Original Article

ABIDING GEOCAST ROUTING PROTOCOL

Dr. P. Chinnaraj[1], Dr. I. Kala[2], Ms. Sherine.S[3]

[1]Associate Professor, Dept of Mathematics, PSG Institute of Technology and Applied Research, Coimbatore.
[2]Associate Professor, Dept of Computer Science and Engineering, PSG Institute of Technology and Applied Research.
[3]I[st] Year B.Tech CSE, Karunya Institute of Technology and Sciences.
Email: chinnaraj@psgitech.ac.in[1], ootykala@gmail.com[2], sherine8112004@gmail.com[3]

DOI: 10.47750/pnr.2022.13.S07.347

Abstract

Mobile Ad Hoc Network consists of group of nodes in specific region. Every node has to rely on subsequent nodes to send the packets[10]. Certain nodes deny to forward packets. Vineyard is the only tree where pruning is done for the growth. In other type of trees pruning is not done. Pruning is to cut the dead branches. To cut or lop superfluous or undesired twigs, branches or roots from like trim. During the pruning season things are made ready. Dead wood is removed; unproductive sucker growth is tossed in to the fire. Similarly in Mobile Ad hoc Networks if any node is selfish node not synchronizing with other nodes and not responding to passing the packets through it. The leader has to remove the deadly node called selfish node like pruning. The most extensible application of Geographical addressing is via a Geocast protocol[11], where nodes selectively rebroadcast packets based on regional consensus guidelines. Classy excommunication heuristics harvest extensible Geographic flooding that outplays deputy geo addressing methodologies. However, previous Geocast Routing applications, while effective, fall into two categories. Methodologies based on flooding are in extensible due to the high load they attain. Extensible approaches, on the other hand, have exertion in complex environments, lacking sufficient intelligence about the necessary directionality of packet flow[14]. The present paper defines a contemporary Vineyard Geocast Routing heuristic, which both significantly improves on reliability of prevailing extensible Geocast Routings and yet also remains extensible as design complexity increases.

Keywords: Vineyard, Pruning, Geocast Routing, Mobile ad hoc networks

INTRODUCTION

In Mobile Ad Hoc network many mobile nodes communicate with each other without any infra structure[1]. Each node acts has a router passing packets between the intermediate nodes in the region[5][12].Mobile Ad Hoc Network expects the cooperation between nodes. Some nodes deny to synchronize with each other[3][13].

Pruning is the good work of shaping, sorting, shifting through the vines for the best, preserving only what will produce good fruit. In MANET deadly nodes are done as pruning.

During the pruning time trimming and cutting and neatening things , making space for the plumpest of red, purple or green grapes , grapes that will grow heavy and rich as harvest time approaches.

Method

How to cut away every vine that didn't have grape buds on it. Have to trim relentlessly and throw away the branches that have no fruit on them. The buds need as much of the sap and sunlight as possible and that, when

Leader cut away huge branches that have no buds on them, Leader actually helping, not hurting the vine.

Leader is the gardener. Leader cuts off every branch in vine that bears no fruit, while every branch that does bear fruit leader prunes so that it will be even more fruitful. Nodes are already inside the region because of the coverage area. Remain in Geo region, as Leader also remain in Geo region. No branch can bear fruit by itself; it must remain in the vine. Neither can you bear fruit unless you remain in Geo region. Nodes are the vine; More Bunch of grapes are connected through the branches. If Nodes remain in connection and within Geo region, node can send packets[2].The vineyard tree will give will bear much fruit; apart from Leader you can do nothing. If Node do not remain in Geo region, it is like a branch that is thrown away and withers; such branches are picked up, thrown into the fire and burned. If vine remain in tree and the energy remain in branch, get whatever vine wish and it will be done for it. This is to Leader will, that you bear much fruit, showing node itself to be its energetic.

Overview

In geographic region and control applications, a roaming node wishes to detect [14] and initiate communications with all nodes in a well-defined geographic area at the predominant time, even when the sender has no responsiveness of which nodes currently occupy the area [9].

