An Overview

Containers and Kubernetes

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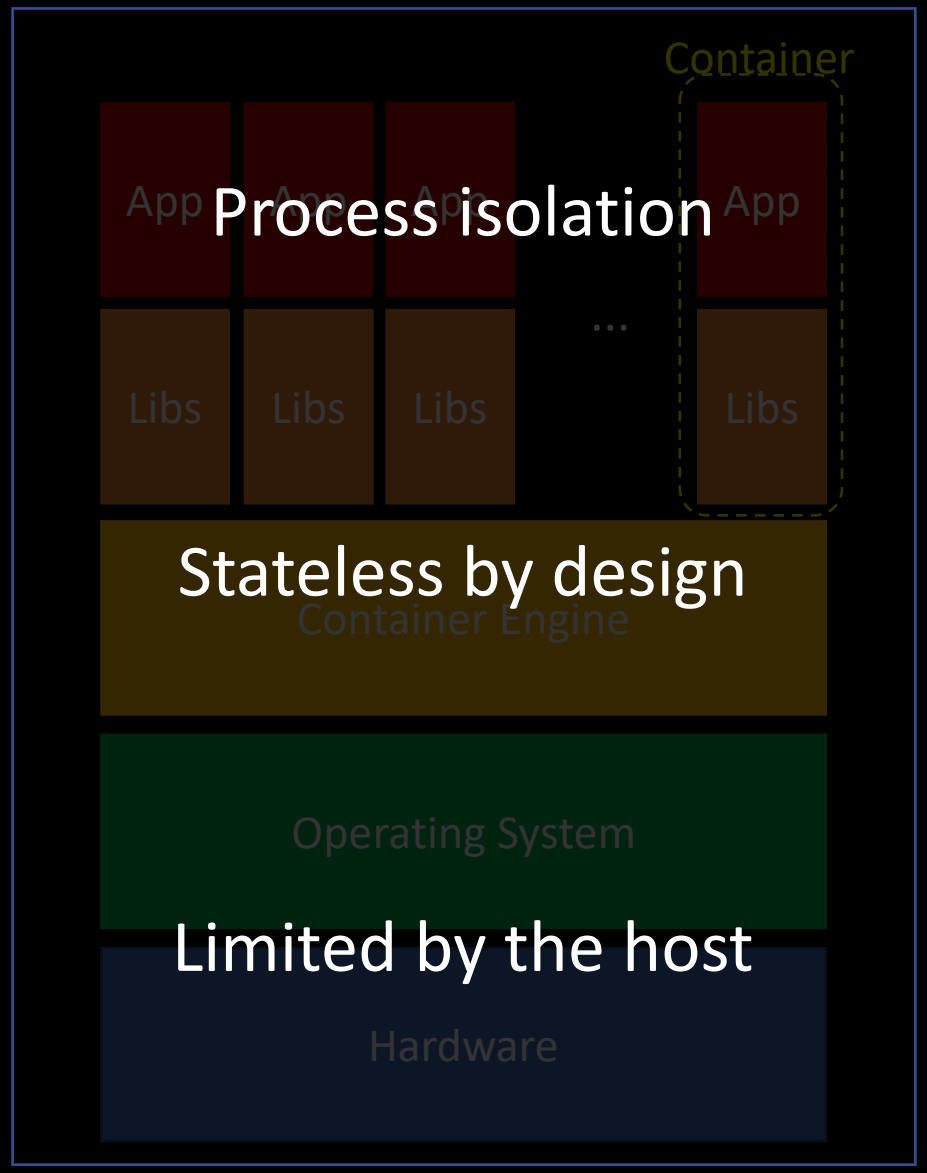
