International Journal of Engineering Science Invention
ISSN (Online): 2319 – 6734, ISSN (Print): 2319 – 6726
www.ijesi.org ||Volume 5 Issue 2|| February 2016 || PP.24-28

Power Aware Geocast Based Geocast Region Tracking Using Mobile Node in Wireless Ad Hoc Network

[1]M. PRAKASH, [2]Dr. M.PRABAKARAN
[1]Research Scholar, Department of Computer Science, Government Arts College, Ariyalur, Tamilnadu, India.
[2]Research Advisor, Assistant Professor, Department of Computer Science, Government Arts College, Ariyalur, Tamilnadu, India

ABSTRACT: *One of the most significant challenges introduced by mobile networks is the difficulty in coping withthe unpredictable movement of Geocast mobile nodes. If, instead, the Geocast mobile nodes could be programmed totravel through the world in a predictable and useful manner, the task of designing algorithms for mobile networks would be significantly simplified.Geocasting represents today a challengingfield of research due to the numerous application scenariosoffered by ad hoc and sensor networks. Recently, the some Geocast routing protocols have beenproposed, most of which are basically inherited from unicastrouting solutions and consequently are not optimizedfor Geocast applications. Another, more interesting, classof region, which will be referred to as position-awareGeocast routing Algorithm, follow a progressive reductionin the distance to the destination, every time a relaynode must be chosen for forwarding a data packet. Thisallows to avoid the unnecessary dissemination of datapackets to nodes farther away from the destination andthe consequent useless energy consumption. This paperwill focus on the exploitation of this interesting positionawareapproach which seems to be more suitable forthe scenarios under consideration.*

Keywords: *Geocast, Region Tracking, PAGRM, Mobile Nodes, Ad Hoc Network.*

I. INTRODUCTION:

Geocasting represents today a challenging field of research for the numerous application scenarios offered by ad hocnetworks. Geocasting is a variant of multicasting: data packetsare delivered to a certain set of users, which constitutethe so called Geocast group, located in a particulargeographical area, called Geocast region. They presented a hierarchy of geographically-aware routers that can route packets geographically and use tunnels to route through areas not supporting geographic routing. Each router covers a certain geographic area called a service area. When a router receives a packet with a Geocast region within its service area, it forwards the packet to its children nodes routers or hosts that cover or are within this Geocast region. If the Geocast region does not intersect with the router service area, the router forwards the packet to its parent. If the Geocast region and the service area in network, the router forwards to its region that cover the intersected in network.

Each node forwards a packet to the neighbor that is closest to the destination. The link quality of that neighbor may be very bad. The existence of such unreliable links exposes a key weakness in maximum-distance greedy forwarding that we refer to as the weakest link problem. At each step, the neighbors that are closest to the destination may have poor links with the current node. These weak links would result in a high rate of packet drops, resulting in drastic reduction of delivery rate or increased energy wastage if retransmissions are employed. This observation brings to the fore the concept of neighbor classification based on link reliability. Some neighbors may be more favorable to choose than others, not only based on distance.

Concerning the reduction in energy consumption, onlynodes having a sufficient residual energy will be responsiblefor forwarding the data packet towards the destination.Moreover, an integrated approach which can helpto preserve either reliability or energetic requirementswill be studied. This consists in dynamically varying thesize of the forwarding zone, being, the latter, and the areawhere candidate relay nodes are searched. This will beimplemented through a threshold mechanism.To satisfy the first requirement,a power energy mechanism at the network layer is proposedwhich allows to guarantee that information is correctlydelivered at the destination.

This improves the reliabilityof the system even if obviously, it can cause a possibleincrease in the signaling travelling the network. Consequentlya tradeoff between these two antagonist featuresis needed.The network which can cause the message not to reachthe destination, without any knowledge at the transmitterside. Moreover, a transmitter node, upon recognizing tobe isolated, can turn into sleep mode, thus reducing theenergy consumption.An approach like this, allows multiple copies of thesame packet to circulate in the network. This improvesthe reliability of the system even if, obviously, it cancause a possible increase in the signaling overheadtraveling the network.

