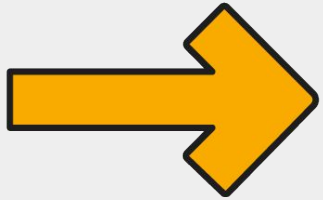
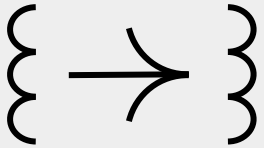
Google Developer Group
Editable University Name

# 확장 가능한 시스템 설계

## with AWS



대규모 시스템 설계 - **GDG 1**기 서버 코어 김기수



**1** 단일 서버

트래픽을 고려하지 않은 서버설계

**2** 확장 시작

수직적 규모 확장 vs 수평적 규모 확장

로드 밸런서, 데이터베이스 다중화

**3** 캐시

데이터베이스 부담을 줄이고, 응답 시간을 더 빠르게

**4 CDN**

물리적 거리에 따른 지연을 줄여 정적 페이지 응답을 더 빠르게

**5** 메세지큐

서비스간 결합을 느슨하게! 확장성과 안정성을 확보하자

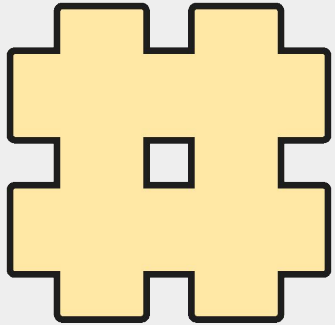
**6** 데이터베이스 규모 확장

데이터베이스 부하를 줄여보자

Source: xxxxx

# Overview

서버는 예상 사용자 수 그리고 용도에 따라 서버 설계가 달라집니다.



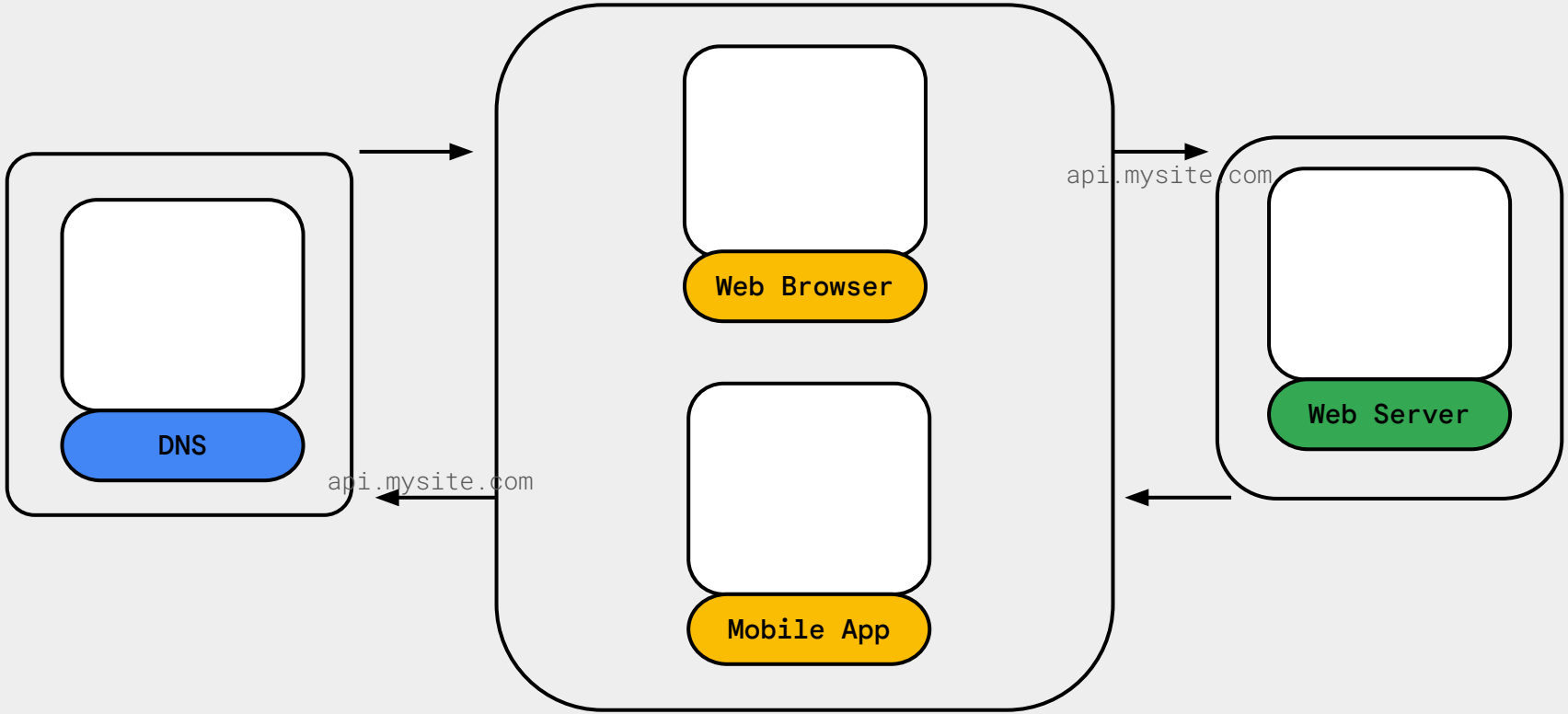
예를들어 사내에서만 사용하는 서버에 (역시 용도에 따라 다르지만 일반적인 백오피스를 가정합니다) 최대 100만명을 수용하는 scalable 한 서버 설계는 오버엔지니어링이 될 것입니다.

한 명의 사용자를 지원하는 시스템에서 시작하여, 최종적으로 몇백만 사용자를 지원하는 시스템을 설계해보겠습니다.

