Solution Design Problem

Tech Lead Interview Question

Introduction

Your task is to design a system to implement a Flight Information Display system at an Airport - you know, one of those information boards that show when flights are departing. The goal isn't to have expert domain knowledge (so no points for researching other solutions), but to propose a solution to the problem as described and have discussions around tradeoffs. It's expected you'll spend up to 2 hours on this exercise. You can assume any technology stack or implementation that you're comfortable with, just note them down. There are more requirements than you can probably solve for in the time allotted - **a complete solution that misses requirements is preferred over an incomplete solution that attempts to boil the ocean.**

Problem Statement

The task is to design a system that meets the following requirements:

1. For this exercise, we'll consider ONLY departing flights (not arrivals as well).
2. There is a flight schedule, which defines when the regularly scheduled flights occur - for example, "Air New Zealand has a flight NZ0128 that flies to Melbourne (MEL) at 6:30am on Monday, Wednesday and Friday"
3. The airlines keep the schedule up to date when they make schedule changes.
4. The flight display has a list of upcoming departures.
5. Each flight has the following properties
    a. An Airline
    b. Flight Number

    c. Destination
    d. Scheduled Departure Time
    e. Estimated Departure Time
    f. Actual Departure Time
    g. Flight Status, which is one of:
        i. On Time
        ii. Check In
        iii. Boarding
        iv. Departed
        v. Cancelled
        vi. Delayed
    h. Departure Gate (assigned once the flight enters “Boarding” status)
6. The big ticker board in the airports will get the information from your system over a web API.
7. The flight information needs to be viewable over the internet (so people can check their flight status before coming to the airport).
8. The internet accessible view of flight information must deal with very large traffic spikes for when a storm or other event means lots of people check flight status.
9. Passengers can subscribe to a particular flight and receive push notifications when it’s status or details change.
10. Airlines must not be able to update the flight information for other airlines.
11. The interface to update the flight information must not be accessible to the internet.

Deliverables

1. A design for how the data should be modeled.
2. A design for how the system would be broken down into components and what each of those components would do, along with technology choice.
3. A description of which requirements are met and not met, any trade-offs considered and any assumptions made.
4. A rough estimate for how long it would take you to implement the system described.

Have fun!