Fides: A Hidden Market Approach for Trusted Mobile Ambient Computing

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Proposal

We propose Fides, a computation offloading mechanism for mobile devices based on trust between them. Fides provides: (i) Application Splitting, (ii) Metric Proposal, (iii) Neighbor Selection, (iv) Reputation Update.

Mobile Apps on Fides

Developers who use Fides mechanism should use the provided annotation (@splitable and @split) to define all the possible points in the application execution where the application can be split.

Credits and Reputation

Nearby users bid to the interested for offloading user and given their bids and their reputation she selects the most suitable.

A collective intelligence scheme (i)estimates, (ii)updates and (iii)broadcasts the trust scores.

Online Algorithm

A preprocessing part sorts the neighbors list, which detected by the CONNECT layer, and the classes list and can be executed proactively by the LEARN layer of Fides. The online algorithm, in linear time, goes through the sorted lists and selects the proper split.

Mobile Apps

Experiments on Google Galaxy Nexus, Samsung Galaxy SII, and Motorola Moto G using Android API and WiFi direct

Figure 1: The three-layer architecture of Fides.

Figure 2: State Diagram of the proposed online algorithm.

Figure 3: The time needed to explore the neighborhood and the idle time while waiting for the results are increasing with the number of nearby devices and the result size. Helper’s delay response depends on her current utilization and in the number of running threads.

References