II. RELATED WORK:

Since each region contains several servers, and insertions and mobility may invokenew server elections, it is unlikely that independent reasonable failures will cause all servers tovanish. In order to avoid this case anyway, servers use a low-frequency periodic soft-statemechanism during silent (low traffic) periods, to detect failing servers and promote new servers.Each server runs a low-frequency timer, which is reset each time an insertion geocast is received.When the server times out, it geocasts a packet checking for other servers [1, 2].

Other servers resettheir timers upon receiving this check and reply back demonstrating their existence. If notenough servers reply back, server election is triggered. Another option is to use thesame rendezvous mechanism, in order to provide a bootstrap overlay that publishes dynamicmappings. Using the mapping for a well-known key, a node sends request to a well-known regionto obtain the mapping function of a set of services [3].

These mappings however are not expected to change frequently. This introduces more flexibility for providing different mappings for differenttype of services and changing them when required.A network consists of one or multiple data centers called a sink node and many low-cost and low-powered adhoc devices, called adhoc network. Each mobile node has the ability of sensing data, processing data, and communicating with others via radio transceivers [4].Geographic routing protocols typically assumed the availability of accurate location information which is necessary for their correct operation [5, 6].

However, in all localization systems an estimation error is incurred that depends on the system and the environment in which it is used. GPS is relatively accurate, but it requires visibility to its satellites and so is ineffective indoors or under coverage. In addition, the high cost, size, and power requirements make it impractical to deploy GPS on all nodes [7]. Infrastructure-based localization systems are mostly designed to work inside buildings and they either have a coarse-granularity of several meters or require a costly infrastructure. In ad hoc localization systems nodes calculate their locations based on measurements to their neighbors or to other reference nodes in the environment [9, 10].

III. PROPOSED SYSTEM:

In our proposed system used Position-Aware Geocast Routing Mechanism (PAGRM), some techniques to improve the performancein terms of reliability in data delivery and energy efficiency. Geographic routing provides a way to deliver a packetto a destination location, based only on local information and without the need for any extrainfrastructure, which makes geographic routing the main basic component for geographicscheme. With the existence of location information, geographic routing provides the mostefficient and natural way to route packets comparable to other routing protocols. Geocasting isthe delivery of packets to nodes within a certain geographic area. It is an extension to geographicrouting where in this case the destination is a geographic region instead of a specific node orpoint.

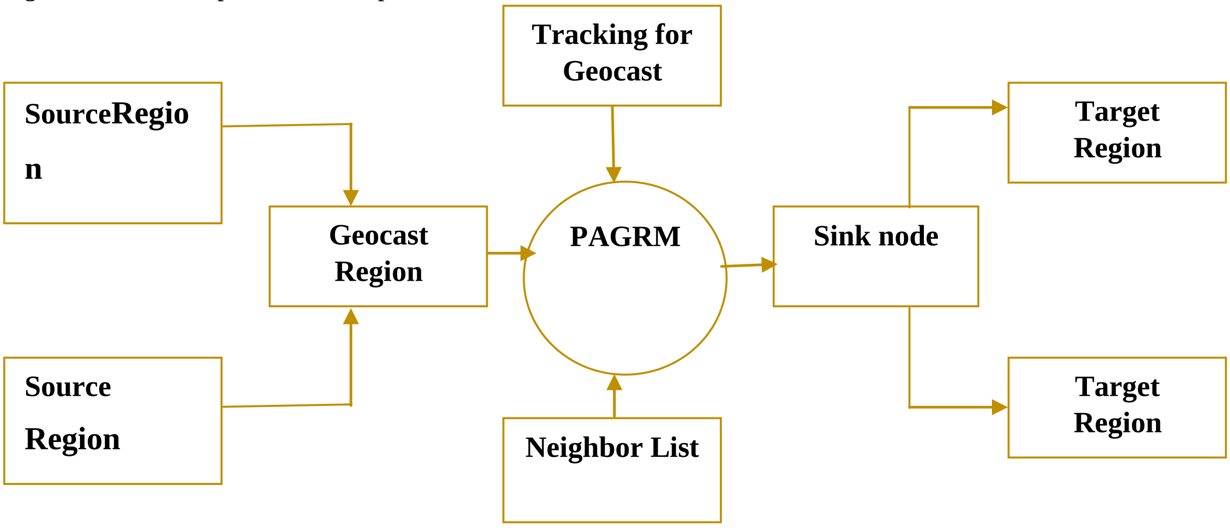


Fig 1: Architecture of proposed system

Geocasting is an important communication primitive in wireless ad hoc networks, since in many applications the target is to reach nodes in a certain region. Inposition-aware geocast routing mechanism,geographical locations are used as a position-aware geocast routing mechanismplace for providers and seekers of information. Position-aware geocast routing mechanismcanbe used as an efficient means for service location and resource discovery in ad hoc networks.They can also provide efficient data dissemination and access in sensor networks.

