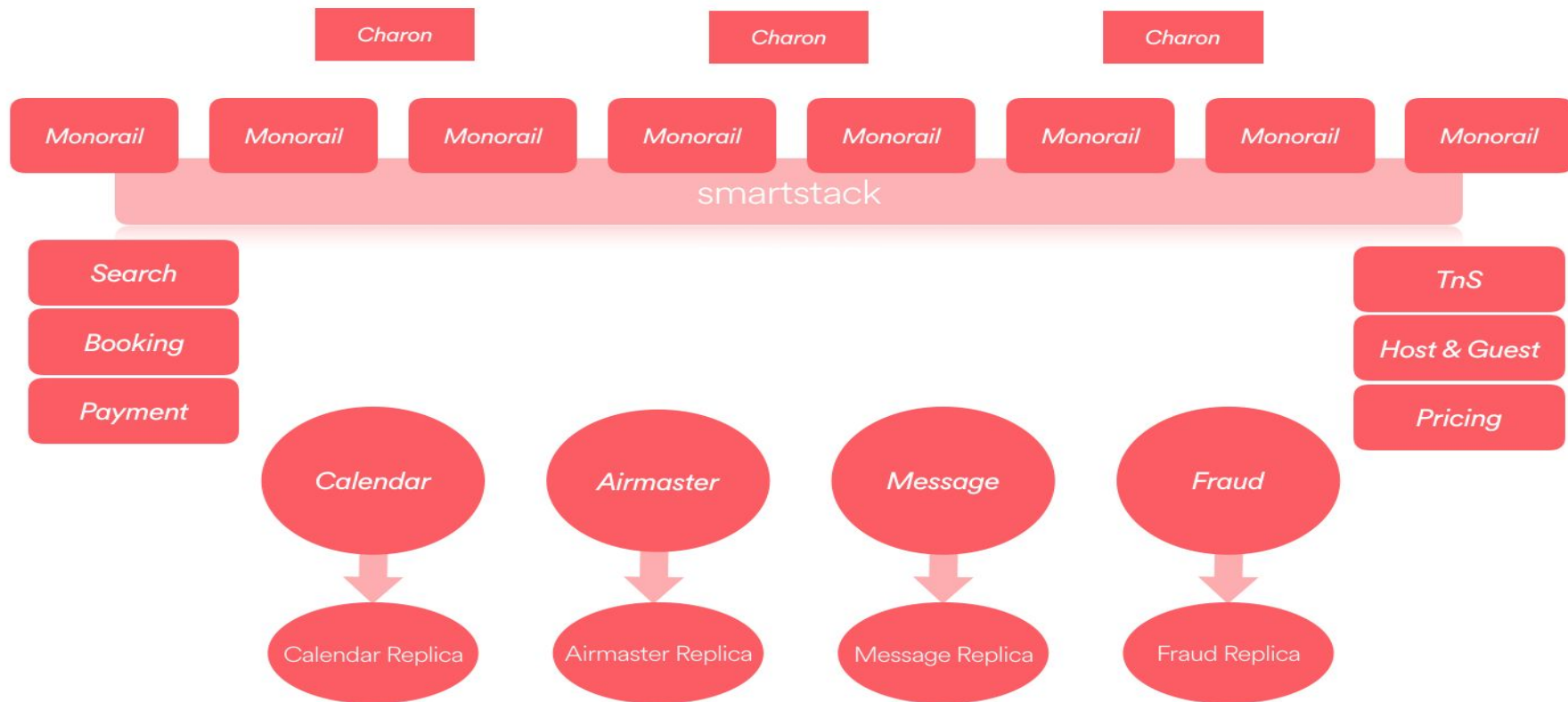Xinyao Hu / 04/27/2017 / Percona Live 2017

