Mobile Code Offloading: Should it be a Local Decision or Global Inference?
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Background

Mobile cloud computing (MCC)
- Extended battery life
- Increased performance
- Augmented functionality

Binding mobile to cloud resources
- Code offloading
- Task delegation

Mobile Cloud Middleware

- Initial results for task delegation
  - Service integration and cloud interoperability
  - Dynamic allocation of cloud resources
  - Handling resource-intensive processing from mobiles
  [Flores et al., MoMM 2011]

Proposed solution

- Offloading from a different perspective
  - “Offloading is a global learning process rather than local decision process”
    1) Fuzzy logic engine running within the mobile
    2) Collecting code traces in cloud storage
    3) Analysis of code offloading traces
    4) Push knowledge to the mobile
  - EMCO: Evidence Based Mobile Code Offloading
    - Cloud is expert, handset asks for expertise
    - Considers mobile and cloud parameters in the offloading decision process
  [Flores et al., MCS 2013]

Hypothesis

- Code offloading may fail?
  - Mobile component execution is non-deterministic. Thus, runtime analysis should be encouraged
  - Cloud infrastructure plays a major role
- Is mobile cloud taking full advantage of cloud computing?
- How to optimize the offloading decision process?

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Results

- Use cases
  - Mobile component scheduling
  - Enhanced offloading decision process
  - Richer application partitioning, etc.

- Performance
  - Responsiveness of cloud-based push technologies

Experiments

- Global inference vs. Local decision
  - Parallelization of mobile components?
    - Beneficial from a global perspective rather than a local context

Diagram:

- Diagram showing mobile cloud computing, execution flow, and offloading decision process.
- Diagram illustrating the proposed solution steps:
  1) Fuzzy logic engine running within the mobile
  2) Collecting code traces in cloud storage
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Graph:

- Graph showing delivery rate over time for different message counts.