3.1 Efficient Geocasting region tracking with PAGRM:

Geocasting region trackingis combine position-aware geocast routing mechanismwith region flooding to achieve high delivery rate and low overhead. The challenging problem in Geocasting is distributing the packets to all the nodes within the Geocast region with high probability but with low overhead. According to our study we noticed a clear tradeoff between the proportion of nodes in the Geocast region that receive the packet and the overhead incurred by the Geocast packet especially at low densities and irregular distributions. We presented two novel mechanism for Geocasting that achieve high delivery rate and low overhead by utilizing the local location information of nodes to combine geographic routing mechanisms with region flooding.

Algorithm:

S-Source, D-Destination, T-Traffic, P-Packets, M-message, GR-Geocast Region
R-Routing Information, RT-Region tracking, U-uncovered Node, E-Energy

Step 1: Initialize network nodes
Initialize the Topology level
Send S message to D
Step 2: If (M=true)
S sends Packets to D
Step 3: if Else (M=false)
Get T on Network Path
Step 4: Message send using MP
S collects the R
Step 5: Routing Information Saved on the network
Shortest route on Region
Step6: Check if (RT=0)
Goto First Priority Node on GRs Path
GR Change dynamically on the network
Step 7: if Else (F≠0)
PAGRM for region tracking
Else
Waiting on network request
End
Step 8: Check Available Route otherwise
Step 9: Node's are sleep mode in the network
Step 10: Save E on Network
Step 11: P send to S to D normally
Packets sending to Destination
Else
End
Step 12: Drop the Packets *P*
Exit
Step 13: Every Time update Routing information on network

3.2 Geocast region overhead in Network:

The delivery of a Geocast packet to all nodes inside the Geocast region, given that the network as a whole is connected. The algorithm solves the region gap problem in light networks, but it causes unnecessary overhead in dense networks.This algorithm uses a mix of geocast and perimeter routing to guarantee the delivery of thegeocast packet to all nodes in the region. To illustrate the idea, assume there is a gap betweentwo clusters of nodes inside the region. The nodes around the gap are part of the same planarface. Thus if a packet is sent in perimeter mode by a node on the gap border, it will go around thegap and traverse the nodes on the other side of the gap. The idea is to useperimeter routing on the faces intersecting the region border in addition to flooding inside theregion to reach all nodes.In addition, all nodes on theborder of the region send perimeter mode packets to their neighbors that are outside of theregion. A node is a region border node if it has neighbors outside of the region. By sendingperimeter packets to neighbors outside the region perimeter mode packets are sentonly to neighbors in the planar graph not to all physical neighbors, the faces intersecting theregion border are traversed. The node outside the region, receiving the perimeter mode packet,forwards the packet using the right-hand rule to its neighbor in the planar graph and thatneighbor forwards it to its neighbor.

