

Media streaming with IBM video streaming

Phase:3-Development part 1

Project overview

Media-Streaming-with-IBM-Cloud-Video-Streaming This project aims to design and develop a virtual cinema platform that provides users with an immersive movie-watching experience. The platform will include features such as user registration, video upload, on-demand streaming, and integration with IBM Cloud Video Streaming services.

Project objectives:

High-Quality Streaming:

Ensure the streaming platform delivers high-quality video and audio to users, minimizing buffering and lag.

Scalability:

Design the system to handle a growing number of users and varying bandwidths without degradation in performance.

Compatibility:

Ensure compatibility across different devices and platforms, such as smartphones, tablets, desktops, and smart TVs.

Content Delivery:

Develop a content delivery network (CDN) to optimize the distribution of media content to reduce latency and improve speed.

Security:

Implement robust security measures to protect against content piracy, unauthorized access, and data breaches.

User Experience:

Prioritize a user-friendly interface, easy navigation, and personalization features for a seamless user experience.

Analytics:

Incorporate analytics tools to gather insights into user behavior, content preferences, and streaming performance.

Monetization:

If applicable, establish monetization strategies, such as subscription models, advertising, or pay-per-view options.

Content Management:

Create efficient content management tools to upload, categorize, and organize media content.

-efficient infrastructure options.

virtual cinema platform using IBM Cloud Video Streaming:

Set Up IBM Cloud Account:

Sign up for an IBM Cloud account and access the IBM Cloud Video Streaming service.

Content Acquisition and Licensing:

Secure rights and licensing for the content you plan to offer on your virtual cinema platform.

Content Preparation:

Prepare your media content by encoding and transcoding it into streaming-friendly formats and bitrates. IBM Cloud Video Streaming may provide encoding services.

Create a Virtual Cinema Space:

Design a virtual cinema space that mimics the ambiance of a real theater. This could include a 3D environment, virtual seating, and interactive elements.

Video Streaming Setup:

Set up live streaming or video-on-demand (VOD) services using IBM Cloud Video Streaming. Configure the platform for the best possible video quality and user experience.

Content Management:

Implement a content management system to organize and manage your media library, scheduling screenings, and handling metadata.

User Registration and Authentication:

Create a user registration and authentication system to control access to your virtual cinema. You can use IBM Cloud services for user management.

Payment and Ticketing:

Implement a payment gateway to sell tickets or access to specific screenings. Ensure secure transactions and support various payment methods.

Security and DRM:

Use digital rights management (DRM) solutions to protect your content from unauthorized distribution. IBM Cloud Video Streaming might offer security features.

Interactive Features:

Incorporate interactive elements, such as live chats, audience interactions, and social sharing.

features of this platform:

- **Live streaming:**

- This feature allows users to stream live events, executive town halls, video marketing product launches, and OTT streaming. The platform is built for privacy, reliability, and scale to optimize video quality and powered by IBM Watson AI for video search and automated closed captioning.
- **Simulated live:**
 - This feature enables users to schedule videos to playback at specific times or trigger automatic looped playback of simulated live broadcasts.
- **Auto-archive:**
 - This feature allows users to store their videos in the cloud for future use.
- **Video on-demand content management:**
 - This feature enables users to manage their video content with ease. Through automated, AI-driven transcription, video content can be searched at the library level, returning results based on keyword searches. Viewers can jump to specific moments based on AI insights.
- **Multi-CDN infrastructure:**
 - This feature allows users to reach virtually unlimited live streaming audience sizes across the globe and keep attendees connected. By using a multi-CDN (Content Delivery Network) infrastructure, you can protect your company brand from event eavesdroppers while supporting viewers across devices like iOS and Android.
- **Security:**

IBM Cloud Video Streaming provides multiple layers of protection and encryption to help instill

confidence in digital experiences. The solution is also ISO 27001 certified.

intuitive interface for media streaming with video streaming:

Seamless onboarding process:

Provide users with a painless onboarding experience. For instance, Netflix's onboarding process runs as smoothly as possible

Personalized recommendations:

Pers Provide an intuitive user experience personalized to each one of your users following the best UI/UX Design Principles A lot of streaming apps have already eliminated friction between users discovering and watching content online.

