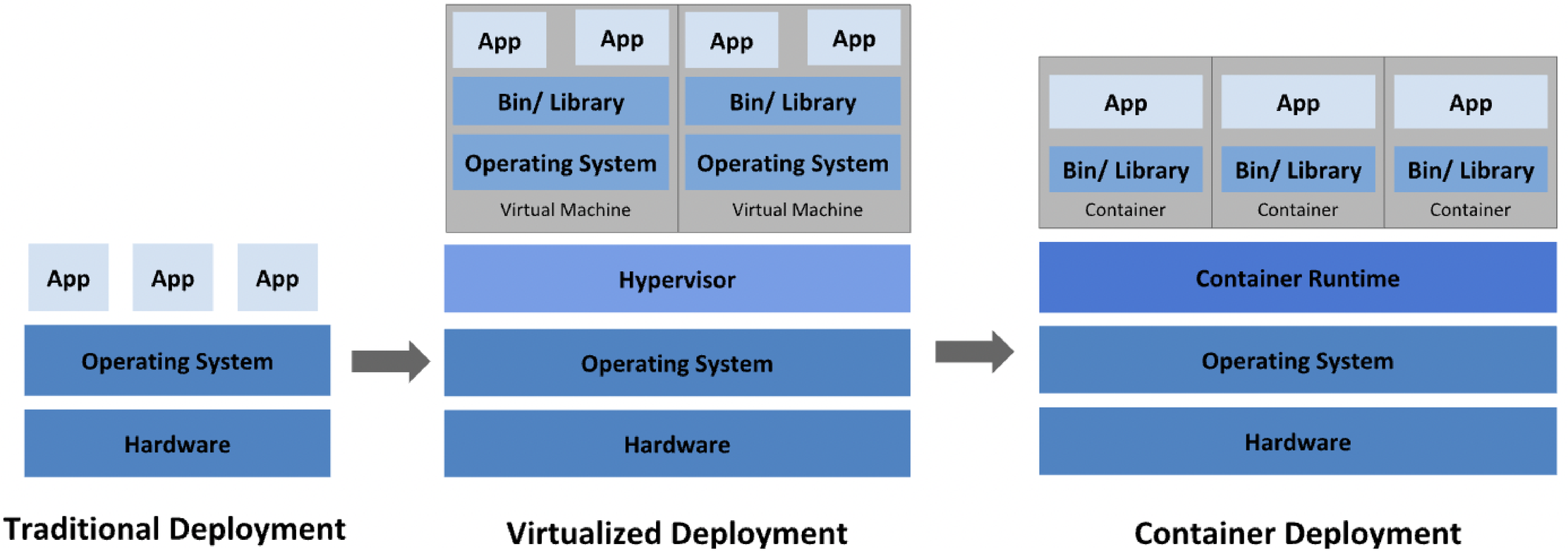
kubernetes

2021. 9. 16 / Lea park

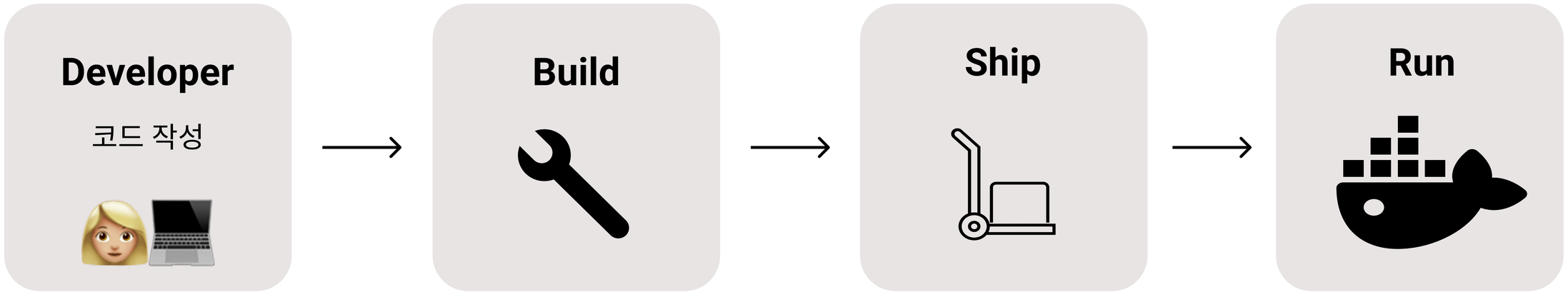
목차

1-1. 컨테이너 환경의 탄생



1-2. Containerization

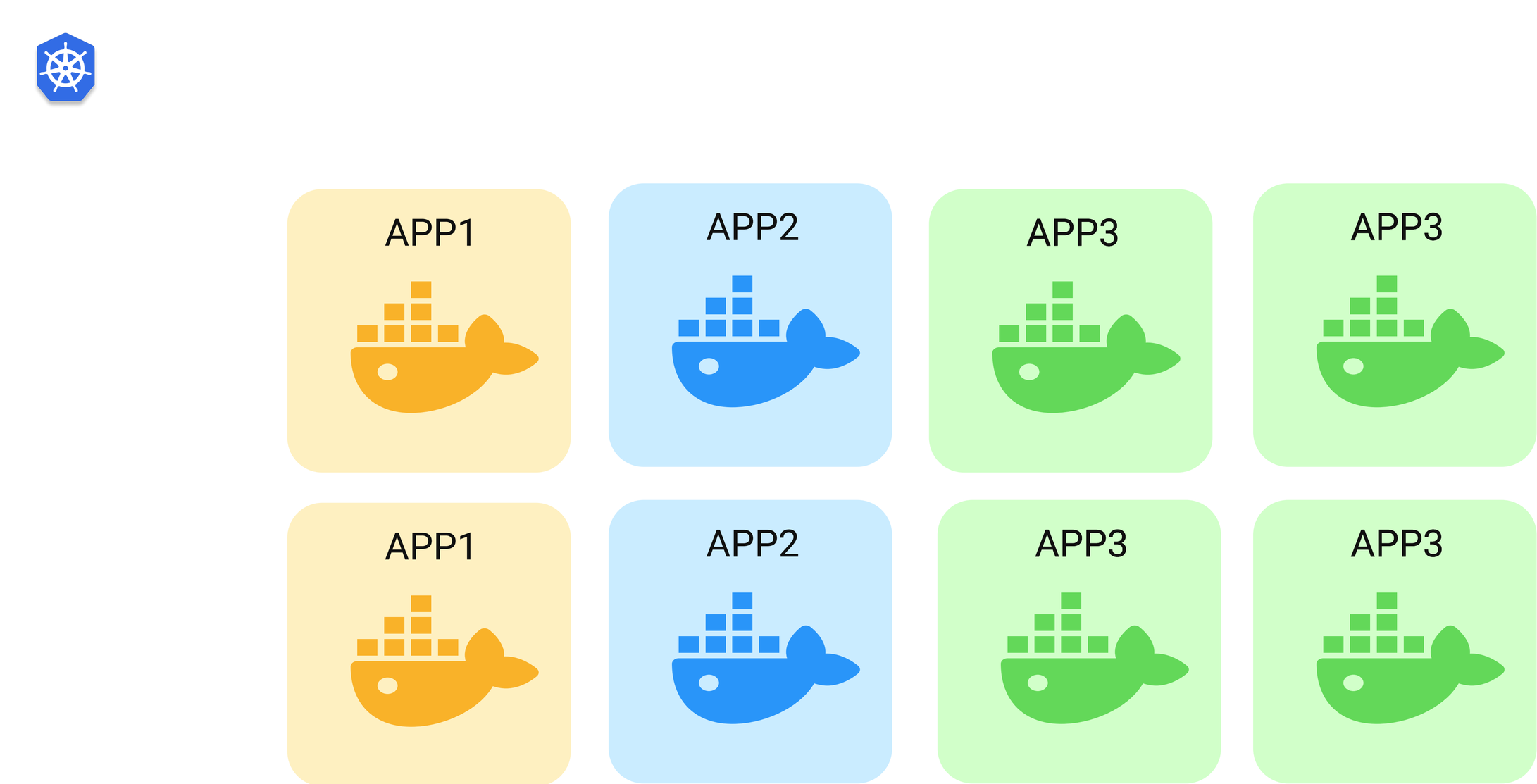
1-2. Containerization



1-3. 컨테이너의 특징

- 가상머신과 비교하여 **생산이 쉽고 효율적**
- 컨테이너 이미지를 이용한 **배포와 롤백이 간단**
- **언어 & 프레임워크에 관계없이** 동일한 방식으로 관리
- 개발, 테스팅, 운영 환경은 물론 로컬 PC와 Cloud까지 **동일한 환경**
- 특정 클라우드에 **종속적이지 않음.**

