International Research Journal of Engineering and Technology (IRJET) e-ISSN: 2395-0056
Volume: 07 Issue: 10 | Oct 2020 www.irjet.net p-ISSN: 2395-0072

Dynamic and Efficient Gateway Node Selection for Reliable Data Transmission

STEVEN RAJ.N [1], YASMEEN FARISA SINDHE [2]

[1]Assistant Professor, Department of Computer Science and Engineering, GNDEC College, Bidar, Karnataka (India)
[2]4th Semester M.Tech Student, Department of Computer Science and Engineering, GNDEC College, Bidar, Karnataka (India)

Abstract - *The collection of gateways is an important problem in integrated ad hoc mobile networks (MANETs). Modern individual and arbitrary decisions beyond the help of a routing coordination mechanism can trigger unstable links or gateways where selected jointly by various nodes. The network output might however not be in suitable manner. Alternatively, the ad hoc existence of MANETs allows the topology adjust vigorously, making it perhaps further challenging to pick the gateway. This paper introduces gateway functionality and a new methodology, call bio-inspired entryway discovery, where gateways be picked by network topology and connected to a collaborative optimization process. The innovation involves the implementation of the concept of attractor choice, the self-adaptability as well as the biological system control. The efficiency of the suggested solution is measured with various circumstances and applied to the traditional methods presently as employed in hybrid MANETs. Efficiency of the suggested solution in provisos of packet deliverance ratio, average deliverance latency, uniform overhead steering as well as weight balancing for gateways across varying network circumstances.*

Key Words: **MANET, Network Transmission Range, Topology, Data Rate Setup, Dynamic Gateway.**

1. INTRODUCTION

It involves heaps and heaps of low-cost objects that would be placed into a defined location or interact nodes dynamically to track the environments. This would include in this WSNs involve the deployment of large quantities of tiny nodes that are pattern over the previous few times. Each node after which witness environmental alterations and report these various nodes over an architecture of a network. Good for distributing throughout the large environmental sensor nodes.

The Characteristics of Sensor Networks
This segment briefly describes the character traits of the sensor nodes:

• The sensor network has heaps with nodes.

• Changes towards a configuration quite frequently due to node crises.

• It comprises resources which are regulated.
• Includes of the common use of the principle for broadcast communication.

1.1RELATED WORK

In this manuscript we describe the condition of the literature of ad hoc networking for (mobile) multi hops. This approach has also been associated with the approaches produced within the IETF MANET research community, and it has been termed a MANET framework for that reason. They don't match though, and they obviously evolved over time in the last decade. Throughout this essay, we begin with the factors why and how the MANET framework did not get a substantial effect on computer communications, as well as we address the development of the multi hop ad hoc networking model by focusing on the lessons gathered from its MANET study. In particular, we are discussing four effective networking frameworks, mesh, sensor, opportunistic, as well as vehicle networks, which originated through the MANET environment more as a realistic implementation of the multi-hop ad hoc computing paradigm. In the domain of multi hop ad hoc networking, we still introduce the latest research recommendations: people oriented networking, activated by the growing popularity of mobile in daily life, which generates a people-focused transformation in communication technologies. Mobile Ad-hoc network are, random, and multi hop system, consisting of shared mobile wireless nodes. MANET utilizes momentary ad-hoc network structures to enable communication between devices and connect to the network flawlessly in areas without pre-existing network connectivity, such as catastrophe restoration environments. The mobile ad-hoc network is often a series of nodes which are linked from a wireless transmission shaping rapidly evolving topologies via one another. Routing inside an ad-hoc mobile network is indeed a complex and difficult term because of its vibrant topology changes. There have been lots of confidence modeling as well as routing protocol used with MANETs to have a protection. Different trust mechanisms have been used in the mobile ad-hoc network to include honesty, integrity and confidentiality to achieve a stable environment. We will discuss the characteristics, threats and protection of mobile ad-hoc networks have been addressed by author in this manuscript.

