(Week-2)

fact Data - every event a user can do

huge - Petabyte per day at netflix

Fact Data Modelling

Fact - can't change it

(postgres)

- that happened or occurred

Ex. User logs in to an app

A transaction is made

You run a mile w/ fitbit - not atomic

can take to steps level - mile is agg level

- 10 - 100x of dimension data

FB - 2B Active user ~ 25 notifications per day

= ~ 50 B noti per day

- Fact need context for effective analysis - funnel of what happened after noti.
- Duplicates in facts - clicking multiple times

they bought somthg

Dimensions - Slowly changing - Easier to Model

Fact Modelling

Normalized

user_id | fact data

- No Dups
- Small scale better
- Smaller than raw logs
- Parse out Json

Denormalized

Zach | 29yr old | login time

Bring in dimensions into fact data but redundancy if

<Raw Logs> - owned by SWEs
Ugly schemas for online system
can have duplicates
Shorter retention -

<Fact>
Who → pushed as IDs (this user clicked the button)
Where → where in webpage they clicked.
How → used an iphone to make the click
What → generated, click, sent, Delivered.
When → event timestamp

<Fact Data> Nice col^n name → trusted Dataset.

2 Petabytes of data every new delta
Every network request Netflix recives every day -

Getting data of how Microservices are interacting w/ eachother.

(Apps)

Security issue if one app gets hacked then all other it talks to. - Network traffic

I.P. App Mapping

IP Address Data for all Netflix Microservices (small dataset > 5-6 GiB)

Worked for IPv4

But not for IPv6

Broadcast Join in Spark

Shuffle Join will not work.

figured out what Application it is after Join

Added a "Sidecar Proxy" in each microservice to log the App they were coming from in each network request. Introduced Denormalisation as I.P. is the identifier. - Remove need for Join

Talked to so many people App owners to install this Sidecar proxy & new Apps. ~ 3000 App owners convos.

100

Logging - contract or shared schema

Thrift at Airbnb & Netflix

Shared Schema → for specification + Language Agnostic schema

Schema description for all teams

Potential options when working w/ high volume fact data.

- Sampling - Works for metric driven use cases where imprecision isn't an issue

like S3 cost will increase if we do this

Law of large numbers → normal distribution to know direction of data not where you want to catch one specific thing.

- Bucketting - Bucket Join to reduce shuffle joins

joined on imp dimension

faster.

- SMB Joins.

Retention — cost to hold data
— legal risk - anonymize it.

Any fact table > 100TBs retention < 14 days

Deduplication of Fact data.

└ Notification dataset dedup at Fb ~ 9 hrs/day.
Do you really care if a user clicks on a notification after 2 yrs.?

Pick right window for deduplication
A day? An hour? A week?
Look at distribution of duplicates.

Deduping options in Hive
- Streaming - lower
- Microbatch - hourly

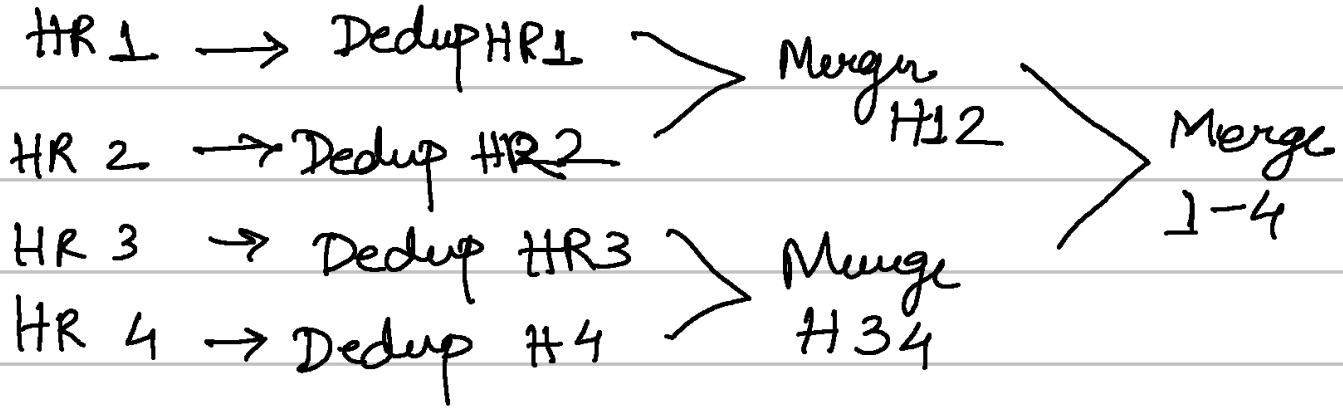
capture in small window

Entire day duplicates can be harder for streaming because it needs to hold onto such big window of memory.

Hourly Microbatch Dedup

All data for an hour for all hour
& remove all duplicates

full outer Join b/w 0 & 1 to remove dups from 2 hours 0 & 1.



Batch - low latency. scale ↑

→ Grain of the data - count(*) group by grain having count > 1.

filter to get rid of data.