



CALIFORNIA STATE UNIVERSITY
Monterey Bay



AD HOC – P2P on Android



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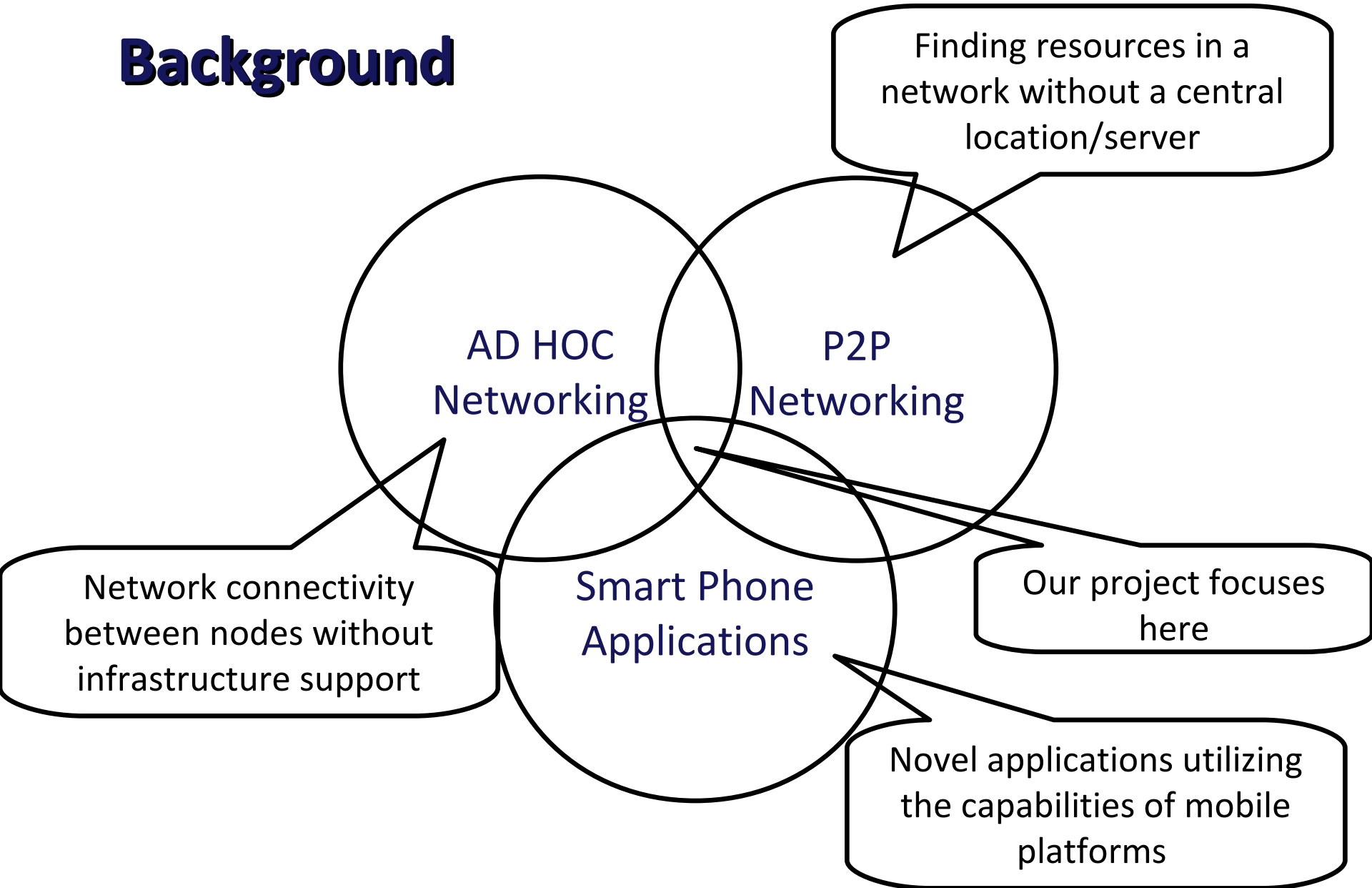
Computer Science and Information Technology Program

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Overview of Talk

- **Background**
- **Demo**
- **Software Architecture and Development**
- **Future Plans**

Background



Our Achievements So Far

■ Initial Objective

- Feasibility study of peer-to-peer communication system on an Ad-Hoc network of Smartphones

■ Prototype System Development

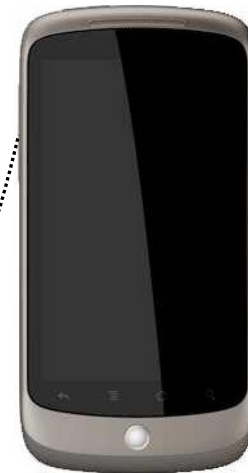
- We developed a prototype system based on an open source project
- A user can exchange text messages with a peer on an Ad-Hoc network

