Vol 5 Issue 4 Jan 2016

ISSN No : 2249-894X

Monthly Multidisciplinary Research Journal

Review Of Research Journal

Welcome to Review Of Research

RNI MAHMUL/2011/38595 **ISSN No.2249-894X**

Review Of Research Journal is a multidisciplinary research journal, published monthly in English, Hindi & Marathi Language. All research papers submitted to the journal will be double - blind peer reviewed referred by members of the editorial Board readers will include investigator in universities, research institutes government and industry with research interest in the general subjects.

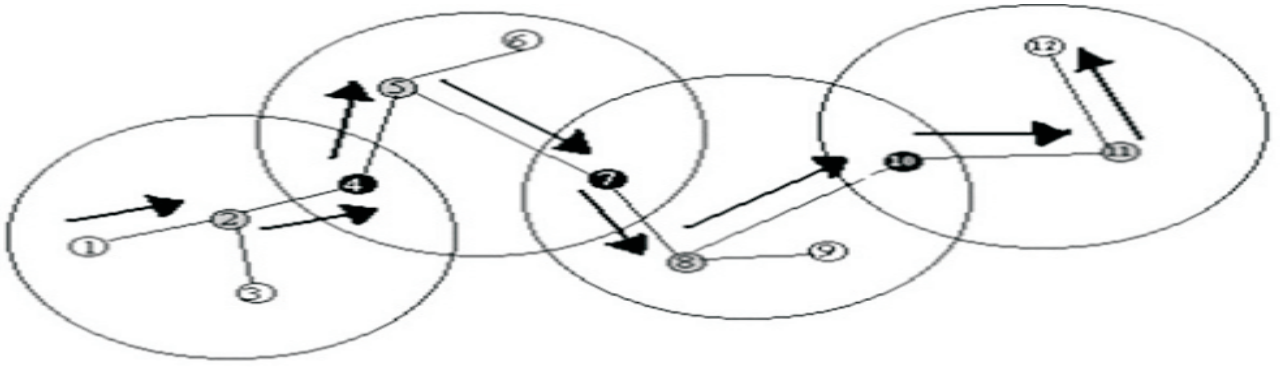
Regional Editor

Dr. T. Manichander

Advisory Board

More.....

International Online Multidisciplinary Journal
Review of Research
Save Tree, Save Paper, Save World
ISSN No : 2249-894X
Impact Factor 2.1002 (UIF) [Yr.2013]
3.1402 (UIF) [Yr.2014]
ISSN: 2249-894X Impact Factor : 3.1402(UIF) Volume - 5 | Issue - 4 | Jan - 2016



A SECURITY IMPROVEMENT SHOW FOR MANET UTILIZING HEREDITARY CALCULATION

Shama P. S.[1] and Suhashini Shinde[2]

[1]PhD Research Scholar, Department of Computer Science and Engineering, PDA College of Engineering , Kalaburagi, India.

[2]Assistant Professor, School of Engineering, Central University of Karnataka , Kalaburagi, India.

ABSTRACT

The versatile impromptu system is a decentralized and self-sorted out remote system which does not chip away at any settled foundation so it is having a period variation topology which differs time to time because of the portability of the hubs. Similarly the normal world is gigantic, dynamic, unfathomably different, and exceptionally perplexing. In spite of the natural difficulties of making due in such a world, organic living beings advance, self-arrange, self-repair, explore, and thrive. For the most part, they do as such with just neighborhood information and with no brought together control. Essentially, Our Versatile Impromptu systems are progressively confronting the comparable difficulties as they become bigger in measure. Consequently, the proposed approach depends on the Hereditary Calculations for the advancement of the different information steering systems for MANETs to take care of the dynamic most brief way issue.

KEYWORDS : Ad hoc Network, Genetic Algorithm, Proactive, MANET, and Cluster head Gateway, Routing Optimization.

1.INTRODUCTION

MANET, a mobile adhoc network is a collection of mobile nodes/ host which are battery powered. These nodes are connected relatively by lower bandwidth wireless links. Mobile adhoc network as the name indicates is a wireless network without any fixed infrastructure such as base station. MANETs allows people and devices to be interconnected seamlessly in areas without any pre-

existing communication infrastructure provided. These network provide wide range of applications such as military operations, natural disaster, search-and-rescue operation and other applications (meeting in a room, airport, stadium and virtual classroom, etc).

