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An analytical and simulation model in order to reduce the content provisioning cost on Mobile Social Networking Sites

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Abstract:

Mobile social networking is social networking where individuals with similar interests converse and connect with one another through their mobile phone and/or tablet. Much like web-based social networking, mobile social networking occurs in virtual communities. A current trend for social networking websites, such as Facebook, is to create mobile apps to give their users instant and real-time access from their device. In turn, native mobile social networks have been created like Foursquare, Instagram, and Path, communities which are built around mobile functionality.This paper proposes and implements cooperative caching policies for reducing electronic content provisioning cost in Social Wireless Networks.

SWNETs are created by mobile devices, such as data enabled phones, electronic book readers etc., sharing common interests in electronic content, and physically gathering together in public places. Electronic object caching in such SWNETs are shown to be able to reduce the content provisioning cost which depends heavily on the service and pricing dependences among various stakeholders including content providers (CP), network service providers, and End Consumers (EC). Drawing motivation from Amazon's Kindle electronic book delivery business, this paper develops practical network, service, and pricing models which are then used for creating two object caching strategies for minimizing content provisioning costs in networks with homogenous and heterogeneous object demands.

The paper constructs analytical and simulation models for analyzing the proposed caching strategies in the presence of selfish users that deviate from network-wide cost-optimal policies. It also reports results from an Android phone based prototype SWNET, validating the presented analytical and simulation results.

Keywords:

Mobile applications, Social Networking Apps, Scalability, Cost, cost-optimal policies, simulation, consumers, Ad-Hoc Networks .

Introduction:

More and more, the line between mobile and web is being blurred as mobile apps use existing social networks to create native communities and promote discovery, and web-based social networks take advantage of mobile features and accessibility. As mobile web evolved from proprietary mobile technologies and networks, to full mobile access to the Internet, the distinction changed to the following types:

1) Web based social networks being extended for mobile access through mobile browsers and smartphone apps, and 2) Native mobile social networks with dedicated focus on mobile use like mobile communication, location-based services, and augmented reality, requiring mobile devices and technology. However, mobile and web-based social networking systems often work symbiotically to spread content, increase accessibility and connect users from wherever they are.

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Mobile social networking sites allow users to create a profile, send and receive messages via phone or computer and visit an on-line version of mobile site. There are different models which were adapted by different networking sites.

Most of these sites have many features in unique feature or special function that other sites don't share, but the main function of the site is exactly the same as other services. All these sites are categorized according to the following business models.

Group Texter:

This model focuses on ability to send short, text based messages to a large group of people simultaneously. It can be by SMS or micro-blog. This category enables messages reach right people as quickly as possible.

Location-Aware:

This model relies on geotags to provide location information about users and content. This allows users to tag particular locations with images and other information. These tags can be accessible by the users which are mapped on world map. Some of the sites in this category enable to receive alerts when the user passes by the location in which somebody was tagged in. Some location-aware applications function more like radar.

They take advantage of growing interest in location-based services by keeping track of all the contacts. This allows knowing people who are nearest to the user. A lot of these sites also allow you to check if there's anyone near a particular venue or location, and some of them will actively alert you if any of your contacts comes within a certain distance.

Dating Service:

The sites using this model are almost identical versions of their online counterparts. Users create a profile and are matched with other profiles on-line. Some of these sites use radar so that they ping you if there is a matching single profile within a certain distance. These sites are marked with serious security measures, so that no personal details are released without user's consent.

Social Networker:

The sites using this try to use on-line social networking sites as closely as possible. Many of these sites use mobile portals of already existing and successful sites such as Facebook. They offer vast number of functions including multimedia posts, photo sharing instant messaging etc. Most of these sites offer inexpensive international calling and texting facilities.

Media Share:

This model can be viewed as an advanced version of the Group Texter category. Instead of text messages, audio and video files are transmitted among the group, or, as in the case of Instagram and its competitors, shared to the public. Most of them store media content online for easy storage and access.

Social Gaming:

This model is about connecting people through both multi-player games and competitive single-player games. Mobile devices are always increasing their capacity for graphics performance and computing power, making them capable gaming devices. The leader in this category is Zynga, creators of Farmville and Words with Friends, though it has suffered a decline.

Existing System:

With the existence of such SWNETs, an alternative approach to content access by a device would be to first search the local SWNET for the requested content before downloading it from the CP's server. The expected content provisioning cost of such an approach can be significantly lower since the download cost to the CSP would be avoided when the content is found within the local SWNET. This mechanism is termed as cooperative caching. In order to encourage the End-Consumers (EC) to cache previously downloaded content and to share it with other end-consumers, a peer-to-peer rebate mechanism is proposed. This mechanism can serve as an incentive so that the end-consumers are enticed to participate in cooperative content caching in spite of the storage and energy costs. In order for cooperative caching to provide cost benefits, this peer-to-peer rebate must be dimensioned to be smaller than the content download cost paid to the CSP.