Demo – Text Messenger Application

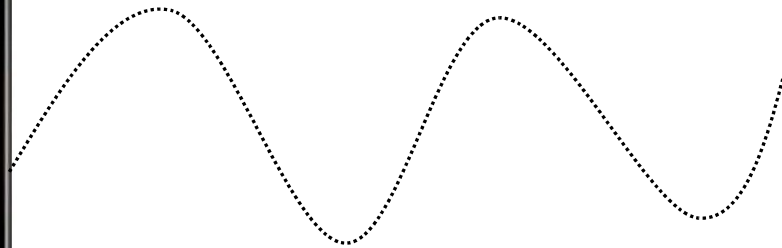
- Direct communication between two phones



Alice

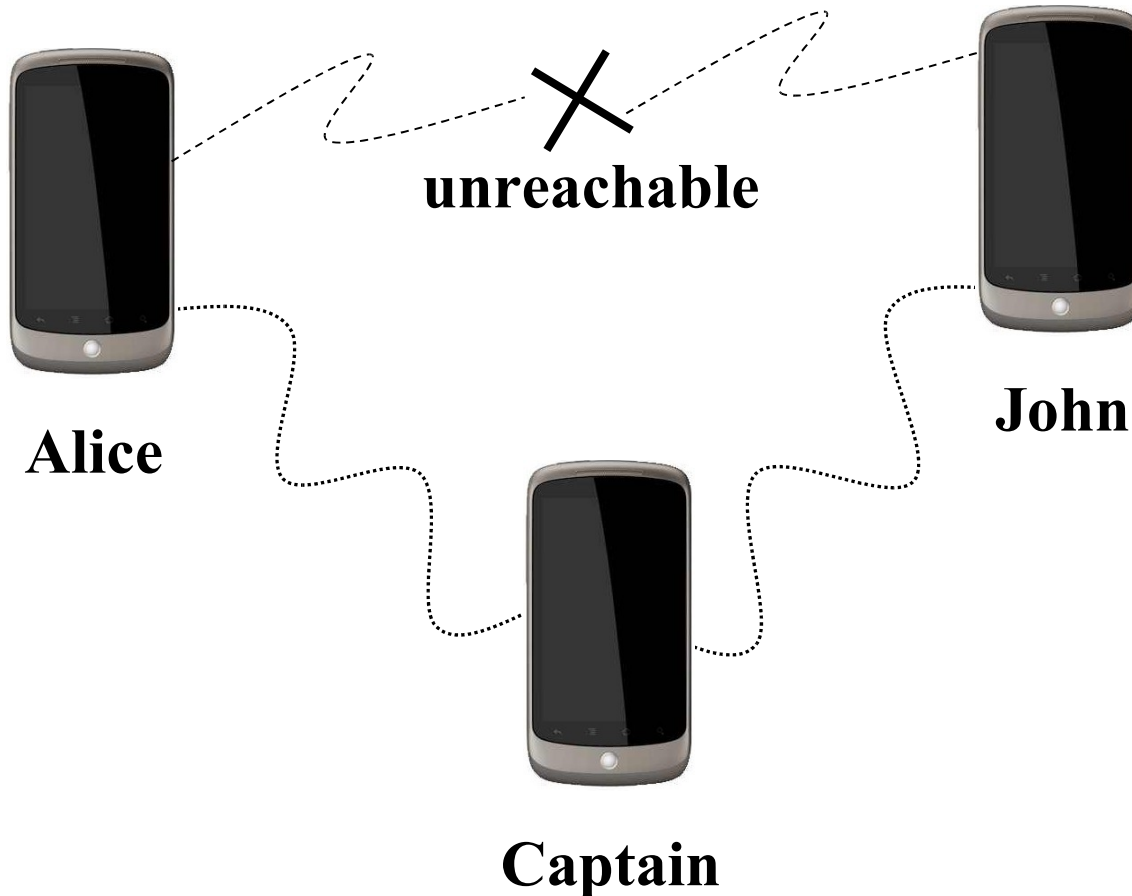


John



Demo – Text Messenger Application

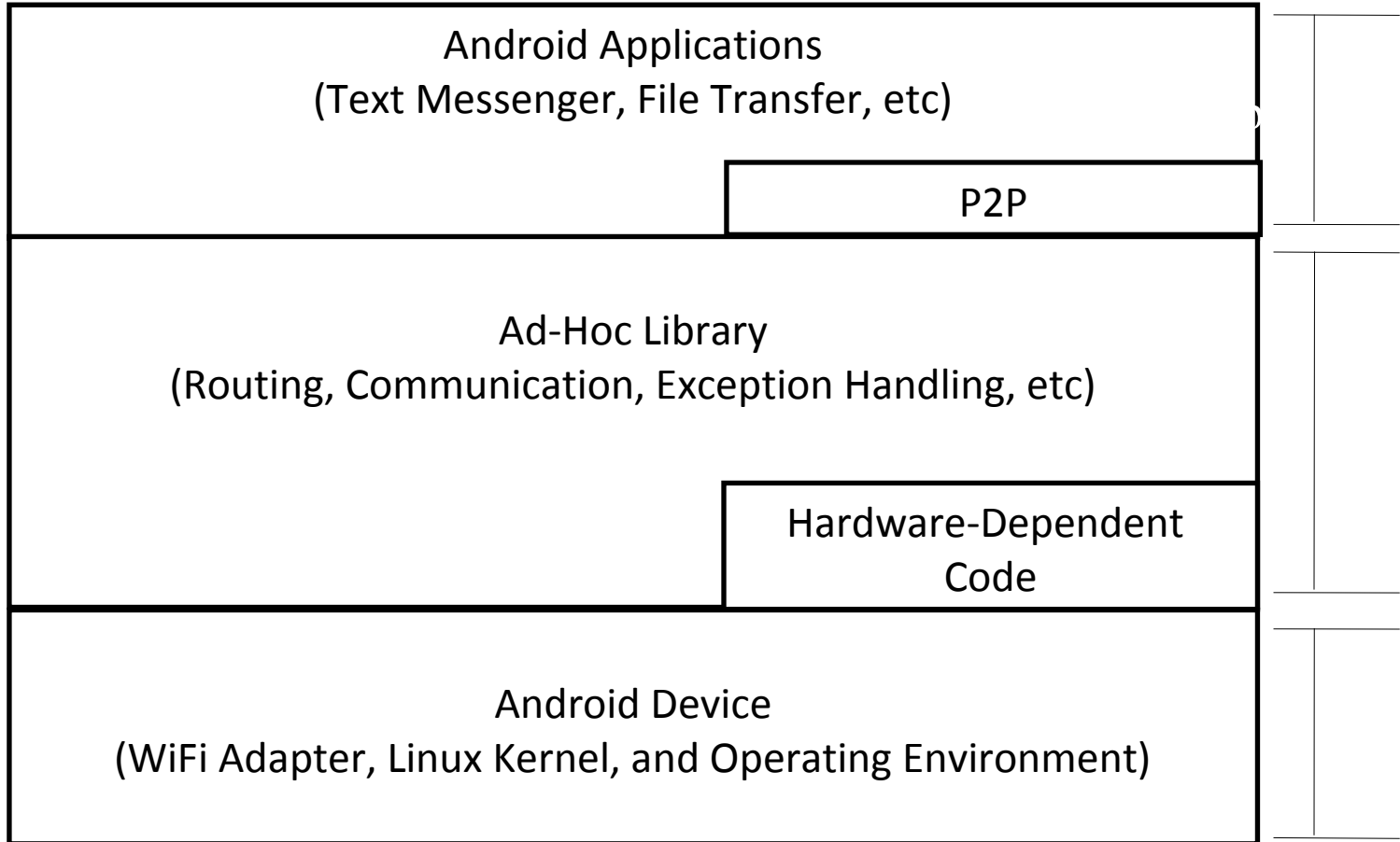
- Indirect communication through a routing phone



Software Architecture

- **We started this project based on an open source implementation**
 - But the source code was not fully matured
 - Stabilized the source base
 - Ported to multiple platforms
- **Software Architecture**
 - Two Components
 - Ad-hoc library
 - Android application on top of the library
 - Contains P2P functionality

Software Architecture



Routing Protocol

- **Ad-hoc library uses AODV (Ad-hoc On-Demand Distance-Vector) routing protocol**
 - A route between two phones is constructed ONLY when needed (on demand)
 - The routing protocol maintains routes as long as they is active data communication
 - Route times out when not used for a given amount of time
 - AODV uses several messages to build routes such as route request, route reply, and route error.

Android Platforms Supported

- The software has been ported on the Nexus One and HTC Evo 4G.
- **Hardware-Dependent Code**
 - Turn on/off the WiFi network driver
 - Enable WiFi ad hoc mode
 - Control signal strength
 - Etc

Future Plans

- **On demand VS table driven routing**
- **Manual vs Automatic resource find at the P2P layer**
 - Structured vs unstructured P2P
- **Security implications**
- **Portability**
- **Seamless integration into Android**