SYNOPSIS REPORT
On

Online Streaming Platform with AWS as Backend

Submitted by:

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MAJOR -1

PROJECT TITLE:

Online Streaming Platform with AWS as Backend.

ABSTRACT:

User Generated Content (UGC) forms the backbone of many popular online streaming services. As internet access grows, more and more people are using apps and services to share their personal experiences with a global audience.

In recent years, live video streaming services featuring user-generated content have become an effective way to connect with others who share similar interests or are experiencing broadcaster-mediated events.
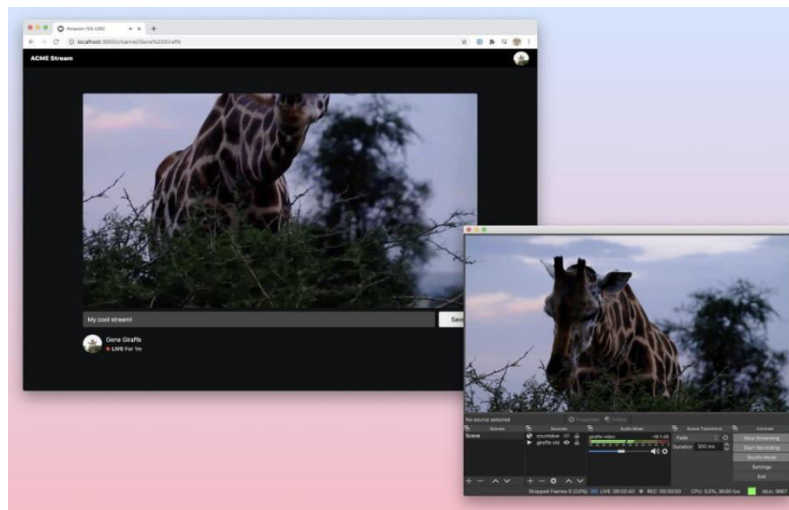
Fig 1. Reference Online Streaming Platform

It is Live streaming is becoming very popular, but building and maintaining a large scale global live video distribution system can be challenging. It's about providing a platform for streaming online using AWS services and an interactive interface for user interaction as indicated in the Fig 1 below [1].

INTRODUCTION :

Online streaming platform service that allows users to upload video-based media content.Users can upload, watch, search, like, dislike videos, add comments to videos. Users can only upload/delete videos as a logout user, but they can also search for and watch videos as a logout user. This is a free advertisement-supported service, so users will see advertisements while watching the video. Users can also follow other users or channels using their accounts. Furthermore, users can only add comments to videos after logging into the system.

Before beginning to design any system, such as a photo and video sharing social networking service system, it is recommended to carefully consider system boundaries and requirements, as well as to try to understand what the system capacities will beAn "Online Streaming Platform" is an on demand online entertainment source for TV shows, movies and other streaming media. There is a substantial need of creating static buckets with transcoded videos to deal with the problem of network latency with respect to the availability zone in which the server for the same application is hosted . Hence the application deals with the same methodology of creating transcoded buckets using the lambda triggers to solve the problem in real time environment . Many businesses and organizations require secure streaming solutions. In particular, groups such as healthcare institutions, universities and schools, corporations, OTT and media companies, intellectual privacy and piracy organizations, lawyers and government agencies must consider security an absolute necessity [4] .

