Literature Survey on Optimization of Power in Adhoc Networks

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Abstract— In the present trend there is a exceptional development in Telecommunication technology in building the mobile electronic equipments attainable to a communication network. These electronic devices are nothing but the nodes of the Mobile Adhoc Network (MANET). Each node is autonomous, it can move from one place to other during communication and this flexibility is having its effect on power consumption of the mobile network. Mobility changes when velocity of the node and pause time with which it moves changes. Power optimization can be obtained either by increasing or decreasing transmission power of mobile nodes as required. Ad-hoc wireless networks will be engaged in situations where the communicating nodes will not have access to wired power such as an electricity networks.

Keywords— Power optimisation, Ad-hoc Network , Mobile Nodes

I. INTRODUCTION

An ad hoc network consists of a group of mobile nodes which spontaneously form temporary networks without the help of a fixed infrastructure or centralized management. The routers are free to move randomly and organize hence the network's wireless topology may change rapidly and unpredictably. Any two nodes can communicate either directly or relayed through other nodes. Here each node can work either as a source, destination or routing node. The nodes in MANET are allowed to move freely in random pattern. The mobility and transmission power of mobile nodes plays an important role on performance of MANET routing protocols. Detailed analysis of performance can give the causes of performance degradation. Remedy of those causes may increase the performance. The research literature of adhoc networks has been traditionally concentrated on routing and medium access control and only recently there has been an increased interest in distinguishing the capacity of such networks. One important feature of adhoc wireless network design and operation is power control, since desired result in this sense will multiply battery life and thus the anticipated operation life of the network [1]. Optimization refers to the process of making a device or a collection of devices run more efficiently in terms of time and resources.

II. LITERATURE SURVEY

A. Optimisation of power in mobile network

M.D.Boomija has proposed a network design in which a process of optimizing variables is used in this paper[1]. The optimization of network parameters is a feedback process of optimization and performance estimation through simulation. Two approaches (i) Generic Solver (ii) Specialized method. In generic solver the set of control variables and objective parameters are the input to the assignment. In the specialized method, the solution is formulated by using AMPL modeling language. It is an encompassing and compelling algebraic modeling language for collinear and non-collinear optimization problems. The resources which are to be efficiently allocated on an adhoc wireless network are spontaneously distributed, occupies either on the nodes or the edges of the graphs that represent the network state. The algorithms in this structure are divided into two categories: 1) centralized and 2) distributed. The first one operates on single snapshots or on a time-averaged model of the global network state. The second one operates as a control mechanism on the node. For a nontrivial multi objective augmented problem, there is not one solution that at the same time optimizes each target. In that case, the target functions are said to be conflicting, and there exists a (possibly infinite number of) Pareto optimal solutions. Researchers study multi objective optimization problems from different viewpoints and, thus, there exist different solution ideologies and objectives when setting and solving them.

B. Analysis of Effect of AODV and DSR

In this paper[2] Banojkumar et al. have compared the performance AODV & DSR routing protocol at different pause time and transmission power.

In this paper they have explained the concept of AODV and DSR routing protocol briefly. Using GloMoSim simulator different performance parameters related to the AODV & DSR routing protocol are calculated and examined. From the analysis it is observed that the Packet delivery fraction is more in AODV routing protocol than DSR routing protocol at high mobility condition and it increases in decrease in mobility. The end to end delay is more in AODV routing protocol than DSR routing protocol at high mobility condition and almost equal in low mobility NRL of AODV is higher than DSR at lower transmission power. In low mobility link break link break is less in both the cases and in case DSR is

comparatively high. PDF of AODV & DSR increases with increase in transmission power at high mobility. With increase in transmission power the number of route break also decreases so the ETD of AODV and DSR decreases and number of route break decreases no NRL also decreases at high mobility.

To overcome the drawbacks of AODV and DSR routing protocol , fish eye state routing protocol is used to route nodes from source to destination in the proposed method. FSR uses the "fisheye" technique where the technique was used to reduce the size of information required to represent graphical data. The eye of a fish captures with high detail the pixels near the focal point. The detail decreases as the distance from the focal point increases.

