

# YouTube Clone Architecture

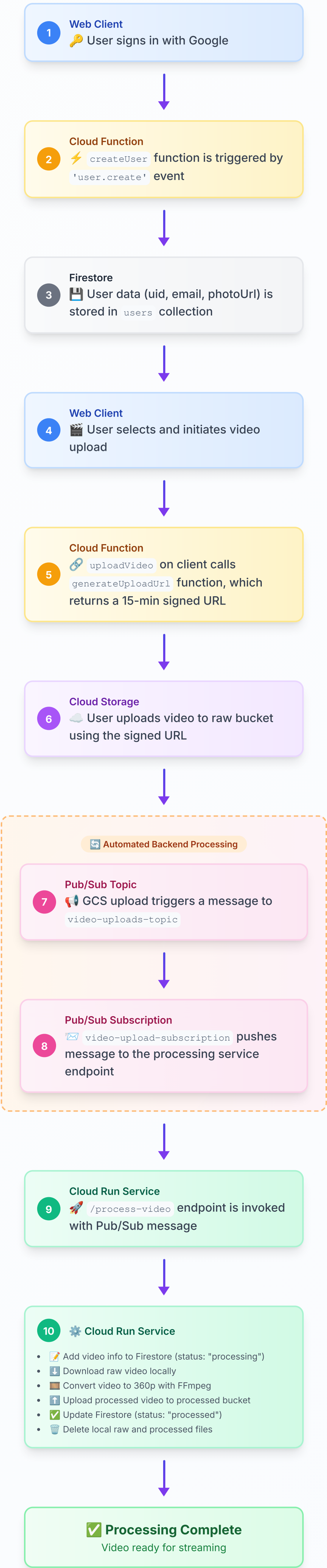
Full-Stack Video Platform Data Flow Visualization

System Architecture • Google Cloud Platform • Serverless Processing



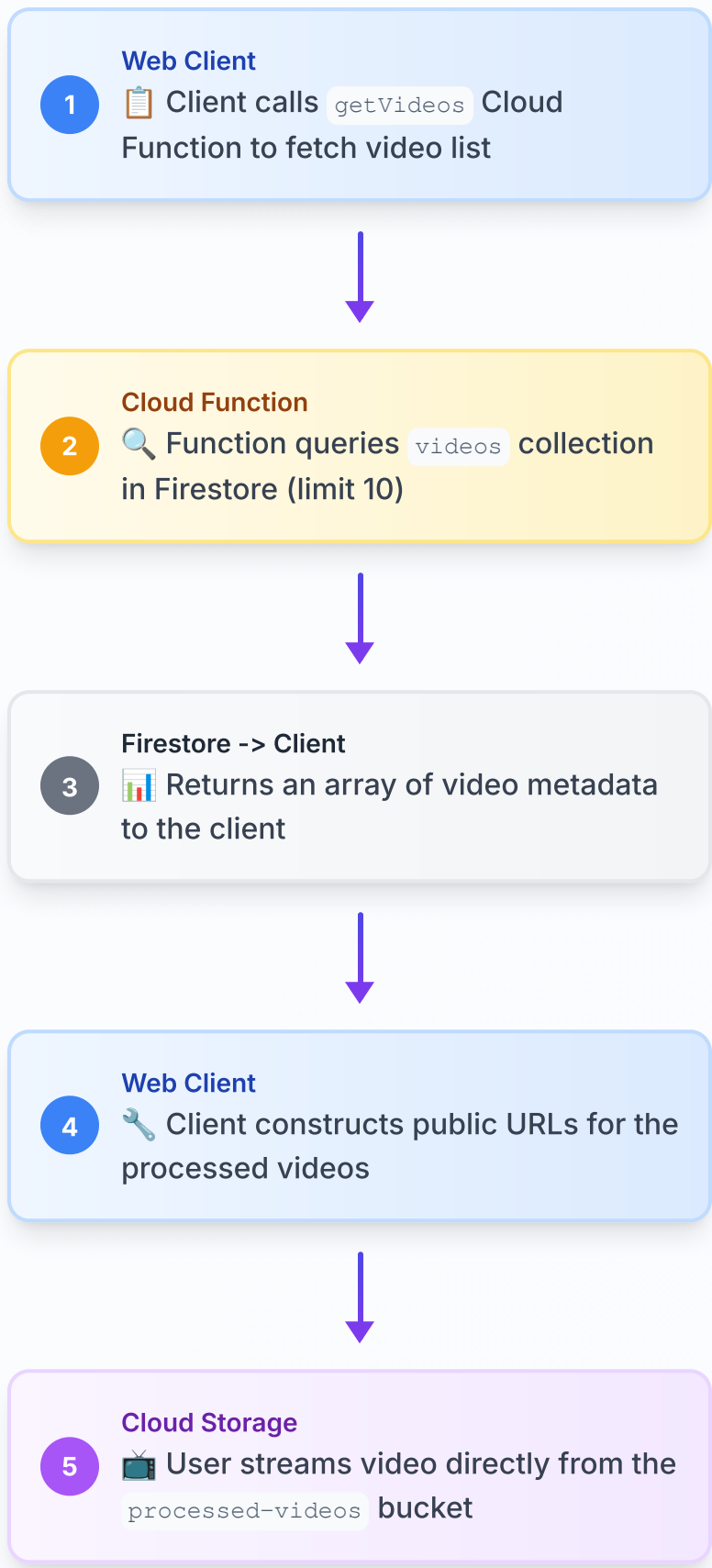
## Video Upload Flow

Authenticated upload with automated processing



## Video Watch Flow

Optimized streaming without authentication



### Upload Process Summary

Authenticated users upload videos via signed URLs to a private bucket. Cloud Storage events trigger Pub/Sub messages, which initiate automatic video processing. The system converts videos to 360p, stores them in a public bucket, and tracks processing status in Firestore — all with robust error handling and cleanup mechanisms.

Firebase Auth

Cloud Functions

Cloud Storage

Pub/Sub

Cloud Run

FFmpeg

Firestore



### Watch Process Summary

The watch process is optimized for a seamless user experience. Videos are accessible without requiring user login. The system retrieves video metadata from Firestore and streams content directly from the public Cloud Storage bucket, using Google Cloud Storage's built-in streaming capabilities to enable smooth playback without full downloads.

Next.js

Cloud Functions

Firestore

Cloud Storage

GCS Streaming