Bluetooth Mesh Network

Abstract

Our goal is to create a decentralised wireless network of mobile devices called a mesh network using bluetooth to enable communication between these devices without using the internet. Decentralising the network will remove dependence upon external internet connectivity (WiFi/Mobile data) for communication purposes.

We could use this for the following purposes:-

1. A chat service like Firechat, enabling us to send personal messages using a more efficient algorithm than broadcasting used by Firechat.
2. A project editing system where multiple people edit the same document simultaneously (similar to Google Docs). Can be used in team meetings and offices, to avoid internet usage.
3. An anonymous communication network similar to tor, but localised

Theory

If phone **A** is connected to phone **B** and phone **B** is connected to phone **C**, **A** can communicate with **C** via **B**, even if **A** is not directly connected to **C**. Phone **B** here will act as a router, with the sole purpose of passing on **A**'s message to **C**.

This simple case can be scaled to messages being passed on by multiple phones before reaching the destination, to create a complex network. If we can enable every device connected to the network to act as a router along with acting as a sender/receiver, we can decentralise communication in the network.

Implementation

1. We will implement a simple chat app, with UI features to enable two phones to communicate with each other.
2. We will try to implement an efficient routing algorithm which will be used to pass messages, minimising the amount of time and maximising chance of success.
3. We will include a message encryption system similar to RSA as a layer of security.

Timeline

Week 1 : Basic UI and simple bluetooth communication features done. A working chat app for phones directly connected will be ready.

Week 2 : Integration of message broadcasting and basic routing functionality(passing on of messages) for every device. App with Firechat features will be ready with this.

Week 3 : Add encryption functionality. Research and design an efficient routing algorithm. Implement basic version of routing algorithm.

Week 4, 5 : Test the routing algorithm using a big enough network and improve upon its efficiency.

Week 6 : Final polishing of the UI elements and API. Final testing of the routing algorithm.

Components required

None.

Cost

Rs.0

Team

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