

Community Awareness System for Android Devices

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What is our project?

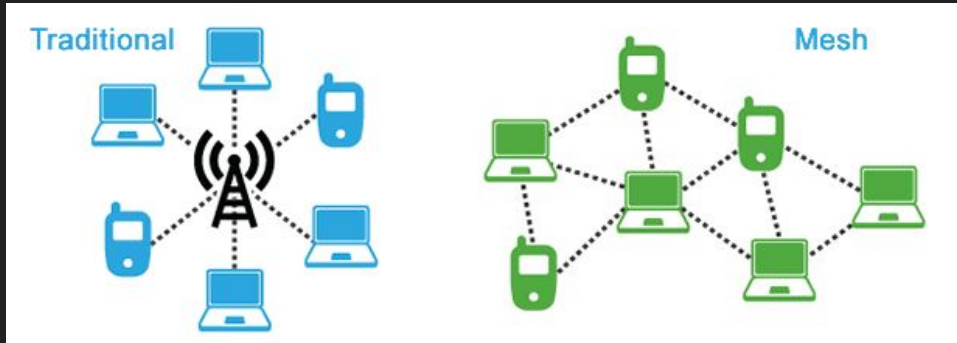
Community Awareness System for Android Devices:

- An Android ad-hoc mesh networking application that will enable communication in places/situations where conventional modes of communication fail (i.e. combat zones, third world countries, natural disasters)

Basically,

- Each user should be able to
 - Retrieve sensor information from any other user in the system (GPS, accelerometer, etc)
 - Send/receive messages and other media files(short audio/video clips)

What is Mesh Networking?



A mesh network is a network topology in which each android devices would relay data for the network.

Why are we doing this?

- Project proposed by NSA to create a community awareness application system for the US military
 - Facilitate the tracking of soldiers to ensure their safety
 - Deploy this application during disaster relief missions
- There are three separate teams working on this project
 - Networking: Dr. Daji Qiao, and Dr. George Amariucaï (** our project)
 - Sensor Engine: Dr. Daji Qiao, and Dr. George Amariucaï (** our project)
 - Biometrics: Dr. Akhilesh Tyagi

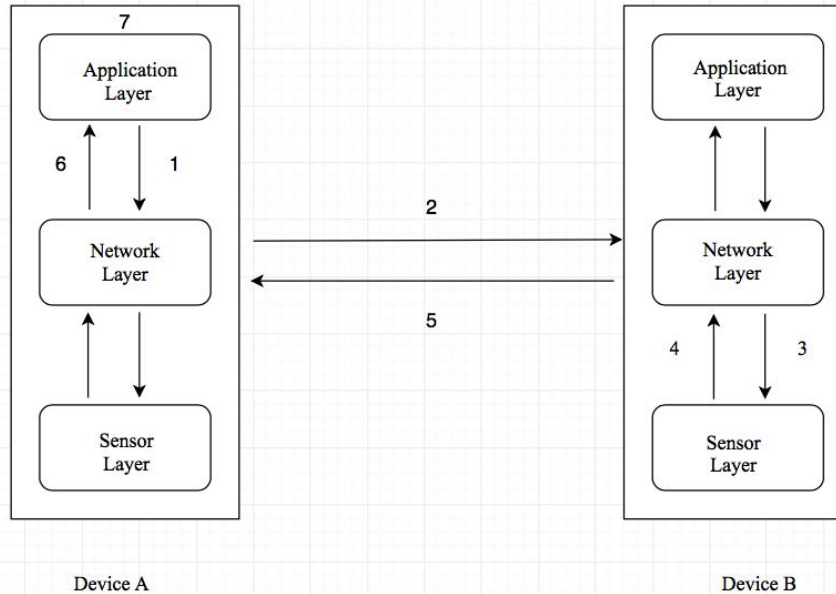
How are we doing this?

- Networking: we will be using Serval Mesh (an open source application) as the base for our product.
 - Two possible solutions:
 - Integrate portable routers
 - Software only (root access, not 100% reliable)
 - Extra Additions
 - Mesh Visualization via RSSI
 - Query Sensor Info
- Sensor Engine
 - Native Android API: GPS, accelerometer, camera, audio
 - AlarmManager



Basic Structure of the Application

Case: Application Layer from Device A intends to access sensor data from Device B



Challenges

- Finding a solution that works on all Android devices
 - Hardware: android devices have different types of wifi chipsets
 - RSSI (Signal Strength) will vary between different chipsets
 - Software: android devices have different types of kernels
 - Ad-Hoc wifi is not supported on many native kernels
- Early deadline: we need a working prototype by the end of the semester to demo to the NSA during summer.

Possible outcomes(+/-) after completing the project

Positive:

- Proof of concept for the NSA
- Will gain knowledge about networking principles
- Will gain knowledge about developing applications for the Android OS

Questions?

Resources

- Image Source : <http://tucu.ca/wp-content/uploads/2014/02/traditional-WiFi-vs-mesh-WiFi-network.png>