

ULOOF framework for automating edge cloud offloading of mobile applications

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In our presentation we will introduce the most recent advances on the offloading framework for Android applications called **ULOOF** [1, 2] (**U**ser **L**evel **O**nline **O**ffloading **F**ramework). ULOOF works in the user space without needing special operating rights or a modified Android distribution, and operates in an on-line fashion as it is equipped with a decision engine that during application's run-time decides whether to offload or not candidate methods to a remote server, based on evaluation of cost functions. We will first introduce the architecture of the framework describing the three main entities: an offloading library, an offloading server and a post-compiler. While introducing the latter, we will focus on the autonomous partitioning task algorithm that, without neither any a-priori knowledge on application structure nor the source code, selects application's methods suitable to be offloaded. In addition, we will explain why static partitioning is not enough in the case of Android applications; thus, we will introduce the additional on-line dynamic filterings that complement post-compiler's partitioning. As this filter is part of the offloading library, we will then introduce its main functionalities focusing on the decision engine, explaining both cost functions calculation and decision making algorithm.

We will present a demo video about our working prototype, showing how users can interact with the post compiler to ask for an offloading-enabled version of an application chosen among those installed in their own device, and how the post-compiler server manages user's request. We will show how the offloading-enabled applications interact with ULOOF offloading server highlighting energy and execution time savings.

References

- [1] <https://uloof.lip6.fr/>
- [2] José L. NETO, Se-young YU, Daniel F. MACEDO, José M. NOGUEIRA, Rami LANGAR, Stefano SECCI, "ULOOF: a User Level Online Offloading Framework for Mobile Edge Computing", IEEE Transactions on Mobile Computing, 2018, hal-01547036.

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