DevOps témalabor beszámoló

Orova Márton

Mi is a DevOps?

Development + Operations

git

GitHub

Travis CI

Jenkins

aws

docker

Docker Compose

kubernetes

Maven

Gradle

JACOCO
Java Code Coverage

JUnit 5

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Docker - Konténer alapú virtualizáció

Docker konténer

- Alkalmazás + függőségek
- Bárhol fut, ha van Docker Engine
- Egymástól elszigeteltek

Dockerfile

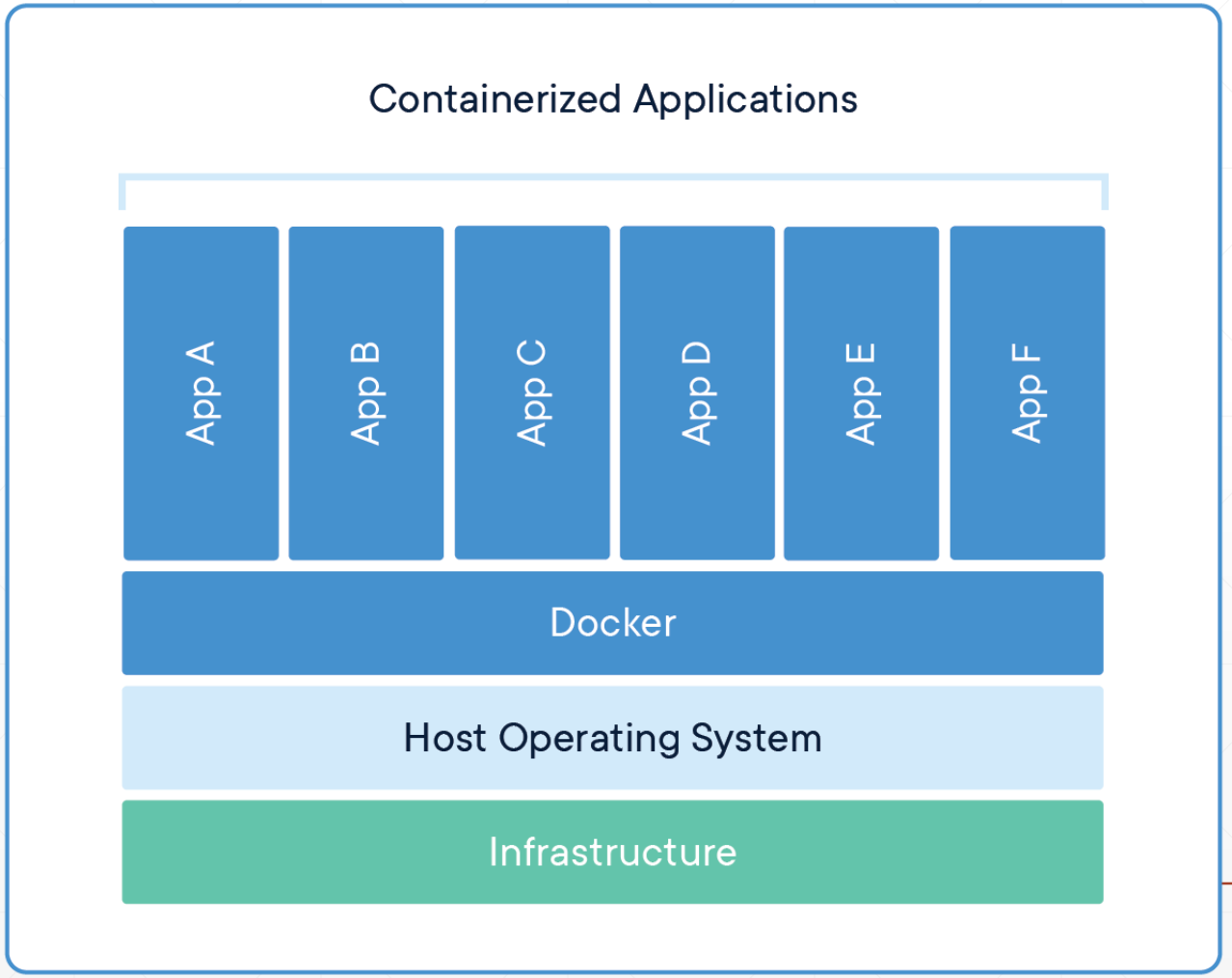
```
# Start with a base image containing Java runtime
FROM openjdk:8-jdk-alpine

# Make port 8080 available to the world outside this container
EXPOSE 8080

# The application's jar file
ARG JAR_FILE=build/libs/devops-demo-0.1.0.jar

# Add the application's jar to the container
ADD ${JAR_FILE} devops-demo.jar

# Run the jar file
ENTRYPOINT ["java","-jar","/devops-demo.jar"]
```

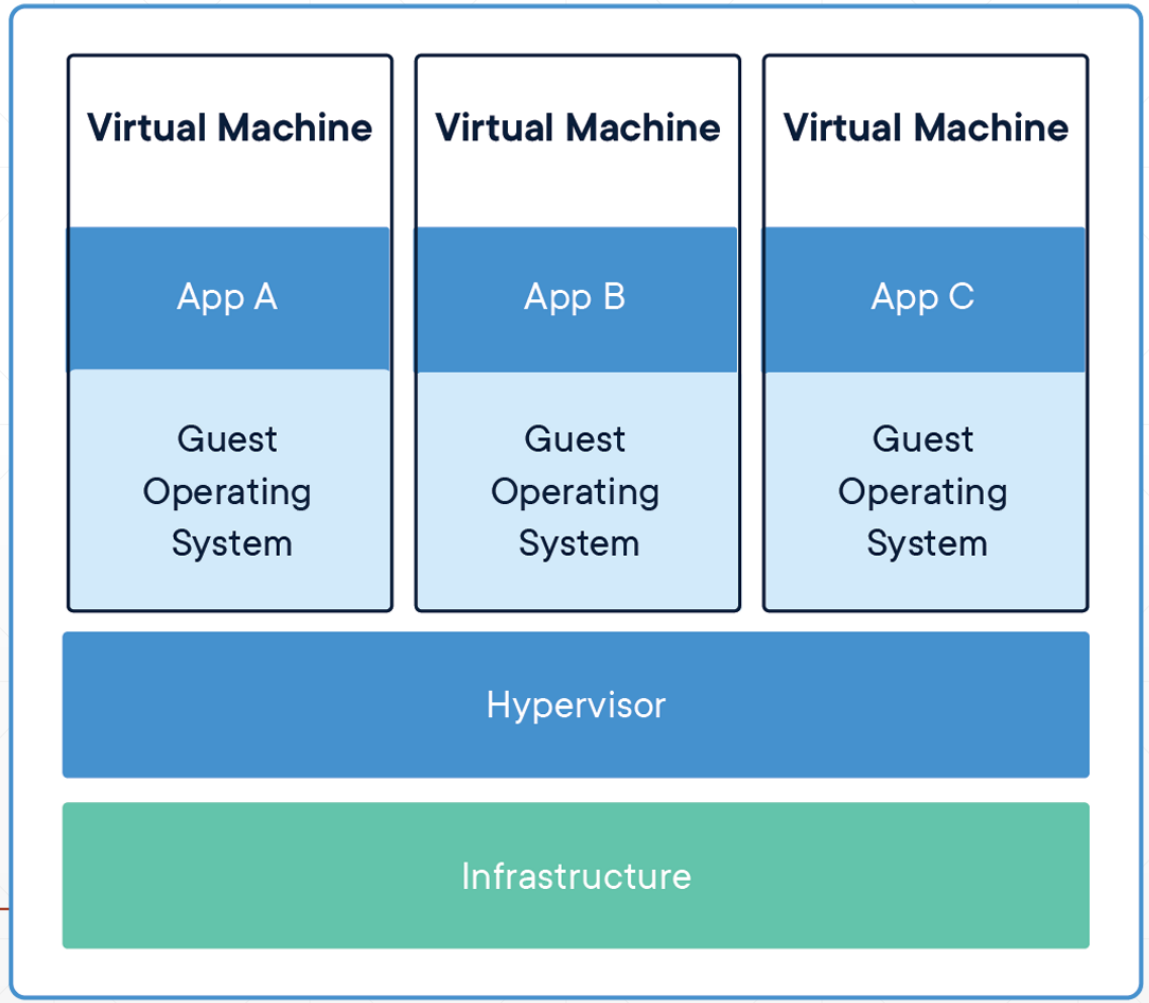
Indítás

```
docker build -t devops-demo .
docker run -d -p 8080:8080 devops-demo
```