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This rebate should be factored in the content provider's overall cost.

Disadvantages:

Due to their limited storage, The main server speed could become slow. This means after downloading and using a content, a content to be stored in local cache.

Proposed System:

In this paper drawing motivation from Amazon's Kindle electronic book delivery business, this paper develops practical network, service, and pricing models which are then used for creating two object caching strategies for minimizing content provisioning costs in networks with homogenous and heterogeneous object demands. The paper constructs analytical and simulation models for analyzing the proposed caching strategies in the presence of selfish users that deviate from network-wide cost-optimal policies.

Node Construction :

In this module we construct a general node to node communication through the socket programming, Every node can communicate with each other .data packet can be transmitted from source node to destination node ,Each node acts as server, it can accept the any connection and receives the data packets from any other node and transmits the data packets to other node.

Evolutionary algorithm :

Genetic Algorithm is an evolutionary algorithmuses genetic operators to generate the offspring of the existing population. This section describes three operators of Genetic Algorithms that were used in GA algorithm: selection, crossover and mutation.

Selection:

The selection operator chooses a chromosome in the current population according to the fitness function and copies it without changes into the new population. GA algorithm used route wheel selection where the fittest members of each generation are more chance to select.

Crossover:

The crossover operator, according to a certain probability, produces two new chromosomes from two selected chromosomes by swapping segments of genes GA. evolutionary algorithm for optimal cooperative communication between the nodes with the parameters channel capacity and signal strength, it leads to the communication cost between the nodes, here genetic algorithm finds the optimal communication cost by applying the process of optimal chromosome or path selection and mutation operators between the nodes, after the mutation again calculate the communication cost between the source and destination nodes followed by relay nodes

Optimal cost computation :

During the cooperative communication between the nodes, nodes communicate with each other with optimal path, which is generated by evolutionary approach, When a node transmits the data to the receiver, initially request made to evolutionary processing module, it computes all the paths between the source to destination and selects the optimal path and transmits the data. Communication cost=Signal strength+channel capacity Obtains the optimal path which has the best communication cost and transmits the data over the path.

Step1: Sourcenodeselectsthedestination to transmit thedata.

Step2: Request received by the processingmoduleandgeneratesthepathsintopology.

Step3: Processing module computes the path with their signal strength and channel capacity.

Step4: Compute communication cost with signal strength and channel capacity for fitness.

Step5:selectoptimalpath(optimal communication cost) and transmits the data.

Architecture:

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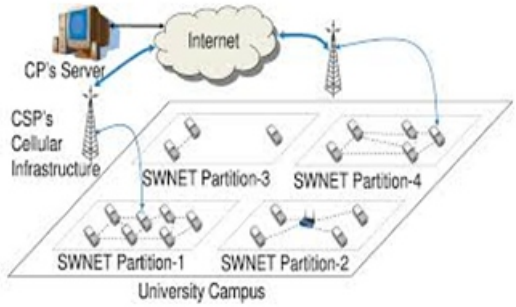


Advantages:

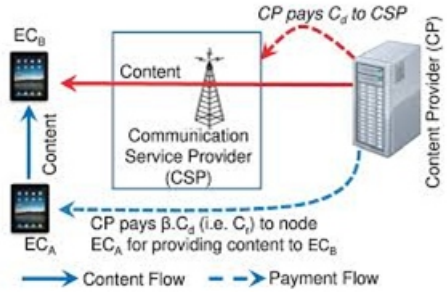
- Based on a practical service and pricing case, a stochastic model for the content provider's cost computation is developed.

- A cooperative caching strategy, Split Cache, is proposed, numerically analyzed, and theoretically proven to provide optimal object placement for networks with homogenous content demands.

- A benefit-based strategy, Distributed Benefit, is proposed to minimize the provisioning cost in heterogeneous networks consisting of nodes with different content request rates and patterns.

- The impacts of user selfishness on object provisioning cost and earned rebate is analyzed.

Content and cost flow Model:



CONCLUSION:

The aim of this work was to build up a cooperative caching approach for provisioning price decrement in SWNET. The main involvement is to reveal that the most excellent cooperative caching for provisioning price decrement in N/W's with homogeneous substance demands needs an optimal crack between entity uniqueness and duplication. Like a split substitution policy was projected and calculated utilizing ns2 simulation and on an investigational test bed of 7 android mobile devices.

Additionally, we analytically (using simulation) and experimentally examined the algorithm's presentation in the existence of client selfishness. It was revealed that selfishness can raise client reimbursement only when the count of selfish nodes in Social Wireless Network is not as much of critical number.

It was explored that with heterogeneous requirements, a advantage based heuristics policy gives better presentation compared to split cache which is projected especially for homogeneous demand. Current work on this theme contains the development of proficient algorithm for the heterogeneous demand circumstances, with a goal of connection between the performance gap of the centralized greedy mechanism and the Benefit Based heuristics which was verified to be most favorable. No collusion assumption removal for client selfishness is also being processing on.

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