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Mobile Messaging using Wi-Fi Adhoc Network

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ABSTRACT: **Today mobile is very useful thing. It is need of everybody. Mobile phones provide one big application that is the SMS. But it not free of cost so we have to make one application which gives free chatting with others with no cost. The problem is that when employing a 3G wireless data connection and uploading to a traditional web server, these transfers can quickly become prohibitively expensive. Users are typically subject to wireless data plans with finite usage limits and steep overage charges. The alternative of uploading content through a wired USB connection is cumbersome and delays the user experience.**

Keywords: **Wi-Fi Adhoc Network, System Model, Peer-to-Peer, Smart phones, Android, Sharing at no cost.**

I. INTRODUCTION

Smart phones have become increasingly popular and commonplace in the last few years. In fact, smart phone penetration is predicted to be over 50% in the U.S. by the end of 2011, according to Nielsen. They have become highly-capable multimedia devices, with embedded video cameras, and many users enjoy sharing the multimedia content that they capture. For example, as part of a home entertainment system, the user of a smart phone may wish to upload user-generated content such as newly-taken videos to another smart phone or tablet device, to a media player connected to a TV, or perhaps to a wireless picture frame. Several users may be interested in automatically receiving multimedia from one particular source. A promising solution is to employ peer-to-peer sharing among smart phones, in order to consume free peer-to-peer wireless links versus expensive packet data networks for file sharing purposes. So we will create Wireless Ad-HOC in our campus where we are going to use this service. Mobile phones also having wireless technology. Mobile has to connect to the Wi-Fi Ad-Hoc network. There is chat application in that mobile by using that we can chat with other mobile by using that chat server. Peer-to-peer networks offer advantages over traditional client-server networking models. They have not yet been effectively adapted to the mobile network environment. This product is to employ peer-to-peer sharing among smart phones. It also consumes free peer-to-peer wireless links and allow user to share contents within an ad-hoc network. The user of this product/system will be those who uses Wireless Ad-Hoc network in their campus. For example a college with 1000 student can host this application in their premises, an organization can host this application which can help their employee to share data/files without using internet or GPRS/3G etc. Our contributions include the proposal of a peer-to-peer system for efficiently sharing large content such as multimedia among smart phones in a way that is transparent to the user and at minimal cost from a hardware and economic point of view.

II. SYSTEM MODEL

As illustrated in Fig.1 consider our system model with a Server side with a database and Android Mobile Handsets with our application.

We propose a high-level framework for a peer-to-peer protocol with these specific constraints addressed. In addition, we investigate the feasibility of a practical implementation of a peer-to-peer file sharing model on smart phones, including an analysis of how performance is impacted by various variables that can be dynamically controlled in the protocol. Through experimentation on leading smart phones, we have found various optimal strategies, including minimizing the upload-to-download ratio to conserve battery life, using larger file segments to increase throughput, and using sockets to decrease memory overhead.

A promising solution is to employ peer-to-peer sharing among smart phones, in order to consume free peer-to-peer wireless links versus expensive packet data networks for file sharing purposes. For instance, a camera-enabled device could publish new content and advertise it through a service that the other devices in the home would subscribe to. Through peer-to- peer connectivity, the participating hardware devices could then share the multimedia resources back and forth without the use of any intermediary hosts, and not be subject to billing.

Software has two major components one is the server and the second one is the mobile application. The server will require Windows XP/Vista/7 machine with minimum 1GB RAM and 100 GB hard disk. The server machine also requires WIFI devices through which it can create Wireless Ad-hoc network. Mobile application will support Android phones so at least 2 Android devices are required for getting the output having version 2.2 or higher.

The user initially registers himself with the server and receives his username and password via mailbox. When the user wishes to use the system he connects to the Ad-Hoc network and logs in using his username and password. After signing in user updates his file list he wishes to share on the network. The user will be able to search for a file in the network, the server will receive his request and process it by searching it in the database and will return the user the name of the file with the IP address of the user willing to share the file. Now the user can receive the file by clicking on the file name with the owners IP address attached with it and then the peer to peer connection will be created between the owner and the receiver and the file transfer will be initiated.