AWS provides an easy way to stream video using Amazon S3 and Amazon CloudFront. I don'twant to set up a server to convert the video to another output format. Fortunately, in this post-cloud world, AWS offers serverless options. This post shows how to build a fully automated and secure video-on-demand solution using AWS services as indicated in the figure 2 below [3].An "Online Streaming Platform" is a website that provides on-demand access to TV shows, movies, and other streaming media. Users have the ability to upload, watch, and search.
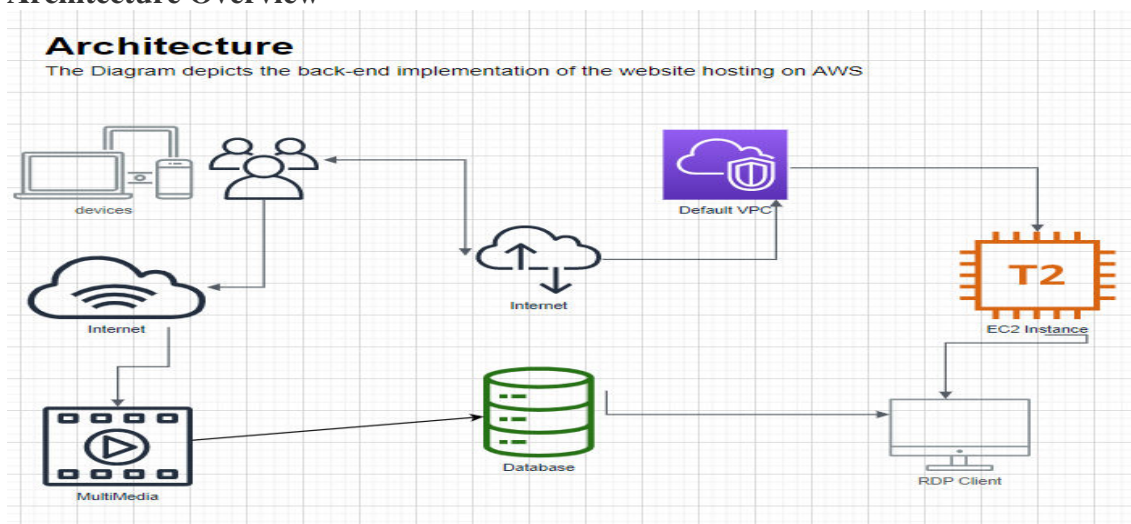
Architecture Overview

Fig 2 : The overall flow of the process for uploading files.

Today, more and more businesses are using video streaming platforms to host and share their content. Both live streaming and video on demand (VOD) are very powerful tools that businesses and businesses can use to increase revenue, communicate effectively, and reach audiences.

Literature Review:

Agarwal et. al [1] proposes online streaming function presented to the end user or the target audience is continuously received by the provider with the most central and well-known services such as Amazon EC2 and Amazon S3. These services are much faster, scalable and cost-effective than building a physical server farm. In the current system, media streaming is done on computers and is not used for common people. That is why this system is designed to enable media streaming to any user using smartphones. The main objective of this proposed system "Cloud Enabled" streaming using Amazon Web Services" is to stream media files through a media server using AWS. media server uses Amazon EC2 server to stream and store multimedia files. Storage of multimedia files is done in EBS and Simple Storage Service (S3) maintains a backup of these files.

Li et. al [2] proposes that cloud technology is adopted due to the great features provided to video stream providers, such as high flexibility of using virtual machines and storage servers at low prices. Video streaming providers prepare multiple formats of the same video to satisfy the device specifications of all users. Video streams in the cloud are either transcoded or stored. However, storing all video formats is still expensive. In this research, we develop an approach that optimizes cloud storage. The proposed method reduces the cost of using cloud services by up to 22%.

Iturriaga et. al [3] states that when we transcode the videos on Amazon Elastic Cloud Computing (EC2) or Virtual Machines (VMs) to further study realistic cloud settings with fine-tuned configurations. Our experiments show the superior performance of some codecs and the effects of machine configurations on transcoding tasks duration. Which generalizes to the idea of a benchmark for practitioners and researchers considering online transcoding in real-time multimedia applications .

Alfayez et al. [4] suggests that during COVID-19, a transcode the videos on Amazon Elastic Cloud Computing (EC2) or Virtual Machines (VMs) to further study realistic cloud settings withfine-tuned configurations, knowledge, and skills, they only provide generic information and do not provide reliable resources from the student's perspective. As a result, a web-based learning system was created in this study to assist University of Basrah students with their academic work throughout the epidemic.

Author and year	Approch	Parameter	Advantage	Limitation
Agarwal et. al 2021	online streaming function presented to the end user or the target audience is continuously received by the provider with the most central and well- known services such as Amazon EC2 and Amazon S3	services such as Amazon EC2 and Amazon S3	The Idea was found to be scalable and cost-effective	In current system, media streaming is done on computers and is not used for common people which is manual and not on cloud.
Li et. al 2021	that cloud technology is adopted due to the great features provided to video stream providers, such as high flexibility of using virtual machines and storage servers at low prices	Services Amazon Elastic Cloud Computing (EC2) or Virtual Machines (VMs)	Video streams in the cloud are either transcoded or stored.	IT was found that storing all video formats are expensive.
Iturriaga et. al 2018	transcode the videos on Amazon Elastic Cloud Computing (EC2) or Virtual Machines (VMs) to further study realistic cloud settings with fine-tuned configurations	Amazon Elastic Cloud Computing (EC2) or Virtual Machines (VMs)	It generalized the idea benchmark for practitioners and researchers considering online transcodingin real-time multimedia applications	effects of machine configurations on transcoding tasks duration
Alfayez et al 2022	transcode the videos on Amazon Elastic Cloud Computing (EC2) or Virtual Machines (VMs) to further study realistic cloud settings with fine-tuned	S3 and EC2	a web-based learning system was created in this study to assist University of Basrah students with their academic work throughout	The website used generic information and did not provide reliable resources.

	configuration7		the epidemic.	

