Experiment - 2

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Subject Name: System Design
Subject Code: 23CSH-314

Aim:

To design an online E-commerce platform similar to Amazon/Flipkart for browsing and purchasing products like mobiles, laptops, cameras, and clothes.

To implement Kafka, Elasticsearch, and a CDC pipeline for real-time data processing, fast search, and scalability.

Objectives:

1. To develop a scalable online shopping system for product listing, search and management.
2. To use Kafka for real-time event streaming and inter-service Communication.
3. To implement Elastic Search for fast and efficient product search.
4. To integrate a CDC pipeline for real-time synchronization between database and service.

API End Points Creation-

1. **Get API Call: product_Search**
   Https://Local_Host/products/search_item = {Search_keywords}

   HTTP Req
   {
      GET: <iPhone 16>
   }

   HTTP Res
   {
      <ProductID:iPhone>
   }

2. **GET API Call: View Product Details:**
   Https://Local_Host/products/{product_id}

   HTTP Req
   {

```
      GET: <Product_id = 17>
   }

   HTTP Res
   {
      Product_id:17,
      Name: iPhone 17,
      Color: Navy Blue,
      Price: $1099,
      Image Thumbnail: URL_Image

   }
```

3. PUT API CALL : To update any order in the cart.

4. DELETE API CALL: To remove any item from the cart.

5. POST API CALL: for Check out and Payment.

```
   Https://Local_Host/checkout -> {post body}
   HTTP REQ
   {
    All products ID's,
    Total Quantity,
    Total Price
   }
   HTTP RES
   {
    Order_ID
   }
```

Functional Requirements -

● User Should be able to search and find the product based on product title or names.
● User should be able to view the details of the product like description, image, available quantity, review, accessed.
● User should be able to select the quantity and move the product/item into the cart.
● User should be able to make the payment and should be able to perform the check out.
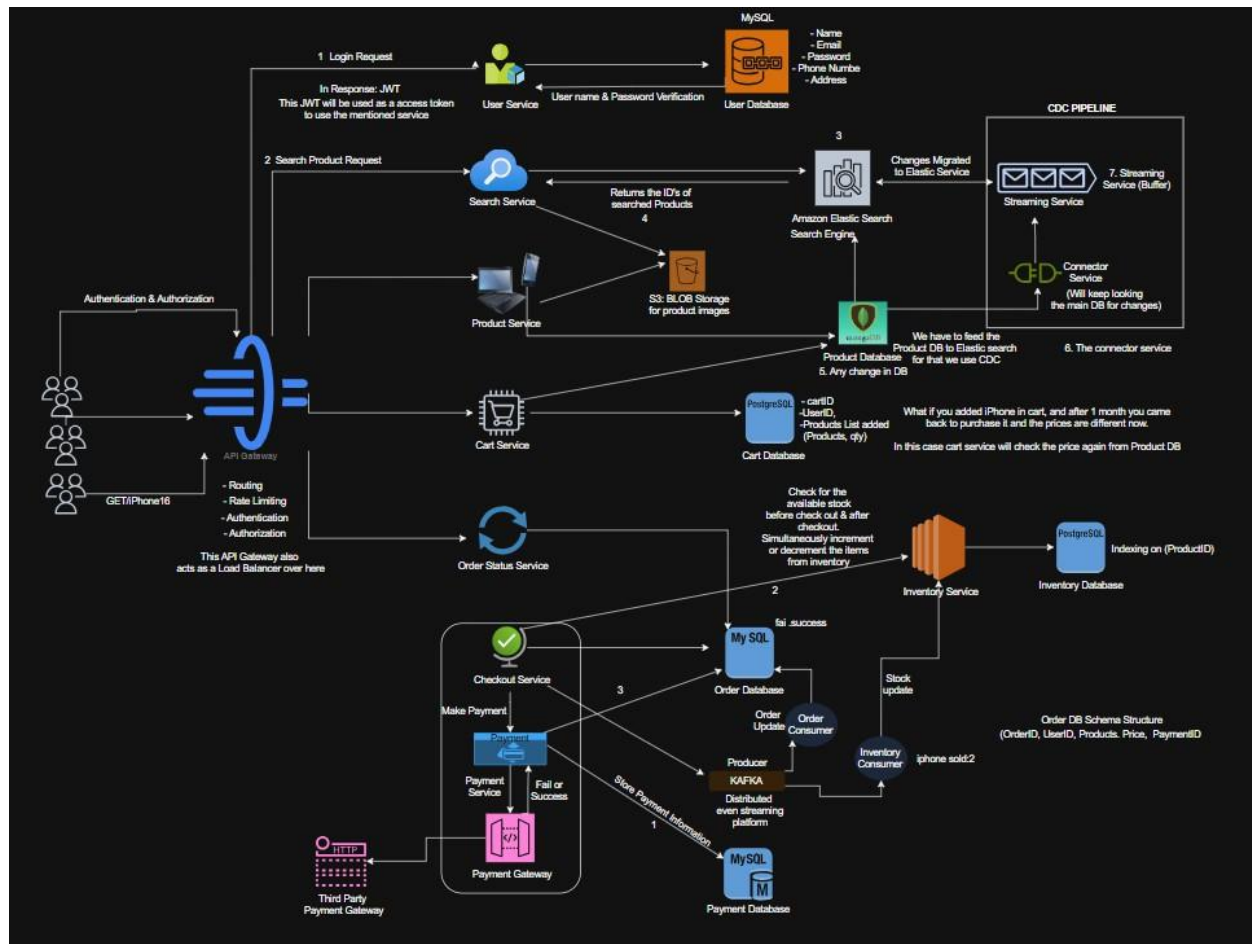
Non-functional Requirements

● Target Scale: 100Million DAU with 10 orders processed per second.

● Availability – System should be available 24/7

- Consistency & Availability: Here for this system we need both as per the Target Scale. Now we should specify that, which part of our system needs what?

- Latency : Required: ~ 200 ms.

- Scaling : Horizontal / Vertical Consistency.

Core-Entitles of the System:

1. User/Client.

2. Product.

3. Cart.

4. Orders.

5. Checkout Followed by Payment.

REQUIRED SYSTEM DESIGN –

Learning Outcomes :

- Understand the Design and Architecture of a Scalable E-Commerce Platform.
- Gain hands-on experience with Apache Kafka for real-time data Streaming.
- Learn to implement fast and efficient search using Elastic Search.
- Understand CDC Pipelines for real-time data Synchronization.