International Journal of Application or Innovation in Engineering & Management (IJAIEM)
Web Site: www.ijaiem.org Email: editor@ijaiem.org
Volume 3, Issue 12, December 2014 **ISSN 2319 - 4847**

Novel approach for cooperative caching in distributed environment

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ABSTRACT

In the present systems that implement cooperative caching the web based associations and their processes are typical. With the usual download model, a user downloads contents directly from a Content Provider's (CP) server over a Communication Service Provider's (CSP) network. Downloading content through Content Service Provider's network involves a cost which must be paid either by end users or by the content provider. The existing systems that usually implement did not solve the budding problems associated with distributed collaboration environments. Suppleness in composition models is limited since sudden changes require change of the entire process. Such changes may cause exceptions disturbing the normal execution of the process. Thus an optimal model is needed to resolve the problems associated with the cooperative caching mechanism. This paper focus on such an optimal model that reduces the cost involved while downloading the required web content by the user.

KEYWORDS:- Social Wireless Network, Content Provider, Content Service Provider.

1.INTRODUCTION

A mobile application is a computer program intended to run on smartphones, tablet computers and other mobile devices. Wireless networks cannot be defined without the underlying social network. Such a network is made available by implementing a mobile ad hoc network (MANET) that is a continuously self-configuring, infrastructure-less network of mobile devices connected without wires. Apps are usually available through these application distribution platforms. The key characteristic feature of such applications is that nearby sensor nodes monitoring an environmental feature typically registers similar values. This kind of data redundancy due to the spatial association between sensor annotations inspires the methods for in-network data aggregation and mining. The capability of mobile network devices to manipulate data that is to store and transmit data is known as data enabling. A list of such data enabling devices includes Apple's iPhone, Google's Android, Amazon's Kindle, and electronic book readers from other vendors. Using these data enabling devices user can download his required content from the web. The usual download model, allows the user to download contents directly from a Content Provider's (CP) server over a Communication Service Provider's (CSP) network. Downloading content through Content Service Provider's network involves a cost which must be paid either by end users or by the content provider. This paper introduces cooperative caching policies for minimizing electronic content provisioning cost in Social Wireless Networks (SWNET). SWNETs are formed by mobile devices, such as data enabled phones, electronic book readers etc., by sharing common interests in electronic content, and physically gathering together in public places. Electronic object caching in such WNETs 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 Social Wireless Network, validating the presented analytical and simulation results.

2.EXISTING SYSTEM

In the existing system web based collaborations and processes are typical. The existing system didn't solve the emerging problems distributed collaboration environ-ments. Flexibility in composition models is limited since unexpected changes require remodelling of the entire process. Such changes may cause exceptions disrupting the normal execution of the process.

3.NOVAL APPROACH FOR COOPERATING CACHING

Policy is expected to incur higher network-wide provisioning cost. In this paper, we analyze the impacts of such selfish behaviour on object provisioning cost and the earned rebate within the context of an SWNET. In other words, when the selfish node population is beyond a critical point, selfish behaviour ceases to produce more benefit from a rebate standpoint.

4.RELATED WORK

The proposed system utilizes the human-provided services enabling flexible interactions in service oriented interactions. The discussion about discovery and interactions is mixed with service oriented systems comprising human provided services and software based services. Mixed service oriented systems supports complex interaction scenarios and composed of both human-provided and software based services interacting to perform joint activities or to solve emerging problems. It presents a novel approach addressing the need for flexible involvement of experts and knowledge workers in distributed collaborations.

