1. Accessing Inaccessible Android APIs: An Empirical Study

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Source: *2016 IEEE International Conference on Software Maintenance and Evolution (ICSME)*, p 411-22, 2016;
ISBN-13: 978-1-5090-3806-0; **DOI:** 10.1109/ICSME.2016.35; **Conference:** 2016 IEEE International Conference on Software Maintenance and Evolution (ICSME), 2-7 Oct. 2016, Raleigh, NC, USA; **Publisher:** IEEE Computer Society, Los Alamitos, CA, USA
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Abstract: As Android becomes a de-facto choice of development platform for mobile apps, developers extensively leverage its accompanying Software Development Kit to quickly build their apps. This SDK comes with a set of APIs which developers may find limited in comparison to what system apps can do or what framework developers are preparing to harness capabilities of new generation devices. Thus, developers may attempt to explore in advance the normally "inaccessible" APIs for building unique API-based functionality in their app. The Android programming model is unique in its kind. Inaccessible APIs, which however are used by developers, constitute yet another specificity of Android development, and is worth investigating to understand what they are, how they evolve over time, and who uses them. To that end, in this work, we empirically investigate 17 important releases of the Android framework source code base, and we find that inaccessible APIs are commonly implemented in the Android framework, which are further neither forward nor backward compatible. Moreover, a small set of inaccessible APIs can eventually become publicly accessible, while most of them are removed during the evolution, resulting in risks for such apps that have leveraged inaccessible APIs. Finally, we show that inaccessible APIs are indeed accessed by third-party apps, and the official Google Play store has tolerated the proliferation of apps leveraging inaccessible API methods. (0 refs)
Inspec controlled terms: Android (operating system) - application program interfaces - authorisation - mobile computing - risk management - smart phones - software engineering - source code (software)
Uncontrolled terms: inaccessible Android API - application program interface - mobile app risk - software development kit - SDK - API-based functionality - Android programming model - source code base
Classification Code: C6150E General utility programs - C6150J Operating systems - C6190V Mobile, ubiquitous and pervasive computing - C6130S Data security - C6110B Software engineering techniques
IPC Code: G06F9/00 - G06F9/44 - G06F9/46 - G06F21/00 - H04M1/725
Treatment: Bibliography (BIB) - Practical (PRA)
Database: Inspec
Data Provider: Engineering Village