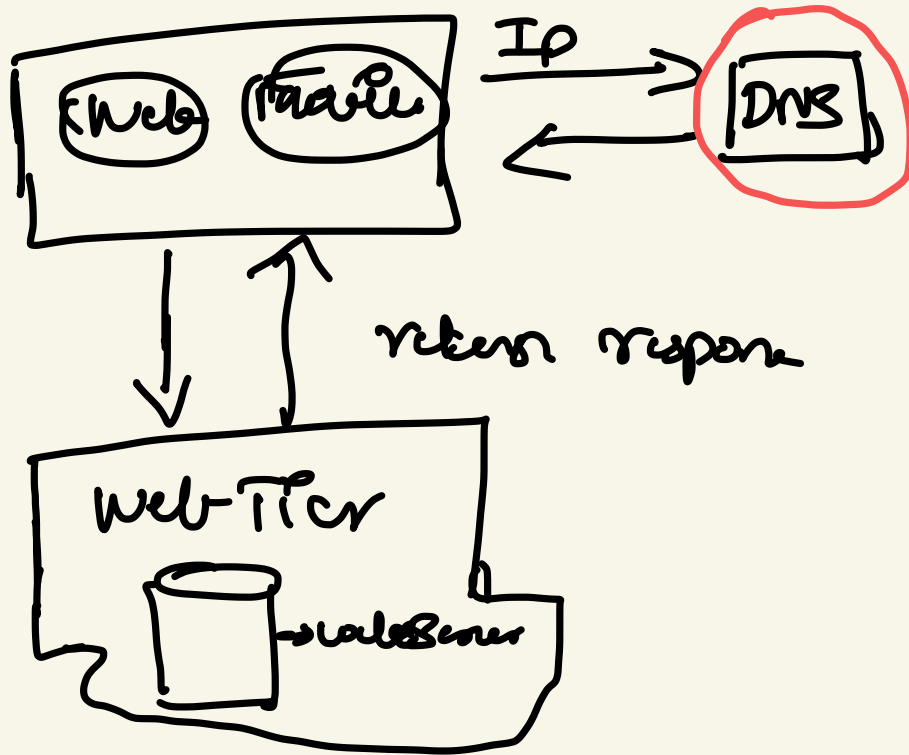


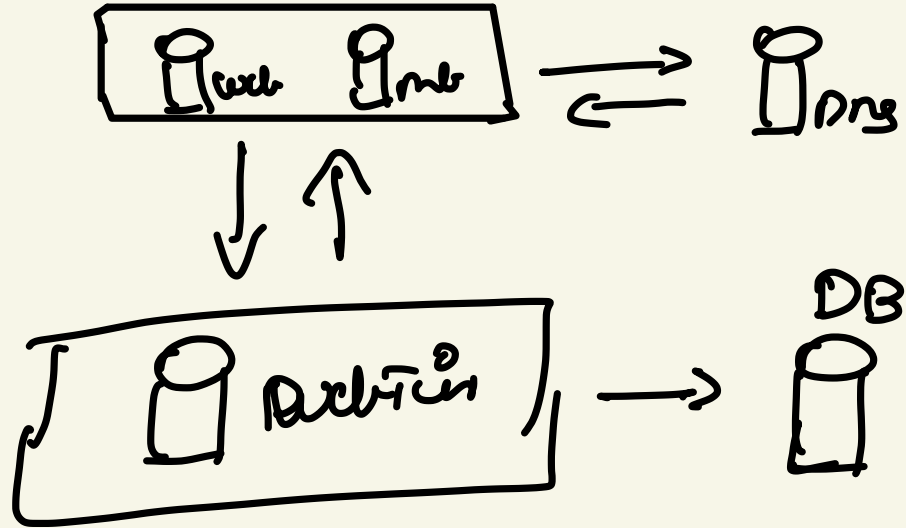
System Design



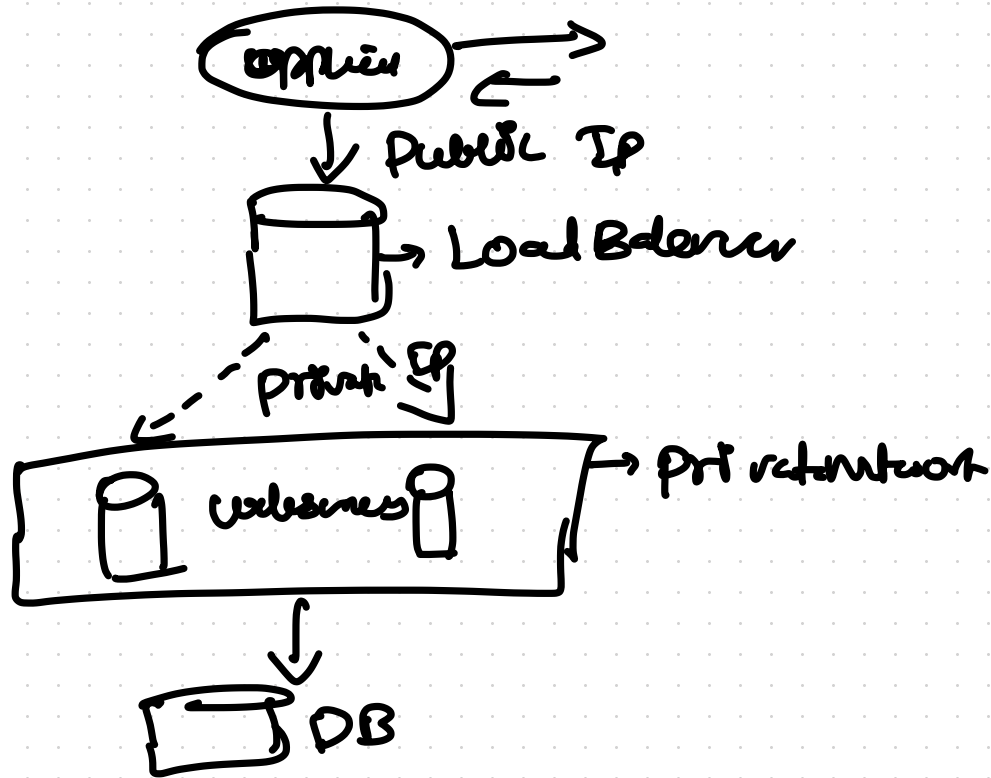
Basic structure



Introduce a DB : For more Data and Traffic



Introduce a Load Balancer:



Introduce Vertical Scaling and Horizontal Scaling

→ Vertical Scaling → adding more cpu and memory in
(Scale up)
Same Server

Disadvantage: SPOF → Single point of Failure
as the Server Gets down makes whole application offline

→ Horizontal Scaling → adding more Servers, so makes
availability, reliability more as one Server fails
we still have more Server

By Scaling web Tier is Fine, For Data Tier we have to Scale it by means of **Data replication**

Data replicator: Adding a "master-Slave Archtctn"

Master DB is used For updates and write operations

Slave DB is used For read operations.