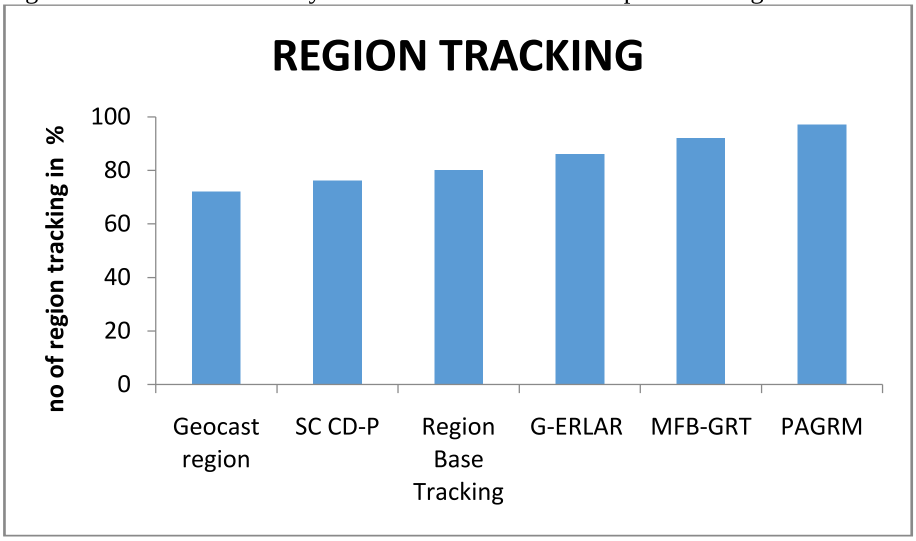
Algorithm:

Input:Region.
Output: Geocast region tracking.

step1: For each region T_i from Ts
Match T_i with regions of Geocast (G)
if $\forall(Region(G)\exists Ti)$ then
Extract the region from G as location = Region (Ti) $\exists Geocast$
End.
end.
Step2: for each size m From M
Constructareaof region size m.
IE = $\int_m^n Region(N \times (m \times m))$
For each Geocast region Pi from IE
ComputeGeocast region Ge = $\int_1^N \frac{\sum NPi}{m}$
N- Total number of region present in IE.
m – Node of region.
if Ge>previous then
Keep the region of Pi.
End.
End
Step3: stop.

IV. RESULTS AND DISCUSSION:

The proposed PAGRM with node region tracking approach has been implemented and tested for its efficiency. The proposed method has produced efficient results in all the factors of ad hoc routing. The method has produced higher resistance in adversary node identification and has produced higher rate of detection.