Marino et al 2022	incorporate IoT technology to increase the accuracy of wind generation forecasting and improve the results of the MG stochastic optimization model	Amazon Web Services (AWS) IoT analytics platform	The stochastic model is solved using the Sample Average Approximation (SAA) algorithm. The innovative methodology leads to significant improvements in the total average operating cost by integrating AWS IoT.	problem is formulated using a two-stage stochastic mixed-integer linear programming problem with recourse
Sharma et al 2022	study used Eisenhardt's multiple case studies approach to derive the strategies used by the top-performing subscription-based OTT platforms in India	ease of accessibility, risk of contracting COVID-19, variety and quality of content, online reviews and affordability drive consumer preference for OTT	derived strategies for maintaining resilience and the in-depth insights into habit formation and consumer behaviour during and after the COVID-19 pandemic.	increased competition, and shaped consumer behaviour and habits. Despite this knowledge, in-depth insights into OTT's consumer behaviour
Habib et al 2022	examine the relationship between digital media marketing, consumer engagement, brand image, and purchase intention of OTT platforms in the Indian context.	role of consumer engagement and brand image in mediating the relationship between digital marketing practices	H2: the higher the influence of DMM, the higher the customer engagement towards OTT platforms.	sad difficulty in this situation is that not all OTT platforms have the financial resources to explore new video content development
SH Liao Et al 2021	determine how online streaming proprietors and their affiliates are disseminated using online streaming consumer behaviors in terms of online recommendations for further electronic commerce development.	Rough set theory (RST)	provides the user with the stored value to purchase virtual gifts from the live streamer or Internet celebrity, or provide services, such as higher viewing quality	users to directly consume via live streaming
Tichem et al 2018	The BKart is now doing a market assessment on digital comparison tools after the UK Competition and Markets Authority (CMA) looked into them.	Google android Operating system and AdSense	Even if there is a penalty, social networks are not allowed to violate data protection laws.	In order to further the conversation on platforms and identify potential issues with competition and consumers, a number of authorities have issued white papers or market studies.

Mohit et al 2018	Serverless Computing, and Function as a Service (FaaS), explores its advantages and limitations, options available with popular cloud and Platform as a Service (PaaS) providers, and emerging use cases and success stories.	Serverless Computing	serverless architectures allows the developers to focus on business logic exclusively without worrying about preparing the runtime, managing deployment and infrastructure related concerns	piece of code (in one of the multiple programming languages supported by the platform) dedicated to do a focused, often single task that are invoked by triggers
Basuki, Ribut et al 2022	Theory is applied to the technology acceptance model, and practitioners in the film industry gain insight into improving customer behavioral intention in the pandemic era.	Smart PLS software	ease of use, usefulness, enjoyment, and intention to use online platforms	Pandemic Covid-19 has resulted in disruption in various industry and business sectors
Liu et al 2022	**OCRs optimal pricing and quality decisions under the basic models and further examine the OCRs sales efforts in the extended model.**	**extensive numerical studies of the basic and extended models**	**OCRs costs of handling returns and maintaining sales channels can help the supply chain achieve the win–win outcome for both the OCR and consumers.**	**construction cost of the live-streaming platform is low, the OCRs product quality and price will decline.**
Lia et al 2022	**behaviors of various users of FB Live in Thailand through an empirical survey research. There are 3081 valid questionnaire data**	**data mining analytic methods, including association rules and K-means clustering analysis, based on a relational data database development**	**how streaming transfers from its audio and video broadcasting role of social media/social network leisure and entertainment usage to social commerce and business development**	**Quite expensive technology from user point of view.**
Camilleri et al 2020	a structural equation modeling (SEM) approach to explore the measurement quality of this research model . SEM-partial least squares (PLS) 3 confirmatory composite analysis' algorithm revealed the results of the reflective measurement model (Hair *et*	PLS algorithm	model's predictive power, in terms of the coefficient of determination (R^2) of the endogenous latent variables. It also shed light on the effect (f^2) of each exogenous construct on the endogenous constructs	seek to gratify their intrinsic and extrinsic needs through habitual consumptions of media technologies

