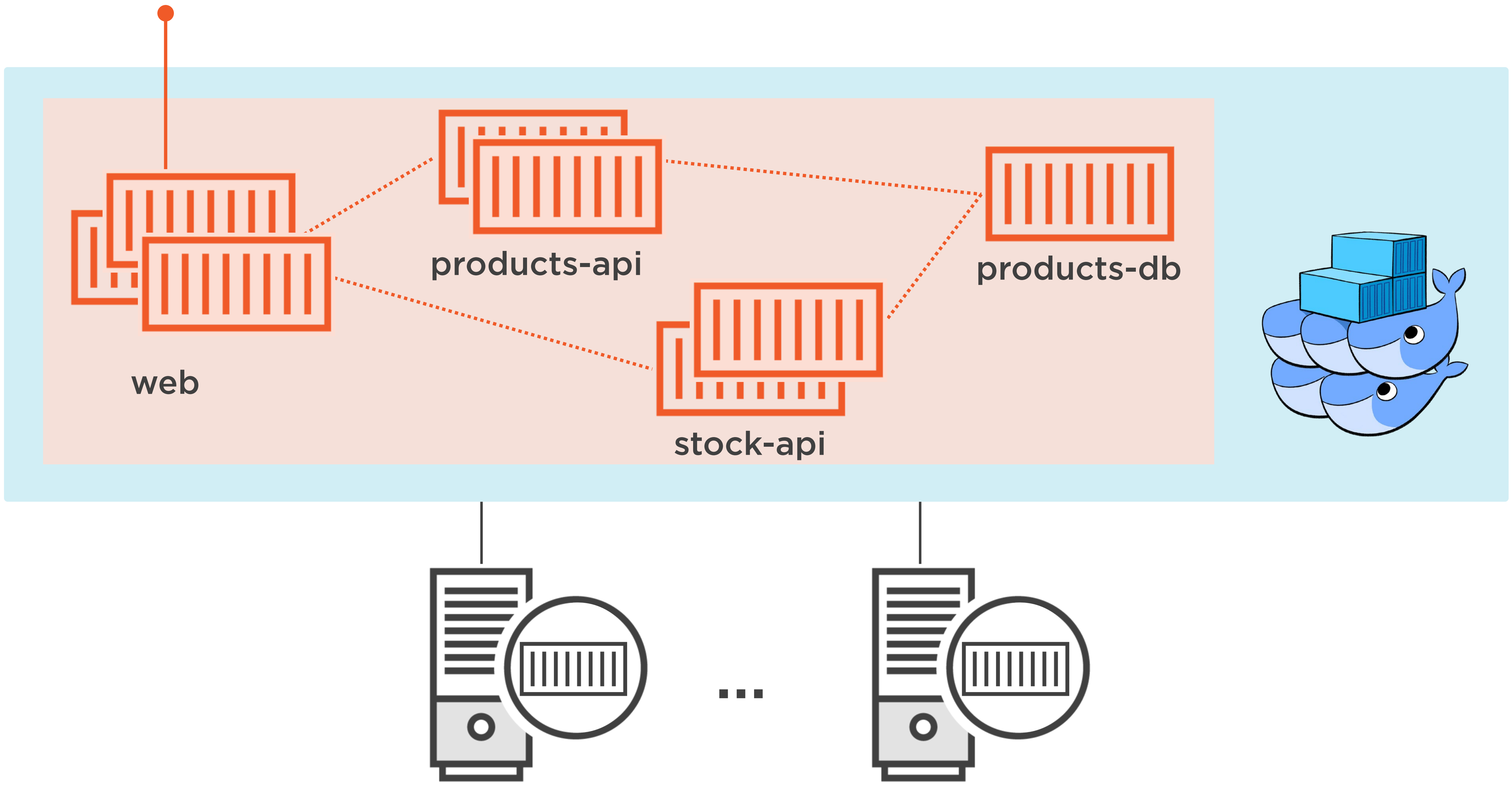
stock-api

products-db

Config Management