1. Easy navigation:

it easy for users to navigate through your app. For example, use a clear and concise menu structure that is easy to understand

2. Minimalistic design:

Keep the design minimalistic and avoid cluttering the interface with too many elements. This will help users focus on the content they want to watch.

set up user registration and authentication mechanism to ensure access to platform for media streaming video streaming:

Choose an authentication method: There are several authentication methods available, including Single Sign-On (SSO) authentication, username/password authentication, and social media authentication¹. You can choose the one that best suits your needs.

Integrate the authentication method with your platform: Once you have chosen an authentication method, you need to integrate it with your platform. For instance, if you choose SSO authentication, you can use SAML 2.0 to link your identity provider with your video service¹.

Create a registration page: Create a registration page that allows users to sign up for your platform. The registration page should collect all the necessary information from users, such as their name, email address, and password¹.

Create a login page: Create a login page that allows users to log in to your platform using their credentials¹.

Implement security measures: Implement security measures such as two-factor authentication and encryption to ensure that user data is secure

Test the registration and login process: Test the registration and login process to ensure that it works smoothly and without any issues

Provide user support: Provide user support to help users who face issues with the registration or login process ¹

Hardware components:

Servers:

High-performance servers for hosting and serving media content.

These servers should have robust processing power and memory to handle video transcoding and streaming.

Storage Systems:

Large-capacity storage systems for storing media files, including videos and related assets.

High-speed storage to ensure quick access to content for streaming.

Content Delivery Network (CDN):

A network of geographically distributed servers to cache and deliver media content efficiently to end-users.

CDNs help reduce latency and improve content delivery speed.

Network Infrastructure:

Reliable, high-bandwidth network connections to support media streaming to a large audience.

Load Balancers:

Load balancing hardware to evenly distribute incoming traffic among multiple servers for scalability and redundancy.

Hardware Security Appliances:

Firewalls and security appliances to protect against DDoS attacks and secure the infrastructure.

Software Components:

IBM Video Streaming Platform:

The core platform for video streaming, provided by IBM.

It includes features for video hosting, transcoding, live streaming, and video-on-demand (VOD) services.

Content Management System (CMS):

A CMS for organizing and managing media content, including video uploads, metadata, and categorization.

Video Encoding and Transcoding Software:

Software for encoding videos into various formats and bitrates to support adaptive streaming.

Transcoding is essential for delivering content to viewers with varying network conditions.

Streaming Protocols:

Support for streaming protocols like HLS (HTTP Live Streaming) and DASH (Dynamic Adaptive Streaming over HTTP) for adaptive streaming.

Content Protection and DRM:

Digital Rights Management (DRM) solutions to protect copyrighted content from unauthorized access and distribution.

Analytics and Monitoring Tools:

Tools for tracking user engagement, viewer statistics, and streaming performance.

These tools provide insights for content optimization and system monitoring.

User Authentication and Authorization:

User management and authentication systems to control access to content, especially for subscription-based services.

Mobile and Web Applications:

Mobile apps and web interfaces for users to access the streaming service.

Quality of Service (QoS) Sensors:

These sensors monitor network conditions and can detect issues such as packet loss, latency, and jitter. QoS sensors can help optimize streaming quality in real-time by adjusting the bitrate or content delivery to match network conditions.

Camera and Microphone Sensors:

If you're involved in live streaming or video conferencing, cameras and microphones on devices (such as smartphones and webcams) act as sensors to capture audio and video content.

Environment Sensors:

In scenarios like outdoor live streaming (e.g., sports events), environmental sensors can monitor weather conditions to ensure the safety of equipment and personnel.

User Behavior Sensors:

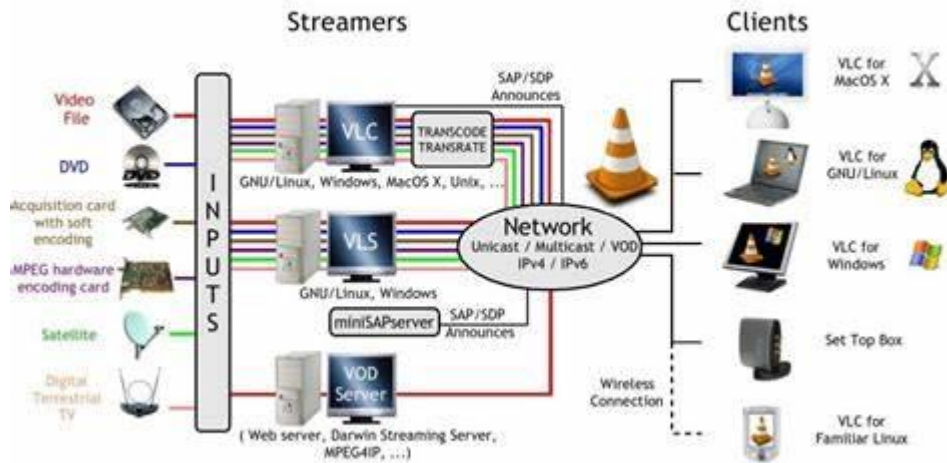
User sensors, such as motion sensors on smartphones, can trigger actions like pausing or resuming media playback when users interact with their devices.

