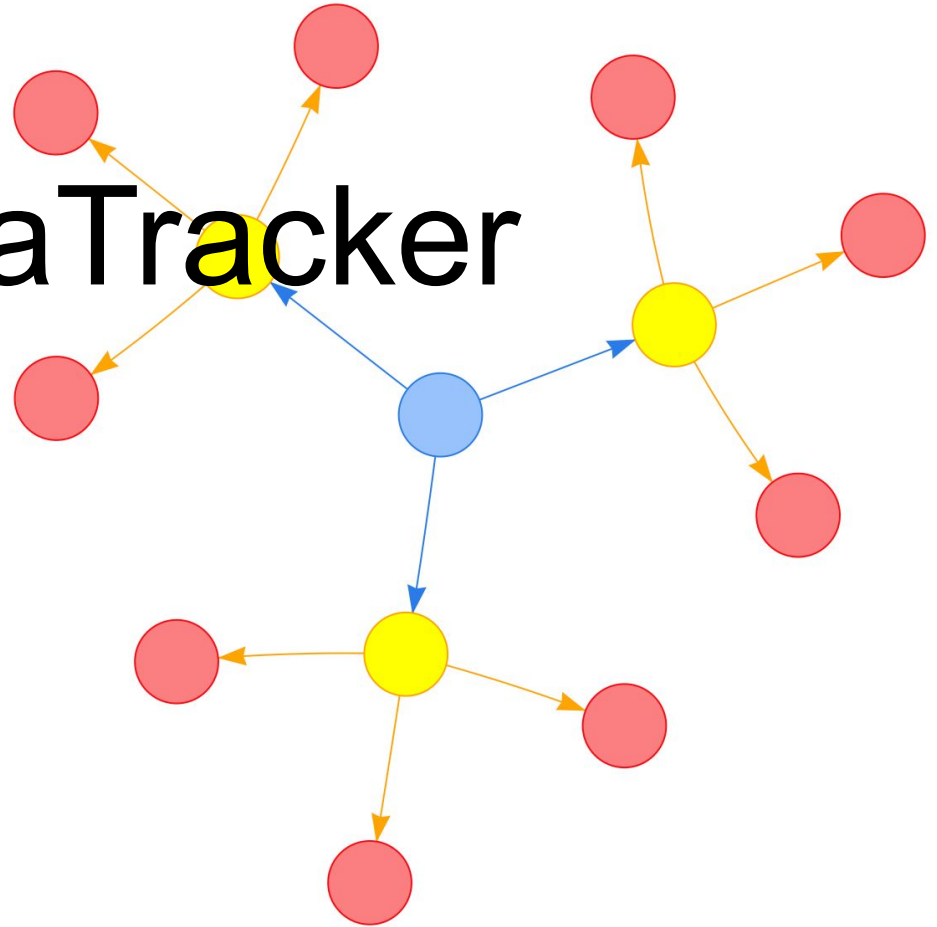# CoronaTracker

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CONCEPT

Issue Warning, Recommend Self-Quarantine, Checkups, since came in contact with the Infected

