Product Catalog Management Architecture

Overview

The Product Catalog Management Architecture is responsible for the centralized control, storage, and dissemination of product information across enterprise systems and channels.

Key Components

- **Product Catalog Service (PCS):** Manages CRUD operations and business rules for products.
- **Database:** Central storage of product records, attributes, and relationships.
- **API Gateway:** Provides secure access to catalog APIs for internal and external consumers.
- **Integration Layer:** Syncs catalog data with other enterprise platforms (e.g., eCommerce, ERP).
- **Admin UI:** Interface for internal catalog management by merchandise or admin users.
- **External Consumers:** Websites, apps, and partners that consume up-to-date product data.

[Architecture Diagram Placeholder]

High-Level Data Flow

1. Admins manage products via the Admin UI.
2. The Product Catalog Service processes requests and updates the Database.
3. API Gateway exposes product information via secured endpoints.
4. External systems fetch catalog data for display or processing.
5. Integration Layer synchronizes data to downstream systems as needed.

Main Database Tables

Table	Description
products	Stores core product records (ID, name, SKU, status, timestamps).
product_attributes	Flexible attributes (e.g., color, size, weight) as name-value pairs.
categories	Product category hierarchy for organization and navigation.
product_categories	Associative table for product-category relationships.
inventory	Stock tracking per product and location (if applicable).

Typical Interactions

- Product creation, update, and deletion by authorized admins.
- Bulk product import/export for integrations and onboarding.
- Product data synchronization across sales and marketing apps.
- Real-time and scheduled API access for external and internal consumers.

Considerations

- Data consistency and integrity across distributed systems.
- Performance and scalability under high read/write operations.
- Role-based access controls for secure management.
- Audit logging and versioning of product changes.