A Network with Packet Transmission represented in matrix form.

$$A = \begin{pmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{pmatrix}$$

In this Network Identity matrix 1denotes node accepted to send the packet. 0 denotes node is a dead node. Within the Network many Geo regions are there as one bunch of grapes. To identify dead node in Geo region Best case scenario is as follows with the true condition A(N)k

PHVR (t) :$di = \sum_{i=1}^{N} (A(N) - ki)$

Where PHVR(t) is the Pruning Heuristic Vineyard Routing true condition

A : Total region

di :Number of dead node detected by the leader.

k: Number of active nodes

N:Total number of nodes in the Network

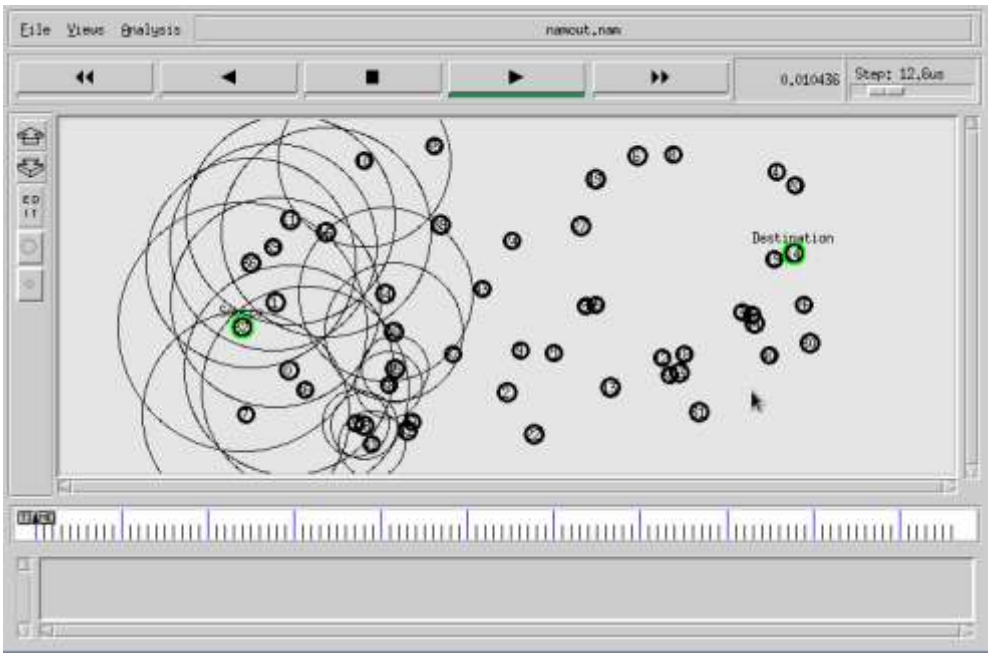
From this equation if the factor of di should be less than or equal to 1 decides that there is minimum number of dead node .

ABIDING THE RELATIONSHIP

The leader is in charge of caring for the packets. It is who purges or prunes the branches so they will send more packets. The more the node abides in the region will send more packets[8].To send more packet The leader has to prune so that the quality keeps up with the quantity.

Figure 1 shows the privilege of abiding and the responsibility of sending packets.

Figure 1: Abiding in Geo Region



Several different energy nodes contains will try to neglect to send packets. Those selfish nodes have to be pruned and make to send packets between source and destination.