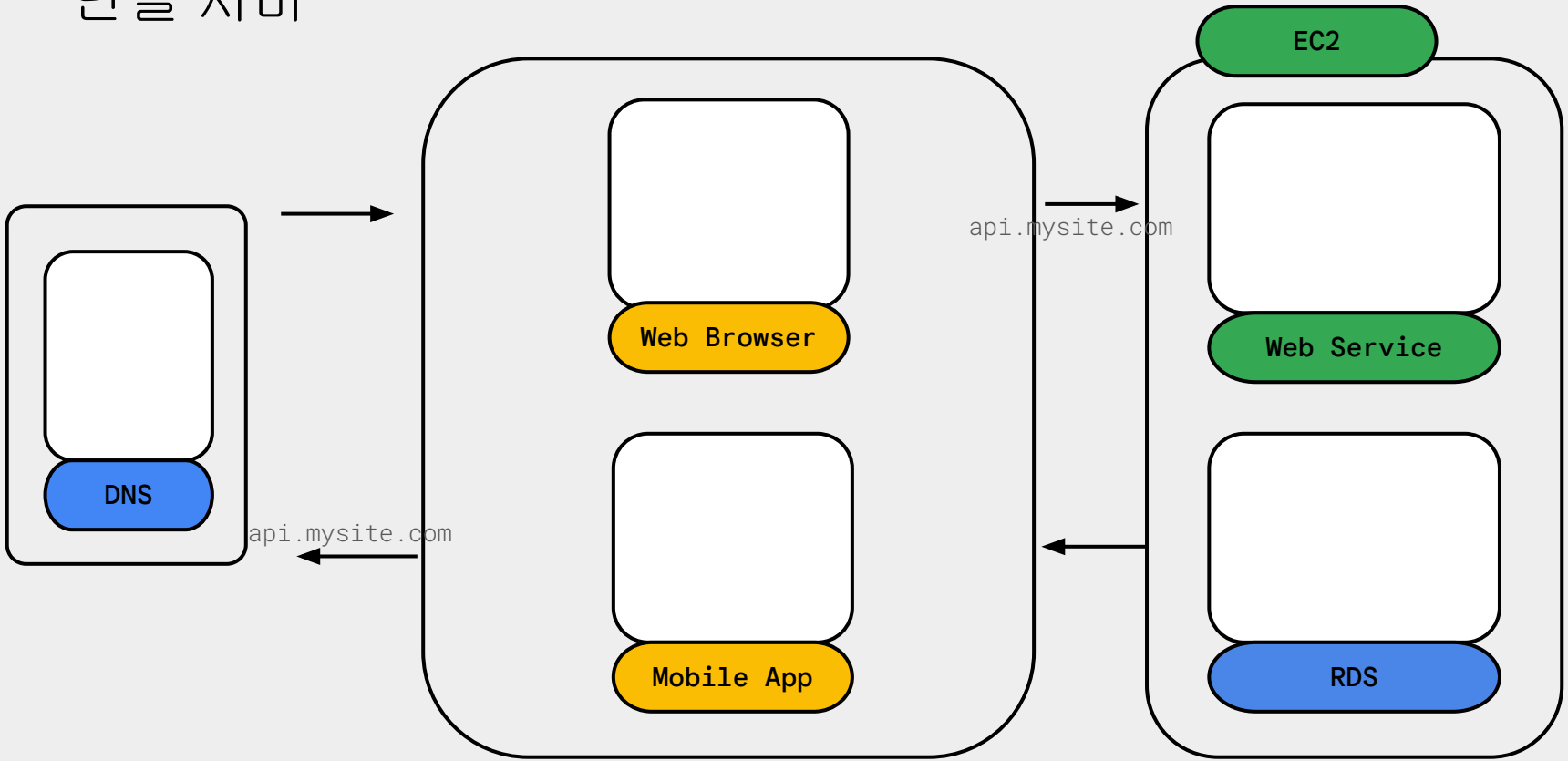
# 1-100

단일서버
- 천 리 길도 한 걸음 부터,,, 단 한대의 서버부터

# 단일 서버


DNS
api.mysite.com
Web Browser
Mobile App
api.mysite.com
Web Server

# 단일 서버


EC2
Web Browser
Web Service
DNS
api.mysite.com
api.mysite.com
Mobile App
RDS

# 100-1k

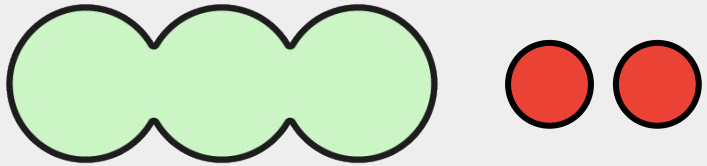
확장의 시작
- 수평적 확장

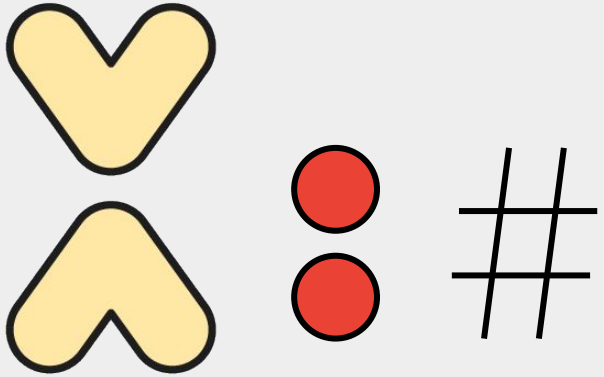
# 어떤 확장 방식?

## 수직적 규모 확장 - **scale up**

서버 성능 업그레이드!

고사양 자원 투입!





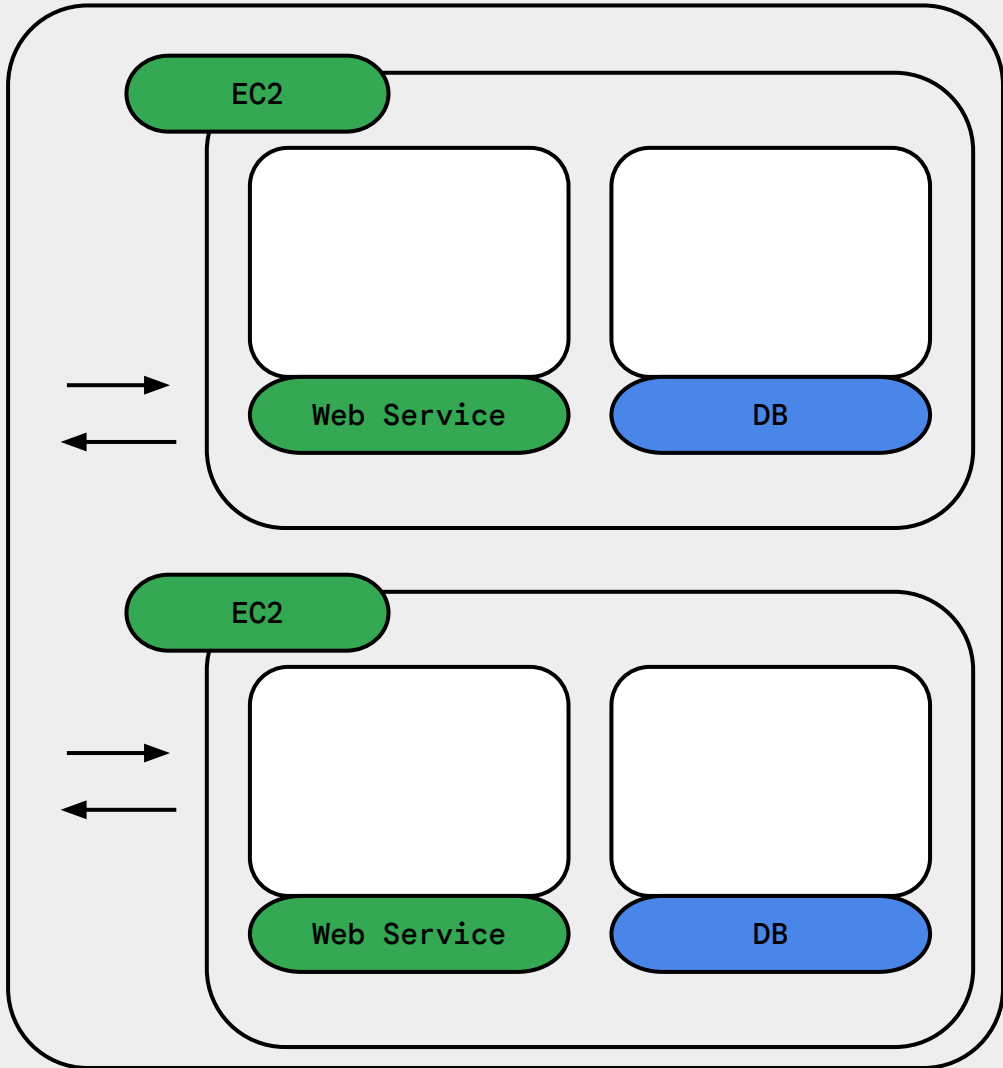
## 수평적 규모 확장 - **scale out**

서버를 여러개!

서버 추가투입!