Figure 1.1: A Mobile-Ad-hoc Network (MANET)

There are various functions among networks; one among those is the Routing. Routing is the primary function that each node has to perform so that they can communicate with other node within range which is not directly connected. In MANETs [5] routing is also a trivial task or function to be achieved because of some characteristics that they possess. They are: (1) Dynamic topology: due to mobility of the nodes, the nodes may change rapidly and randomly through different environments at unpredicted times. (2) As these mobiles devices are battery powered, Energy consumption is also important. (3) The bandwidth available is low and may vary due to the noise and inference. Other characteristics of these networks are summarized as follows:

- Communication via wireless means.
- Nodes can perform the roles of both hosts and routers.
- Bandwidth -constrained, variable capacity links.
- Energy -constrained Operation.
- Limited Physical Security.
- Dynamic network topology.
- Frequent routing updates.

In adhoc networks each node belongs to a group or subgroup based on the similar characteristics they posses, known as Cluster. Cluster is group or collection of objects or nodes that has similar characteristics within it and has different characteristics comparatively outside the cluster. Each Cluster has many cluster members and a node which posses some special characteristics known as Cluster-head that controls, manages all the cluster members and routing information within and among the clusters. When a cluster member wants to communicate with another node, a route is established and provided by its cluster head. A crucial question is which node will become a cluster head. Typically a cluster head is more burdened than its members and could easily become a bottleneck of the system if not chosen appropriately.

The main aim of this project is routing the information efficiently and securely. Routing is the function of transferring information from source to destination. The path it takes always should be efficient i.e., shortest path has to be selected or choose to send the information. The Shortest Path is

selected based on some algorithms. In MANETs there arises a problem in selecting the Shortest Path due to the dynamic topology. Thus this project provides an approach for reducing the SPP (shortest path problem) using Genetic Algorithm (GA) [8]. GA is the search heuristic algorithm used in various applications such as routing where it provides the shortest path and also some feasible solution for a given problem along with the optimal solution. GA also provides various security approaches, MANETs make use of wireless media regarding sign, which usually brings out safety flaws for the networks. Generally anybody while using the appropriate products as well as familiarity with the existing community topology and the methodologies may access the community. Both active as well as unaggressive violence for instance impersonation, eavesdrop ping, concept redirection, as well as traffic examination, may be per formed simply by the adversary. Within specific scenarios, MANET nodes can be dispersed on the huge area. Many nodes or perhaps community ingredients can be not watched or perhaps hard for you to observe, as well as subjected to the physical violence. Mainly because MANETs would not have just about any middle authority, this can be a major hurdle for you to safety. The safety systems utilized in wired networks, for instance Open Key Administration, Node Authentication, as well as Perseverance involving Node Behavior, are in fact extremely tough to achieve without the middle administration. Random networks are generally very active throughout characteristics. Node joins as well as departures aren't predictable. Moreover, community topology is obviously modifying throughout Random networks.

2. RELATED WORK

2.1 Classification of routing algorithms

Since the advent of DARPA [1] packet radio networks in the early 1970s, numerous protocols have been developed for ad-hoc mobile networks. Such protocols must deal with the typical limitations of these networks, which include high power consumption, low bandwidth, and high error rates. As shown in Figure 2.1, these routing protocols may generally be categorized as:

- Table-driven (Proactive protocols)
- Source-initiated on-demand driven (Reactive protocols)
- Hybrid routing protocols

Despite being designed for the same type of underlying network, the characteristics of each of these protocols are quite distinct.

2.1.1 Proactive algorithms

Proactive Algorithms (protocols) maintain unicast routes between all pairs of nodes regardless of whether all routes are actually used. Therefore, when the need arises (i.e., when a traffic source begins a session with a remote destination), the traffic source has a route readily available and does not have to incur any delay for route discovery. These protocols also find optimal routes (shortest paths) given a model of link costs. Routing protocols on the Internet (i.e, distance vector-based RIP and link state-based OSPF) fall under this category. However, these protocols are not directly suitable for resource-poor and mobile ad hoc networks because of their high overheads and/or somewhat poor convergence behavior. Therefore, several optimized variations of these protocols have been proposed for use in ad hoc networks. In the rest of this section, protocols from this category that have receive wide attention are described.

