A Survey on Balancing the Network Load Using Geographic Hash Tables

Patil Prajakta[1], Prof. Vinod Wadne [2]

[1,2] *Department of Computer Engineering, JSPM's Imperial College of Engineering& Research, Wagholi, Pune, Savitribai Phule Pune University , India.*

Abstract: *The load Balancing in the network is a severe problem in network. The data created in wireless network is kept on node. It accessed over geographic hash table. The geographic hash table is used to recover data from the nodes. The preceding approaches permit the balancing load by varying georouting protocol [1]. In our work, it is prove that it's probable to balancing the network load in geographic hash table. It can happen without any change of underlying georouting protocols. As a replacement of changing the straight line in georouting protocols, it can used to direct query after ode delivering query to the node handling queried key at the destination. It proposes to the hash functions are used to stock data in network, applying sort of load-aware task of the keys to the nodes. This new method is instantiated in to two exact approaches: analytical, which is target density function getting load balancing is characterized below uniformity conventions for concerns site of the nodes and sources; and an iterative, heuristic method that could be recycled when these consistency rules are not satisfied. It attempts to stop many request sent to single node. Here we are going to use hash algorithm for the security purpose.*

Keywords: *Georouting protocols, analytical, georouting protocol, heuristic, and Load balancing.*

I.   Introduction

The load balancing of resources is most important in the network. The memory of nodes is restricted. If the imbalance is happened in the network it has negative influence on the network. Since transmission and reception operations are not consistently spread amongst network. To extend the life of a network we are going to use load balancing in the GHTs. Geographic Hash Table [7] has used to get and stock data from the nodes. Respectively node is get assigned value of the certain ranges. For Example: 2D real interval [0, 1]. Respectively data is added with the metadata. The metadata is getting hashed to key values. The Keys are getting stored in nodes.
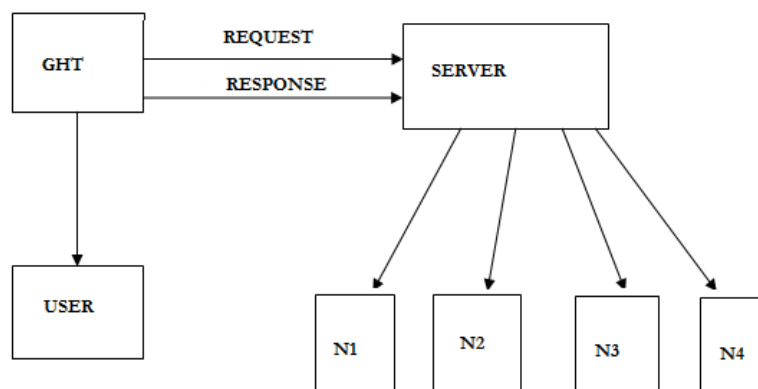
Fig. 1: GHT Data Retrieval

As presented in the Figure [1], Geographic Hash Table is maintaining in all the data about the nodes. Geographic Hash Table is approach for the effectively recovering data from the network. The network is collected by the large number of small powers, small cost nodes which is self-organizes into multi hop ad hoc network. The data is collected by outside node when connected to networks. Node could either static or movable. It is retrieved by outside operator and recovers data collected by the networks. The network stable in size, it does amount of data which should process. It collected by network. In efforts to deliver accomplished entrance to data and stand disturbances between networks and nodes [3], it proposed Geographic Hash Tables (GHT). GHT measures hash functions to map the data to geographic positions trying to allocate data

consistently across networks. GHT hashes name of the data to store a location s in field. The boundary mode of GPSR [2] is used to select the closest sensor to s, which becomes the home node for the data. GHT stores a copy of data in node as well in nodes belonging perimeter. Keeping on perimeter is crucial to assurance data persistency.

II.   Related Work

2.1 Georouting
Georouting is also known as geographic routings or position based routings. In the georouting instead of the particular destination, message routed toward a specific geographic location and it is delivered to the node whose key is closest to destination [4]. The load imbalance is reduced when modification of the georouting protocol. Varying georouting protocols come at price. It might be impact on the upper layer and the existing application.

2.2 Load Balancing in the Networks
The Load balancing splits incoming transaction to the all servers. It may send transactions to the next server. Load balancing services usually delivered by the devoted software and hardware.

3.3 Dynamic Geographic Hash Table
The problems caused due to static GHT, the proposal of Dynamic GHT solutions, which used sequential attribute of the queries. The data is in addition to occasion type to choose hashed positions for events. Set of hashed positions changes over the time to get ensured that nodes are contributing justly to network processes. Also, DGHT evades hashing actions into resonating regions by occasionally informing network data [5]. DGHT trusts on schemes such as: a temporal based geographic hash table and a location selection scheme depends on node contribution.

