How does Cloud support OTT Platforms in delivering content seamlessly?

19CSE447 – Cloud Computing – Case Study

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INTRODUCTION

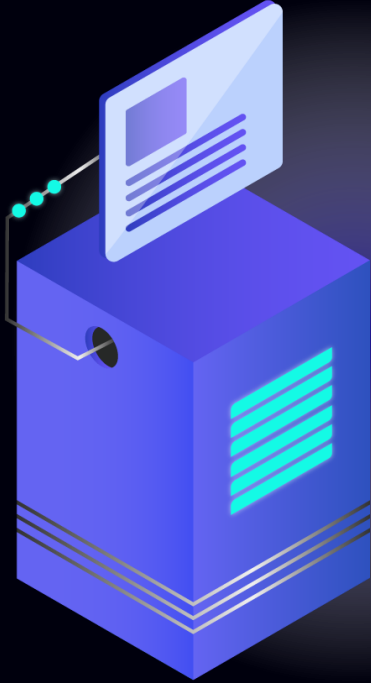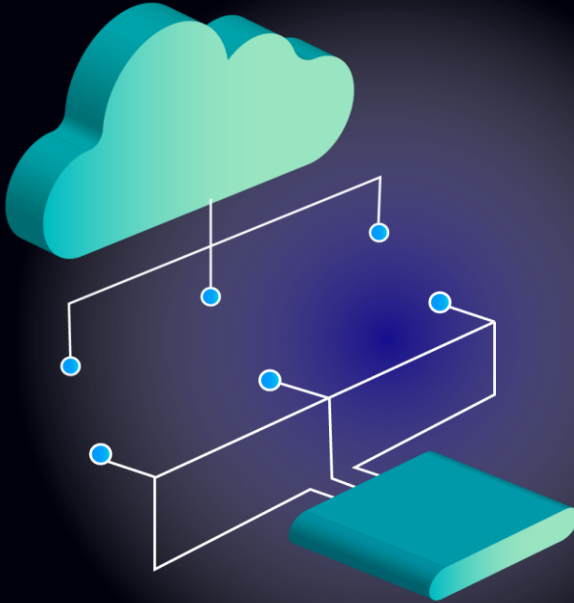As video streaming business grows in popularity, businesses are looking for the most reliable, secure, and scalable cloud video streaming. As you know, due to this current COVID scenario, people around the world are consuming more content than ever before.

Cloud video

- Streaming occurs when we tend to deliver data to internet-enabled devices and play that data in real time.

- The internet – enabled devices use cloud servers where the videos are delivered over the internet and can be accessed anytime, anywhere at your own pace.

The famous OTT platforms

Netflix

Amazon Prime

Hotstar

Eros Now

Zee5

Voot

WORKING

- Cloud-based streaming software relies on a network of cloud servers that are dedicated to hosting video files and efficiently delivering this content to viewers.

