

# Vulnerability Disclosure Report on Spyware Apps Hiding App Icon on Android Phones

Enze “Alex” Liu\*, Sumanth Rao, Sam Havron, Grant Ho,  
Stefan Savage, Geoffrey M. Voelker, Damon McCoy

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## 1 Summary

Consumer spyware apps (e.g., spy24.app) that are sideloaded to an Android phone can hide their icons from the app launcher by abusing the `LEANBACK_LAUNCHER` category. This abuse works even on Android 12.

## 2 Platform

Android 12 and below.

## 3 Class

Android OS implementation bug

## 4 Bounty Programs

Any eligible bounty program and researcher recognition program

## 5 Summary

Spyware apps (e.g., spy24.app) that are sideloaded onto an Android phone exploit `LEANBACK_LAUNCHER` (launcher category for TV apps) to hide their icons from the app launcher on Android phones. Specifically, an app with an Activity that only specifies category `LEANBACK_LAUNCHER` and action `ACTION_MAIN` will run properly on Android phones without an icon. This app runs properly because the Activity specifies action `ACTION_MAIN`. However, this app will not display an icon in the app launcher, because it only has an Activity of category `LEANBACK_LAUNCHER`, which specifies that the Activity is optimized for Leanback mode and should be displayed in the Leanback launcher (for TV use).

## 6 Proof of Concept

### 6.1 Implementation

Figure 1 demonstrates the implementation in the simplest form.

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\*Point of contact, email: [e7liu@eng.ucsd.edu](mailto:e7liu@eng.ucsd.edu)

```

<activity android:name=".MainActivity" android:excludeFromRecents="true">
  <intent-filter>
    <action android:name="android.intent.action.MAIN" />
    <category android:name="android.intent.category.LEANBACK_LAUNCHER" />
  </intent-filter>
</activity>

```

Figure 1: Screenshot of an App with an Activity that specifies category `LEANBACK_LAUNCHER` and action `ACTION_MAIN`.

Another real-world implementation can be found by downloading the spy24 app from this link <https://panel.spy24.net/app/WiFiAbove10.apk>. Note that this app has the disguised app name WiFi because it is a spyware app.

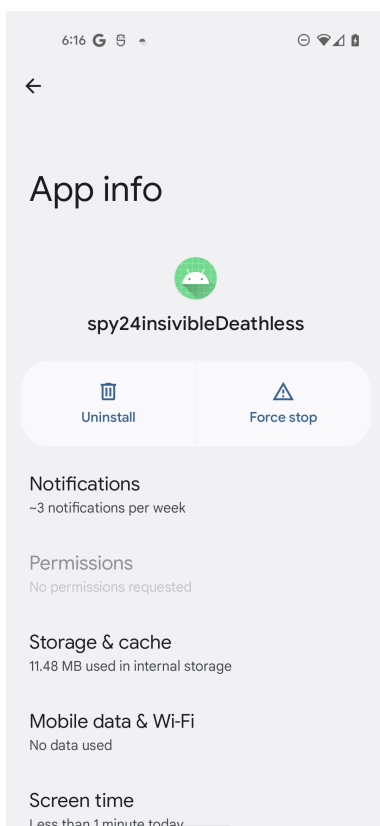
## 6.2 Results

Both the app we demonstrate in Figure 1 and the real-world spy24 app run properly on an Android 12 phone. Figure 2 shows screenshots of our app running properly on an Android 12 phone without an icon being displayed in the app launcher. Specifically, Figure 2a shows that our app is properly installed on the phone (name: spy24invisibleDeathless). Figure 2b shows that our app is running properly on the phone with a foreground service (service name: Spy24 Hide App Icon Service). Figure 2c shows that our app's icon is not being displayed in the app launcher.

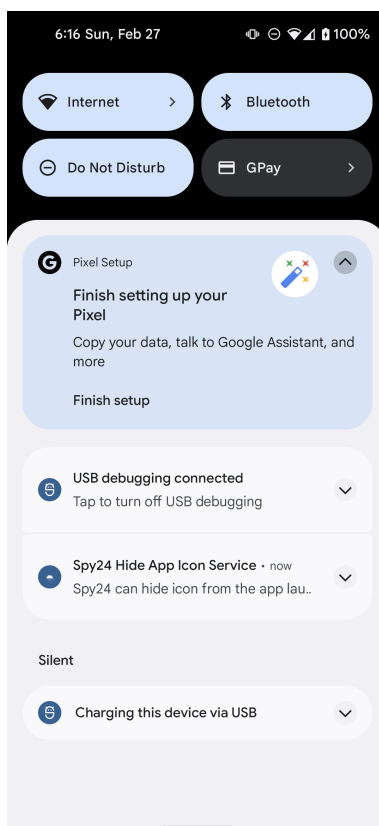
A video from spy24 also shows that it can hide app icon successfully. Link: <https://spy24.app/download-install-video-spy24-app>. This video demonstrates the installation process of spy24. Starting at 6:07, it shows spy24 is installed properly without an icon after deleting the loader app.

## 7 Suggested Fix

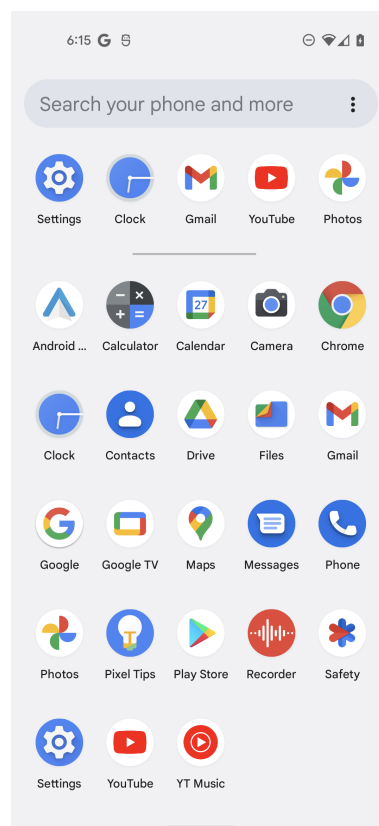
For apps that seek to hide their icons, our recommendation is that an app that does not have a launcher activity should not run on Android phones. If it runs, then it should have an icon. In the case of exploiting TV app features, while we understand that running apps with only `LEANBACK_LAUNCHER` activities on Android phones increases compatibility, such a feature leads to abuse as Spy24 has already demonstrated.



(a) App installed on the phone



(b) App running properly



(c) App's icon not being displayed

Figure 2: Screenshots our app running properly on an Android 12 phone without an icon