

High Level Design(LLD)

PlayWave: Video Streaming WebApp Remaining

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1. Introduction

1.1 Why this High Level Design Document?

The purpose of this High Level Design Document (HLD) is to provide a structured model for the development of the PlayWave Video Streaming App. It outlines the architecture, system components, and interactions at a high level, ensuring a clear path for implementation.

This document will:

- Define the system architecture and design aspects.
- Describe the software interfaces and components.
- Provide a clear process flow for video processing and streaming.

1.2 Scope

The HLD defines the structure of the PlayWave system, including local storage management, video streaming processes, and technology architecture. This document will serve as a guideline for developers and stakeholders.

1.3 Definitions

- FFmpeg: A tool for video processing and conversion.
- Multer: Middleware for handling file uploads in Node.js.
- HLS/DASH: Adaptive bitrate streaming protocols.

2. General Description

2.1 Product Perspective

PlayWave is a MERN stack-based video streaming application that enables users to upload, store, and stream videos locally without relying on cloud services. The system ensures smooth and adaptive video playback.

2.2 Problem Statement

Most video streaming solutions depend on costly cloud-based services. PlayWave aims to provide a more affordable and efficient alternative using local storage and FFmpeg for video processing.

2.3 Proposed Solution

- Local video storage with efficient file management.
- FFmpeg for adaptive streaming and format conversion.
- Real-time video playback using React Player.
- Multer for handling video uploads securely.

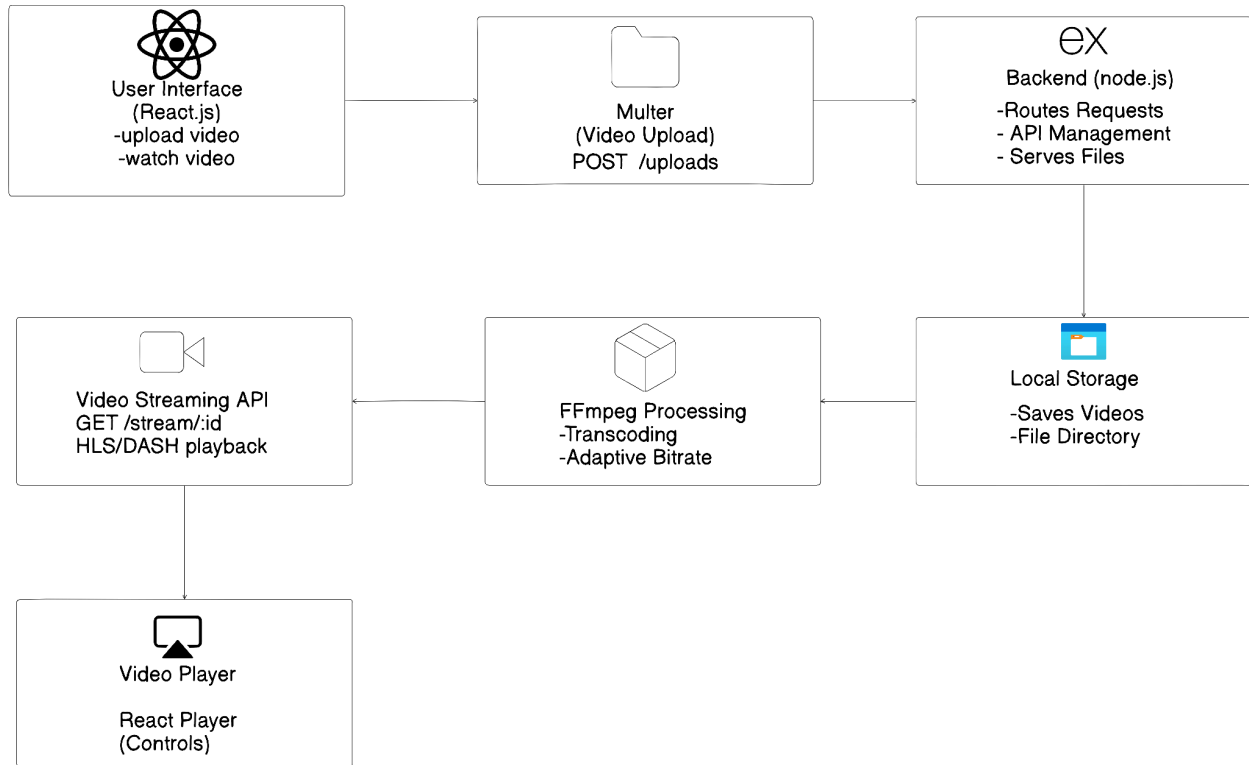
2.4 Further Improvements

Future enhancements may include:

- Integration of AI-powered video recommendations.
- Support for live streaming.
- Mobile compatibility enhancements.

5. Design Details

5.1 System Architecture (Detailed Overview)



This updated architecture includes API routes, ensuring clear endpoint definitions for video upload, processing, and streaming.

6. Performance Considerations

- **Scalability**: Optimized file handling for multiple users.
- **Reusability**: Modular components for easy updates.
- **Deployment**: Can be containerized using Docker.

7. Conclusion

The PlayWave High Level Design (HLD) provides a structured foundation for building a scalable, efficient, and cost-effective video streaming platform leveraging local storage, FFmpeg, and MERN stack. The outlined architecture and design ensure smooth streaming, efficient processing, and an intuitive user experience.