- Once broadcasters upload files to these cloud streaming servers, they're encoded and trans-coded into a variety of formats that are ready for playback.
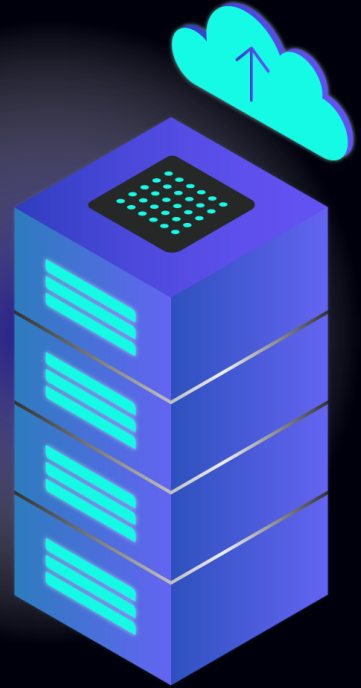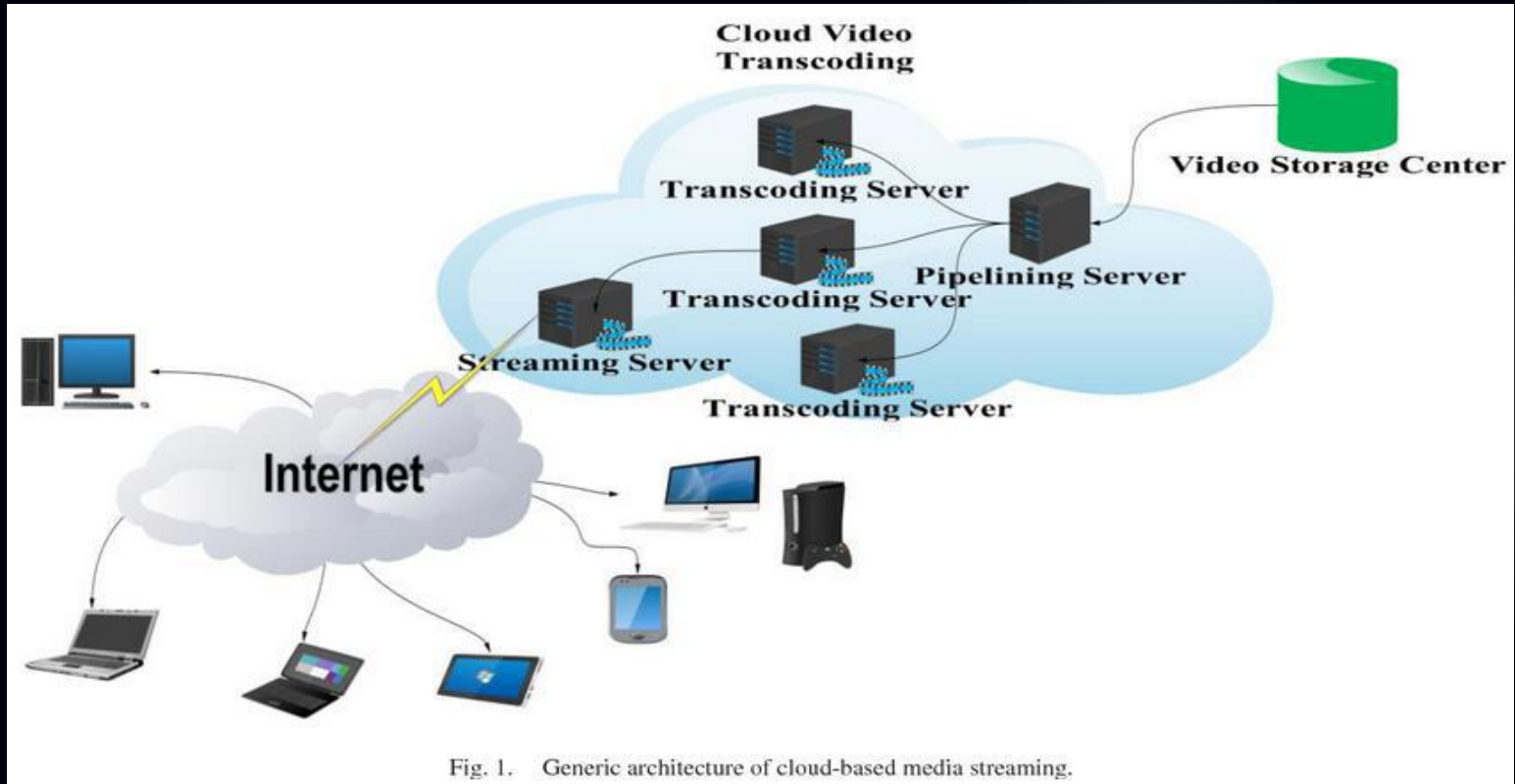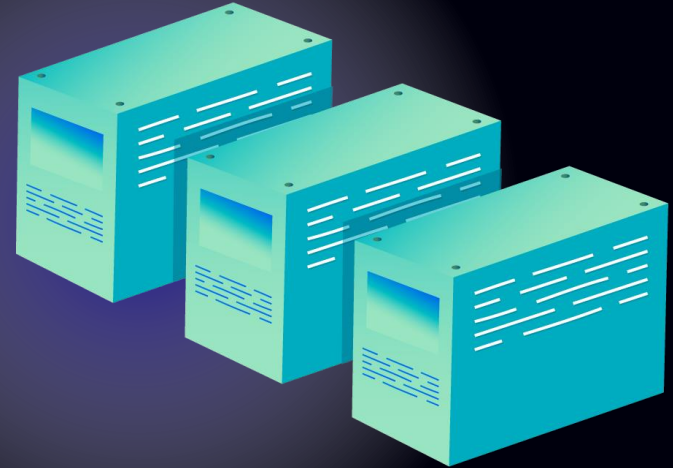
Fig. 1. Generic architecture of cloud-based media streaming.

