IMPLEMENTATION OF CELLULAR NETWORKS WITH LEASING CAPABILITIES FOR LARGE QUERY PROCESS

M.surendra[1], T.Sujilatha[2],
#1 Student of M.Tech (C.S) and Department Of CSE, GOKULA KRISHNA COLLEGE OF ENGINEERING & TECHNOLOGY, SULLURPET
#2 Department Of CSE, GOKULA KRISHNA COLLEGE OF ENGINEERING & TECHNOLOGY, SULLURPET

Abstract: **Mobile applications has cellular networks as well as the integration of different types of networks within the Multi-hop Cellular Networks (MCN)) an attractive technology. Coding is used to combined the uplink and downlink transmissions, and consolidate it into the best functioning in two directions using relay nodes (leasing). The transmission latency on the uplink will be higher as larger query data are transmitted through the network. Thus, there is an inherent tradeoff between battery usage and latency (time). As mobile devices become more sophisticated with higher resolution image and video capability, the query data will continue to improve resulting in more demand for intelligent navigation of this tradeoff. By leasing the processing power from Mid-network nodes, the communication latency in such applications is reduced. Mid-network processing can help lighten the processing burden off the Mobile Station without increasing the service latency. The concept of Leasing Mid-network processing is implemented in an online apartment search and ranking system. A 28% reduction in the communication latency in the network is observed. We are achieved by making use of the processing power in the intermediate nodes in the network. The speed of the search is improved as well as the processing required at the user's android device is reduced. By applying better query processing mechanisms in the mid-network nodes, the communication latency can be further reduced. The performance can be further enhanced by optimal selection of mid-network nodes using shortest path time scheduling algorithm.**

Index Terms **– mid-network nodes, Cellular networks with leasing capabilities, network optimization**

INTRODUCTION

Mobile phones have evolved into powerful image and video processing devices, provide with high resolution cameras, color displays, and to perform some functions faster than is possible in graphics,[2], [3]. Various mobile applications fetch the requested data from remotely located servers by means of question generated by users. These queries need to be organizing before the desired content can be identified and provided to users Such applications can be used, e.g., for recognize products, juxtaposition shopping, ending information about movies, CDs, real estate, prints media or artworks.

The multiservice network requires security services to guarantee that only authorized users can deploy services. Various mobile applications fetch the requested data from remotely located servers by means of question generated by users. These queries need to be organizing before the desired content can be identified and provided to users. Processing these requests on user equipments will quickly drain the limited battery resources. Conversely, processing these queries at remote servers will result in slow response. Time due to the communication latency caused during the transmission of the potentially large user-query.

The proposed system utilizes mid-network processing. Leasing the computational power from mid network nodes will help in reduction of communication latency. The uplink transmission and processing of a single user generated request is considered. An Android Mobile Application to list apartments which are geographically in a certain radius using GPS Calculation and ranking Methods is developed. The implementation is accomplished using java on android platform. The data storage and processing capabilities of mobile devices are becoming increasingly powerful.

EXISTING STRATEGIES

Processing user queries at remote servers can have slow response times due communication latency

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incurred during transmission of the potentially large query [2]. The varying quality of the wireless channel, data may not be able to be retrieved at the precise instant it is needed. Mobile Augmented Reality applications, it is infeasible to store even part of the large database required.

Limitations of existing Solutions

- Many mobile devices are equipped with a small camera.
- Database is so large it cannot feasibly be stored on the limited memory of the mobile device.
- Request has been fully processed the desired content can be streamed downlink to the requesting handheld device.

PROPOSED SOLUTION

The transmission latency on the uplink will be higher as larger query data are transmitted between the networks [2]. Where uplink queries requesting pleased are processed without these uplink data having to travel all the way to backend servers. Leasing processing power from mid-network nodes can help lower communication latency because rather than transmitting the entire, large request message over multiple crowded links to the AS, mid-network processing will decrease the message size [7].

Advantages:

- Mid-network nodes bring in the tradeoff of leasing cost
- Battery use and latency can be reduced by leasing processing power.
- Battery usage and latency will grow.

IMPLEMENTATION

There has been increasing popularity of applications deployed on mobile devices, such as smart phones or tablets. Many of them, e.g., YouTube, Pandora, Face book etc, require access to the Mobile Internet for content sharing while running, and contribute a huge amount of data traffic sent through cellular networks, which causes cellular networks currently to be overloaded[1]. Moreover, it is predicted that mobile data traffic will increase very fast in the next few years. As a result, many cellular network providers are putting a lot of effort to seeking solutions for improving their network capacity, e.g., upgrade their infrastructure, as well as decide to move away from unlimited data plans to less flexible charging models. In this paper proposed, [6] we address the problem of efficient rich content sharing from/to mobile devices by proposing practical approaches that provide high delivery performance, reduce cellular data traffic, and release the pressure of cellular networks' heavy load on mobile users and cellular network services providers.

Mobile communication issues

1. Low bandwidth: One of the biggest issues, because the radio resource for wireless networks is much scarcer than wired networks.
2. Service Unavailability: Mobile users may not be able to connect to the cloud to obtain a service due to traffic congestion, network failures, and mobile signal strength problems.
3. Heterogeneity: Handling wireless connectivity with highly heterogeneous networks to satisfy MCC requirements (always-on connectivity, on-demand scalability, and energy efficiency) is a difficult problem.

- Implementation phase contains total three Modules
  - ✓ Leasing Model
  - ✓ Relaying Strategies
  - ✓ Multi-hop Transmission

1. Leasing model

Nowadays, all mobile devices are becoming more complex as they are capable of creating high quality image, Audio and video, thus the query data size will be growing continuously. As larger query data is transmitted through the network, the communication latency on the uplink will be higher. So there is a trade-off between battery usage and communication latency [7]. The transmission pathway from User Equipment (UE) to Application Server (AS) is shown in Fig.1.