In the research community of multi hop wireless networking, opportunistic data routing has attracted a great deal of focus, with many other researches being carried out for fixed wireless devices. One of its purposes how opportunistic data transmission in mobile ad hoc network (MANETs) has not really be commonly used is the inadequacy of a reliable constructive lightweight routing method for a strong source routing. In this document, we plan a comprehensive lightweight source steering (PSR) protocol. PSR could retain more knowledge of the network than remote distance vector (DV) routing which allows source routing, even though overhead would be far smaller over conventional DV-based protocols. Mobile ad hoc networks (MANETs) run without infrastructure. Although, when malicious nodes seem to be present in the system, they will be subject to various kinds of data protection attacks. However, one attack seems to be the wormhole. A procedure (called Cell-based Open Tunnel Avoidance (COTA)) is presented in a previous work that resolves this issue, it composed of a framework to monitor and identify a wormhole attacks throughout the network. The COTA function on the location assisted routing protocol (LAR1) is introduced throughout this paper, contributing to so-called COTA-LAR1 scheme.

1.2 SYSTEM DESIGN

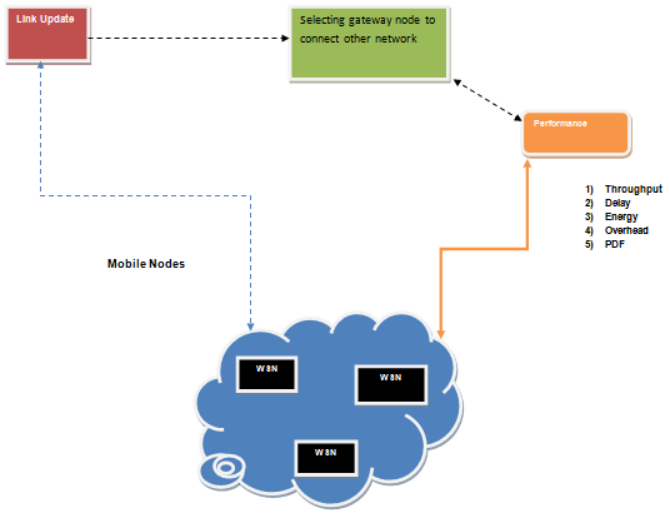

Fig 1: System Architecture

From the above given system architecture, the part seems to provide an elevated-stage summary of how well the device's capabilities as well as roles and responsibilities had been portioned and then concisely allotted to categories or the component parts or modules.

2. IMPLEMENTATION DETAILES

2.1 Modules

1. Network Module
2. Energy Module

1. Network Module

This module describes the nodes distribution in the network area and the nodes specifications and configurations. Initially the nodes are configuring with the default parameters which are required for communication which is mentioned below.

The configuring default parameters involve:

- **Topology creation:** This involves in creating wireless node and configuring with node specifications such that all nodes are homogeneous.
- **Network Transmission Range:** This defines the transmission range of nodes which decides to take multi or single hop communication.
- **Data rates setup:** To process the packet, the bandwidth has to be set as data rates where it processes packets per sec
- **Discovery of neighbor:** For data transmission source and destination finding neighbor nodes within transmission range is important. These relay or neighbor nodes carries data through multi hop and delivers data to destination.
- **Selecting source and destination**: This involves in randomly selecting source and destination nodes for data transfer.
- **Simulation run time:** This defines the total simulation time, where different events occur at different time and analyzing the scenarios.

2. Energy Module

In this energy module, the nodes are assigned with initial energy and the nodes are homogeneous. The energy of the node is calculated as at the start time of simulation all the nodes have higher initial energy, as the nodes moves randomly the nodes energy decreases. Each node consume energy while transmitting and as well as receiving data which is represented as t_x and r_x power. For saving energy the parameter like sleep power, idle power and transition power are assigned for awake and sleep modes. Theses modes will be automatically be shifting to awake when the node has data transmission and goes to sleep after transmission. The residual energy is defined as remaining left out energy after data transmission. The residual energy

should be balanced among nodes to extend network lifetime. The residual energy is formulated as

RE = IE (initial energy) – CE (consumed energy)

