International Journal of Technical Research and Applications e-ISSN: 2320-8163,
www.ijtra.com Volume 3, Issue 3 (May-June 2015), PP. 286-289

IMPLIMENTATION ON DISTRIBUTED CO-OPERATIVE CACHING IN SOCIAL WIRELESS NETWORK (SWNET)

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Abstract: This paper introduces co-operative caching policies for reducing electronic content provisioning cost in Social Wireless Networks (SWNET). SWNET are formed by mobile devices such as laptops, modern cell phones etc. sharing common electronic contents, data and actually gathering in public places like college campus, mall etc. Electronic object caching in such SWNET are shown to be able to minimize the content provisioning cost which mainly depend on service and pricing dependencies between various stakeholders including content provider(CP), network service provider, end consumer(EC). This paper introduces practical network service and pricing model which are used for creating two object caching strategies for minimizing provisioning cost in networks which are homogeneous and heterogeneous object demand. The paper develops analytical and simulation design for analyzing the proposed caching strategies in the presence of selfish user that deviates from networks-wide cost-optimal policies.

Keywords- Social wireless networks, co-operative caching, cost optimal policies, selfish users

I. INTRODUCTION

A. Motivation

Modern appearance of data enabled mobile devices and wireless enable data applications have fostered new content dissemination models in today’s mobile eco-system wireless devices have scarcity of resources such as storage capacity and processing power. A list of such devices includes apple’s iPhone, Google’s android, amazon’s kindle and electronic books readers from other vendors. The array of data application includes electronic book and magazine and mobile device application with the conventional download model, a user download contents directly from a content provider (CP) server, over a communication service provider (CSP) network. Downloading data through CSP’s involves cost which must be paid either by customer or by the CP. So for minimize this effort we take on amazon’s kindle electronic book delivery selling model in which the content provider(CP) pays to sprint, the CSP, for the cost of web usage due to downloaded EBook by kindle user.Social Wireless Networks (SWNETs) can be formed using wireless connections between the mobile devices.

B. Optimal Solution

For contents with unpredictable level of acceptance, a greedy approach for each node would be to store as many distinctly common contents as its loading allows.

This approach sums to noncooperation and can grow to heavy network-wide data photocopying. In the other excessive case, which is fully cooperative, a fatal would try to make the top of the total number of single contents put in storage within the SWNET by avoiding photocopying. In this Paper, we show that none of the above extreme approaches can decrease the content provider’s burden. We also show that for a given rebate-to-download-charge ratio, there is recent an item placement policy which is somewhere in between those two ends, and can growth the content provider’s cost by striking a constancy between the greediness and full support.

C. User Selfishness

The probability for producing peer-to-peer allowance may encourage selfish activities in some clients. A selfish client is one that swerves from the network-wide finest policy in order to receive more allowances. Any distinction from the optimal policy is predictable to incur higher network-wide provisioning cost. In this work, we study the impacts of such selfish behavior on objective provisioning cost and the earned refund within the context of a SWNET. It is given that out there a threshold selfish node population, the amount of per-node allowance for the selfish users is lower than that for the selfless users. In additional terms, when the selfish terminal population overdoes a certain point, selfish actions discontinue producing more advantage from a refund viewpoint.

D. Contributions

First, based on a practical service and rating case, a stochastic model for the content provider’s cost computation is established. Second, a cooperative caching strategy, Split Cache, is proposed, numerically analyzed, and theoretically confirmed to provide optimal object placement for networks with homogenous content demands. Third, a benefit-based strategy, Distributed Benefit, is proposed to reduce the Provisioning cost in heterogeneous networks involving of nodes with different content demand rates and patterns. Fourth, the impacts of user selfishness on entity provisioning cost and earned rebate is analyzed.

Finally, numerical results for both strategies are authorized using virtual reality and related with a series of outdated caching policies.

II. NETWORK, SERVICE AND PRICING MODEL

A. Network Model

Fig.1 describes a model SWNET within a University area we consider two types of SWNETs. The first one involves stationary SWNET partitions. Meaning, after a partition is formed, it is maintained for sufficiently long so that the cooperative object caches can be formed and reach steady states. We also investigate a second type to explore as to what happens when the stationary assumption is relaxed. To investigate this effect, caching is applied to SWNETs formed using human interaction traces obtained from a set of real SWNET nodes.

