

# Resource Monitor



Traz and Christian

# Introduction/Scope

- **Resource Monitor:** A tool that uses both native and self-implemented functionality to poll the Android system for a variety of hardware and software statistics
- **Scope:**
  - **Original:** As many statistics as possible, and functionality to manipulate the system (Manager)
  - Scope was narrowed due to the complexity/learning process of every statistic and security bound limitations
  - **Final:** Primary software and hardware information (RAM, CPU, processes, etc)

# Objectives

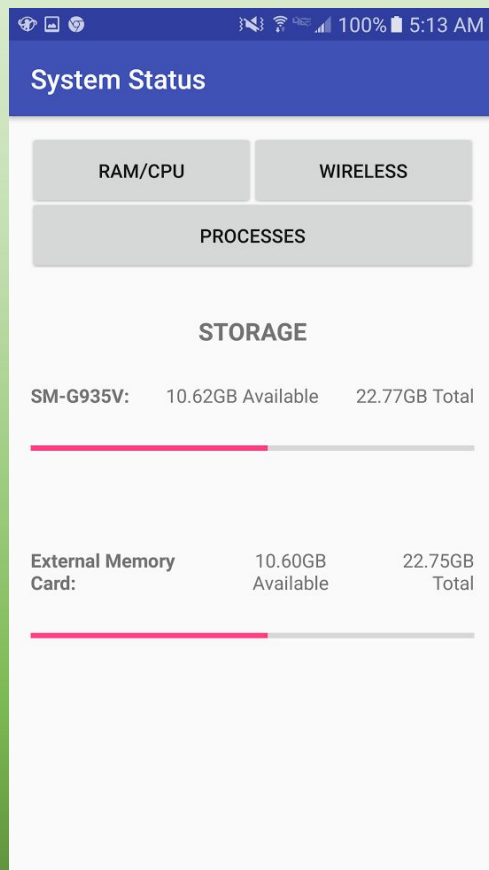
- Develop a detailed as possible Android resource monitor
- Monitor Hardware:
  - CPU Usage, RAM Usage, CPU speed/model, RAM speed/model, component temperature, internal storage usage, external storage usage, cellular connection type/status, WiFi connection type/status, Bluetooth connection status
- Monitor Software:
  - Process list, WiFi SSID
- Provide shortcut to relevant settings
- Keep an eye out for additional features

# Overview

- 4 Views/Activities (Subject to change)
  - MainActivity - Main screen and storage info
  - RAMCPUViewer - Displays all information related to system RAM and CPU
  - Misc - Displays all wireless information (will be expanded on or renamed)
  - Processes - Displays a list of running Apps/Services on the device (not yet complete)
  
- Main UI components: Button, TextView, ProgressBar, LinearLayout, ImageButton(TBD), Charts (TBD)

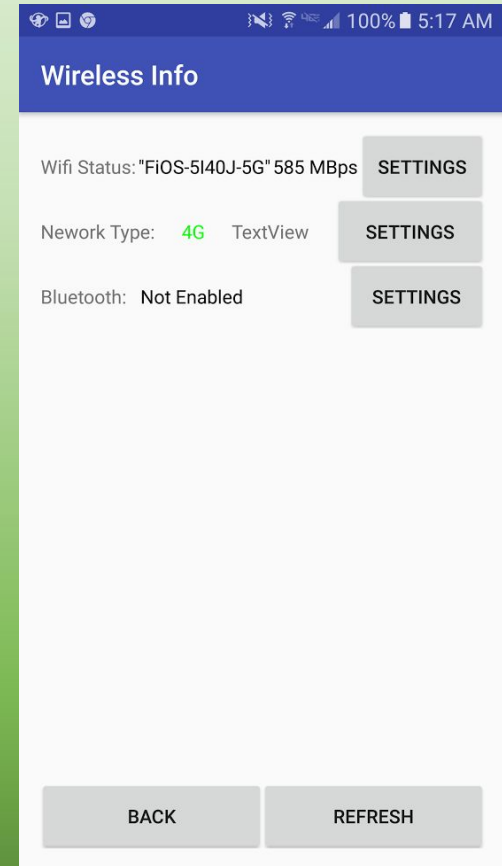
# Methodology - Storage Info

- Display internal and external storage
- Acts as main screen of app
- Bars show storage
  - Modeled after “Computer” in windows
- Bug: `getExternalStorageDirectory()` Gets internal



