CSci 5221: Foundations of Advanced Networking (Spring 2013)

Project I Assignment: Mobile Apps and Cloud Services

February 6, 2013

1 Overview, Topics, and Policy

In this project, you will form a team of 4 students to develop “apps” for mobile smart phones, e.g., Windows Phone, Android or iPhone, and deploy supporting services in the “cloud” or in the network. The goal of the project is multi-fold: i) to guide you to learn the basics of mobile phone programming, and get a taste of the emerging paradigm of mobile and cloud computing services; ii) to walk you through the whole process of project proposal, design and implementation; iii) to enable you working in a collaborative environment; and most importantly, iv) to have fun.

To help you get started, we have listed in the Project Site some plausible project ideas. You can work on these suggested topics or, preferably, leverage these ideas to come up with a variation of them or your own. To claim a topic, please team up first and then talk to the TA in charge. Each topic can be claimed by only one team.

Aside from these suggested ideas, feel free to propose your own project topic, and consult the instructor or the TA for approval. Three principles apply on your proposal: i) it must not be a trivial clone of an existing project; ii) it shall reflect non-trivial effort on both the mobile app programming and the backend server development; and iii) preferably, it should aim to address some problem in, or at least closely related to, computer networks or related system fields. Self-proposed topics will be approved on a case-by-case basis.

We encourage discussion and collaboration, not only within a team, but also across teams. Feel free to share ideas or even source code with other teams, but remember to give appropriate credits; you can also borrow ideas or code snippets from existing projects on the Internet, provided that you cite the sources.

2 Timeline and Deliverables

- **2/6-2/17: Project Starting Phase.** Three tasks, ranked by urgency:
  1) Take initiatives to team up by yourself, and email your tentative team members to the TA in charge by 2/8. Those who have not joined a team by 2/10 by themselves may be randomly teamed up by the TA.
  2) Claim or propose your project topics, and share your ideas or draft proposal on the Project Site. Proactively approach the TA, and get approval on self-proposed topics.
  3) Start to explore the development tools and learn programming for mobile phones and backend servers by yourselves.

- **Due 2/17 (Sun 11:59pm): Final Proposal.** Finish your project proposal (500~800 words, plus diagrams if necessary) on the Project Site by this date, and share with other teams. Briefly describe the motivation and key ideas of your project as well as your plan.
• 2/17-3/03: Project Design Phase. Flesh out your project ideas in more details, sketch out typical use cases, identify key components (e.g., components on mobile phones, backend servers, etc.), draw system architecture diagrams and class diagrams, and so forth. Decide what prototype that can be implemented and presented by the 3/31 deadline; and what other features may be left for further development if time permits. An in-depth understanding on the development tools and workflow is usually necessary for the design. So we suggest you try to go through the whole development process and sketch out a working prototype as early as possible, so as to get a better sense of the technical details that may affect your design.

• Due 3/03 (Sun 11:59pm): Initial Design Document. Submit your Initial Design Document (5-8 pages) as well as Execution Plan (1 page) by this date. Your design document may include use cases, overall system architecture, class diagram and/or database schema, tentative user interface, and specifications on each component. It should provide executable details for your implementation. In addition, please provide 1-page Plan sketching out how you plan to implement your design, including the tentative work division among your team members.

• 3/03-3/31: Implementation Phase. Implement a basic prototype of your project, which ideally can be presented in some fashion. If for some reason you have difficulty in the physical deployment of your backend cloud or server (depending on how complex or ambitious your project is), make sure it can at least be emulated on local machines in some fashion. Due to time constraints, it is crucial to prioritize your development tasks. We highly recommend you focus on the core functionalities first, build a working prototype as early as possible, and then augment it with optional features step by step.

• Due 3/31 (Sun 11:59pm): Implementation and Final Documents, including:
  1) Source Code: All source code, including the mobile app code and the server-side code. Please clean up all unnecessary binaries prior to submission.
  2) Final Design Document (5-8 pages): Update your initial design document and make it consistent with your actual implementation.
  3) Progress Report (1 page or so): Report what have been accomplished with respect to your original design/plan, and what you may want to continue in the future; In addition, please articulate “who has done what” in this report – this will be used for individual grading.
  4) [Optional] User manual: not required. You may work on it if you have time.

• [Optional] By 5/10: Continued Development Phase. If so desired, you can continue the development work (e.g., polishing your implementation, adding more features, writing user’s manual, etc.) and re-submit all your updated code and documents by 5/10. This is optional, and bonus points may apply depending on your improvement.
3 Grading Rationale

Doing a team work does not mean that there is no individual responsibility. To encourage every member to contribute his/her fair share of the team work, each project will be graded both as a team and on an individual basis.

- **Team grading**: each team as a whole will receive a grade reflecting the accomplishment of the entire project. Tentative score division on each deliverable is as follows:
  - 10% for the project proposal.
  - 30% for the initial design document.
  - 60% for the implementation (50%), and the final documents (10%).
  - 0%-15% bonus for the continued development.

- **Individual grading**: individual team member will get his/her own grade by multiplying his/her team grade with a factor that reflects his/her contribution. This multiplier usually ranges from 0.75 to 1. However, if an individual rarely participates in the development activity, s/he may get a multiplier less than 0.5, or even zero.