Healthcare System Architecture

Comprehensive microservices-based telemedicine platform

System Architecture   Data Flow   Infrastructure

Patient Appointment Booking Flow

1   Patient initiates booking
    Patient App → API Gateway

2   Authentication check
    API Gateway → Auth Service (validate JWT)

3   AI-powered triage
    Appointment Service → Triage Service (symptom analysis)

4   Doctor recommendation
    Triage Service → Doctor Service (find specialists)

5   Availability check
    Appointment Service → Database (check slots)

6   Risk assessment
    Appointment Service → Risk Assessment (patient history)

7   Create appointment
    Appointment Service → Database (save appointment)

8   Send notifications

Appointment Service → Notification Service (SMS/Email/Push)

9   Return confirmation
     API Gateway → Patient App

Payment Processing Flow

1   Payment initiated
     Patient App → API Gateway → Payment Service

2   Process payment
     Payment Service → External Gateway (Stripe/PayPal)

3   Update records
     Payment Service → Database (transaction record)

4   Generate invoice
     Payment Service → S3 (store invoice PDF)

5   Confirm appointment
     Payment Service → Appointment Service (confirm booking)

6   Send receipt
     Payment Service → Notification Service (email receipt)

7   AI prediction update
     Payment Service → Prediction Service (update revenue forecast)

Doctor Consultation Flow

1   **Access patient records**
Doctor App → API Gateway → Patient Service

2   **View medical history**
Patient Service → Database + S3 (documents)

3   **AI insights**
Doctor App → Prediction Service (suggested diagnosis)

4   **Risk alerts**
Risk Assessment → Doctor App (critical alerts)

5   **Create prescription**
Doctor App → Patient Service (save prescription)

6   **Update appointment**
Doctor App → Appointment Service (mark complete)

7   **Notify patient**
Appointment Service → Notification Service

Legend

Client Applications   Backend Services

AI/ML Services   Data Layer