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# ****AOSP HAL Integration for H.264 Video Decoding using FFmpeg****

## ****1. Introduction****

This project focuses on integrating **FFmpeg** into the Android Hardware Abstraction Layer (HAL) for **H.264 video decoding**. By developing a custom HAL, we enable Android to decode H.264-encoded video streams using software-based decoding, making it useful for platforms without hardware acceleration. The implementation will be tested on an AOSP emulator and optimized for performance.

## ****2. Project Objective****

* Develop a custom HAL for **video decoding** in AOSP.
* Integrate **FFmpeg** for **H.264 video decoding**.
* Test the HAL on an AOSP emulator with real video data.
* Profile and optimize **decoding** performance.

## ****3. Functional Requirements****

### ****AOSP Environment Setup****

* Download & configure AOSP source.
* Install dependencies & build tools.
* Select and configure AOSP emulator.

### ****HAL Development****

* Implement a HAL module for **video decoding**.
* Define an interface for **H.264-encoded input & raw video output**.
* Register the HAL within the Android system.

### ****FFmpeg Integration****

* Compile and link **FFmpeg** with the HAL.
* Ensure correct interaction with **FFmpeg APIs for decoding**.

### ****Testing & Validation****

* Build & flash the AOSP image.
* Run tests to verify H.264 **decoding** functionality.

### ****Performance Profiling****

* Measure CPU usage, memory consumption, and **decoding speed**.
* Optimize performance and compare with hardware solutions.