Lee, Minhyung, et al	increased Internet penetration led the decline of music record sales, after the stabilization of the online music platform and the introduction of online streaming services	Internet penetration	Analysis suggests that online streaming positively impacts music record sales.	prefer male artists, have a higher willingness-to-pay for individual services
2016				

Problem Statement :

The global Online Streaming platforms market is currently rising with almost USD 45.1 Billion in 2021 and is expected to somewhat cross a value of USD 123.67 Billion by 2028 in accordance to a report by Gartner Quadrant, hence there is a need of establishing professional streaming workflows without worrying about the hardware and technical challenges along with on premises infrastructure scaling .

Online streaming cloud platforms gives us an advantage of both end to end video streaming capability reduced the considerable operation costs large scalable storing capability.

- Before beginning to design any system, such as a photo and video sharing service system, it is proposed that the system boundaries and requirements be thoroughly investigated.

- This is critical since if the system's user count grows exponentially, the system's capacity will eventually be grossly inadequate to even provide fast response.

- Architectural design must take into account five pillars (availability, reliability, resiliency, durability, as well as cost performance).

- These are the pillars that we should consider together because they are interconnected.

Objective

Following are the goals that we are planning to currently implement in our system-:

- Users must be able to create an account.

- When users log in, they must be able to upload and delete videos from the system.

- User is able to stream the uploaded videos on-demand.

Methodology

- We would require one EC2 instance. The AMI used for this is windows base 2019 X64 t2.micro.

- While defining the security rules we are allowing the HTTPS , HTTP and RDP.

- RDP is said to custom IP,HTTP and HHTPS are set to Anywhere(for IPv4, IPv6)

- After creating the instance we have to make sure that the .pem file used is correct one.

- Then we will connect the instance using RDP available for windows.

- We have to make sure that port 3389 is open.

- Then we will use Xampp server to host.

Pert Chart:
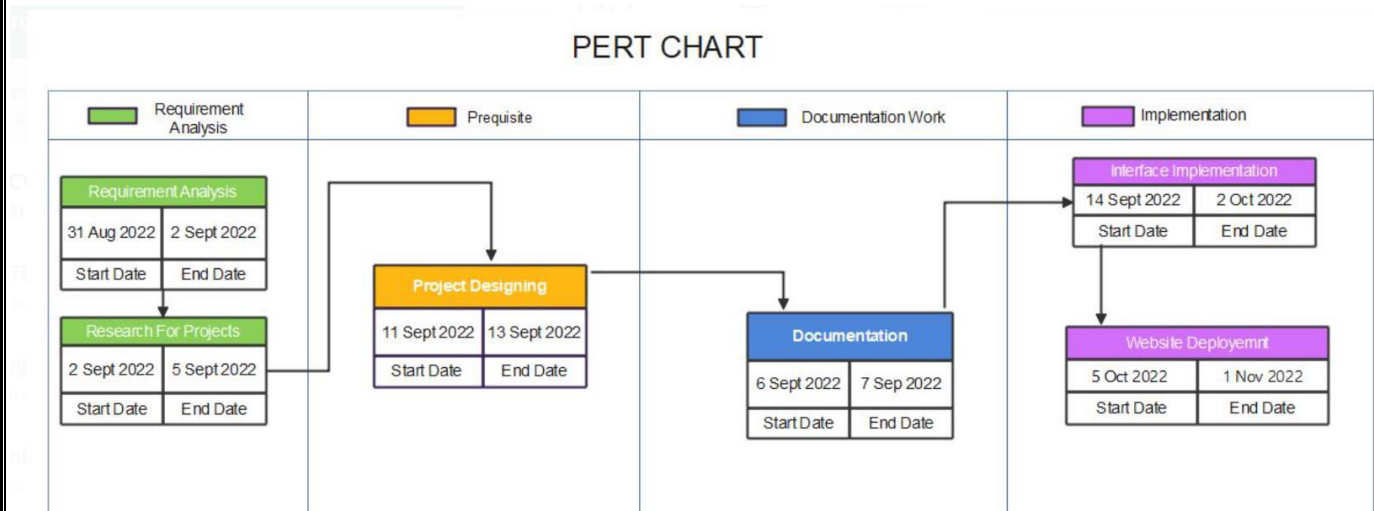
Technical Stack

Platform used : Amazon Web Services

Version Control : GitHub

Database : (Relational) MySQL

Development : Backend -: AWS

          Frontend -: PHP

          Scripting Language : PHP Scripts (executed on the server)

