Software System: Lazada Online E-Commerce Platform

Architecture Style: Microservices Architecture

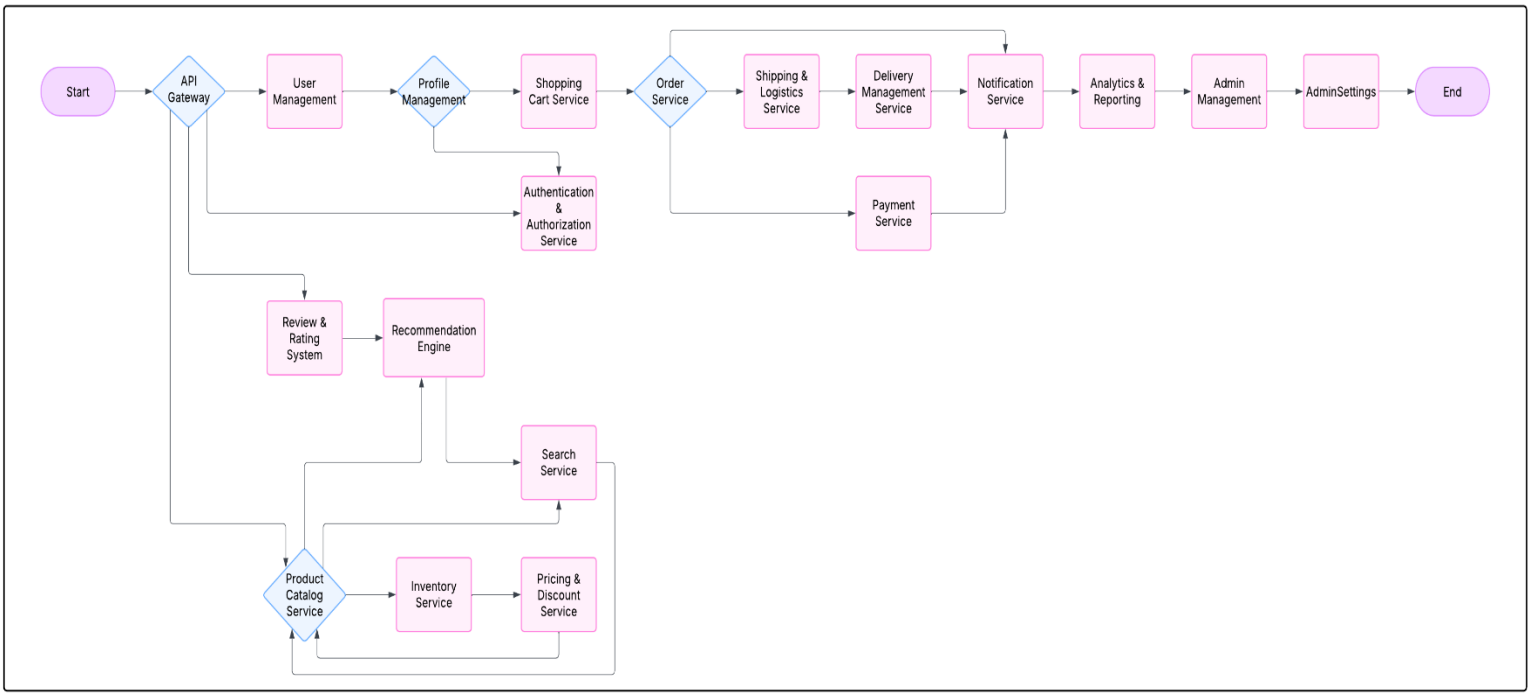
Lazada, a popular online e-commerce platform, follows a **microservices architecture**. This architecture style divides the entire system into smaller, independently deployable services, each focusing on a specific business function. These services are loosely coupled, scalable, and communicate with each other through APIs. Microservices allow for independent scaling, quick updates, and improved system resilience.