  (ex. AWS -> Google Cloud로 쉽게 서버 이동)


APP1
APP2
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컨테이너수의 증가 이유

- 요청의 증가
- 서비스 크기의 증가
- 마이크로 서비스


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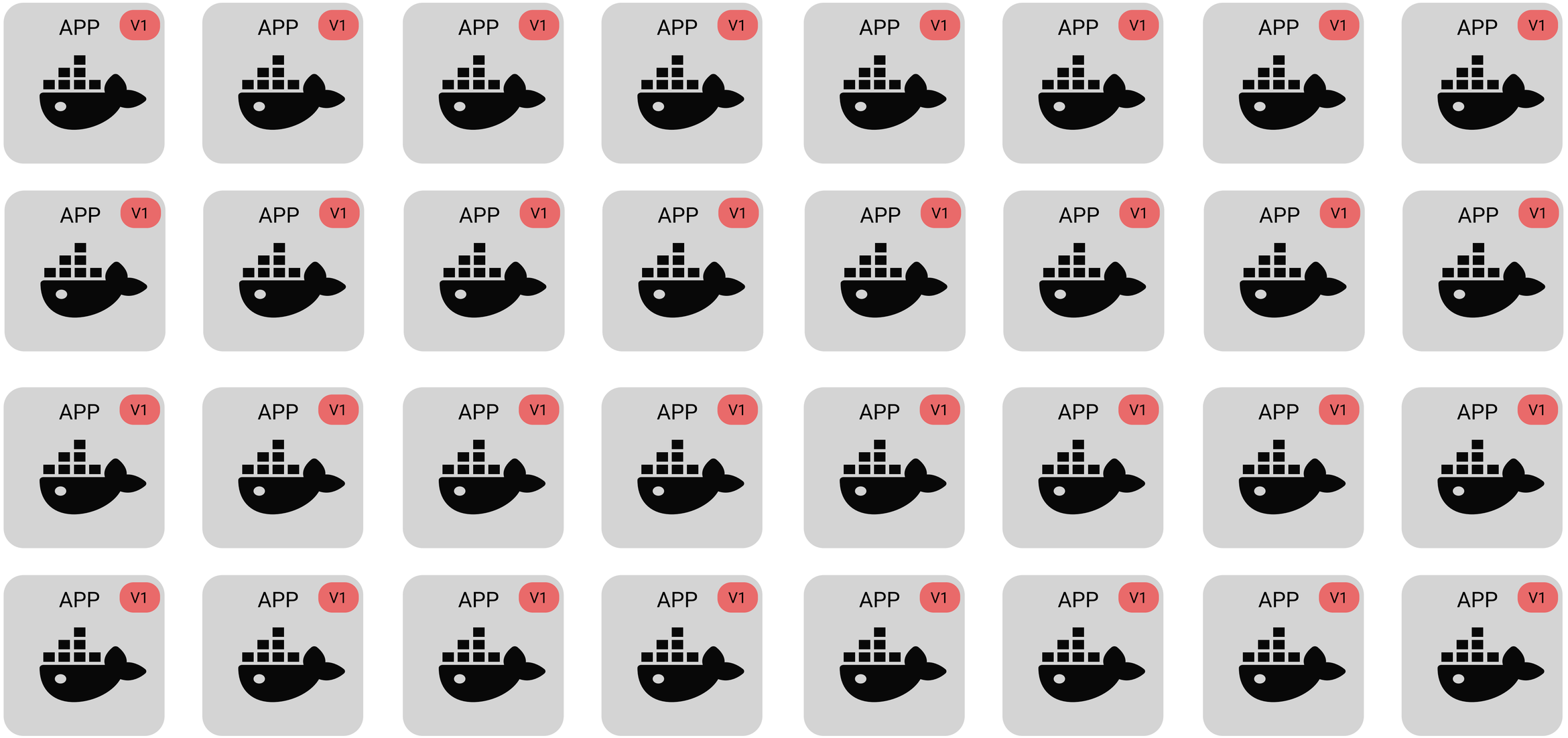
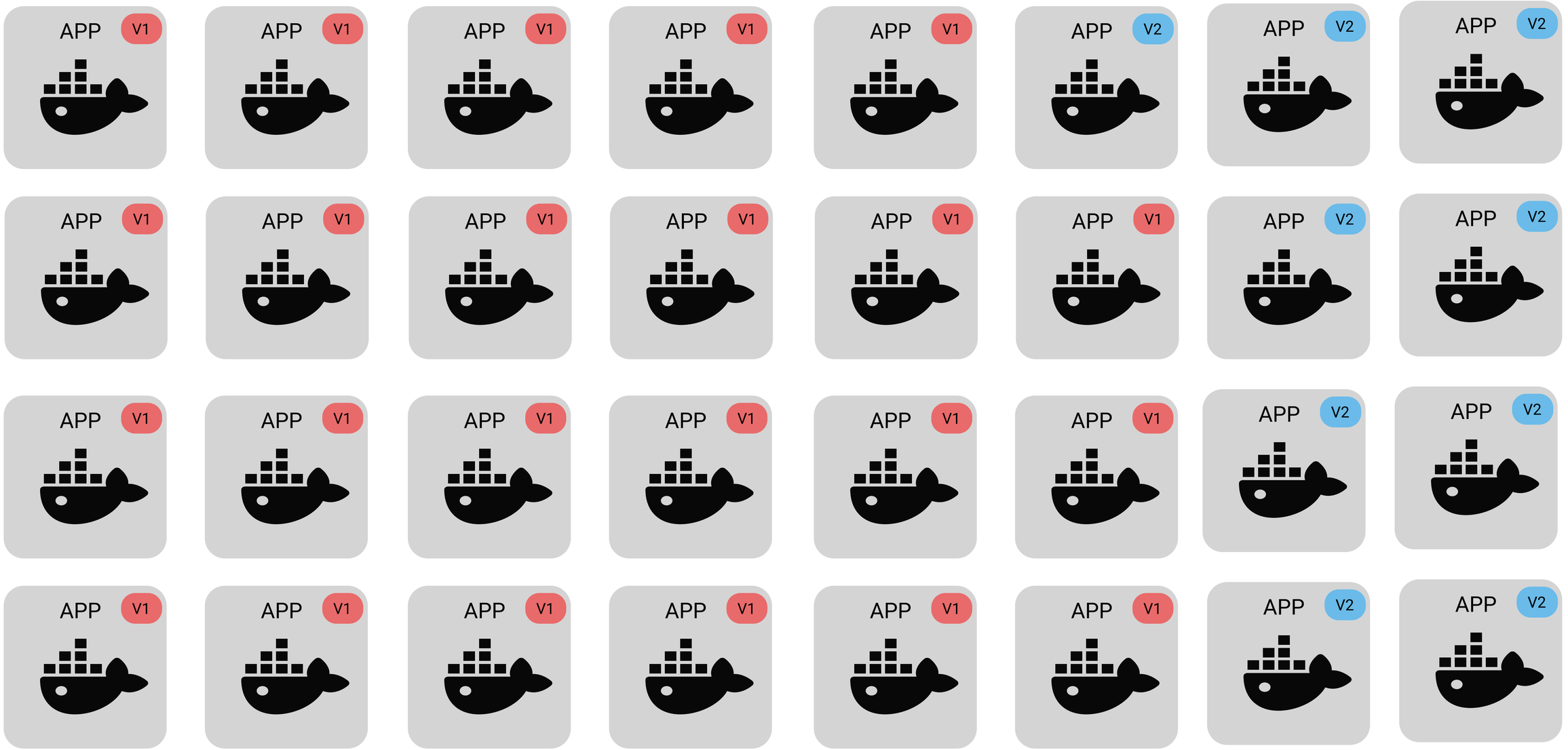
컨테이너 배포

버전 관리, Rollout & Rollback...

