What is PhoneLab?
The expanding capabilities and growing number of smartphones are producing a new computing infrastructure integrating phones, users, and the Internet. We call this emerging device the phone cloud, and its power is transforming user expectations. The users now expect their phones to locate friends; identify the song playing at a restaurant; provide instant access to music, video, and other information; and help document their lives --- all in addition to placing phone calls and sending text messages. Meeting these expectations requires addressing multiple challenges: efficiently utilizing multiple radio technologies and integrated sensors, harnessing powerful processors to support demanding applications, and leveraging distributed storage to move data closer to users. Yet, despite the challenges and transformative nature of the phone cloud, no public Test-Bed exists enabling large-scale realistic smartphone experimentation.

Story
Dr. KnowItAll wants to run an experiment on a group of 100 cell phones but doesn’t have the resources to do so. Thanks to a co-worker, he remembers that he can use PhoneLab to run his experiment. Dr. KnowItAll decides to call up his friends at PhoneLab and sends his experiment suggestion over for approval. Upon receiving approval to conduct his research, Dr. KnowItAll sends his experiment out to 100 different participant cell phones. After two weeks of running his experiment, Dr. KnowItAll goes to the PhoneLab server, downloads his data and analyzes the results. Upon thoroughly analyzing the information, he discovers that the results prove his initial hypothesis. After presenting his findings at a conference, Dr. KnowItAll receives an award for the groundbreaking research he was able to conduct, all thanks to PhoneLab!

Internals
PhoneLab has four major components: Server, Controller, Status Monitor and Data Logger

Controller
The PhoneLab Controller receives commands from the server and makes sure the phone handles these issues.

Status Monitor
The Status Monitor runs basic tests that most researchers would request. It currently gathers Phone location, signal strength, battery level and phone ID and sends its results to the datalogger.

Data Logger
The PhoneLab Datalogger records information sent from the Status Monitor. The datalogger then pushes its records to the server for analysis.

Participants
Privacy
Participant privacy is a major concern to PhoneLab. All research must be approved through a certified IRB before it may run through PhoneLab. With this being said, participants are well aware that their phone usage is being researched and thus confidential information may be tracked.

Benefits
Participants in PhoneLab will get reduced cost cell-phone plans among other perks. They will also receive the satisfaction that they are helping make an impact. By working with PhoneLab, the participants are helping researchers discover and solve problems with smartphones for the average population.

Next Steps
Now that the basic system is in place, PhoneLab is working on scaling up the Test-Bed population. Starting Fall 2012, PhoneLab will be actively recruiting over 200 participants to take part in the Test-Bed. Participants entering in the fall will receive free smart phones and service for their participation. Pending successful results and extra funding, PhoneLab will continue to scale out to a much larger Test-Bed.