International Journal of Science Engineering and Advance Technology

# Optimal Object Placement Policies To Minimize The Network-Wide Content Provisioning Cost

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**Abstract:**
Social Wireless Networks are formed by mobile devices such as data enabled phones, electronic book readers etc., allocating common interests in electronic content and physically gathering together in public places. Electronic object caching in such social wireless networks (SWNETs)are capable to diminish the content provisioning cost which depends greatly on the service and pricing dependences amide range of stakeholders together with content providers (CP), network service providers and End Consumers (EC). Drawing inspiration from Amazon's Kindle electronic book delivery business, this paper build up practical network, service and pricing models which are then used for creating two object caching approaches for diminishing content provisioning costs in networks with homogenous and assorted object demands. The paper creates logical and replication models for analyzing the proposed caching approaches in the presence of selfish users that diverge from network-wide cost-optimal policies.

**Keywords:** Online social networks, information filtering, short text classification, policy-based personalization.

**Introduction:**

A user download contents directly from a Content Provider's (CP) server over a Communication Service Provider's (CSP) network. Downloading content through CSP's network includes a cost which must be paid either by end users or by the content provider. In this work we adopt Amazon Kindle electronic book delivery business model in which the CP (Amazon) pays to Sprint (CSP) for the cost of network procedure due to downloaded E-books by Kindle users. Social Wireless Networks (SWNETs) can be formed using ad hoc wireless connections between the devices. With the survival of such SWNETs can substitute approach to content access by a device would be to first look for the local SWNET for the application content before downloading it from the CP's server. The normal content provisioning cost of such an approach can be considerably lower since the download cost to the CSP would be avoided when the content is found within the local SWNET and this mechanism is termed as cooperative caching.

**Related Work:**

The Social Wireless Networks investigated which are often formed using mobile ad hoc network protocols are dissimilar in the caching context due to their supplementary constraints such as topological insatiability and limited resources. Cache Data a forwarding node make sure the passing-by objects and caches the ones consider useful according to some predefined criteria. This way the succeeding requests for the cached objects can be satisfied by an intermediate node. An issue with this approach is that storing large number of popular objects in large number of intermediate nodes does not scale well. Cache Path is different in that the in-between nodes do not save the objects instead they only record paths to the nearby node where the objects can be found. The thought in Cache Path is to lessen latency and overhead of cache resolution by finding the location of objects. This approach works poorly in a highly mobile environment since most of the recorded paths become outdated very soon. Hybrid Cache in which either Cache Data or Cache Path is used based on the properties of the passing-by objects through an intermediate node.

**Existing Method:**

The estimated content provisioning cost of an approach can be considerably lesser since the download cost to the CSP would be evade when the content is found within the local SWNET. This method is expressed as cooperative caching. In order to support the End-Consumers (EC) to cache formerly downloaded content and to distribute it with other end-consumers a peer-to-peer rebate mechanism is proposed. This method can provide as an incentive so that the end-consumers are persuaded to contribute in cooperative content caching in spite of the storage and energy costs. In order for cooperative caching to provide cost benefits the peer-to-peer rebate must be dimensioned to be smaller than the content download cost paid to the CSP. This rebate should be factored in the content provider's overall cost.

ISSN 2321-6905

**Disadvantages:**

Because of the inadequate storage mobile handheld devices are not probable to store all downloaded content for long. This means after downloading and using a purchased electronic content a device may take away it from the storage.

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

It is very difficult to detect Selfish users .

**Proposed Method:**

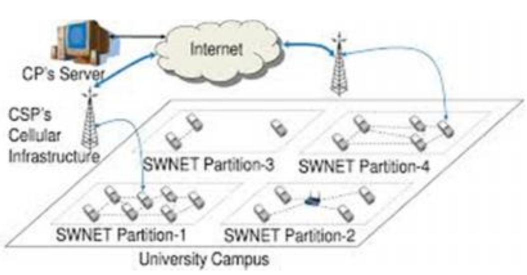
The paper expand practical network, service and pricing models which are then used for generating two object caching strategies for diminishing content provisioning costs in networks with homogenous and heterogeneous object demands. The paper creates analytical and simulation models for analyzing the proposed caching strategies in the presence of selfish users that diverge from network-wide cost-optimal policies. It also reports results from an Android phone based prototype SWNET authenticate the presented analytical and simulation results.

**Advantages:**

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 reduce the provisioning cost in heterogeneous networks consisting of nodes with dissimilar content request rates and patterns. The impacts of user selfishness on object provisioning cost and earned rebate is analyzed.

1. Based on a practical service and pricing case, a stochastic model for the content provider's cost computation is developed.
2. A cooperative caching strategy, Split Cache, is proposed, numerically analyzed, and theoretically proven to provide optimal object placement for networks with homogenous content demands.
3. 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.
4. The impacts of user selfishness on object provisioning cost and earned rebate is analyzed

**System Architecture:**




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.

**Short Text Classifier:**

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.

**Text Representation:**

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

**Machine Level -Based Classification:**

If the local search fails it look for the object within its SWNET partition using inadequate broadcast message. If the search in partition also fails the object is downloaded from the CP's server. In this paper, we have replica objects such as electronic books, music, etc., which are time conveying and therefore cache reliability is not a critical issue. The popularity tag of an object point to its global popularity. It also indicates the probability that random request in the network is generated for this specific object.