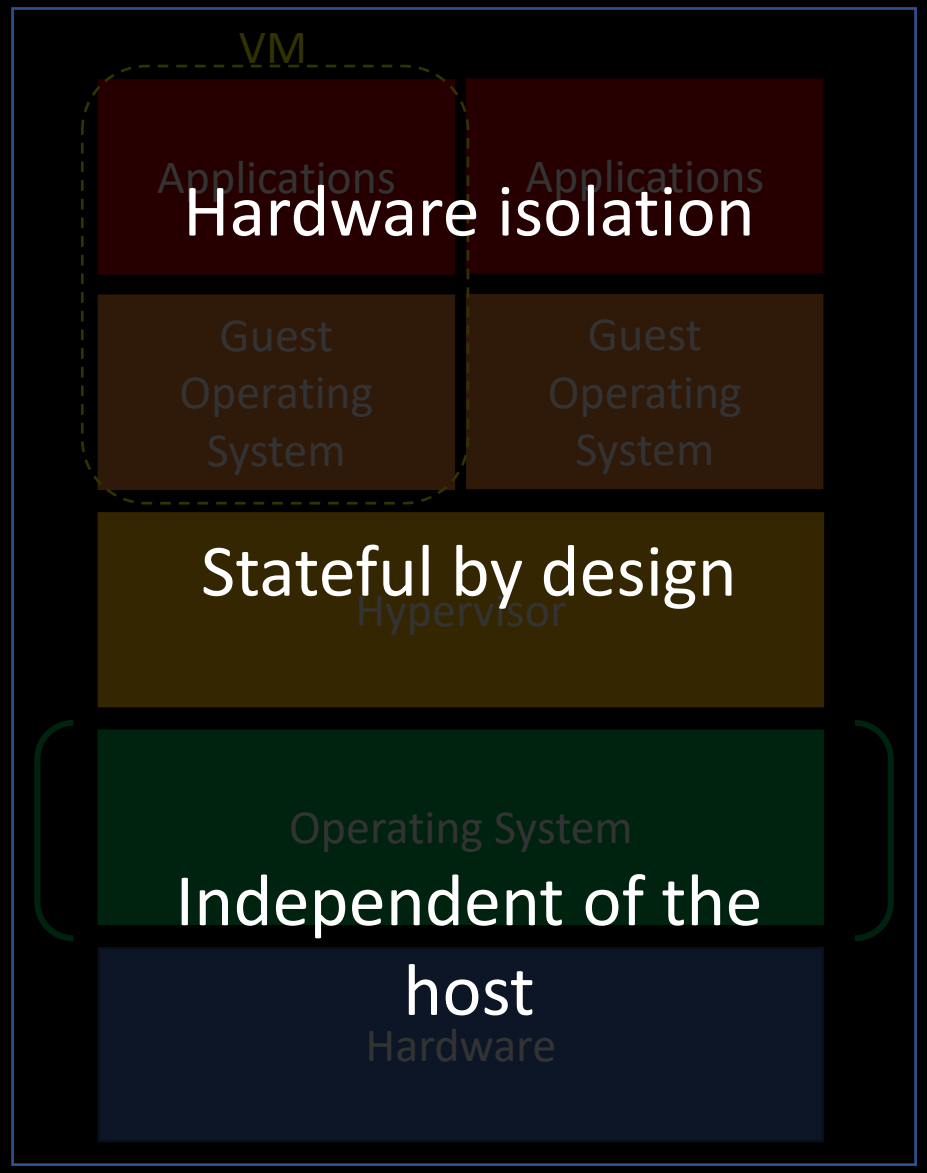
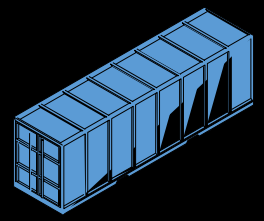
Containers

