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RESEARCH ARTICLE

Network Assisted Mobile Computing with Efficient Cache Maintenance

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Abstract - Mobile applications retrieve content from remote servers through user generated queries. Processing the request fully on the mobile devices can quickly reduce battery resources. Alternatively, processing request at remote servers can have slow response times due communication latency incurred during transmission of large query. We use network-assisted mobile computing method where mid-network nodes with "leasing" capabilities are deployed by a service provider. Leasing computation power can be reducing battery consumption on the mobile devices as well as improve response times. We evaluate the dynamic programming algorithm to solve for the optimal processing policies that suggest the amount of processing to be done at each mid-network node in order to minimize processing and communication latency and processing costs. In this research provide efficient cache maintenance at mid-network nodes using Push and Pull algorithm (PP) and Fast Lender Detection (FLD) to minimize processing time because we retrieve content from mid-network nodes.

Keywords—Dynamic Programming, Network Assisted Mobile Computing, Network Optimization, Push and Pull(PP) algorithm, Fast Lender Detection(FLD)

I. INTRODUCTION

The processing of images or videos on the mobile devices involves several demanding processes like pattern recognition, background extraction, feature extraction, and feature matching which when done often can reduce the battery lifetime of the mobile device.Conversely,the request process on application server which can increasing bandwidth consumption. We use network assisted computing to reduce processing on the mobile phone thereby increasing battery consumption and extending operational lifetime. Leasing processing power from mid-network nodes can help lower communication latency because some of the query request processed at mid-network nodes before reach the application server.But,problem was network assisted method does not minimize cost.so using the dynamic programming algorithm, we solve for the optimal processing policies that suggest amount of processing to be done at a node in the network which is to minimize the processing and communication latency and processing costs.We provide the efficient cache maintenance at mid-network nodes by using Push and Pull(PP) algorithm and Fast Lender Detection(FLD) to minimize the processing time compare than previous method.

II. PROBLEM STATEMENT

A. Constructing Mid-Network

We construct statically constructed Mid-network which is collections of nodes in each base station. It considers systems with leasing servers which are constructed at mid-network nodes to offer processing capability for the user queries before they reach the application server.

B. Network Assisted Computing Method

We use Network assisted computing method reduce battery consumption on mobile devices. Leasing processing power from mid-network nodes which can help reduce bandwidth consumption where mid-network nodes processing can reduce message size. In this method provide security is major problem.

C. Dynamic Programming Method

The optimal processing policies that suggest the amount of processing to be done at each mid-network node in order to minimize the processing and communication latency and processing costs. In this paper we provide frequent data updation at mid-network nodes from server using Push and Pull (PP) method.

III. RELATED WORKS

A. Prefetching Protocol for Continuous Media Streaming In Wireless Environments

We develop a streaming protocol for the real-time delivery of prerecorded continuous media from (to) a central base station to (from) multiple wireless clients within a wireless cell. Proposed protocol pre-fetches parts of the ongoing continuous media streams into pre-fetch buffers in the clients (base station). Proposed protocol pre-fetches according to a join-the-shortest-queue (JSQ) policy. By exploiting rate adaptation techniques of wireless data packet protocols, the JSQ policy dynamically allocates more transmission capacity to streams with small pre-fetched reserves.

B. Supporting Guaranteed Continuous Media Streaming In Mobile Ad-Hoc Networks with Link Availability Prediction

In this paper, they introduce a new QoS criterion called path-availability-based service coverage to mobile streaming applications. Based on this QoS criterion, they propose a dynamic service replication strategy for providing guaranteed continuous streaming service to all nodes in mobile ad-hoc networks (MANETs).

C. Peer-To-Peer Aided Streaming In A Future Multimedia Framework

Peers are then motivated with monetary rewards, to share their, often underutilized, resources to distribute the content. The paper presents a hypothesis that states the conditions for Server inited peer to peer to prevail future framework.

D. A Survey of Current Directions In Service Placement In Mobile Ad-Hoc Networks

Service placement deals with the problem of selecting which node in a network is most suitable for hosting a service that responds to queries from other nodes. Optimally placing services reduces network traffic and improves connectivity between clients and servers.

IV. MODELS AND ASSUMPTION

A. Cache Model

The cache or relay model is a generic and flexible scheme. By adjusting the time-out value associated with the cache copies, as well as the tolerable delay of updating the source data. To associate timeout values with cache copies. When the time-out values expire, the caching nodes renew the time-out values from the data source node. Upon a data update on the data source node, it first needs to push invalidations to the caching nodes. Since the invalidations may be lost, especially in dynamic mobile adhoc networks, the caching nodes are required to send back the acknowledgment. Until the data source node postpones updating the data.

B. Lender Selection

The lender selection is the process of selecting best lender over the mobile network. Utilizing the processing power of lender nodes is the main idea behind the lender selection module. Leasing processing power from mid-network nodes can be extremely beneficial to reduce latency and to extend the battery life of a mobile device.

C. Push and Pull algorithm

The proposed system also proposes the Combination of Push and Pull (PP) algorithm which satisfies user-specified data requirements under the FLD model. In PP users can specify their updating requirements in two orthogonal dimensions. To satisfy consistency requirements under the FLD model, this proposed the combination of Push and Pull (FCPP) algorithm. Using push, the data source node proactively informs the caching nodes of cache information.

- Using pull, a caching node fetches cache information from the data source node. This also assume that the data source node and the caching nodes have synchronized clocks.
- Withdrawal & ACK process in PP is well compensated when the caching nodes directly serve the (frequent) cache queries.

V. SYSTEM ARCHITECTURE

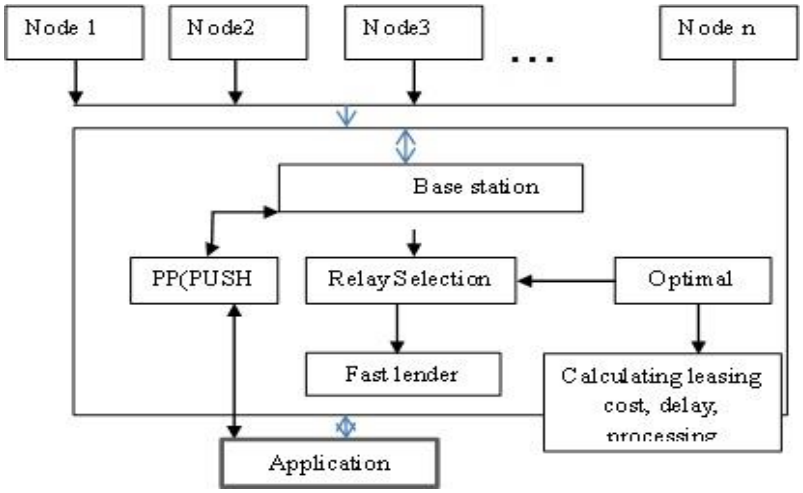

Fig. 1. Network Assisted Mobile Computing Model

The proposed system aims to Design of a cost effective and flexible model, which enables the users to flexibly and precisely get their updated data from the cache. Design of a dynamic updation algorithm which is named as PP (push and pull) algorithm, which satisfies user-available energy consistency requirements at the minimum cost.

VI. DISCUSSION

In this paper frequent updation of data at mid-network nodes if relevant server updates any data using Push and Pull (PP) algorithm. Using PP approach to minimize processing times and performance is improved.

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