

# Kotlin Responsiveness

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## Background

- RPM is a measurement of a network connection's latency that accounts for normal usage.
- The aim of the RPM Test is to give users intuitive feedback on their connection's responsiveness and to bring light to the problems surrounding lack of responsiveness, namely, Bufferbloat.
- The RPM Test is defined in an in-progress Internet-Draft under IETF.
- Currently, there exists an open-source tool for desktop (GoResponsiveness), and proprietary tools developed by Apple for macOS and iOS.

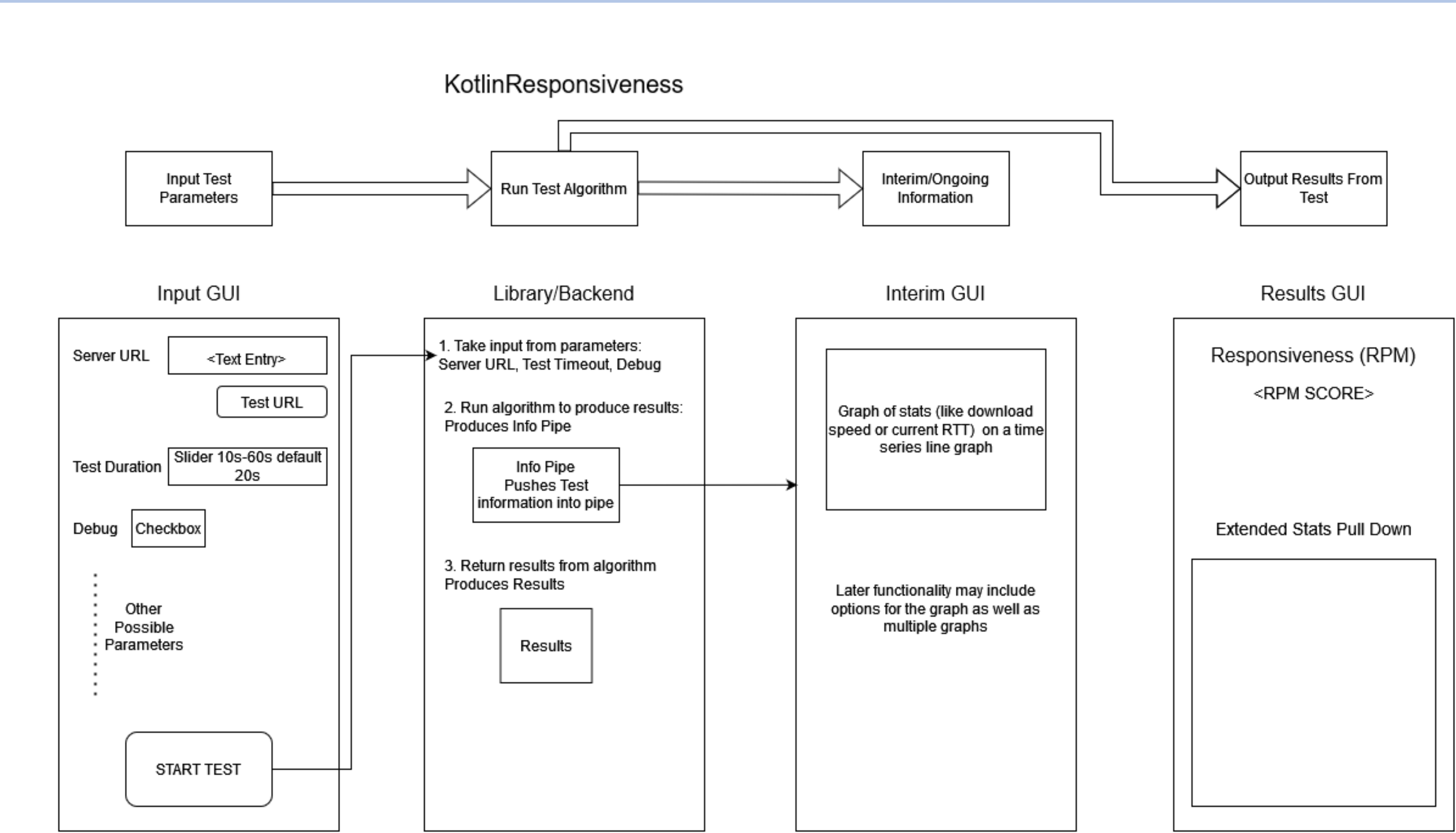
## Initial Goals

- Create an Android app that utilizes the above implementation to run the test.  
This is the overall goal, to allow Android users to have the same access to the test.
- Create a multiplatform library for the RPM Test to aid in community development for different implementations.
- Create a prototype version of the RPM Test for Java using Kotlin in the multiplatform library.

## Achievements

- Created prototype version of RPM Test for Java using Kotlin.
- Created a blank Android app to utilize this implementation.

