Situation

Client

PeaceState is a blessed country, led by an affable and clear-sighted ruler. He takes great pride in its effort to bring peace, happiness, and harmony to all its citizens.
To do so, the benevolent ruler heavily rely on his fellow peacemakers. A governmental agency dedicated to make peace around the country. To reach their ambition, they bring assistance to any agitated person and help them to recover peace. More generally they help citizen to stay in line with their country harmonious goal

To help its peacemakers squads, PeaceState engineers have created a working autonomous drone called peacewatcher.
They need you to create the program that will receive and manage peacewatchers's data.
This program must

- store every peacewatcher data
- trigger alerts
- enable peacemaker officers to perform analysis on peacewatcher data

Drone description

Each peacewatcher sends a report every minute.
One report contains

- peacewatcher id
- peacewatcher current location (latitude, longitude)
- name of surrounding citizens (identify with facial recognition) with their computed «peacescore». Peacescore being recomputed for every report.
- words heard by the peacewatcher in its surrounding

Alert

When a citizen peacescore is bad, your program must trigger an alert with the location of the peacewatcher and the name of the agitated citizen.
Peacemakers will take it from there and help the person to find peace.
They may send him to a peacecamp. In such camp citizen learn to reach happiness following the ideas of the beneveland leader of Peacestate. Or they will put him in a sustainable and never ending peace state.
This alert must be triggered as quickly as possible because an agitated citizen may spread its lack of peace to other citizens. Thus, the peacemaker reaction must be as fast as possible.

Statistics

Peacemakers are convinced that we need to keep every peacewatcher report in order to make statistics and improve their Peacestate harmony. But they still don't know what kind of question/statistic they will want to address.
Peacestate engineer estimate that when the first wave of peacewatcher will be operational the sum of all their daily report will weight 200Gb
They also estimate that less than 1% of peacewatcher report contains alert.

Failed attempt

To create a POC of the program, Peacestate hired a team of data-scientists and Despite all their efforts, this team have not been able to set up a scalable program that can handle the load.

Preliminary questions

1) What technical/business constraints should the data storage component of the program architecture meet to fulfill the requirement described by the customer in paragraph «*Statistics»* ?
   So what kind of component(s) (listed in the lecture) will the architecture need?
2) What business constraint should the architecture meet to fulfill the requirement describe in the paragraph «Alert»? Which component to choose?
3) What mistake(s) from Peacestate can explain the failed attempt?
4) Peacestate has likely forgotten some technical information in the report sent by the drone. In the future, this information could help Peacestate make its peacewatchers much more efficient. Which information?

Project

Peacestate understands this is beyond their team limits, it can not put in place a programm to deal with the drone's data. Peacestate asks you for advice to design an architecture allowing them to create a product they could sell to different police forces.

It's up to you to report and recommend the right architecture.

Based on the preliminary questions, your solution is very likely to include :

- at least one distributed storage
- at least one distributed stream
- at least two stream consumer