Attain High Signal Strength: Offload Data Traffic for Distinct Locations Using Android Based Application

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ABSTRACT

The network signal varies from various networks. Different wireless devices used to attain signals based on the network. Though network speed is very high, the user loses signals in different location. The strength of the signal can only be viewed by the user. To overcome this drawback, In this paper we propose an android application which attains high signal strength and sends as an notification to the user with the location details.The user can use this high signal strength to download files from the cloud or upload any files to the cloud.This android application saves the high signal strength location details in the application server, where the user can view those locations and reach the target location by finding the distance shown through polynomial line**.**

KEY WORDS: GSM,Signal strength,Traffic offloading.

1. INTRODUCTION

Due to many practical deployment issues, some areas have good coverage while other areas may not. As a result, the wireless signal strength of a mobile device varies based on its location. Moreover, the data throughput in an area also depends on the number of people in that area and the network carrier. When the service quality is low, it takes longer time to transmit the same amount of data and consumes more energy.

In this paper, the locations are saved in an android server using latitude and longitude calculation. The signals are received using GSM SIM operator name. As the cellular network is crowded in some locations, lots of research has been done to offload cellular traffic to WiFi networks to reduce the traffic and increase the network throughput. Since WiFi is not always available, researchers also propose to offload the cellular traffic networks, such as Bluetooth and WiFi direct. Among all device to device interfaces WiFi direct attracts more attention since it has much higher throughput. It has also been used in the standard of proximity service.

The proposed android application which attains high signal strength, an notification sent to the user with the location details. The user can use this high signal strength to download files from the cloud or upload any files to the cloud. This android application saves the high signal strength location details in the application server, where the user can view those locations and reach the target location by finding the distance shown through polynomial line.

The efficiency of the application, our work is a full implementation and runs on real devices. Experimental results show that it can reduce energy by 38 percent in downloading and 70 percent in uploading, and reduce delay by 45 percent in downloading and 88 percent in uploading.

2. LITERATURE SURVEY

Mobile data offloading how much can wifi deliver? - S. Chong, K. Lee. – April 2013: Mobile data traffic is growing at an unprecedented rate. Many researchers from networking and financial sectors forecast that by 2014, an average broadband mobile user will consume 7 GB of traffic per month, which is 5.4 times more than today's average user consumes per month, and the total mobile data traffic throughout the world will reach about 3.6 EB per month, 39 times increase from 2009 at a compound annual rate of 108%. It is also predicted by Cisco that about 66% of this traffic is mobile video data.

The main drive behind this explosive growth in traffic demand is rapid increase in the number of smart phones and tablets that offer ubiquitous Internet access and proliferation of traffic-intensive applications for such smart devices (e.g., applications providing cloud-based services).Trace-driven simulation using the acquired whole-day traces indicates that WiFi already offloads about 65% of the total mobile data traffic and saves 55% of battery power without using any delayed transmission.

If data transfers can be delayed with some deadline until users enter a WiFi zone, substantial gains can be achieved only when the deadline is fairly larger than tens of minutes.

Energy efficient computation offloading in cellular networks–Y.Geng,W.Hu,Y.Yang–June2015: Computationally intensive applications may quickly drain mobile device batteries. One viable solution to address this problem utilizes computation offloading. The tradeoff is that computation offloading introduces additional communication, with a corresponding energy cost. Yet, previous research into computation offloading has failed to account for the special characteristics of cellular networks that impact mobile device energy consumption.

This paper developed the energy efficient computation offloading algorithms for cellular networks. It analyzes the effects of the long tail problem on task offloading, formalize the computation offloading problem, and use Dijkstra's algorithm to find the optimal decision. Since this optimal solution relies on perfect knowledge of future tasks, later an online algorithm for offloading has been proposed and this algorithm implemented on Android-based smartphones. Trace-driven simulation shows that this algorithm can significantly reduce the energy of computation offloading in cellular networks.