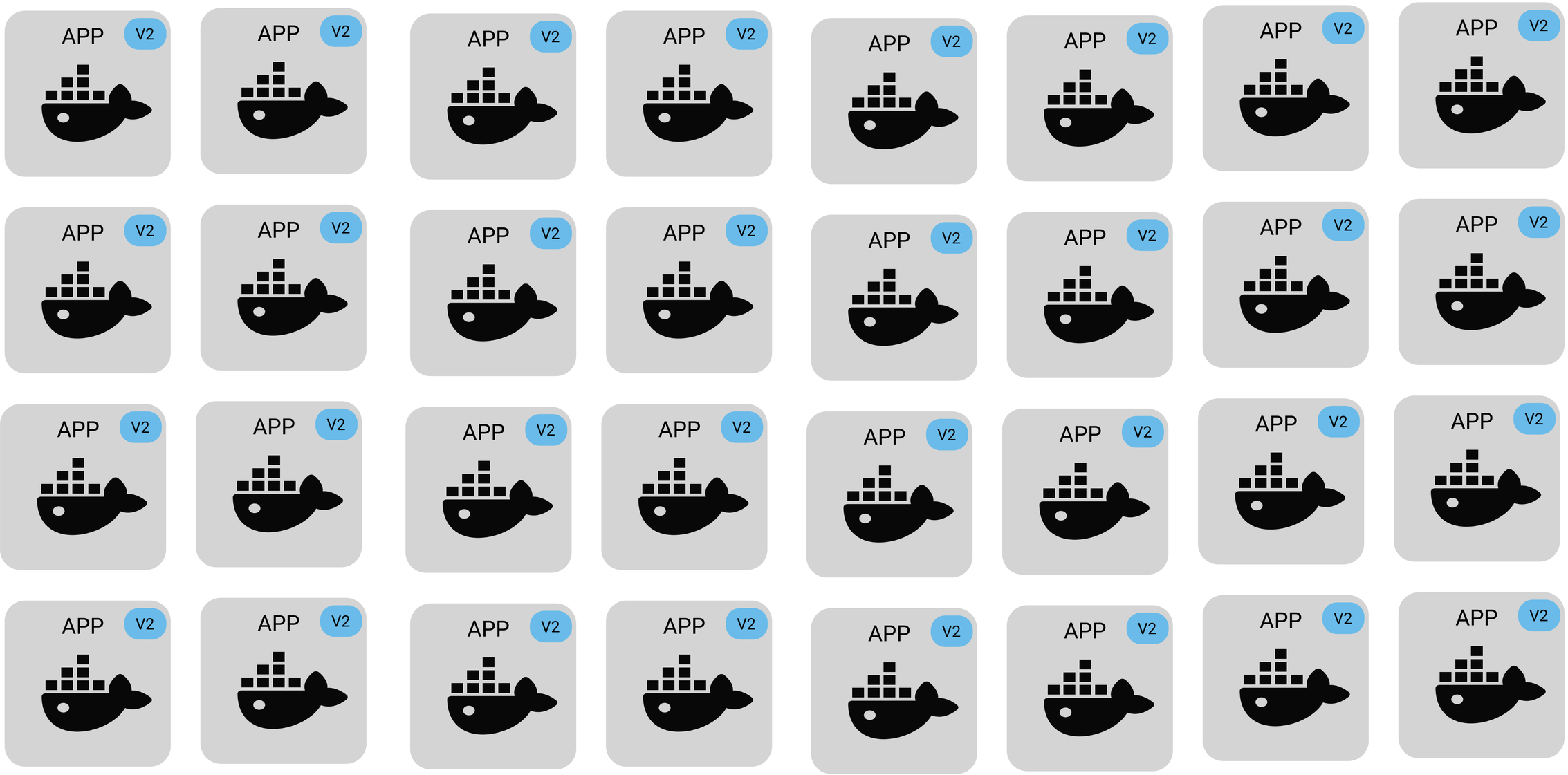
2-1. 컨테이너 배포



2-1. 컨테이너 배포

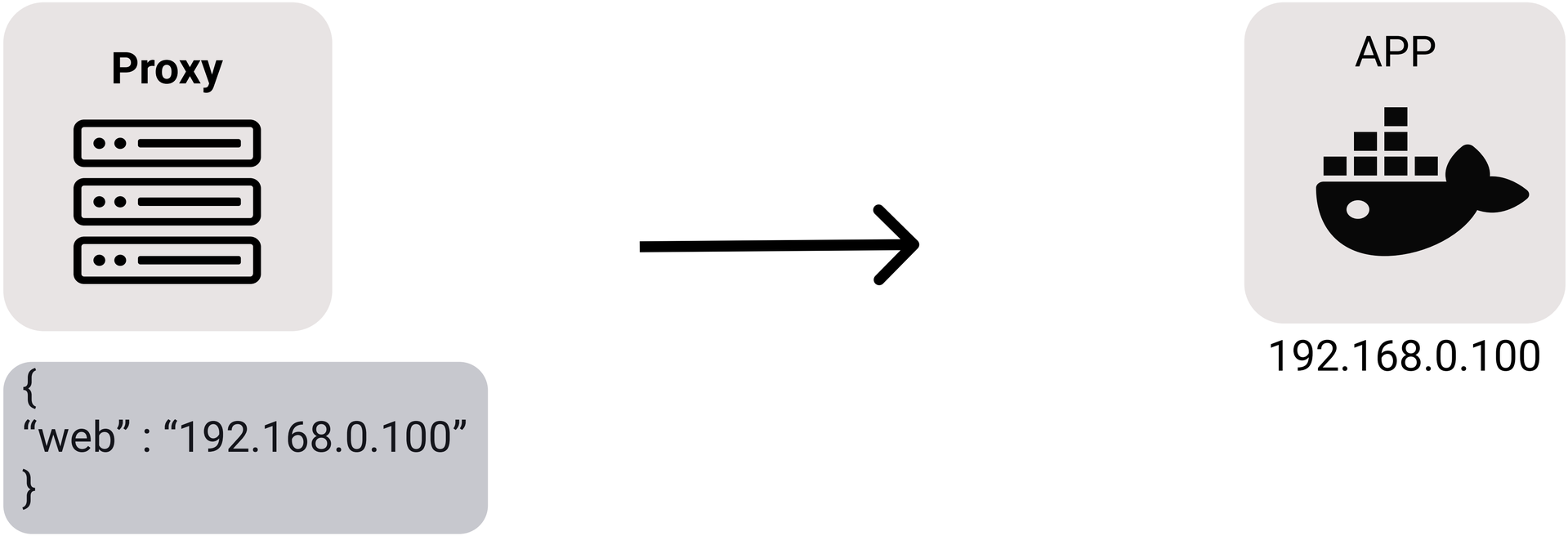


2-1. 컨테이너 배포

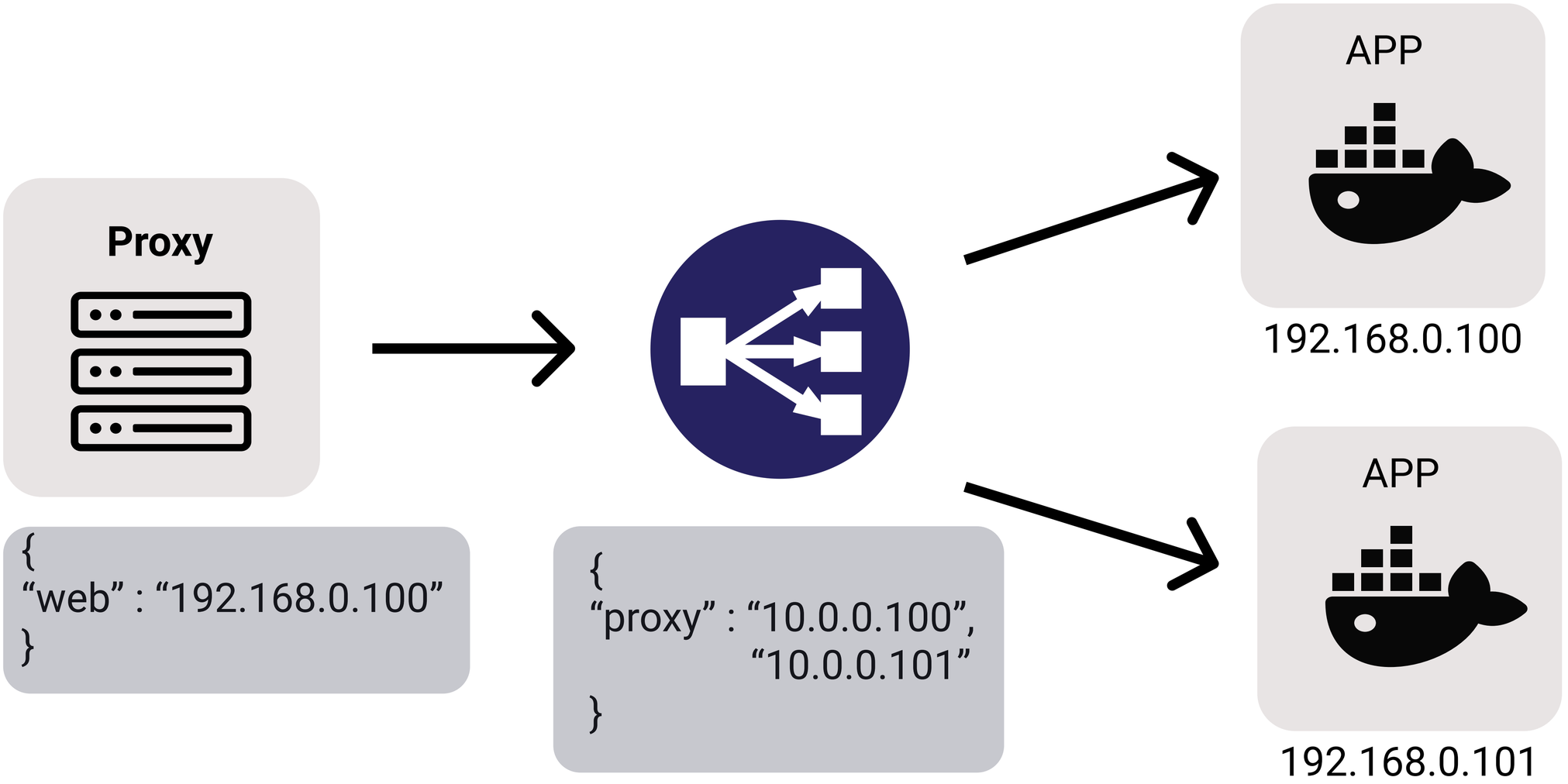


서비스 검색

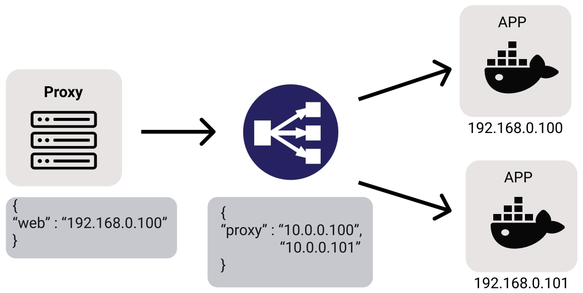
2-2. 서비스 검색



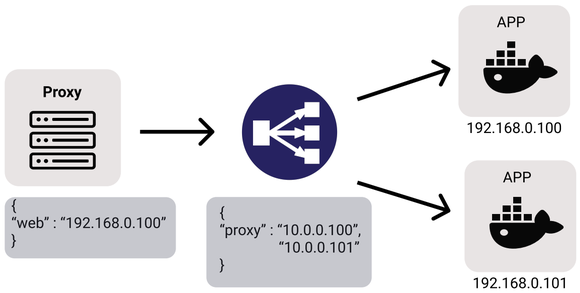
2-2. 서비스 검색


APP
192.168.0.100
Proxy
{
“web” : “192.168.0.100”
}
{
“proxy” : “10.0.0.100”,
“10.0.0.101”
}
APP
192.168.0.101