Docker vs virtuális gép

- Közös OS kernel használat
- Teljes virtuális OS





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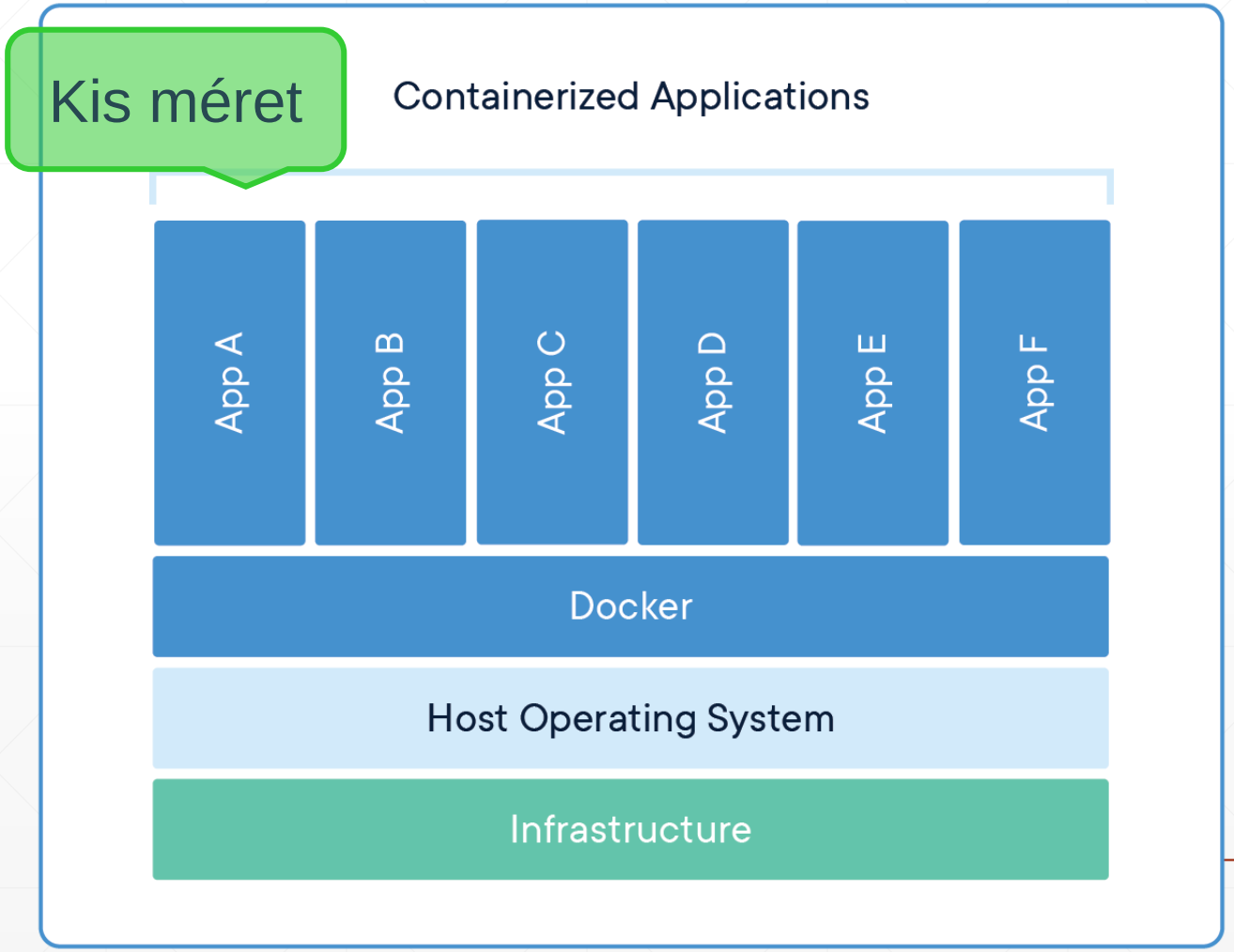

