Volume 5, Issue 1, January 2015 ISSN: 2277 128X
International Journal of Advanced Research in Computer Science and Software Engineering
Research Paper
Available online at: www.ijarcsse.com

Survey on Speed Issuses in Mobile Computing

M. Savithri, C. Arun
Assistant Professor, Department of computer science, Dr. N.G.P Arts and Science College, Coimbatore, India
M.Phil Research scholar, Department of computer science, Dr. N.G.P Arts and Science College, Coimbatore, India

Abstract--Mobile communication is rapidly growing service business areas in the world, there are already many commercial application available. Benefits of the service for the customer are advertised, but very rarely there is any mention of speed of the system. Mobile computing system contains communication speed and data processing. This paper covers speed processing problems and how to improve speed.

Keywords—Mobile computing, speed processing, internet

I. INTRODUCTION

Wireless networking is a technology that enables two or more computers to communicate using standard network protocols, but without network cabling. We can categorize wireless network in primarily following two categories. Two types of wireless networks

1. Infrastructure network: A network with fixed and wired gateways.
2. Infrastructure less (ad hoc) network: All nodes of these networks behave as routers and take part in discovery and maintenance of routes to other nodes.

A mobile ad hoc network (MANET) is a collection of mobile devices that can communicate with each other without the use of a predefined infrastructure or centralized administration. A MANET can be constructed quickly at a low cost. Due to mobility of nodes, it becomes difficult to perform routing in a MANET as compared to a conventional wired network.

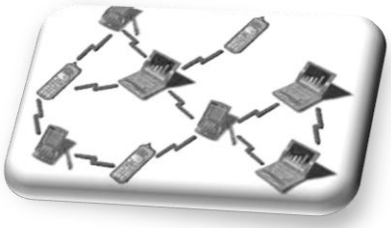

Figure 1.1 Mobile ad hoc Networks

A Mobile network is one of the most available decentralized system in which nodes are generally in moving position. Because of the property, the computer exit and enter from one network to another. This dynamic nature of mobile network is itself a challenge in terms of mobility in the network. Each computer in mobile network itself acts as a router or the host. To perform the communication with any node, each node depends only on current neighbors and these neighbor nodes are not fixed. It means the communication in mobile network cannot be fully reliable at any time. There are number of issues faced by a mobile network because of different mobility. A special categorization of mobile network in which communicating nodes are moving in high speed is called speed network. No node is considered as the term neighbor so that the neighbor node search required while initializing the communication each time. In this communication network, higher the speed lesser the coordination or tracking of node for communication. High speed gives higher chances of data loss and data fading. Because of these restrictions, the routing in such network is always a challenge. To provide the effective network communication, low speed node movement gives more reliable communication over the network. In such network, algorithmic approach and the network throughput depends on node speed and dynamic architecture.

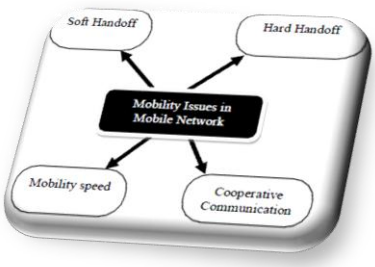

Figure 2.2 Issues in Mobile computing

II. ROUTING IN MANET

The entire routing concept includes two functions: determining optimal routing paths and transferring the packets through the network. Because of the dynamic topology of the ad-hoc networks, routing packets between any pair of nodes becomes difficult. Multi cast routing is another challenge because the multi cast tree is no longer static due to the random movement of nodes within the network. Routes between nodes may contain multiple hops which is more complex.

Routing Protocols Terminology:

Routing is the process of information exchange from one host to the other host in a network. Routing is the mechanism of forwarding packet towards its destination using most efficient path. In Ad-hoc network each host node acts as specialized router itself. A routing protocol maintains a routing table to keep information about the linking node and neighbors. Researchers have proposed several routing protocols for both wired and wireless networks. They lie into four distinct categories depending on their characteristic:

1. Centralized Vs. Distributed

In centralized algorithms, all route selection are made at a central node, while in distributed algorithms, the evaluation of route is shared among the network nodes.

2. Static Vs. Adaptive

In static algorithms, the route used by source-destination pairs is fixed being independent of traffic conditions. Here route for transitions change only in response to a node or a link failure. Such types of algorithms cannot achieve high throughput under a wide variety of traffic input patterns. Most major packet networks use some form of adaptive routing which in response to congestion may change the route between the source and destination.