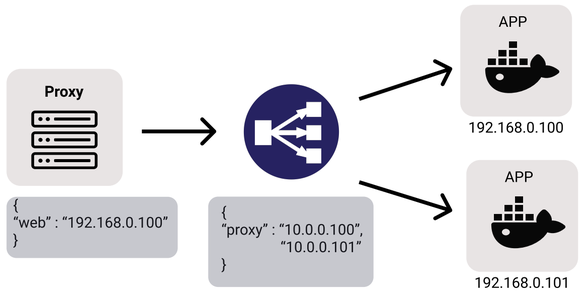
2-2. 서비스 검색



Server1



Server2

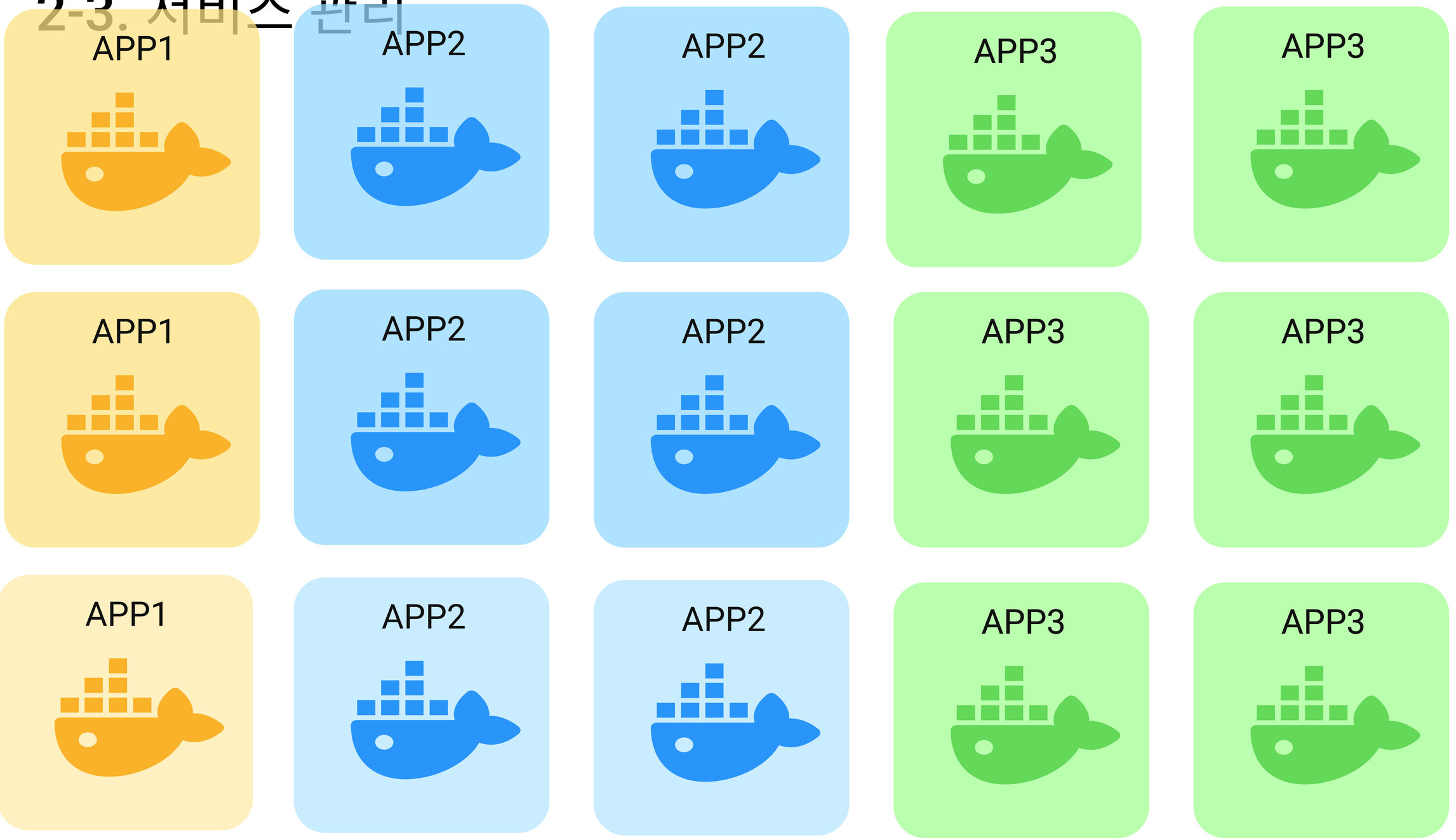


Server3

서비스 관리

부하 모니터링, 환경 체크...

2-3. 서비스 관리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2-3. 서비스 관리


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2-3. 서비스 관리


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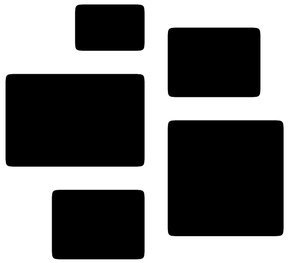
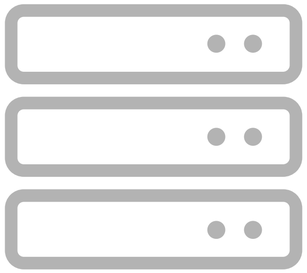
Container Orchestration

- 복잡한 컨테이너 환경을 효과적으로 관리하기 위한 도구
- 서버 관리자의 역활을 대신 할 프로그램을 만드는 도구

3-1. Container Orchestration의 기능



Cluster

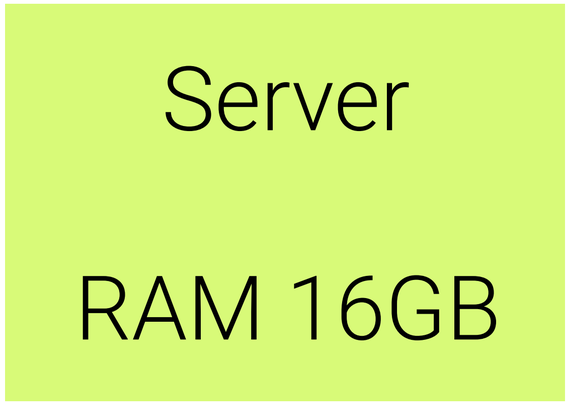


State

Scheduling

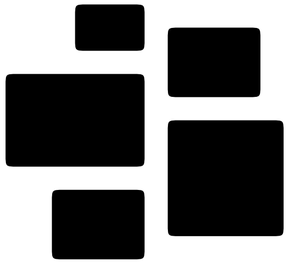
Rollout & Rollback

- 클러스터

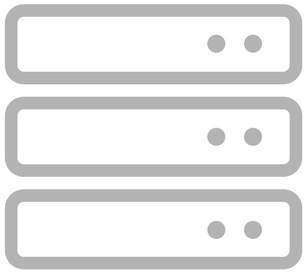


서버마다 CPU, RAM이 다른데 서버 관리자가 하나하나 알고 설정함.

3-1. Container Orchestration의 기능



Cluster

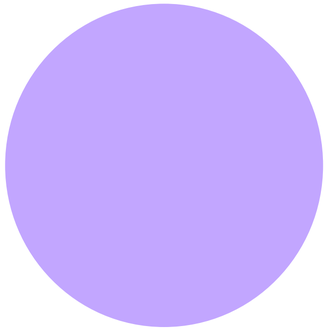


State

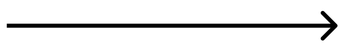
Scheduling

Rollout & Rollback

- 클러스터

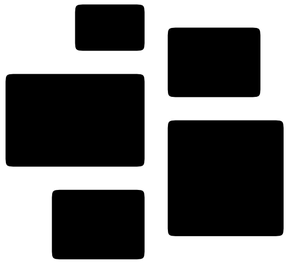


master node

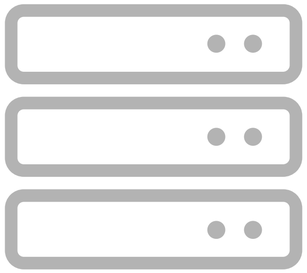


컨테이너 오케스트레이션에서는 서버를 클러스터링 해서 master node로 관리

3-1. Container Orchestration의 기능



Cluster

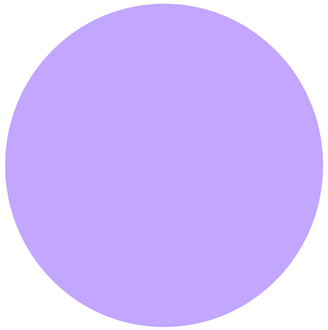


State

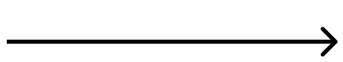
Scheduling

Rollout & Rollback

- 클러스터



master node

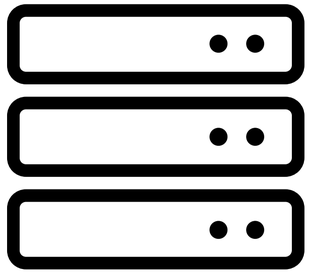


x 1000

노드의 갯수가 수천개 수만개가 되더라도 잘 돌아가야함.

3-1. Container Orchestration의 기능

Cluster



State

Scheduling

Rollout & Rollback

- 상태

설정 파일

replicas 2

Server

RAM 16GB

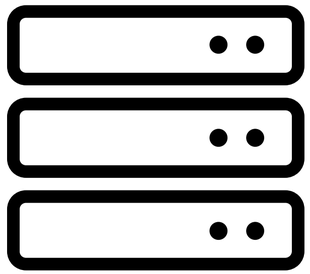
Server

RAM 16GB

컨테이너 수량을 두개로 설정 했다면, 두개의 복제 컨테이너가 있어야 함.

3-1. Container Orchestration의 기능

Cluster



State

Scheduling

Rollout & Rollback

- 상태

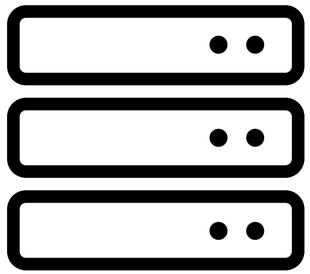
설정 파일

replicas 2

장애로 인해 상태가 변경 된 경우 설정 된 상태를 유지하기 위한 명령이 자동으로 실행 되어야 함.