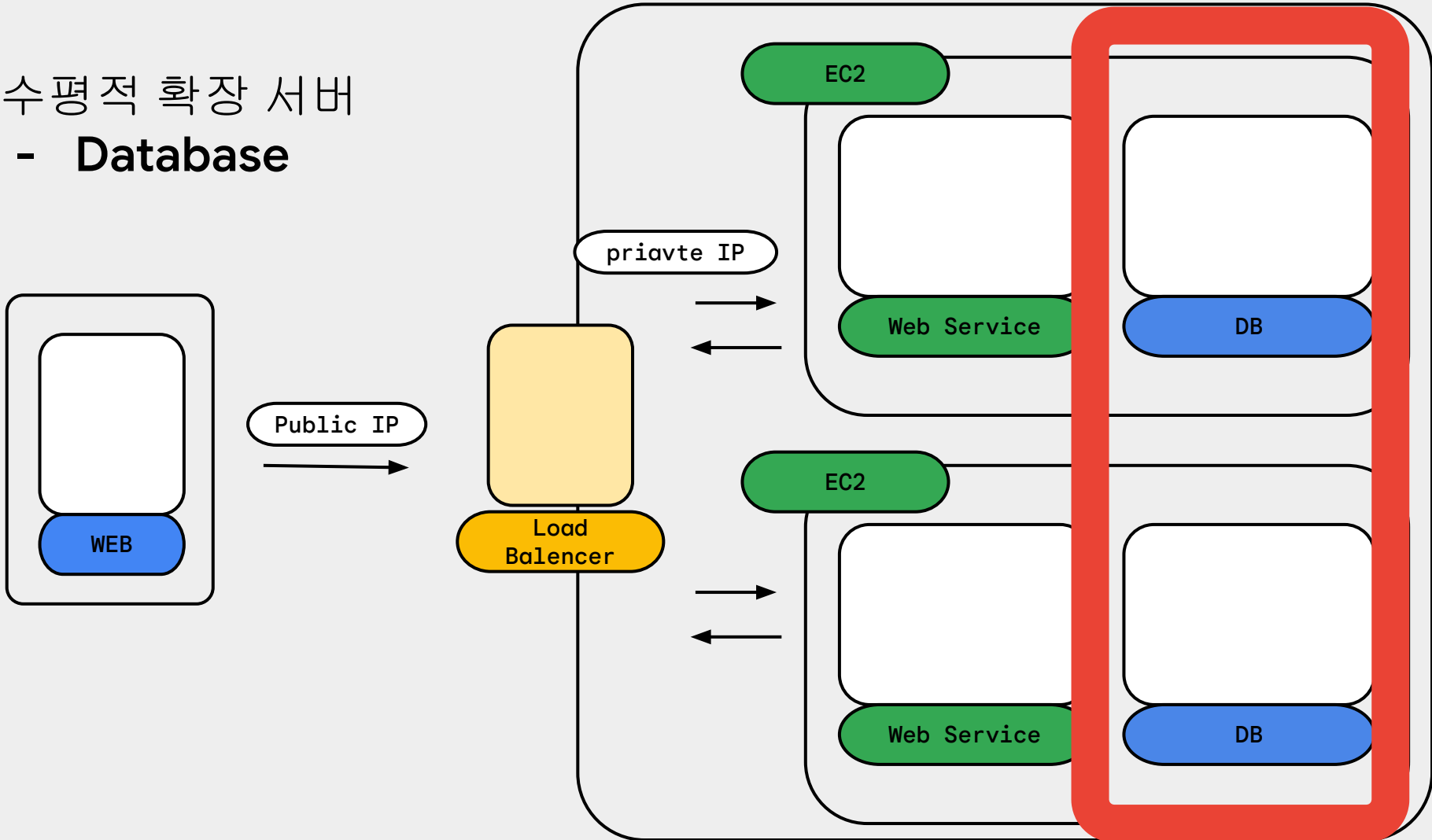
# 수평적 확장 서버

?