Issue Warning, since came in contact with 1st degree

COVID-19 INFECTED

6 ft
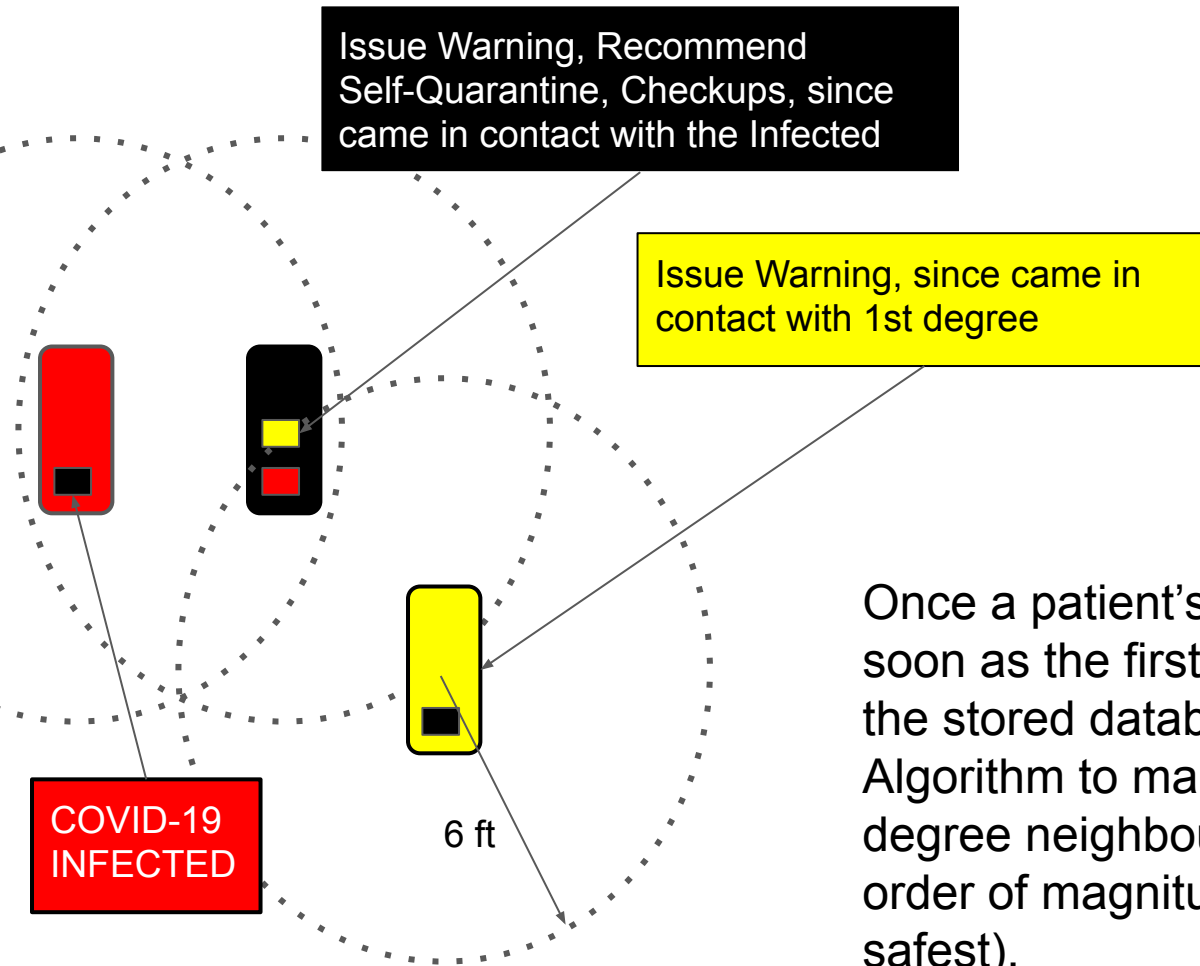
Once a patient's id is marked **infected**, as soon as the first neighbour is discovered (in the stored database), we use a Graph Algorithm to mark the population upto nth degree neighbours as **unsafe** in decreasing order of magnitudes(nth degree neighbour is safest).