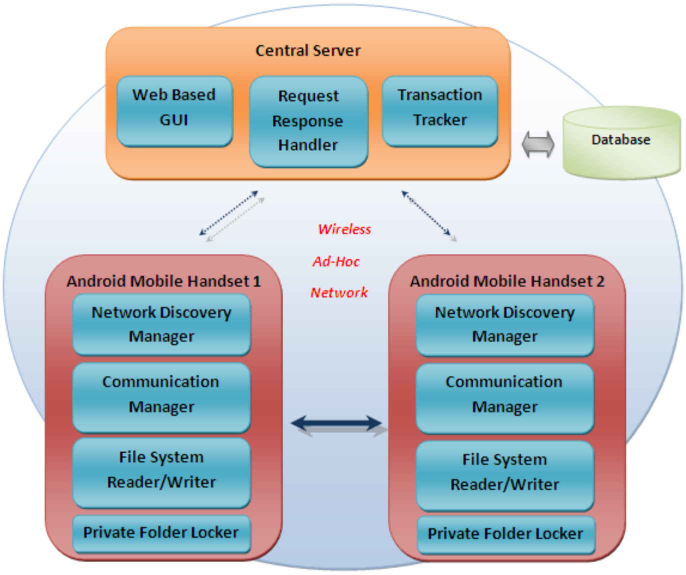

Fig. 1. System Model for Mobile Messaging using Wi-Fi Ad-Hoc Network

III. Literature Survey

A comparison with peer-to-peer file sharing on desktop systems is warranted. The popular Bit Torrent protocol provides centralized tracking, whereby clients download torrent files that contain hashes corresponding to file segments, as well as the location of a tracker that lists other clients to connect to. It is not plausible to translate a torrent implementation directly to the mobile environment, and in fact the only mobile applications widely available perform remote control of desktop torrents as opposed to native peer-to-peer transfers.

The general problem is that Bit Torrent does not recognize the sporadic connectivity inherent in mobile devices. For instance, as described in, Bit Torrent utilizes a rarest-first algorithm, in which each peer maintains knowledge of the number of copies of each file segment in its peer set. It then determines which segments are rarest, and downloads those first while it still has the opportunity to do so. In our model, this stratagem does not confer an advantage as it is not foreseen that a large number of peers would be within the very short range permitted by a peer-to-peer protocol such as Bluetooth. Bit Torrent also prioritizes the download of remaining blocks of a segment so that it can start sharing a complete segment once it assembles a copy of it. In the case of a peer-to-peer wireless protocol, it is assumed that packet loss in the transport would be relatively rare, and so no prioritization of packets is necessary.

The concept of super-seeding in Bit Torrent is also superfluous. Here, the seeders initially advertises that is has no pieces, then un-chokes a peer by degree only if it has received confirmation that the segments made available earlier have already been distributed to other clients. Although this has the benefit of restricting uploads which are a big battery drain, it can result in stalling when interacting with only one other peer. It also requires feedback from other peers which is deemed expensive in a mobile environment.

It is argued that file sharing on mobile devices is infeasible for the following reasons: limited bandwidth and high cost to the user, intermittent disconnections, and IP address changes due to network migration. We, however, hold that short-range networking technologies such as Bluetooth entail no cost to the user and are sufficiently fast to make file transfers very practical. In addition, the authors claim that the periodic sending and receiving of heartbeat messages from peers, as in the Gnutella network, would drain power. We contend that the power consumption of Bluetooth is so minimal that this is not a limitation. In our approach, nodes subscribe to content and retrieve it from adjacent neighbours only. We do not model a constantly changing topology of interconnected clusters of nodes, and so we avoid the problem of flooding of control messages or routing information in the network. Our proposed model involves direct connectivity between mobile phones that are in close proximity for a short duration; yet, the transfers are organized through automatic content subscription, peer discovery, and file transfer involving multiple nearby peers; this is a significant improvement over a one-time point-to-point single file transfer between a pair of phones that is managed by a user.