C. Semantic Solutions for Saving Energy

Kalil A Bispo et al. present a semantic solution composed by a middleware and ontology which have especially focused on energy savings in this paper[3].The results of the conducted experiments have raised our awareness about the importance of such approach. Not to mention that one feature of the proposed solution refers to the fact that all data will be semantically "enriched" with categorized information, thereby facilitating their access. Moreover, the proposed middleware adopts the model of component oriented programming supported by TinyOS. In addition to a programming style in a high level abstraction, the use of a programming model enables the reuse of many middleware components that assist in the development applications for many fields. All in all, as a result of this study, we have reached the implementation of an architecture which focuses on semantics, as well as the development of an ontology that works to optimize energy savings. In the final analysis, the research carried out for the development of this work and its respective results have shown the need for further studies on particular aspects and suggested new research directions such as predicting future behavior based on data collected from semantic inference.

D. Power Control Algorithms

It is noticed after literature review that an algorithm decides the set of powers for planned users to reduce transmission power in a framework. It was not possible to decide the individual power of node in a network build up algorithm is effective in determination of individual node power. This algorithm is not working systematically with encoded scheme in a framework.

1) Distributed Power Control Scheme and Power Scheduling

It is observed after the literature review that the power control problem is continue due to crowding, methodical and high data transfer rate in mobile ad-hoc network.

2) Transmission Power Control Protocol

It is observed after literature review that Transmission power control scheme is not effective for long range communication due to signal loss and low throughput. Access window scheme is affected by interference of nodes. Transmission control scheme has higher link throughput with higher transmission power. Quality of signal is low in a network

3) Power Control By Power Saving

It is observed after literature review that On-demand power management frame work is not effective for large size network due to dynamic configuration of network.[4] Powers saving algorithms are not effective in case of high speed dynamic topology. Ad-hoc medium access layer cannot maintain quality of service with low transmission power. Multiple input multiple output communication system could not maintain lifetime of network. Network efficiency could not improved by using routing algorithm. Power control is not maintained by power saving.

Power control algorithms are not effective way of optimizing power because of following reasons i)high data transfer rate in mobile adhoc network ii)interference of nodes iii)quality of signal is low in mobile networks iv) on demand power management framework is not effective for large size network due to dynamic configuration of network.

In the proposed method power is optimized by a semantic technique wherein power is efficiently used.

E. Fast Route Convergence

The work presented here launches a redirector discovery algorithm which arrives at the final route in lesser number of iterations, by including the possibility of adding two redirectors in each iterations. With this faster route convergence, greater power savings may be achieved, with the respective advantages this brings. **[5]**

III. CONCLUSIONS

In literature survey, identified problems in the research work related to power control, which need to be addressed in an attempt to promote power control for mobile ad-hoc network.

Mobile Ad-hoc networks consist of mobile nodes with no fixed infrastructure and self organized in nature. There are number of challenges offered by mobile ad-hoc network environment like limited power, route failure, synchronization, security etc. Nodes in the mobile ad-hoc network environment have limited battery power. Design of each layer protocol must approach to save energy. Each node in mobile ad-hoc network works as router.

Extra amount of energy is needed by router to forward and to relay packets. Power control in ad-hoc networks is a more difficult problem due to non-availability of access point in network. Power control problem is defined by two ways. First, in ad-hoc networks, a node can be both a data source and a router that forwards data for other nodes .Node is involving in high-level routing and control protocols. Additionally, the role of a particular node may change over time. Second, there is no centralized entity such as an access point to control and maintain the power control mode of each node in the network.

Neuron based network model may be used to assign transmission powers to the nodes in such a way that total power consumption is minimized in mobile ad-hoc network. The neural based network model is based on the minimum energy level of each node in ad-hoc network. This model will be helpful to design effective algorithm to solve power control problem in mobile adhoc network. Neural processing nature of algorithm presents a different effective way to store and manipulate knowledge. Module is based on a connectionist approach. The connections are based on the learning capability and discovery of representations

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