Media Streaming Server using AWS

Abstract:

Delivering media content over the internet at scale poses a unique set of challenges for architects and platform operators. End customers expect the highest-quality experience with reliable delivery, low startup latency, and the ability to choose from a wide range of content. Live streaming magnifies the challenges of maintaining consistent low latency and reliable delivery, with sharp peaks in demand for popular content. Media operators also need to ensure that content is secure in order to protect rights holders as well as their own revenue and reputation.

Amazon CloudFront is a CDN platform that securely delivers video, data, applications, and API operations to customers globally with low latency, high transfer speeds, and with a developer-friendly environment. CloudFront is integrated with AWS services and physical locations that are directly connected to the AWS Global Infrastructure. Media workloads in this context include live streaming and video on demand (VOD) content delivered over the internet.

Existing System:

In today's technological world, a challenging and competitive streaming server is needed as a cup of tea in Media domain. Even, country like India under the PM Narendra Modi vision is also building a unique master class streaming platform which is encrypted and secured.

The potentiality and vulnerabilities in the Media streaming domain, India vexed up with western and eastern country products like Zoom and other streaming platforms due to the problem of security, transmission speed, band width control, and managing of cloud resources.

Proposed System:

CloudFront has a global footprint with more than 200 edge locations in over 40 countries across five continents, providing global access for your viewers. AWS continues to extend CloudFront based on growth and anticipated customer needs. Availability is one of the high-priority design tenets of CloudFront. Metropolitan areas have the highest concentration of traffic, and CloudFront provides multiple edge locations for scale and performance. These locations are deployed in different facilities to provide a high degree of resilience. A cluster of edge locations in a single area gives CloudFront the ability to route viewers quickly to another location in close proximity without noticeable performance impact.

CloudFront edge locations have multiple connections to local internet service providers (ISPs) and global carriers through internet exchanges and direct private fiber connections. This minimizes video delivery latency, reduces probability of congestion and traffic loss, and provides high availability. Edge locations also leverage the AWS global network, which connects AWS Regions and edge locations.

The AWS global network provides high bandwidth, resilience and redundancy at scale. This gives you consistent performance, high availability and also shields your viewers from internet instabilities and changing conditions. The quality of the connection from the origin to the edge location is just as important as the proximity of the edge location to the viewer, providing low latency and avoiding rebuffering, which is a factor in reducing viewer churn. AWS works closely with our customers to understand their current and future traffic patterns to guide further expansion with new edge locations and scaling of the existing locations. This can be particularly relevant when planning the launch of your video platform in a new Region or anticipating high peak events.

Software Tools:

1. AWS Kinesis
2. AWS CloudFront
3. AWS S3
4. AWS Elemental Media Store
5. AWS Elemental Media Package
6. AWS IAM
7. AWS CDN
8. AWS CLI
9. Python3
10. VS Code

Hardware Tools:

1. Laptop
2. Operating System – Windows 11
3. RAM – 16GB
4. ROM – 8GB
5. Fast Internet Connectivity

Applications:

1. Internal Private Streaming Platform
2. E-Conference Meeting Rooms
3. Media and Entertainment