3. Flat Vs. Hierarchical

A flat addressing is one of the pre-requisite for the flat routing approach. Each underlying node participating in routing plays an important role and all nodes have same responsibilities means no special gateway nodes are present. In contrast, hierarchical routing usually assigns different roles to network nodes. Example Protocols: Control based routing protocol.

4. Proactive (Table-Driven) Vs. Reactive (On-Demand-Driven) Vs. Hybrid

• Proactive routing protocol

These types of protocols are called table driven protocols in which fresh lists of destinations and their routes are maintained by periodic distribution of routing tables throughout the network and this category of protocol always strives to maintain consistent and updated routing information at each node. Packets are transferred over the predefined route specified in the routing table. The proactive routing protocols use link-state routing algorithms which frequently flood the link information about its neighbors and the main drawback of proactive routing protocol is that all the nodes in the network always maintain an updated table. Proactive protocols have lower latency in comparison to reactive protocols. Example Protocols: Destination sequenced distance vector routing, Optimized Link State Routing.

• Reactive routing protocol

These types of protocols are also called as On Demand Routing Protocols where the routes are not predefined for routing. Reactive protocols establish a route to a destination on demand. The route discovery mechanism is based on flooding algorithm which employs on the technique that a node just broadcasts the packet to all of its neighbors and intermediate nodes just forward that packet to their neighbors. Reactive protocols have higher latency and smaller routing overheads as compared to proactive protocols. Example Protocols: Dynamic source routing, Ad hoc On-Demand Distance Vector.

• Hybrid routing protocol

Hybrid protocols are the combinations of reactive and proactive protocols and take advantages of these two protocols and thus combine the advantages of both. Example Protocol: Zone Routing Protocol.

III. PROPOSED ALGORITHM

Hierarchical routing protocols:

Hierarchical routing protocol the choice of reactive and of proactive routing depends on the hierarchic level. The routing is initially established with some proactively prospected routes and then serves the demand from activated nodes through reactive flooding on the lower level. The choice for one or the other method requires correct attribution for correct levels.

Cluster Based Routing Protocol: Clustering is a process that divided the network into interconnected sub-structures called as *clusters.*

Every cluster has a *cluster-head* as a coordinator within the sub-structure, which acts as a medium for data transfer between the computers. Cluster heads communicate with each other by using *gateway nodes.* The Gateway node has two or more cluster heads as its neighbors or when the clusters are disjoints at least one cluster head and another gateway node.

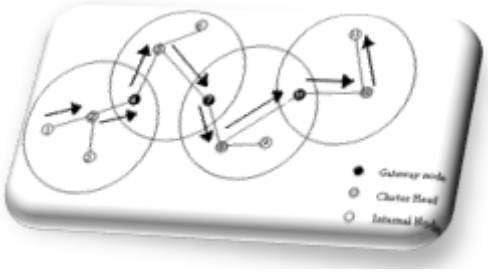

Figure 3Different States in which a Node can exist

Cluster formation using two mechanisms:
Identifier based Clustering: A node elects itself as the head if it has the highest /lowest ID in its neighborhood.
Connection – based Clustering: The node, which has the most neighbor nodes, is elected as the cluster head.
The control based routing protocol uses a variation of the lowest-ID algorithm, which is an identifier -based algorithm. Each node uses a neighbor table. Information stored in a neighbor table are:
1. Role in the cluster (i.e. Cluster head or Member node),2.Unique Node IDs 3. Status of the link to that node (Bidirectional /Unidirectional).The neighbor table is maintained by periodically broadcasting messages. The message contains information about a node's state, its neighbor table and its cluster adjacency table.

Mechanisms in Control based routing protocol:
Routing Process
Control based routing protocol uses two data structures to support the routing process:
1. The Cluster Adjacency Table (CAT) - The CAT stores information about neighboring clusters, i.e. whether the links are bi-directional or unidirectional.
2. The Two-Hop Topology Database - The two-hop topology database contains all nodes that are at most two hops away.
The routing process works in two steps:
1.**Discovery of a route** from a source node 'S' to a destination node 'D'.
2.Actual **transmission** of the data packets.

