Experiment-4

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Section/Group: KRG-3B
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Subject Name: System Design
Subject Code: 23CSH-314

1. **AIM :** To design an scalable OTT platform (Similar to Netflix or Amazon Prime)

2. **Objective:**

- To design and specify an OTT platform that supports user onboarding, subscriptions, content discovery, and video streaming.
- To define functional and non-functional requirements ensuring scalability, availability, and low latency.
- To identify core system entities and design RESTful APIs for seamless client interaction.
- To ensure high availability for video streaming while maintaining consistency in payments and subscriptions.

3. **Tools Required:**
   - **Frontend:** HTML, CSS, JavaScript, React.js
   - **Backend:** Node.js, Express.js
   - **Database:** MongoDB
   - **API Testing:** Postman
   - **Authentication:** JWT
   - **Media Storage:** Cloudinary / AWS S3
   - **Version Control:** Git, GitHub
   - **Deployment:** AWS / Render / Vercel

4. **SYSTEM DESIGN / SYSTEM SPECIFICATION:**

4.1. Functional Requirements:

- Client should be able to create account on the OTT platform.
- After the successfull login, client should be able to opt for the subscription plans.
- Client should be able to search for the shows/movies based on the video title or names.
- Client should be able to watch the videos / tv shows in multiple different resolutions (480p,720p,1080p, 4k etc.)
- Recommendation for TV shows and movies.

4.2. Non-functional Requirements:

- Scalability: 200-300M, for which let's say total videos we are having are 20K videos (~1 hour each)
- CAP Theorem: Availability >>>>> Consistency
  Availability on **watching TV shows and movie**
  Consistency in making **payments and in subscription plans**
- Latency: 50 - 80 ms
  Client should be able to see the video with zero or neglibile buffering.

4.3. Core-Entites of the System:

1. Client
2. Clients Metadata
3. Video / TV shows
4. Video metadata: (images(Thumbnails + description)

4.4. API Endpoints Creation:

A. Client-Onboarding

1. POST Call: https://www.netlfix.com/user/register
2. POST Call: https://www.netlfix.com/user/login
3. PUT Call: https://www.netlfix.com/user/update
4. User Data Update: PUT API CALL: PUT / api / users / {user_id} / profile

