

Agenda.

- Design Hotstar.
- Streaming
- live streaming.

Video Ingestion

⇒ Raw Video upload (S3/HDFS)

⇒ Codecs. (.mp4, avi, mkv, ...)

⇒ Convert into multiple resolutions.

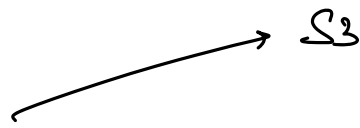
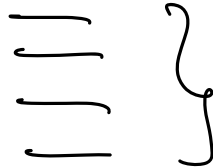
↳ 480p | 720p | 1080p | ...

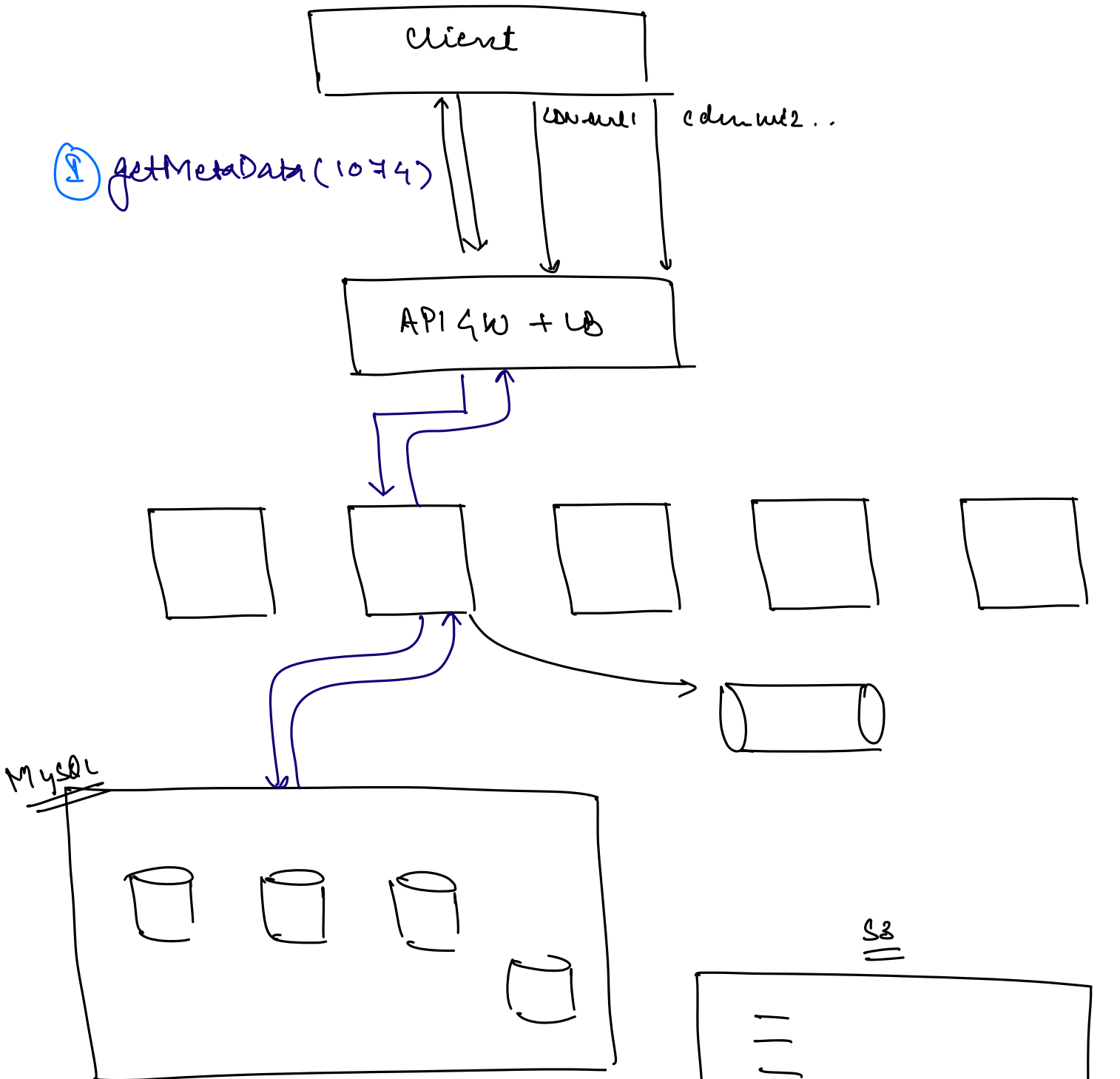
⇒ Chunks.

