IJCSEC- International Journal of Computer Science and Engineering Communications.
Vol.3, Issue 2, 2015, Page.781-786, ISSN: 2347–8586

An Efficient Data Explore Scheme with Multiple DHT in Mobile Wireless Networks

K.Lavanya[1], Prof.K.S.Thirunavukarasu[2]
UG Scholar[1], Professor[2]
Department of Computer Science and Engineering,
Erode Builder Educational Trust Group of Institutions,
Kangayam, India
lavanyaklv@gmail.com[1], kst.cse@ebet.edu.in[2]

ABSTRACT

Multiple Mobile Distributed Hash Table used to make easy the data search over the large scale infrastructure. And also it is used to enhance the mobility resilience and reduce the maintenance overhead. To augment the data search over large scale infrastructure extend the work in Locality-based distributed Data search system, Mobile Distributed Hash Table maps data on to mobile nodes by storing the data on the node that moves along the most similar path to that associated with the data item. Finally multiple Mobile Distributed Hash Table for System divides network into a number of geographical regions. The metadata of a file is mapped to a region using the Mobile Distributed Hash Table data mapping policy, and metadata is stored in a subset of the nodes in the region, thus enhancing mobility spirit. A node needs to update data mapping only when it moves crossways regions, thus reducing safeguarding overhead.

Index Terms– Mobile Wireless Network, Region, Multiple Distributed Hash Table.

I.INTRODUCTION

Mobile wireless sensor networks (MWSNs) can simply be defined as a wireless sensor network (WSN) in which the sensor nodes are mobile. MWSNs are a smaller, emerging field of research in contrast to their well-established predecessor. MWSNs are much more versatile than static sensor networks as they can be deployed in any scenario and cope with rapid topology changes. However, many of their applications are similar, such as environment monitoring or surveillance. Commonly the nodes consist of a radio transceiver and a micro controller powered by a battery. As well as some kind of sensor for detecting light, heat, humidity, temperature, etc. Since there is no fixed topology in these networks, one of the greatest challenges is routing data from its source to the destination. Generally these routing protocols draw inspiration from two fields; WSNs and mobile ad hoc networks (MANETs). WSN routing protocols provide the required functionality but cannot handle the high frequency of topology changes. Whereas, MANET routing protocols are can deal with mobility in the network but they are designed for two way communication, which in sensor networks is often not required.

A Mobile Ad hoc network (MANET) is a continuously self-configuring, infrastructure-less network of mobile devices connected without wires. Each device in a MANET is free to move independently in any direction, and will therefore change its links to other devices frequently. Each must forward traffic unrelated to its own use, and therefore be a router. The primary challenge in building a MANET is equipping each device to continuously maintain the information required to properly route traffic. Such networks may operate by themselves or may be connected to the larger Internet. They may contain one or multiple and different transceivers between nodes. MANETs are a kind of Wireless ad hoc network that usually has a routable networking environment on top of a Link Layer ad hoc network. MANETs consist of a peer-to-peer, self-forming, self-healing network in contrast to a mesh network has a central controller. Ad-hoc networks form spontaneously without a need of an infrastructure or centralized controller.

This type of peer-to-peer system infers that each node, or user, in the network can act as a data endpoint or intermediate repeater. Thus, all users work together to improve the reliability of network communications. These types of networks are also popularly known to as mesh networks" because the topology of network communications resembles a mesh.

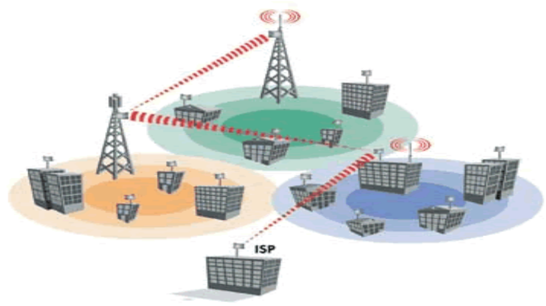

Fig.1. Mobile Wireless Network

II.RELATED WORK

This part of the document include the following things.