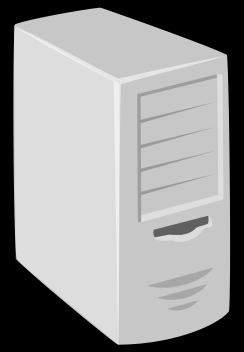


Virtual Machines

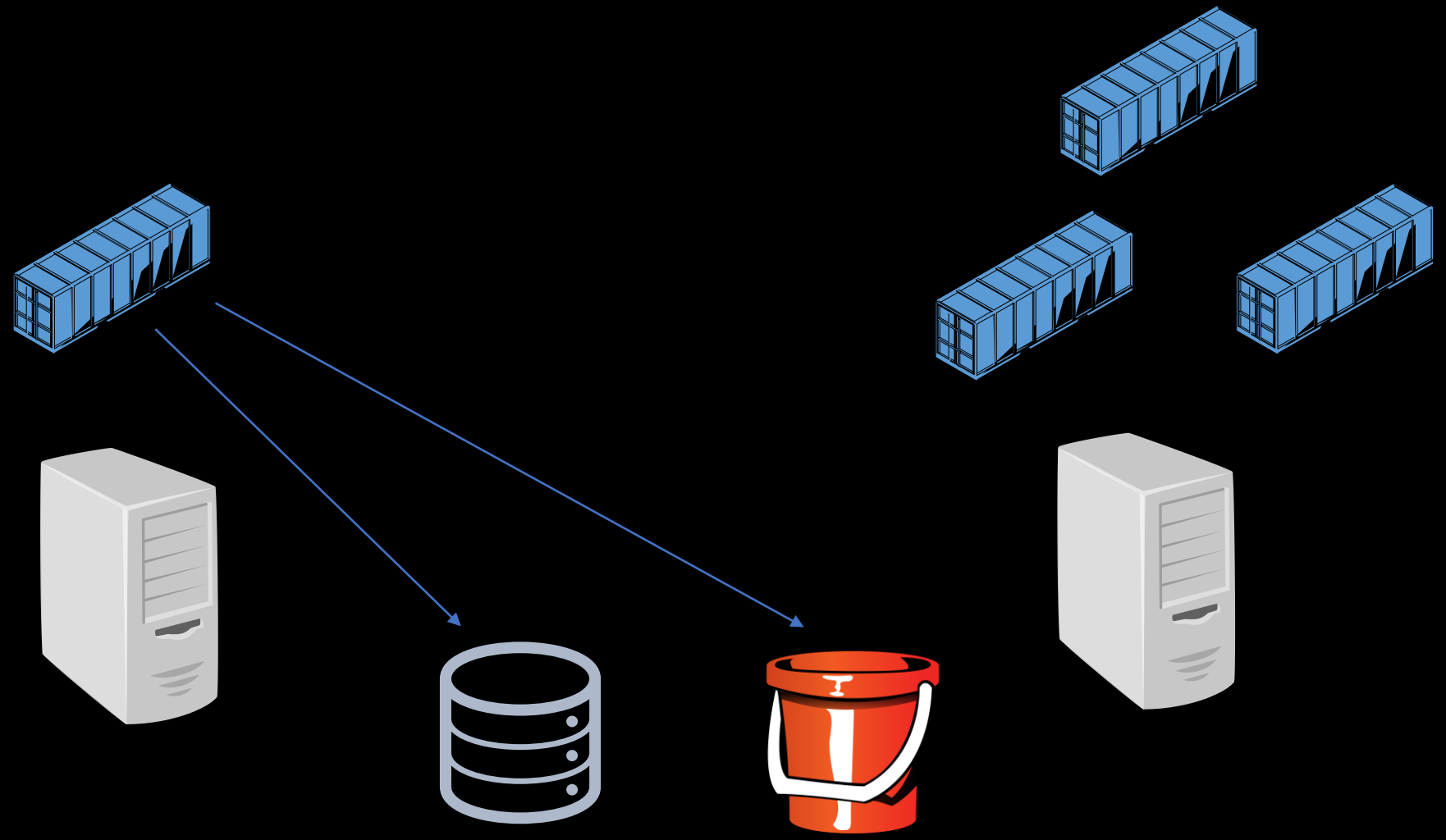