Asynchronously.

(Message Queues).

movie-id, Video-id, Chunks

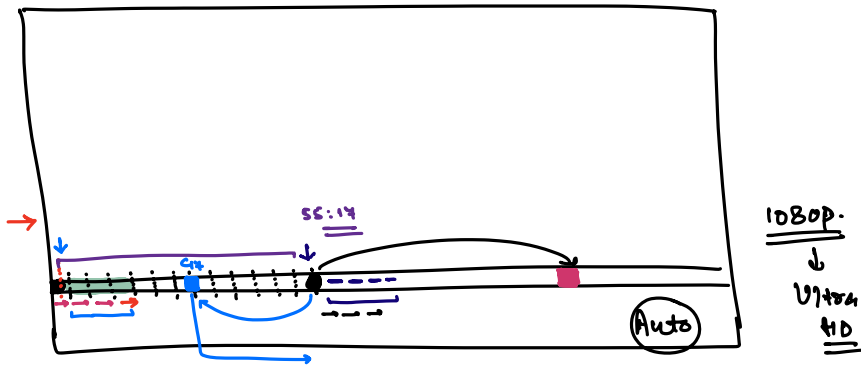
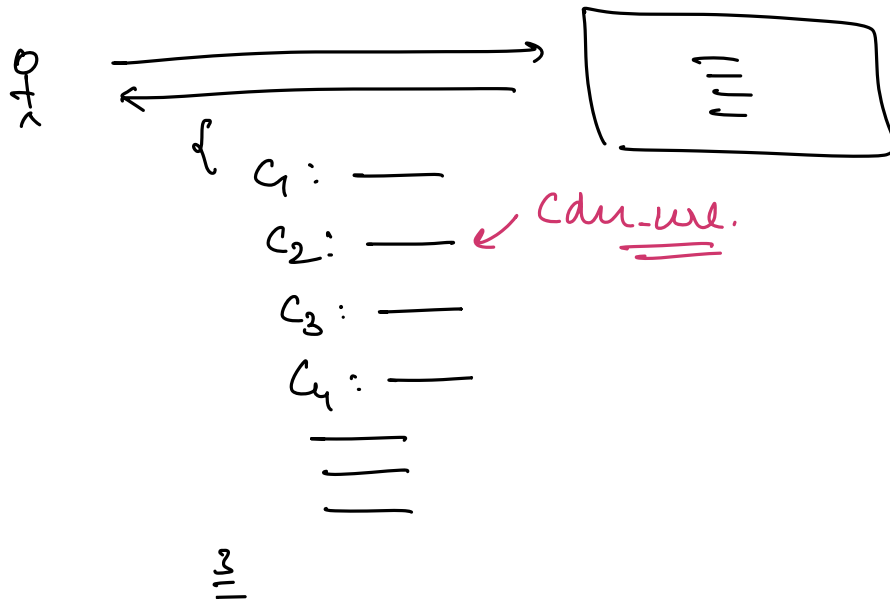




Metadata

- Movie Name
- Description
- Actors
- Trailers / Trailers / Thumbnails.
- Chunks info.

⇒ CDN



⇒ Client side cache

⇒ Processing power of Client.

⇒ Trade off b/w Buffering vs Quality.

⇒ CDN.
↓
Costly.

Akamai (vs)
↓
Costly.

Own CDN.
↓
Manage Infra.
⇒ Infra Cost.

Ans cloudfront.