GENERAL TREND OF COMMUNITY SPREAD

Infected

1st degree

2nd degree

nth degree
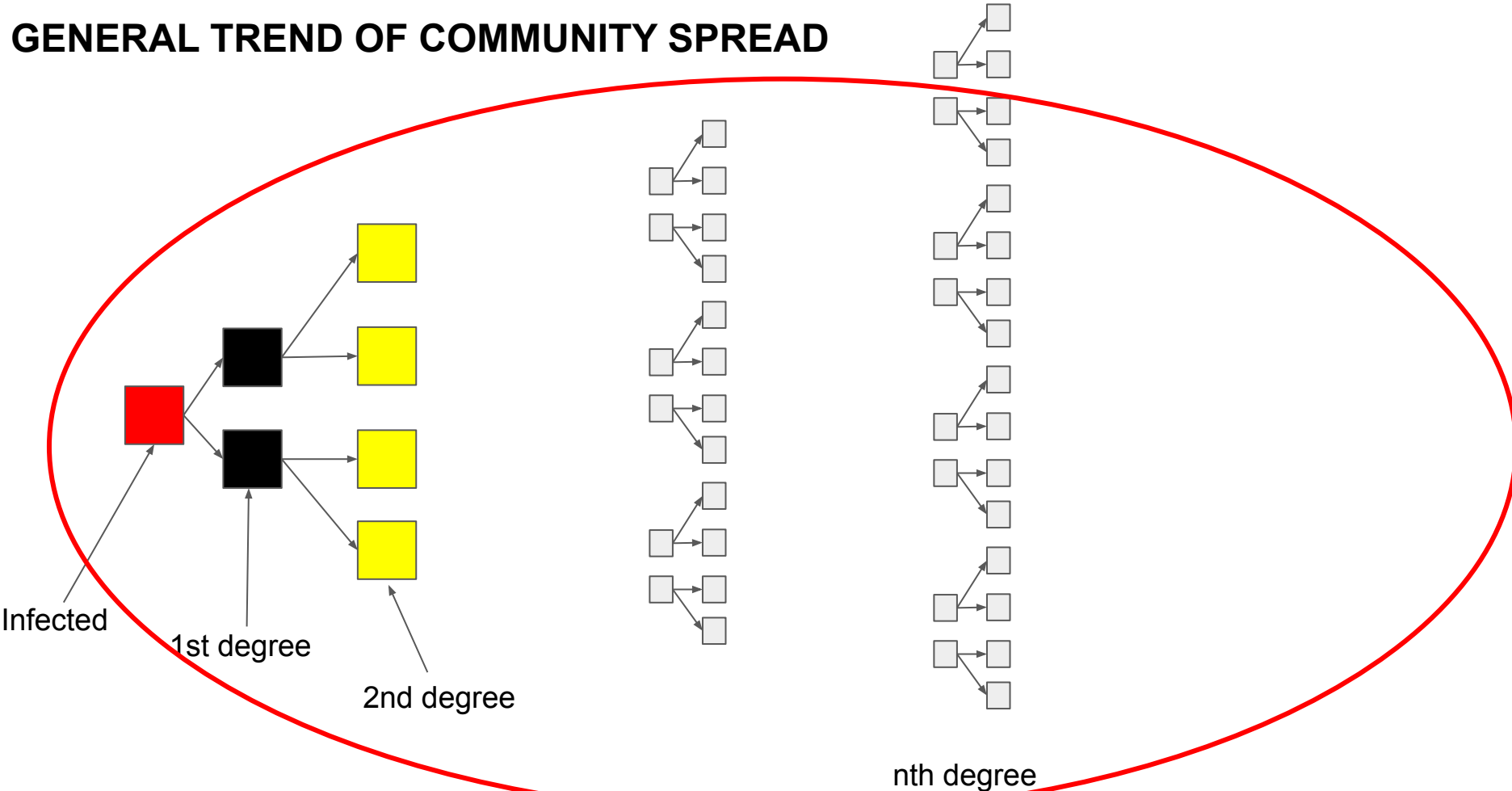
