Week 10 Blog

Sree Ram Boyapati	a1775690@student.adelaide.edu.au
Course	Comp Sci 7092 - Mobile and Wireless Systems
Group	CovidGuard-F
Supervisor	Zach Wang

What have I done this week?

This week, I have done a couple of enhancements to the application and tested the backend server for any issues and load tested the download teks.

How to show a notification from a periodic task which checks for exposure with an infected user.
This is not yet resolved and we will be focusing on it this week. We used to trigger the matching process on button click and operate in the lifecycle of an activity. With a periodic schedule, that is no longer true. We tied the work manager's periodic task to the foreground service and tried to trigger a notification.

PRs Merged

https://github.cs.adelaide.edu.au/2020-Mobile-and-Wireless-Systems/CovidGuard-F/pull/71
Taking the input of the professor, We have added functionality to trigger background tasks when they meet certain constraints. It retries submit/download functionality when the user submits and the first event fails. MAX_RETRIES has been set to 5 and it does exponential backoffs.

https://github.cs.adelaide.edu.au/2020-Mobile-and-Wireless-Systems/CovidGuard-F/pull/70
There are some error conditions that have been handled. If the BLE support is not present, App will not crash. BLE advertisement is set to use LOW_POWER and LOW_TX_POWER. We will not show splashActivity if the token is present (registration was successful) and location permission has been obtained. I have added TxPower and Distance to RPI database and updating RPI entries with the running average of RSSI of beacons received.

https://github.cs.adelaide.edu.au/2020-Mobile-and-Wireless-Systems/CovidGuard-F/pull/73
There is a necessity that submission of teks and positive contact matching happen periodically. When I was working on this, I also did some refactoring to prevent storing of

downloaded teks and directly use them during matchmaking. I made the code modular at few places. I removed certain constraints from a UX perspective that the user wants those work managers tasks to execute immediately.

PRs in Progress

https://github.cs.adelaide.edu.au/2020-Mobile-and-Wireless-Systems/CovidGuard-F/pull/72
I am working on this with lokesh to introduce consent flow in the app and authorize verification servers to get test results for a user.

These are our interactions and plan to introduce consent taking some key points on terms and conditions from California Covid Notify.

https://github.cs.adelaide.edu.au/2020-Mobile-and-Wireless-Systems/CovidGuard-F/wiki/Consent-Flow---Health-Care-and-API

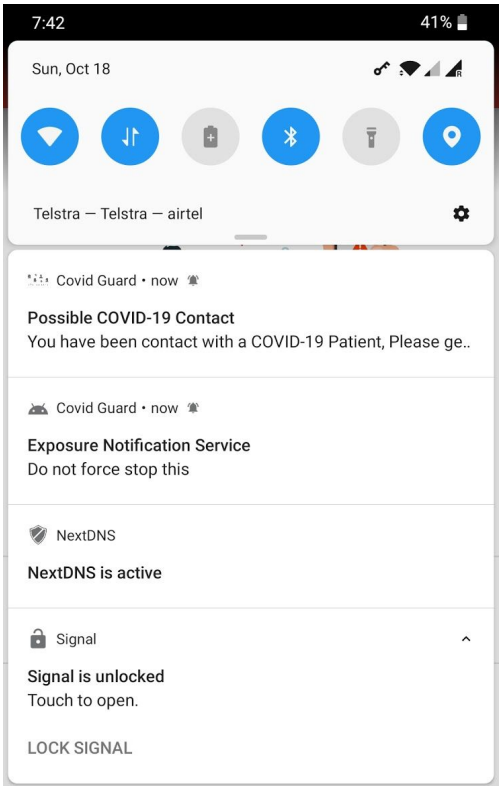

Figure 1: Positive Contact Notification

Load Testing of Downloaded TEKs

Configuration: ali --rate 100 -w 100
https://ens-server.ts.r.appspot.com/download-diagnosis-keys