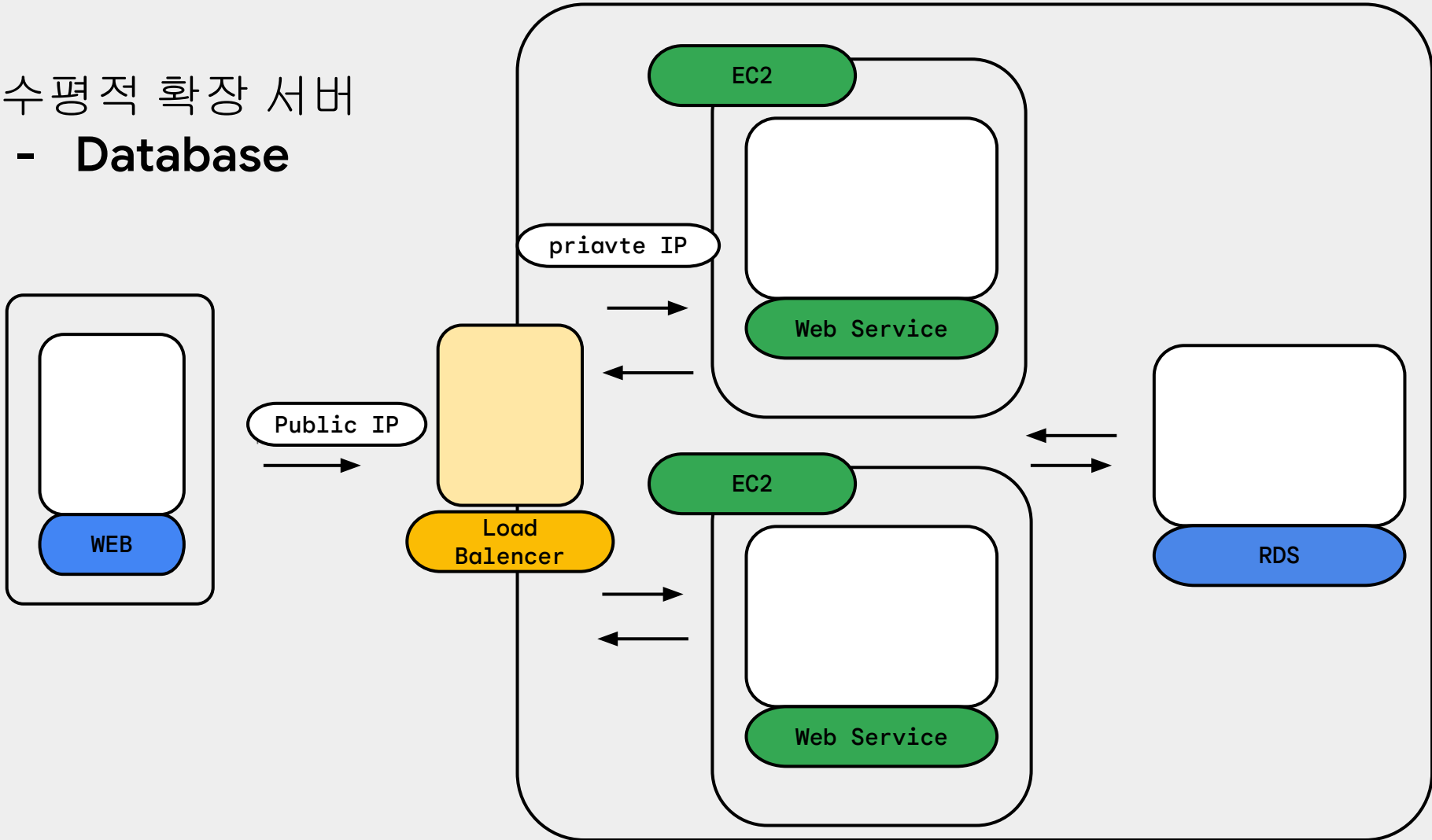
# 수평적 확장 서버

- **Database**

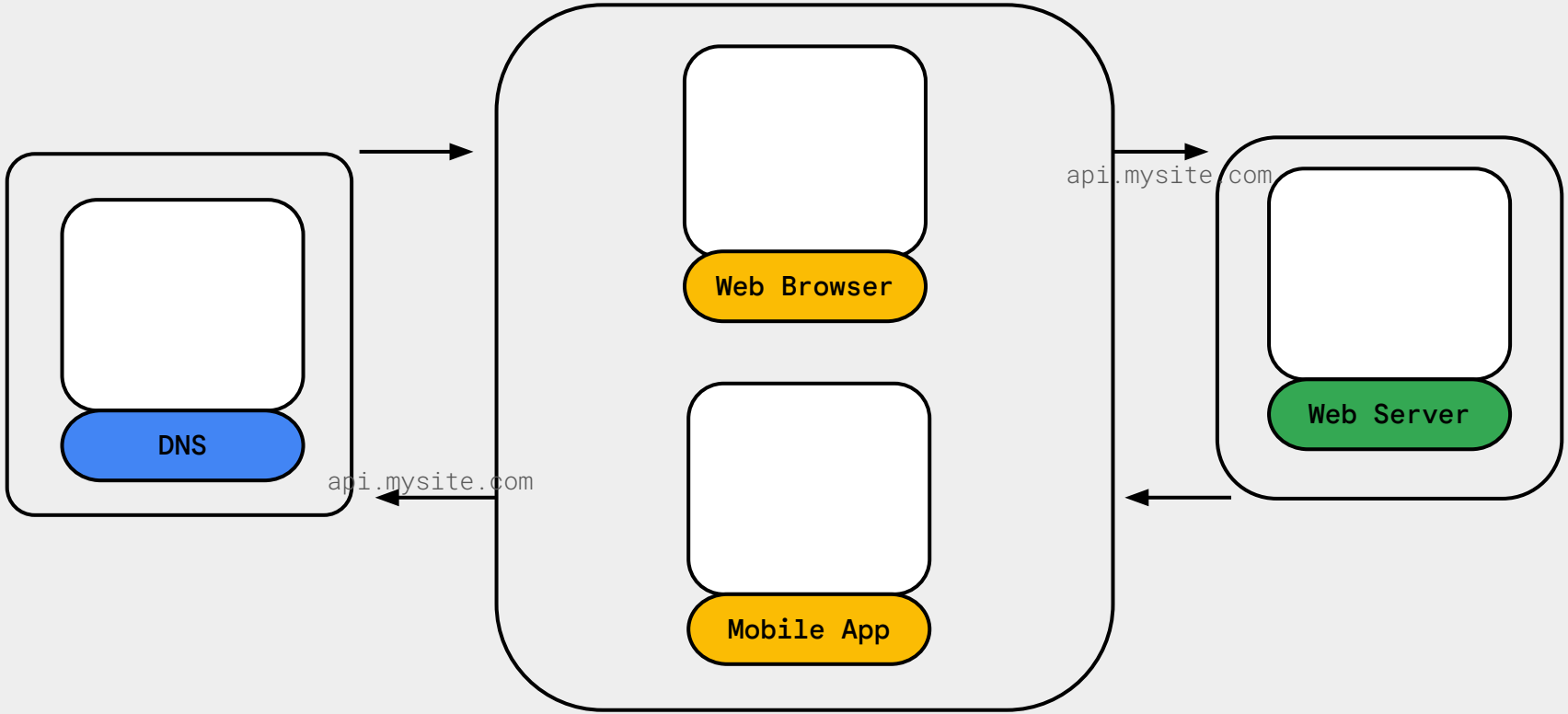


# 수평적 확장 서버

- **Database**



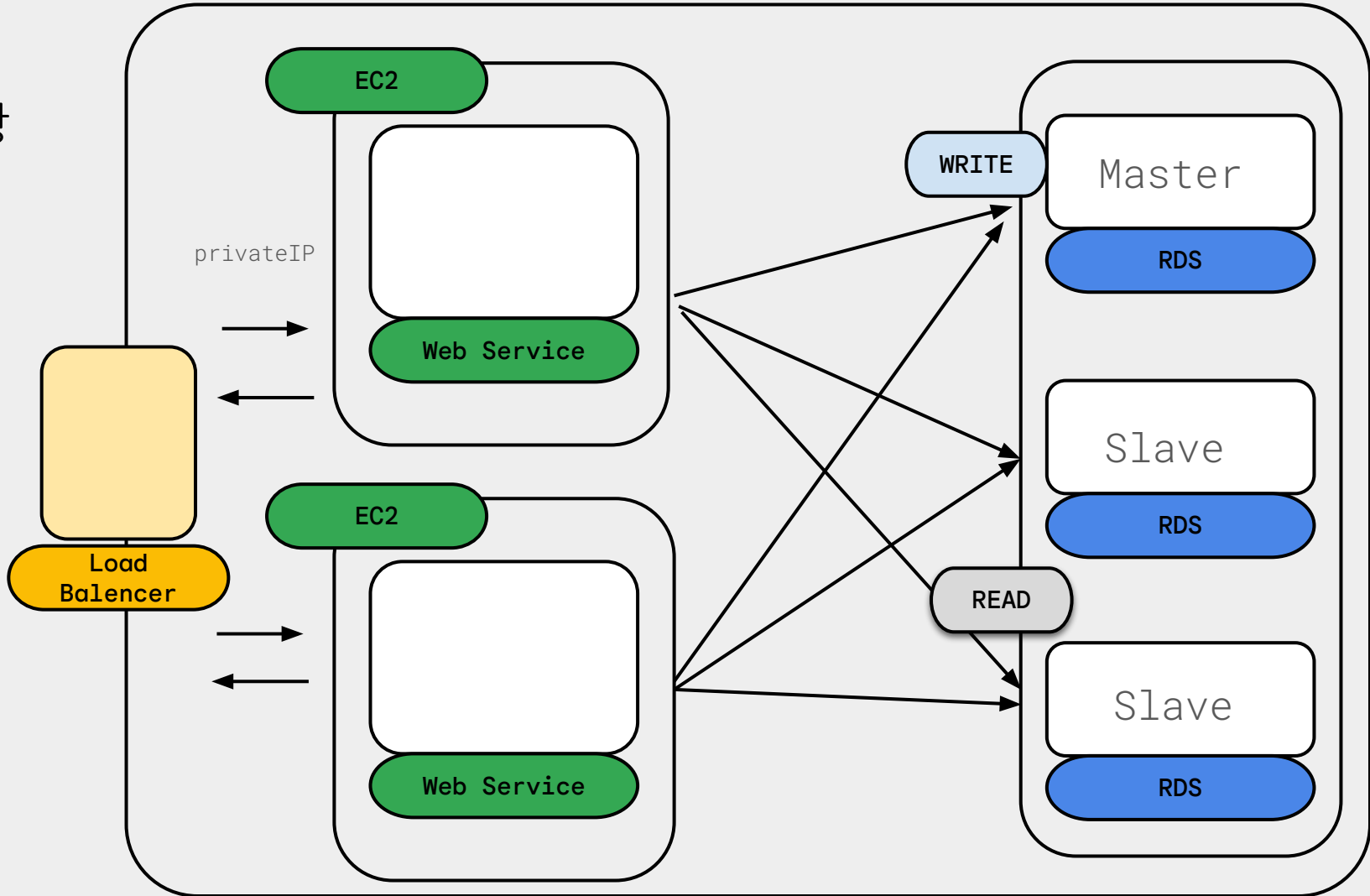
# 단일 서버


DNS
api.mysite.com
Web Browser
Mobile App
api.mysite.com
Web Server

