

OPTIMIZING THE INTERMEDIATE NODES TO PROCESS QUERY IN CELLULAR NETWORKS

D.V Satishkaladhar Reddy¹, CH. Praveen Kumar², Mr R. Konda Reddy³

¹ M.Tech. Research Scholar Department of CSE, ASCET, Gudur, India.

satheeshreddy562@gmail.com

² M.Tech. Research Scholar Department of CSE, ASCET, Gudur, India.

praveenkumar539work@gmail.com

³ Associate Professor, Department of CSE, PBR VITS, Kavali India.

rkondareddy75@gmail.com

ABSTRACT

Mobile applications has thus emerged for providing a better quality of experience for the end users a user clicks a picture or shoots a video of a desired object-a building, painting in a museum, a CD cover, or a movie poster through a camera mobiles. The video or image is then processed and sent over the network to an application server (AS) hosting a structured of images. The more query image is then equal with a suitable entry and the resulting content-object information, location, title songs from a CD, or movie trailer-is then streaming back to the user. The processing of query image or video on the phone often involves computationally demanding processes like pattern recognition, background extraction, quality extraction, and feature matching which when done often can diminish the battery lifetime of the mobile device. Comparably running a text to speech conversion application or an OCR engine for usage scenarios such as listening to a book on mobile device while driving or text extraction from pictures is computationally and battery intensive. Several wireless carriers have also reported a staggering increase in data traffic over mobile networks because of unprecedented use of mobile data applications. The transmission latency on the provide will be higher as larger query data are transmitted through the network. Thus, there is a built-in trade-off between battery usage and latency. As mobile devices become more experienced with higher resolution image and video capacity, the query data will continue to grow resulting in more demand for intelligent navigation of this trade-off.

Index Terms: Dynamic programming (DP), Intermediate nodes in Cellular Networks, Mid-Network nodes, Equipment

INTRODUCTION:

Many mobile applications retrieve content from remote servers via user create queries. Processing these queries is often needed before the desired content can be recognized. Processing the request on the mobile devices can quickly sap the limited battery resources [1]. Conversely, processing user-queries at distant servers can have slow response times due communication latency incurred during transmission of the specifically large query. We evaluate a network- assisted mobile computing scenario where Mid-network nodes with “leasing” capabilities are deployed by a Mobile station. Leasing computation power can reduce battery usage on the mobile devices and improve response times. Present, all mobile devices are becoming more flexible as they are capable of create high quality

video and pictures and audio, thus the query process data size will be growing continuously [3]. As large query process data is transmitted through the network and communication time on the uplink will be more advanced. So there is a trade-off between battery usage and communication latency [5]. We use the dynamic programming framework 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 the processing and communication latency and processing costs [7].

Existing Strategies:

Processing user queries at remote servers can have slow response times due communication latency incurred during transmission of the potentially large query. The varying quality of the wireless channel, data may not be

able to be retrieved at the precise instant it is require [4]. Mobile Augmented more applications, it is in feasible 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 down link to the requesting handheld device.

Proposed Solution:

The transmission latency on the uplink will be higher as larger query data are transmitted through the network. Where uplink queries requesting content are processed without these uplink data having to travel all the way to backend servers [5]. Leasing processing power from intermediate nodes can help lower communication latency because rather than transmitting the entire, large request message over multiple crowded links to the AP, mid-network processing will decrease the message size.

Advantages:

- ❖ Mid-network nodes bring in the trade-off of leasing cost.
- ❖ Battery consumption and latency can be reduced by leasing processing power.
- ❖ Battery usage and latency will increase.

IMPLEMENTATION:

1. Relay Nodes:

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 communicate through the network, the communication latency on the uplink will be higher [10]. So there is a trade-off between battery usage and communication latency. The transmission pathway from Mobile Station (UE) to Application Server (AP) is shown in Fig.1.

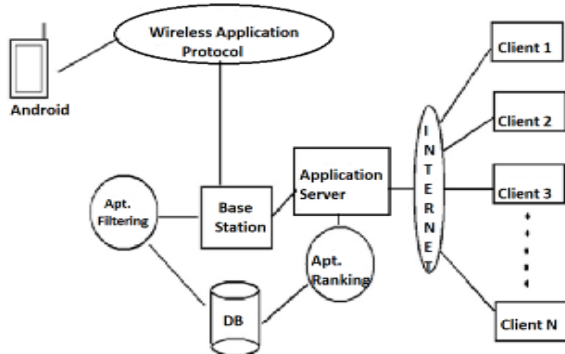


Figure 1: HighLevelSystem Architecture

A distributed mobile system consists of a group of heterogeneous mobile devices connected by wireless. The Context figure explains the advantage that each mobile User has [11]. The mobile User is classified into various such as Admin mobile User and Application User and Guest User. Each User has right prerogative. Shown in below figure.2.