TREND OF SPREAD BY USING OUR APP
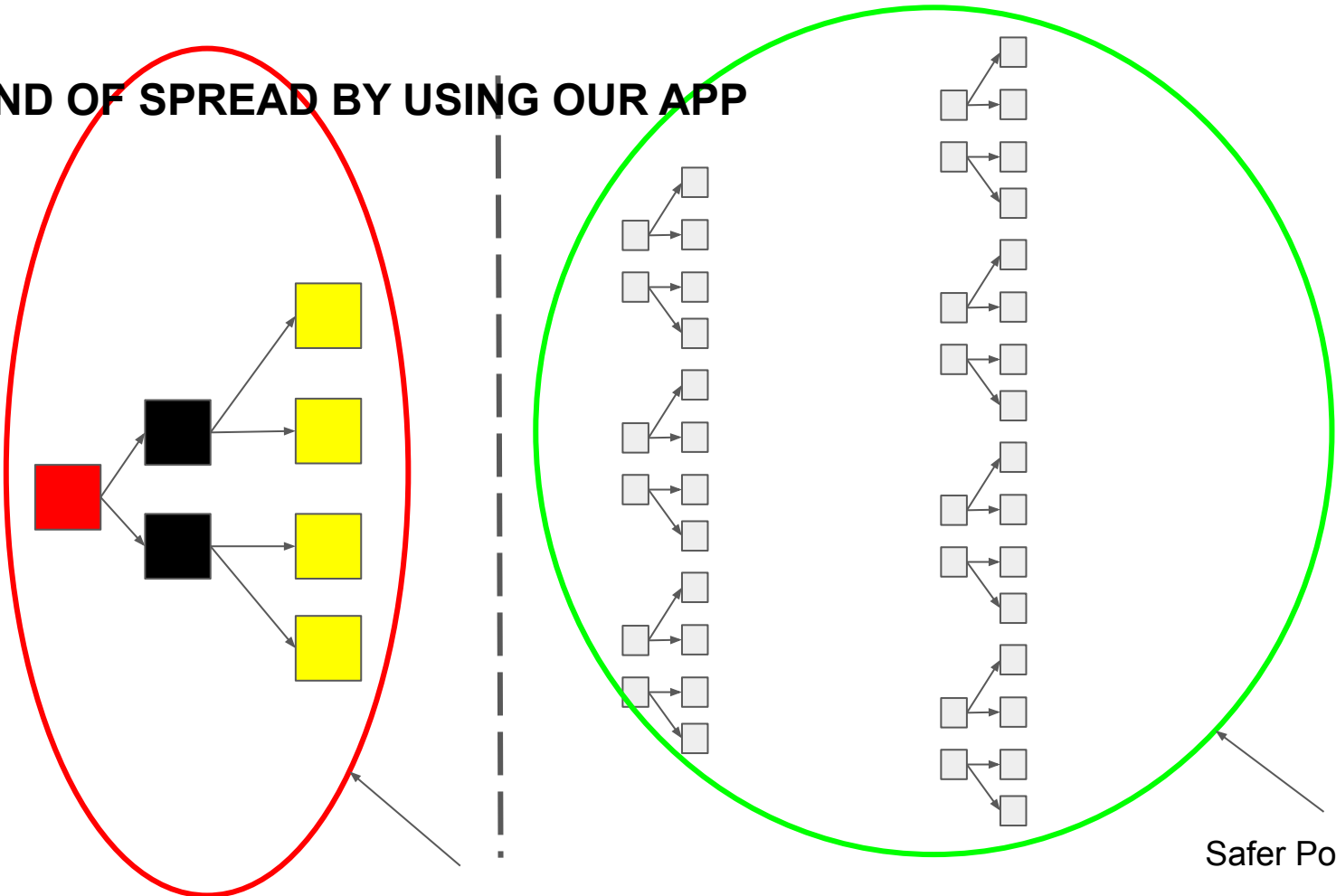
Extremely Unsafe but Quarantined

