Dear reviewer,
Thank you for your comments. The replies to these comments are shown as following.

Comment 1:
The authors should emphasize the novelty and significance of the contributions. Section 3 is based on some prior work, and it isn't clear to me the novel contributions in this quantitative information flow model.

**Answer:** We add the descriptions on the difference and novelty of our quantifying information flow rules in section 3. Prior works are specified for the single program analysis in a centralized way, which aim at quantifying the overall leakage instead of each flow's leakage. Therefore, they don't support distributed quantifying across multiple services.

Comment 2:
The algorithms in Section 4 need more explanations. Some examples would be helpful.

**Answer:** We add the more explanations and examples for a clear description on our algorithms.

Comment 3:
The evaluation is a bit weak to me. The workload and settings are unclear. The authors should clearly describe the test environment and settings.

**Answer:** I’ve modified the experiment section a lot for clear descriptions including the network and mobile device configuration, data set, test criteria and analysis on the results.

Comment 4:
Section 2.2 is not "attacker mode". Actually the objective and attacking approaches of the attackers are not clearly stated in this paper.

**Answer:** I’ve modified the section title as "threat mode".

Comment 5:
There are typos and grammatical errors throughout the paper.

**Answer:** I’ve modified some typos and grammatical errors in our paper.