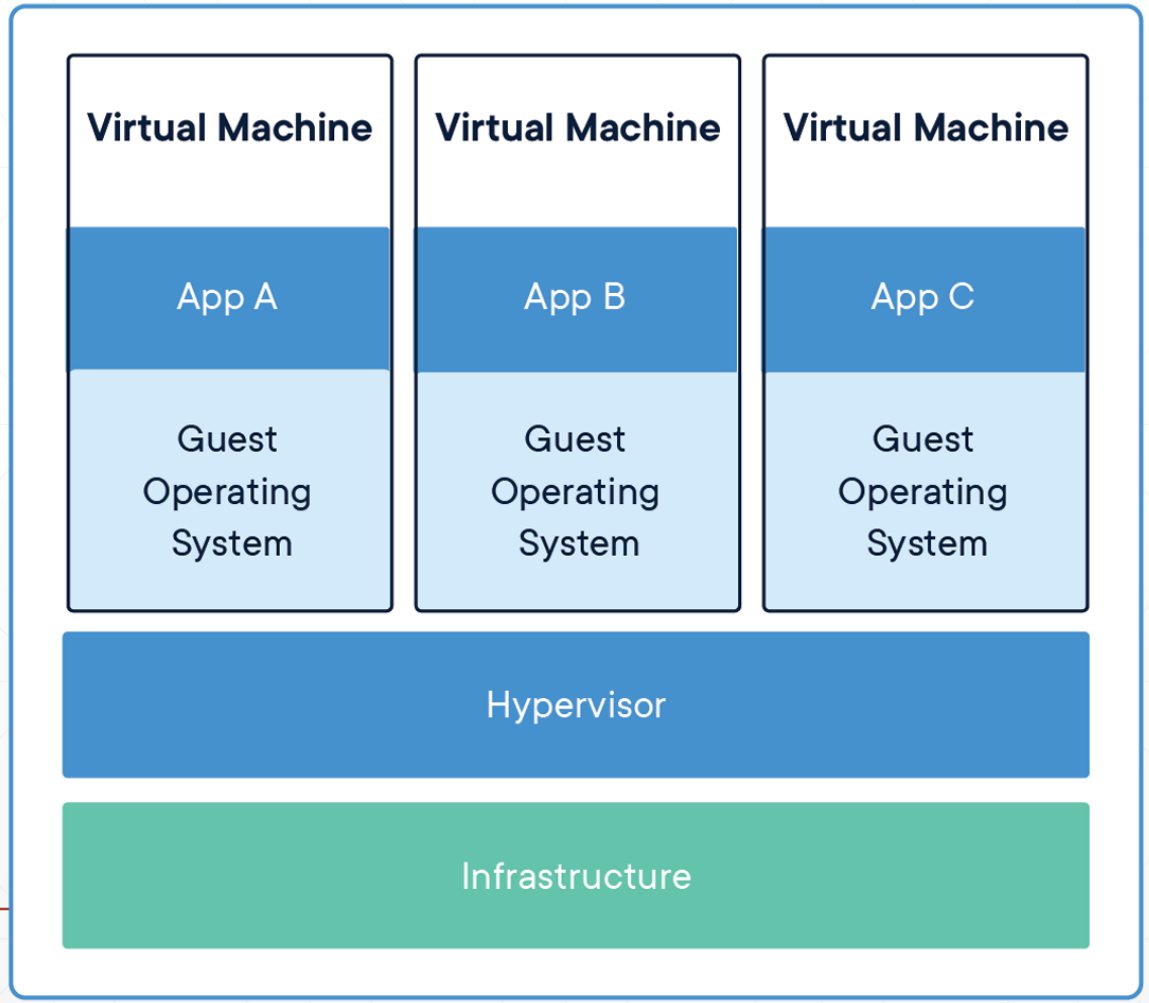

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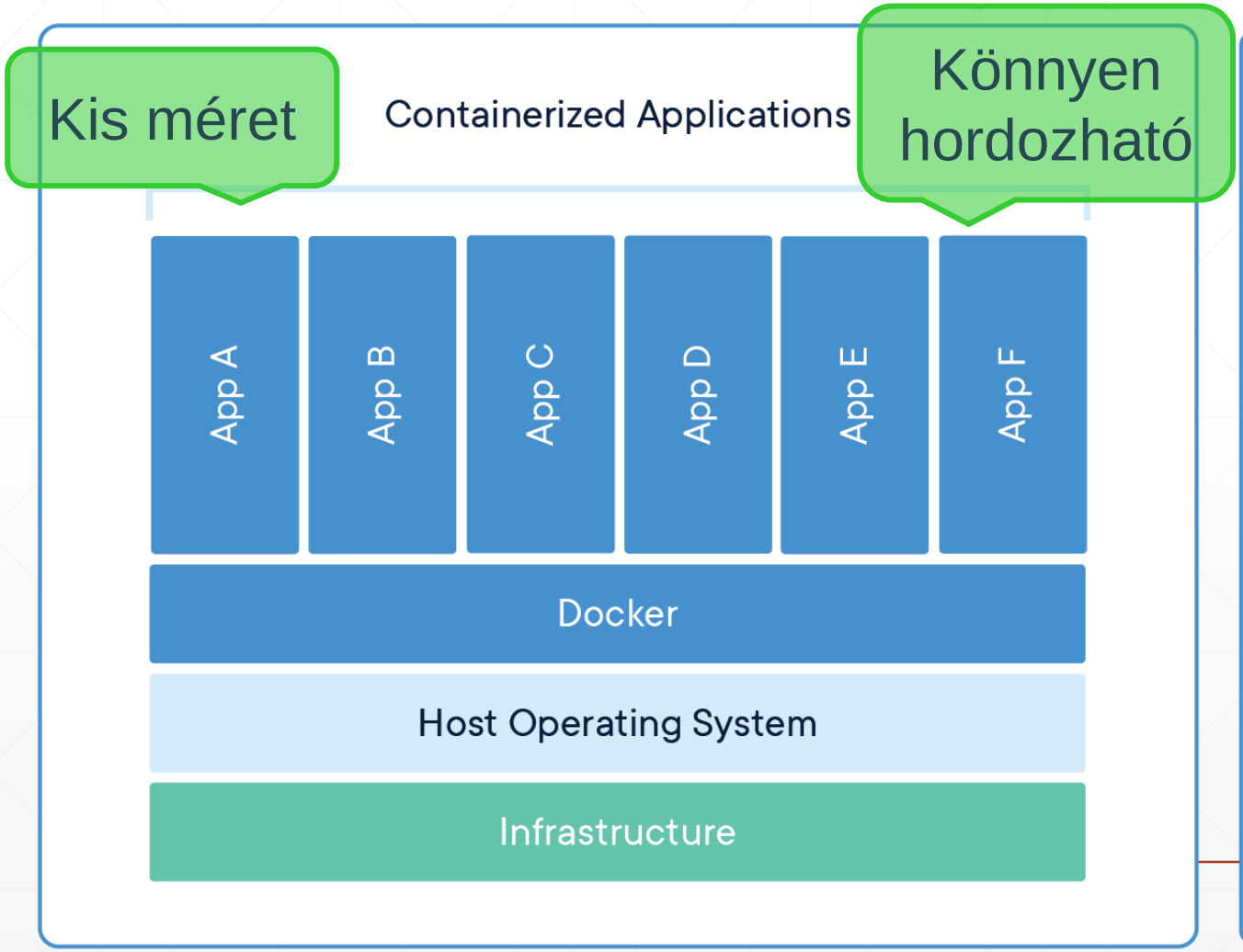