Safer Population
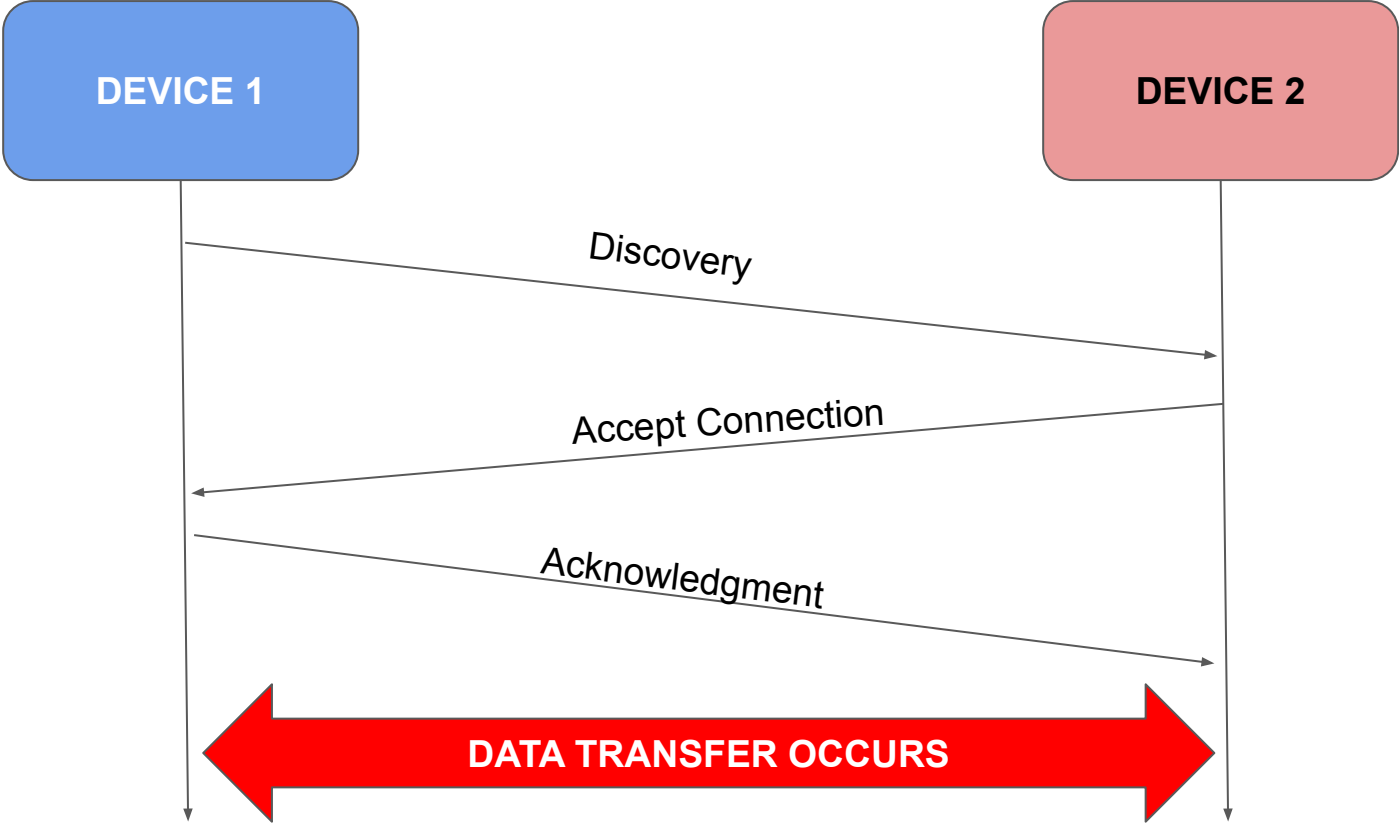
HOW WE ENSURE PRIVACY AND SECURITY