**Filtering Rules:**

In this module we detect the selfish node based on credit risk scores. At each relocation period, node detects selfish nodes based on normalized credit score. Each node may have its own initial value of Pki as a system parameter. Interestingly, the initial value of Pki can represent the basic attitude toward strangers. For instance, if the initial value equals zero, node Ni always treats a new node as a non selfish node. Therefore, node can cooperate with strangers easily for cooperative replica sharing. Replicas of data items are allocated by allocation techniques. After replica allocation, node sets NDki and SSki accordingly. Recall that both NDki and SSki are estimated values, not accurate ones

**Blacklists:**

BLs is directly supervised by the system which should be capable to establish and decide when user's retention in the BL is finished. To improve suppleness such information are given to the system through a set of rules called as BL rules. They are not supposed as general high-level directives to be functional to the whole community. Rather we decide to let the users themselves, the wall's owners to state BL rules adaptable who have to be disqualified from their walls and for how long. Therefore a user might be excluded from a wall by, at the same time being capable to post in other walls.

**DICOMFW:**

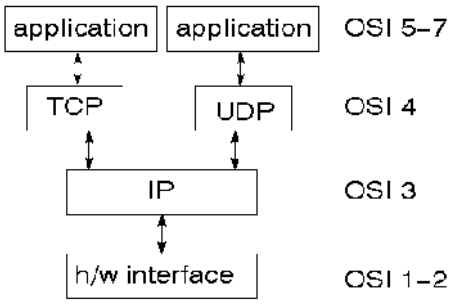
```
INPUT: Oj      //The new downloaded object
       flag    // Change status flag
IF ( Oj is downloaded from Internet || flag == True)
        Oj.benefit = Uj + Dij
        Oj.label = Primary
ELSE
        Oj.benefit = Dij
        Oj.label = lecondary
END
Omin = Object l ith minimum benefit
IF (Oj.benefit > Omin.benefit)
        replace Omin l ith Oj
        send change status message to the provider node
END
```

Ahead unloading of the object and the change status flag the requesting node believe the object as a primary copy and if it can find an object with lower benefit or if it has an empty slot it stores the new object in its cache. After storing it the requesting node sends another change status message to the provider node which grounds the provider node labels its object as a secondary copy. The complete logic of the Distributed Benefit heuristics is summarized.

**Object Replacement Policy Algorithm**

object in the "duplicate" area of the local cache;
else; /* object comes from if *(the new object comes from another device in the Domain)* then
candid = the least popular outside of domain */
candid = the least popular object in the entire cache;
end
if *(new object.popularity > candid.popularity)* then
replace candid with the new object;
else
do not cache the new object;
end

**Experimental Results:**




**IP datagram's**

The IP layer provides a connectionless and unreliable delivery system. It considers each datagram independently of the others. Any association between datagram must be supplied by the higher layers. The IP layer supplies a checksum that includes its own header. The header includes the source and destination addresses. The IP layer handles routing through an Internet. It is also responsible for breaking up large datagram into smaller ones for transmission and reassembling them at the other end.

**UDP**

UDP is also connectionless and unreliable. What it adds to IP is a checksum for the contents of the datagram and port numbers.

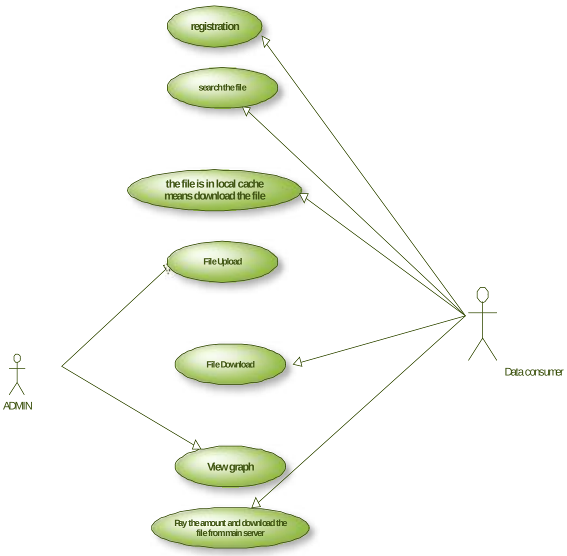
**TCP**

TCP supplies logic to give a reliable connection-oriented protocol above IP. It provides a virtual circuit that two processes can use to communicate.

**Enhancement:**

We propose an algorithm, universal –match based Indirect Noise Node which makes use of noise nodes to preserve utilities of the original graph. Finally that technique prevents an attacker from reidentifying a user and finding the fact that a certain user has a specific sensitive value.

**Use Case Diagram:**




**Conclusion:**

The key involvement is to show that the best cooperative caching for provisioning cost decrease in networks with uniform content demands requires an optimal split between object repetition and individuality. Such a split replacement policy was proposed and evaluated using ns2 simulation and on an experimental tested of seven android mobile phones. In addition we experimentally using simulation and systematically calculated the algorithm's performance in the presence of user selfishness. It was shown that selfishness can augment user rebate only when the number of selfish nodes in an SWNET is less than a critical number. The objective of this work was to develop a cooperative caching strategy for provisioning cost minimization in Social Wireless Networks.

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