System Design - Appointment Scheduling System

Problem Statement:

You are tasked with designing an online appointment scheduling system for a medical clinic. The system should allow patients to request appointments without specifying a specific doctor. The platform should internally assign a doctor based on availability. The system should handle a high volume of appointment requests, ensuring reliable scheduling even in the event of failures.

Requirements:

1. Patients should be able to see available appointment times and reserve that slot
2. The system should internally assign an available doctor based on their schedule.
3. Doctors should have the ability to set their availability and view their assigned appointments.
4. The system should handle a large number of appointment requests and ensure low latency for scheduling.
5. The system should be fault-tolerant and capable of recovering from server crashes, network issues, or other technical problems.
6. Patients should receive appointment confirmations and reminders via email or notifications.
7. The system should provide an admin interface for clinic staff to manage doctor schedules and appointments.

Please provide a high-level architectural diagram of your proposed system, including the various components and their interactions. We're not looking for a perfect solution, we are interested in seeing your thought process and encourage questions and discussion.