1)Data-Centric Storage in Sensornet With GHT: A Geographic Hash Table

A sensornet is a distributed sensing network comprised of a large number of small devices, each with some computational, storage and communication capability. Such networks can operate in an unattended mode to record detailed information about their surroundings. They are thus well suited to applications such as location tracking and habitat monitoring. As these networks scale in size, so will the amount of data they make available. The great volume of these data and the fact that they are spread across the entire sensornet create the need for data-dissemination techniques capable of extracting relevant data from within the sensornet.

2) KDDCS: A Load- Balanced in-Network Data-Centric Storage Scheme in Sensor Network

In KDDCS scheme, the refinement of regions in the formation of the K-D tree has the property that the numbers of sensors on both sides of the partition are approximately equal. As a result of this, K-D tree will be balanced, there will be no orphan regions, and, regardless of the geographic distribution of the sensors, the ownership of events will uniformly distributed over the sensors if the events are uniformly distributed over the range of possible events. **T**he weighted split median problem, that is at the heart of both the construction of the initial K-D tree, and the re-balancing of the K-D tree. In the weighted split median problem, each sensor has an associated weight/multiplicity, and the sensors' goal is to distributively determine a vertical line with the property that the aggregate weight on each side of the line is equal.

III.PROPOSED SYSTEM

To increase the data search over large scale infrastructure extend the work in Locality-based distributed Data search system, modified DHT into Mobile DHT maps data on to mobile nodes by storing the data on the node that moves along the most similar path to that associated with the data item. The location of the data item at any point in time can be calculated. To query for a data item a MHT node it calculates the data item location and then routes the query to that position in the MANET. Finally multiple Mobile DHT in Proposed system, it divides into a number of geographical regions. The metadata of a file is mapped to a region using the Mobile DHT data mapping policy, and it is stored in all or a subset of the nodes in the region, thus enhancing mobility resilience. This System has a novel Region-based Geographic Routing (RGR) protocol for data publishing and querying. RGR only requires nodes to know their located regions and region angle information. A parallel file fetching algorithm, which determines several physically close file servers to send different file segments to minimize file retrieval latency and a coloring-based partial replication algorithm that replicates metadata to a subset of nodes rather than all nodes in a region while maintaining search efficiency.

a)Creation of Network Model

The whole network is composed of the neighborhoods of landmarks, which means a node is always associated to a certain landmark in the network. The mobility of node m with a time homogeneous with discrete time and states are represented by the landmarks L = 1………L. An node that moves between landmarks**.** Each landmark has a unique landmark id in the network, and nodes are aware of which landmark they are located at anytime. A highly mobile and dense wireless network with nodes spreading over an area and are independently and identically distributed . System is proposed for a wireless network with a number of landmarks. Considering the promising ubiquitous computing environment, once the landmarks are determined, System divides the entire area into a number of regions. A region is the neighboring zone in the transmission range of a landmark and centered by the landmark. Each region is identified by an assigned integer ID. The regions can be any shape.

The design of the proposed system based on irregular shapes convex polygons though the regular shape a special case of irregular shape would make the design much easier.

b) Region-Based Data Publishing and Querying

Locality sensitive hash function (LSH) hashes two similar keyword groups to close values with high probability. System uses LSH to hash a file to store the metadata of similar files into the same region for similarity search. A file's keywords can be its file name or the keywords retrieved using information retrieval algorithms. The number of LSH hash values of a file can be one or more than one based on the settings of LSH. The metadata is mapped to a region that contains the virtual coordinates in the region map. Then, the data host publishes the metadata to the mapped regions using the RGR routing protocol. The node in a destination region that firstly receives the metadata broadcasts it to all other nodes in the region. In a mobile network, it is important to maintain the mapping between data and regions. Proposed system uses a reactive data mapping update scheme, in which a node conducts updates only when it moves from one region to another region. During the movement, when a node notices that it moves to a different region based on the signal from the landmarks, it drops the old region's metadata and acquires all metadata in the new region from its new neighbor. It also conducts location updates by sending messages to the mapped regions of its file's metadata to update its current location in the metadata.