Security Sensors:

Security cameras and sensors may be used to protect physical infrastructure, data centers, or facilities where streaming equipment is hosted.

In summary, while sensors are not directly used in media streaming processes, they can play a supportive role in optimizing and securing the streaming experience or in monitoring the physical environment where streaming infrastructure is located. These sensors can help ensure the quality, safety, and security of the streaming process but are often not a core component of the streaming technology itself.

VideoLAN Streaming Solution



IBM Video Streaming Account:

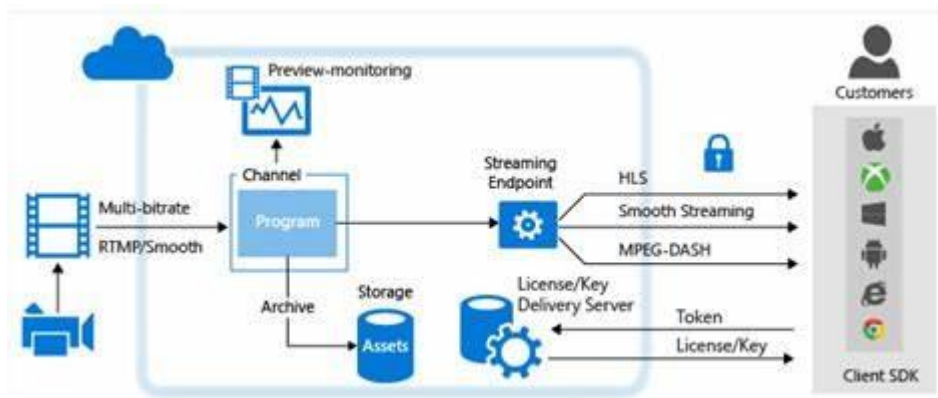
Sign up for an IBM Video Streaming account if you haven't already.

Prepare Your Content:

Organize and prepare your media content, such as videos, audio, and related assets.

Configure IBM Video Streaming:

Log in to your IBM Video Streaming account and configure your channel, settings, and access controls.



Video Encoding and Transcoding:

Use encoding and transcoding tools or services to convert your media files into streaming-friendly formats and bitrates. IBM Video Streaming may offer some of these capabilities.

Content Management:

Use a content management system (CMS) to manage your media content. IBM Video Streaming may provide some content management features.

Set Up Live Streaming (Optional):

Configure live streaming settings if you plan to stream live events.

Integrate with the API:

Use the IBM Video Streaming API to integrate your streaming solution with your website or application.

Embed the Video Player:

Embed the IBM Video Streaming player into your website or app, allowing users to access your content.

Security and Access Control:

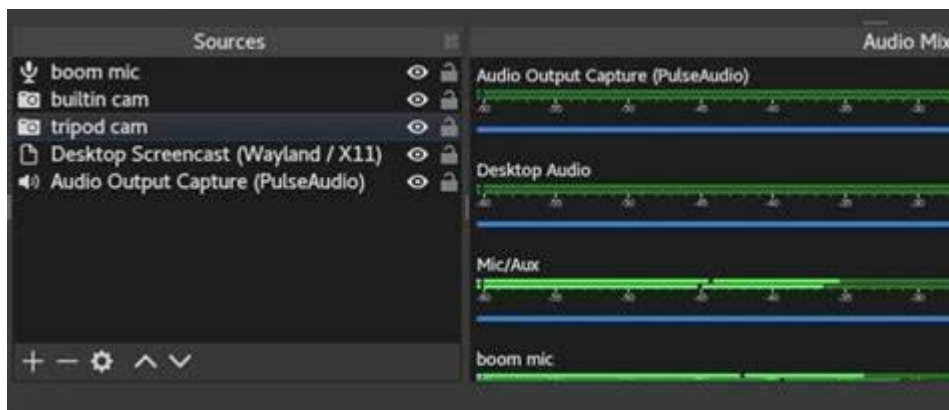
Implement security measures such as DRM, user authentication, and authorization to protect your content.