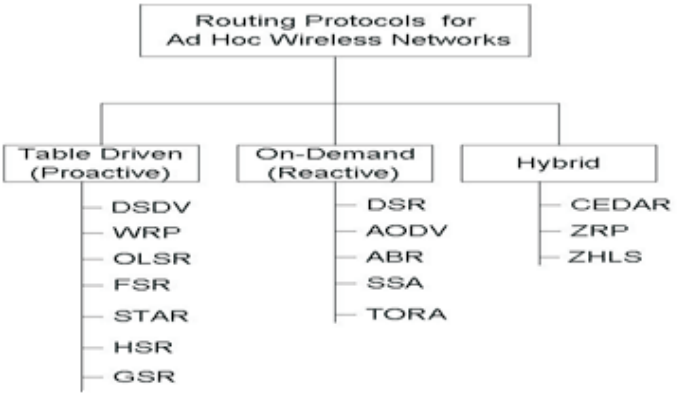


Figure 2.1: Classification of Routing Protocols

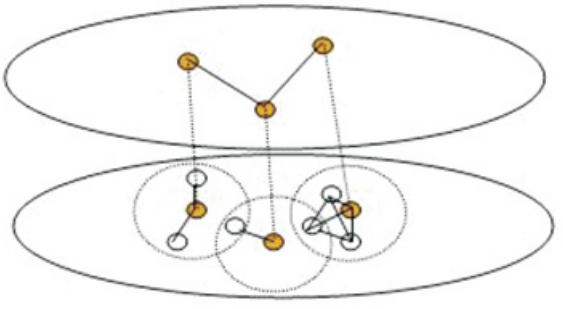
2.2 Destination-Sequenced Distance-Vector Routing (DSDV)

The Destination-Sequenced Distance-Vector Routing protocol (DSDV) [3] described in is based on the classical Bellman-Ford routing mechanism . The improvements made to the Bellman-Ford algorithm include freedom from loops in routing tables [3]. Every mobile node in the network maintains a routing table in which all of the possible destinations within the network and the number of hops to each destination are recorded. Each entry is marked with a sequence number assigned by the destination node. The sequence numbers enable the mobile nodes to distinguish stale routes from new ones, thereby avoiding the formation of routing loops. The node looks up for destination in the routing table and forwards using next hop information given the routing table. Routing table updates are periodically transmitted throughout the network in order to maintain table consistency. These updates are done as infrequently as possible i.e., when the link state is changed or a node state is changed. As the nodes in the network are mobile the links break very frequently, triggers a lot of updates and clogs the entire the entire network with update packets even at lower mobility.

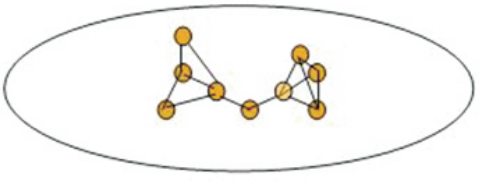
Obtaining a hierarchical organization of network is a well-known and studied problem of distributed computing. It has been proven effective in the solution of several problems, such as, minimizing the amount of storage for communication information (e.g., routing and multicast tables), thus reducing the information update overhead, optimizing the use of the network bandwidth, distributing resources throughout the network, etc [4].

Partitioning of nodes into logical groups (clusters) is called clustering [7]. In the context of ad hoc wireless networks as the nodes are mobile the nodes in the groups get disconnected and then the cluster structure has to be reorganized. In addition, clustering is crucial for controlling the spatial reuse of shared channel (e.g., in terms of time division or frequency division schemes), for minimizing the amount of data to be transmitted in order to maintain routing and control information in a mobile environment, as well as for building and maintaining cluster based virtual network architectures.

Routing algorithms like WRP, OSLR, DSR, TORA, AODV depend upon flooding for route identification [5]. As the density of nodes in the network increases, the inter node contention for broadcast message retransmission increases. This will cause in lost messages and eventual drop of messages which will cause a failure in route identification. The hierarchical organization of network reduces the size of forwarding set. This will lead to



(a) Hierarchical organization



(b) Flat Organization

Figure 2.2: Hierarchical vs Flat Organization

A drastic improvement in the network bandwidth utilization. The size of forward set is n and the number of retransmissions of broadcast message is O(n) [6]. The hierarchical organization of network can eventually be done by using multi cluster architecture. Figure 2.2(a) shows hierarchical organization of network, achieved with multi-cluster architecture with duel power mode for inter-cluster communication, while Figure2.2(b) shows the flat architecture. Nodes in the top oval of Figure 2.2(a) are forwarding nodes while all the nodes in Figure 2.2(b) are forwarding nodes.

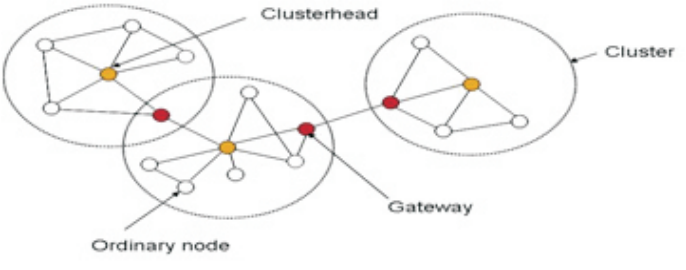


Figure 2.3: Cluster Head Gateway Routing

Hierarchical organization of network gives better location management and improves the scalability of networks. While the flat architecture gives optimal routes and have low power consumption while not being scalable. But the routes formed are suboptimal and leads to single points of failure.

