Local Wireless File Sharing with Live Share and Browse with Social Network with File Replication Using Structured P2P Approach in MANNET

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Abstract

Smart file sharing is the software used to share files between the two or many devices. Wireless file sharing with current wireless sharing approaches lack in giving sufficient features to users who frequently share files, so it cannot satisfy both senders and receivers. Sharing process between cross platform might not result in good performance due to device constraints or result in poor user experience due to various Operating System versions and hardware configurations in low end wireless Smart Phones. Security is a major risk with live sharing feature. In order to avoid hacking of files by unauthorized users this software method will make the user place a file to transfer one time and many users can have access to it from their mobile device so that sender need not send the same file to multiple users. This system acts like a temporary cloud (or) like a buffet system. This file sharing is mainly focused on media files sharing through Wi-Fi Bluetooth in wireless device like smart phone devices. This software will learn the environment of each data which needs to be shared and will decide what should be sent and what should be authenticated, and who can access a particular file. This software will notify each transaction for getting it verified by senders. The most important new feature is that receivers can browse the files in sender's devices from their own devices using Live Sharing feature to select what they need. This process of file sharing is applicable for sharing file with enterprises corporate industries, social network communities etc.

Keywords: Wi-Fi, Bluetooth, Live Sharing, Location Propagation, Median finding

I. Introduction

Smart file sharing software is going to be developed in the programming language Java. This project is meant to create smart file sharing software and should work without using internet data connection and is only for local use by using Wi-Fi. It differs from other systems as instead of sharing a file each time, it broadcasts a file almost like a buffet system. It is proposed that the system create a temporary local cloud or wireless LAN connectivity among smart phone devices as now all devices have sufficient wireless port hardware configurations for sharing data.

A. Bluetooth

Bluetooth is a wireless technology used for exchanging data over short distances [1][2]. Smart phones users & desktop users share files within distances of 6-10 meters [2]. Advantage of bluetooth data transferring is that it is very fluid and it is easy to pair devices to share the small sized data between two devices. The disadvantage is that Bluetooth works only in short range, at slow speed, and file transfer is not possible in parallel connection.

B. Wi-Fi

Wi-Fi is a local area wireless technology that allows an electronic device to participate in computer networking [1] [2]. Wi-Fi file sharing is the new and fast way of sharing files between devices like smart phone, computers. Wi-Fi is being used more as compared to other sharing hardware because of fast communication. Its name is different from others but the way of sharing data is the same.

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C. NFC

Android mobile operating system uses NFC method to transfer files between two devices [4]. This automatically copies files from one device to the other and notifies the user when file transfer is complete [3][5]. This file transferring is enabled by simple gesture and the process of transaction starts just by touching each others' devices.

II. Technology Used

This project is going to be developed with Java programing language for the front-end. This software is going to be developed using

❖ Xcode,
❖ ns2,
❖ gini testbed.

This application holds ipa executable application as the backend which can run on IOS devices.

There is no major disadvantage in transferring file to receivers but the senders were struggling in sending the actual original file they wanted to share. As an example, smart phone users who were handling file transferring software in case of bluetooth or Wi-Fi have to select the file each time for multiple sharing but they can select many number of files to share in one transfer. So, smart phone users are not sharing but instead they create a file server as the existing data sharing is not smart enough to carry out the automated process. There is not enough privacy in sharing what the software is sharing and with whom it is sharing.

A. Smart File Sharing

This software is going to be developed in the programming language Java. The solution for the file server for actual file sharing is to design the software for file sharing like the buffet method system. This process works locally without using internet connections. This software consists of a breakthrough feature in sharing which has learning capabilities for each file created or downloaded. This software will learn about each file with details such as time, place of creation, and with whom it was shared or downloaded.

An example of learning process of this software is that it will read the file which is downloaded or created in memory, as an example, a photo from a camera in mobile devices. This software will read the environment by

