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Hybrid Approach to Enhance Architecture Supporting WSN Using AODV AND DPR

Kulbir Singh Khatra [1],Vinay Bhardwaj[2]

[1] *Research Fellow,* [2] *Asst. Professor*
[1,2] *Sri Guru Granth Sahib World Univ., Fatehgarh Sahib, Punjab*

Abstract -Wireless ad-hoc networks are highly resource constrained in terms of network topology, throughput and computation energy. A wireless sensor network (WSN) is a highly constrained wireless ad-hoc network. Due to the constraints in Wireless sensor networks such as throughput, energy consumption, there is an essential need for effective communication techniques for improvement of quality of collected data. Routing protocols from this perspective have a very important role in wireless sensor networks. Reliable dissemination of data in a short time interval to base station (BS) is need of sensors in sensor networks in order to quickly respond to the transmitted information by user from time to time because the information that arrives out of time may cause huge disastrous. So, this thesis will focus on the various routing protocols like AODV and DPR for energy efficiency and throughput maximization. Also the use of Neural Networks is done for the reduction of overloaded nodes. The performance of the proposed technique is based on the various parameters like packet loss ratio, throughput, Overloaded nodes, Mac Collision rate and energy Consumption. The experimental simulation is taken place in MATLAB environment.

Keywords-AODV, DPR, ENERGY, THROUGHPUT

I. INTRODUCTION

A wireless sensor network is a collection of nodes organized into a co-operative network. Each node consists of processing capability and may contain multiple types of memory (program, data and flash memories), have a RF transceiver (usually with a single Omni-directional antenna), have a power source (e.g., batteries and solar cells), and accommodate various sensors. The nodes communicate wirelessly and often self-organize after being deployed in an ad hoc fashion. Systems of 100s or even 10,000 nodes are anticipated. Such systems can transmute the way we live and work. Today wireless sensor networks are beginning to be deployed at an accelerated pace. It is not unreasonable to expect that in 15-20 years that the world will be covered with wireless sensor networks with access to them via the Internet. This can be considered as the Internet becoming a physical network. This new technology is exciting with unlimited potential for numerous application areas including environmental, medical, transportation, military, crisis management, entertainment, smart spaces, and homeland defense [12].

The mobile nodes in MANET usually need to be untethered and thus powered by batteries which provide limited energy. In the absence of central controlling, each node participates in the network, causing them to spend more energy. A lot of work is getting done in terms of optimizing the wireless sensor networks using a lot of different algorithms. The up standard of wireless sensor network is Mobile ad hoc network. There are vast algorithms in mobile adhoc network which consists better routing algorithms as compared to the wireless sensor network algorithm. In the past few years many protocols has been came into existence like BIP, LMST, SPT that enhance throughput and then decreasing energy consumption , but they increases the network size. Our proposed work is motivated from the mobile adhoc network protocols in which we are trying to combine the two MANET algorithms to enhance the performance of the system in terms of bit energy consumption and throughput. So here we use MANET along with AODV and DPR.

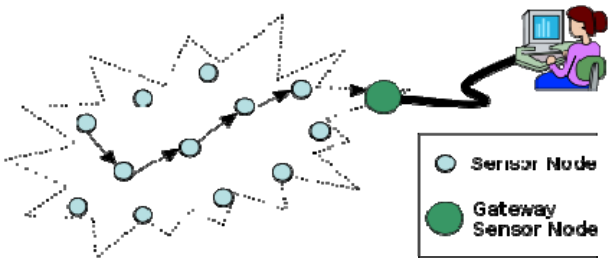


Figure Structure of simple WSN

Ad-hoc On-Demand Distance Vector (AODV) routing protocol is designed for use in ad-hoc mobile networks. It is a reactive protocol: the routes are created only when they are needed. AODV uses traditional routing tables and one entry per destination, and sequence numbers to determine whether routing information is up to - date and to prevent routing loops. An important feature of reactive protocol is the maintenance of time-based states in each node: a routing-entry not recently used becomes invalid. In case of a route is broken the neighbors can be informed. Route discovery is based on query and reply cycles, and route information is stored in all middle nodes along the route in the form of route table entries. More control packets are used: routing request message (RREQ) is broadcasted by a node requiring a route to another node, routing reply message (RREP) is unicasted back to the source of RREQ, and route error message (RERR) is sent to notify other nodes of the loss of the link. HELLO messages are used for detecting and monitoring links to neighbors.

Dynamic Probabilistic Route Discovery (DPR) protocol based on neighbor coverage. In this approach, each node determines the forwarding probability according to the number of its neighbors and the set of neighbors which are covered by the previous broadcast. This scheme only

considers the coverage ratio by the previous node, and it does not consider the neighbors receiving the duplicate RREQ packet. Thus, there is a room of further optimization and extension for the DPR protocol. Several robust protocols have been proposed in recent years besides the above optimization issues for broadcasting.