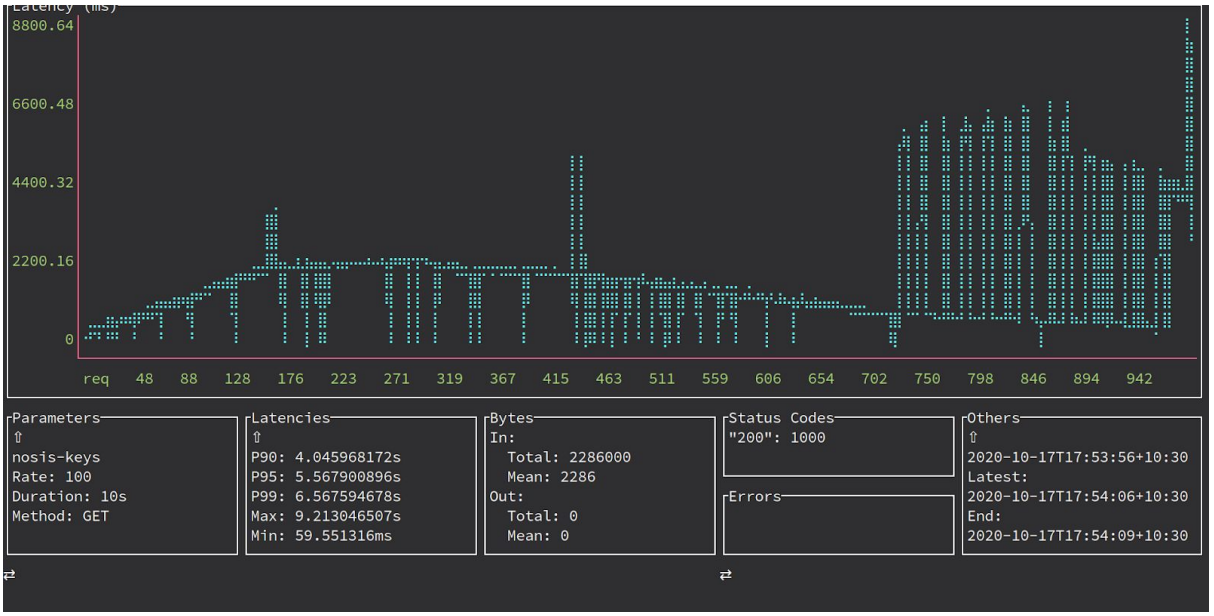

Figure 2: Load testing done using ali

I have done load testing using ali[1] a command line tool. I have not autoscaled google app engine instances and ran it from my computer spawning 100 connections requesting at a rate 100 requests per sec. Latencies were quite high but none of them gave 503 errors.

By settings app engine autoscaling using target CPU utilization or number of requests[2], we can bring the latency down.

[1] "nakabonne/ali: Generate HTTP load and plot the ... - GitHub." https://github.com/nakabonne/ali. Accessed 18 Oct. 2020.

[2] "How Instances are Managed - Google Cloud." 17 Aug. 2020, https://cloud.google.com/appengine/docs/standard/python/how-instances-are-managed. Accessed 18 Oct. 2020.

Nikto[3] Web Server Scanning

I tried nikto web server scanning tool for any issues with the server setup.

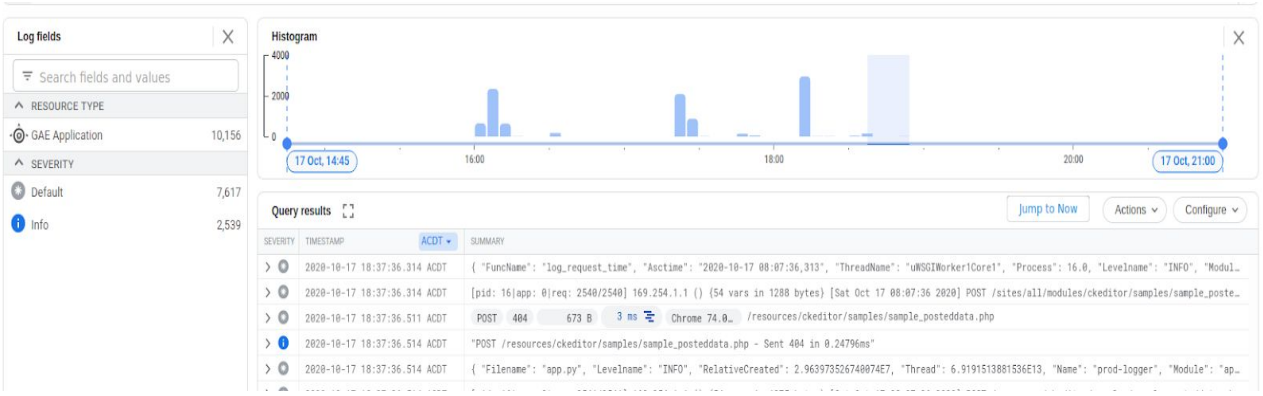

Figure 3: Nikto made 8000 requests in a span of half an hour to test for common vulnerabilities

Configuration: ./nikto.pl -h https://covidgaurd-285412.ts.r.appspot.com -o out.json

It just found an uncommon header **'x-cloud-trace-context'** and later it was found to enable cloud tracing[4]

Some of the sample requests made by nikto checking for editors, wordpress vulnerabilities and CGI scripts -

1. /wp-content/plugins/ckeditor-for-wordpress/ckeditor/samples/sample_posteddata.php
2. /scgi-bin/platform.cgi
3. /ckeditor/samples/sample_posteddata.php

Scan results are stored here.
https://github.cs.adelaide.edu.au/2020-Mobile-and-Wireless-Systems/CovidGuard-F/blob/master/assessment/verificationserver-niktoscan.json

What I want to focus on next week:

1. Risk Scoring analysis and classification based on NHSx algorithm.
2. Calibration using Device data from Google (https://developers.google.com/android/exposure-notifications/files/en-calibration-2020-08-12.csv)
3. Further bug fixes and enhancements after consent flow PR merges

[3] "sullo/nikto: Nikto web server scanner - GitHub." https://github.com/sullo/nikto. Accessed 18 Oct. 2020.
[4] "Cloud Trace | Google Cloud." https://cloud.google.com/trace. Accessed 18 Oct. 2020.