Cloud Transcoding

- Cloud transcoding is the process of converting a video file into additional formats entirely in the cloud.

- More specifically, transcoding means creating new files in different sizes, resolutions, and bitrates from a single encoded video file.

- While video compatibility is crucial, the most common use case for cloud transcoding is Adaptive Bitrate Streaming (ABS).

Cloud based Workflow for Video Streaming

Ingestion → Monitoring → Encoding → Ad Insertion → Protection → Packaging & Publishing → Delivery → Playback → Analytics

Fig 3: A cloud based work-flow for providing a quality streaming experience to end consumers

- This functional work-flow is aided by infrastructure components which includes:

a) Content Management System (CMS)

b) Failover and Redundancy management hardware .

HLS and DASH

- MPEG-DASH is a streaming method. DASH stands for "Dynamic Adaptive Streaming over HTTP." Because it is based on HTTP, any origin server can be set up to serve MPEG-DASH streams.
- HTTP live streaming (HLS) is one of the most widely used video streaming protocols. Although it is called HTTP "live" streaming, it is used for both on-demand streaming and live streaming. HLS breaks down video files into smaller downloadable HTTP files and delivers them using the HTTP protocol.
- MPEG-DASH is similar to HLS, another streaming protocol, in that it breaks videos down into smaller chunks and encodes those chunks at different quality levels. This makes it possible to stream videos at different quality levels, and to switch in the middle of a video from one quality level to another one.

CDN's have long been used for speeding up the delivery of content to end consumers.

a) On Demand Video CDN:

The underlying principle is that video content is no different from serving a large file or application.

b) Live Video CDN:

Live video CDN's are particularly useful for optimizing the delivery of live video content by ensuring lower latency, lower packet loss and high availability.
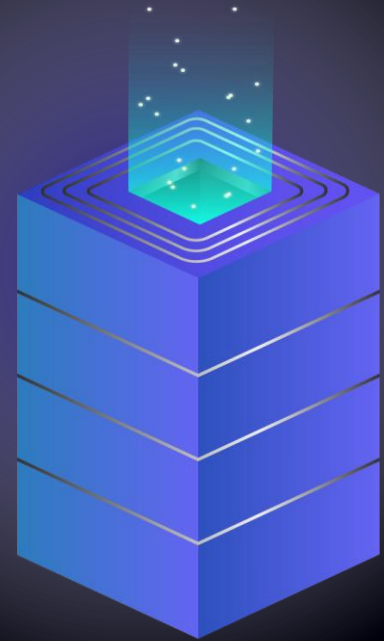
Real Life Scenario

- **Disney+ Hotstar** as an example and analyze how they manage to deliver content seamlessly for huge number of users.

- This owned by Star India as of July 2020, with around **300 million** active users and over **350 million** downloads.

