#ASLI ENGINEERING

How Grab stores and processes millions order every day

SWIPE

BY

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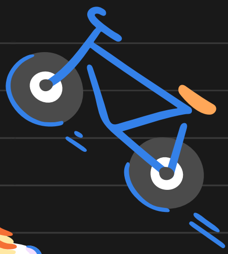
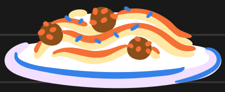
Architecture of Order Platform @ Grab

Grab order platform processes millions of orders, across Food and Mart every day.





Query patterns

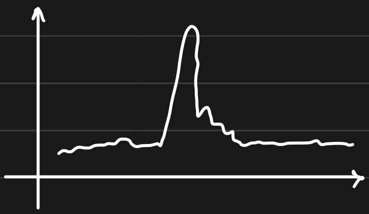
Two kinds of queries

1. Transactional → Get, create, update orders
2. Analytical → Historical orders, Statistics

Traffic patterns

Spikey and peaks are harsh.

Load during peak can become 3x/4x



Design Goals

1. Stability : handle high QPS (reads and writes) & High availability
   some fragment going down should not affect everything
   degraded perf >> complete outage
2. Cost effectiveness : be cost effective @ scale
3. Consistency : strong for transactional eventual for analytics

Architechure

1. Separate databases for Transactional and Analytical

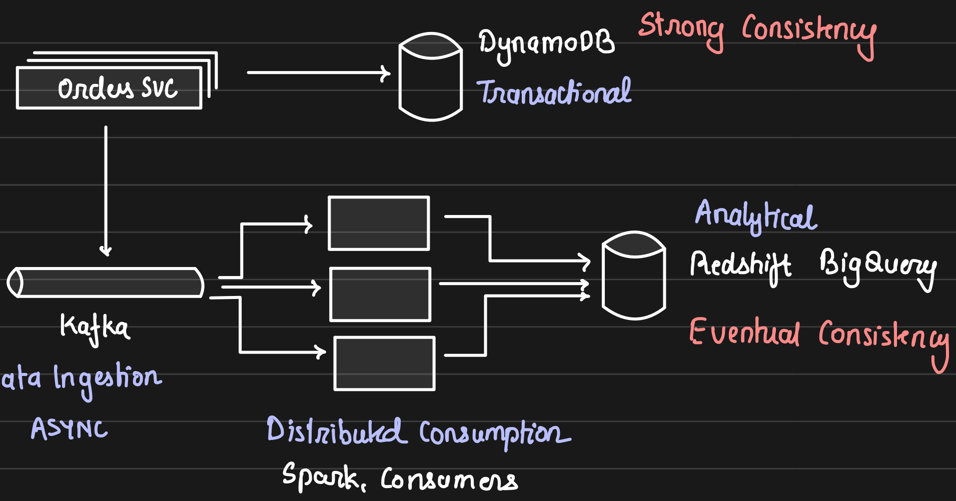
OLTP : online order processing. holds data for short time

- single source of truth
- heavy analytical queries won't affect this DB
- may not hold all the data

OLAP : same data but historical & statistical processing

- data stored for longer duration
- specialized DB to make analytics efficient

2. How do we keep data in sync?



3. Type of Transactional Queries

Key value queries: get, create and update an order

Grab chose to go with DynamoDB

1. Scalable and Highly available
2. Consistent reads by primary key
3. Internally moves the data across partitions to balance load
   ↳ handles hotkey problem by moving infreq ones to dedicated partion (hot can use entire capacity)

Schema: orders table

- order_id → Partition key
- state
- created_at
- user_id
- user_id_gsi ⟶ Global Secondary Index

when order is 'ongoing'

Grab stores

user_id_gsi = <user_id>

but when ongoing → done

user_id_gsi = NULL

* This removes the entry from GSI, keeping the index lean and performant.

* set TTL to auto delete entry after 3 months

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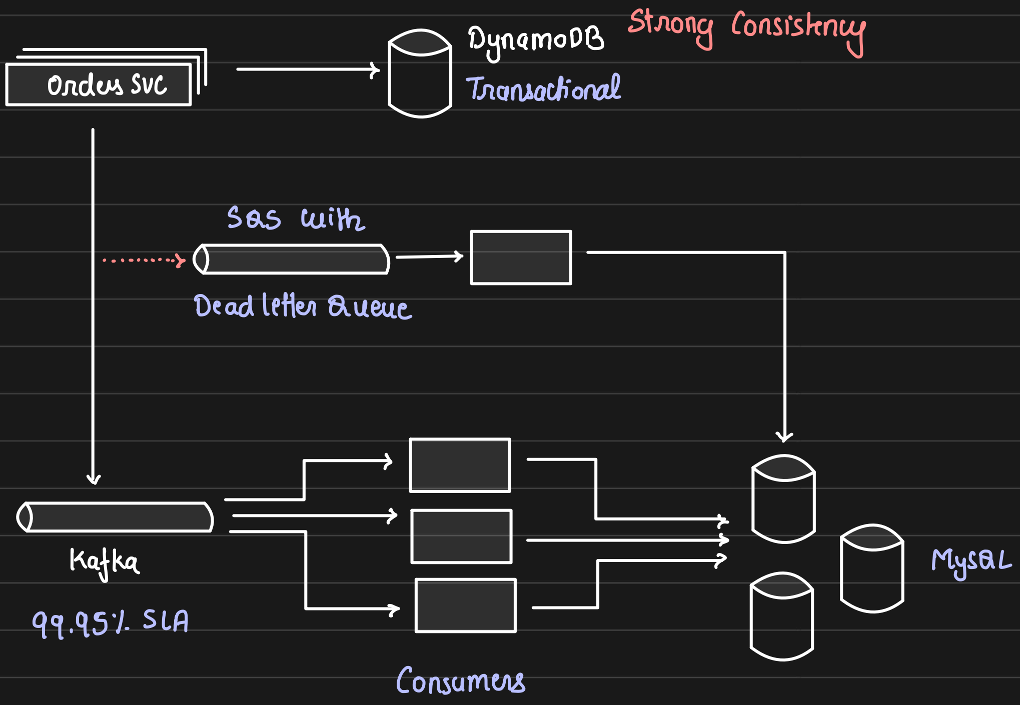
4. OLAP Database

Grab uses MySQL as their OLAP for orders system

1. data is partitioned by created at monthly
2. minimal cross partition queries
3. old partitions (>6 months) are dropped



* upsert

* update only if latest

Out of order messages

1. update before create
2. update 2 came before update 1