We use the standard Bluetooth technology in a different way.
The **Connection establishing phase** or the **Network discovery phase** is used to tactfully exchange the unique ids(IMEI of the phone itself).
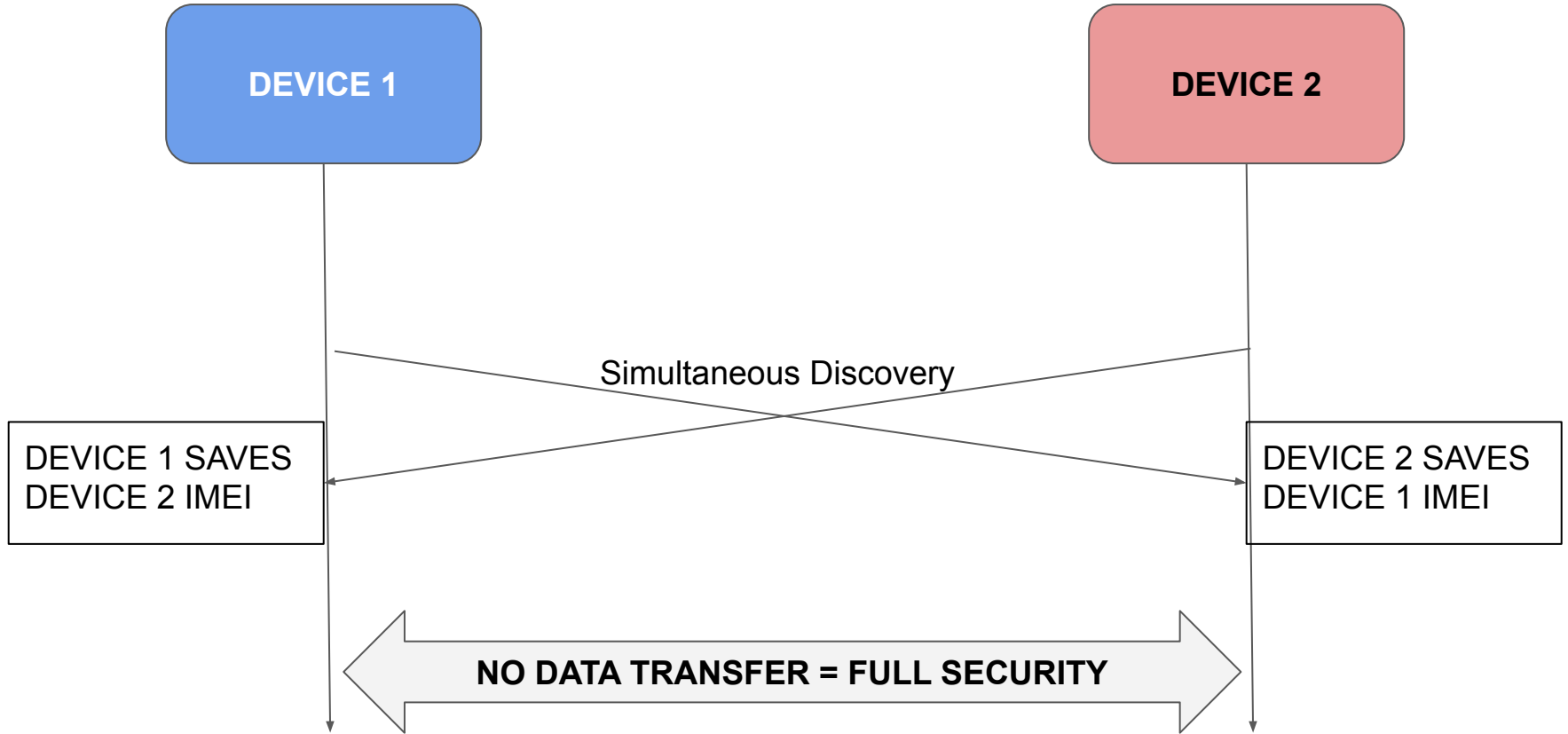
Note: No connection is established between any 2 devices.
This maintains necessary levels of privacy and safety of devices.