## Initial Design



## Results Android App

```
I/System.out: Test did not reach stability
I/System.out: Final Stabilities: UploadLatency: not stable | DownloadLatency: not stable |
ForeignLatency: stable | UploadThroughput: stable | DownloadThroughput: stable
I/System.out: Partial Results below
I/System.out: Latest Upload Throughput: 6.865334 MB/s | Latest Download Throughput:
6.2350345 MB/s
I/System.out: Upload Latency P90: 155.324 ms | Download Latency P90: 9488.405 ms | Foreign
Latency P90 55.7587 ms
I/System.out: RPM Score: 24.602144
```

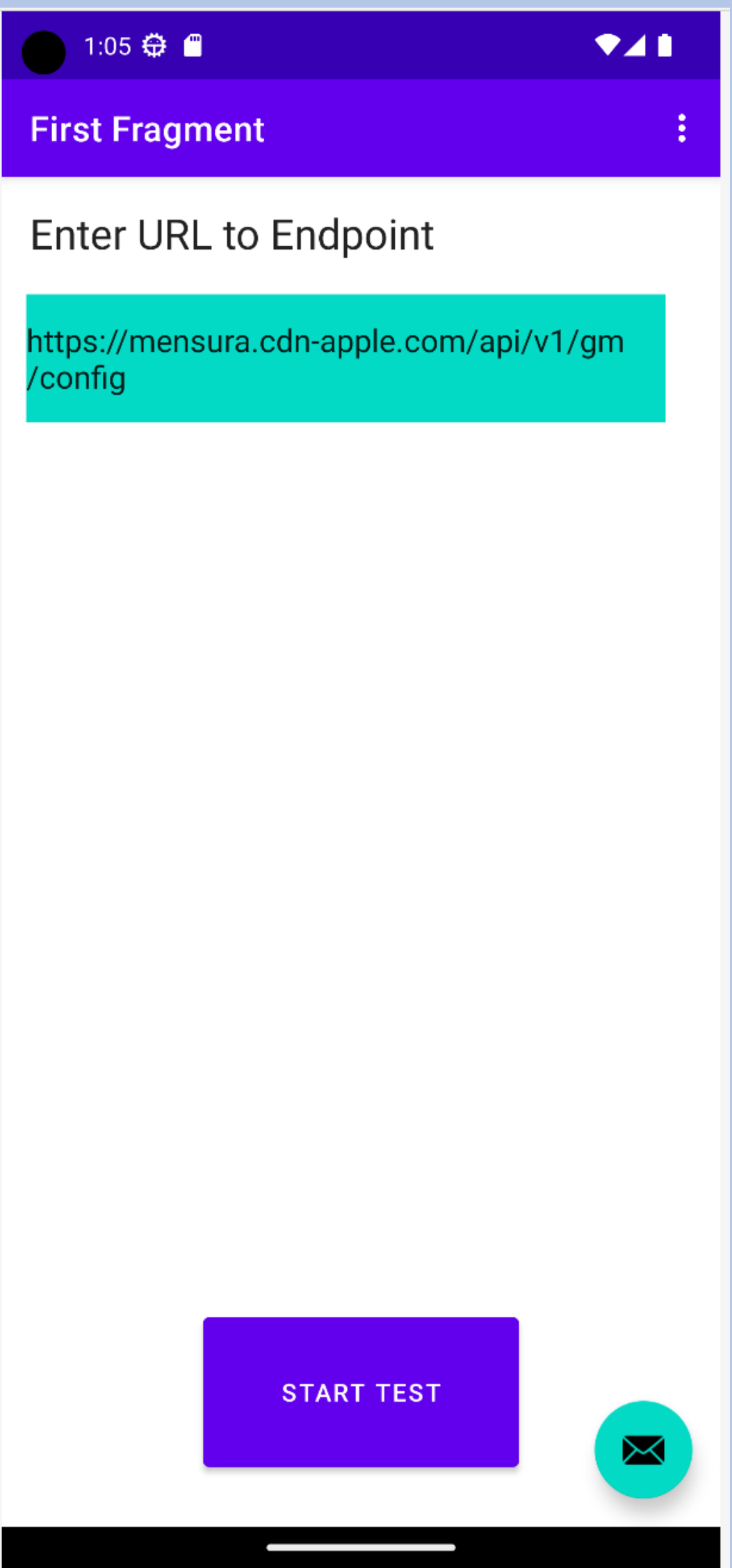
Partial GUI implementation.  
Library integration on Android emulation.

## Results JVM

```
Test did not reach stability
Final Stabilities: UploadLatency: not stable | DownloadLatency: not stable |
ForeignLatency: not stable | UploadThroughput: not stable | DownloadThroughput: stable
Partial Results below
Latest Upload Throughput: 14.405062 MB/s | Latest Download Throughput: 72.29696 MB/s
Upload Latency P90: 30.9095 ms | Download Latency P90: 2162.5571 ms | Foreign Latency P90
29.1027 ms
RPM Score: 106.58746
```

Consistently reaches the end of the test.

## Android App Layout



## Major Challenges

- Confirmation that the measurements are equal to that described in the Internet Draft.
- Finding a way to measure the intervals during connection establishment and data transfer specified by the test methodology.
- Integrating Library into a package that can be utilized.
- Working with concurrency and the limitations of the Android Platform.

## Plans

- Create the Testing framework for the multiplatform library.
- Create a full GUI for the Android App.
- Publish the Android App.