In this way, when the metadata of a file is retrieved, the current locations of the file's hosts can always be acquired. System is also characterized by metadata storage instead of data storage. Most current wireless data search systems use data storage.

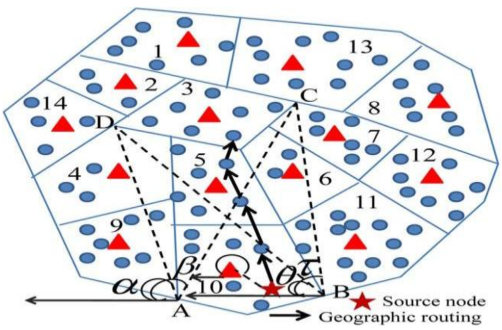

Fig.2 Region Based Routing

When node ni searches for a file, it first sends out a metadata query to receive the metadata of the file. Second, ni sends out a file query, and then the queried file will be sent back to ni. Finally, ni publishes the metadata for its received file. These different types of messages (including metadata query, metadata for publishing, a metadata reply, a file query and a file) need a routing algorithm to forward them to their destinations.

IJCSEC- International Journal of Computer Science and Engineering Communications.
Vol.3, Issue 2, 2015, Page.781-786, ISSN: 2347–8586

c) RGR Parallel File Fetching

After receiving the metadata of its queried file, a requester can retrieve the region IDs of the file's holders. It then locates the file holders in the region map initially configured to itself. To reduce file fetching latency, System uses a parallel transmission algorithm, in which different file segments are simultaneously transmitted from different file holders to the file requester. Since each segment has a shorter data stream than the whole file, the total time period for transmitting all segments to the file requester is shorter than transmitting the whole file from one file holder. Specifically, the file requester chooses geographically close file holders among the located ones, and asks each file holder to transmit a segment of the file. Different segments destined to the same destination may arrive at the same node in routing. Then, this node can merge these segments before forwarding them out to save energy for forwarding.

d)Back tracking algorithm

A data requester incorporates the ID of its source region into its request when querying for metadata or data. The required metadata or data will be sent back to the requester based on the RGR protocol. In a highly mobile wireless network, the requester may move out of its region or even travel through a number of regions before the response arrives at the source region. System has a backtracking algorithm to keep track of the requester's movement. In the algorithm, if a requester moves out of its current region before receiving the response, it sends a back-tracking message (including its current region) to the source region. The message is piggybacked on the ''hello'' messages between neighbor nodes. Thus, each node in the source region keeps a back-tracking message of the requester. Using this message, the response can be forwarded to the requester that moves out of the source region.

e) Coloring-Based Partial Replication

Algorithm 1 Pseudo-code for metadata replying

```
//Sending a back-tracking message;
while have not received the metadata reply do
ifit moves to a new region then
Send a back-tracking message to its old region
end if
end while
//Receiving a back-tracking message;
if receive a back-tracking message then
Add the message to its back-tracking message list
Broadcast the message to its neighbors in the region
end if
//Receiving a metadata reply;
if receive a metadata reply with its region as destination then
if its back-tracking message list contains the message from the requester then
Forward the reply to the requester's current region
Flood a message in its region to delete the backtracking message for this reply
else
if the requester is its neighbor then
Send the metadata to the neighbor
else
Broadcast the metadata to its neighbors
end if
end if
end if
```

Storing a metafile in every node in a region enables Mobility-resilient and fast file retrieval but generates a high overhead for node storage, data mapping updates, and location updates. To handle this problem, we propose a coloring-based partial replication algorithm. The coloring policy in graph theory aims to prohibit two neighboring nodes in a graph from having the same color. Stimulated by this idea, the coloring-based partial replication algorithm aims to guarantee that a node has at least one neighbor holding a metafile while avoiding having the metafile in neighboring nodes.

