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Improve the Utilization of Resource Allocation in Wireless Sensor Network using Heuristics Approach

Madhu Sharma[1], Prof. Jitendra Mishra[2]

[1]M. Tech Scholar, Department of EC, PIES, Bhopal (India)

[2]Head & Professor, Department of EC, PIES, Bhopal (India)

[1]er.madhu05@gmail.com, [2]jitendramishra@gmail.com

ABSTRACT

Resource allocation in wireless mesh network is very critical task. For the allocation of resource such as channel used various scheduling technique such as centralized and distributed. In centralized technique the allocation of channel resource shares in single window process. For the improvement of the performance various authors used various optimization techniques such as evolutionary approach and other heuristic function. In this paper we used genetic algorithm for the selection of resource such as cannel in wireless network. By the genetic algorithm the selection of channel is very fair and improved the channel capacity, throughput, and packet delivery ratio.

Keywords: Wireless sensor networks, Attack, resource allocation, Cognitive radio network, Mobile ad-hoc networks.

INTRODUCTION

Wireless Mesh Networks (WMNs) have become the focus of much research since they allow for increased coverage while retaining the attractive features of low cost and easy deployment. WMNs have been identified as key technology to enhance and complement existing network installations as well as provide access where traditional technology is not available or too costly in install [1]. A WMN is made up of mesh routers (MRs), which have limited or no mobility, and mesh clients (MCs) which are often fully mobile. The mesh routers form the backbone of the network allowing the clients to have access to the network through the backbone. We propose an algorithm for fair scheduling in WMNs with multiple gateways [9]. We also propose another algorithm for scheduling which places more emphasis on throughput while retaining a basic level of throughput called mixed-bias. This technique biases against characteristics of the network which are detrimental to performance, fairness, or both. Many protocols currently implemented for WMNs have evolved from traditional single-hop wireless local area networks (WLAN) and mobile ad-hoc networks (MANET).

Resource allocation and resource utilization is important factor in wireless mesh network. In wireless mesh network faced a problem of traffic congestion and delay rate. Such type of event generated due to sharing of channel and limited number of channel. For the reduction of traffic congestion and delay various authors used optimization technique. In consequence of optimization technique one author are used game theory techniques [8]. Game theory technique search number of available channel using Depth search technique and increase the rate of delay. Now in this dissertation used genetic algorithm for the selection of channel. Genetic algorithm is dynamic population based searching technique

used for the process of resource optimization. The process of optimization finally gives the optimal list of channel for allocation.

The network that uses wires is known as a wired network. Initially the networks were mostly wired networks. When there is a use of wire in a network, definitely it also requires network adapters, routers, hubs, switches if there are more than two computers in a network. The installation of a wired network has been a big issue because the Ethernet cable should be connected to each and every computer that makes a network. Definitely this kind of connection takes time, in fact more time than expected, because when we connect wires with computers we have to take care of lot of things like wire should not come under the feet, it should be under ground or it should be under the carpet if computers are in more than one room. However in new homes nowadays, the wiring is being done in such a way that it will look like as it is a wireless connection, greatly simplifying the process of cables. Similarly the wiring of a wired network depends on lot of things like what kind of devices are being used in a wired network, whether the network is using external modem or is it internal, the type of internet connection and many other issues. As we know making a wired network is not an easy task, but still there are many other tasks that are more difficult than making a wired network, but we are not going to discuss these tasks here. In configuring the wired network, the hardware implementation is a main task. Once the hardware implementation is finished in a wired network, the remaining steps in a wired network do not differ so much from the steps in a wireless network [6].

The rest of this paper is organized as follows in the first section we describe an introduction of about the wireless sensor network and attack. In section II we discuss about the Channel fading, In section III we discuss about the Dynamic channel assignment. In section V we discuss about the rich experimental results and discussions, finally in section V we conclude and discuss the future scope.

II FADING

In wireless communications, fading is deviation of the attenuation affecting a signal over certain propagation media. The fading may vary with time, geographical position or radio frequency, and is often modeled as a random process. A fading channel is a communication channel comprising fading. In wireless systems fading may either be due to multipath propagation, referred to as multipath induced fading, or due to shadowing from obstacles affecting the wave propagation, sometimes referred to as shadow fading. The presence of reflectors in the environment surrounding a transmitter and receiver create multiple paths that a transmitted signal can traverse. As a result, the receiver sees the superposition of multiple copies of the transmitted signal, each traversing a different path. Each signal copy will experience differences in attenuation, delay and phase shift while travelling from the source to the receiver. This can result in either constructive or destructive interference, amplifying or attenuating the signal power seen at the receiver. Strong destructive interference is frequently referred to as a deep fade and may result in temporary failure of communication due to a severe drop in the channel signal-to-noise ratio. Fading channel models are often used to model the effects of electromagnetic transmission of information over the air in cellular networks and broadcast communication. Fading channel models are also used in underwater acoustic communications to model the distortion caused by the water.

III DYNAMIC ASSIGNMENT

Dynamic assignment strategies allow any interface to be assigned any channel, and interfaces can frequently switch from one channel to another. Therefore, when nodes need to communicate with each other, a coordination mechanism has to ensure they are on a common channel. For example, such mechanisms may require all nodes to periodically visit a predetermined rendezvous channel to negotiate channels for the next phase of transmission. In the Slotted Seeded Channel Hopping (SSCH) mechanism, each node switches

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channels synchronously in a pseudo-random sequence so that all neighbors meet periodically in the same channel. The benefit of dynamic assignment is the ability to switch an interface to any channel, thereby offering the potential to use many channels with few interfaces. However, the key challenges involve channel switching delays (typically on the order of milliseconds in commodity 802.11 wireless cards), and the need for coordination mechanisms for channel switching between nodes.