3-1. Container Orchestration의 기능

Cluster



State

Scheduling

Rollout & Rollback

- 상태

설정 파일

replicas 2 -> 3

Server

RAM 16GB

Server

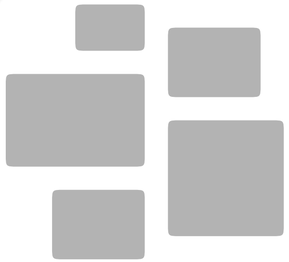
RAM 16GB

Server

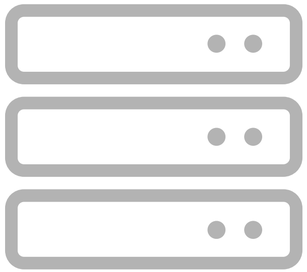
RAM 16GB

설정을 변경하면 별도의 명령없이 해당 상태로 변경될 수 있어야 함.

3-1. Container Orchestration의 기능



Cluster

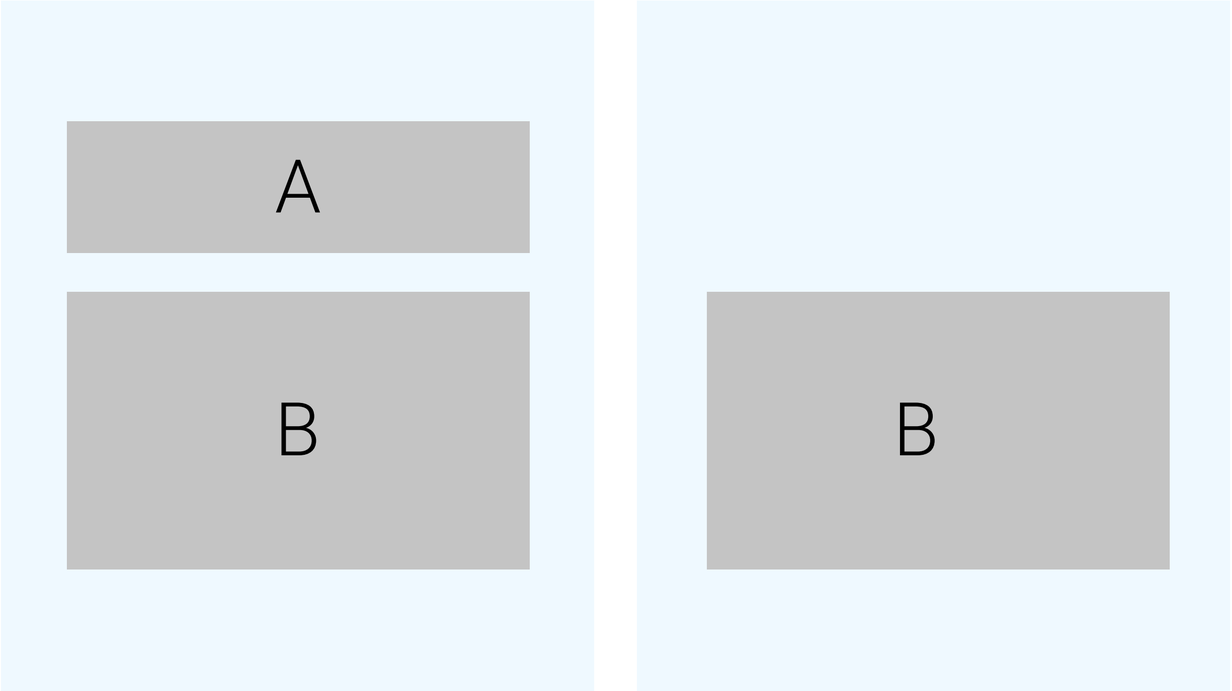


State

Scheduling

Rollout & Rollback

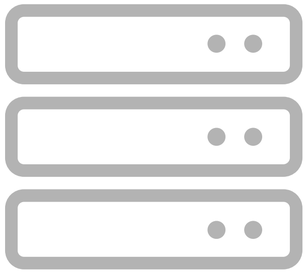
- 배포 관리



유휴 리소스를 관리하여 새로운 컨테이너 생성 시 알맞은 서버에 배치 시킬 수 있어야 함.

3-1. Container Orchestration의 기능

Cluster

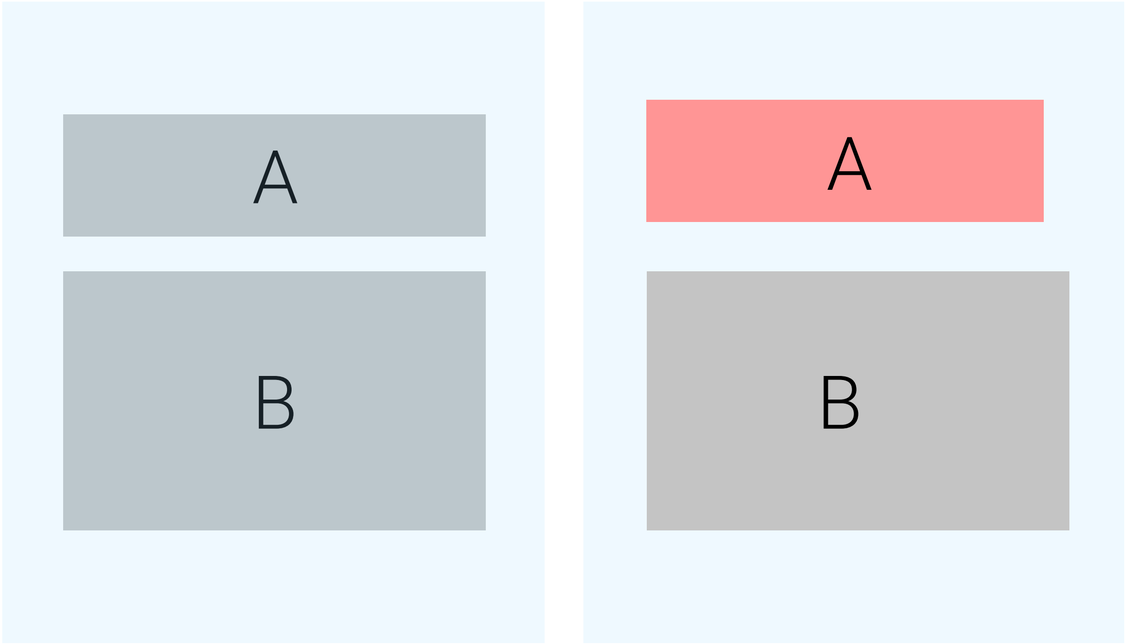


State

Scheduling

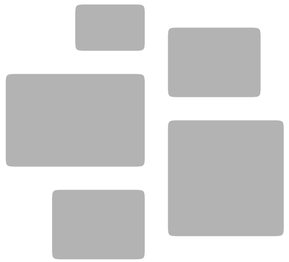
Rollout & Rollback

- 배포 관리

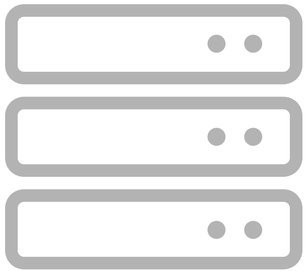


유휴 리소스를 관리하여 새로운 컨테이너 생성 시 알맞은 서버에 배치 시킬 수 있어야 함.

