Analysis of Modded Android Apps and Marketplaces

Luis A. Saavedra, Alastair R. Beresford, Hridoy S. Dutta, Alice Hutchings
Computer Laboratory, University of Cambridge
las91@cl.cam.ac.uk, arb33@cl.cam.ac.uk

The open design philosophy of the Android mobile operating system allows users to easily install applications downloaded from the internet and unofficial markets, also known as sideloading. Many third-party application marketplaces have emerged as a result and compete for users and downloads.

Some third-party markets specialise in modified or modded apps. Such apps are based on an existing app and incorporate changes which alter the app behaviour. Modifications can include offering paid apps and games for free, freemium apps including paid content for free, bypassing subscription requirements to offer premium subscription features for free, removing ads or displaying different ads, or free in-app or in-game resources such as unlimited in-game currency or resources.

We have investigated the dynamics of modded apps. We are interested in how these markets operate, whether and how they make money, and the incentives for maintainers and developers who publish or modify apps published in these marketplaces.

In order to achieve this we have taken a two-pronged approach: We conducted a survey on more than 200 marketplace operators; and we conducted a large-scale scan of a subset of these modded app markets, including, periodically scanning more than a dozen of the most popular and biggest marketplaces. Our scans allow us to obtain the metadata and APKs related to all available apps and games in each market, often including a version history which allows us to download older versions.

We are capturing data from more than a dozen markets and in the order of hundreds of thousands of APKs and their respective metadata. Preliminary results show a portion of APKs being duplicated accross marketplaces. Many of these marketplaces include banners and ads in their websites, others combine this with a blog-like landing page section featuring sponsored posts. Analysis on a random sample has provided us with multiple examples of these mod 'developers' changing the original advertising IDs before repackaging the application, or even using a different advertisement library altogether compared to the original version of the app from the Google Play Store. In both cases effectively rerouting Ad revenue to themselves away from the original developers. In other cases, we have seen an unjustified increase in the number of permissions compared to the original applications, raising user privacy concerns.