IV. Implementation Constraints

Needs at least 2 mobile devices and 1 router as Android handset don't discover local Ad-Hoc network. So we need to create actual network. The user is expected to have Wi-Fi connected Mobile phone and should be able to send and receive messages when connected to Wi-Fi network. First the user has to register to Wi-Fi network to use the service. Network gives the functionality to login and registration facility. The registered user uses this network to send and receive messages when connected to Wi-Fi network.

A mobile device has limited battery life. It was discovered that the consumption of a Lucent IEEE 802.11 wireless card is approximately 25% higher in receive mode than in idle mode and 63% higher in transmit mode than in idle mode. In addition, it was discovered that if a node transmits faster, it stays active for a shorter amount of time, and thus consumes less energy. Thus, it is advantageous for a mobile device to transmit as little as possible, and to do so at the highest rate.

Finally, mobility is a challenge. In the desktop environment, the duration of connectivity is generally affected by the length of time that a computer resource is turned on and the user is logged in. In the mobile environment, it is generally affected by physical movement, which results in a shorter window of opportunity for completing a transfer. Thus, burst traffic is preferred.

V. IMPLEMENTATION

We implemented the core features of a file-sharing protocol on two real smart phone platforms so that we could assess its practical feasibility with confidence. We developed the server system which initiates a network and allows tracking of all devices, transactions between the devices, showing the available users for chatting. The Server also provides web based access to registered users. The Server accepts the search request from the clients and further continues the job of searching and responds with the search results with the clients IP address. We developed the Client system for Android Mobile which provides a user friendly graphical interface for connecting to the Server Network and provide the features of the proposed system like Peer to Peer sharing of contents, chatting via messages, providing Folder Lock to maintain security and protecting sensitive data. The main feature we implemented is all this is done without involvement of any 2G/3G Internet connection which will help to cut the cost of sharing. Moreover the testing results proved that the throughput of the system was much better as compared to other systems of similar category.

Further we will implement the system on other devices supporting different operating systems like Blackberry OS, Apple's iOS and Windows Mobile OS.

VI. CONCLUSION

We have proposed a peer-to-peer model that permits efficient file sharing between mobile smart phones over a low-cost transport. Our experimental results lead us to conclude that peer-to-peer file transfers between today's mobile devices are viable, but severe restrictions must be enforced on the transfers, which are unique to the mobile device environment. For instance, the upload-over-download ratio should be relatively low, due to the higher current drain on transmit. File segments, in relation to the total file size, should be relatively large so as to maximize data throughput, although the size will not have a great impact overall. Peer-to-peer connectivity achieved via Wi-Fi requires close range, and we must assume that peers are constantly moving, so the transfer time is important. Small segments are desirable when multiple clients are involved, as they allow for increased parallelism of downloads. Also, smaller flash writes will result in more frequent idle garbage collection (on JVM-equipped phones) that will not interrupt the UI. Preferably, downloads should be cached into dynamic RAM and flushed to flash memory during user inactivity. If the target file system is very slow, however, then by using larger file segments, Direct Memory Access (DMA) mode can be utilized as opposed to Program Input Output (PIO) mode; this will result in much faster flash writes. Clearly, tradeoffs exist with this parameter.

We believe that we have overcome some key barriers to adoption through our design approach. Peer-to-peer sharing allows for efficient content distribution using low-cost links that do not impose a load on the mobile carrier infrastructure. Bluetooth is low-cost, from a performance and economic point of view. Peer discovery and content distribution occurs automatically without involvement from the user. Finally, the transport is also implemented in the application layer and uses existing standard protocols without modification.

VII. ACKNOWLEDGMENT

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