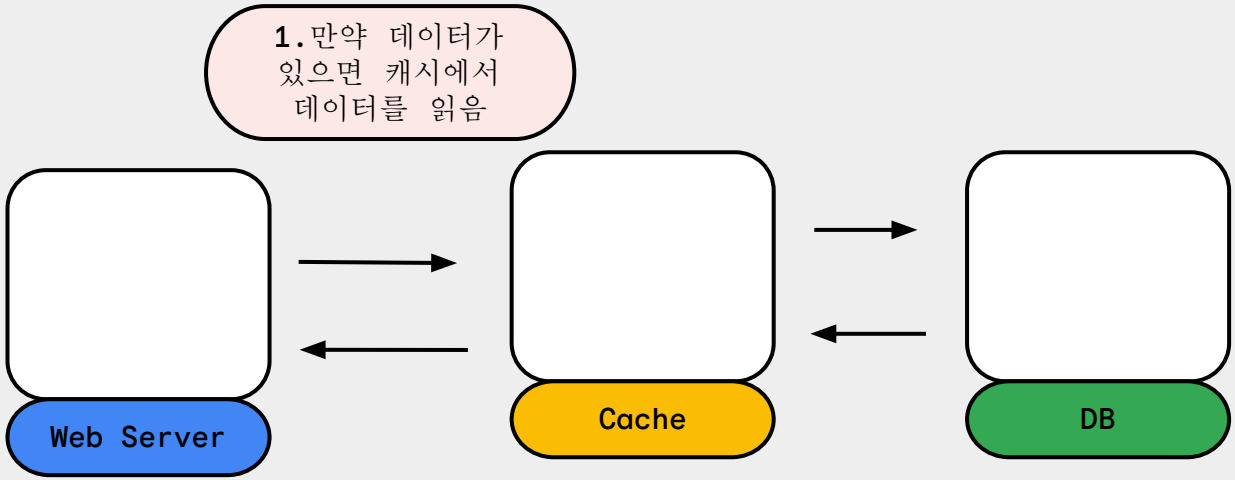
# 1k-10k

DB : SOS ㅠㅠ

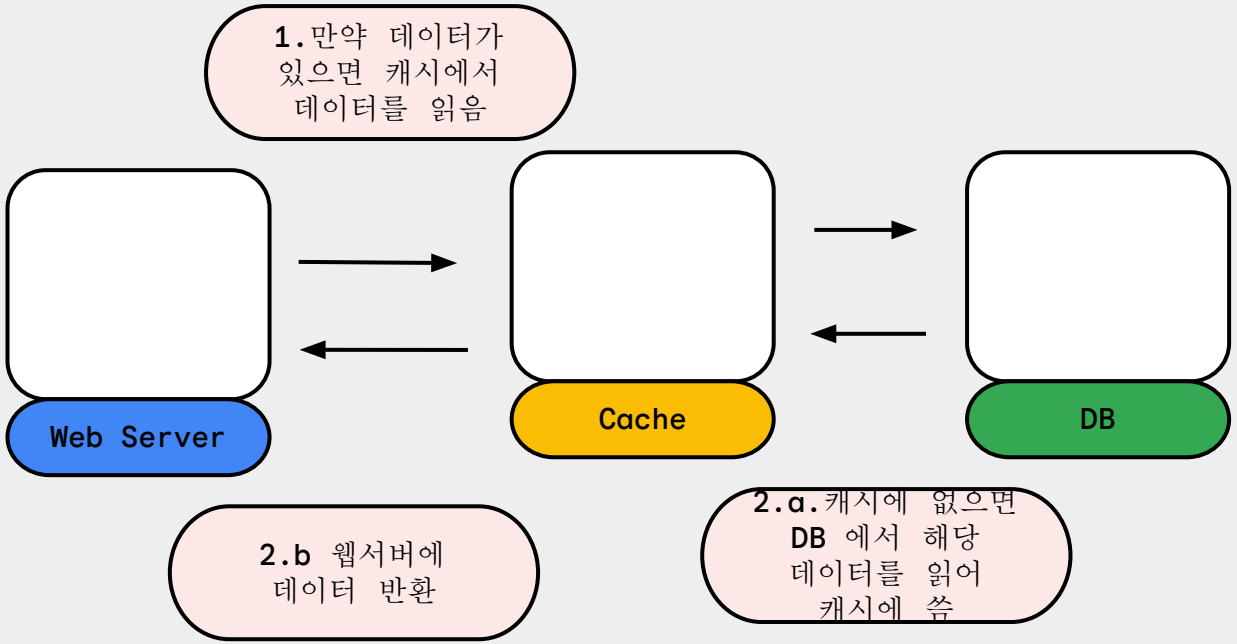
# DB 확장

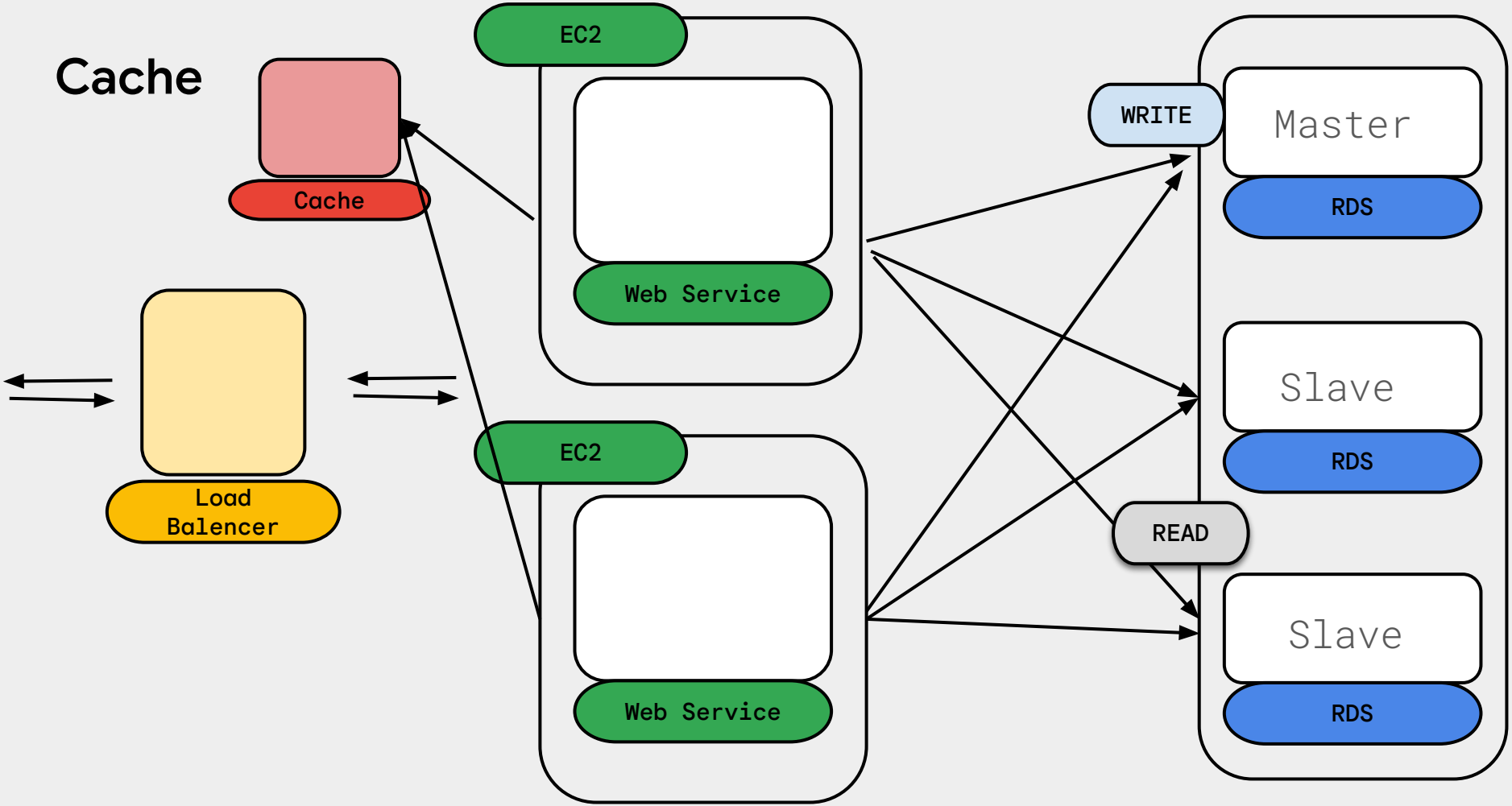

EC2
privateIP
Web Service
Load
Balencer
EC2
Web Service
WRITE
Master
RDS
Slave
RDS
READ
Slave
RDS