An incentive framework for cellular traffic offloading - X. Zhuo, W.Gao –March .2014: The recent popularization of cellular networks (e.g., 3G) provide mobile users with ubiquitous Internet access. However, the explosive growth of user population and their demands for bandwidth-eager multimedia content raise big challenges to the cellular networks. A huge amount of cellular data traffic has been generated by mobile users, which exceeds the capacity of cellular network and, hence, deteriorates the network quality. To address such challenges, the most straightforward solution is to increase the capacity of cellular networks, which however is expensive and inefficient. Some researchers studied on how to select a small part of key locations to realize capacity upgrade, and shift traffic to them by exploiting user delay tolerance.

Remaining the capacity of cellular networks unchanged, offloading part of cellular traffic to other coexisting networks would be another desirable and promising approach to solve the

overload problem. The incentive cost given an offloading target, users with high delay tolerance and large offloading potential should be prioritized for traffic offloading. Extensive trace-driven simulations verify the efficiency of incentive framework for cellular traffic offloading.

Energy optimization through traffic aggregation in wireless networks - W. Hu and G. Cao – July 2014 : Smartphones have become the essential components of our daily life; however, users are also frustrated with their short battery life. One major source of the power consumption comes from the cellular interface which is used for supporting mobile data. In UMTS 3G network or 4G (HSPA+) network, multiple timers are used to control the cellular interface, and the timeout value for releasing the radio resource can be more than 15 seconds. Thus, it is possible that the cellular interface continues to consume a large amount of energy (also referred to as the long tail problem) before the timer expires, even when there is no network traffic.

Cellular networks can provide pervasive data access for smartphones, but also consume lots of energy, because the cellular interface has to stay in high power state for a long time (called long tail problem) after a data transmission. This paper, reduce the tail energy by aggregating the data traffic of multiple nodes using their P2P interfaces. This traffic aggregation problem is formalized as finding the best task schedule to minimize energy.An A* search algorithm, was proposed which can reduce the search space for finding the optimal schedule offline, and then introduce an online traffic aggregation algorithm. Trace-driven simulations and Experimental results show that our traffic aggregation algorithm can significantly reduce the energy and delay.

Mobile data offloading through opportunistic communications and social participations – Y.Geng, W.Hu, Y.Yang – May 2012: Due to the proliferation of smartphones (e.g., Apple's iPhone and Nokia N95), mobile operating systems (e.g., Google's Android and Symbian OS), and online social networking services, Mobile Social Networks (MoSoNets) have begun to attract increasing attention in recent years. The development of MoSoNets has already evolved from the simple extensions of online social networking sites to powerful mobile social software and applications.

Currently, a large percentage of mobile data traffic is generated by these mobile social applications and mobile broadband-based PCs. A side effect of the explosion of these applications, along with other mobile applications, is that 3G cellular networks are currently overloaded.3G networks are currently overloaded, due to the increasing popularity of various applications for smart phones. Offloading mobile data traffic through opportunistic communications is a promising solution to partially solve this problem, because there is almost no monetary cost for it. It exploit opportunistic communications to facilitate information dissemination in the emerging Mobile Social Networks (MoSoNets) and thus reduce the amount of mobile data traffic.

Our work aims to reduce energy and delay by offloading traffic to neighbors with better service quality.In this paper, the locations are saved in an android server using latititude and longitude calculation. The signals are received using GSM SIM operator name.

As the cellular network is crowded in some locations, lots of research has been done to offload cellular traffic to WiFi networks to reduce the traffic and increase the network throughput. Since WiFi is not always available, researchersal so propose to offload cellular traffic networks, such as Bluetooth and WiFi direct. Among all device to device interfaces WiFi direct attracts more attention since it has much higher throughput. It has also been used in the standard of proximity service.

The proposed android application attains high signal strength and sends an notification to the user with the location details. The user can use this high signal strength to download files from the cloud or upload any files to the cloud. This android application saves the high signal strength location details in the application server, where the user can view those locations and reach the target location by finding the distance shown through polynomial line.

To examine the efficiency of the application, our work is a full implementation and runs on real devices. Experimental results show that it can reduce energy by 38 percent in downloading and 70 percent in uploading, and reduce delay by 45 percent in downloading and 88 percent in uploading.