HOTSTAR LOGIN PAGE
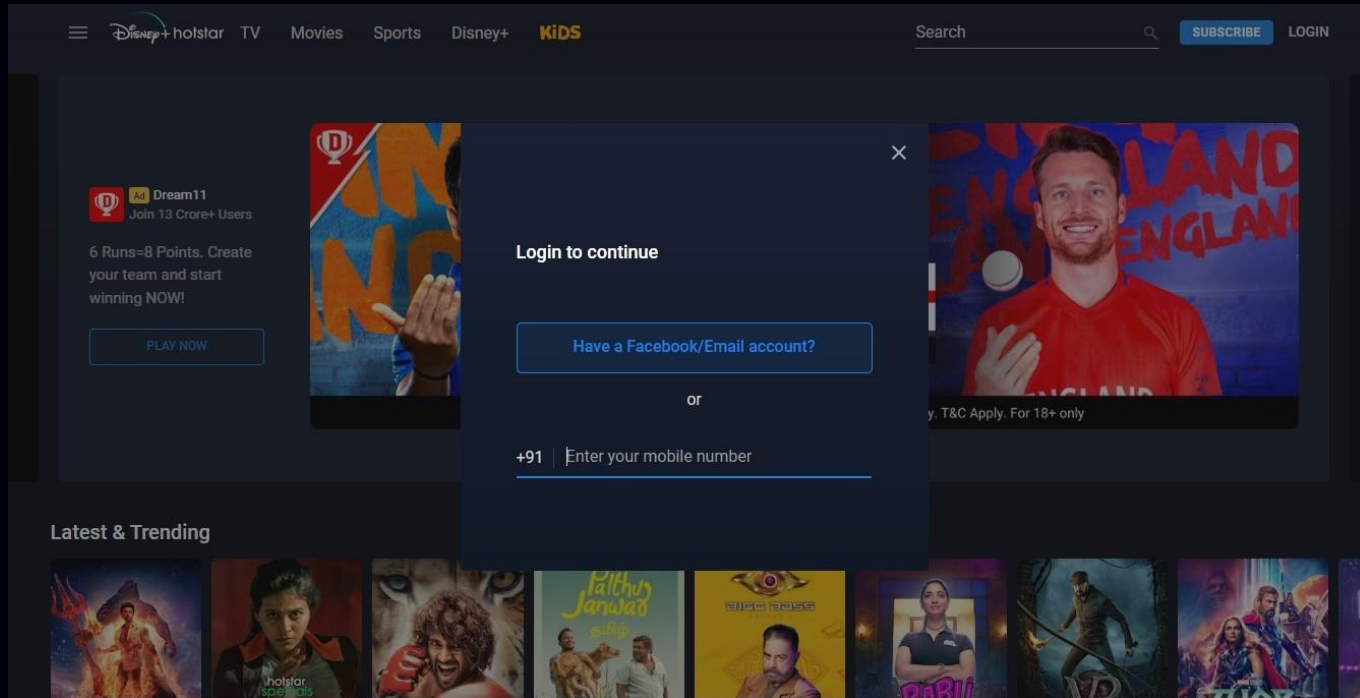
