Mobile Peer to Peer Network
(Computer Networks Assignment 1)

Shashwat Shivam(2016CS10328),
Saransh Verma(2016CS10326),
Sushant Rathi(2016CS10329)

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1 Motivation

Currently, distribution of media files in areas with low bandwidth internet connectivity (like rural areas in India) usually takes place via applications like ShareIt, which come with a host of limitations, such as the fact that I have to ask/know a person with a file that I want. Also, for media streaming services like Hotstar/Netflix, such markets are out of reach as the internet speeds do not permit HQ streaming. Even though telecom networks like Jio have drastically brought down data rates today, it is unclear whether such data rates will keep up with the data consumption- 10 years from now, people might consume VR content which is very costly in terms of data. Hence, we present a different approach to distribute this content.

2 Idea

The core idea is of establishing a peer to peer network for on-the-go sharing of files using mobile devices with the devices in their vicinity. We will use wifi-technology (used by applications like ShareIt) to transfer files, however the file sharing will be triggered by the application layer (possibly mediated by a server), by detecting whether a file that a user requires is in the vicinity or not. This application layer will run on top a p2p network to handle the actual file sending/receiving.

3 Implementation

The implementation will have two parts which are as follows :-

3.1 Hardware

An extra hardware component will need to be added to devices which will be based on existing wifi technology. This hardware will emit and receive frequencies of a fixed wi-fi band.

3.2 Software

The newly added firmware will have full permission to send any file which is allowed by the user. The files allowed to sent will be stored in a secure list on the users device as an editable ledger. The files which will be downloaded using this p2p hardware will be initiated by user permission.

4 Application

This p2p system can be used in multiple areas of file sharing. It can also act as a piggyback system to deliver messages in case internet is down. The major uses of this network are as follows :-

1. For file sharing applications like ShareIT are prevalent. The protocol for such sharing systems need creation of hotspot and then connecting to the wifi which takes a lot of time. This new p2p system will already keep the devices connected and therefore the files can be sent instantaneously.

2. Consider services like Netflix. We get a download feature for multimedia so that we can view the content offline. In areas with slow net many users may not be able to download the videos but if there is a p2p network then if anybody on the network has the file, the Netflix application can pull the content from that device resulting in a much higher distribution of content.

3. If due to some reason the internet network is down in an area, the p2p network will be unaffected by this. Applications can try sending messages through both internet and p2p network and messages can be delivered by bouncing it through multiple devices after which it finally reaches the receiver. In this case security considerations can be relaxed as the message packet will be 128 bit key encrypted.

4. While surfing internet , content can be cached into the mobile device after which if someone on the p2p network is trying to view the same page, it can be served from the p2p network itself which will be much faster as it is transferring the data in a small locality.