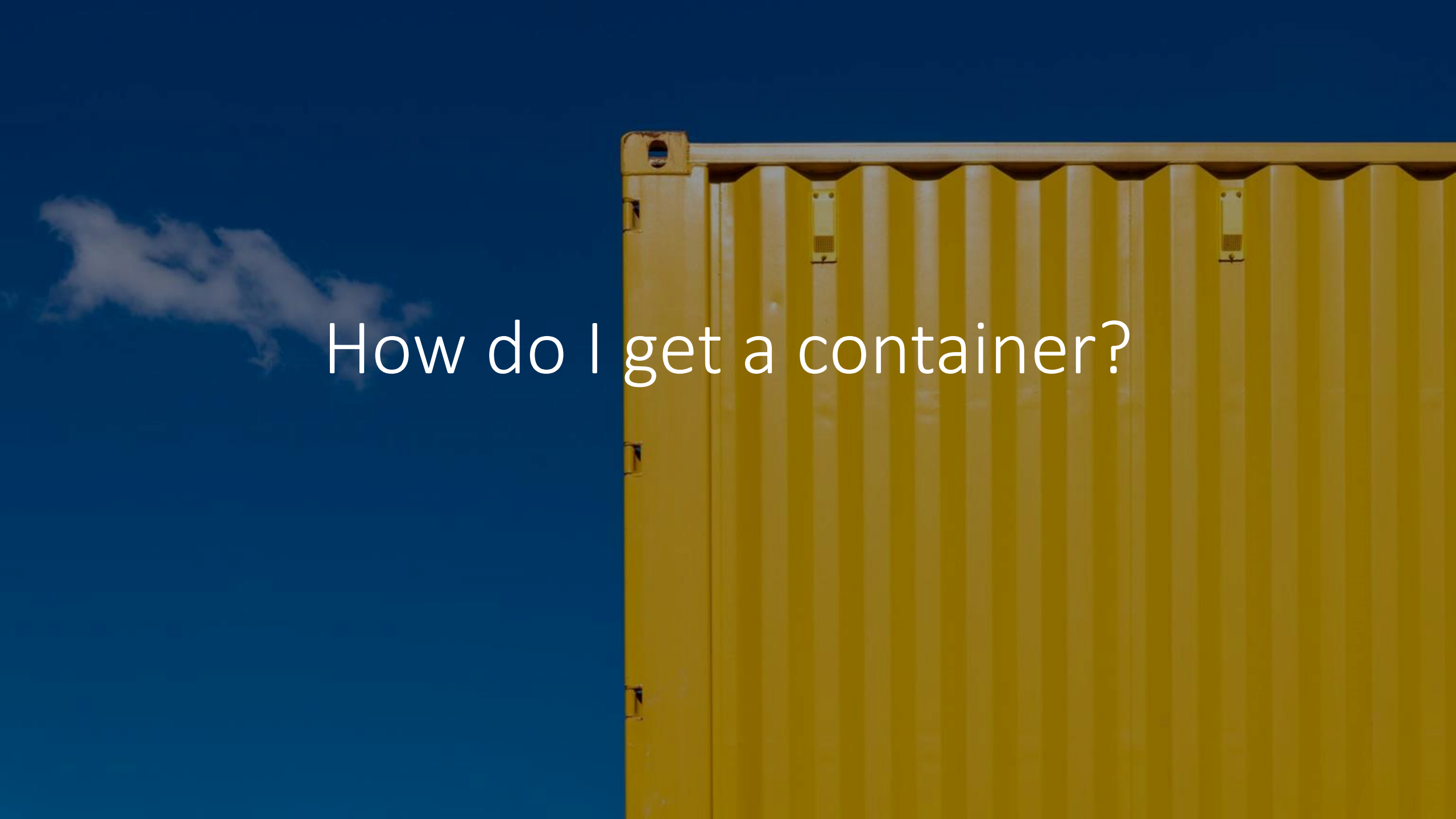
Statelessness





Statelessness





How do I get a container?