Services of AWS Used : 1. EC2 instance

                    2. AMI – Windows base 2019 , t2.micro X64

                    3. Protocols : HTTPS,HTTP,RDP

                    4. Port 3389 (Must be open)

SWOT Analysis

Strength

1. Uses t2.micro hence no network latency issues.
2. The model can be scaled up and down accordance to the need of business.

Weakness

1. The model still requires working on android interfaces.
2. The rising demand for storage capacity is due to increased electricity, energy, and fibre capacity use. To handle the multiple versions that are generated, more storage is required.

Opportunity

1. Using simple cloud platform with no downtown issues leading various business opportunity like advertising.
2. We can even automate several functionality daily functionality making more practically feasible.

Threat

1. In modern era website like these are prone to attacks which can lead to loss of data and integrity of users.
2. Because the content displayed on these platforms is unregulated, various petitions have been filed in courts seeking to impose restrictions on the content displayed on these platforms.
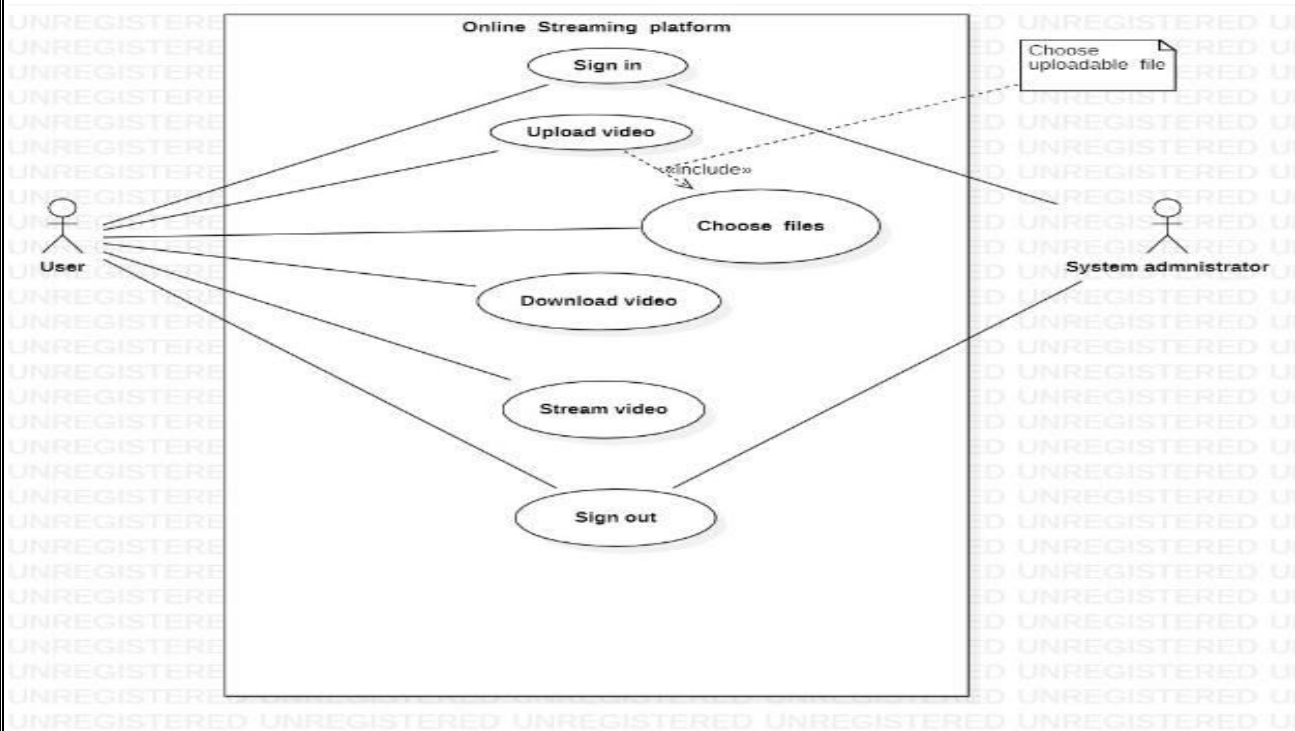
Technical Diagram:-

Fig 4 : Use Case

Testing:

There are two main approaches used for testing the website's code visibility, which are summarized further below:

Link examination:

- A crawler is used to obtain all links and images.
- All of them are checked for syntax and existence.
- If a link or image's target can be replaced with a mock target, the user should be notified. All forms and buttons have been tested.
- The user enters data into the form. Changes to the page are tracked and the user is notified. Buttons are checked for proper syntax.

