Analysis of Android and iOS modded apps ecosystem

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The Android operating system allows users to install apps directly from the Internet, outside official app stores. Consequently, many third-party app markets have emerged, some of which offer *modded apps*: unofficial versions of popular apps which typically include additional popular features. Modifications may include one or more of: free subscription features, unlocked in-app purchases (IAPs), in-app or in-game perks such as in-app or in-game currency or tokens, no ads, or simply access to paid apps without charge.

The iOS ecosystem on the other hand is usually referred to as a 'walled garden', due to the difficulties in downloading and installing modded and third-party market apps. However, such markets exist – we have found more than 70 modded app markets in our research. These markets provide an App Store-like interface and the most popular markets operate associated discussion forums as well, with thousands of users on Telegram, Discord, and Reddit. The general iOS side-loading subreddit (Reddit forum) 'r/sideloaded' contains 108k users and is described as "A community dedicated to discussing various apps you can sideload on your iOS device without a jailbreak!". Despite this, we have found a lack of previous research into modded apps and sideloading on Android and especially iOS.

This presentation will give an overview of the results and findings of our research into the Android and iOS modded app ecosystem as well as an overview of the iOS side-loading process. Our research studies modded app markets using both a survey method with operators and a technical analysis of the apps available on those markets. We use the data obtained to gain insight into how these markets operate, whether and how they make money, and the incentives for maintainers and developers who publish and modify apps.

Apart from studying the ecosystem as a whole, by mapping the modded apps with their official app market counterparts, we measure app security and the extent of their modifications. In the Android ecosystem we found a limited number of ad-free apps (apps with all ads and tracker libraries removed) or with fewer permissions; in contrast, significant numbers of modded apps came with additional permissions and advertising libraries. We also found many modded apps with updated advertising IDs, which suggests the author of the modded app is collecting a revenue stream at the expense of the original app developer. We also found markets hosting modded Android apps contain a much higher proportion of malicious apps than the official Google Play store. Our analysis of modded iOS apps is on-going, but we aim to present our initial results at MobiUK in July.