2.2. Experimental results

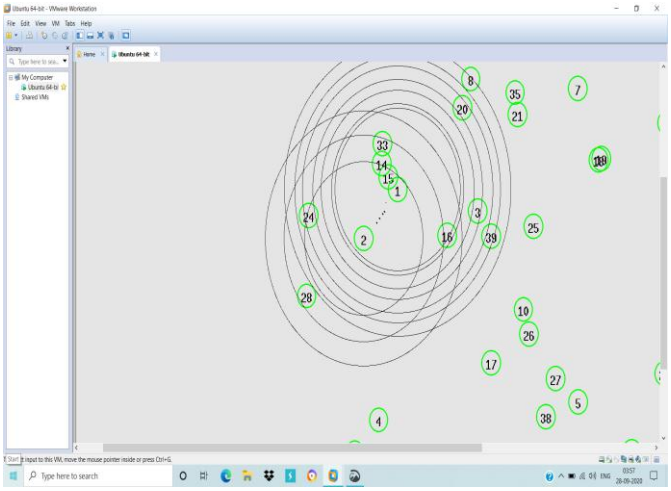

Fig2: Data packet transmission from source to destination node (1, 8) node (1,2) act as intermediate gateway

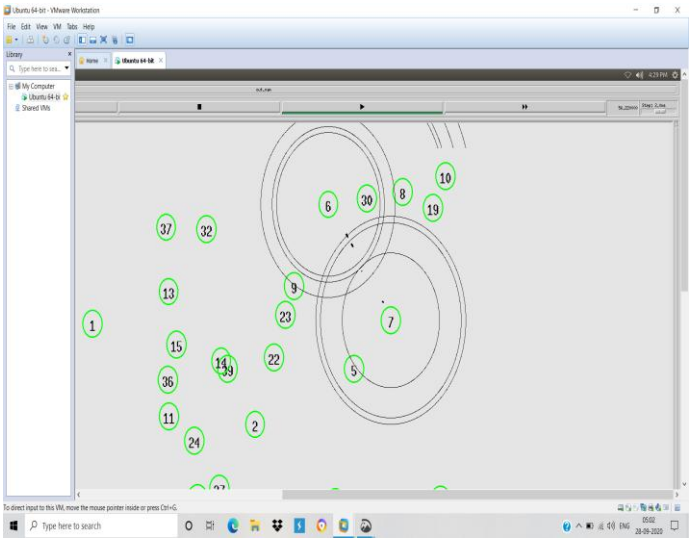

Fig3: Node (6, 7) act as a intermediate way to transfer data from source to destination.

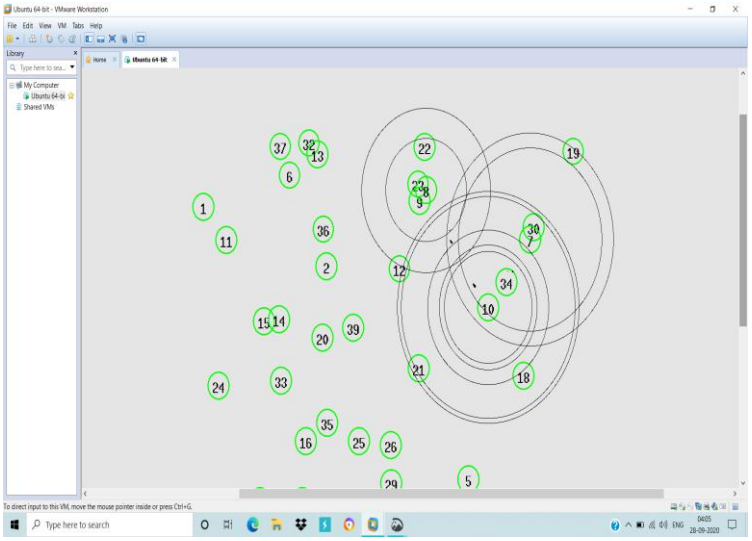

Fig4: Node (7,10) acting as intermediate gateway for packet transmission from source to destination.

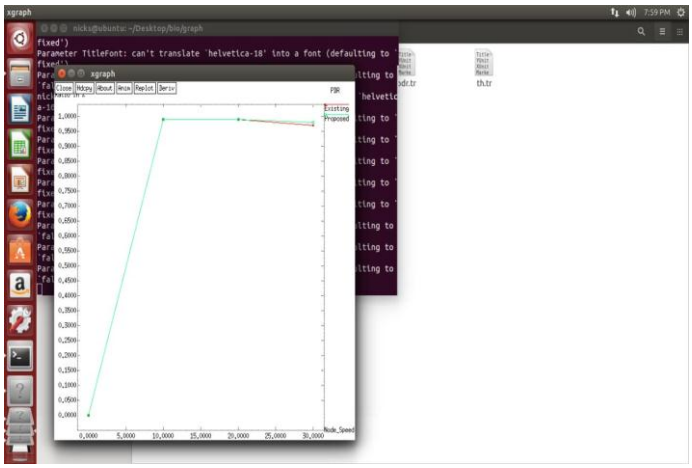

Fig 5: Comparing to existing system, packet delivery ratio is more in propose system.