3-1. Container Orchestration의 기능



Cluster

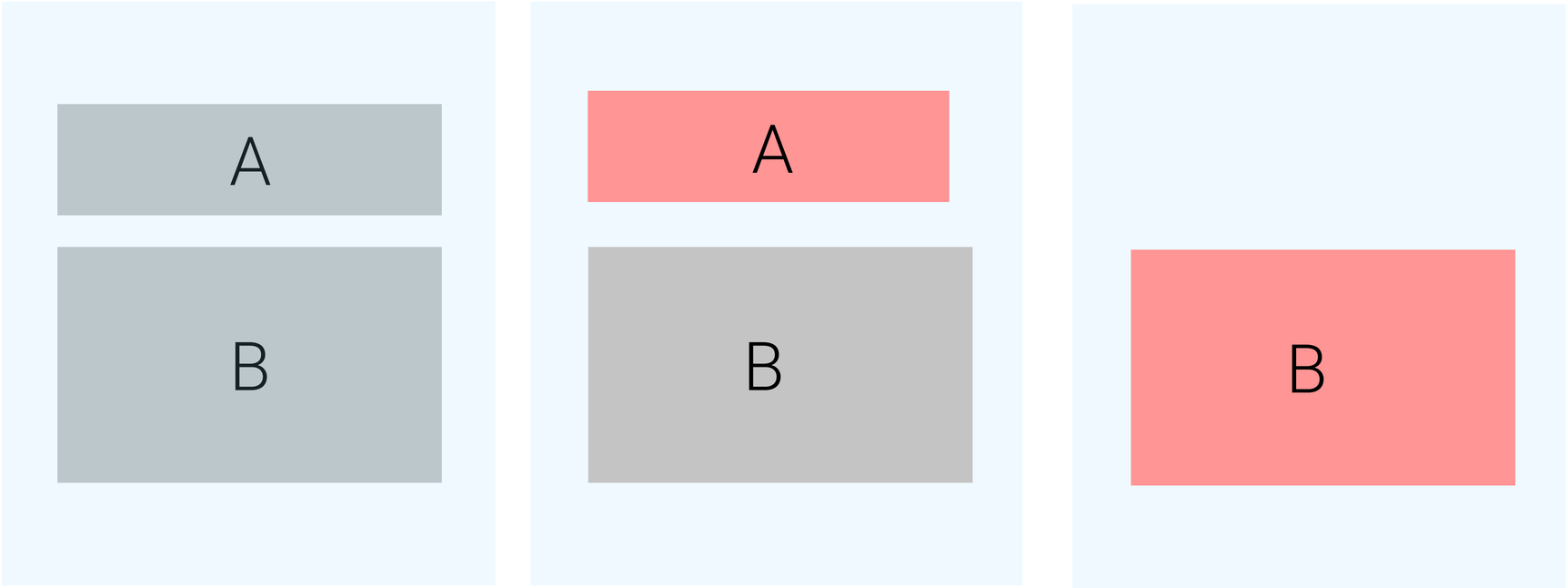


State

Scheduling

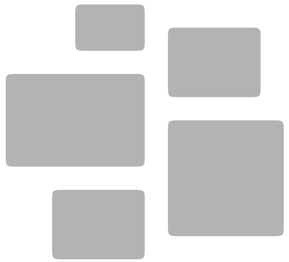
Rollout & Rollback

- 배포 관리

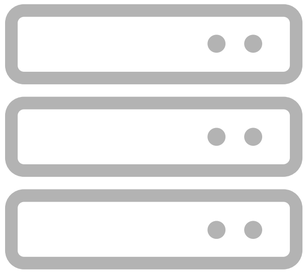


추가 리소스가 필요 한 경우 리소스를 할당하여 컨테이너를 배치 시킬 수 있어야 함.

3-1. Container Orchestration의 기능

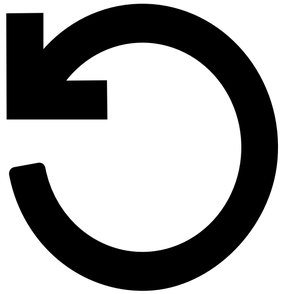


Cluster



State

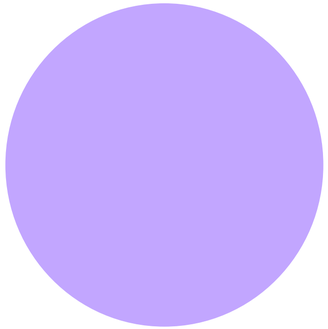
Scheduling



Rollout & Rollback

- 배포 버전관리

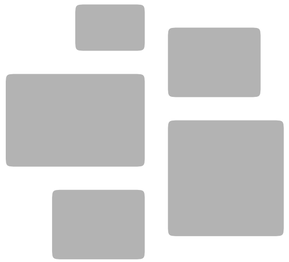
update!!



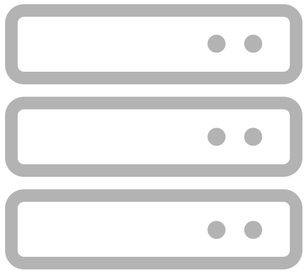
master node

배포 시 개별 배포가 아닌 중앙에서 자동 배포가 진행될 수 있어야 함.

3-1. Container Orchestration의 기능

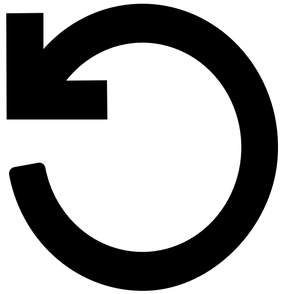


Cluster



State

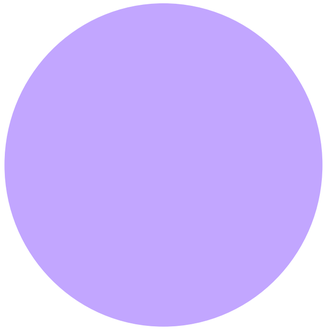
Scheduling



Rollout & Rollback

- 배포 버전관리

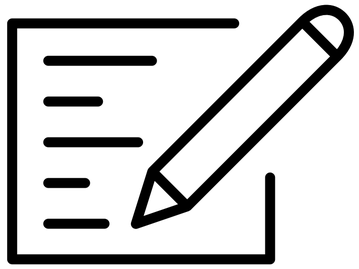
Rollback!!



master node

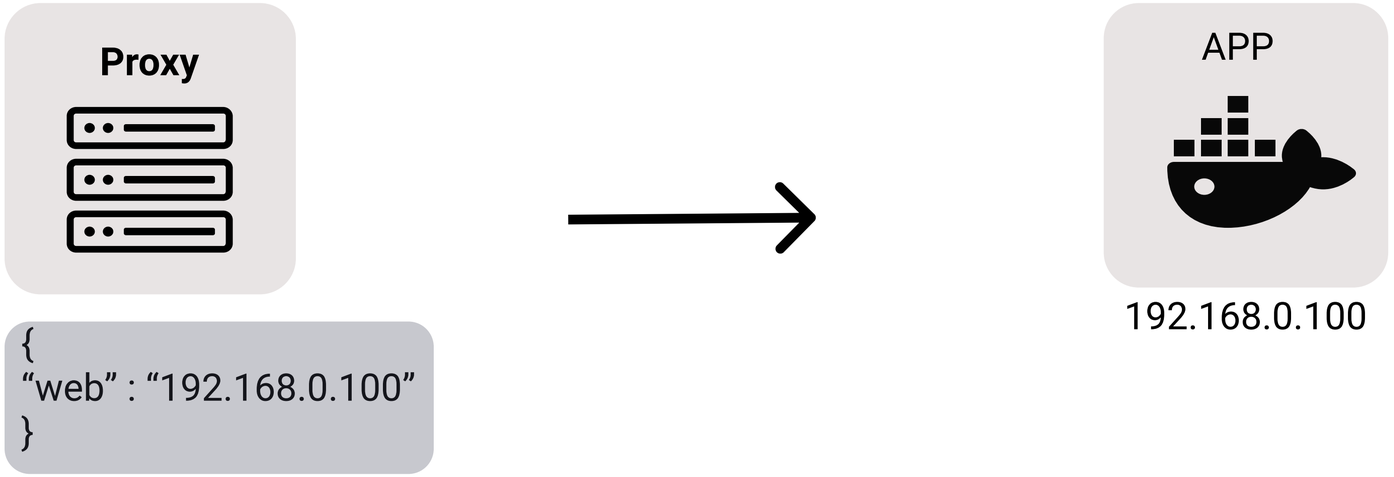
롤백의 경우에도 중앙에서 관리하여 일괄적으로 롤백이 진행될 수 있어야 함.