Key Components of Lazada's Microservices Architecture:

1. **API Gateway**:
   - The API Gateway serves as the entry point for all external client requests. It is responsible for routing requests to the appropriate microservices, handling authentication, and providing rate limiting and security measures.
2. **Authentication & Authorization**:
   - Manages user authentication (e.g., OAuth, JWT) and authorization to ensure secure access to the platform.
3. **User Management**:
   - Handles user registration, login, session management, and user data storage.
4. **Profile Management**:
   - Manages user profiles, preferences, and order history. It ensures users can view and update personal information.
5. **Product Catalog Service**:
   - Manages product details, categories, and pricing information. It integrates with other services like inventory and pricing to provide accurate data.
6. **Search Service**:
   - Provides the functionality for full-text search, filtering, and sorting of products in the catalog.
7. **Recommendation Engine**:
   - Analyzes user behavior and preferences to suggest personalized products to users based on their activity on the platform.
8. **Inventory Service**:
   - Manages product stock levels, synchronizes inventory across warehouses, and ensures real-time updates of stock availability.
9. **Pricing & Discount Service**:
   - Handles dynamic pricing, special offers, and discounts across products. It integrates with product catalog services to update pricing in real time.
10. **Review & Rating System**:
    - Collects user-generated reviews and ratings for products, which influences the recommendation system and helps other customers make informed purchase decisions.

11. **Order Service**:
    - Handles order placement, status tracking, and updates throughout the order lifecycle.
12. **Shopping Cart Service**:
    - Manages user shopping carts, including adding/removing products, saving carts, and syncing carts across devices.
13. **Payment Service**:
    - Handles the integration with payment gateways, processing transactions, fraud detection, and providing payment confirmations.
14. **Shipping & Logistics Service**:
    - Manages shipping, tracking of delivery statuses, and integration with third-party carriers like DHL, FedEx, etc.
15. **Delivery Management Service**:
    - Coordinates with shipping services to manage the dispatch, tracking, and delivery of products.
16. **Notification Service**:
    - Sends notifications about order status, promotions, discounts, and updates via email, SMS, or push notifications.
17. **Analytics & Reporting**:
    - Analyzes data related to user behavior, sales, and traffic to provide insights for business decision-making.
18. **Admin Management**:
    - Provides administrative features such as platform configuration, inventory management, user role management, and monitoring of system health.

Diagram of Lazada's Microservices Architecture



Summary of Components and Their Interactions:

- **API Gateway**: Routes incoming requests to the appropriate microservice. It handles load balancing and security.
- **Authentication & Authorization**: Ensures that only authenticated and authorized users can access specific services.
- **User Management**: Manages user accounts, sessions, and handles user data.
- **Profile Management**: Stores user preferences, order history, and profile settings.
- **Product Catalog Service**: Manages product listings, categories, and prices.
- **Search Service**: Provides product search functionality.
- **Recommendation Engine**: Personalizes product suggestions based on user behavior.
- **Inventory Service**: Ensures accurate stock levels and inventory management.
- **Pricing & Discount Service**: Handles product pricing and discounts.
- **Review & Rating System**: Collects customer reviews and ratings, influencing product recommendations.
- **Order Service**: Handles the processing of orders and tracking their status.
- **Shopping Cart Service**: Manages users' shopping carts and synchronization across devices.
- **Payment Service**: Handles payment processing and integrates with payment gateways.
- **Shipping & Logistics**: Tracks delivery status and integrates with shipping carriers.
- **Delivery Management**: Coordinates order fulfillment and delivery tracking.
- **Notification Service**: Sends notifications about orders and shipping status.
- **Analytics & Reporting**: Collects data for business insights and performance analytics.
- **Admin Management**: Provides tools for administrative control and platform configuration.

Lazada’s microservices architecture supports scalability, flexibility, and high availability. Each microservice is designed to perform a specific task, and they work together to provide a seamless e-commerce experience. By using a microservices approach, Lazada can quickly deploy updates, scale individual services as needed, and maintain resilience across the platform. This architecture is well-suited for large, dynamic systems like online e-commerce platforms.