Dockerfile

my-node-app/Dockerfile

```
FROM node:12-alpine                          # Base image
RUN apk add --no-cache python2 g++ make      # Dependencies
WORKDIR /app                                 # Somewhere sensible
COPY . .                                     # Puts your code to /app
RUN yarn install --production                # Each keyword creates a layer
CMD ["node", "src/index.js"]                 # When the container starts
EXPOSE 3000                                  # Help the user
```

$ docker build –t my-first-app .

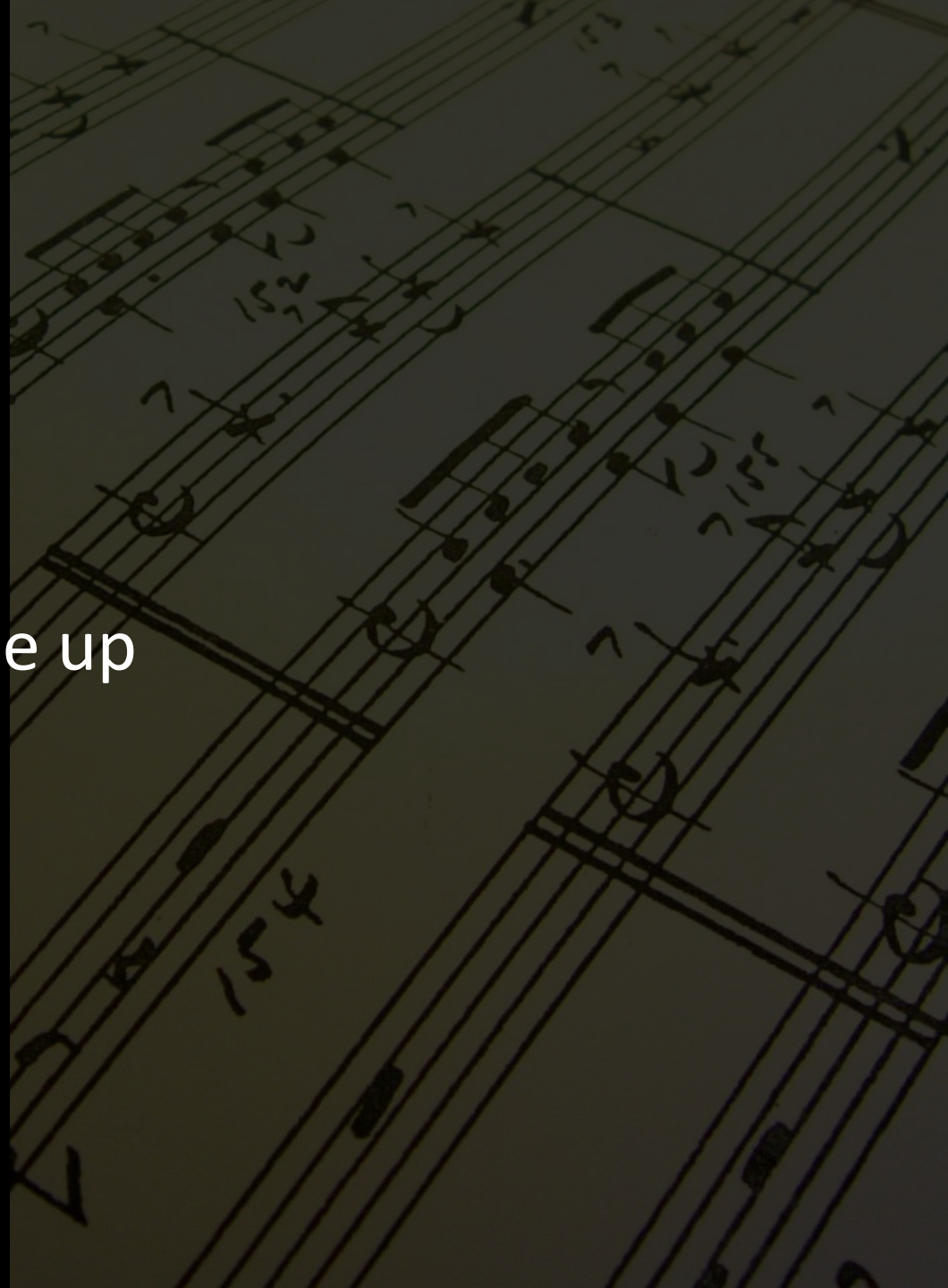
```
$ docker run -d my-first-app
```

Composing containers

my-django-app/docker-compose.yml

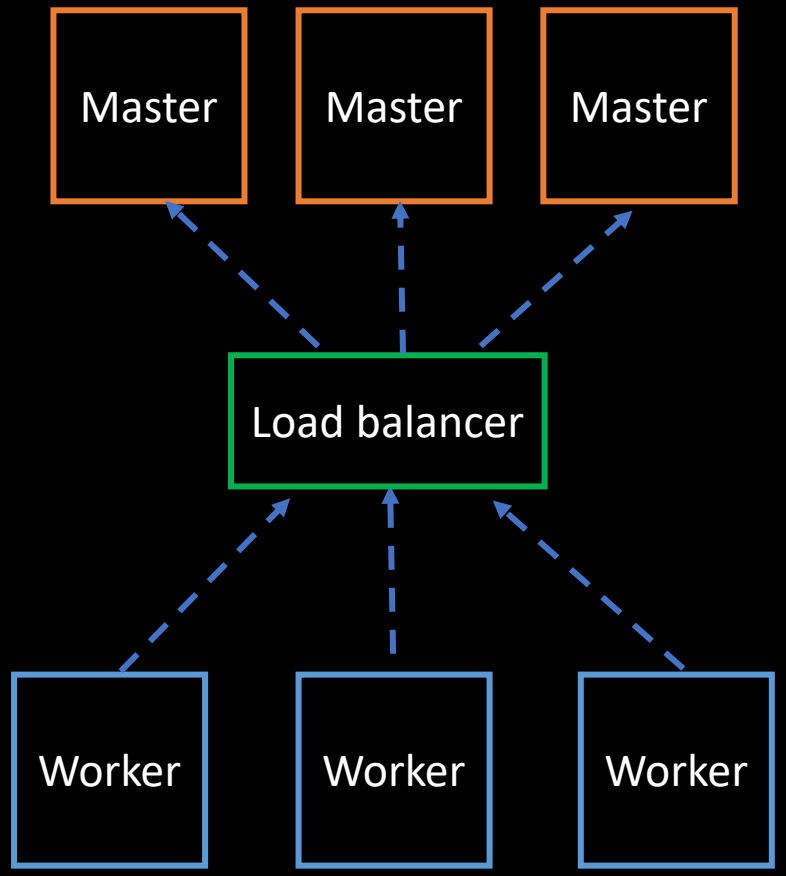
```
services:
  db:
    image: postgres
    volumes:
      - ./data/db:/var/lib/postgresql/data
    environment:
      - POSTGRES_DB=postgres
      - POSTGRES_USER=postgres
      - POSTGRES_PASSWORD=Postgre5
  web:
    image: my-django-app
    ports:
      - "8000:8000"
    environment:
      - POSTGRES_NAME=postgres
      - POSTGRES_USER=postgres
      - POSTGRES_PASSWORD=Postgre5
```