Route Discovery
In Control based routing protocol only cluster heads are flooded with route request package. Gateway nodes receive route request and forward them to the next cluster head. Initially, the source node 'S' broadcasts a route request with unique ID containing the address of the destination node 'D'. When a node 'N' receives a route request it does the following:
1.If 'N' is Gateway Node -> Forwards the route request to the next Cluster head 'C'.
2.If 'N' is Cluster Head -> Checks whether 'D' is a neighbor or is two-hops away from it. It then sends the route request to 'D'. Else broadcasts it to the neighboring Cluster head.

Route Reply:
1. If the route request reach the destination node 'D', it contains the path called as "*loose source route*", [S,C1,C2,C3.C4..,Ck,D].
2. 'D' sends a Route Reply message back to S using the reversed loose source route [D, Ck,.C4.C3.C2,C1,S], Route Reply is sent back to source along reversed loose source route of cluster heads.
3. Every time a cluster head receives this route reply it computes a *strict source route*, which then consists only of nodes that form the shortest path within each cluster.

Route Error Detection:
1. After determining the route, source routing is used for actual packet transmission.
2. A forwarding node sends a Route Error Message to packet source if the next hop in source route is unreachable.

Local Route Repair:
Objective
1. Increase Packet Delivery Ratio.
2. Save Route Rediscovery flooding traffic.
3. Reduce overall route acquisition delay.
4. A forwarding node repairs a broken route using its 2-hop-topology information and then modifies the source route header accordingly.
5. Destination node sends a *Gratuitous Route Reply* to inform source of the modified route.

Advantages of Control Based Routing Protocol:
1. Clustering approach minimizes on-demand route discovery traffic and routing overhead.
2. Uses "local repair" mechanism to reduce route acquisition delay and new route re-discovery traffic.
3. Increases the packet delivery ratio to a great extent.

IV. CONCLUSION

The ad hoc network, play a critical role in places where a wired (central) connection is neither available nor economical to build, such as law enforcement operations, at the time of war communications, disaster recovery situations, etc. Such situations demand a network where all the nodes are potentially mobile and communication must be supported untethered between any two nodes. The motivation of my research work is to improve the speed in node selection using Cluster Based Routing Protocol.

REFERENCES

[1] Bhupender, Gopal Singh,A Study on Requirement and Issues in Mobile Speed Network Published in IJCSMC, Vol. 3, Issue. 7, July 2014, pg.100 – 105

[2] Mukesh Kumar, Rahul Rishi, D.K. Madan. Comparative Analysis of CBRP, DSR, AODV Routing Protocol in MANET. Published in ` PP.2853-2858

[3] MainakChatterjee, Sajal K. Das &DamlaTurgut. WCA: A Weighted Clustering Algorithm for Mobile Ad Hoc Networks. Published in Cluster Computing, Vol-5, PP.193–204, Year- 2002

[4] Basagni, Stefano, Marco Conti, Silvia Giordano, Ivan Stojmenović, et al. Mobile Ad Hoc Networking. Wiley-IEEE Press, 2004.

[5] Mohammed Joda Usman1, Zhang Xing,HarunaChiroma, Ahmed Aliyu1, UsmanWaziri, SaniDanjuma and AbdulraufGarba: Recent Advances on Energy Efficient Cluster Based Routing Protocols of Wireless Sensor Networks for Healthcare Systems Published inIJCSI International Journal of Computer Science Issues, Vol. 11, Issue 3, No 1, May 2014.

[6] NidhiChaudhary,Madhu Bhatia,Deepak Goyal:A Mobility and Communication Aware Routing Approach for Nested Mobile Network.Published in IJCSMC, Vol.3 Issue.7, July- 2014, pg. 784-789

[7] Jayanti, VikramNandalRouting Protocols in MANET: Comparative Study.Published in IJCSMC, Vol. 3, Issue. 7, July 2014, pg.119 – 125

[8] Ankita, VikramNandal: Routing Protocols in Ad-hoc Network.Published in IJCSMC, Vol. 3, Issue. 8, August 2014, pg.240 – 245

[9] List of ad hoc routing protocols From Wikipedia, the free encyclopedia(file:///M:/List%20of%20ad%20hoc%20routing%20protocols%20-%20Wikipedia,%20the%20free%20encyclopedia.html)

BIOGRAPHY

Mrs. M. Savithri, working as a Assistant professor, Department of Computer Science, Dr N.G.P Arts and Science College,Combatore, India

Mr C. Arun Pursuing M.Phil Research Scholar, Department of Computer Science, Dr. N.G.P Arts and Science College, Coimbatore, India