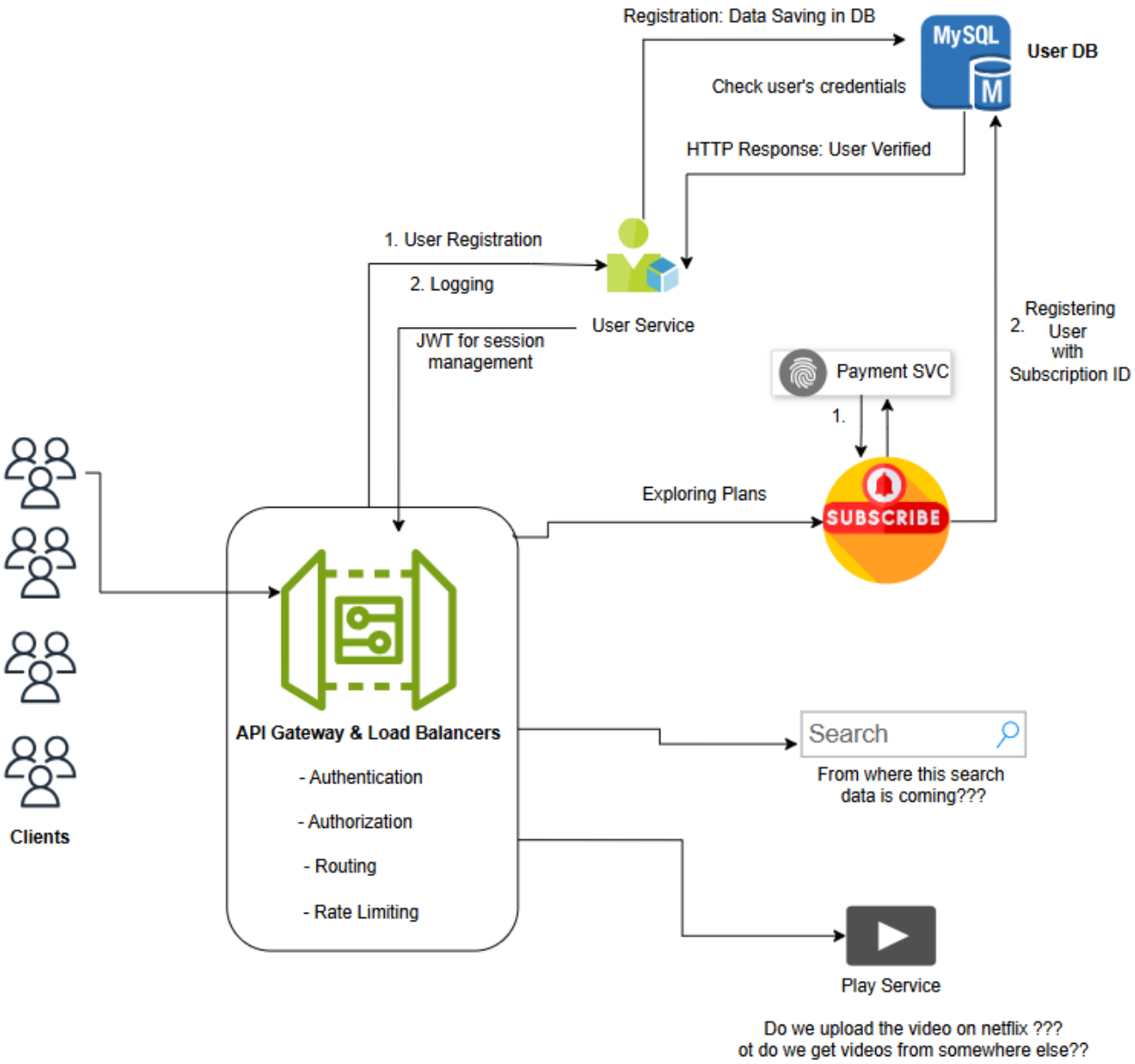
B. Subscription

1. GET Call: https://www.netlfix.com/Get-subscription-plans
2. POST Call: https://www.netlfix.com/subscription
   {
   userMetadata,
   subscriptionID
   }