The tool is under development stage and does not have a stable release. Functionalities may be added or removed to extend its usefulness.

Black Box Testing -:

Black box testing can be performed on any software program since it is not necessary for you to be familiar with the code. Some examples of black box testing done for are website include:
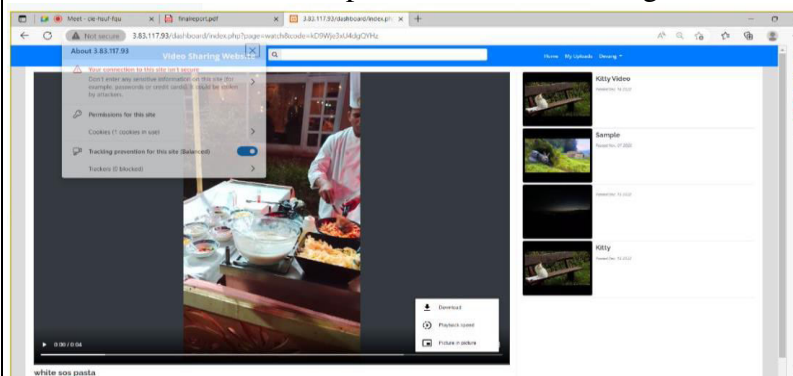

Fig 5: Link Analysis Testing .
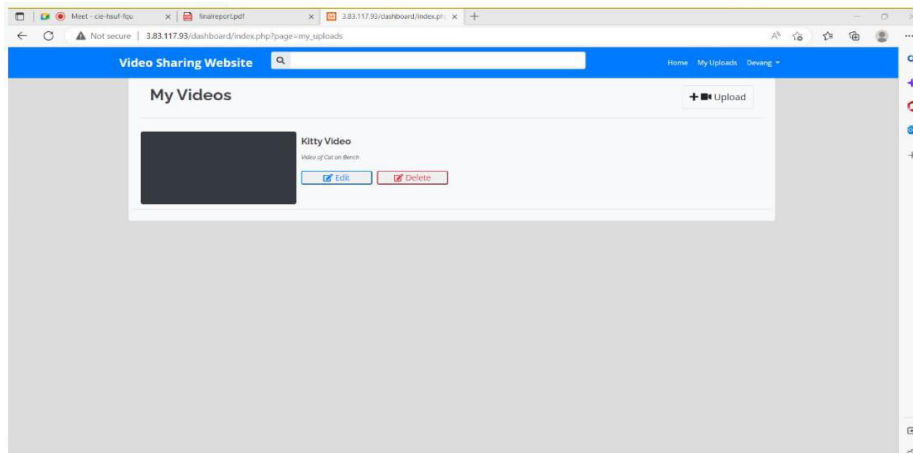
<u>Functional testing</u>
- Upload

Fig 6 : Upload Functionality

Conclusion :

- Our system can satisfy the requirements of customers in a manner similar to that offered by well-known online streaming platforms such as Netflix.
- However, it is also capable of mitigating some of the risks that come with these systems being exposed to high traffic.
- There can be a huge number of request at the same time at the system and system should tend to respond to all requests in a real-time experience.
- The above problem is mitigated by using AWS load balancing.
- In addition, the system should respond with as little latency as possible.

Software Requirement :

Hardware requirements:

- 4GB RAM (minimum)

- Windows 10 / MacOS (Catalina) / Linux-Ubuntu

Software requirements:

- Chrome/ Firefox/Edge

Area of Applications:

There are numerous reasons why live streaming have various application in the business. driven scenarios some of them are as follows-:

- Companies can also use live broadcasts to enhance and maximize direct communication with customers and community partner .
- Live streaming an event allows you to reach and interact with more people across the world. One of the top advantages of live streaming is that you can connect with a wider, worldwide audience.
- A live streaming service for businesses allows you to present a professional front when sharing live video content.

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