Figure 2 : Identification of selfish node

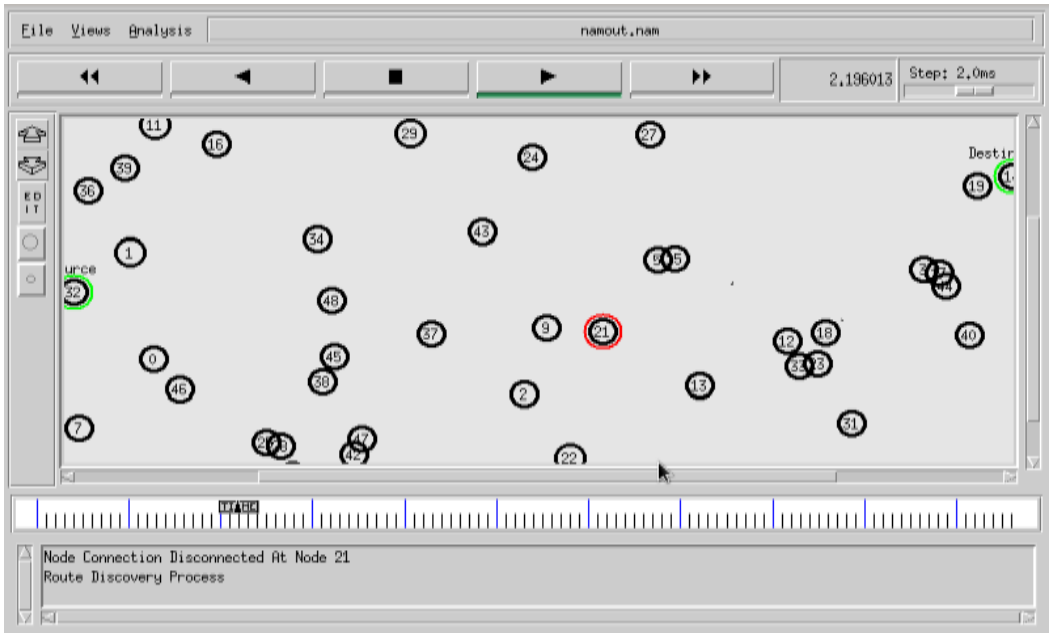


Figure 2 shows the Pruning process is the most important part of the whole enterprise and the leader who do it must be carefully trained or they can destroy the entire node. Leader wants both Quality and Quantity[7]. The more nodes abide in the Geo region will send more packets. The more leader prune the Node so that the quality keeps up with the Quantity. As nodes as the privilege of sharing its energy and the responsibility of abiding.

Figure 3 shows the selfish node denies to send packets from source to destination. The packet is being sent from the source node and it's been passing through the intermediate nodes and the selfish node denies forwarding the packet[4].

