**Updating Android Permissions**

As policy is updated by the Internal Review Board (IRB) the policy document will be analysed with natural language processing tools to create a list of policies that an Android research application must comply with. The Android Manifest specifies permissions, and permission levels for the app, users grant these permissions when the app is installed.

Table 1 illustrates the process used to update existing apps

Table 2 illustrates an example policies deduced from the IRB policy document

Table 3 illustrates how a policy will be implemented in the app

**Pseudocode (language TBD)**

|  |
| --- |
| // 1. Clean-up any prior runs of the script  // 2. Run APKTool to decompile the application  // 3. Find AndroidManifest.xml  // 4. Add/Remove/Update permissions based on the input file  // 5. Recompile and sign the APK |

Table 1

**Policy List**

In this example the policy states that GPS\_Location cannot be precise, and that no wifi access is permissible.

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| --- |
| <policies>  <gps\_location>imprecise</gps\_location>  <wifi>imprecise</wifi>  </policies> |

Table 2

**Android Manifest**

Code in **RED** will be removed, code in **BLUE** will be inserted. Because GPS\_location must be imprecise, and WiFi access is not allowed, these will be removed. GPS location can be imprecise, and Android allows for approximate location, therefore we will insert a coarse location access.

|  |
| --- |
| *<?*xml version="1.0" encoding="utf-8"*?>* <manifest xmlns:android="http://schemas.android.com/apk/res/android"  package="edu.uccs.andreasslovacek.decompiletestproject">     <application  android:allowBackup="true"  android:icon="@mipmap/ic\_launcher"  android:label="@string/app\_name"  android:roundIcon="@mipmap/ic\_launcher\_round"  android:supportsRtl="true"  android:theme="@style/AppTheme">  <activity  android:name=".MainActivity"  android:label="@string/app\_name"  android:theme="@style/AppTheme.NoActionBar">  <intent-filter>  <action android:name="android.intent.action.MAIN" />   <category android:name="android.intent.category.LAUNCHER" />  </intent-filter>  </activity>  </application>    *<!-- Grants the app access to the users exact location-->* **<uses-permission android:name="android.permission.ACCESS\_FINE\_LOCATION"/>**  *<!-- Grants the app access to the users approximate location-->* **<uses-permission android:name="android.permission.ACCESS\_COARSE\_LOCATION"/>**  *<!-- Grands the app access to managing all aspects of wifi connectivity-->* **<uses-permission android:name="android.permission.ACCESS\_WIFI\_STATE"/>**   </manifest> |

Table 3