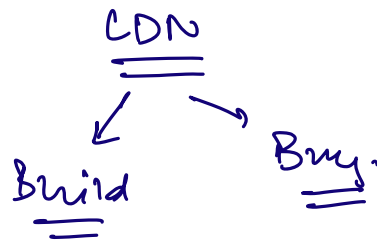
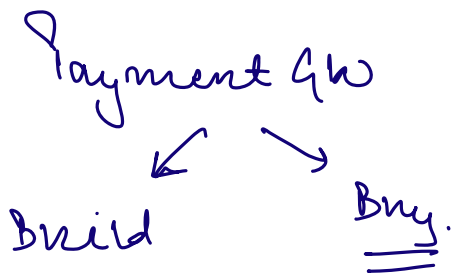
CDN.

Chunks \Rightarrow CDN.

\Rightarrow Chunks keep on getting added or removed from CDN depending on demand.

\Rightarrow Stand on the shoulder of giants.

\Rightarrow Build vs Buy.



\rightarrow CDNs

\rightarrow Codecs.

\rightarrow Chunkify.

\rightarrow Pre-emptive chunks download.

\rightarrow Client side Caching

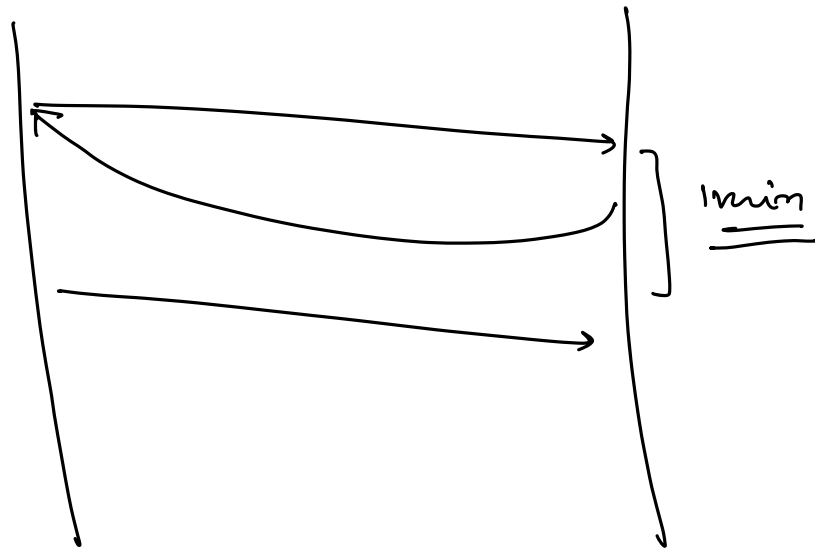
\rightarrow Adaptive Bitrate streaming.

Live Streaming

⇒ In case of movie streaming, we have enough time to spend on the video ingestion part so that we can ingest the video effectively.