scanning the related hardware through its own software which is around locally without using internet. When the photo shutter button is clicked, this software will automatically scan and get the information from nearby user using this same software. This even tags the person who is in the photo, so if any friends need the particular photo, only they can browse the photo from their mobile device through this software to get it directly into their devices. Other private content cannot be displayed for the same browser. This makes it easier as the receiver does not have to always approach the owner.
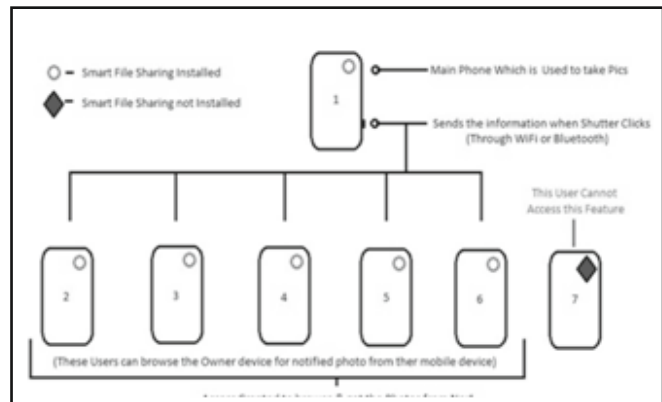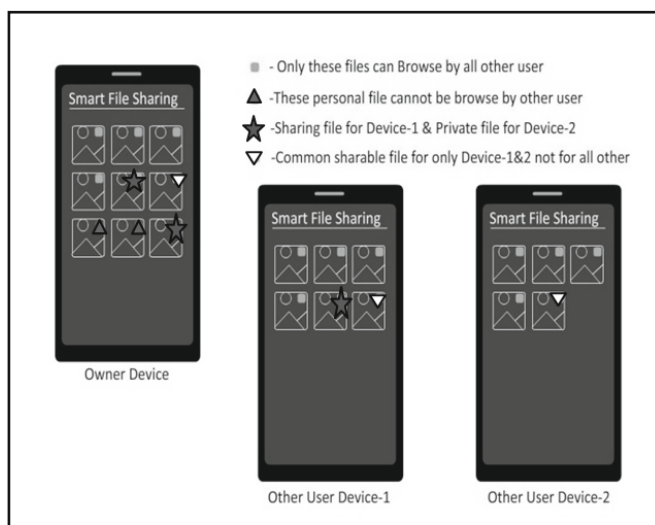

Fig. 1. Smart File Sharing

B. Live Sharing

User Browse is the special feature included in this software that makes senders more comfortable in sharing withthose who installed smart file sharing in their devices. This feature does not show all the content of the owner's mobile but it will show only the files for which the user has been given access. Browser will show only the data by using software learning capability and also its shows the content what the owner recommends to show.

C. Security

Security is the major part of this software that protects privacy of the owner of each device - what others should see & what others should not see is in user's hand. This software is planned with the concern for security in each functional feature and component.

D. Smart identifying

Media file plays major role in sharing among personal devices but there is no privacy in sharing unknown files like photos and videos. Whenever user shoots photos or videos from their smart phone, software should identify

Fig. 2. File browsing in smart file sharing

the environment, identify people who were there with the owner and tag them automatically in photos or videos that the owner shoots. This will be possible by scanning surroundings through Wi-Fi or Bluetooth if the other smart phone users enter their identity in this software.

E. Application

This software can be used by industries and educational institutes.

III. Contribution

This software contributes to locally socializing the wireless sharing among wireless devices. This will ensure time saving for users who will send files through the proposed live sharing feature. File sharing will be possible between large number of devices locally without internet and in a secure way.

IV. Hardware Requirements

We considered a PC with windows 7 operating system or higher version which is more stable for development. 2GB RAM is sufficient and the minimum requirement for processor is Intel Core i5. Storage space of 256GB (Segate HDD) is recommended.

Back end smart phone requirement is that it should be based on Apple IOS operating system, version should be IOS 7.X.X or higher. It should have Wi-Fi IEEE 802.11 a/b/g/n/ac, dual-band speed up to 900Mb/s which is useful and sufficient for Live Sharing Feature Efficient File Sharing. As a 2nd port and option for Bluetooth V4.0

IEEE 802.15.1 Duel Band. Internal Storage-16GB or higher internal memory is needed.

V. Requirements Gathering

ID	DESCRIPTION
A.1.1	Attributes to define memory, disk and WLAN requirements should be available
A.1.2	Attributes to user data privacy shall be considered
A.1.3	Attributes to send data to large number, such as geographical location must be supported
A.1.4	IOS operating systems should be supported
A.1.5	Data information should be gathered and grouped according to the appropriate format category
A.1.6	The ipa shall be able to collaborate efficiently between the user modules and administrator modules
A.1.7	The Live sharing option must effectively be aware of the presence of other users.