Spinaltap: Airbnb's Change Data Capture System

Architecture Overview

Request Processing Path

Charon

Charon

Charon

Monorail

Monorail

Monorail

Monorail

Monorail

Monorail

Monorail

Monorail

smartstack

Search

Booking

Payment

TnS

Host & Guest

Pricing

Calendar

Airmaster

Message

Fraud

Calendar Replica

Airmaster Replica
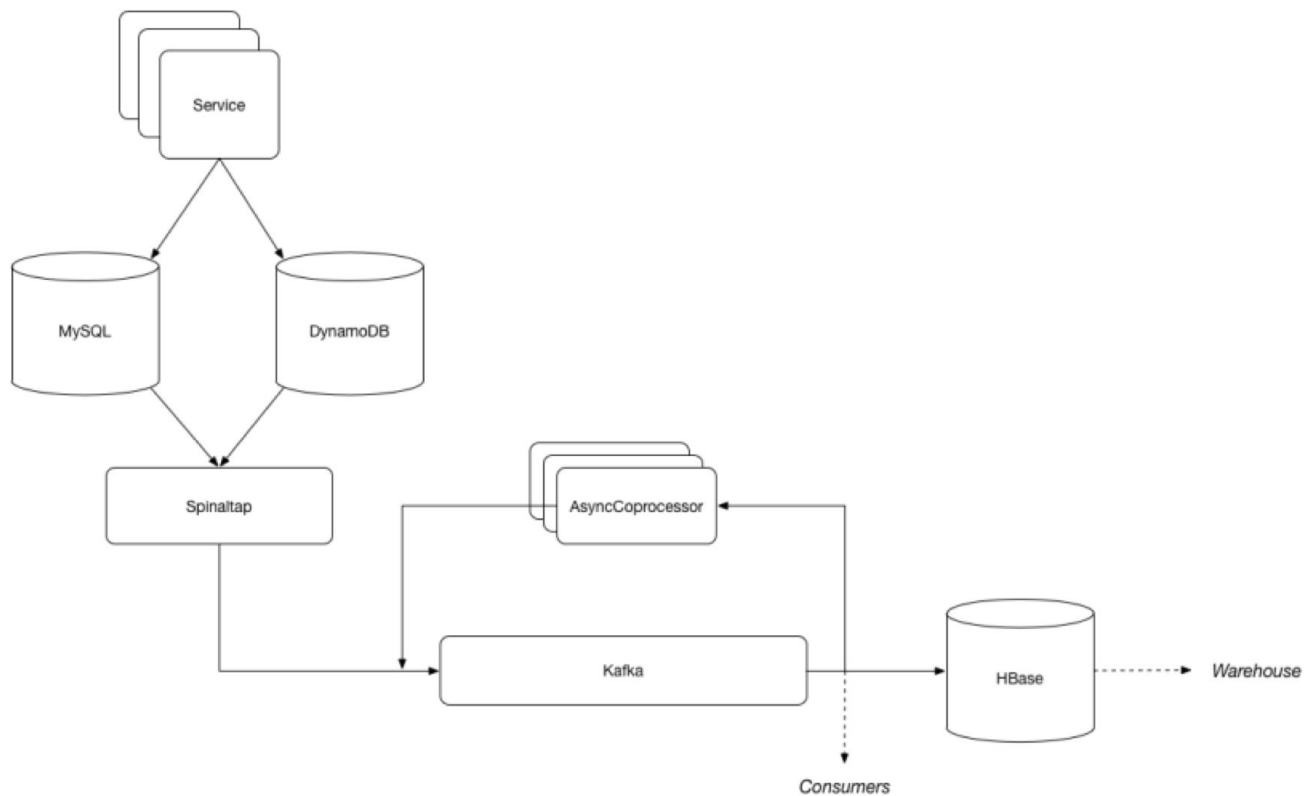
Message Replica

Fraud Replica

Design Principle

- Build for production
- Prepare for 5x growth
- Favor existing mature solution
- **Service should own its data.**
- **Data changes are populated through standardized events.**

Change Data Capture

- Timeline consistency
- Near realtime
- Strong consistency with source of truth data store

Architecture of Spinaltap

Requirement of Spinaltap

- Timeline consistency with at least once delivery
- Easy to add new data sources
- Support use cases with high throughput and low latency
- High Availability
- Support different types of data sources, such as MySQL / DynamoDB

MySQL as Data Source for Spinaltap

- Binlog events
  - write_rows, update_rows, delete_rows
- Use binlog + offset / GTID as logic order
- Use XidEvent to separate transaction boundary

DML (InnoDB)

Query	BEGIN
Table_map	table_id: 71 (test.person)
Write_rows	table_id: 71 flags: STMT_END_F

...