Figure 3 : Selfish node denial of Service

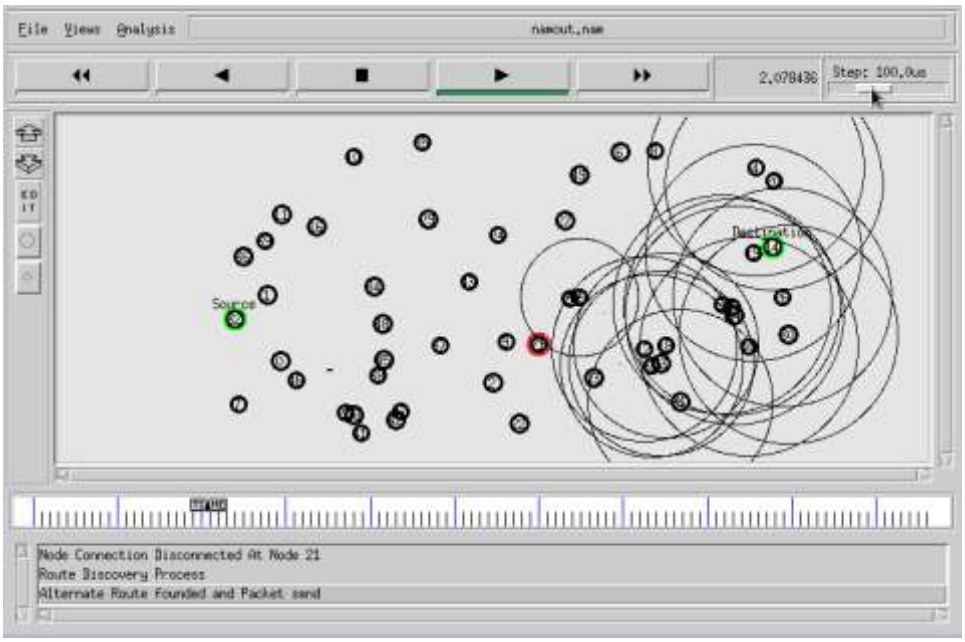
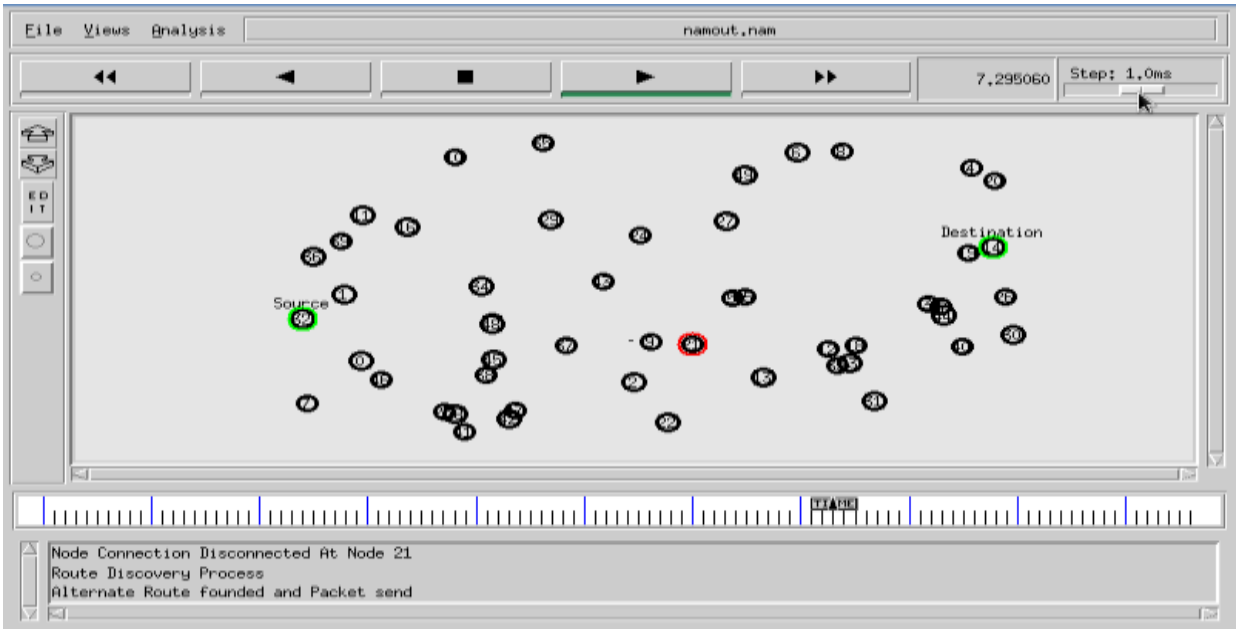


Figure 4 shows choosing the another path to send the packets between sender and receiver.

Figure 4: Identification of another path



RESULT & DISCUSSION

Table 1 depicts before pruning process the density of each node packet. When Packets increases node density gradually increases.

Table 1: Selfish Nodes vs Node Density

Node Packets	Node density
2	103
4	202
6	310
8	418
10	540
12	600
14	699

Figure 5 illustrates the pruning process deletes the selfish nodes and when the selfish nodes decreases the node density decreased. From this figure infer that the pruning process deletes the deadly nodes and improves the performance of the network.