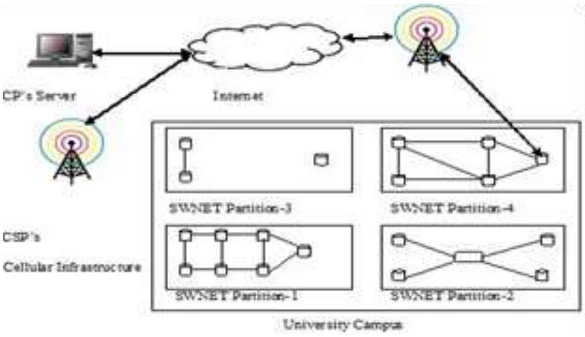


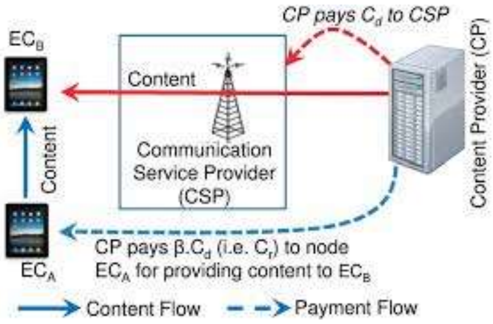
Fig. 1. Content access from a SWNET in a University Campu

B. Search Model

We search the file means, it first searches its local cache. If the local search fails, it searches the object within its SWNET partition using limited broadcast message. If the search in partition also fails, the object is downloaded from the CP's server. In this paper, we have modeled objects such as electronic books, music, etc., which are time non varying, and therefore cache consistency is not a critical issue. The popularity-tag of an object indicates its global popularity; it also indicates the probability that an arbitrary request in the network is generated for this specific object.

C. Pricing Model

We use a pricing model similar to the Amazon Kindle business model in which the CP pays a download cost Cd to the CSP when an End-Consumer downloads an object from the CP's server through the CSP's cellular network. Also, whenever an EC provides a locally cached object to another EC within its local SWNET partition, the provider EC is paid a rebate Cr by the CP. Optionally, this rebate can also be distributed among the provider EC and the ECs of all the intermediate mobile devices that take part in content forwarding .The selling price is directly paid to the CP by an EC through an out-of-band secure payment system. A digitally signed rebate framework needs to be supported so that the rebate recipient ECs can electronically validate and redeem the rebate with the CP. We assume the presence of these two mechanisms on which the proposed caching mechanism is built.



III. REQUEST GENERATION MODEL

We study two request age group models, namely, homogenous and heterogeneous. In the homogenous case, all moveable devices maintain the same content demand rate and pattern which follow a Zipf distribution. Zipf distribution is widely used in the literature for exhibiting popularity based online entity request distributions [5]. According to Zipf law, the popularity of the ith popular object out of N different objects can be expressed as the parameter α ($0 < \alpha < 1$) is a Zipf parameter that defines the skewness in a appeal pattern.

The quantity pi indicates the probability that an arbitrary request is for the ith popular object (p1 > p2 > _ _ _ > p*N*). As α increase, the access pattern becomes more concentrated on the popular data items.

In the heterogeneous request model, each movable device follows an individual Zipf distribution. This means popularity of entity j is not necessarily the same from two different nodes standpoints. This is in dissimilarity to the homogenous model in which the popularity of object j is same from the outlook of all network nodules. Also, the object invitation rate from different nodes is not automatically the same in the heterogeneous model.

IV. SPLIT CACHE REPLACEMENT

To realize the optimal object appointment under homogeneous entity request model we propose the following Split Cache policy in which the available cache space in each device is at odds into a duplicate segment (_fraction) and a unique segment.

In the first segment, nodes can store the most popular objects without worrying about the object repetition and in the second segment only unique objects are allowed to be stored. With the Split Cache additional policy, soon after an object is downloaded from the CP's server, it is regarded as as a unique object as there is only one copy of this object in the network. Also, when a node copies an object from another SWNET node, that object is categorized as a duplicated object as there are now at least two copies of that object in the network.