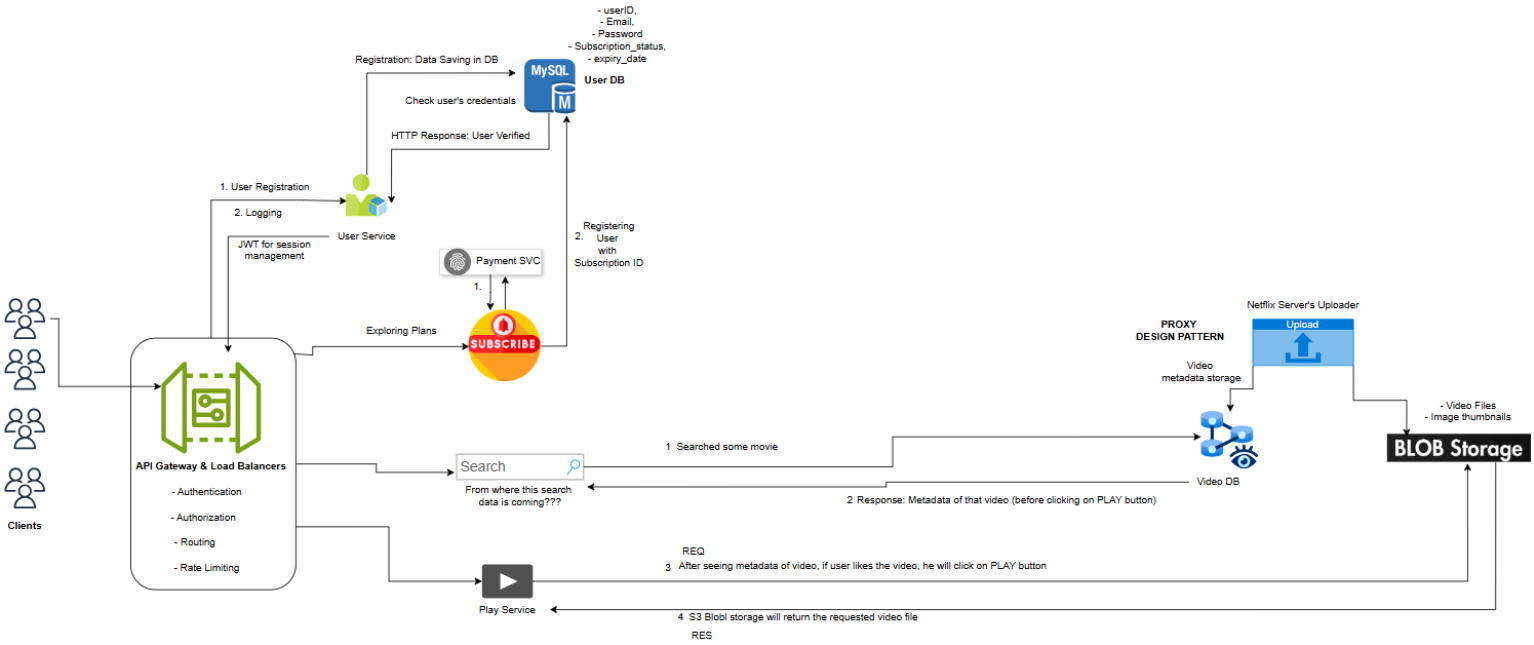
C. Searching & Video Playing

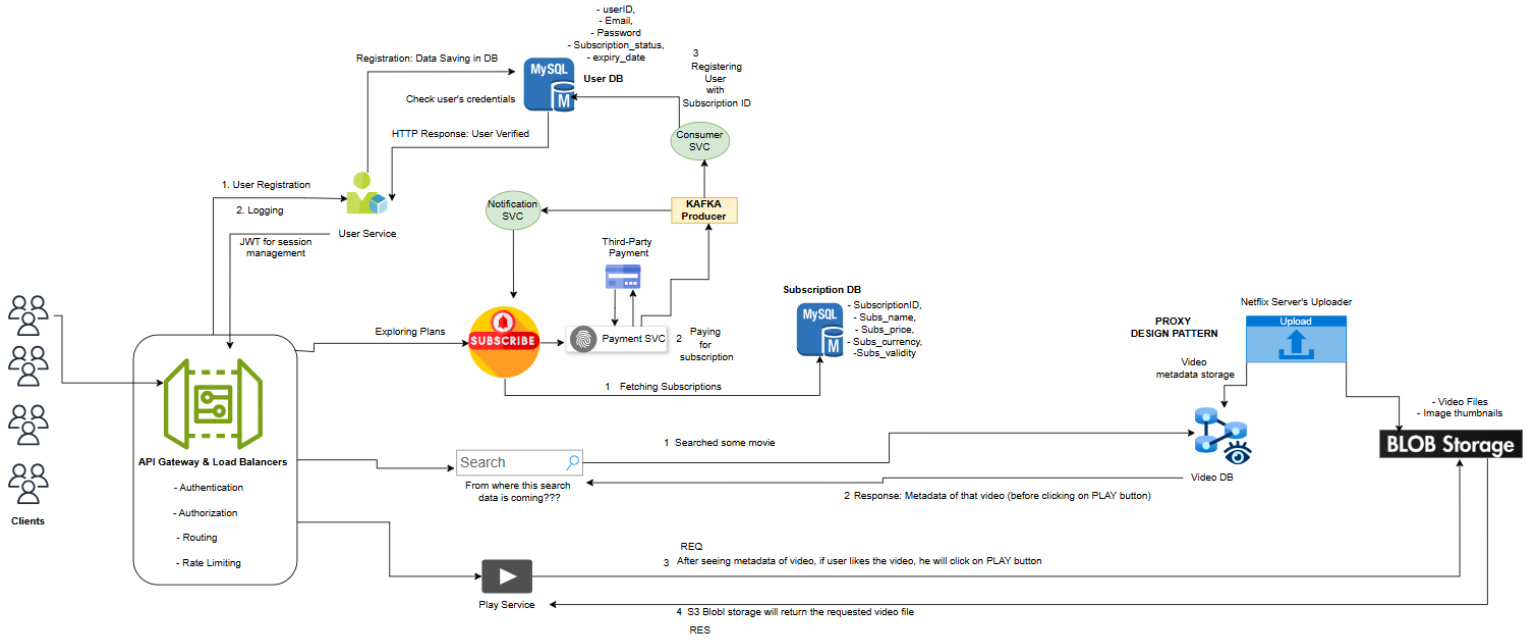
1. GET Call: https://www.netlfix.com/search?q={movie_name}
   Response: List<Video_ID> + some meta data of video
2. GET Call: https://www.netlfix.com/{video_ID}
   Response: Metadata of the video (JSON)
3. GET Call: https://www.netlfix.com/play/{video_ID}

