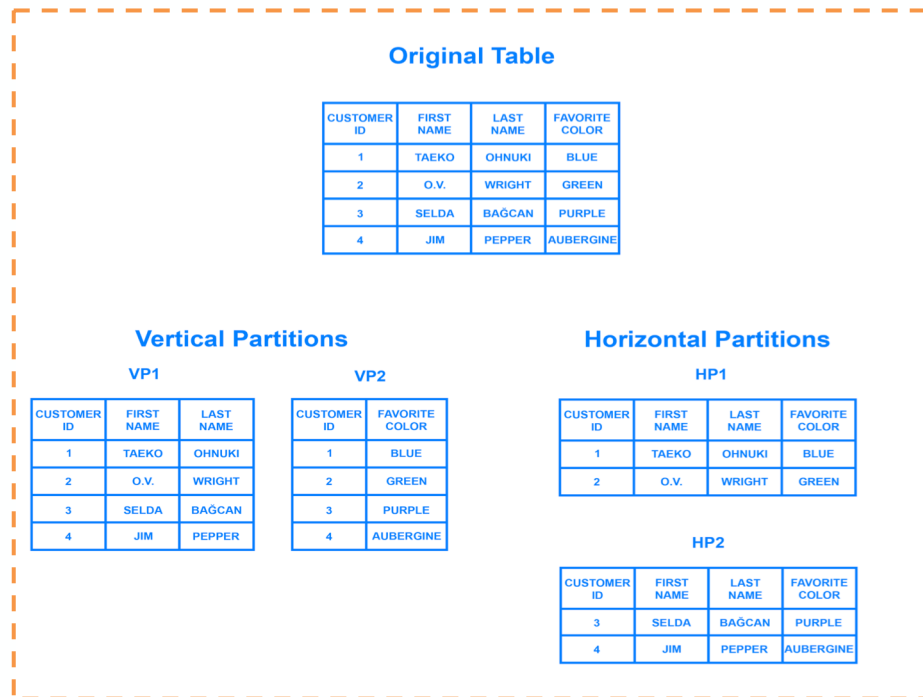# Sharding | Partitioning

Database Sharding

❑ **Horizontal partitioning** that splits one giant database into smaller components (shards/partitions), which are faster and easier to manage

❑ A **shard** is an individual partition that exists on independent database servers called **nodes**

Source: digitalocean.com

Evaluating Business Application Fit

Growth in application data **EXCEEDS** the storage capacity of a single database node
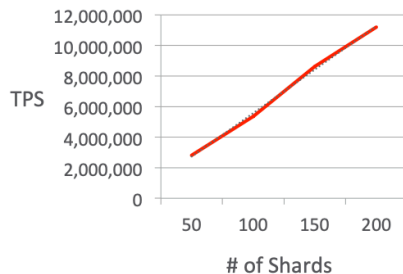
Volume of writes or reads to the database **SURPASSES** what a single node can handle, resulting in slowed response times

Network bandwidth required by the application **OUTPACES** the bandwidth available to a single database node, resulting in slowed response times

Benefits

Linear Scalability

Fault Isolation

Built on **shared-nothing** architecture

Geographic Distribution

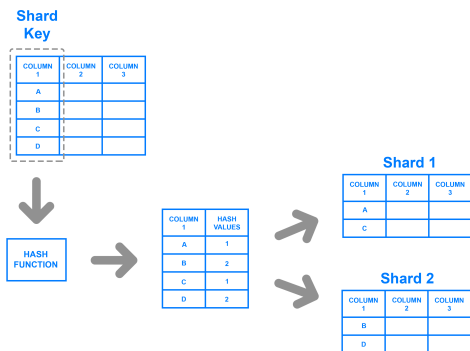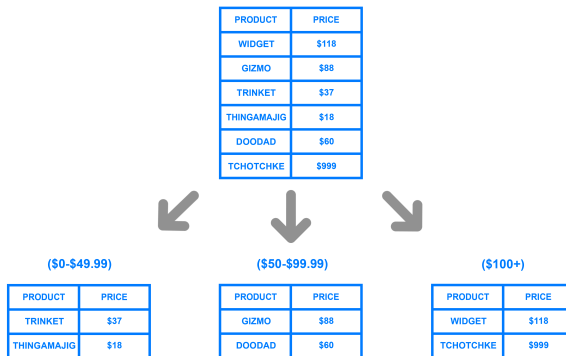Data Proximity & Sovereignty

Cost Effective

Pets vs. Cattle

Scale Out

VS

Scale Up

Source: oracle.com

Sharding Architectures

Source: digitalocean.com
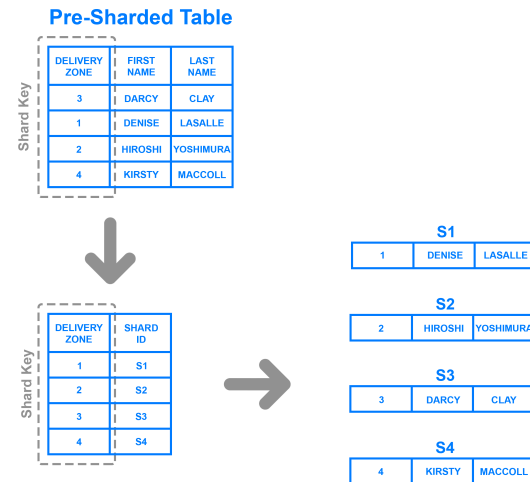
Case Studies

❑ Adopted Oracle Sharding for WeChat IoT Application

❑ Narrow Based (NB) IoT Network user base is projected to grow exponentially

❑ Chief benefit desired - **SCALIBILITY**

"We do not need to worry about what to do when we need to scale to larger

number of users"

❑ Adopted Oracle Sharding to easily and effectively scale their **mission critical transactional databases**

❑ **"Key is Key"** – Choose one STRONG key and align. E.g. Account/User ID

❑ Sharding required major rework in Data Model and Data Design