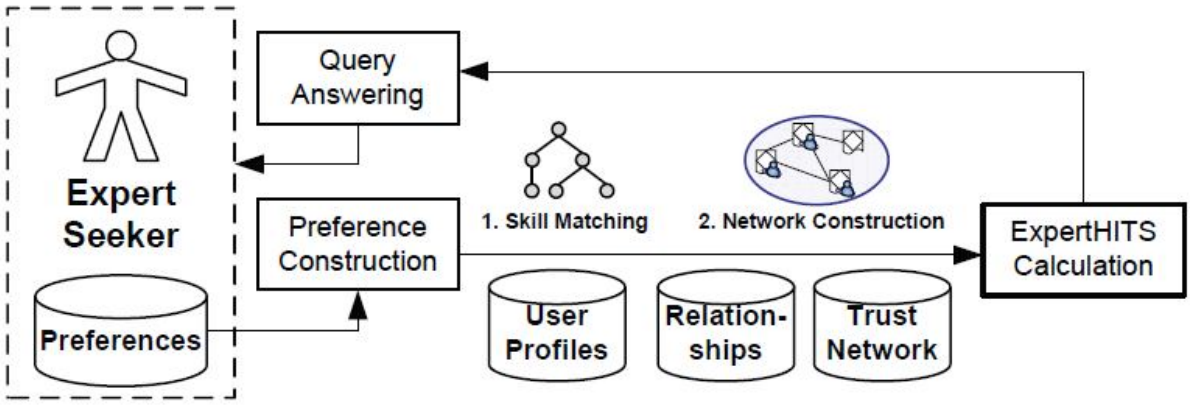
4.1 ADMINISTRATIVE USER INTERFACE

The administrative user interface concentrates on the consistent information that is practically, part of the organizational activities and which needs proper authentication for the data collection. The Interface helps the administration with all the transactional states like data insertion, data deletion, and data updating along with executive data search capabilities.

Considering the flexibility for the data enabling device users an interface has been developed keeping graphics concepts in mind, associated through a browser interface. The GUI's at the top level has been categorized into an Administrative User Interface Design and an Operational and Generic user interface design.

4.2 operational and generic interface

The operational and generic user interface helps the users upon the system in transactions through the existing data and required services. The operational user interface also helps the ordinary users in managing their own information helps the ordinary users in managing their own information in a customized manner as per the assisted flexibilities. This paper implements the novel cooperative caching model by using split cache implementation and a search mechanism.



4.3 Split Cache Mechanisms

Split Cache Replacement helps to realize the optimal object placement under homogeneous object request model. This paper proposes the Split Cache policy in which the available cache space in each device is divided into a duplicate segment and a unique segment. In the first segment, nodes can store the most popular objects without worrying about the object duplication and in the second segment only unique objects are allowed to be stored. The parameter indicates the portion of cache that is used for storing duplicated objects. With the Split Cache replacement policy, soon after an object is downloaded from the Content Provider's server, it is categorized as a unique object as there is only one copy of this object in the network. Also, when a node downloads 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 storing a new unique object, the least popular object in the whole cache is selected as a candidate 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 accommodate a duplicated object. The Split Cache object replacement mechanism realizes the optimal strategy

established in Section 4. With this mechanism, at steady state all devices' caches maintain the same object set in their duplicate areas, but distinct objects in their unique areas.

4.4 search model

After an object request is originated by a mobile device, it first searches its local cache. If the local search fails, it searches the object within its Social Wireless Network partition using limited broadcast message. If the search in partition also fails, the object is downloaded from the Content Provider's server using the CSP's 3G/4G cellular network. In this paper, we have proposed a model of objects such as electronic books, which are time invariant and therefore cache consistency is not a critical issue. We first assume that all objects have the same size and each node is able to store up to "C" different objects in its cache. It is also assumed that all objects are popularity-tagged by the Content Provider's server. 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.

5.RESULTS

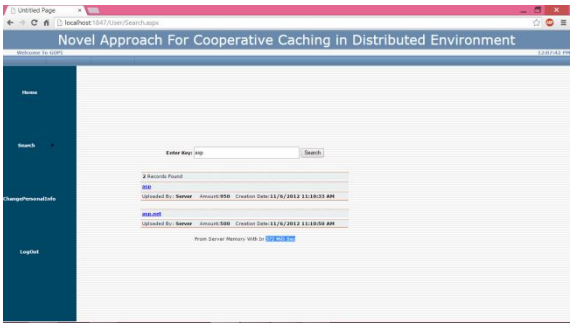


Fig 2: Getting data from the server.

Fig 3: Getting data from the cache.

6.CONCLUSION& FUTURE WORK

This paper, utilizes Human-Provided Services (HPSs) enabling flexible interactions in service-oriented systems. This paper discusses the discovery and interactions in mixed service oriented systems comprising HPS and software based services (SBS). Experts offer their skills and capabilities as HPS that can be requested on demand. This paper focuses on the following key issues of estimating the user reputation based on a context-sensitive algorithm, an approach for community reputation influenced by trust relations.

The assumption that all the objects are of the same size and are time invariant can be handled in our future work that supports objects with varying size along with time.

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