# Cache 흐름



# Cache 흐름

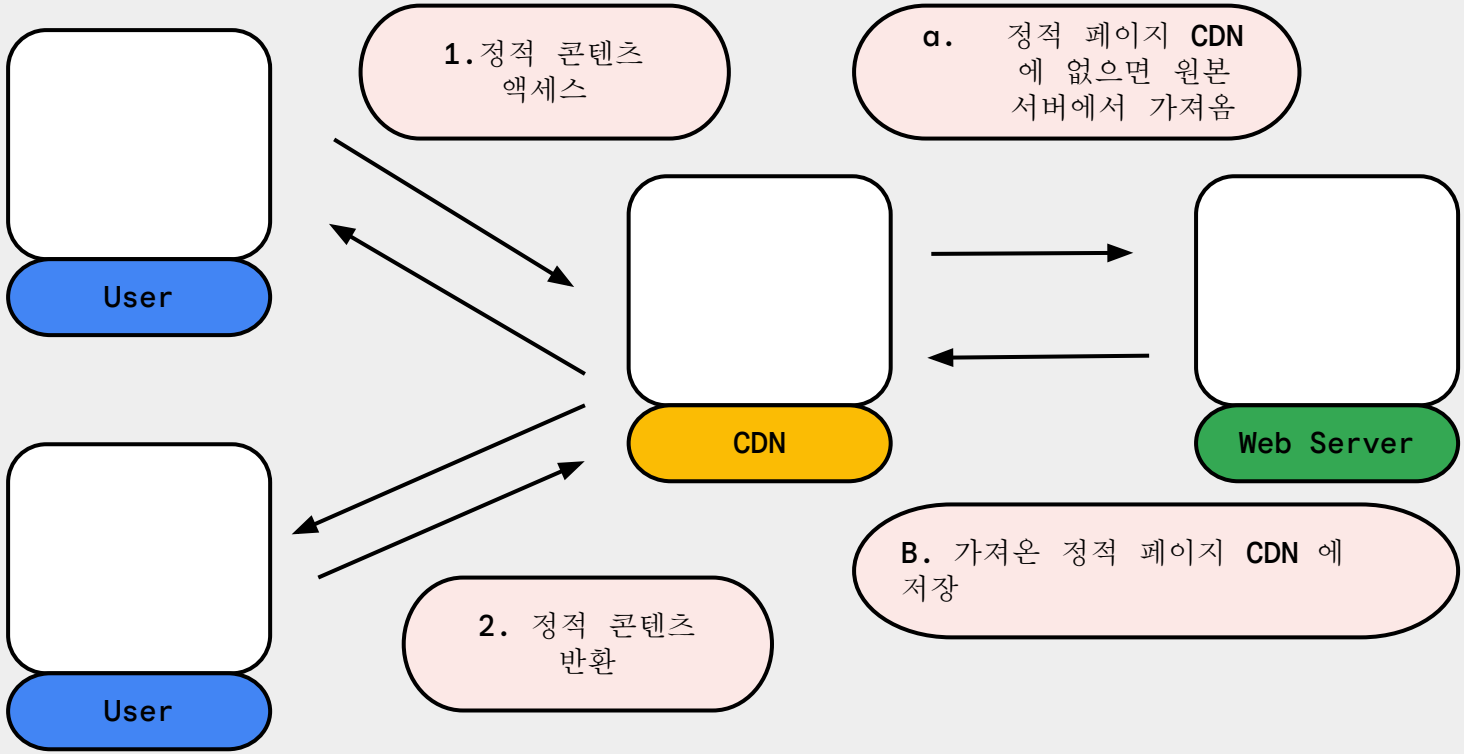

1. 만약 데이터가 있으면 캐시에서 데이터를 읽음
Web Server
Cache
DB
2.a. 캐시에 없으면 DB 에서 해당 데이터를 읽어 캐시에 씀
2.b 웹서버에 데이터 반환

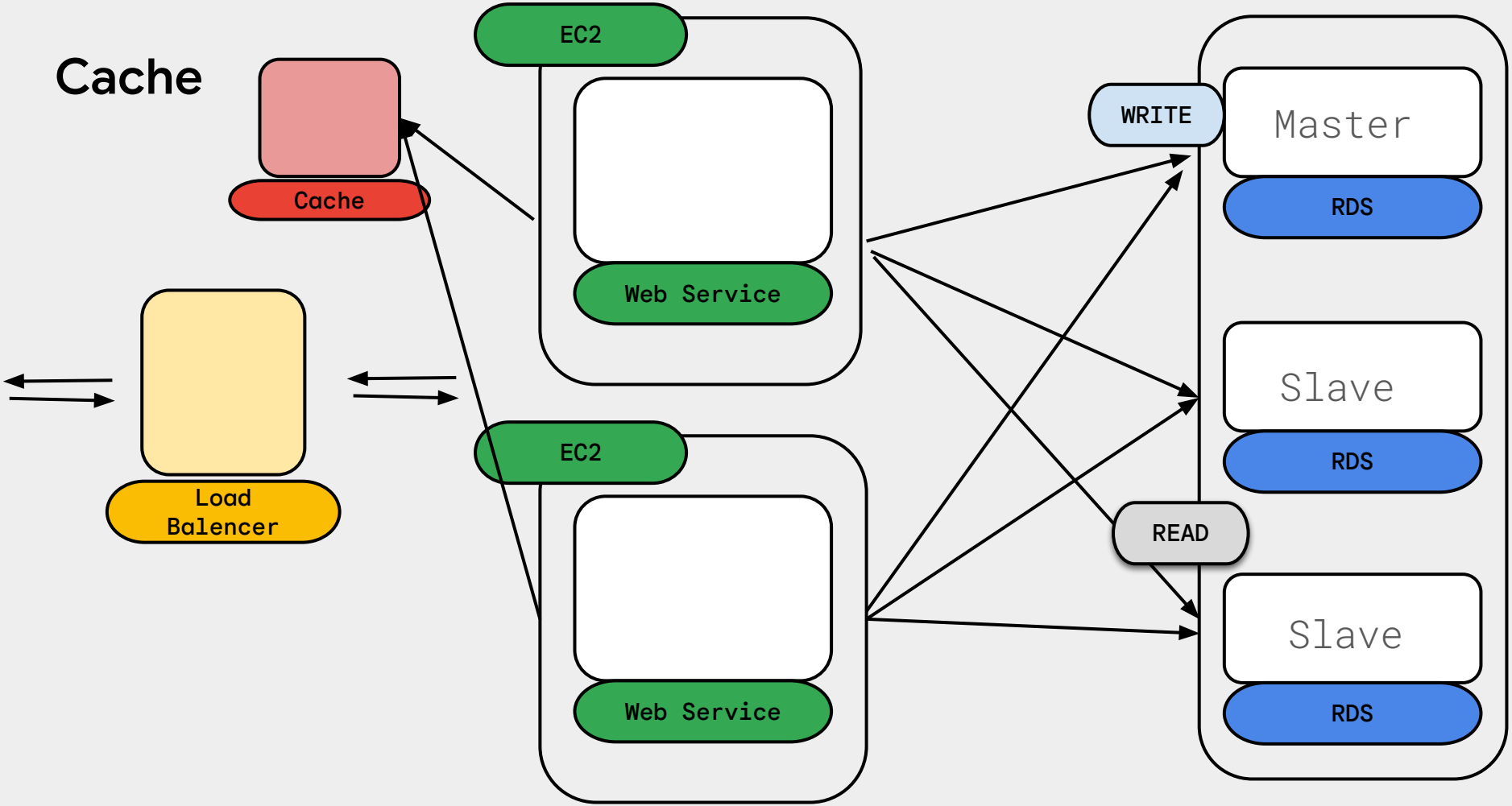

Cache
Cache
EC2
Web Service
EC2
Web Service
Load
Balencer
WRITE
Master
RDS
Slave
RDS
READ
Slave
RDS