3. ARCHITECTURE DIAGRAM

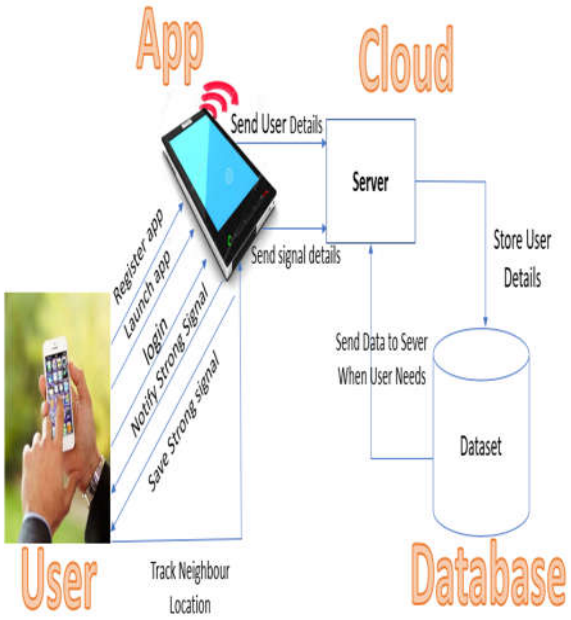

Figure.3.1. Architecture diagram for Attain High Signal Strength: Offload Data Traffic for Distinct Location Using Android Based Application

3.1 Android Application: This architecture digram shows the overall process of android application. First the user register the application using internet connection with the username and password. Once the user is registered the user will be able to login the using their username and password, if the user forgets the password, the user will be able to create a new password through an OTP sent to their mail id.

Once the user login into the application, map is shown where the user's current location details are displayed.Signal strength of the location is sent as an notification, then it will be stored in the application server. Later, the user can login in to the application and view the saved locations and can reach the high signal strength location through polynomial line(target location distance) to download or upload any files.

4. IMPLEMENTATION: In this paper, implementation process comprises of five modules.

4.1 User Registration: Here first the user wants to create an account and then only it is allowed to access this ANDROID application. Once the user creates an account, the user will be able to login into their account. The user has to provide username, password and conform password to register this application.The required field validation is set for all these fields,it shows an error if any of these field is empty. All these user details will be stored in the Database of the application server. User can access the requested data if authenticated by the Server.

Figure 4.1: User Registration

4.2 User Login: ANDROID'S application Server will contain information about the user in their Data Storage. The User will login into this application using the registered username and password. The required validation is set for both the fields ,it shows an error "the field cannot be blank"if the user do not provide username or password. If the user forget the password, the user can click forgot password button to get an OTP. Through that OTP user will able to create new password and login into the application. The server will maintain all the user information to authenticate when user wants to login into their account.

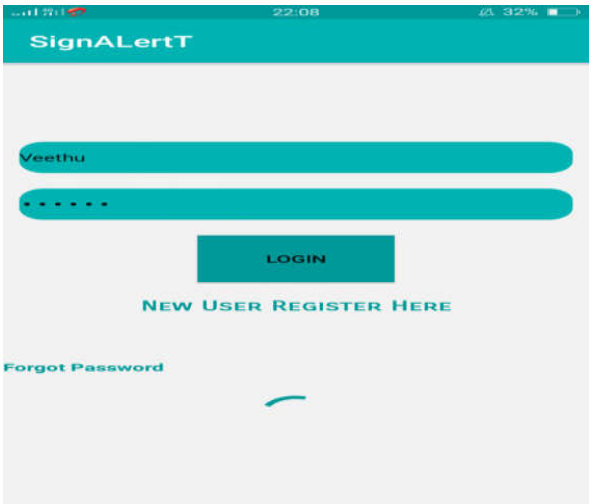

Figure 4.2: User Login

4.3 Get Current Location: After the user login into the application, using registered username and password, the application asks permission from the user to provide permission for GPS location. Once the permission is granted by the user it propagates to map where the current location of the user details i.e. current place, state, country, latitude and longitude is shown inside the map through marker and these details(current place, state, country, latitude, longitude) are toasted inside the map. These details are stored in the android server.