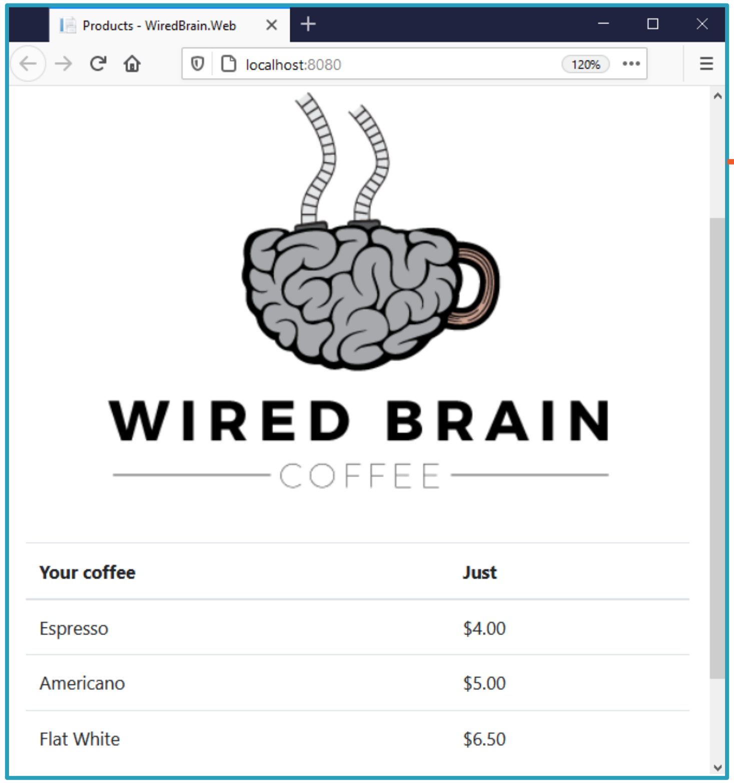



web
products-api
stock-api
products-db
...