For placing away a new unique object, the least popular object in the whole cache is selected as a applicant and it is replaced with the new object if it is less popular than the new incoming object. For a duplicated object, however, the evictee candidate is selected only from the first duplicate segment of the cache. In other words, a unique object is never evicted in order to put up a duplicated object. The Split Cache object replacement mechanism realizes the optimal strategy recognized in Section 4. With this mechanism, at

V. 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. It also reports results from an Android phone based prototype SWNET, validating the presented analytical and simulation results.

VI. ADVANTAGE

- 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.

VII. SYSTEM STUDY

A. Feasibility Study

The feasibility of the project is analyzed in this phase and business proposal is put forth with a very general plan for the project and some cost estimates. During system analysis the feasibility study of the proposed system is to be carried out. This is to ensure that the proposed system is not a burden to the company. For feasibility analysis, some understanding of the major requirements for the system is essential. Three key considerations involved in the feasibility analysis are

- ECONOMICAL FEASIBILITY
- TECHNICAL FEASIBILITY
- SOCIAL FEASIBILITY

1) Economical Feasibility

This study is carried out to check the economic impact that the system will have on the organization. The amount of fund that the company can pour into the research and development of the system is limited. The expenditures must be justified. Thus the developed system as well within the budget and this was achieved because most of the technologies used are freely available. Only the customized products had to be purchased.

2) Technical Feasibility

This study is carried out to check the technical feasibility, that is, the technical requirements of the system. Any system developed must not have a high demand on the available technical resources. This will lead to high demands on the available technical resources. This will lead to high demands being placed on the client. The developed system must have a modest requirement, as only minimal or null changes are required for implementing this system.

3) Social Feasibility

The aspect of study is to check the level of acceptance of the system by the user. This includes the process of training the user to use the system efficiently. The user must not feel threatened by the system, instead must accept it as a necessity. The level of acceptance by the users solely depends on the methods that are employed to educate the user about the system and to make him familiar with it. His level of confidence must be raised so that he is also able to make some constructive criticism, which is welcomed, as he is the final user of the system.

VIII. INPUT DESIGN

The input design is the link between the information system and the user. It comprises the developing specification and procedures for data preparation and those steps are necessary to put transaction data in to a usable form for processing can be achieved by inspecting the computer to read data from a written or printed document or it can occur by having people keying the data directly into the system. The design of input focuses on controlling the amount of input required, controlling the errors, avoiding delay, avoiding extra steps and keeping the process simple. The input is designed in such a way so that it provides security and ease of use with retaining the privacy. Input Design considered the following things:

- What data should be given as input?
- How the data should be arranged or coded?
- The dialog to guide the operating personnel in providing input.
- Methods for preparing input validations and steps to follow when error occur.

B. Objectives

1. Input Design is the process of converting a user-oriented description of the input into a computer-based system. This design is important to avoid errors in the data input process and show the correct direction to the management for getting correct information from the computerized system.

2. It is achieved by creating user-friendly screens for the data entry to handle large volume of data. The goal of designing input is to make data entry easier and to be free from errors. The data entry screen is designed in such a way that all the data manipulates can be performed. It also provides record viewing facilities.

3. When the data is entered it will check for its validity. Data can be entered with the help of screens. Appropriate messages are provided as when needed so that the user will not be in maize of instant. Thus the objective of input design is to create an input layout that is easy to follow

IX. OUTPUT DESIGN

A quality output is one, which meets the requirements of the end user and presents the information clearly. In any system results of processing are communicated to the users and to other system through outputs. In output design it is determined how the information is to be displaced for immediate need and also the hard copy output. It is the most important and direct source information to the user. Efficient and intelligent output design improves the system's relationship to help user decision-making.

1. Designing computer output should proceed in an organized, well thought out manner; the right output must be developed while ensuring that each output element is designed so that people will find the system can use easily and effectively. When analysis design computer output, they should Identify the specific output that is needed to meet the requirements.

2. Select methods for presenting information.

3. Create document, report, or other formats that contain information produced by the system.

The output form of an information system should accomplish one or more of the following objectives.

- Convey information about past activities, current status or projections of the
- Future.
- Signal important events, opportunities, problems, or warnings.
- Trigger an action.
- Confirm an action.

X. SCREEN SHOT

A. Home page

B. Admin Login:

C. New User Registration

D. Content Flow Model

E. Rresul

X. ACKNOWLEGEMENT

We would sincerely like to thank Mrs. Sonali Tikde, our guide, for her guidelines and support.

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