Figure 5: Node Density for Selfish Nodes

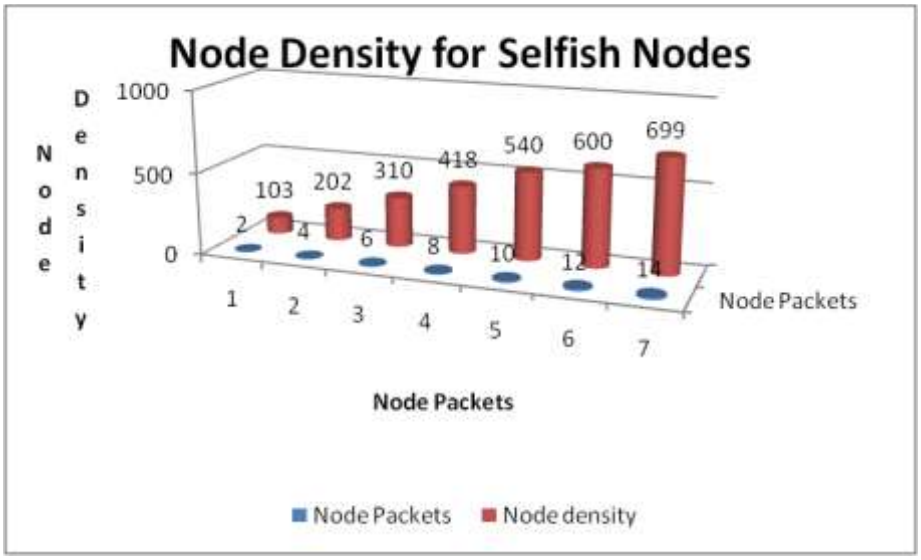


Table 2 depicts before pruning process the selfish nodes offering much load and drain the performance of the network pruning process helps in removal of dead selfish nodes there by improves the network performance.

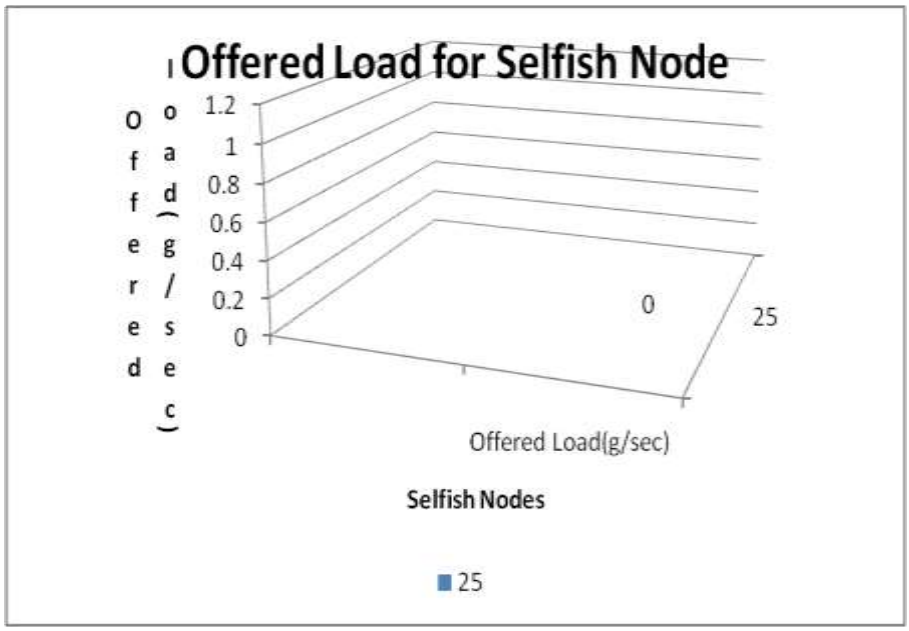
Table 2: Selfish Nodes vs Offered Load

Selfish Node	Offered Load(g/sec)
23	436

110	162
22	304
24	435
28	436
72	437
122	448
108	160
110	160
24	134
52	136
112	136
148	438
25	306

Figure 6 shows the Offered Load provided for Selfish Nodes. Based on Geo region various environmental constraints the selfish nodes count and offered load varies rapidly.