2. Cellular Network:

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, Mobile device B can request helps from mobile AP A or mobile AP E. B will pay a small monetary fee for mobile AP to use its service [2]. Mobile AP A provides two services: cellular data connection (T-Mobile base station) and Wi-Fi Hotspot data connection (T-Mobile Wi-Fi Hotspot). Different services charge different prices. Network Architecture and Design General Terms: DP

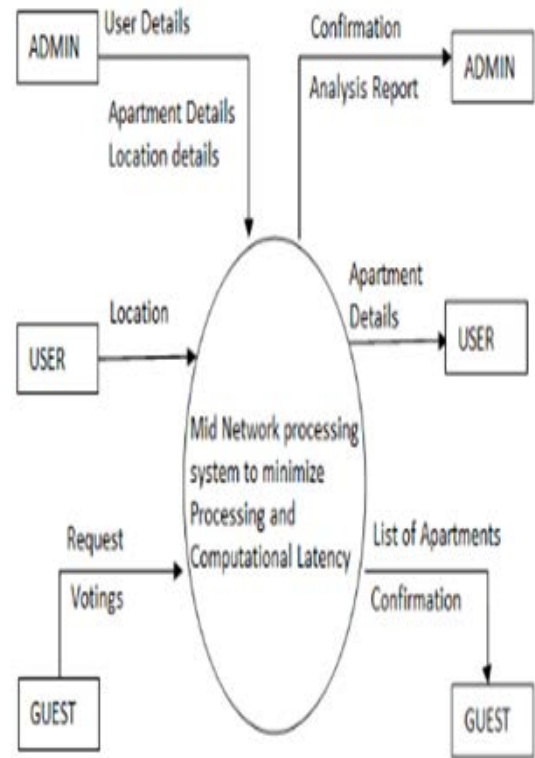


Figure 2: Context Diagram

Algorithm, Design, Experiment, and Presentation. Shown in below Fig.3.

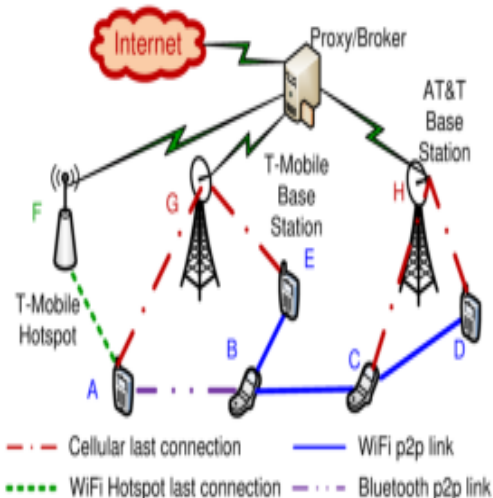


Figure 3: Mobile station & AT&T Base Station System architecture.

A user request originates at the mobile station (MS). In order to be completed. The request must be transmitted up stream to a remote application server (AS) via a Base Station (BS) And a series of relay nodes. We refer to the node at the first hop as the base station, similarly running a text to speech conversion application for usage scenarios. Leasing Processing Power from Mid-Network nodes can be extremely beneficial to reduce latency and to extend the battery life of mobile devices however it comes with a cost these costs can capture the fee required to lease CPU power from the Mid-network node

DYNAMIC PROGRAMMING ALGORITHM:

The dynamic programming (DP) technique rests on a very simple idea, the principle of optimal. The name is due to Bellman, who contributed a great deal to the popularization of DP and to its transformation into a systematic tool.

$$E \left\{ g_N(x_N) + \sum_{k=i}^{N-1} g_k(x_k, \mu_k(x_k), w_k) \right\}.$$

Then the truncated policy $\{J/I, fLi+ 1l \dots, /1N-1\}$ is optimal for we sub problem. Involving the last stage, then extending the optimal policy to the "tail sub problem" involving the last two stages, and continuing in we manner until an optimal policy for the entire problem is constructed. The DP algorithm is based on us idea: it proceeds sequentially, by solving all the tail sub problems of a given time length, using the solution of the tail sub problems of shorter time length [8]. It also addresses extensively the practical application of the methodology, possibly through the use of estimation, and provides a

large-scale treatment of the far-reaching methodology of Nero-Dynamic Programming/Reinforcement Learning.

EXPECTED RESULTS:

In this approach Due to the fact that most of the mobile devices are battery form, the lifetime of a mobile system more on both the battery behavior and the energy consumption characteristics of tasks. We proposed battery-aware algorithms to obtain task schedules satisfying the battery lifetime constraints. We proposed a user-defined checkpoint technique for Based on the information of when a mobile device will leave the network or stop due to low battery [9]. Our checkpoint capability implement checkpoints by two conditions: when a mobile device leaves its current cell and when it turns off due to low battery capacity [5]. By performance evaluation, proposed task migration scheme decreases total execution time and total job completion time. Shown in Fig.3 & Shown in below Table.1