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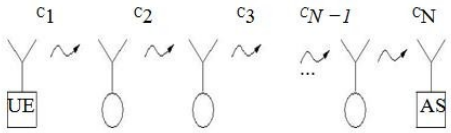

Fig.1. System using leasing networks

A user request originates at the User Equipment. The requested message is transmitted to the Application Server through mid-network nodes. The processing of the user generated query is done at the base station, intermediate nodes and at the Application Server in order to stream the desired content. The video/audio files which have large size are stored in database at remote Application Server and the request must be transmitted upstream in order to be satisfied. The request message must be processed before the media stream can be transmitted downstream [5]. In Mid-network processing, the processing power is leased from mid network nodes. We reduce the processing burden on User Equipment (UE). It can lower communication latency by reducing the message size. Mid-Network Processing is useful in media applications such as Mobile Augmented Reality. Many mobile devices are equipped with a small camera.

In Mobile Augmented Reality, a picture captured by a mobile device corresponds to a request, such as streaming a desired video or audio stream to the mobile device. A series of image processing techniques are used to do us. It is often the case that we database is so large it cannot feasibly be stored on the limited memory of the mobile device. Therefore, a request must be transmitted uplink to the Application Server. Once the request has been fully processed, the desired content can be streamed downlink to the requesting handheld device. The focus is on the uplink transmission and processing of a single original request. Shown in Fig.2.

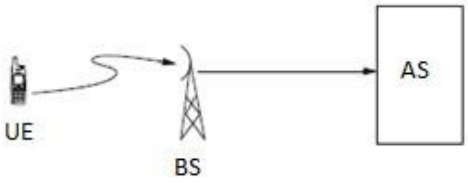

Fig2. Simple System Model diagram

2. Relaying Strategies

Robust transmission of multimedia signals is an important issue for a number of emerging applications, including wireless mobile communications with enhanced services, and cable-free or power-line communication in the home or data networks. Among the techniques which have been proposed to achieve robustness against transmission errors and packet losses, Multiple Description (MD) has been investigated by several authors. In we contribution, of redundancy in the representation of a signal by using “more” channels than necessary [4]. Frames, valid block modes, and search area for each 16x16 block and its sub partitions. Hence, redundant computations and memory accesses can be avoided, decreasing ME complexity while keeping unaltered coding efficiency performance in a wide bit-rate range, from tens of kbits/s to tens of Mbits/s. shown in Fig.3.

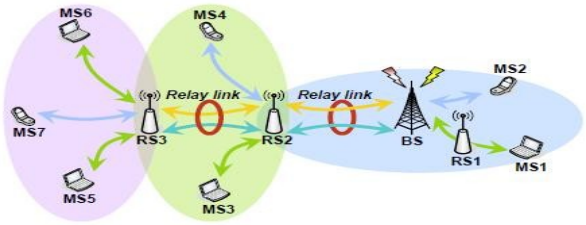

Fig 3: Relay links between ms to bs

The optimization objective is to minimize the processing and communication time and processing cost. Life time of mobile devices however comes with a cost this cost can capture the lee required to lease CPU power from the Mid-network nodes.

3. Multi-hop Transmission

Multi-hop cellular networks (MCNs) are proposed in respond to the demand for next generation cellular systems to support high data rates with efficient power consumption the network capacity can be linearly expand, comparable to the number of new base stations (BSs) or the scaling factor [10]. Several routing algorithms have been proposed for MCNs based on e.g. Location, path-loss, transmission-power, and congestion. In the relay station overload problem is considered in the route selection protocol.

BS reachability,hopcount,path loss, link quality, signal strength, bit error rate(BER) carrier to interferenceratio,delaysensitivity,throughput,power,battery level, mobile speed, And energy consumption for multicast traffic optimization in cellular networks as Well as the integration of different types of networks within the MCN. MCNs contain

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coordinators (BSs or APs) and mobile users, routing, BSs are responsible for route discovery and maintenance.

SHORTEST PATH TIME SCHEDULING ALGORITHM

To be efficient, the scheduling algorithm must implicitly rule out a large number of orderings without explicitly examining them. The key observation that enables enough orderings to be pruned is that many schedules share identical dependences at particular intermediate points in their executions [8]. Specifically, suppose Associate with each process the length of its next CPU burst. If two processes have the same length next CPU burst, FCFS scheduling is used, and all the schedules have the same remaining work and same time to meet future deadlines [9]. Gives minimum average waiting time for a given set of processes.

CONCLUSION AND FEATURE WORK

Using the cellular networks query processing is very cost effective and processing query is very late[2].In this transmission latency is increase and transmission late increased using mid-networks nodes using shortest path time Scheduling algorithm [9],with leasing capability help the lower communication latency and large request message Over multiple links to the AS (application server) [7]. Mid-networks processing will be reduced message size and trade off the leasing cost using the time (latency). Battery consumption and latency reduced by leasing process. This paper shows that battery usage, processing latency and communication latency, and leasing costs are highly interrelated. These costs are also dependent on system parameters such as communication bandwidth, processor speeds at MS,AS and mid nodes as well as request message size as a function of the number of stages processed. By studying these tradeoffs we can gain a better understanding of the relationships between each cost. This knowledge will help future system design.

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M.Surendra
M.Tech (cse)
Student
Department Of Cse,
Gokula Krishna College Of
Engineering & Technology
Sullurpet.

T. Sujilatha
Associate Professor
M.Tech in the Dept: - CSE
Gokula Krishna College Of Engineering
& Technology
YEAR's OF Teaching EXP - 6yrs
Area of interesting is Networking and
cloud computing

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