VI. Requirements Analysis

ID	DESCRIPTION
A.2.1	Modules for user login, user profile, context information and administration are required
A.2.2	User IDs and Passwords are provided to the users to ensure privacy and authentication
A.2.3	Profile information, sharable data, location information shall be automatically updated
A.2.4	Appropriate Live browsing data shall be filtered from the ones made available through the sender based on the user queries and preference

VII. Algorithm

3 major algorithms are going to be implemented in this project. PCS (Projective Cone Scheduling) algorithm, Location Propagation Model algorithm which reads location by RSSI value in Indoor field, and median finding algorithm used to find median or middle value between n number of values.

Algorithm Steps Proposed

PART 1
Step 1. File source ready to send
Step 2. Location Propagation Algorithm receiving RSSI Value and reading location
Step 3. Median Finding algorithm reads locations and chooses the median devices
Step 4. Sending file to chosen devices

Step 5. PCS Algorithm replicating file to rest of the devices

PART 2
Step 1. File source is placed for live sharing & hotspot service is executed.
Step 2. File source is ready to share in live at hotspot.
Step 3. Proposed algorithm will execute when receiver's device is approached.
Step 4. Data source deployed to target device.
Step 5. Proposed algorithm executed according to number of targets.

ANALYSIS OF GLOBALLY OPTIMAL FILE REPLICATION PROTOCOL

$$\bar{\bar{T}}_j = \frac{1}{\sum_{i=1}^{N} \hat{m}_i X_{ij}} \qquad (1)$$

then, the average number of intervals needed to satisfy a request is

$$\bar{\bar{T}}_j = \sum_{j=1}^{F} q_j \bar{\bar{T}}_j = \sum_{j=1}^{F} \frac{q_j}{\sum_{i=1}^{N} \hat{m}_i X_{ij}} \qquad (2)$$

DISTRIBUTED FILE REPLICATION PROTOCOL
❖ Resource allocation without a central server
❖ The OFRR Formula

$$P_1 / \sum_{k=1}^{n_1} V_{1k} = P_2 / \sum_{k=1}^{n_2} V_{2k} = P_F / \sum_{k=1}^{n_F} V_{Fk},$$

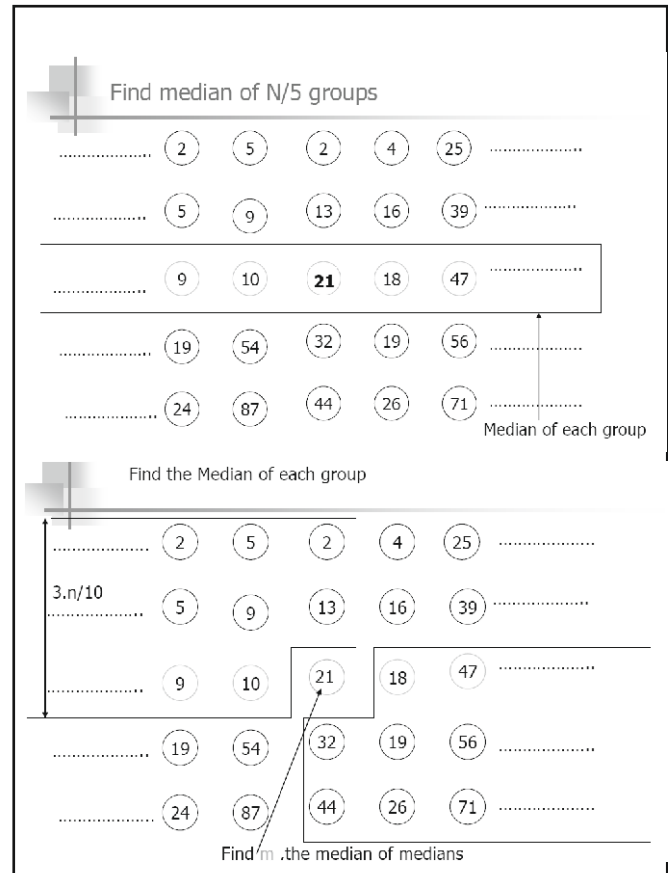### PCS Algorithm (Projective Cone Scheduling)
❖ In PCS, each node dynamically updates its meeting ability (Vi)

$$R_j = R \times \sqrt{b_j q_j} / \sum_{k=1}^{F} \sqrt{b_k q_k}.$$

These algorithms will be used for the entire implementation of this project.

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Fig. 3. Median Finding Algorithm