1. DaPanda: Detecting Aggressive Push Notifications in Android Apps

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Abstract: Mobile push notifications have been widely used in mobile platforms to deliver all sorts of information to app users. Although it offers great convenience for both app developers and mobile users, this feature was frequently reported to serve malicious and aggressive purposes, such as delivering annoying push notification advertisement. However, to the best of our knowledge, this problem has not been studied by our research community so far. To fill the void, this paper presents the first study to detect aggressive push notifications and further characterize them in the global mobile app ecosystem on a large scale. To this end, we first provide a taxonomy of mobile push notifications and identify the aggressive ones using a crowdsourcing-based method. Then we propose sc DaPanda, a novel hybrid approach, aiming at automatically detecting aggressive push notifications in Android apps. sc DaPanda leverages a guided testing approach to systematically trigger and record push notifications. By instrumenting the Android framework, sc DaPanda further collects all notification-relevant runtime information to flag the aggressive ones. Our experimental results show that sc DaPanda is capable of detecting different types of aggressive push notifications effectively in an automated way. By applying sc DaPanda to 20,000 Android apps from different app markets, it yields over 1,000 aggressive notifications, which have been further confirmed as true positives. Our in-depth analysis further reveals that aggressive notifications are prevalent across different markets and could be manifested in all the phases in the lifecycle of push notifications. It is hence urgent for our community to take actions to detect and mitigate apps involving aggressive push notifications. (0 refs)

Inspec controlled terms: Android (operating system) - mobile computing - smart phones

Uncontrolled terms: aggressive push notifications - mobile push notifications - global mobile app ecosystem - notification-relevant runtime information - Android apps - DaPanda - push notification advertisement

Classification Code: C6190V Mobile, ubiquitous and pervasive computing

IPC Code: G06F9/44 - G06F9/46 - H04M1/725

Treatment: Practical (PRA)

Database: Inspec

Data Provider: Engineering Village