Youtube Live Video Stream
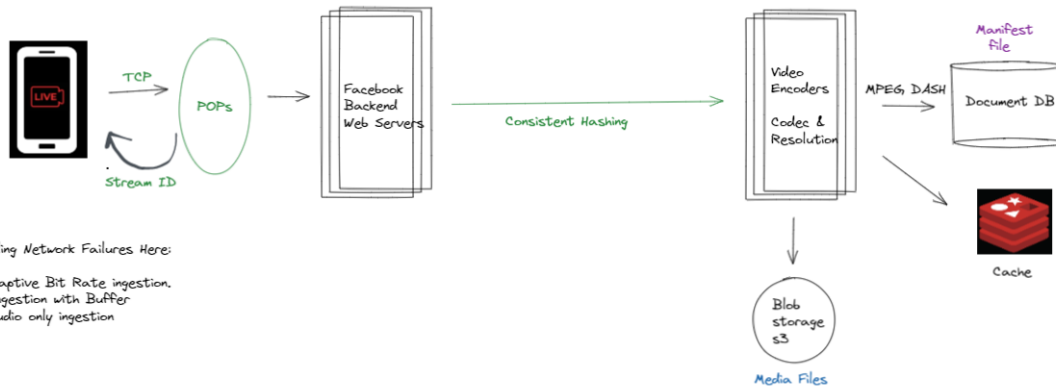
Why its HARD ???

1) Video content is produced on the fly unlike in the case of Netflix.

2) Load is un-predictable unlike in the case of ESPN.

3) Network does not always behave very well.

Broadcast → **Backend** → **Delivery** →

Stream Broadcast Flow

RTMP ---> TCP

TCP → **POPs** → **Facebook Backend Web Servers** → Consistent Hashing → **Video Encoders / Codec & Resolution** → MPEG, DASH → **Document DB** (Manifest file)

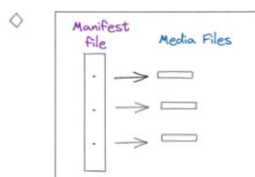Stream ID

→ **Cache**

→ **Blob storage s3** (Media Files)

Handling Network Failures Here:

1) Adaptive Bit Rate ingestion.
2) Ingestion with Buffer
3) Audio only ingestion

MPEG DASH

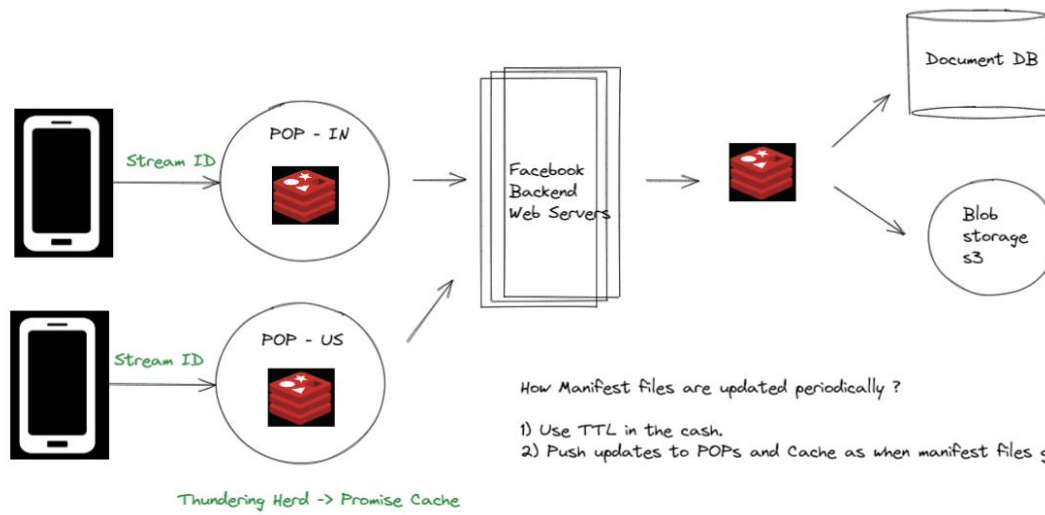◇ It is a simple protocol over HTTP

◇ **Manifest file**   **Media Files**

◇ For a given stream, FB creates one manifest file containing pointers to its media files.

◇ For a given running stream, FB creates 1 media file every 1 second and updates it in its corresponding manifest file.

◇ Clients watching a given stream, request the manifest file for that stream.

◇ Clients refresh the contents of manifest files via HTTP GET

◇ New media files are also fetched via HTTP GET.

◇ Adaptive BIT Rate

Stream Delivery Flow

Stream ID

POP - IN

POP - US

Facebook
Backend
Web Servers

Document DB

Blob
storage
s3

Thundering Herd -> Promise Cache

How Manifest files are updated periodically ?

1) Use TTL in the cash.
2) Push updates to POPs and Cache as when manifest files get updated.