→ advantages: 1.) reduced Traffic → as read is separate and write is separate

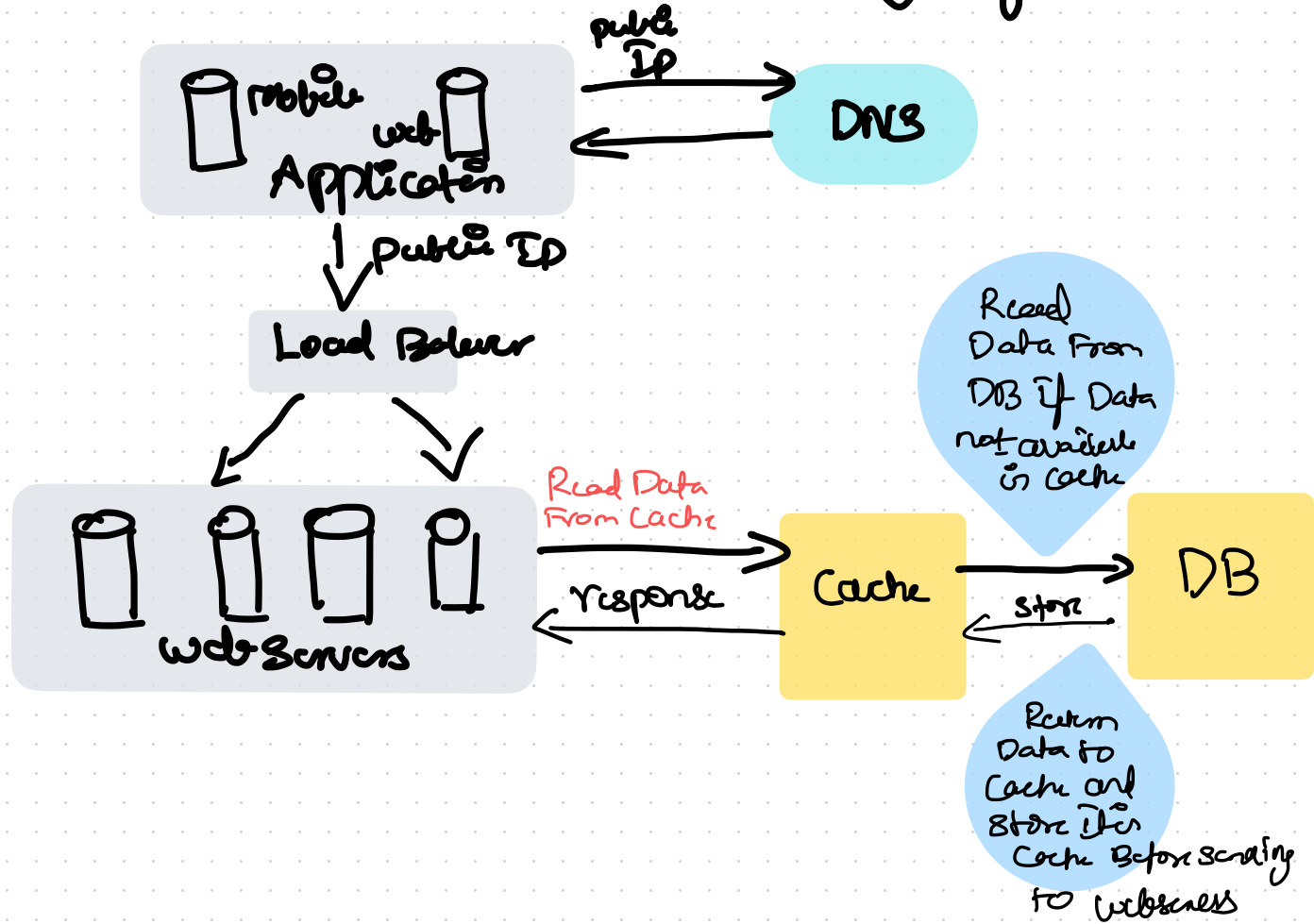
2.) High availability: If one Slave is Down requests will be Forwarded to other Slave

If master DB is Down, then we can make one of the Slave DB as master or we can have multiple master DBs

Introduce a cache: why Cache

- 1.) If we have more non-Frequently updating Data, then we can use Cache memory
- 2.) To retrieve data in a faster way, where ^{same} data is called many times

Cache can be Memcached or Redis or anything.



1.) Cache is not useful if more data is updated frequently. Cache is mainly for static content or less frequently updated content.

2.) Cache Eviction:- Cache Eviction is if cache is full and DB returns the data to update in cache, some data might be deleted. Removal of data can be done by:

- LRU Cache \rightarrow Least Recently Used Data removal
- LFU Cache \rightarrow Least Frequently Used Data removal
- FIFO \rightarrow First In First Out

CDN → Content Delivery Network

- 1.) Keep the static content like pics, JavaScript Pages, Videos in Location Specified Network cloud.
- 2.) It is mostly provided by third party, so use the Data which is more frequently gets updated
- 3.) Why CDN : (See Next Page)

→ Cache might cause SPOF → Single point of Failure

→ so to avoid that we use CDN

Eg:

