

2nd Exam - Mobile Computing / Computação Móvel
IST - MEIC/MERC - June 27th - 2^o Semester - 2011/12

Duration: 1h30m

Attention:

Use the appropriate sheets of paper for IST exams.
Identify each sheet you use. Justify all your answers.
Respect the order of questions. Be succinct.

Question values:

Each question is worth 2 points.

- 1. Consider the following sentence: "For proactivity to be effective, it is crucial that a pervasive computing system track user intent." Do you agree with this sentence? Is the user intent the only relevant information for a system to be proactive?
- 2. The need to make mobile devices smaller, lighter and have longer battery life means that their computing capabilities have to be compromised. However, meeting the ever-growing expectations of mobile users may require computing and data manipulation capabilities well beyond those of a lightweight mobile computer with long battery life. Reconciling these contradictory requirements is difficult. Is cyber foraging a possible solution?
- 3. Consider a large-scale distributed service discovery system. Can bloom filters help to make the system scalable? How?
- 4. Consider an email distributed service in which there are several servers S1, S2, ..., Sn. Each user of this email service can connect to any server to read and/or send emails.
 - (a) Is it possible the following situation for some client C1: i) C1 connect to Si, ii) C1 reads emails from Si (mails M1, M2, M3 and M4), iii) C deletes mails M1 and M3, iv) C1 disconnects from Si, v) C1 connects to Sj, vi) C1 receives again mails M1 and M3 ?
 - (b) If the above situation is not possible to occur, say what is the session guarantee that is being used (indicate the least demanding guarantee).
- 5. Consider the following sentence and say if you agree: the session guarantee "Read your Writes" guarantees that, in every copy of the database, Writes made during the session are ordered after any Writes whose effects were seen by previous Reads in the session.
- 6. Consider the following statement: "The automatic adaptation of the applications to the variability of operating conditions in mobile environments can not be sustained solely by changing the operating system (i.e. without the source code of the applications undergoing any change)". Say if you agree and present an example that illustrates your answer.
- 7. Consider the following rule: "Before sending a message containing a replica of an object X from a process P, X must be scanned for references and the corresponding GC-scions created in P." How is this rule called? What may happen if this rule is not ensured by the system? (Draw a figure describing what happen if the rule is not ensured.)
- 8. Location systems can provide, for persons and/or objects, their physical or symbolic location. What is the meaning of each one? Answer the question focusing on their differences and provide examples of both.
- 9. In ubiquitous computing, in which the context information plays an important role, say what you mean by "Bayesian network" and in which case the notion of "Bayesian network" can be useful. Give a concrete example that illustrates your answer.
- 10. Consider an off-loading system that partitions the application's program objects into two groups, offloading some to a powerful nearby surrogate to reduce the device's memory requirement. What is the main aspect, related to performance, that has to be taken into account?