#### husseinnasser.com



# Sharding

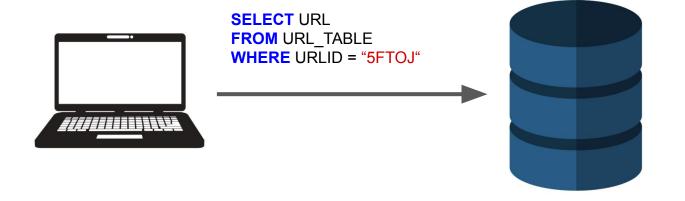


**Sharding & Consistent Hashing** 

#### Agenda

- What is sharding?
- Consistent Hashing
- Horizontal Partitioning vs Sharding
- Example (Code with Postgres)
- Pros & Cons
- Summary

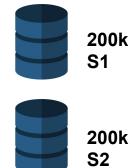
# What is Sharding?



# URL shortener table with 1 million pages URL\_TABLE

id	Url	urlid*
1	https://www.canva. com/design/DADr SCuKq4I/5sKekxV dctoGGq7Ri9O5G Q/edit	5FTOJ
2	https://en.wikipedi a.org/wiki/Shard ( database architec ture)#Database ar chitecture	CeG0z
1M	https://www.quora. com/How-does-ba se64-encoding-wo rk	J9COp

# What is Sharding?







Split 1 million rows table into 5 database instances.. Same schema





# **Consistent Hashing**



postgres:5432







postgres:5433

#### Consistent Hashing



postgres:5432







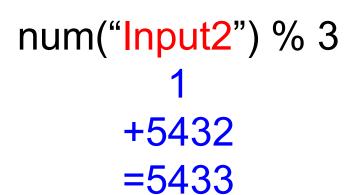
postgres:5433

#### **Consistent Hashing**



postgres:5432







postgres:5433

# Horizontal Partitioning vs Sharding

- HP splits big table into multiple tables in the same database
- Sharding splits big table into multiple tables across multiple database servers
- HP table name changes (or schema)
- Sharding everything is the same but server changes

# Example Code with Postgres (Url shortener)

- Spin up 3 postgres instances with identical schema
  - 5432, 5433, 5434
- Write to the sharded databases.
- Reads from the sharded databases.

## **Pros of Sharding**

- Scalability
  - Data
  - Memory
- Security (users can access certain shards)
- Optimal and Smaller index size

#### Cons of Sharding

- Complex client (aware of the shard)
- Transactions across shards problem
- Rollbacks
- Schema changes are hard
- Joins
- Has to be something you know in the query

## Summary

- What is sharding?
- Consistent Hashing
- Horizontal Partitioning vs Sharding
- Example (Code with Postgres)
- Pros & Cons