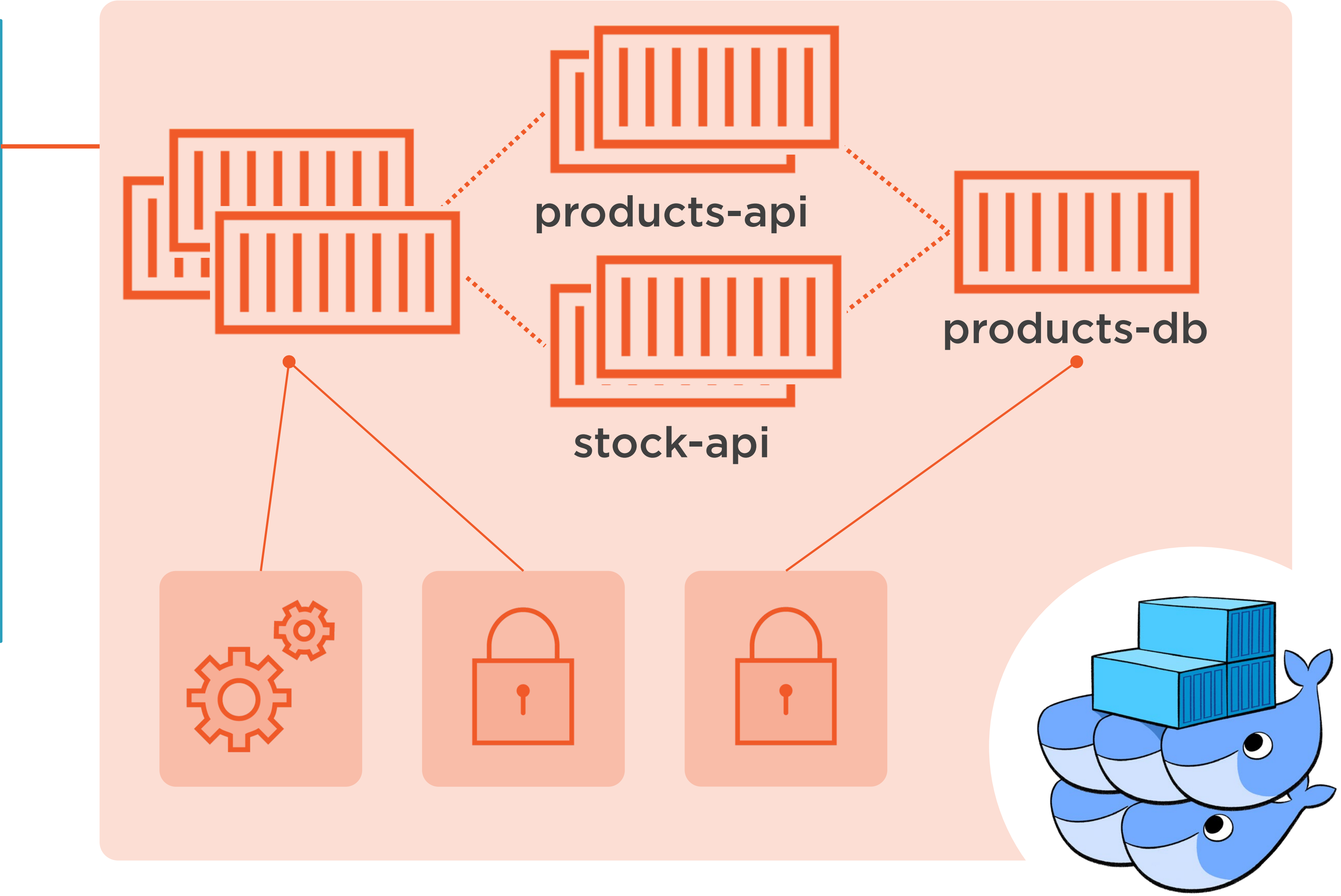
Demo

Scale and Reliability in Docker Swarm

- Self-healing applications
- Running containers at scale
- Automated rolling upgrades



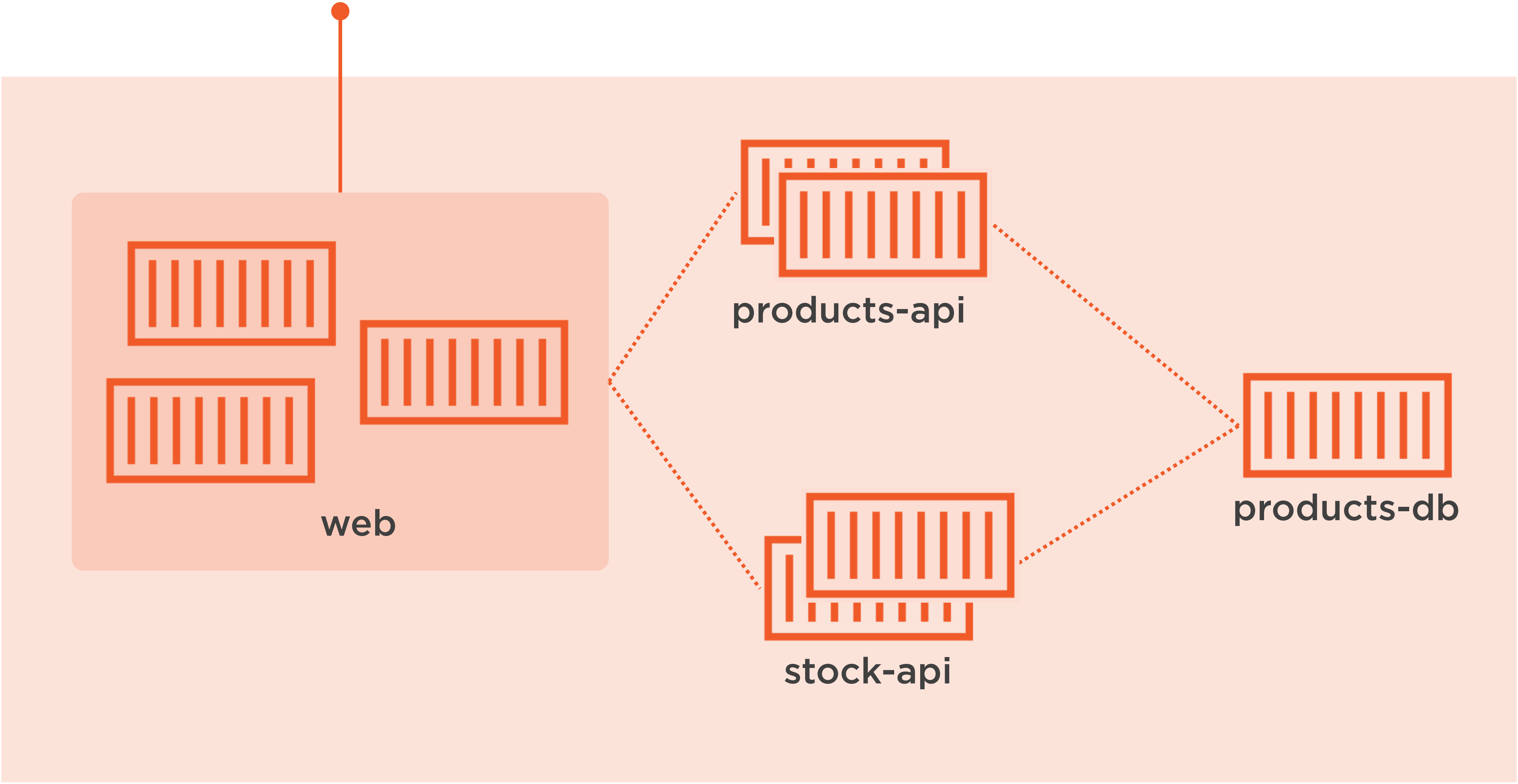
Your coffee	Just
Espresso	$4.00
Americano	$5.00
Flat White	$6.50

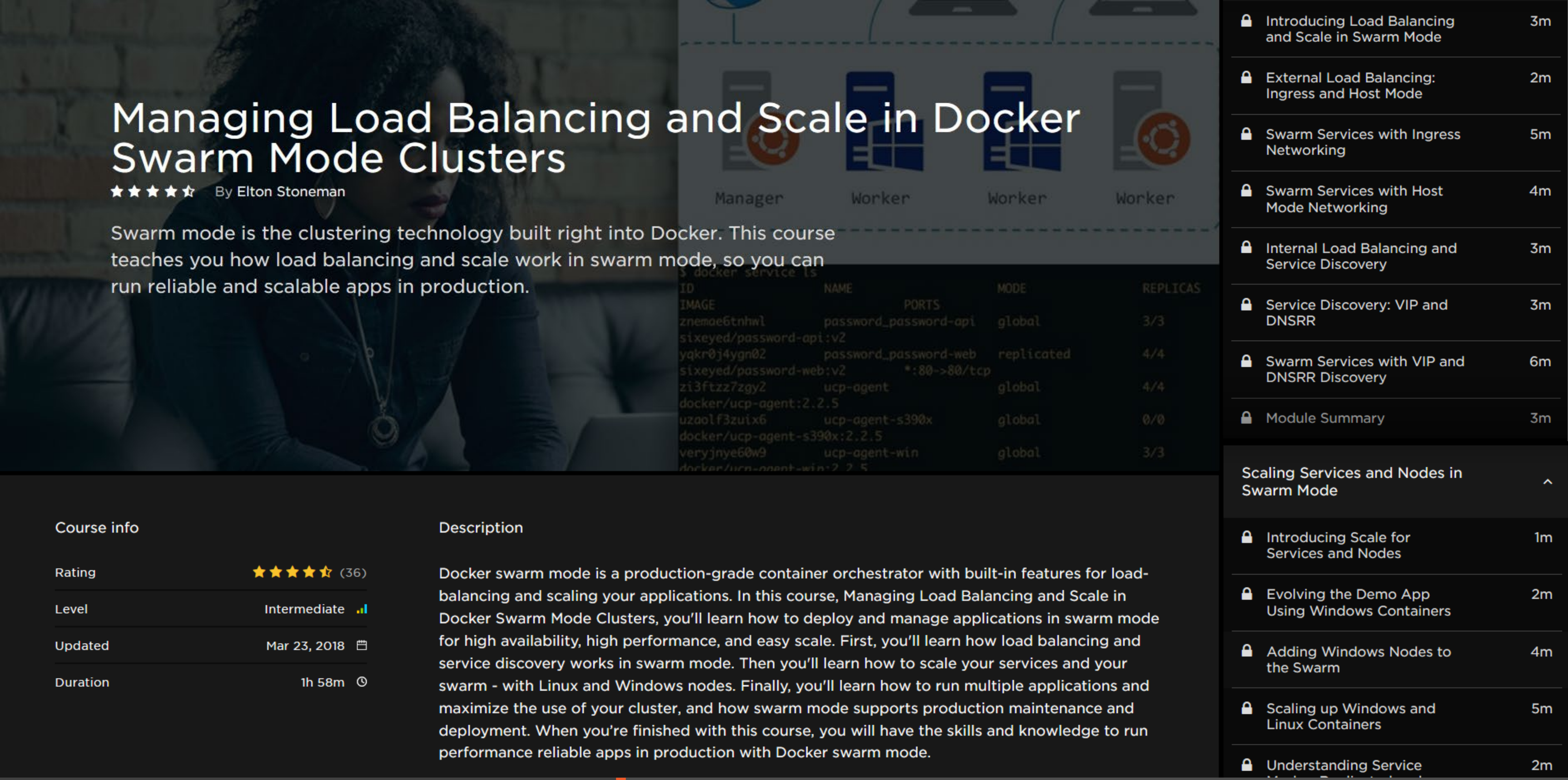


docker-compose.yml

```yaml
services:

  stock-api:
    image: psdockerrun/stock-api
    ports:
      - "8082:8080"
    environment:
      - POSTGRES_CONNECTION_STRING=...password=wiredtest2
    networks:
      - wb-net
    deploy:          # used for Swarm-specific settings
      replicas: 2
```


web
products-api
stock-api
products-db



```
$ docker service ls
ID                  NAME                      MODE                REPLICAS
IMAGE                                  PORTS
znemae6tnhwl        password_password-api     global              3/3
sixeyed/password-api:v2
yqkr0j4ygn02        password_password-web     replicated          4/4
sixeyed/password-web:v2                *:80->80/tcp
zi3ftzz7zgy2        ucp-agent                 global              4/4
docker/ucp-agent:2.2.5
uzaolf3zuix6        ucp-agent-s390x           global              0/0
docker/ucp-agent-s390x:2.2.5
veryjnye60w9        ucp-agent-win             global              3/3
docker/ucp-agent-win:2.2.5
```

Managing Load Balancing and Scale in Docker Swarm Mode Clusters

★★★★½ By Elton Stoneman

Swarm mode is the clustering technology built right into Docker. This course teaches you how load balancing and scale work in swarm mode, so you can run reliable and scalable apps in production.