# HOW A DATA TRANSFER CONNECTION TYPICALLY WORKS?

HOW OUR SOLUTION WORKS?

DEVICE 1

DEVICE 2

Simultaneous Discovery

DEVICE 1 SAVES
DEVICE 2 IMEI

DEVICE 2 SAVES
DEVICE 1 IMEI

NO DATA TRANSFER = FULL SECURITY

Timeline from User POV

- Doctor predicts the time since which the Infected Patient might have been spreading the virus.
- All the users the patient in came in contact with (1st and 2nd degree), after the specified time, are notified.
- Afterward, if any of the users (marked user) breaks the adviced quarantine, all other users in the vicinity are notified. The marked user is asked again to refrain from coming in contact with any other person.
- If 1st and the 2nd degree users do not show any symptoms within 14 days, they are unmarked. Similarly, cured patients are also unmarked.
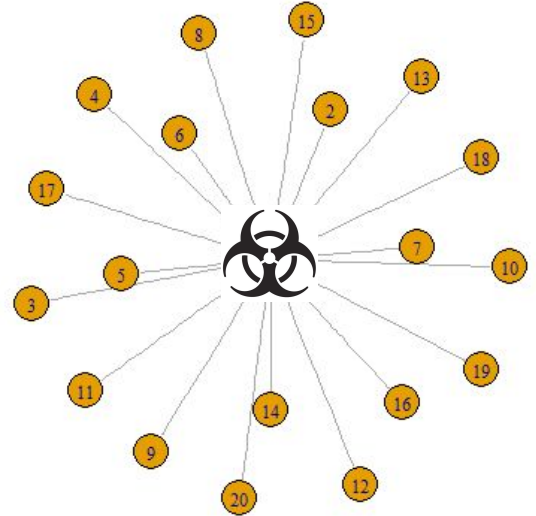
Strategy

- We are using **P2P Cluster** connections to discover for nearby android devices.
- For this, we are only using **Bluetooth**.
- Bluetooth will be turned ON the whole time. The users can not turn it OFF, even if they want.
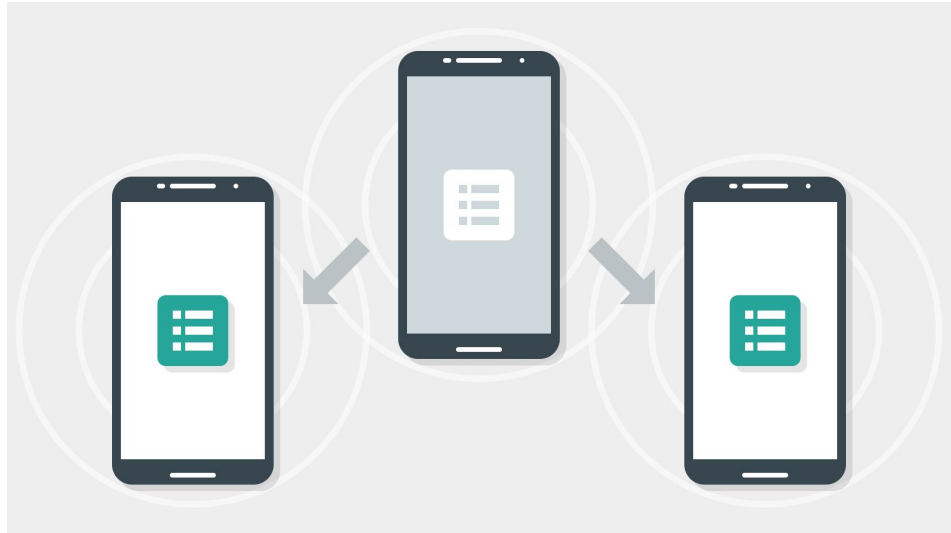
What if someone does not have the app…..

- If the GPS is already ON, we will fetch the GPS location and update it on the cloud.
- If not, we will just fetch the tower location and update it on the cloud every time it changes. This is done to save the battery consumption caused by the keeping the GPS constantly ON.
- Although we do not encourage this, but incase someone did not install the app, we can have the option of sharing the location history of all the infected people with everyone so that they can self verify the location track and see for himself if he might be at risk. For better results and notifications, it is still recommended to install the app.

TECHNICAL ASPECTS AND SALIENT FEATURES

1. Fire and Forget for user
2. Maintains user security, by **not establishing connections**
3. App **not required to run even in background**
4. **User is restricted** to switch off bluetooth
5. Multi-Directional **BFS** upto k(configurable externally) neighbors
6. Adjacency list notion used along with **NoSQL** database to make it scalable(supports **higher queries per second**)
7. Requires **no user update(for minor operations)** and hence future-proof
8. Does **not** require a 24x7 internet connectivity