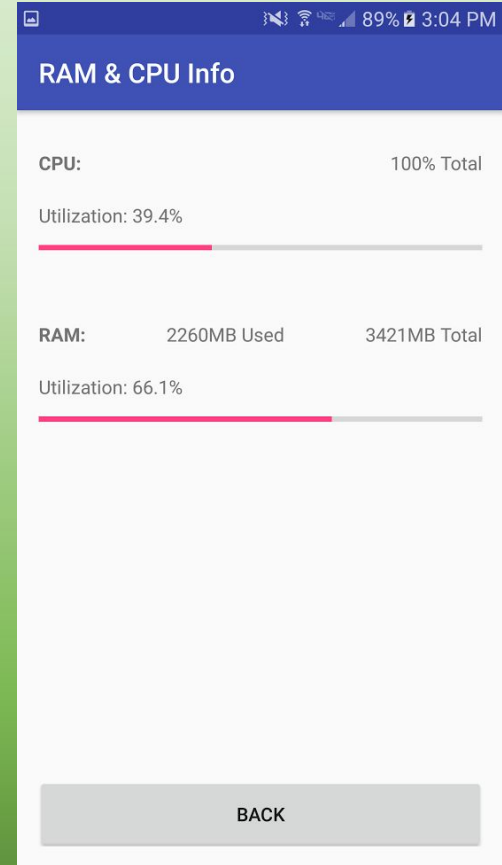
# Methodology - Misc

- Shows miscellaneous info about phone's state
- To add: SIM info
- Bugs:
  - Network strength not working
    - TextView placeholder
  - Bluetooth settings Intent crashes



# Methodology - RAM & CPU Info

- Display RAM & CPU utilization numerically and graphically
- Display RAM & CPU model/spec information
- Display RAM & CPU temperature
- Primary Through: ActivityManager.MemoryInfo, RandomAccessFile, “\$ cat /proc/cpuinfo”
- Makes use of Android Handler’s postDelayed() function
- ```
return (float)(cpu2 - cpu1) / ((cpu2 + idle2) - (cpu1 + idle1));
```



# Wrap Up

- Fix bugs related to accessing certain settings pages, and polling a couple statistics
- Finish implementing CPU/RAM stats (temperature, etc.)
- Implement process list viewer
- Improve UI appearance
- Include bells and whistles (app icon, etc.)
- Possibly investigate further statistic polling (time dependent)



# Bibliography

- [1] "ActivityManager", *developer.android.com*, 2016. [Online]. Available: <https://developer.android.com/reference/android/app/ActivityManager.html>. [Accessed: 12 - Dec - 2016].
- [2] "RandomAccessFile", *developer.android.com*, 2016. [Online]. Available: <https://developer.android.com/reference/java/io/RandomAccessFile.html>. [Accessed: 12 - Dec - 2016].
- [3] "StatFs", *developer.android.com*, 2016. [Online]. Available: <https://developer.android.com/reference/android/os/StatFs.html>. [Accessed: 12 - Dec - 2016].
- [4] "ConnectivityManager", *developer.android.com*, 2016. [Online]. Available: <https://developer.android.com/reference/android/net/ConnectivityManager.html>. [Accessed: 12 - Dec - 2016].
- [5] "NetworkInfo", *developer.android.com*, 2016. [Online]. Available: <https://developer.android.com/reference/android/net/NetworkInfo.html>. [Accessed: 12 - Dec - 2016].
- [6] "TelephonyManager", *developer.android.com*, 2016. [Online]. Available: <https://developer.android.com/reference/android/telephony/TelephonyManager.html>. [Accessed: 12 - Dec - 2016].
- [7] "WifiManager", *developer.android.com*, 2016. [Online]. Available: <https://developer.android.com/reference/android/net/wifi/WifiManager.html>. [Accessed: 12 - Dec - 2016].
- [8] "BluetoothAdapter", *developer.android.com*, 2016. [Online]. Available: <https://developer.android.com/reference/android/bluetooth/BluetoothAdapter.html>. [Accessed: 12 - Dec - 2016].
- [9] "Handler", *developer.android.com*, 2016. [Online]. <https://developer.android.com/reference/android/os/Handler.html>. [Accessed: 12 - Dec - 2016].