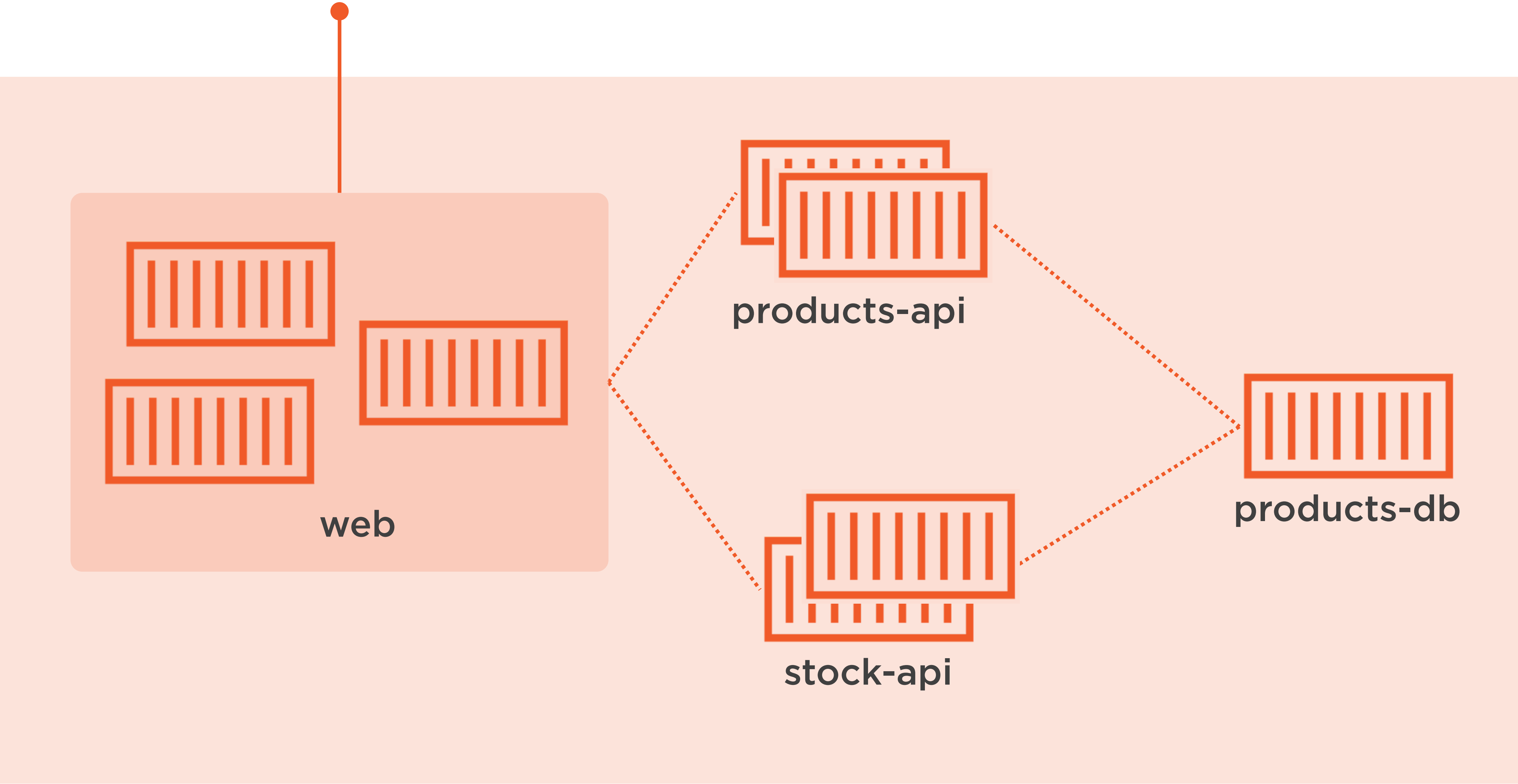
Course info

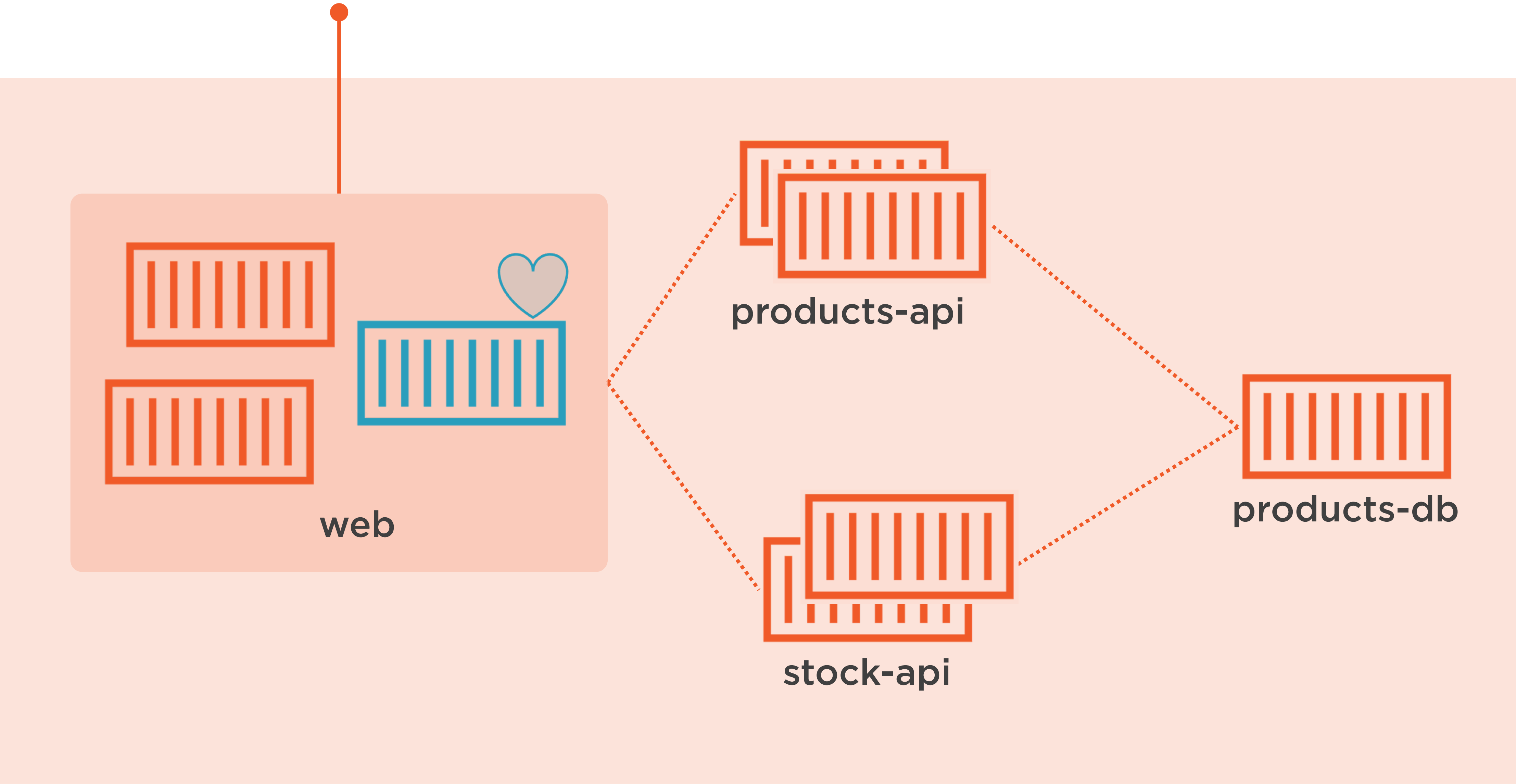
Rating	★★★★½ (36)
Level	Intermediate
Updated	Mar 23, 2018
Duration	1h 58m