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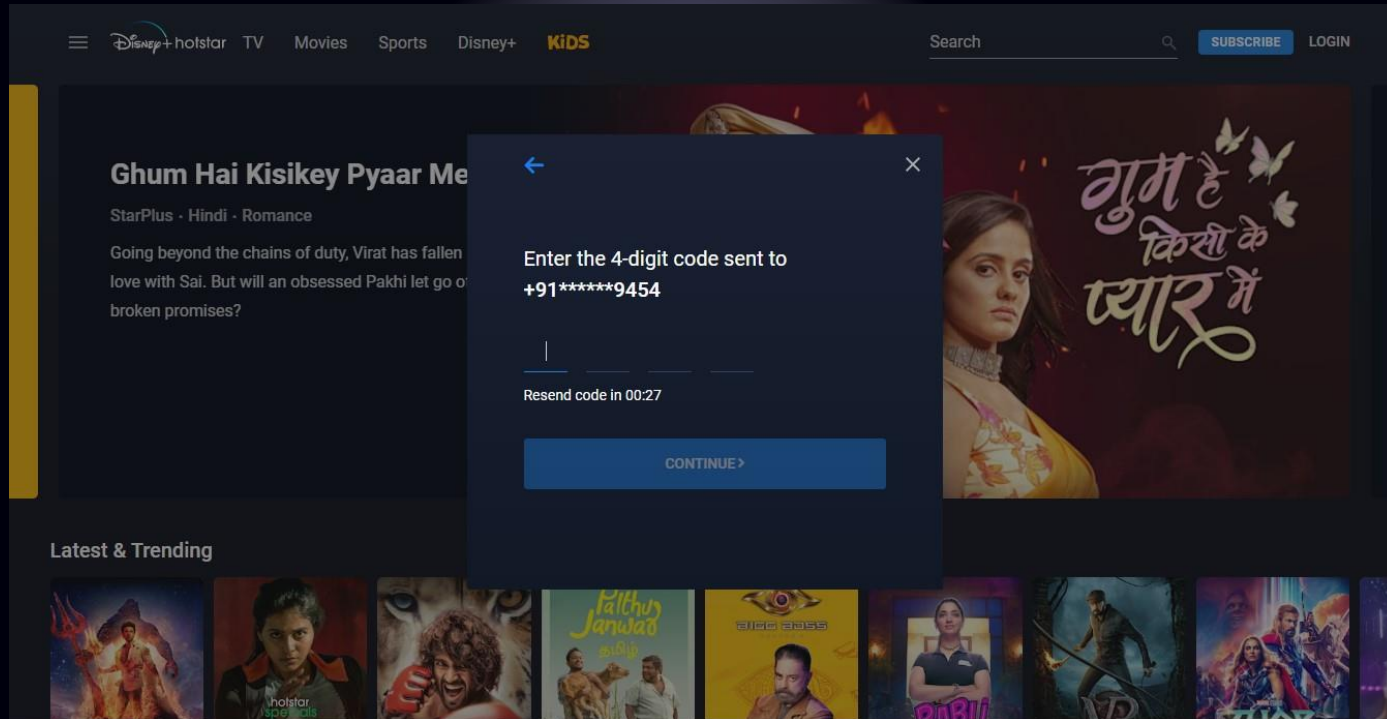
HOTSTAR HOMEPAGE