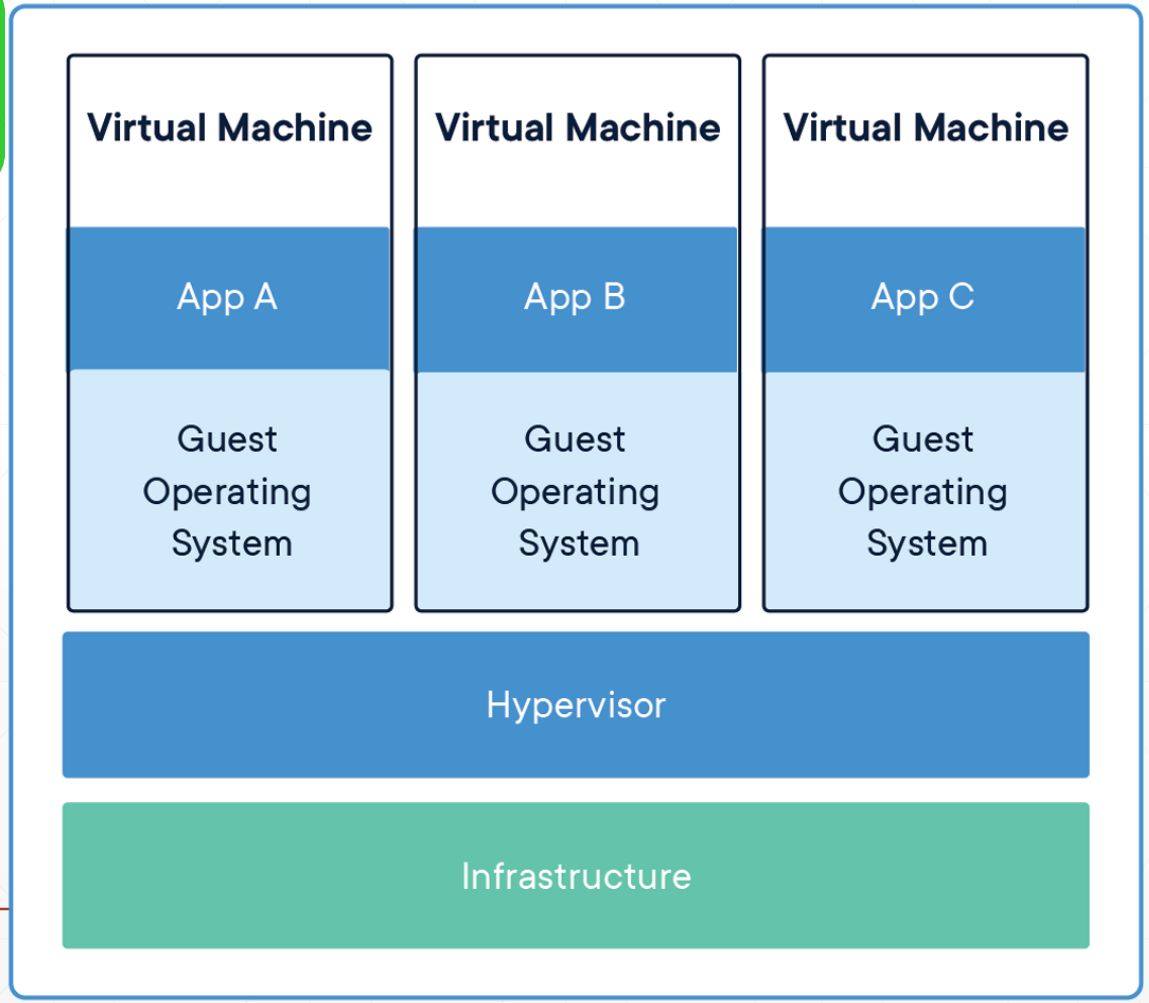

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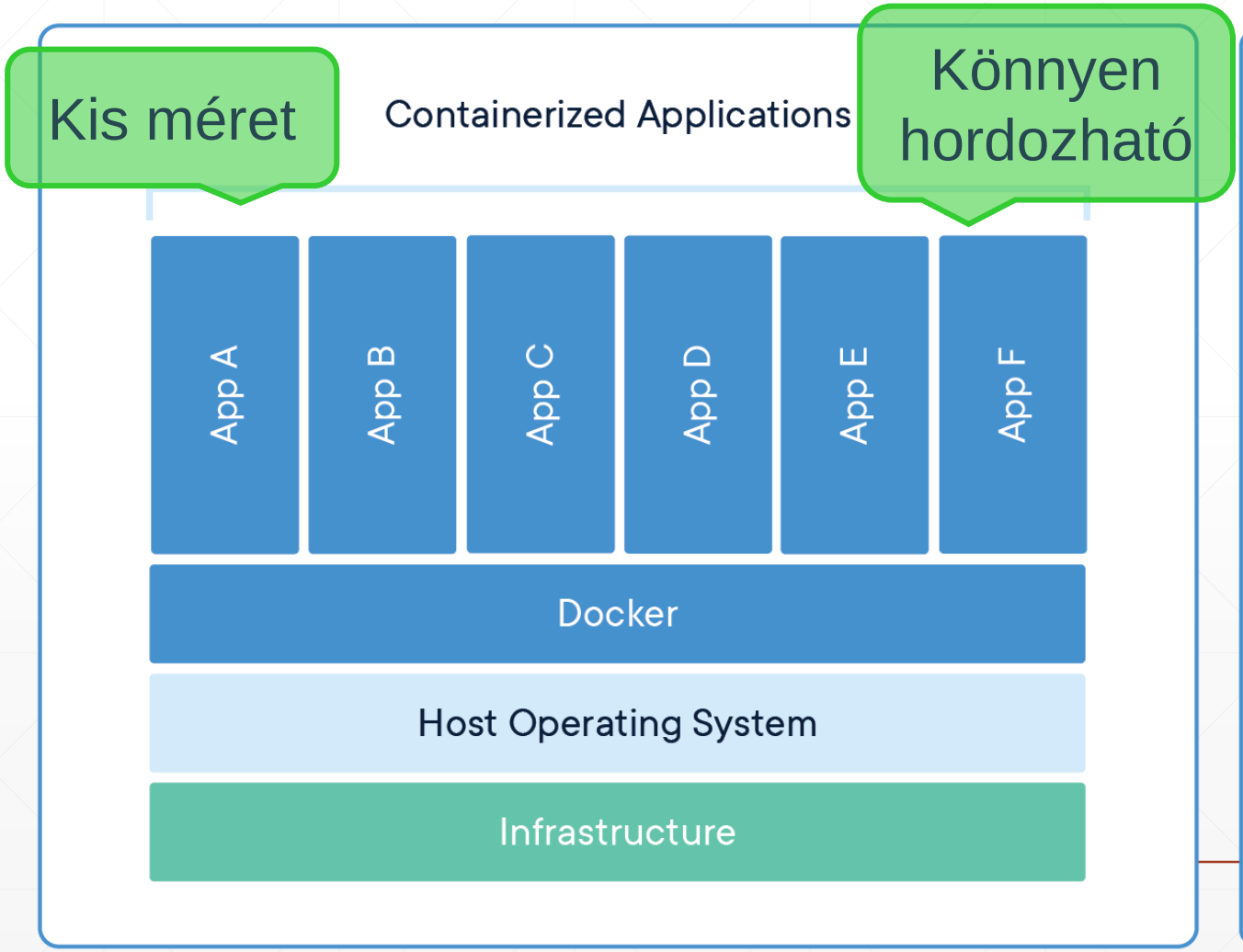
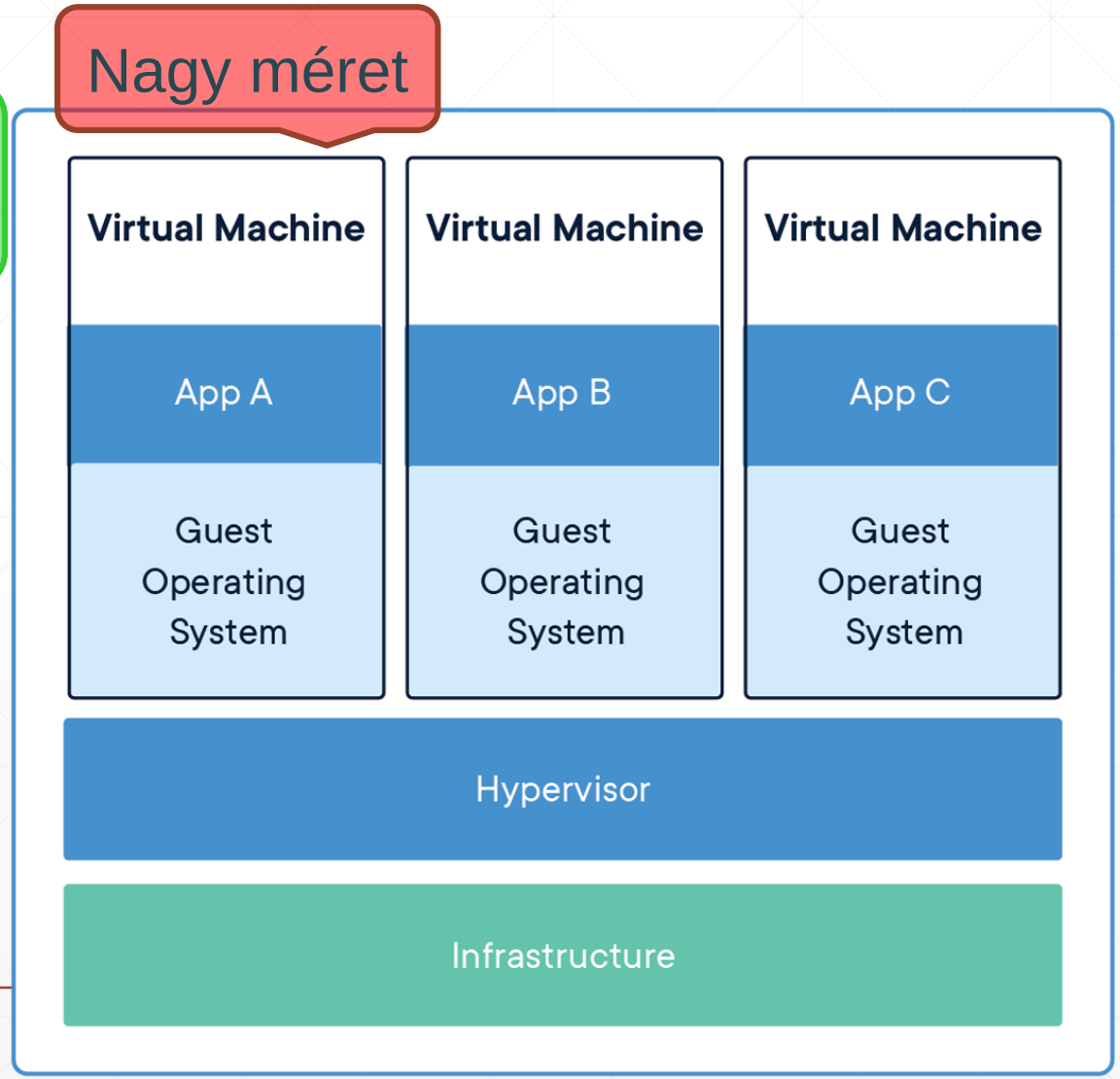
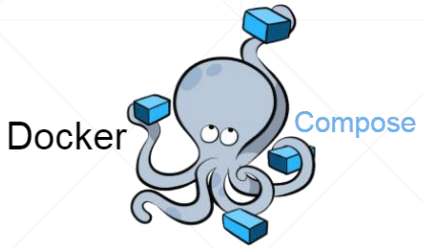




Docker Compose



- Több konténeres Docker alkalmazás futtatása
- Alapvetően egy host-on
- Több konténer indítása egyszerre
  - docker-compose.yml
- Networking
  - konténer név alapján láthatóak és elérhetőek az egyes service-ek
- Skálázás service-enként

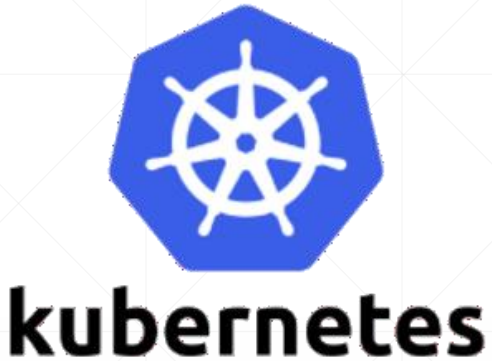
```
docker-compose up
```

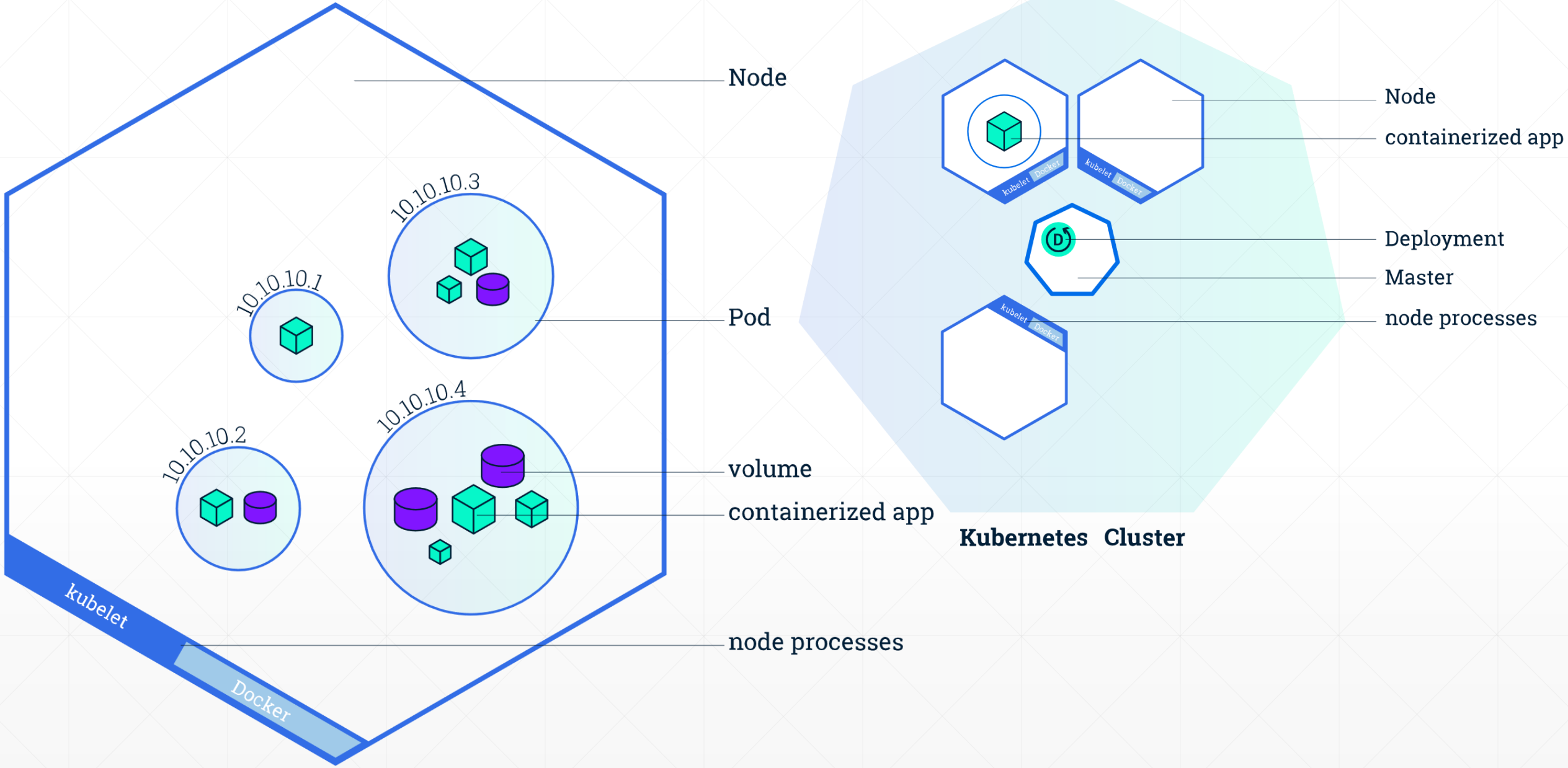
```yaml
version: '3'

services:
  db:
    image: mysql:latest
    environment:
      - MYSQL_ROOT_PASSWORD=password
      - MYSQL_DATABASE=devops_demo_db
      - MYSQL_USER=user
      - MYSQL_PASSWORD=userpw
    volumes:
      - /tmp/data/mysql
  devops-demo-app:
    restart: on-failure
    image: devops-demo
    build:
      context: ./
      dockerfile: Dockerfile
    depends_on:
      - db
    ports:
      - 8080:8080
    volumes:
      - /tmp/data/devops-demo-app
    environment:
      - DATABASE_HOST=db
      - DATABASE_NAME=devops_demo_db
      - DATABASE_USER=user
      - DATABASE_PASSWORD=userpw
      - DATABASE_PORT=3306
```