Xid	COMMIT /* xid=20 */

DDL

Query	use `test`; ALTER TABLE person DROP COLUMN first_name, ADD COLUMN last_name VARCHAR(255)

Spinaltap for Online Traffic

Power Airbnb Search

Sync between MySQL and
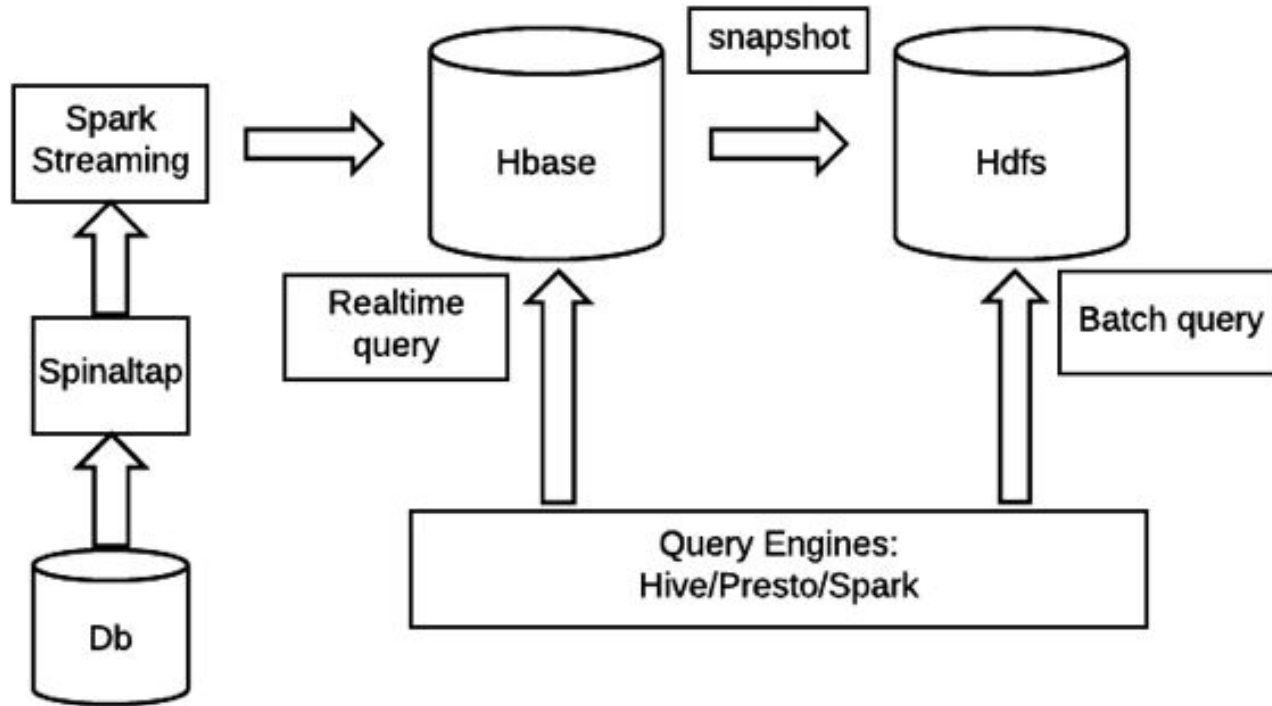Lucene Index

Memcache Invalidation
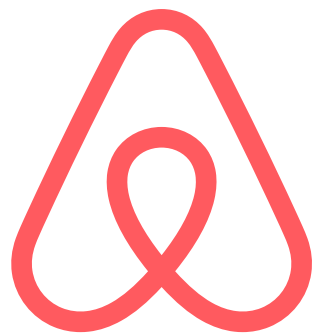
Sync between MySQL and
Memcache

Review / Message Search

Sync between MySQL and
ElasticSearch to power full-text
search and geo based queries

Spinaltap for Offline Processing