3-1. Container Orchestration의 기능



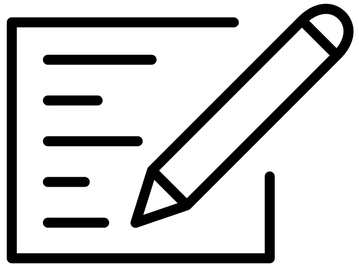
Service Discovery

- 서비스 등록 조회



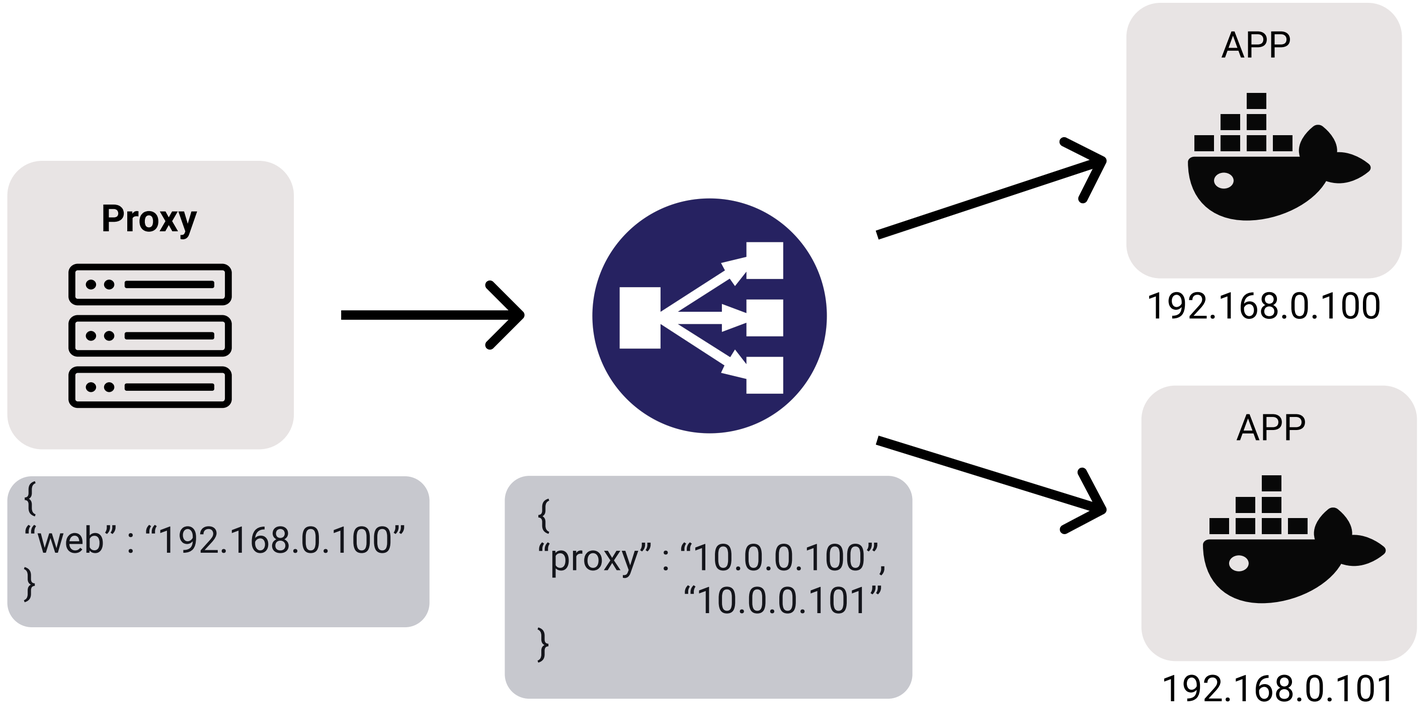
새로운 서비스가 추가 된 경우 자동으로 해당 서비스에 대한 설정이 추가 되어야 함.

3-1. Container Orchestration의 기능



Service Discovery

- 서비스 등록 조회



난 암것두 안함..!

새로운 서비스가 추가 된 경우 자동으로 해당 서비스에 대한 설정이 추가 되어야 함.

왜  kubernetes 일까?

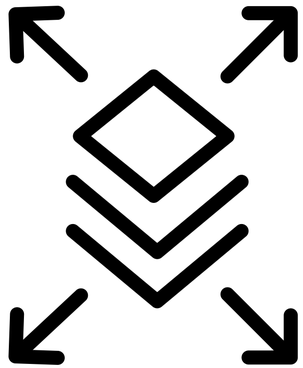
kubernetes

- 컨테이너를 **쉽고 빠르게 배포/확장** 하고 **관리를 자동화** 해주는 오픈소스 플랫폼
- 2015년 구글에 의해 공개(v1.0 release)
  - 1주일에 20억개의 컨테이너를 생성
  - 컨테이너 배포/관리를 위해 사용하던 brog를 기반으로 만든 오픈소스

kubernetes

- 정의
  - 운영 환경에서 사용 가능한 컨테이너 오케스트레이션
  - 자동화된 컨테이너 배포, 스케일링과 관리

Planet Scale



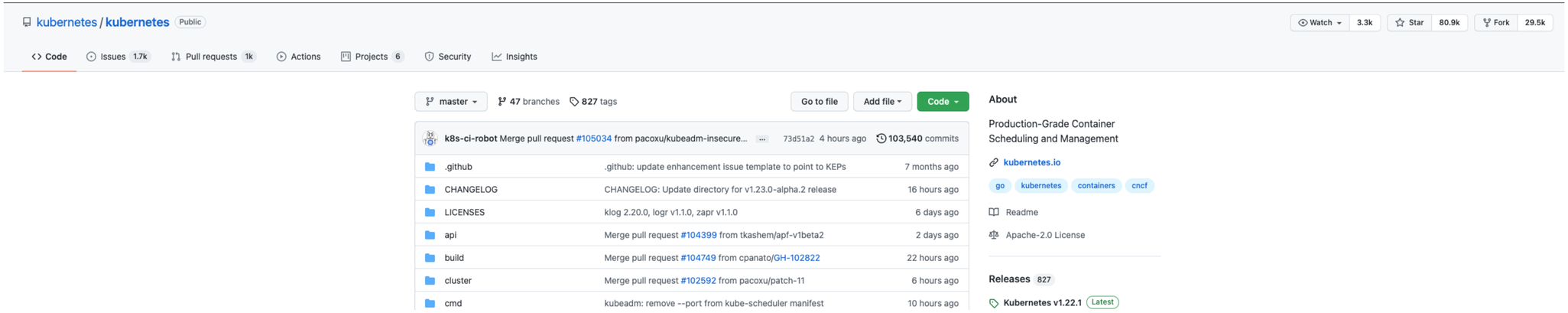
Never Outgrow

Run AnyWhere

kubernetes

엄청난 **인기!!**

star: 80.9k



kubernetes

엄청난 확장성

- 쿠버네티스를 기반으로 동작하는 플랫폼들이 많아지고 있음.

  - ML : Kubeflow
  - CI/CD : TEKTON
  - Service Mesh : Istio
  - Serverless : Knative

kubernetes

컨테이너 오케스트레이션의 **(사실상) 표준!!**