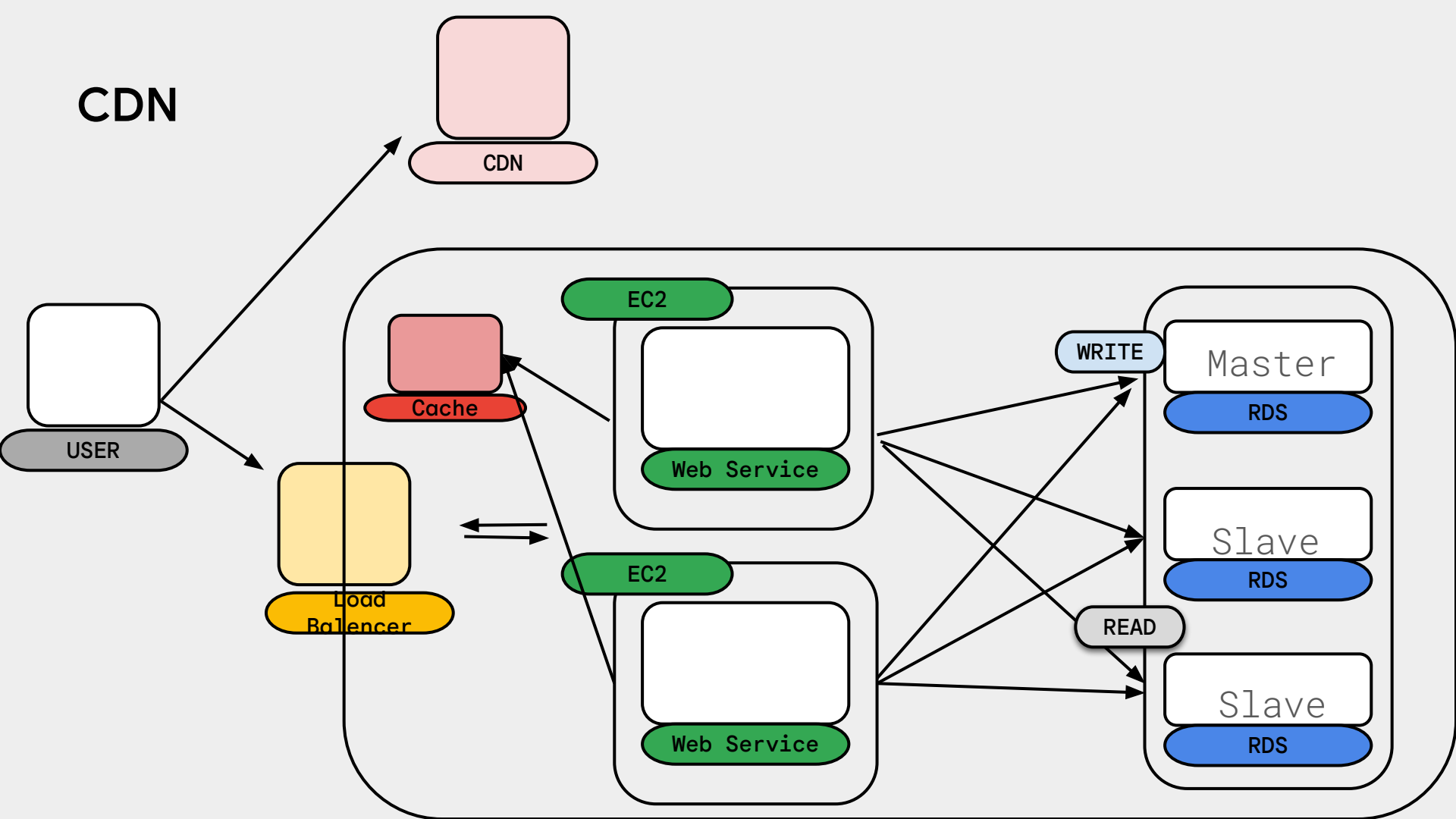
# 10k-100k

콘텐츠는? CDN

# CDN


1. 정적 콘텐츠 액세스
a. 정적 페이지 CDN 에 없으면 원본 서버에서 가져옴
User
CDN
Web Server
User
B. 가져온 정적 페이지 CDN 에 저장
2. 정적 콘텐츠 반환

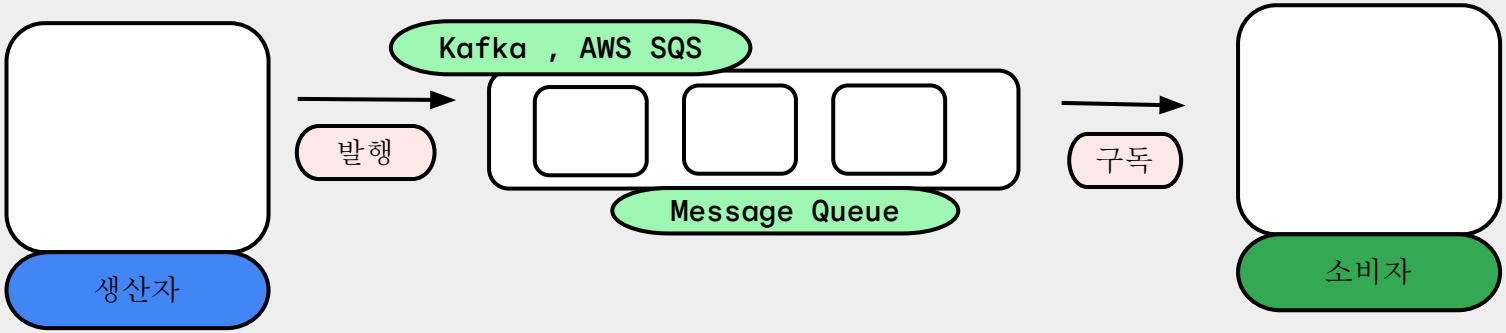

Cache
Cache
EC2
Web Service
EC2
Web Service
Load
Balencer
WRITE
Master
RDS
Slave
RDS
READ
Slave
RDS