Kubernetes (K8s)

- Platform több konténer több host-on való menedzselésére
  - Jellemzően a felhőben
- Konténerek logikai csoportosítása
  - Pod, Label, Service
- Automatikus
  - Terheléselosztás
  - Skálázás
  - Ütemezés (‘desired state’ kontrollált elérése)
- Web UI (Dashboard)




Node
10.10.10.3
10.10.10.1
Pod
10.10.10.2
10.10.10.4
volume
containerized app
kubelet
Docker
node processes
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Deployment
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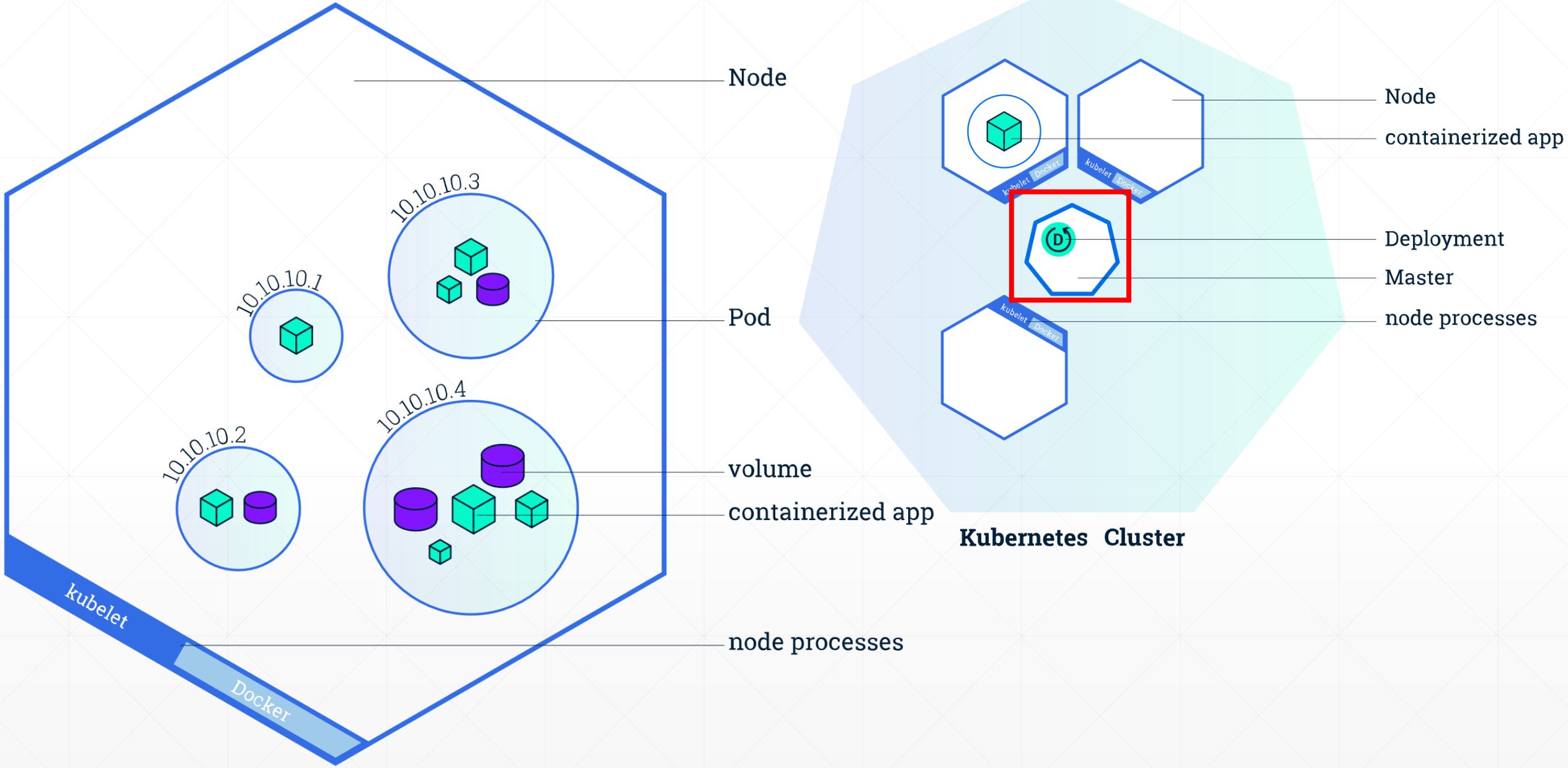
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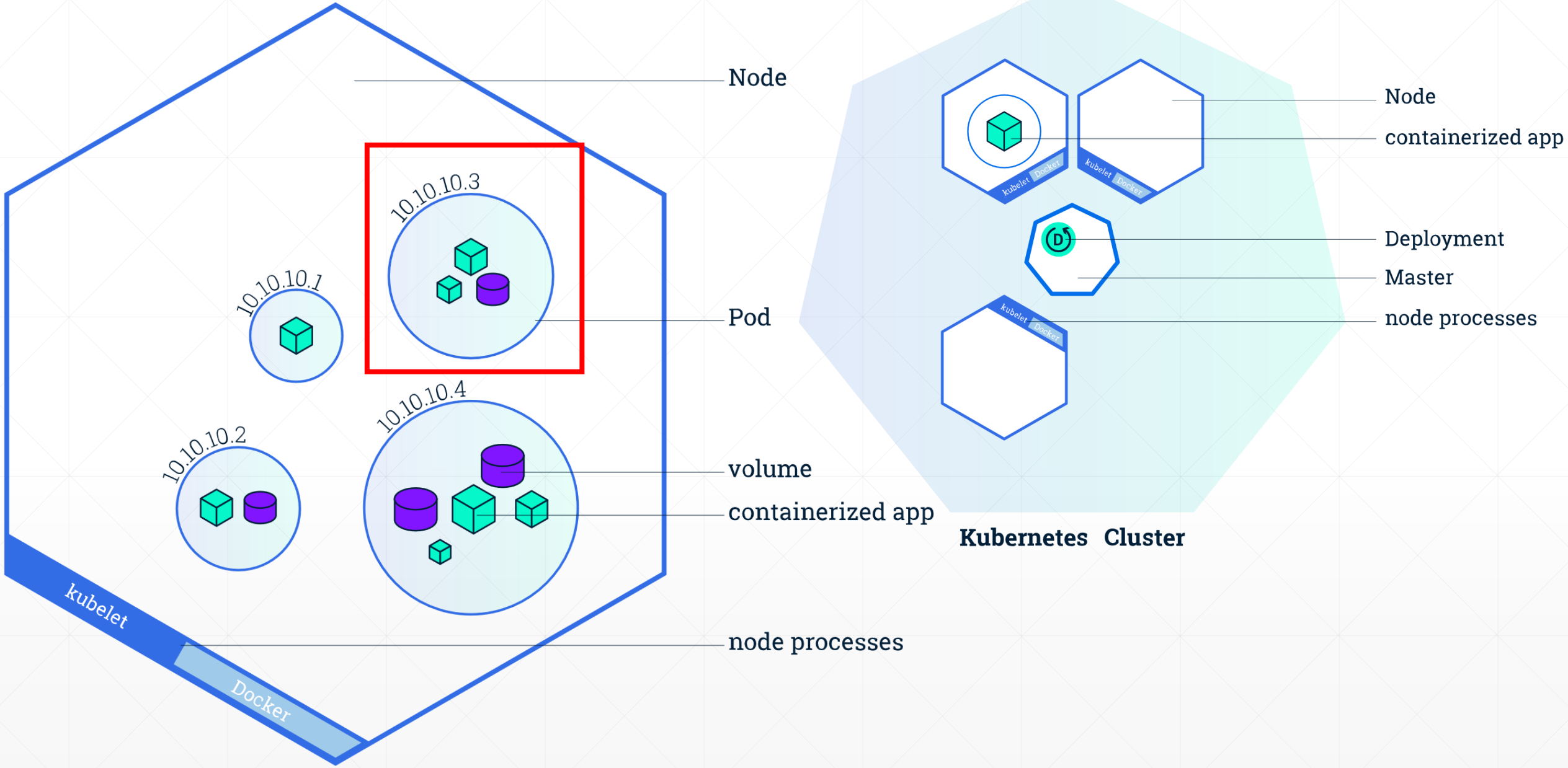
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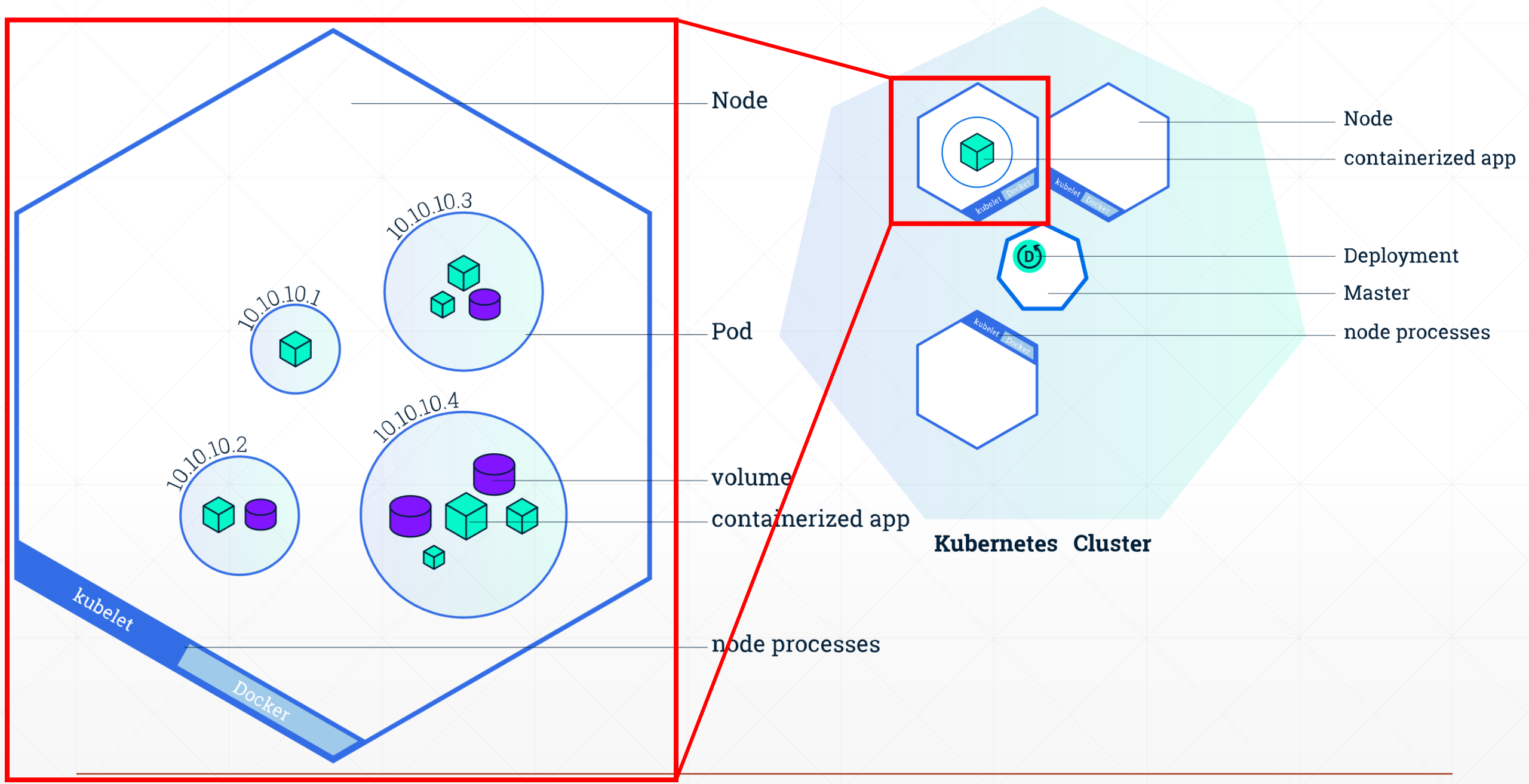
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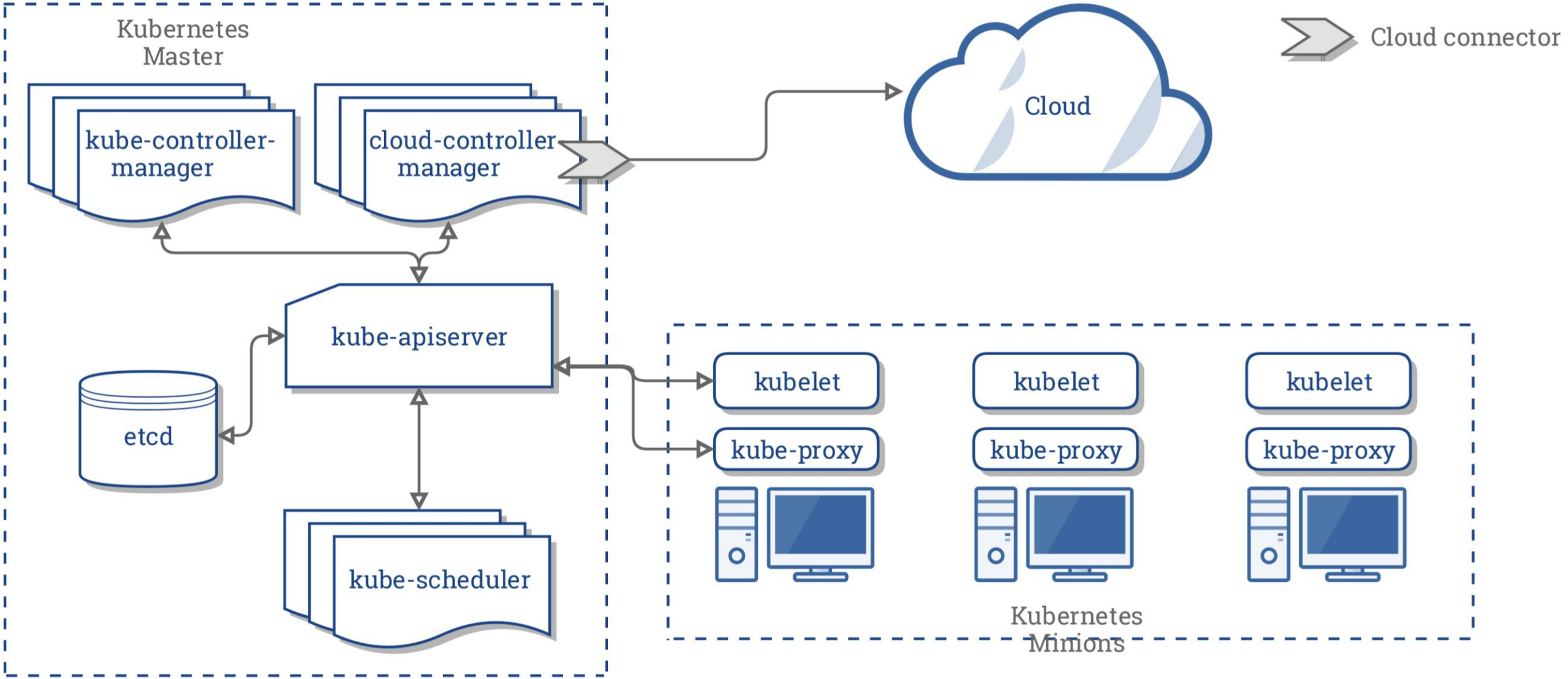
Kubernetes architektúra