In this coloring-based partial replication algorithm, when a node in a region receives the first metadata of the region, it stores the metadata and broadcasts it along with a flip-flop key with an initial value of zero (i.e., K =0) and a TTL (Time to Live). If a node receives metadata with K = 0, it changes K to 1, decreases TTL by 1, and further broadcasts the metadata without replicating it. If a node receives metadata with K = 1, it replicates the metadata, changes K to 0 and decreases TTL by 1 before broadcasting. A receiver of TTL = 0 will not further forward the metadata. When a non-replica node notices that none of its neighbors has a replica, it sends a metafile request with a TTL to a randomly chosen neighbor. The request is forwarded until meeting a replica node, which sends a metafile to the requester along the original path. When a non-replica node notices that none of its neighbors has a replica, it sends a metafile request with a TTL to a randomly chosen neighbor.

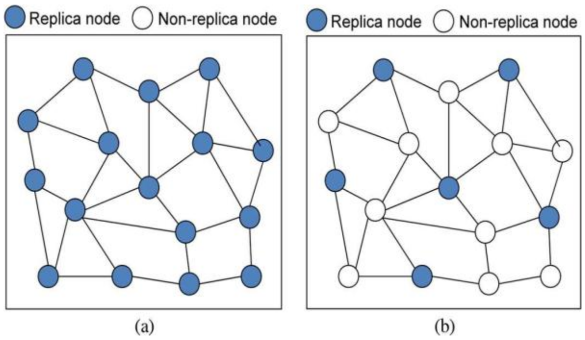

Fig. 3. Metadata replication in a region. (a) Full replication; (b) coloring-based partial replication.

The coloring-based partial replication algorithm also reduces the overhead due to intra-region mobility. When anode moves into a new region, without the algorithm, It needs to acquire metadata and drops its old metadata. With the algorithm, only when the node is a replica node, it needs to move its metadata to its old neighbor; if the node has a neighbor with metadata in the new region, it does not need to acquire metadata.

IV.CONCLUSION

The advancements in WSNs and the rapid increase of wireless devices necessitate an efficient data search system for a large-scale, highly mobile and dense wireless network. Current decentralized data search systems either rely on topological routing or geographic routing. In this paper, we propose a system for large-scale, highly mobile and dense wireless networks. It divides the network area into regions, maps the meta data of similar files to the same region for similarity data retrieval, and stores the metadata in multiple nodes in the region multiple Mobile DHT are used to enhance the mobility-resilience.

REFERENCES:

[1] S. Guo, Y. Gu, B. Jiang, and T. He, ''Opportunistic Flooding inLow- Duty-Cycle Wireless Sensor Networks With UnreliableLinks,'' inProc.MobiCom, 2009, pp. 133-144.

[2] S. Schnitzer, H. Miranda, and B. Koldehofe, ''Content Routing Algorithms to Support Publish/Subscribe in Mobile Ad Hoc Networks,'' in Proc. IEEE LCN Workshops, 2012, pp. 1053-1060

[3] S. Ratnasamy, B. Karp, S. Shenker, D. Estrin, R. Grovindan, L. Yin,and F. Yu, ''Data-Centric Storage in Sensornet With GHT: A Geographic Hash Table,''Mobile Netw. Appl., vol. 8, no. 4, pp. 427-442, Aug. 2003.

[4] M. Aly, K. Pruhs, and P.K. Chrysanthis, ''KDDCS: A LoadBalanced in-Network Data-Centric Storage Scheme in Sensor Network,'' inProc. CIKM, 2006, pp. 371-326

[5] S. Datta, I. Stojmenovic, and J. Wu, ''Internal Node and Shortcut Based Routing With Guaranteed Delivery in Wireless Networks,'' in Proc. Cluster Comput., 2002, pp. 461-466.

[6] B. Karp and H. Kung, ''Greedy Perimeter Stateless Routing,'' in Proc. MobiCom, 2000, pp. 243-254

[7] G.D. Stefano and A. Petricola, ''Distributed AOA Based Localization Algorithm for Wireless Sensor Networks,'' J. Comput., vol. 3, no. 4, pp. 1-8, Apr. 2008.

[8] Z. Li and H. Shen, ''A Mobility and Congestion Resilient Data Management System for Mobile Distributed Networks,'' in Proc. IEEE MASS, 2009, pp. 60-69