TABLE 1: Literature Survey

Title	Description
Tradeoffs between Stretch Factor and Load Balancing Ratio in Routing on Growth Restricted Graphs (2004)	This paper discussed the tradeoff between two quality measures for routing in growth restricted graphs. The two measures considered stretch factor, which measures the lengths of the routing paths, and the load balancing ratio, which measures how
	evenly the traffic is distributed.
Balancing Traffic Load in Wireless Networks with Curveball Routing (2007)	The problem is addressed to balancing the traffic load in multi-hop wireless networks, which considers a point-to-point communicating network with a uniform distribution of source-sink pairs.
Routing in Outerspace: Fair Traffic Load in Multihop Wireless Networks (2008)	This paper consider security-related and energy-efficiency issues in multi-hop wireless networks

Covering Space for In Network Sensor Data Storage (2010)	This paper proposed to map data to a *covering space*, which is a tiling of the plane with copies of the sensor network, such that the sensors receive uniform storage load and traffic. Distributed algorithms proposed to construct the covering space with Ricci flow and Mobius transforms

III.   Model Of A Network

Source Node[s]:

The source node initiates query for the key k.

Destination Node[d]: The destination node d responsible for the key called k. In routing protocols such as GPSR the packets may encounter end. The packets are then distracted till path to target gets available .They don't consider path distance when the routing around the local obstacles such that packets move from the source to the destination.

Probability density function:

Source density s(x, y), is denoting probability densities of having source s of the query located at the (x, y). Destination density d(x, y) is denoting probability density of having destination d of the query located at the (x, y).

IV.   Design Of Hash Function

4.1 Hash functions

The hash function algorithms or subroutines map large amount of data arrangements of the variable length to the small data sets of the fixed lengths. Hash function is shown in the figure **[2]**.
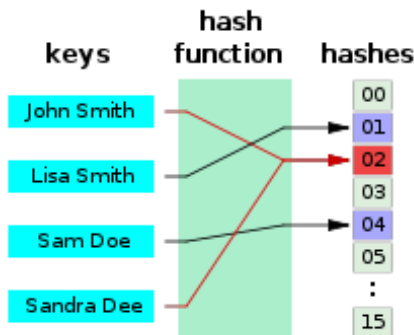

Fig. 2

In the particulars, we are going to specify the hash functions can calculated in the distributed and localized approach, so according to the typical network designs and guidelines.

4.2 Hash tables

The hash function is primarily used in the hash table. It locates data record fast (e.g. dictionary definition) which is given the search keys or the headword.

V.   Modules

5.1 Analytical Approach

It is decided that number of servers are going to be used. Nodes are connected to it. It is considered that nodes and servers are created. This approach adds new node to server in following conditions.
1. The amount of data goes beyond the allowable boundary in each node.
2. Creation of a new node.

5.2 Heuristic Approach

These approach efforts to stop several requests being directed to node. It does by moving information from extremely loaded node to other nodes having smaller load. This approach is founded on consistency conventions for what concerns nodes and source densities. Such assumptions aren't met, we proposed to usage dissimilar load balancing approaches, based on heuristic that recurrently fluctuations key range allocated to nodes load balancing is enhanced. Request for the data from source, data would be analyzed through geographic hash table (GHT) which map demanded information through its related key values [6]. These key values are actually stored in the geographic hash table (GHT). Hence mapping would be made to the node, which requested data could be retrieved.

VI.   Conclusion

In our proposed work, we presented different way of upcoming load balancing problems in GHT designs. The proposed method has instantiated into analytical and the heuristic methods. It has shown that it provides good load balancing to deal with the conditions. To provide the load balancing enhancements compare or even greater to those providing by the existing chimes in applied scenario, even consistency assumption do not valid. The main advantage of presented load balancing method in existing systems lies in practicality. Promising extension of ideas to the other field like mobility and security has been discussed. The future enhancement will plan to detect possible approach of covering and incorporating the approach with the present idea.

References

[1]. M. Elena Renda, Giovanni Resta, and Paolo Santi Load Balancing Hashing in Geographic Hash Tables, VOL. 23, NO. 8, AUGUST 2012

[2]. P. Bose, P. Morin, I. Stojmenovic, and J. Urrutia, "Routing with Guaranteed Delivery in Ad Hoc Wireless Networks," Wireless Networks, vol. 7, no. 6, pp. 609-616, 2001.

[3]. C. Canali, M.E. Renda, and P. Santi, "Evaluating Load Balancing in Peer-to-Peer Resource Sharing Algorithms for Wireless Mesh Networks," Proc. IEEE MeshTech, pp. 603-609, 2008.

[4]. D.B. Johnson and D.A. Maltz, "Dynamic Source Routing in Ad Hoc Wireless Networks," Mobile Computing, Kluwer Academic Publishers, pp. 153-181, 1996.

[5]. A. Mei and J. Stefa, "Routing in Outer Space: Fair Traffic Load in Multi-hop Wireless Networks," Proc. ACM MobiHoc, pp. 23-31, 2008.

[6]. L. Popa, A. Rostamizadeh, R.M. Karp, C. Papadimitriou, and Stoica, "Balancing Traffic Load in Wireless Networks witCurveball Routing," Proc. ACM MobiHoc, pp. 170-179, 2007.

[7]. S.Ratnasamy, B. Karp, S. Shenker, D. Estrin, R. Govindan, L. Yin,and F. Yu, "Data-Centric Storage in Sensornets with GHT, a Geographic Hash Table," Mobile Networks and Appl., vol. 8, no. 4, pp. 427-442, 2003.