Graph1: Various types of region tracking

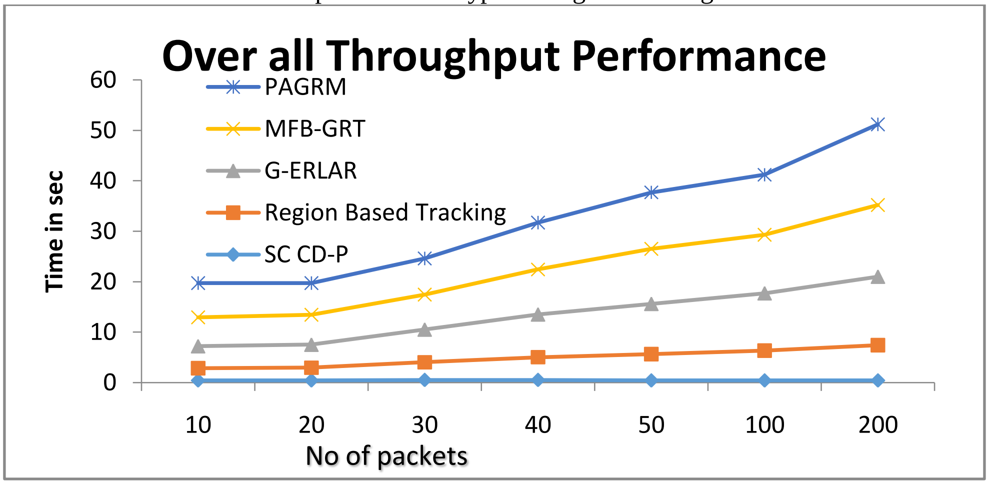


Figure 2: Performance of Throughput

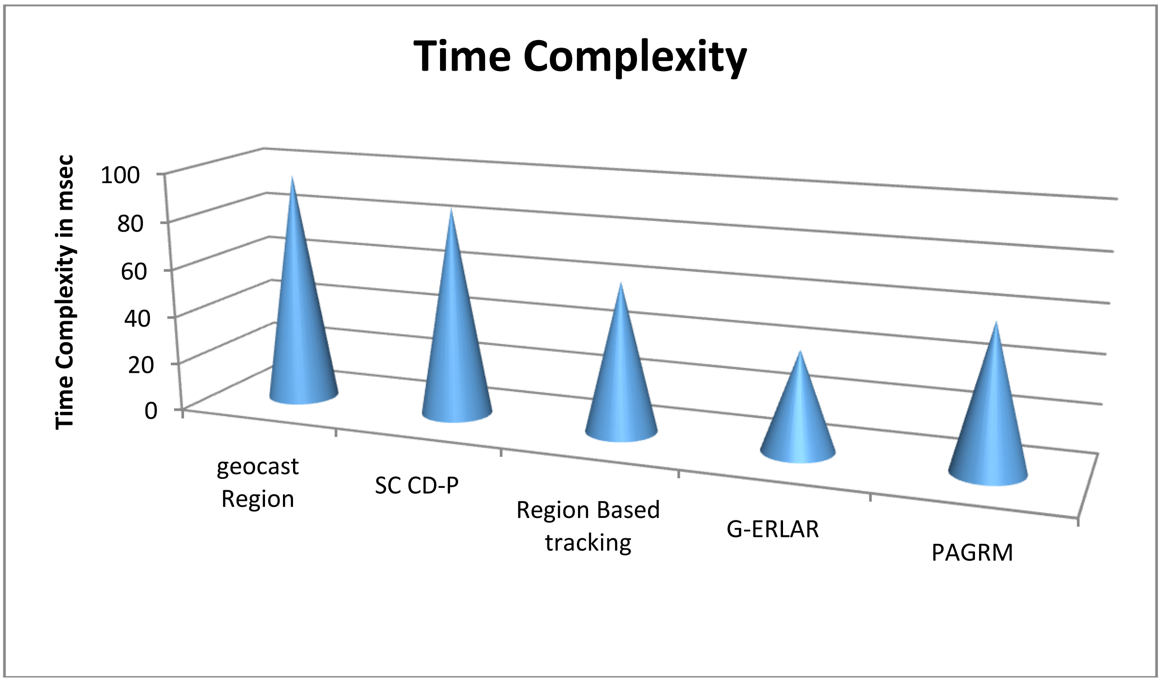


Figure3: Comparison of time complexity in region tracking

The graph3, shows the comparison of time complexity introduced by various methods in region tracking and it shows clearly that the proposed method has produced less time complexity than others.

V. CONCLUSION:

We have presented an overview of geographic PAGRM for wireless ad hoc networks. It is obvious that utilizing the geographic information is vital for building scalable and efficient techniques in these environments. This study shows that there is a significant amount of work done in this area. Nevertheless, in order for power aware Geocast region to be implemented in the real-world, they need a higher degree of robustness to the realistic environmental conditions. In our work, we focus on this issue of assessing the robustness of geographic region tracking to non-ideal conditions corresponding to the real-world environments and designing new strategies and protocols that take these conditions into network.

REFERENCES:

[1] Prakash and prabakaran,"A Region Based Target Tracking for Geocast in Mobile Adhoc Networks",Issue 1, May 2015.
[2] Ahmed Helmy, "Architectural Framework for Large-Scale Multicast in Mobile Ad Hoc Networks". April 2011
[3] S. Deering and et al. Protocol independent multicast version 2-dense mode specification (Internet-Draft), May 1997.
[4] Selvi Ravindran1, Narayanasamy Palanisamy, "Parametric based mobility for providing opportunistic geocasting in spatially separated wireless sensor networks".
[5] I. Akyildiz, J. Ho, and Y. Lin. "Movement-Based Location Update and Selective Paging for PCS Networks". August 2006.
[6] D. Estrin, M. Handley, A. Helmy, P. Huang, and D. Thaler. "A Dynamic Bootstrap Mechanism for Rendezvous-basedMulticast Routing". 2010.
[7] D. De Couto and R. Morris. "Location Proxies and Intermediate Node Forwarding for Practical Geographic Forwarding". June 2001.
[8] W. H. Liao, Y. C. Tseng, K. L. Lo, J. P. Sheu. "Geogrid:A geocasting protocol for mobile ad hoc networks based ongrid". 2010.
[9] J. C. Navas, T. Imielinski. "Geocast-geographic addressing androuting".September 2012.
[10] N. Bulusu, J. Heidemann, D. Estrin. "GPSless low cost outdoorlocalization for very small devices". October 2012.