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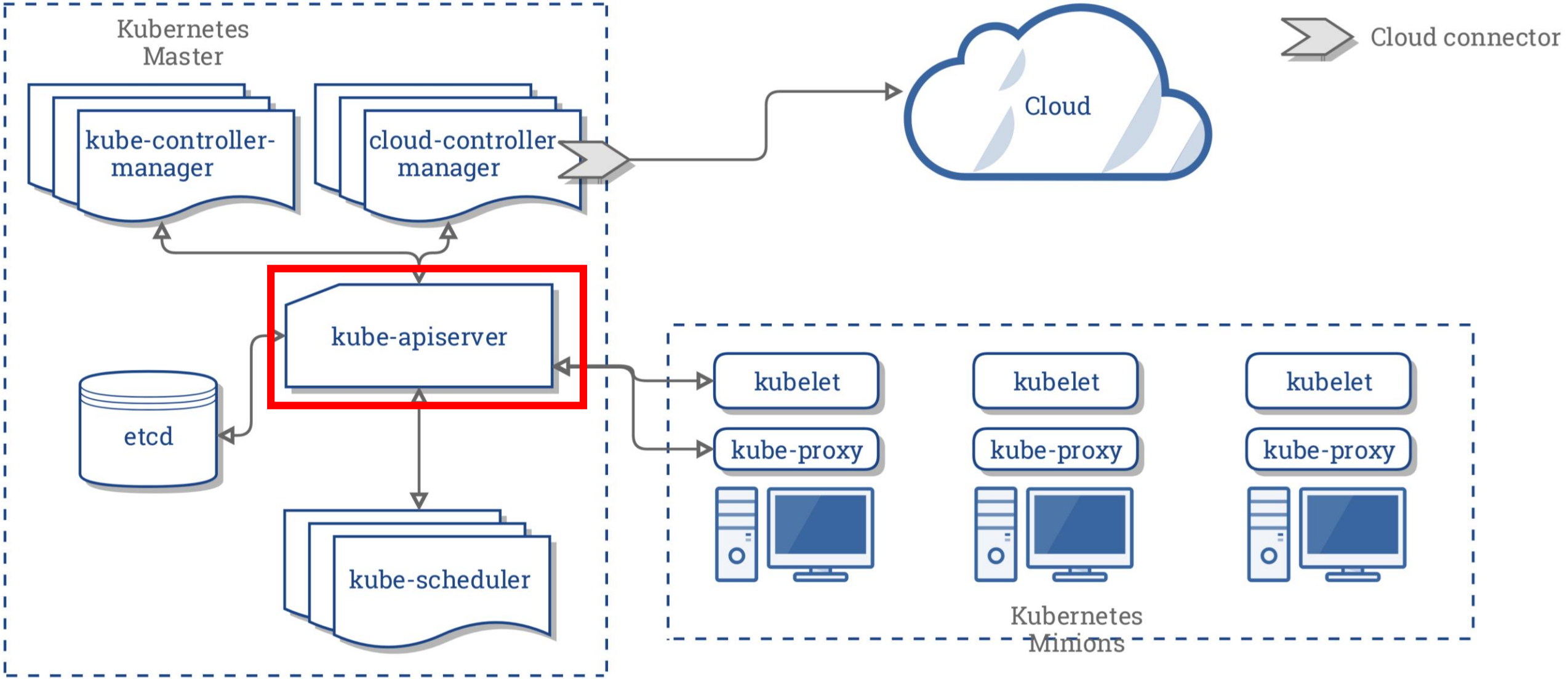

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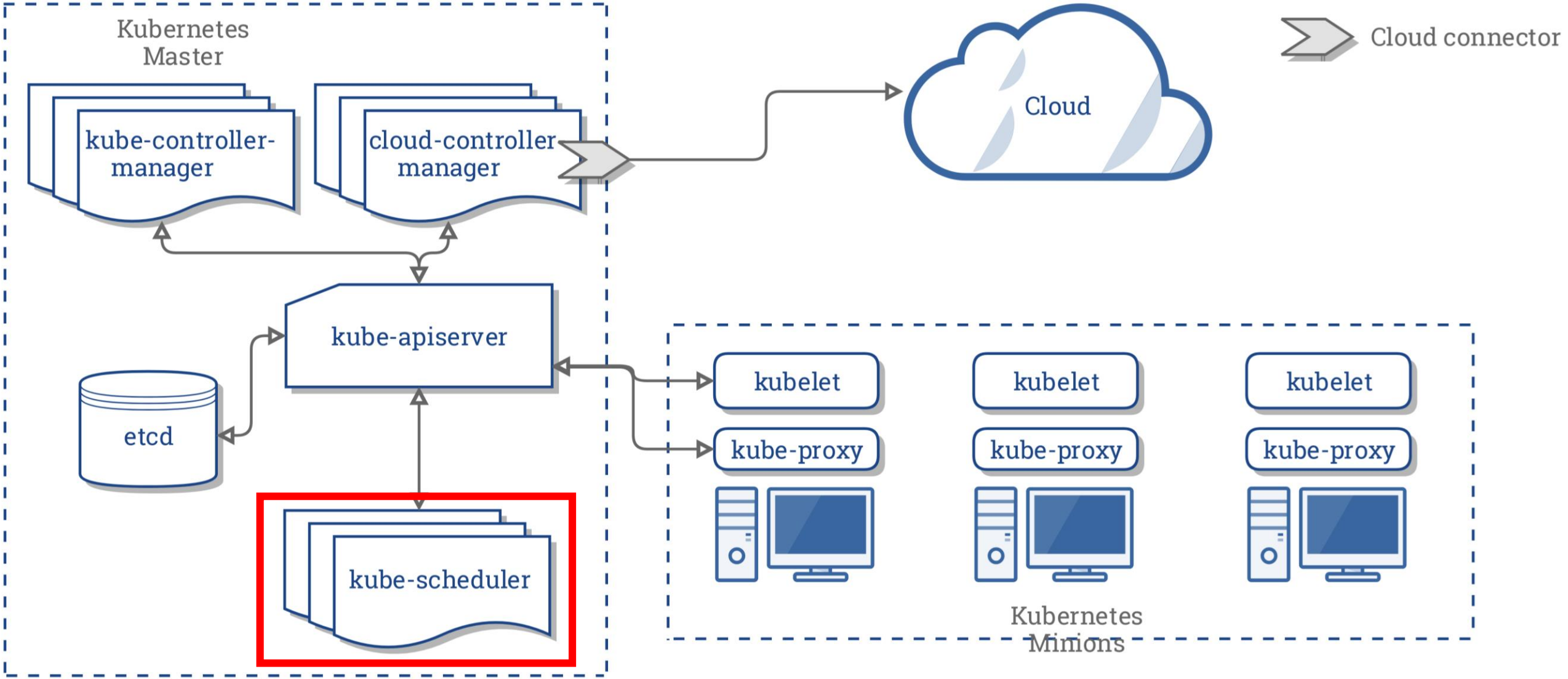