The effect being little when compared to the advantages obtained with the hierarchical organization.Due to the wireless and mobility of the nodes the routing overhead is caused where the

location changes within the network and some stale routes are generated in the routing table which leads to unnecessary routing overhead. There may also occur interference within the mobile adhoc network as the links come and go; depending on the transmission characteristics one transmission might interfere with another one, and node might overhear transmissions of other nodes and can corrupt the total transmission. Also in MANETs the available bandwidth provided is low. Dynamic topology causes the routing information i.e., the shortest path between the mobile nodes will be differing based on their mobility. Thus finding the shortest path becomes a problem.

3 .PROPOSED SYSTEM

Genetic Algorithm: The solution for the above problems is the genetic approach. Genetic algorithms [8] are the search heuristics approach and also an evolutionary optimization approach. GA is inspired by the Darwin's theory about evolution. They are particularly applied to the problems that are large, non-linear and possibly discrete in nature. GA works on the principle of natural selection, as in natural selection over the time , individuals with good genes survive whereas the bad genes are rejected.

Genetic algorithm collects are the possible alternative solutions for any given problem as a generic string. GA [8] maintains a population of candidates' solutions, where each candidate solution is called a chromosome. The chromosome consists of sequence of positive integers that represent the IDs of nodes through which a routing path passes. Each locus of the chromosome represent an order of a node in a routing path. The gene of the first locus is always reserved for the source node. The length of the chromosome is variable, and it should not exceed its maximum length i.e., the total number of nodes in the network.

A chromosome (routing path) encodes the problem by listing up node IDs from its source node to its destination node based on topological information database (routing table) of the network [9]. A set of chromosomes forms a population, which is evaluated and ranked by fitness evaluation function. The fitness evaluation function plays a critical role in GAs because it provides information how good is each candidate. The initial population is usually generated at random.

The evolution from one generation to the next one involves mainly three steps:

- Fitness evaluation,
- Selection and
- Reproduction

First, the current population is evaluated using the fitness evolution function and then ranked based on their fitness. A new generation is created with the goal of improving the fitness. Simple GA uses three operators with probabilistic rules: reproduction, crossover and mutation. First selective reproduction is applied to the current population so that the string makes a number of copies proportional to their own fitness. This results in an intermediate population.

Second, GA select parents from the current population with a bias that better chromosome are likely to be selected. This is accomplished by the fitness value or ranking of a chromosome.

Third, GA reproduces children (new strings) from selected parents using crossover and/or mutation operators. Crossover is basically consists in a random exchange of bits between two strings of the intermediate population.

Finally, the mutation operator alters randomly some bits of the new strings. This algorithm

terminates when an acceptable solution is found, when convergence criterions met or when a predetermined limit number of iteration is reached.

BASIC STEPS OF A SERIAL GENETIC ALGORITHM for the Proposed Method:

Nc - be the Number of Clusters
Nr - be the Number of Regular nodes
Ng - be the number of Gateway nodes
N = Ng+Nr be the total number of regular and gateway nodes

A simple genetic algorithm consists of the following steps[4]:

1. [Initial Population] Generate random population of Nr clusters, Nr regular nodes and Ng gateway nodes.
2. [Form Ad-Hoc network from above inputs] combine all the Ng and Nr with respective clusters in Nc
3. [Weight Fitness] Evaluate the Weight fitness wf(N) of each nodes in the Cluster Nc
4. [New population] Create a new population by repeating following steps until the new Population is complete

a) [Selection of Cluster] Select any cluster Nc to which the new Node being added from a population according to their weight fitness. (The lower weight fitness, the bigger chance to be selected)
b) [Check for Neighbor] check if this selected node N is having any neighbors or not if neighbors are present add them in the same cluster or with the other cluster if the present node is gateway node.
c) [Looping Check] will check for the any loop exists while constructing the clusters with neighbor nodes if present will remove it.

5. [Replace] Use new generated population for a further run of algorithm
6. [Test] If the end condition is satisfied, stop, and return the best solution in current population
7. [Optimal Path] find the optimal path from the following two ways

a) By the Frequency, where the number of times traversed in the same path
b) Based on the Lower summation of the weight fitness in that path. Lower the value accurate the optimal path

8. [Loop] Go to step 2.