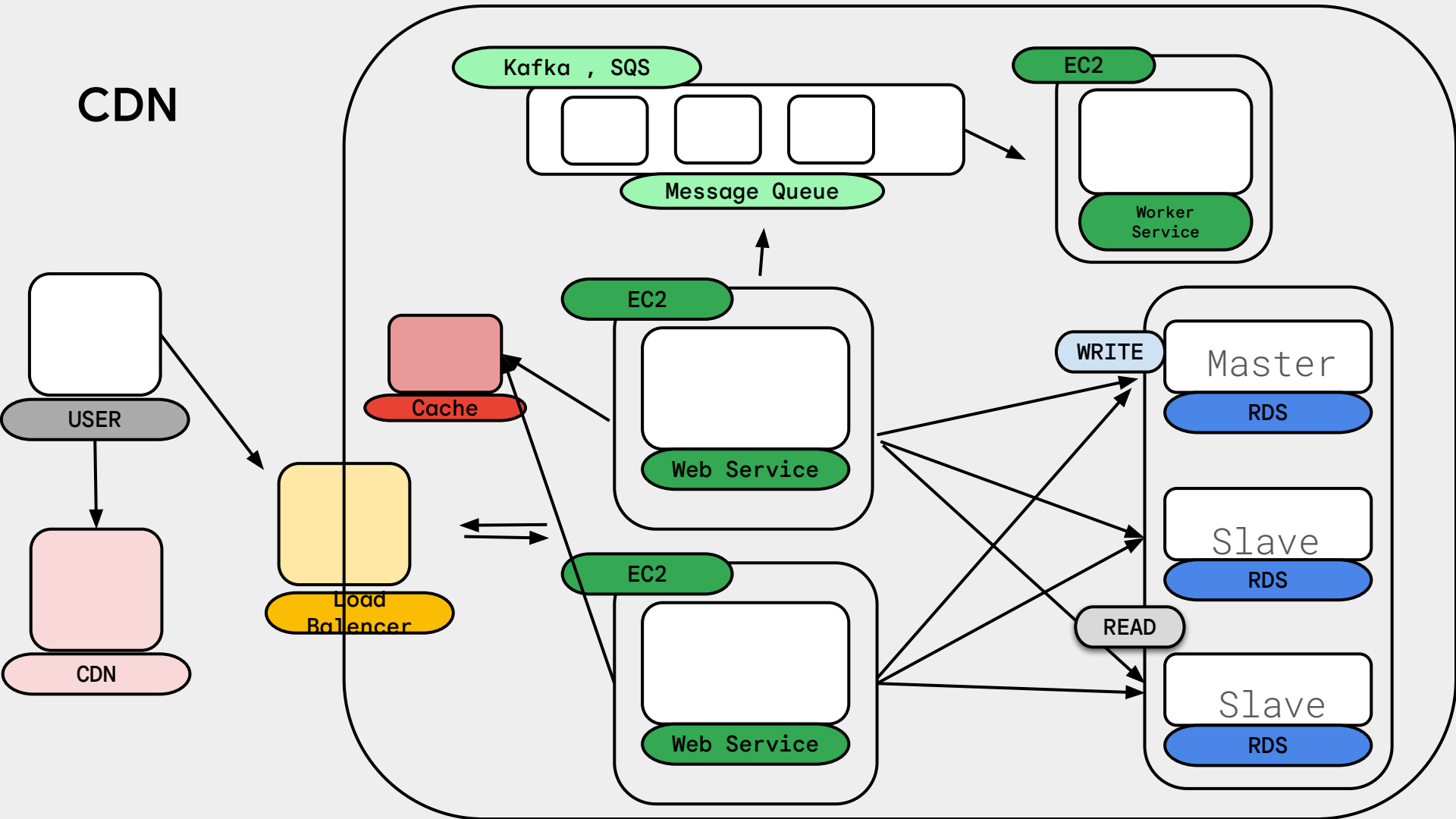

CDN
CDN
USER
Cache
EC2
Web Service
EC2
Web Service
Load Balancer
WRITE
READ
Master
RDS
Slave
RDS
Slave
RDS

# 100k-1M

서비스간 결합을 느슨하게
-메세지 큐

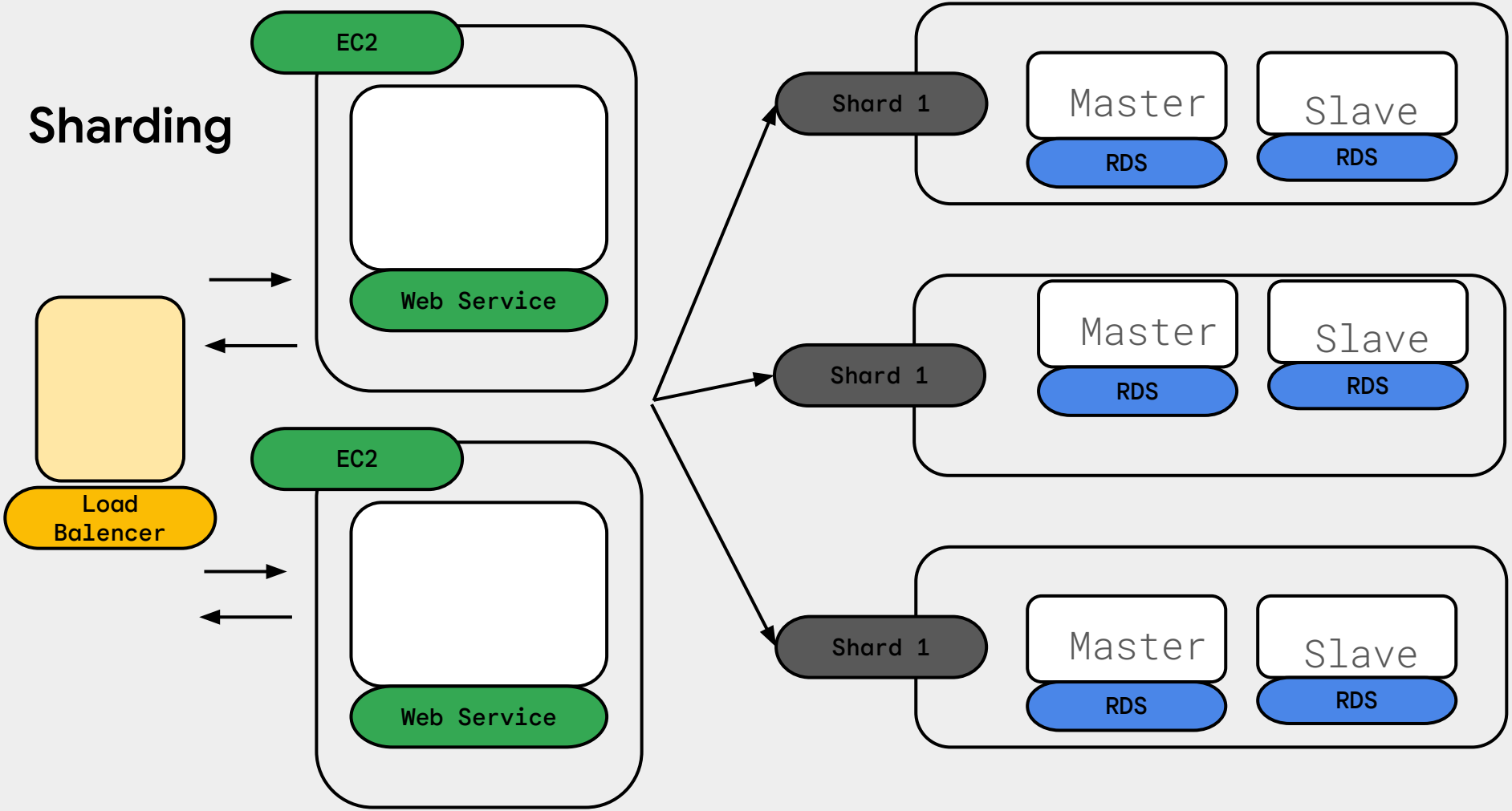
# Message Queue 흐름




CDN
Kafka , SQS
Message Queue
EC2
Worker Service
EC2
Web Service
Cache
USER
Load Balancer
CDN
EC2
Web Service
WRITE
Master
RDS
Slave
RDS
READ
Slave
RDS

# 1M-50M

아무리 나눠도 **DB**가 느리다
**Sharding**


Sharding
EC2
Web Service
Load Balencer
EC2
Web Service
Shard 1
Master
RDS
Slave
RDS
Shard 1
Master
RDS
Slave
RDS
Shard 1
Master
RDS
Slave
RDS

# Q&A