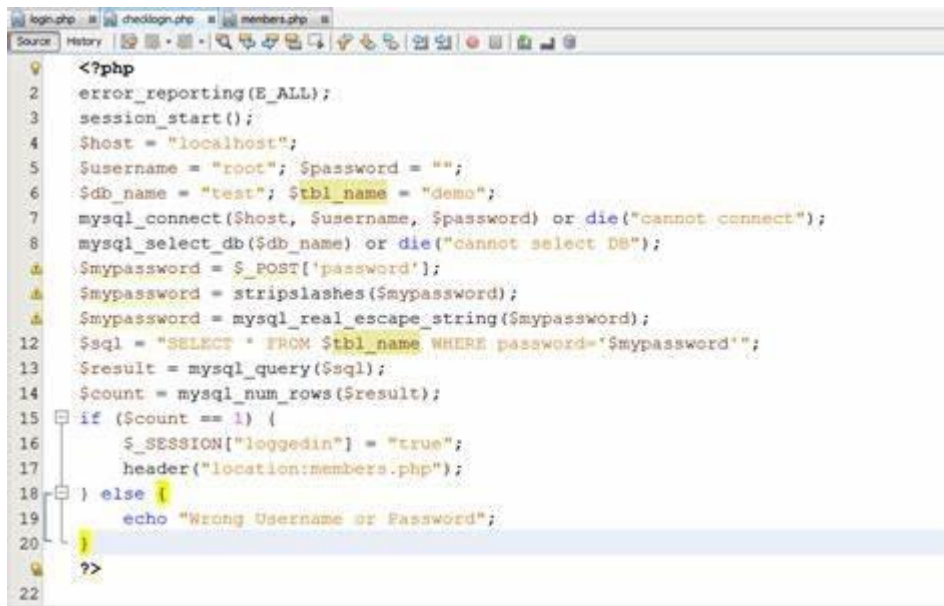
Monitoring and Analytics:

Set up tools for monitoring the performance of your streaming service and gathering analytics on viewer engagement.

Test and Optimize:

Test your streaming solution thoroughly and optimize it for a smooth user experience.





```
<?php
2  error_reporting(E_ALL);
3  session_start();
4  $host = "localhost";
5  $username = "root"; $password = "";
6  $db_name = "test"; $tbl_name = "demo";
7  mysql_connect($host, $username, $password) or die("cannot connect");
8  mysql_select_db($db_name) or die("cannot select DB");
9  $mypassword = $_POST['password'];
10 $mypassword = stripslashes($mypassword);
11 $mypassword = mysql_real_escape_string($mypassword);
12 $sql = "SELECT * FROM $tbl_name WHERE password='$mypassword'";
13 $result = mysql_query($sql);
14 $count = mysql_num_rows($result);
15 if ($count == 1) {
16     $_SESSION["loggedin"] = "true";
17     header("location:members.php");
18 } else {
19     echo "Wrong Username or Password";
20 }
21 ?>
```

Conclusion

Video streaming, in various forms of video on demand (VOD), live, and 360 degree streaming, has grown dramatically during the past few years. In comparison to traditional cable broadcasters whose contents can only be watched on TVs, video streaming is ubiquitous and viewers can flexibly watch the video contents on various devices, ranging from smart-phones to laptops and large TV screens. Such ubiquity and flexibility are enabled by interweaving multiple technologies, such as video compression, cloud computing, content delivery networks, and several other technologies. As video streaming gains more popularity and dominates the Internet traffic, it is essential to understand the way it operates and the interplay of different technologies involved in it. Accordingly, the first goal of this paper is to unveil sophisticated processes to deliver a raw captured video to viewers' devices. In particular, we elaborate on the video encoding, transcoding, packaging, encryption, and delivery processes. We survey recent efforts in academia and industry to enhance these processes. As video streaming industry is increasingly becoming reliant on cloud computing, the second goal of this survey is to explore and survey the ways cloud services are utilized to enable video streaming services. The third goal of the study is to position the undertaken research works in cloud-based video streaming and identify challenges that need to be obviated in

future to advance cloud-based video streaming industry to a more flexible and user-centric service.

