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A Survey of Location Based Services Caching for Efficient Data Access in DTN

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Abstract: ***Data caching can significantly improve the efficiency of information access in a wireless mobile network by reducing the access latency and bandwidth usage. Whenever, designing efficient distributed caching algorithms is on trivial when network nodes have limited memory. In this article, we consider the cache placement problem of minimizing total data access cost in mobile network networks with multiple data items and nodes with limited memory capacity. Our distributed algorithm naturally extends to networks with mobile nodes. We simulate our distributed algorithm using a network simulator (ns2) and demonstrate that it significantly outperforms another existing caching technique in all important performance metrics. In this paper, The location based services monitor a new node and a set of moving objects and answer queries pertaining to their locations and access the data efficiently in DTN. The performance differential is particularly large in more challenging scenarios such as higher access frequency and smaller.***

Keywords: Location based caching, Disruption tolerant networks, data access, cache replacement.

1. Introduction

Mobile network networks are multi hop wireless networks of small computing devices with wireless interfaces. The computing devices could be conventional computers (for example, PDA, laptop, or PC) or backbone routing platforms or even embedded processors such as sensor nodes. The problem of optimal placement of caches to reduce overall cost of accessing data is motivated by the following two defining characteristics of mobile network networks. First, the adhoc networks are multi hop networks without a central base station. Thus, remote access of information typically occurs via multi hop routing, which can greatly benefit from caching to reduce access latency. Second, the network is generally resource constrained in terms of channel bandwidth or battery power in the nodes. Caching helps in reducing communication, this results in savings in bandwidth, as well as battery energy. The problem of cache placement is particularly challenging when each network node has a limited memory to cache data items. In this paper, our focus is on developing efficient caching techniques in mobile network networks with memory limitations. Research into data storage, access, and dissemination techniques in mobile network networks is not new.

Disruption Tolerant Network (DTN) is a network architecture design to used in unstable and stressed environment where network normally be subject to frequency and long lasting interrupt and high bit error rate. In particular, these mechanisms have been investigated in connection with sensor networking, peer-to-peer networks, mesh networks, world wide Web , and even more general mobile network networks . However, the presented approaches have so far been somewhat “mobile network” and without any strong analytical foundation. In contrast, the theory literature abounds in analytical studies into the optimality properties of caching and replica allocation problems. It is even unclear whether these techniques are amenable to efficient distributed implementations.

Our goal in this paper is to develop an approach that is both analytically tractable with a provable performance bound in a centralized setting and is also amenable to a natural distributed implementation. In our network model, there are multiple data items; each data item has a server, and a set of clients that wish to access the data item at a given frequency. Each node carefully chooses data items to cache in its limited memory to minimize the overall access cost. Essentially, in this article, we develop efficient strategies to select data items to cache at each node.

2. Proposed System

Our Basic idea is to find center point among all Network Centre Locations (NCLs), for efficient data access. To intentionally cache data only at specific set of NCLs. For each NCL, all nodes in it are properly adjusted, organized and having right address. Each node is then updating in routing table.

Each node cache the items most frequently accessed by itself. Eliminate replications among neighboring nodes. Creation of stable groups to gather neighborhood inform and determine caching placements. Each node act as a server. Server maintains nearest cache node and Server nearest cache node by using routing protocol. First save data item on local space. IF any other items are exist that will be replace.

According to the analysis three modules has been traced out in the design of work. The modules are as follows.

- Self-Organizing
- Self-Addressing
- Self-Routing
- delete the path update table in each node

3. System Architecture

Whenever the new node needs to be enter in the network, network initially checks if the new node is active or not. If yes, then it calculate new position for that node. A new node is organized and get its address as illustrate in fig. 1. It is then check for the host availability. Readdressed the node and transfer to the network tree for updating the routing table. After, it broadcast the ACK message to all nodes and gets weights of edges of all nodes. Find its central locator from selected routing table. In such a way, we can add new node in the network call network central location (NCL).

4. Algorithmic Analysis

1. Search for new node
2. If new node active
3. Calculate new node position
4. Re-organizing
 -address update
 -check availability
 >if yes, go to step no. 6
 >else, go to step no. 7
 -select or delete node
5. Re-addressing node
6. Update routing table
 -broadcast Ack message
 -weight all edges of nodes
 -find central locator from selected routing table
 (i.e. C1 from {N1, N2, N3,…})
7. Stop

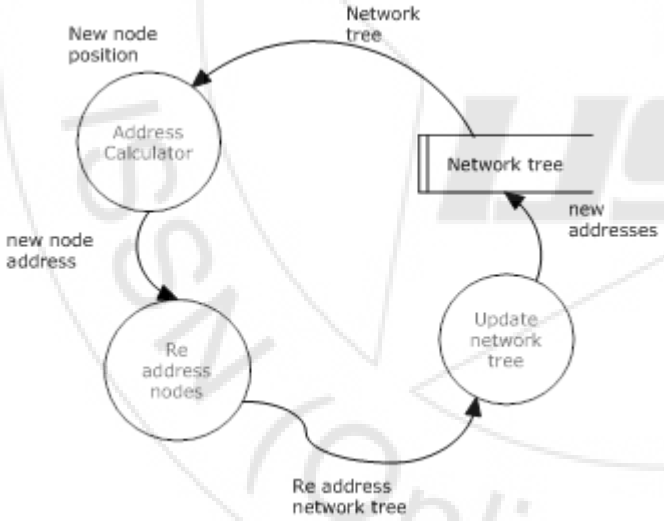

Figure 1: System Model

5. Conclusion

As Data Access Efficiency is very much important. Our proposed model increases data efficiency and accessibility using location based services caching. The location based services monitor a new node and a set of moving objects and answer queries pertaining to their locations and access the data efficiently in DTN.

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