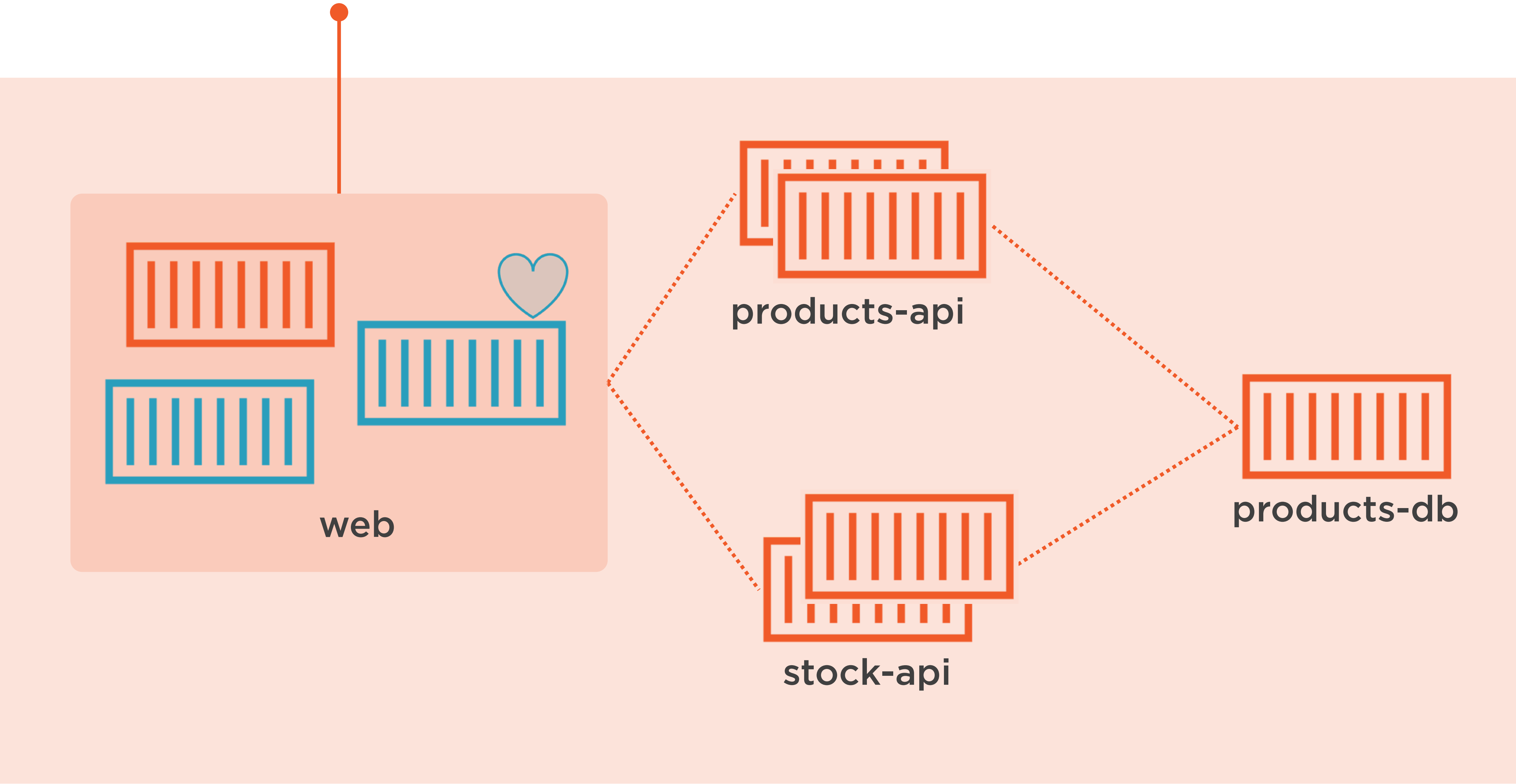
Description

Docker swarm mode is a production-grade container orchestrator with built-in features for load-balancing and scaling your applications. In this course, Managing Load Balancing and Scale in Docker Swarm Mode Clusters, you'll learn how to deploy and manage applications in swarm mode for high availability, high performance, and easy scale. First, you'll learn how load balancing and service discovery works in swarm mode. Then you'll learn how to scale your services and your swarm - with Linux and Windows nodes. Finally, you'll learn how to run multiple applications and maximize the use of your cluster, and how swarm mode supports production maintenance and deployment. When you're finished with this course, you will have the skills and knowledge to run performance reliable apps in production with Docker swarm mode.

https://is.gd/buwaqu


web
products-api
stock-api
products-db


web
products-api
stock-api
products-db


products-api
web
products-db
stock-api

Summary

Orchestration with a Container Platform

- Cluster abstracts infrastructure
- Reliability and scale
- Desired-state deployment

Docker Swarm

- Native orchestration in Docker
- Production-grade & multi-arch

App Modelling in Docker Swarm

- Docker Compose specification
- Additional options for Swarm objects
- Configuration and networking

Up Next:
Understanding Kubernetes