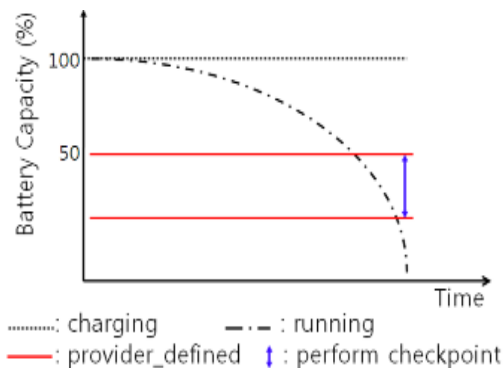


Figure 3: SimpleSystemModel

1: If current battery capacity is equal to battery capacity of provider defined
2: Perform checkpoint (current state)
3: Else if current battery capacity is less than battery capacity of provider defined
4: Send checkpoint to mobile proxy

Table.1: shows checkpoint operation more to battery capacity.

CONCLUSION AND FEATURE WORK:

Communication bandwidth limitation is a main disadvantage that mobile users are facing, especially while running multimedia applications. By leasing the processing power from Relay nodes, the communication latency. The mobile station without increasing the latency. Battery consumption and latency reduced by leasing process. This paper shows that battery usage and

processing Time and communication Time, and leasing costs are thoroughly interrelated. This is achieved by making use of the processing power in the intermediate nodes in the network. These costs are also dependent on system parameters such as communication bandwidth, process 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 trade-offs we can gain a better understanding of the relationships between each cost. The performance can be further enhanced by optimal selection of mid-network nodes. This knowledge will help future system design.

ACKNOWLEDGEMENTS:

I would thank my head of department Prof. Mr. D. Srujan Chandra Reddy sir & my guide Associate Professor Mr. R. Konda Reddy sir for guiding me to this project. I thank my parents', friends' lecturers who gave a contribution for this project.

REFERENCES:

1. Minimization of Communication Latency by Mid-Network Processing for Android Applications authors S. Glitziness and N. Bambos.
2. New network paradigms for future multihop cellular systems author Beatriz lorenzoveiga.
3. Leasing Processing Power from Mid network using Wireless Communication Authors T.P. Latchoumi, V.M.Vijay Kannan, and T.P. Ezhilarasi.
4. A Survey of Software Optimization Techniques for Low-Power Consumption Authors Oscar Acevedo, Dr. Manuel Jimenez.
5. Battery-Aware Task Scheduling in Distributed Mobile Systems with Lifetime Constraint Authors Jiayin Li, Meikang Qiu, Jian-Wei Niu, Tianzhou Chen.
6. A survey of software optimization techniques for low-power consumption Authors J. Apostolopoulos.
7. Leasing processing power from mid network using wireless communication Authors D. Chen, S. Tsai, V. Chandrasekhar, G. Takacs, J.P. Singh, and B. Girod.
8. Dynamic Programming and Optimal Control Authors P. Bertsimas.
9. Battery-aware task scheduling in distributed mobile systems with lifetime constraint Authors C.W. Chan, N. Bambos, and J. Singh.
10. S. Gitzenis and N. Bambos, Mobile to base task migration in wireless computing, in Proc. IEEE Per Com, pp.187–196, Mar.2004.
11. S. Mohapatra and N.Venkatasubramanian, Para: power aware reconfigurable middle ware, in Proc. IEEE Int. Conf. on Distributed Computing Systems, p.312319, 2003

AUTHORS



D.V Sateesh Kaladhar Reddy received the PBR Visvodaya Institute of Technology & Science B.Tech degree in computer science engineering from the Jawaharlal Nehru technological university Anantapur, in 2011, and received the Audisankara College of Engineering and Technology M.Tech degree in Software engineering from the Jawaharlal Nehru technological university Anantapur in 2014, respectively. He Publishing Four International Journals and He Participated two International conferences and Four National conferences and He Participated Seven National Level Paper Symposiums in different Colleges. He interests Computer Networks, Mobile Computing, Network Programming, and System Hardware. He is a member of the IEEE.



Mr. R. Konda Reddy has received his MCA Degree at Sri Krishna Devaraya University Campus College affiliated to Sri Krishna Devaraya University in 2000 and M.Tech Degree in Computer science from Allahabad Agriculture Institute –Deemed University in 2006. Now He is pursuing Ph.D from Rayalaseema University. He is dedicated to teaching field from the last 11 years. He has Guided 15 P.G and 40 U.G students. His research areas Included Computer Networks/Mantes Routing. At present he is working as Associate Professor in PBR Visvodaya Institute of Technology & Science, Kavali, and Andhra Pradesh, India.



CH. Praveen Kumar received the PBR Visvodaya Institute of Technology & Science B.Tech degree in computer science engineering from the Jawaharlal Nehru technological university Anantapur, in 2013, and received the Audisankara College of Engineering and Technology M.Tech degree in Computer Science engineering from the Jawaharlal Nehru technological university Anantapur in 2015. He Publishing One International Journal. And Participated Three National Level Paper Symposiums in different Colleges. He is a member of the IEEE.