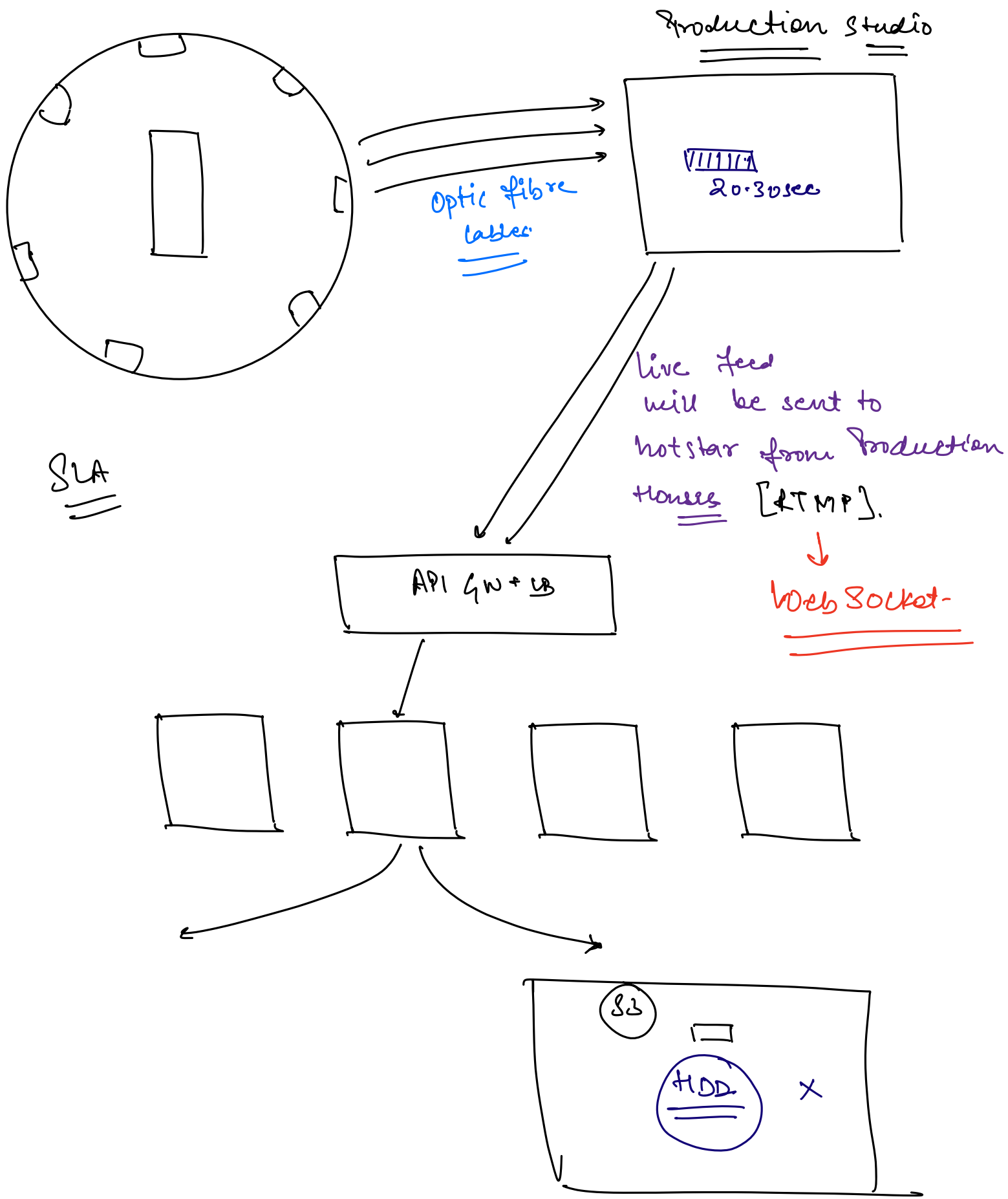
⇒ In case of live streaming, we constantly keep on getting data that we need to upload, we don't have pre-processing time.

⇒ Web Socket (vs) long Polling.



⇒ lot of N/w calls.

↳ Web Socket.