Figure 6: Offered Load for Selfish Nodes



CONCLUSION

In this paper, we propose a new routing protocol to detect deadly nodes. Deadly nodes are nodes which deny carrying the networking tasks for others mean while using the network services provided by others in the network. In this paper, we proposed a new protocol to detect deadly node using pruning. Vineyard based

Geocast Routing is a heuristic based Pruning process. If any node not synchronizing and not forwarding the packets will be pruned and sustenance is done to stable the communication[6].Review results shows that this protocol will performs well to detect deadly nodes in a MANET. In future work, we plan to investigate the effect of data packet rate to our routing protocol. We are in progress with deadly nodes detection system in MANET by using NS2 network simulator.

REFERENCES

1. FZ Bousbaa, CA Kerrache, Z Mahi, AEK Tahari…, "GeoUAVs: A new geocast routing protocol for fleet of UAVs", Computer Communications, Elsevier, Volume 149, , Pages 259-269, January 2020.

2. Chowdhury S., Emelogu A., Marufuzzaman N., Nurre Sarah G., Bian L., "Drones for disaster response and relief operations: A continuous approximation model",Int. J. Prod. Econ., 188, pp. 167-184,2017, 10.1016/j.ijpe.2017.03.024.

3. Uddin A., Mansour A., Le Jeune D., Ayaz M., M. Aggoune e.-H, "UAV-Assisted dynamic clustering of wireless sensor networks for crop health monitoring Sensors", 18, p. 555,2018, 10.3390/s18020555.

4. R.J. Hall and J. Auzins, "An Improved Geocast for Mobile Ad Hoc Networks," IEEE Transactions on Mobile Computing (Volume: 10, Issue: 2, February 2011.

5. Arafat M.Y., Moh S, "A survey on cluster-based routing protocols for unmanned aerial vehicle networks",IEEE Access, PP (2018), pp. 498-516, 10.1109/ACCESS.2018.2885539.

6. Pirmagomedov R., Kirichek R., Blinnikov M., Koucheryavy A, "UAV-Based gateways for wireless nanosensor networks deployed over large areas",Comput. Commun., 146 (2019), pp. 55-62, 10.1016/j.comcom.2019.07.026.

7. Al-Turjman F., "A novel approach for drones positioning in mission critical applications", Trans. Emerg. Telecommun. Technol., 0 (0) (2019), p. e3603e3603 ETT-18-0435.R1, 2019.

8. Aadil F., Raza A., Khan M.F., Maqsood M., Mehmood I., Rho S., "Energy aware cluster-based routing in flying ad-hoc networks",Sensors, 18 (5) (2018), 10.3390/s18051413,2018.

9. Omprakash Kaiwartya; Sushil Kumar, "Geocast routing: Recent advances and future challenges in vehicular adhoc networks," 2014 International Conference on Signal Processing and Integrated Networks (SPIN), 10.1109/SPIN.2014.6776965,2014.

10. Kaiwartya, O., Kumar, S., Kasana, R. "Traffic Light based Time Stable Geocast (T-TSG) Routing for Urban VANETs," Contemporary Computing (IC3), IEEE, Sixth International Conference on, Vol., no., pp. 113-117, 2013.

11. Kaiwartya, O., Kumar, S. "Enhanced Caching for Geocast Routing in Vehicular Ad-Hoc Networks (ECGR)", Advanced Computing, Networking, and Informatics (ICACNI), Springer, International Conference on, Vol., no. 243, pp. 213-220, 2013.

12. I. Khan, A. Javaid, and H. Qian, "Distance-Based Dynamically Adjusted Probabilistic A heading for Wireless Mobile Ad Hoc Networks," Proc. Fifth IFIP Conf. Wireless and Optical Comm. Networks (WOCN '08), pp. 1-6, May 2008.

13. Raw R. S., Das, S. "Performance Analysis of P-GEDIR Protocol for Vehicular Adhoc Network in Urban Traffic Environments", Wireless personal Communications, Springer, 68(1), pp. 65-78 , 2011.

14. Jiang R., Zhu Y. "Coverage-aware Geocast Routing in Urban Vehicular Networks", Parallel and Distributed Processing Symposium Workshops & PhD Forum (IPDPSW), IEEE 26th International, Vol., no., pp. 2522-2525, 2012