5. HLD(High Level Design):

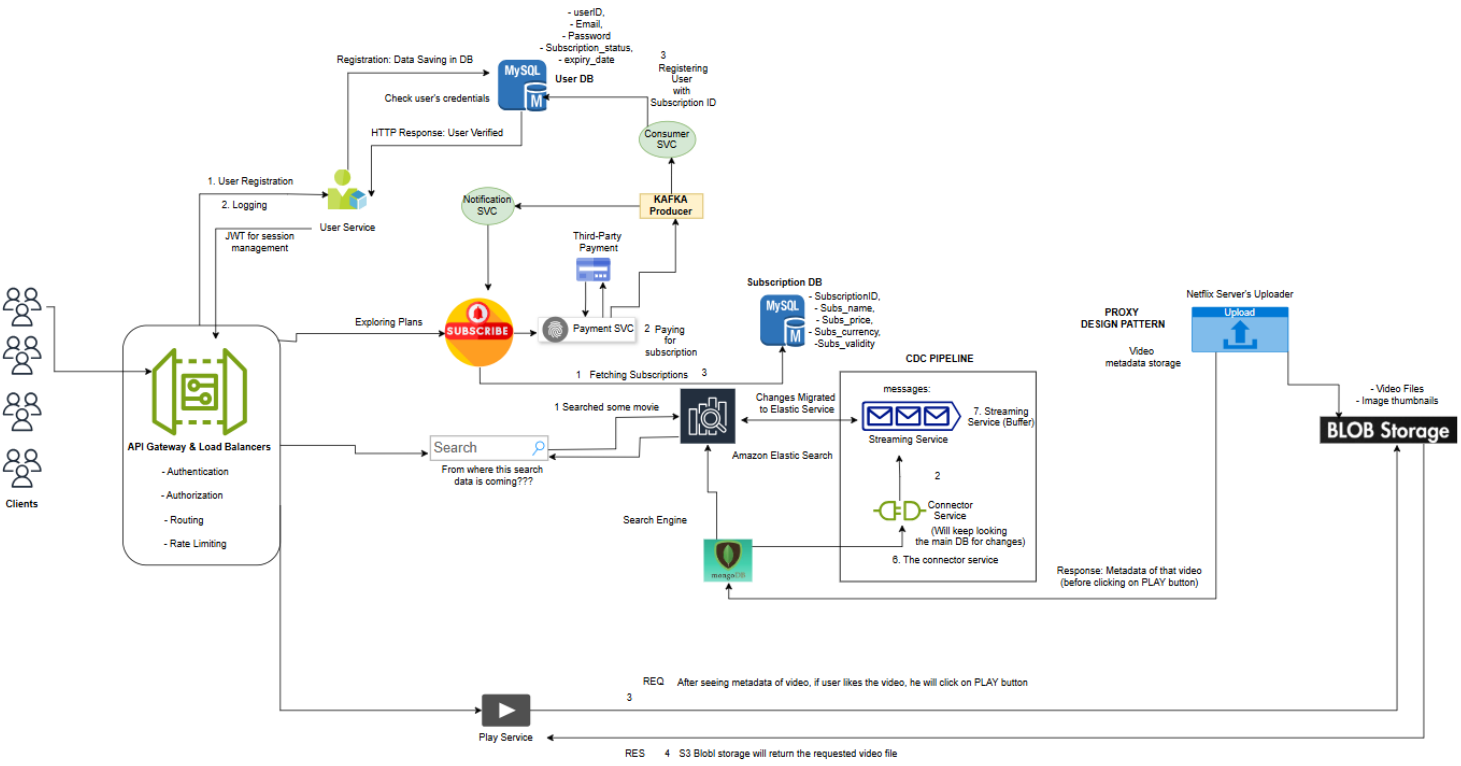


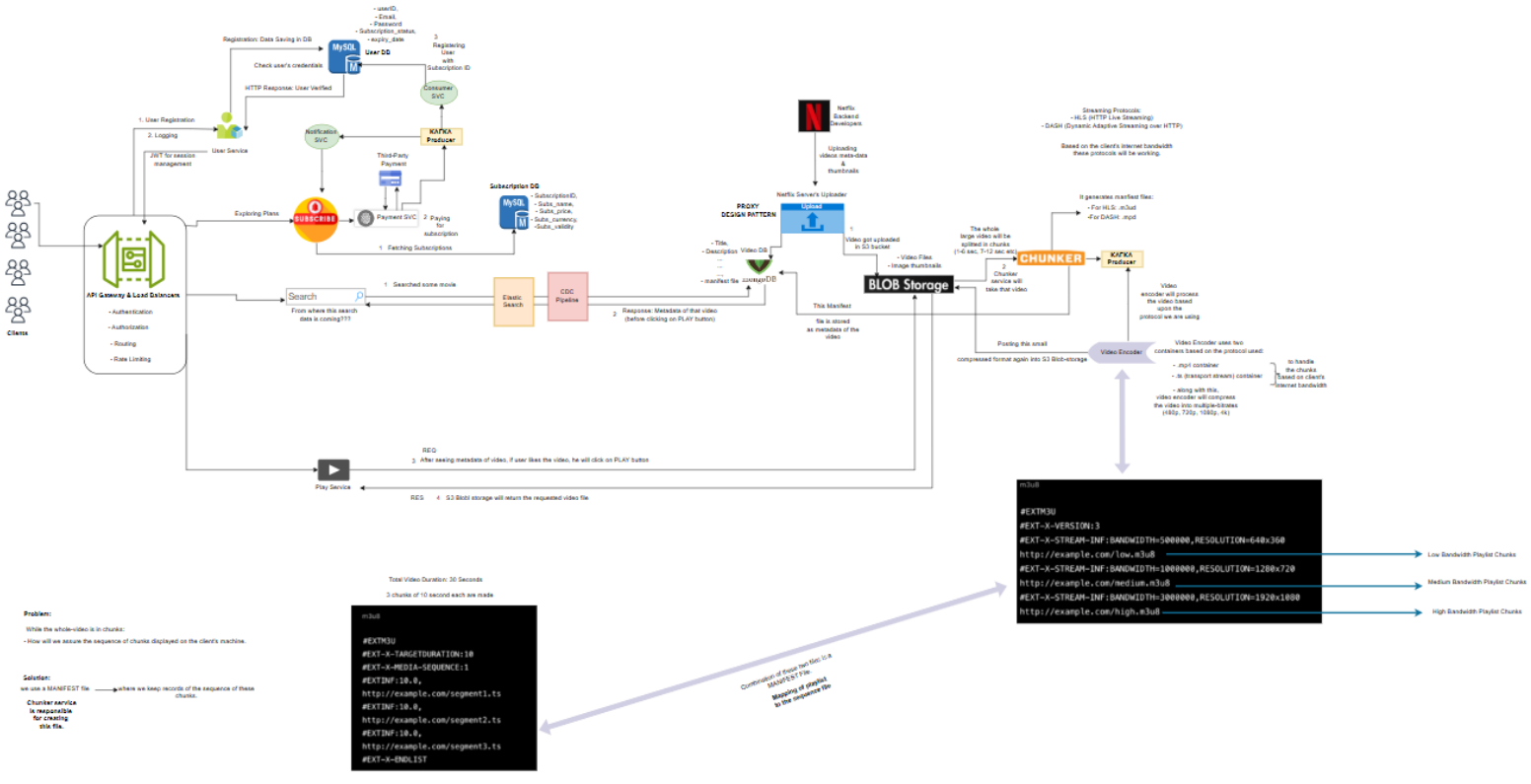
6. LLD(Low Level Design





Search Service





7. Learning Outcomes

- Understand and document functional and non-functional requirements of a large-scale OTT system.
- Apply CAP theorem concepts in real-world system design scenarios.
- Identify core entities and their roles in system architecture.
- Design RESTful API endpoints for user management, subscriptions, search, and video playback.
- Analyze scalability, availability, and latency requirements for high-traffic applications.