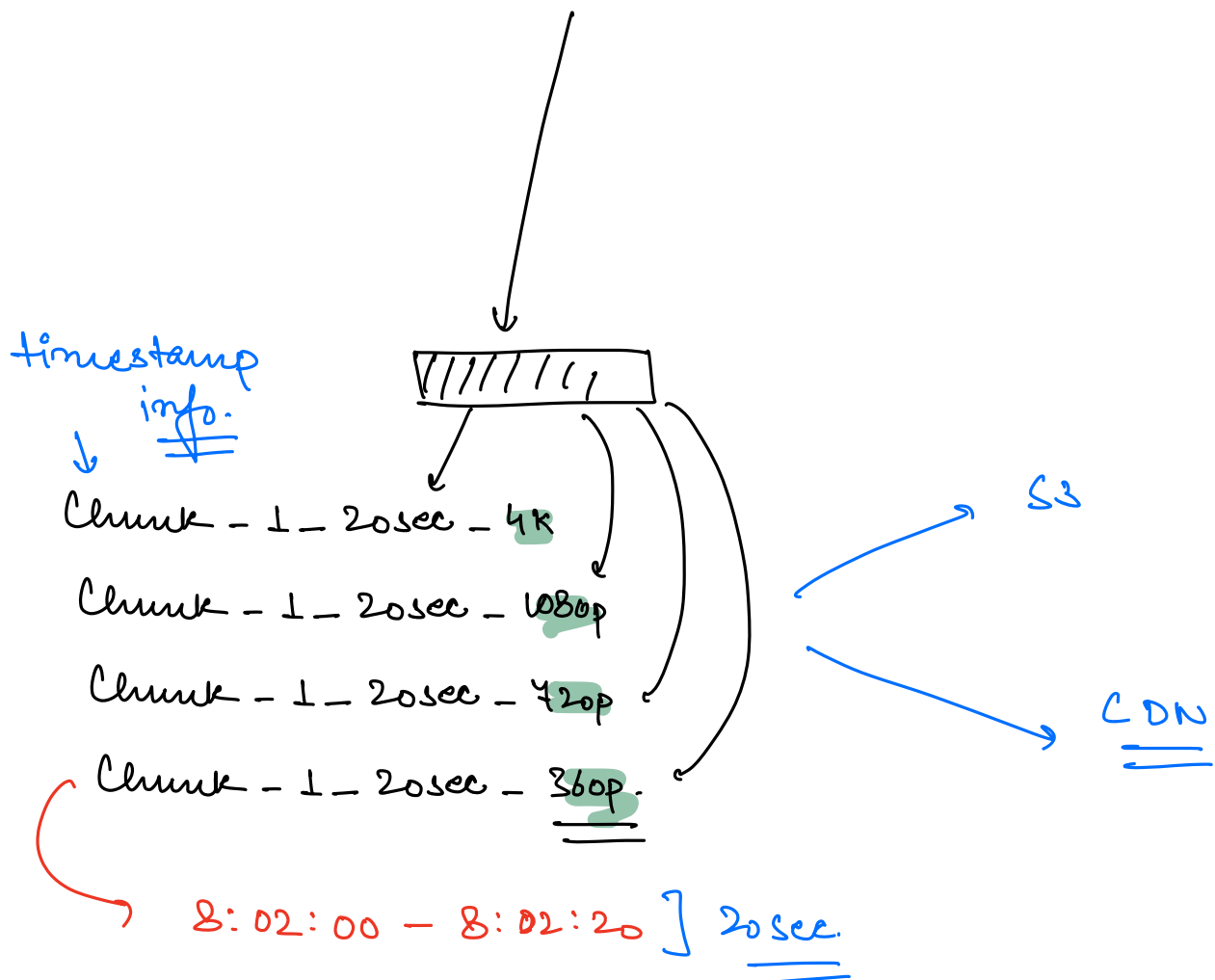


⇒ Hotstar uploads the chunks on CDN.

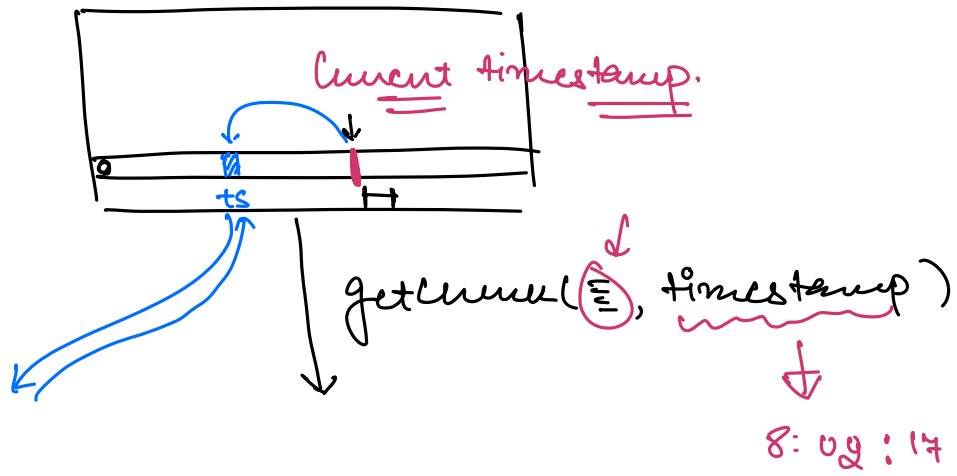
⇒ Production house sends video to Hotstar after every 20-30 sec.

⇒ Hotstar triggers video ingestion process.