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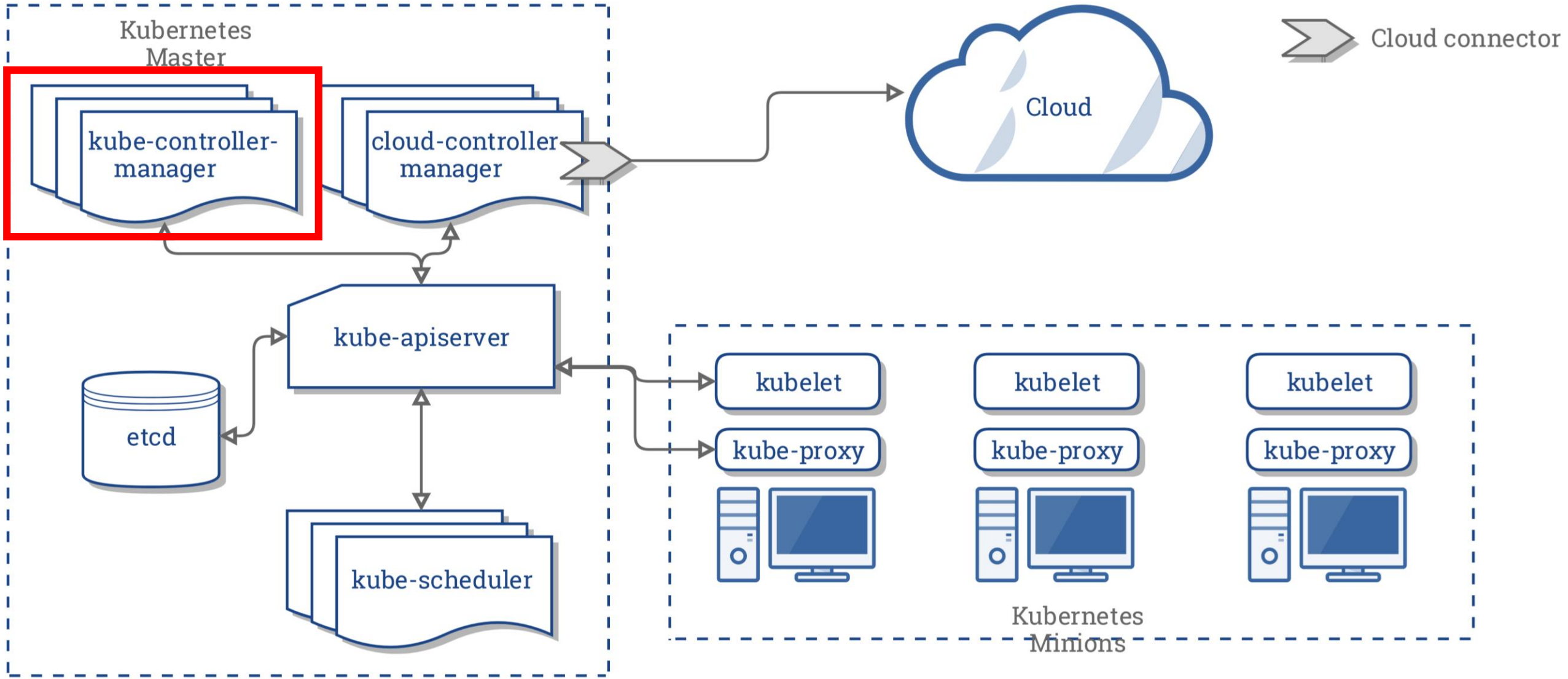

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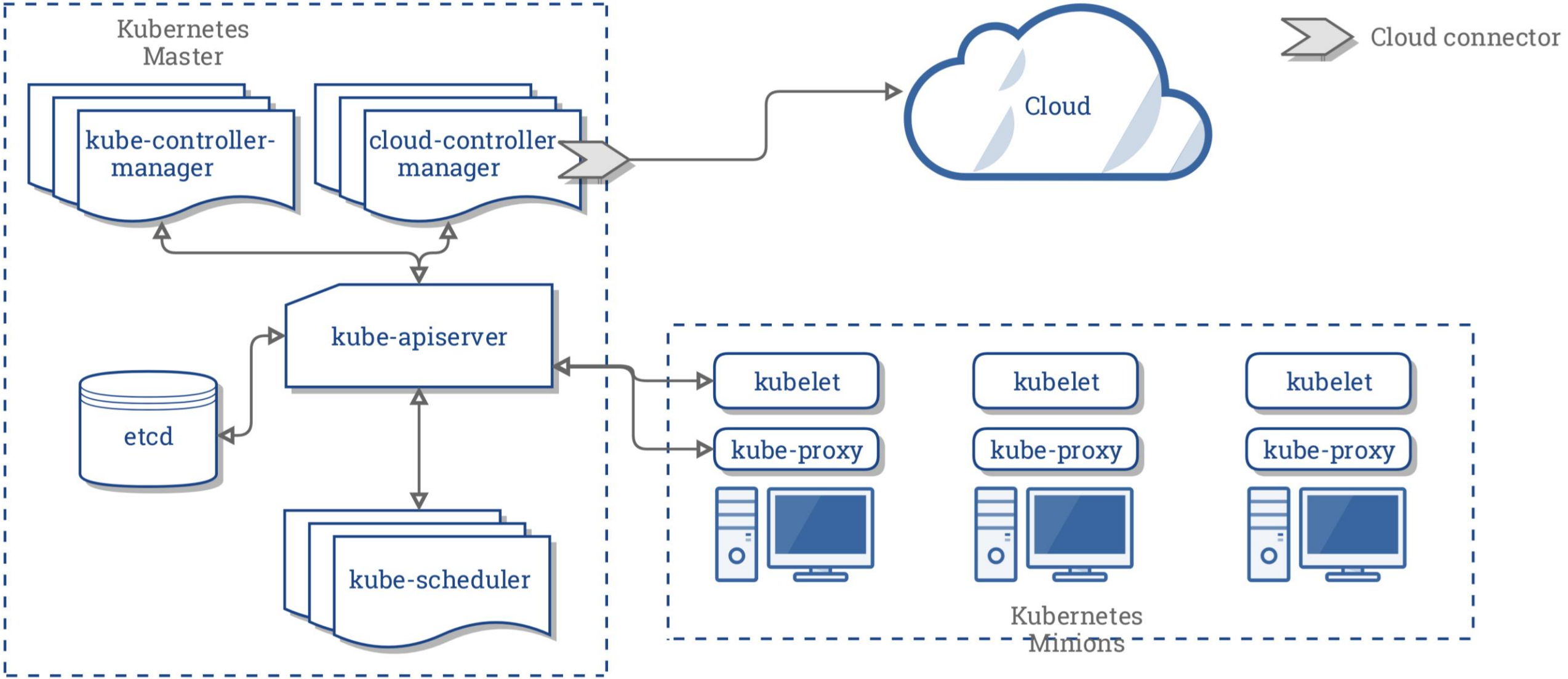
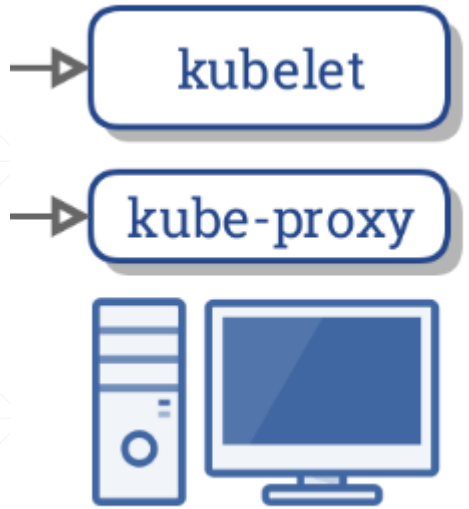


K8s Service

- A Pod-ok életciklusa dinamikus (skálázódás)
  - nincs stabil IP címük
- Frontend – Backend Pod-ok
  - hogyan tudják követni, melyik Pod hova tartozik?

K8s Service



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  - nincs stabil IP címük
- Frontend – Backend Pod-ok
  - hogyan tudják követni, melyik Pod hova tartozik?
- **Service** – logikai absztrakció Pod-ok egy halmazára
  - stabil IP (cluster-en belül vagy kívül)
  - terhelés elosztás
  - szolgáltatás felderítés a Pod-ok számára (általában Label-ek segítségével)
- microservices

Köszönöm a figyelmet!

Gyakorlat: Kubernetes via Minikube

- HelloWorld Spring Boot alkalmazás

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```
kubectl run --image=rest-hello morova/rest-hello:latest --port=8080
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```
~$ kubectl get deployments
NAME          DESIRED   CURRENT   UP-TO-DATE   AVAILABLE   AGE
rest-hello    1         1         1            1           17m

$ kubectl get pods
NAME                          READY   STATUS    RESTARTS   AGE
rest-hello-5c5cc4469-qws5z    1/1     Running   1          2h
```

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kubectl run --image=rest-hello morova/rest-hello:latest --port=8080
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kubectl expose deployment/rest-hello --type="NodePort" --port 8080
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```

```
$ kubectl get deployments
NAME          DESIRED   CURRENT   UP-TO-DATE   AVAILABLE   AGE
rest-hello    4         4         4            3           2h

$ kubectl get pods -o wide
NAME                           READY   STATUS    RESTARTS   AGE   IP           NODE
rest-hello-5c5cc4469-mtfcr     1/1     Running   0          44s   172.17.0.8   minikube
rest-hello-5c5cc4469-qws5z     1/1     Running   1          2h    172.17.0.5   minikube
rest-hello-5c5cc4469-w45nk     1/1     Running   0          44s   172.17.0.6   minikube
rest-hello-5c5cc4469-zl9q9     1/1     Running   0          44s   172.17.0.7   minikube
```

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```

```
$ curl $(minikube ip):$NODE_PORT/greeting
{"id":1,"content":"Hello, World!"}
$ curl $(minikube ip):$NODE_PORT/greeting
{"id":2,"content":"Hello, World!"}
$ curl $(minikube ip):$NODE_PORT/greeting
{"id":1,"content":"Hello, World!"}
$ curl $(minikube ip):$NODE_PORT/greeting
{"id":3,"content":"Hello, World!"}
$ curl $(minikube ip):$NODE_PORT/greeting
{"id":1,"content":"Hello, World!"}
```