PEDroid: Automatically Extracting Patches from Android App Updates (Artifact)

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Abstract
We propose an approach to automatically identify and extract patches from updated Android apps by comparing the updated versions and their predecessors. PEDroid, a prototype patch extraction tool against Android apps, consists of two phases: differential analysis and patch identification. We evaluated it with a set of popular open-source apps to demonstrate its effectiveness. PEDroid achieves a recall of 92% in differential analysis and successfully identifies 28 of 36 patches in patch identification. We also provide specific guidance on reproducing the experimental results.

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1 Scope
We propose a bytecode-level patch extraction approach, named PEDroid, to automatically locate the patches in updates of Android apps. PEDroid consists of two phases: 1) differential analysis to locate the modified methods in two versions of an app, and 2) patch identification to identify patches among the modified methods. Differential analysis is implemented in Python, and we disassemble the Dex bytecode of APK files by the tool baksmali. For patch identification, our taint analysis is based on the taint engine provided by Find Security Bugs [1], and the analysis of internal semantics is implemented in Java on top of Soot [2], a framework for analyzing and transforming Java and Android apps.
In addition to the programs and the requirements, the benchmark \textit{dBench} we collected also could be found here. And we provided detailed instructions to guide how to produce the results in the paper.

## 2 Content

The artifact package includes:
- a Docker image that includes the programs and data;
- a benchmark \textit{dBench} used in paper;
- a documentation (in Markdown format) that provides guidance on how to use the artifact and obtain the results in the paper.

## 3 Getting the artifact

The artifact endorsed by the Artifact Evaluation Committee is available free of charge on the Dagstuhl Research Online Publication Server (DROPS). In addition, the artifact is also available at: https://github.com/huawanbibi/PEDroid.

## 4 Tested platforms

We have carried out all the experiments on a server running Ubuntu 18.04 x64 with two Intel Xeon Gold 5122 Processors (each has eight logical cores at 3.60 GHz) and 128GB RAM.

## 5 License

The artifact is available under MIT license.

## 6 MD5 sum of the artifact

b0b89511355472af631311792fdf8f89

## 7 Size of the artifact

1.51 GiB

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### References