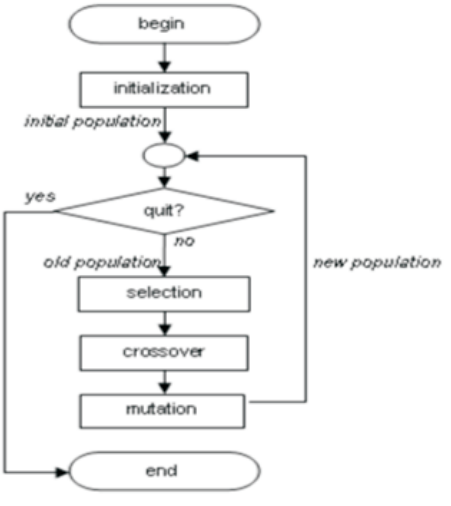


Figure 3.1:GENETIC ALGORITHM FLOWCHART

CONCLUSION

A Genetic Algorithm as an optimization technique for routing in MANET. With the genetic algorithmic technique each cluster head handles the maximum possible number of mobile nodes in its cluster. Also a fewer cluster heads are obtained by the genetic algorithm technique. With the genetic algorithm technique the cumulative distributions of the paths are almost the same. Generally, another criterion of research can concentrate to simplify parameters of GA's optimization to leave the bad one out and optimize the good parameters. Thus GA's are able to find, if not the shortest, at least an optimal path between source and destination in mobile ad-hoc network nodes and sending packets in secure manner from source to destination using security techniques. And we obtain the alternative path or backup path to avoid reroute discovery in the case of link failure or node.

REFERENCES

[1]. Abolhasan, M., Wysocki, T., &Dutkiewicz, E. (2004). "A Review of Routing Protocols for Mobile Ad hoc Networks." , VOL 2, ISSUE 1, 1-22.

[2]. Mustafa AL-GHAZAL, Ayman EL-SAYED (IEEE Member), Hamedy KELASH," Routing Optimization using Genetic Algorithm in Ad Hoc Networks ",proc. ISSPIT 2007, 15-18 December 2007, Cairo, Egypt.

[3]. Clarles E. PerKins and PravinBhagwat "Highly Dynamic Destination Sequenced Distance Vector Routing (DSDV) for mobile computer "SIGCOMM, ACM (1994).

[4]. C.E. Perkins and E.M.Rayer, "Ad-Hoc On Demand Distance Vector Routing" Proc. (IEEE) WMCSA '99 New Orleans, LA, Feb. (1999), pp. 90-100.

[5]. RobinpreetKaur&Mritunjay Kumar Rai, A Novel Review on Routing Protocols in MANETs, Undergraduate Academic Research Journal (UARJ), ISSN : 2278 – 1129, Volume-1, Issue-1, 2012.

[6]."Evolutionary Computation", IEEE Transactions on Volume 6, Issue 6, Dec 2002 Page(s): 566 – 579 Digital ObjectIdentifier10.1109/TEVC.20 02.804323.

[7]. DalmaTurgu. "Optimizing Clustering algorithm in Mobile Ad hoc Networks" Journal of Clustering Computing, Vol. 5, No. 2. Oct. 2002. Pp.193-204.

[8] GihanNagib And Wahied G, "Network Routing Protocol Using Genetic Algorithms", International Journal Of Electrical & Computer Sciences IJECS-IJENS Vol: 10 No: 02, Pages 40-44 . (2008).

[9]Sonam Jain, SandeepSahu "The Application of Genetic Algorithm in the design of Routing Protocols in MANETs: A Survey"(IJCSIT) International Journal of Computer Science and Information Technologies, Vol. 3 (3), 2012, 4318 - 4321

Publish Research Article
International Level Multidisciplinary Research Journal
For All Subjects

Dear Sir/Mam,

We invite unpublished Research Paper,Summary of Research Project,Theses,Books and Books Review for publication,you will be pleased to know that our journals are

Associated and Indexed,India

- Directory Of Research Journal Indexing
- International Scientific Journal Consortium Scientific
- OPEN J-GATE

Associated and Indexed,USA

- DOAJ
- EBSCO
- Crossref DOI
- Index Copernicus
- Publication Index
- Academic Journal Database
- Contemporary Research Index
- Academic Paper Databse
- Digital Journals Database
- Current Index to Scholarly Journals
- Elite Scientific Journal Archive
- Directory Of Academic Resources
- Scholar Journal Index
- Recent Science Index
- Scientific Resources Database

Review Of Research Journal
258/34 Raviwar Peth Solapur-
413005,Maharashtra
Contact-9595359435
E-Mail-ayisrj@yahoo.in/ayisrj2011@gmail.com