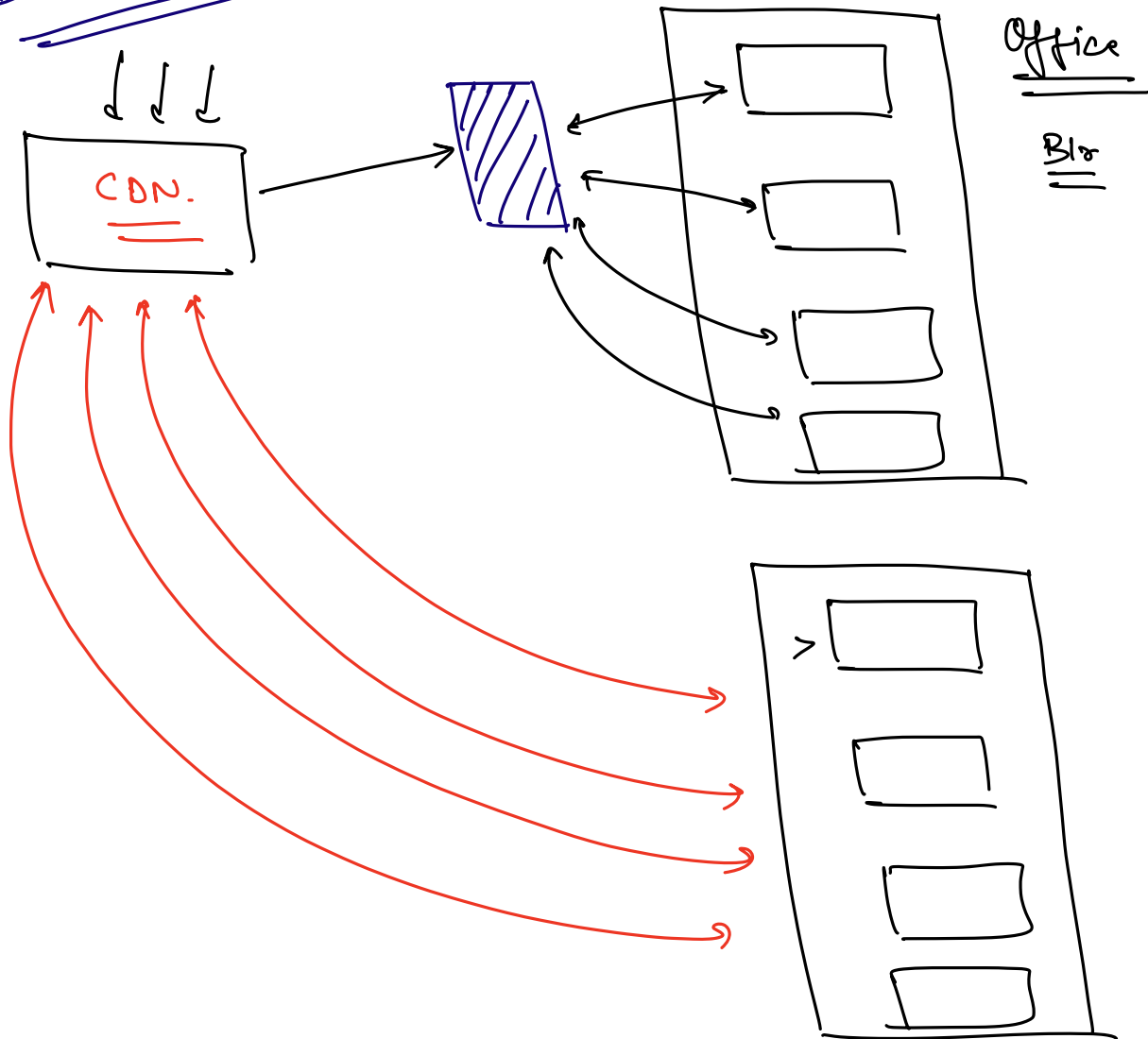
⇒ Production house sends very high quality video to Hotstar & Hotstar converts that video into different lesser resolutions.
(format)



Hotstar



BottleNeck.



latency \propto Distance

CDN : Geographically distributed Nodes.

Deploying Data closer to the user as much as possible.