IV EXPERIMENTAL RESULT ANALYSIS

Simulation is an experimental process in that process proposed a simulated model for resource allocation for wireless network and put some standard parameter for valuation of result. In our research work perform improve the throughput, energy efficiency and packet delivery ratio in wireless network.

For the performance evaluation of wireless mesh network used MATLAB software package. MATLAB is a software package for high-performance numerical computation and visualization. It provides an interactive environment with hundreds of built-in function for technical computation, graphics and animation.

Genetic algorithms are search algorithms based on the mechanics of natural selection and natural genetics. They combine survival of the fittest among string structures with a structured yet randomized information exchange to form a search algorithm with some innovative flair of human search. These algorithms are started with a set of random solution called initial population. Each member of this population is called a chromosome. Each chromosome of this problem which consists of the string genes, the number of genes and their values in each chromosome depends on the population specification.

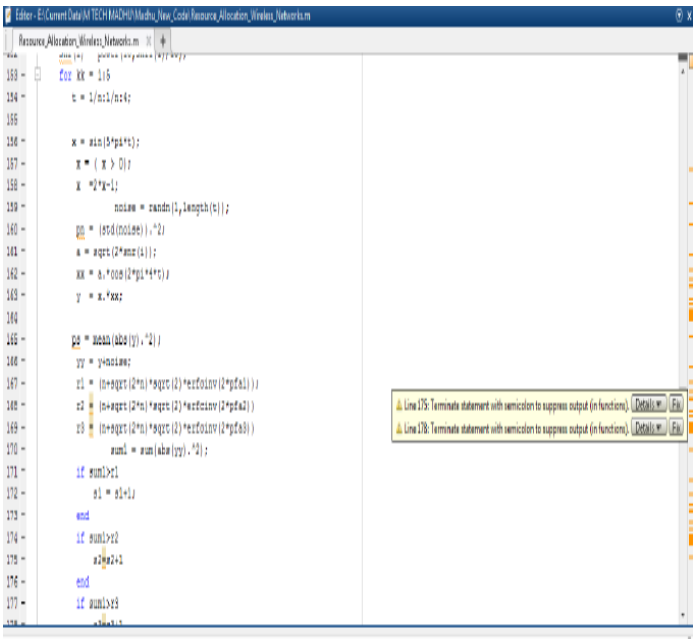

Figure 1: The above figure shows that the initially script environment for the matlab simulation.

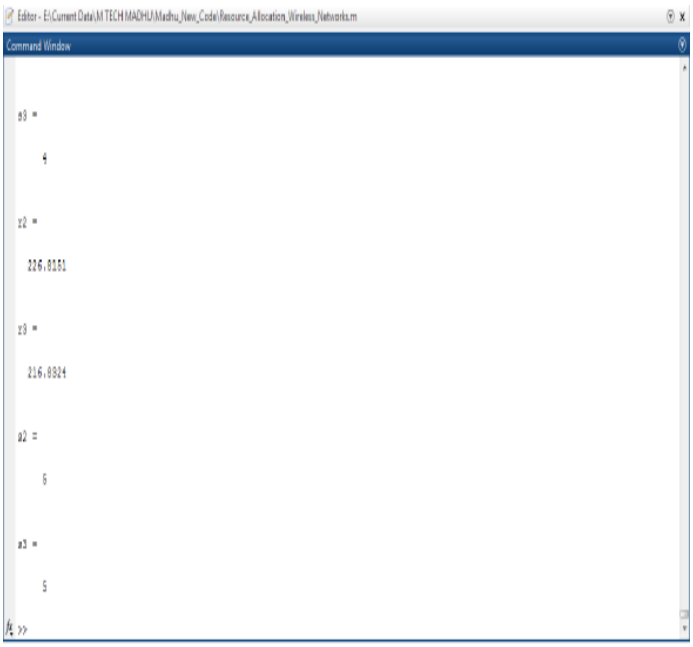

Figure 2: Shows that simulation scenario of existing methods for the resource allocation, also show background process.

V CONCLUSIONS AND FUTURE SCOPE

In heterogeneous multi-homing network, each mobile terminal has the requirement for secure communication over all available radio interfaces. Therefore, security issue becomes critical. Especially, physical layer security (PLS) is one of the important techniques against attacks from heterogeneous wireless medium based on information-theoretic approaches. In this dissertation modified the process of channel selection in wireless mesh network. The process of channel selection in wireless mesh network is very difficult due to limited number of resource and maximum number of user traffic. For the improvement of channel selection used genetic algorithm, genetic algorithm is dynamic population based searching technique. The increasing the size of mesh network the process of genetic channel selection process faced a problem of normal selection of channel.

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Madhu Sharma received her Bachelor`s degree in Electronics & comunication, MIT, Ujjain, M.P., in 2011. Currently she is pursuing Master of Technology Degree in Electronics & Comunication (Digital communication) from PIES, (RGPV), Bhopal, Madhya Pradesh India. Her research area include Wireless sesnor networks.

Mr. Jitendra Kumar Mishra he is Associate Professor and Head of the Department of Electronics and communication in PIES, Bhopal (RGPV). His received Master of Technology and Bachelor's of engineering respectively in Digital communication from BUIT, Bhopal and from RGPV, Bhopal. He has more than 11 years of teaching experience and publish 35+ papers in International journals, conferences etc. His areas of Interests are Antenna & Wave Propagation, Digital Signal Processing, Wireless Communication, Image Processing etc.