$ docker-compose up



Orchestration

Kubernetes topology



Manifests

kind: Service

kind: Deployment

apps/nginx-app.yaml

```yaml
apiVersion: v1
kind: Service
metadata:
  name: my-nginx-svc
  labels:
    app: nginx
spec:
  type: LoadBalancer
  ports:
  - port: 80
  selector:
    app: nginx
---
apiVersion: apps/v1
kind: Deployment
metadata:
  name: my-nginx
  labels:
    app: nginx
spec:
  replicas: 3
  selector:
    matchLabels:
      app: nginx
  template:
    metadata:
      labels:
        app: nginx
    spec:
      containers:
      - name: nginx
        image: nginx:1.14.2
        ports:
        - containerPort: 80
```

Manifests

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  ports:
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    spec:
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Manifests

```
labels:
  app: nginx
```

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Manifests

```yaml
spec:
  replicas: 3
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  spec:
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```
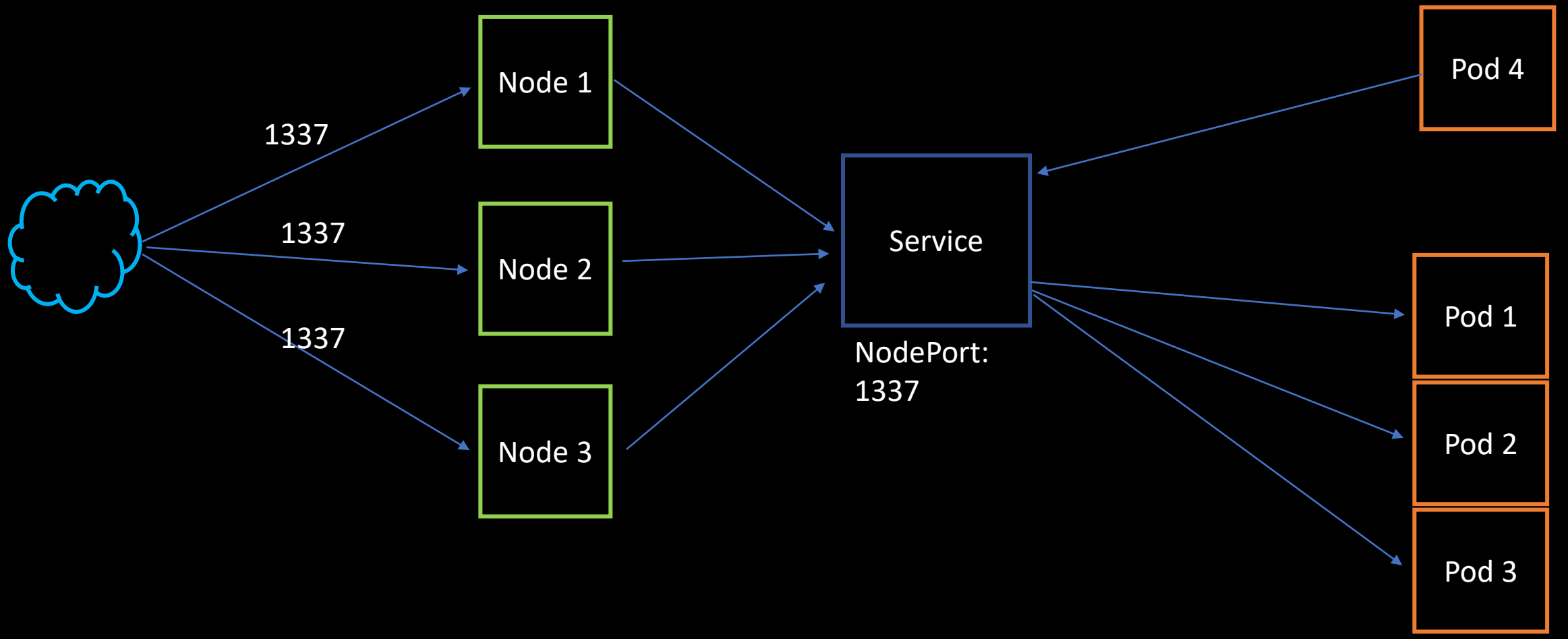
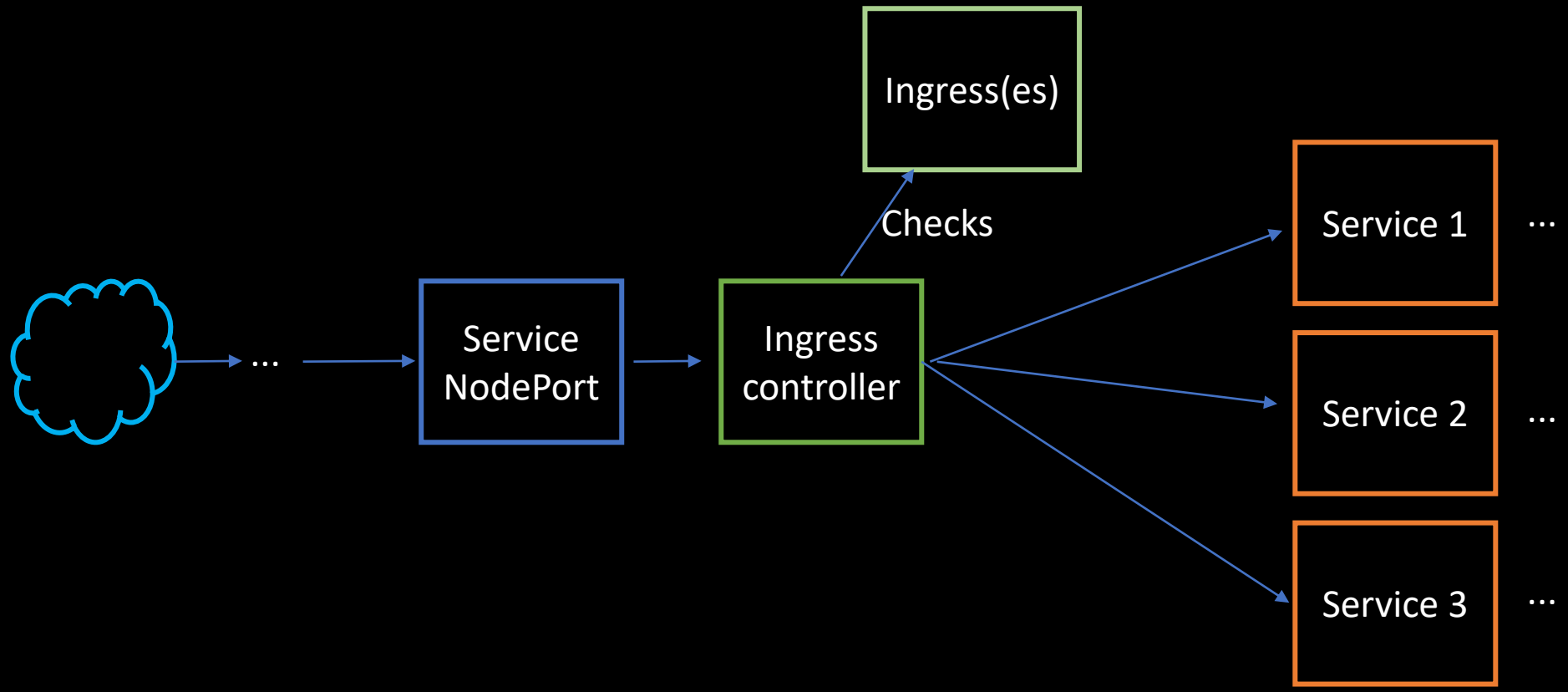



Self-healing

Communication is key



Can we do better?



Summary

- Containers != Virtual Machines
- Dockerfile -> Image -> Container
- Docker compose helps you spin up multiple containers
- Kubernetes is basically a bunch of servers and DNS
- Declare your desired state and let the computer handle the hard part
- Self healing and high availability
- Most problems are solved with good communication

Thanks!