Figure 4.3: Get Current Location

4.4 Signal Strength Notification: In this module, signal strength of the location is notified to the user after getting the current location details and the signal strength location is stored in the server. The signal strength notification provides strength of the network signal whether 2G/3G/4G and the range of the signal whether average/moderate/high is also provided.The strength of the network signal and range of the signal are toasted inside the map.

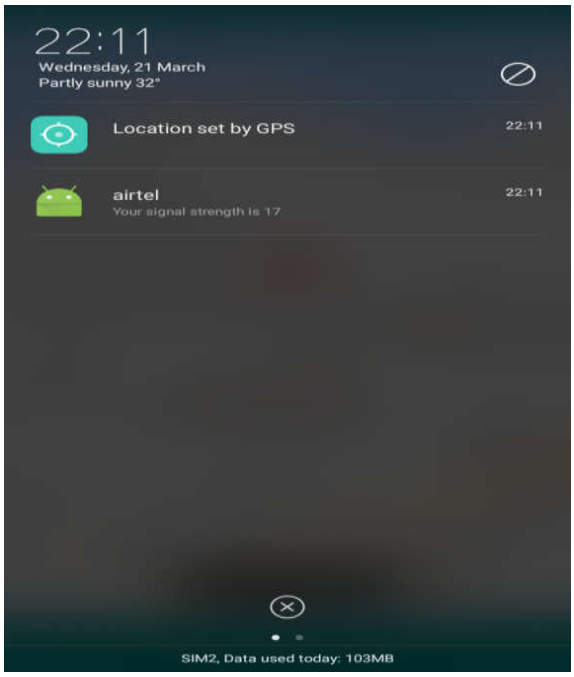

Figure 4.4: Signal Strength Notification

4.5 Show Distance Of High Strength Location: In this module, current location and the locations stored in the application server are displayed in the map through marker where the user will able to view all the locations. Different loations are shown using different coloured markers. The locations in the application server are stored whenever the user login into this application with different locations. User can view the current location and the saved locations and user can locate the target distance of the high strength signal location by clicking the information window of the location through polynomial line.

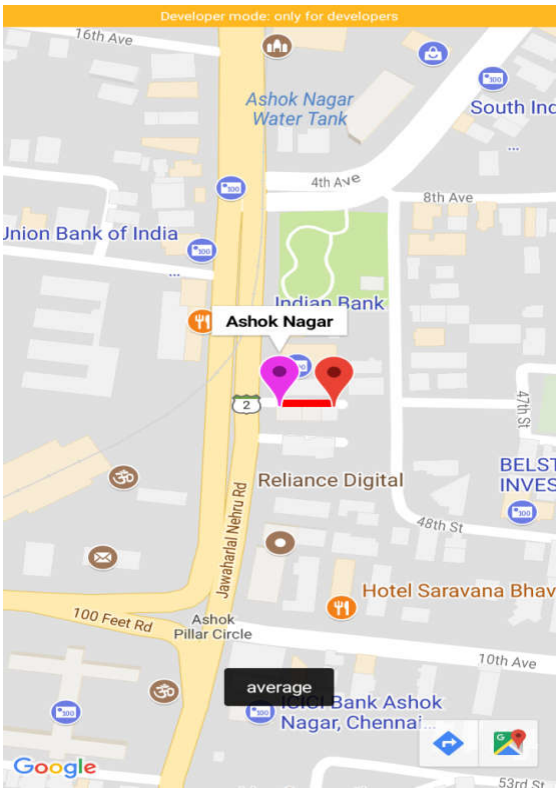

Figure 4.5: High Strength Location

5. CONCLUSION

In this paper, we proposed an Android Application where the user is able to receive the signal strength of the location through notification and able to store it. The signal strength can be shown through polynomial line. This signal strength is used to download or upload users files (mp3, mp4, txt, etc.,).This application is used to share the locations signal strength and able to trace the location of the neighbour. This app also used to find the target location (strong signal strength is already saved) distance.

6. FUTURE ENHANCEMENT

This android application can be enhanced with high speed. It can also be used to avoid more traffic loads. It can be used to determine the speed of the signal strength using multiple networks at a time. This application only provides details if the GPS location permission is granted and network provider is also used to work with this application but speed of the network is very slow and user will not be able to get the correct location. So this application can be enhanced using Network provider with high speed.

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