

Healthcare System Architecture

Comprehensive microservices-based telemedicine platform

System Architecture Data Flow Infrastructure

Client Layer



Patient Mobile App
iOS & Android

Book Appointments Video Consultations Health Records Payments Notifications



Doctor Mobile App
iOS & Android

Schedule Management Patient Records Video Consultations Prescriptions Analytics



Web Dashboard
Admin & Clinic Portal

User Management Analytics Reports Billing Configuration





API Gateway / BFF (Backend-for-Frontend)

Request routing, authentication, rate limiting, load balancing



Backend Microservices



Auth Service Authentication & Authorization

JWT Tokens OAuth 2.0 Role Management Session Control MFA



Appointment Service Scheduling & Booking

Book/Cancel Availability Reminders Waitlist Recurring



Notification Service Multi-channel Alerts

Push Notifications SMS Email In-app Templates



Payment Service Transactions & Billing

Stripe/PayPal Invoicing Refunds Insurance Reports



Doctor Service Provider Management

Profiles Specializations Availability Ratings Documents



Patient Service Patient Management

Profiles Medical History Prescriptions Documents Family

AI/ML Microservices



Prediction Service ML-based Forecasting

Disease Prediction Treatment Outcomes Resource Planning No-show Prediction



Triage Service Symptom Assessment

Symptom Checker Priority Scoring Specialty Routing Urgency Detection



Risk Assessment Health Risk Analysis

Risk Scoring Complication Detection Early Warnings Population Health



Data Layer



PostgreSQL Database

Primary relational database

Users & Auth

Appointments

Medical Records

Payments

Doctors & Patients

Audit Logs



Additional Data Stores

Specialized storage solutions

Redis (Cache & Sessions)

S3 (Medical Documents)

Elasticsearch (Search)

TimescaleDB (Metrics)

MongoDB (Logs)

RabbitMQ (Message Queue)

Legend

Client Applications

Backend Services

AI/ML Services

Data Layer