II. Problem Statement

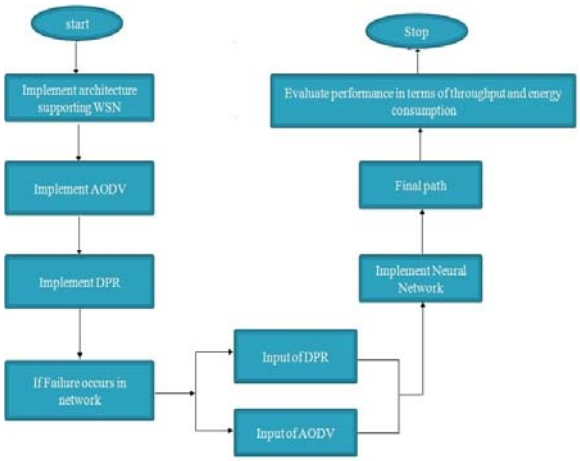
If the wireless nodes are within the range of each other, the routing is not necessary. But if nodes moves out of this range, and they are not able to communicate with each other directly, intermediate nodes are needed to organize the network which takes of the data transmission with less throughput and high energy consumption. The purpose of a routing algorithm is to define a scheme for transferring a packet from one node to another by consuming less energy consumption and high throughput. These two algorithms should choose some criteria to make routing decisions, for instance number of hops, latency, transmission power, bandwidth, etc so that this problem can be minimized

III. Methodology

The energy constraint and throughput are the critical issues for such a network, and a lot of works have focused on how to optimize the energy consumption and keep the same level of network efficiency and throughput. These works was principally interested on the routing layer, and tried to propose optimized routing protocols that take into consideration the energy constraint. In fact, routing in these networks is based on a simple and intuitive approach: the retransmission of the packets by each node allows the propagation through the network. The problem lies in the choice of the optimal route. The totality of routing protocols, suggested by the Mobile Ad-hoc Network group (MANET) of the Internet Engineering Task. Thus, some nodes become responsible for outing packets from many source destination pairs. After a short period of time, the energy resources of those nodes get depleted, which leads to node failure. It is therefore significant that the routing protocols designed for ad hoc networks take into account this problem. Indeed, a better choice of routes is one where packets get routed through paths that may be longer but that contain only nodes that have enough energy. This work aims at specifying an energy and throughput aware routing protocol based on this concept, and we use the most known routing protocols. AODV (Ad-hoc on demand Distance Vector) and DPR.

IV. Proposed Model

In the proposed approach the WSN is implemented using the MANET routing protocols called AODV and DPR. These routing protocols are embedded in WSN to enhance the network life time, energy consumption, throughput and other quality parameters. In propose case if any failure occurs in network then inputs of AODV and DPR is feeded to neural network which generate final path from source to destination. From that final path we can evaluate performance in terms of throughput and energy consumption.



Flow chart of proposed work

V. Result And Analysis

The experimental setup, defines about the network architecture and the MANET protocol that are embedded in the WSN to increase the throughput and reduce the energy consumption.

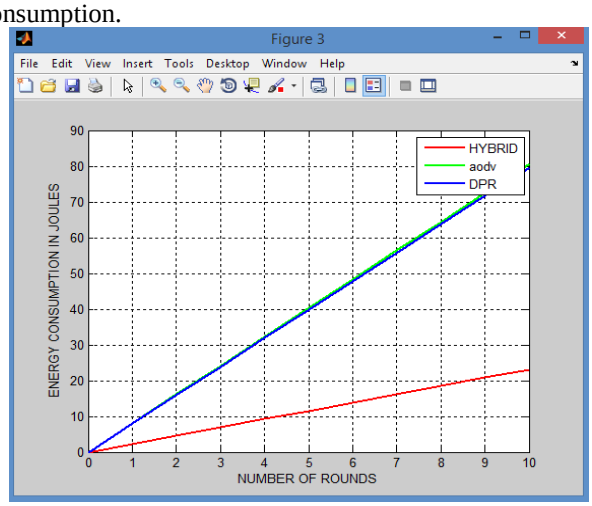


Figure shows Energy Consumption

The above graphs detail us about the number of rounds and the energy consumption. As the number of rounds increases energy consumption decreased in HYBRID protocol.

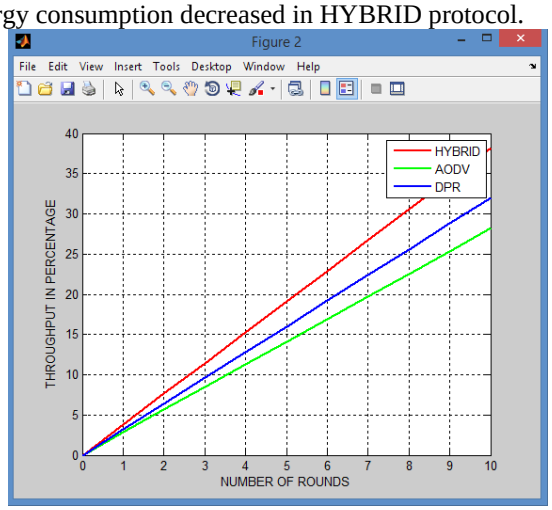


Figure shows Throughput

The above graphs detail us about the number of rounds and the throughput. As the number of rounds increases throughput also increased in HYBRID protocol.

VI. CONCLUSION ANDFUTURE SCOPE

In this paper, we proposed a fusion of AODV and DPR based on neural networks. From the simulation results, we can illustrate a number of conclusions. Throughput of Hybrid approach based on Neural- Network is better than that of existing approach. Energy consumption of Hybrid approach based on Neural Network is reduced as compare to existing approach. There are several scheduling algorithms which can be tried in this contrast like ROUND ROBIN, PRIORITY ALGORITHM which can put a lot of good effort on the system. The future research workers might also try other swarm optimization techniques like PSO.

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