HOTSTAR ACCOUNT
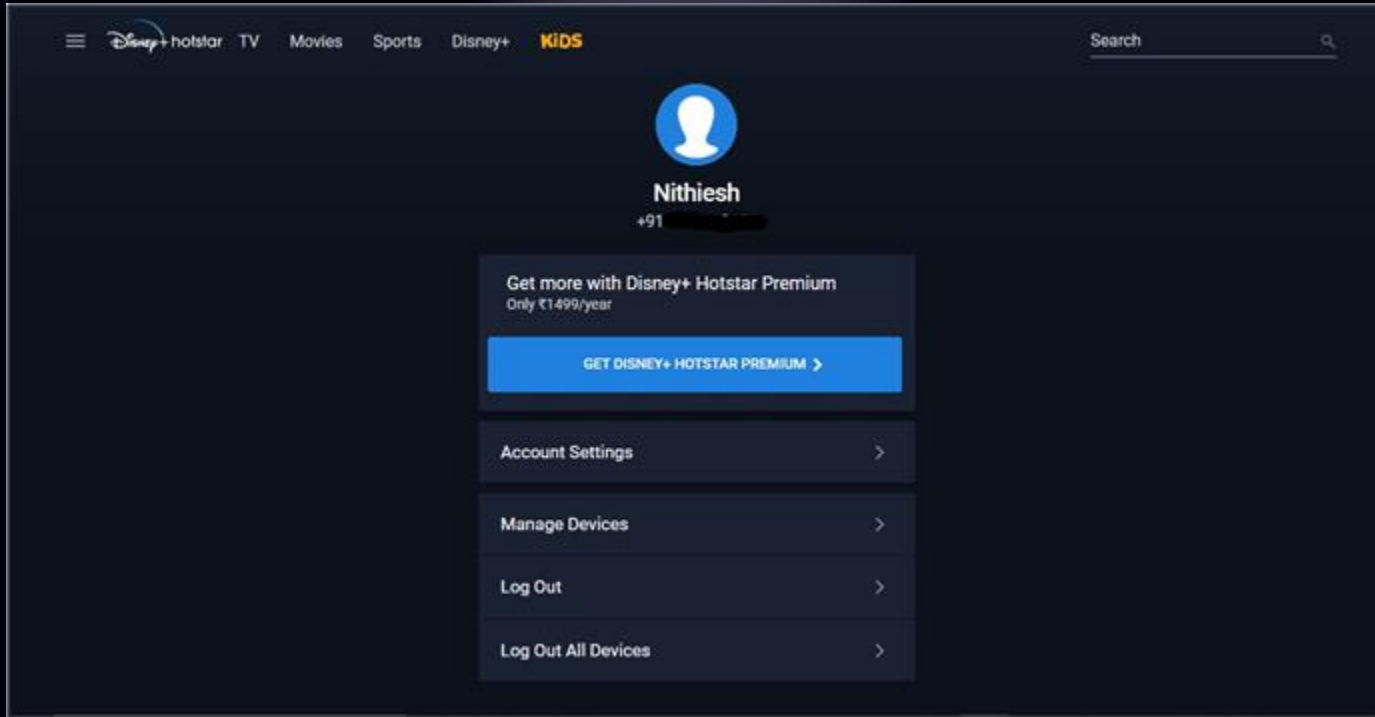
HOTSTAR CHANNELS

HOTSTAR STREAMING

HOTSTAR SERIES

Hotstar with 25M users

India vs. New Zealand cricket match in 2019.

Hotstar with 25M users

25.3 M

13.9 M

1M+

Hotstar faced the challenge of handling **25.3 M** concurrent users in live streaming.

13.9 M is the first peak before it started raining, and the game was postponed to the next day.

They received around **1M+** peak requests per second. The bandwidth consumption was more than 10TB per second.

Hotstar with 25M users

Hotstar with 25M users

- During that time Hotstar was using **AWS** (Amazon Web Services) as their cloud provider. Hotstar followed a new strategy called **Project HULK**.

- It involved Load generation, Performance and Tsunami tests.

- By utilizing the power of cloud, they have distributed the system across 8 geographical locations to handle the load.
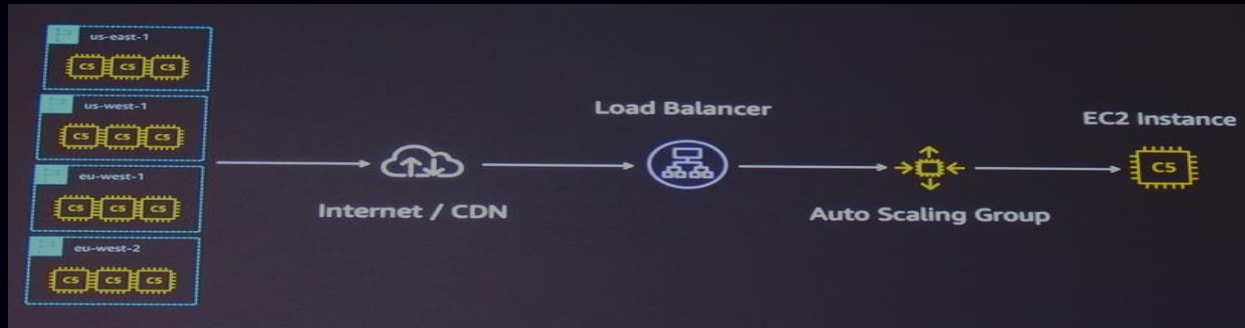
Hotstar with 25M users

- Battle tested scaling strategy is used by Hotstar.

- It scales up based on request count or platform concurrency.

- They are also prepared for the worst-case mode.

- To keep critical components running; so they turned off recommendations or personalization .

Future of OTT

- As we know there are multitude of cloud based streaming for content businesses to choose & leverage with its newly-packed features, you can quickly take a glance of them individually.

- Ultimately, broadcasters, content providers or professional streamers like need to determine their business hosting needs & weigh several options accordingly .

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THANK YOU

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