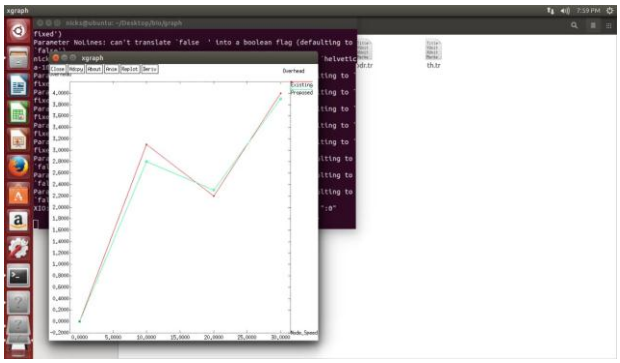

Fig6: Comparing to existing system, overhead is less in proposed system.

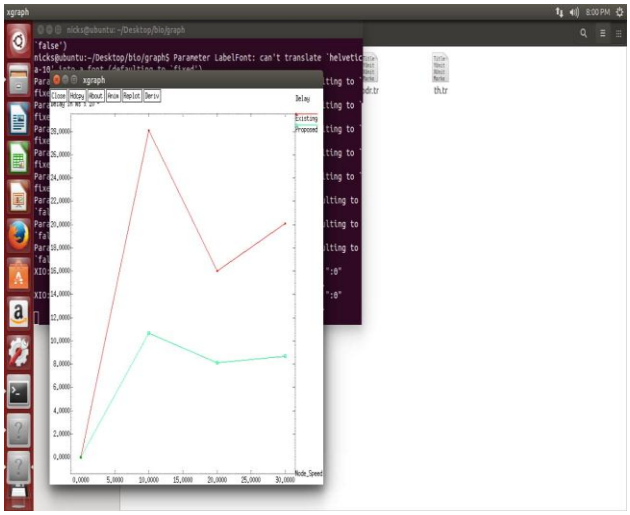

Fig7: Comparing to existing system, delay is less in propose system

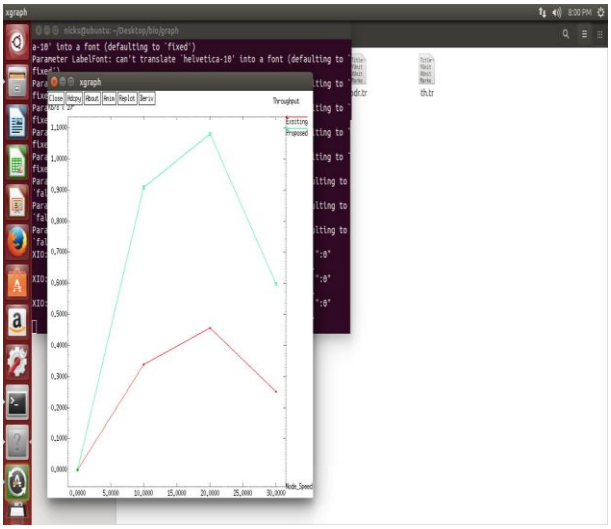

Fig8: Comparing to existing system, throughput is high in propose system.

3. CONCLUSIONS

This proposed model explores the potential of traffic gateways by constructing a computational formula and introduces a bio-inspired model Gateway choice framework for hybrid MANETs it enables source nodes to actively identify appropriate gateways in a potentially cooperate manner, particularly in an ad hoc network setting, by introducing an attractor modeling approach. Four performances -interrelated metrics be defense to measure the excellence of the gateway range stricture Operation. Replica controls the operation parameter to change, and thus to adapt source nodes Appropriate State Vector gateways. In future enhancement an efficient trust model can be implemented to detect attacker in MANET's for secure and efficient data broadcast.

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