IOSR Journal of Computer Engineering (IOSR-JCE)
e-ISSN: 2278-0661, p-ISSN: 2278-8727
PP 48-57
www.iosrjournals.org

AN ENERGY EFFICIENT ROUTING BASED ON OLSR IN WIRELESS SENSOR NETWORK

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Abstract: A wireless Sensor Network transfers the data one node to another node, energy efficient manner. An OFDMA method reduced the power conception is independent for Transmitted and Reception. We designed, Optimized link state routing protocol (OLSR).The link state routing protocol. all lump contribute inside an OLSR MANET has to at least fulfill the core functionality while it may implement further enhancements from the auxiliary functions without influencing compatibility with core functionality. Messages corresponding to functions not implemented by this node have to be forwarded in such a way that other nodes that do implement these functions can receive these packets The RFC specifies OLSR as a pure route maintenance protocol which is responsible for determining and maintaining routes but not for actually forwarding data packets. This is supposed to be done by some necessary system. In OLSR all node is known by a “major address” Though a node can have multiple interfaces it is identified by just one of these which is chosen to be the nodes. Finally, minimize the Transmission power using MIMO (Multi-Input and Multi-Output).

Index Terms— Wireless sensor networks, Exterior gate way routing protocol (EGP), MIMO, Optimized Link State (OLSR), Orthogonal Frequency-Division Multiple Access (OFDMA)

I.INTRODION

Why Energy-Efficient Communications AdditiUCTonally, it has been reported that mobile operators are previously among the top energy consumers (for example, Telecom Italia is the second major energy consumer in Italy), and energy consumption of mobile networks is increasing much quicker than ICT on the whole in addition, as the collection operation of 3G systems in increasing countries (like China and India) and presently 4G systems worldwide occurs, mobile communications will put away considerably more energy if no efficient procedures are taken. A large electricity bill results from the huge energy consumption of a wireless base station (BS). More than 50% of the whole energy is consumed by the radio access part, where 50-80% is used for the power amplifier (PA). it is as well pointed out that the energy bill accounts for around 18% of the Operation Expenditure (OPEX) in the grown-up European market and at least 32% in India. Therefore, beginning the operators’ perspective, energy efficiency copy expected 26 March 2011; revised 7 September 2011 and 14 December 2011.therefore, it is urgent to change from follow optimal capacity and spectral efficiency to efficient energy custom what time designing wireless networks. From the users’ perspective, energy-efficient wireless communication is also imperative.

Wireless sensor networks have been the center of large research during the past few years. The study issues currently addressed in wireless sensor networks are hardware limitation, communication and direction-finding issues, data management problems, and software engineering principles. One of the most significant issues separately from the above mentioned ones is energy optimization in wireless sensor networks. A Sensor network is collected of a large number of sensor nodes that are densely deployed either inside the environment or close to it. The location of sensor nodes is prearranged. This allows random deployment in inaccessible terrains or 0

Wireless Sensor Networks (WSNs) are creature use in a broad variety of severe needs such as services and health-care applications. WSNs are organized closely in a variety of physical environments for accurate monitoring. A WSN is usually deployed with motionless sensor nodes to carry out monitoring missions in the area of notice. However, due to the active changes of events and unfriendly surroundings, a clean static WSN could face the following cruel troubles: The original operation of a WSN may not assurance total reporting of the sensing field and connectivity of the complete system.

Generally, sensor nodes may be dotted in a aggressive region from the airplane or by robots [1]. Conversely, these arbitrarily deployed sensors could not assurance to envelop the entire area and may be partitioned into more than a few no connected sub networks, even though we spread out a vast quantity of nodes. In addition, the dynamic change of regions of concentration and the survival of obstacles could make the difficulty become more hard.2. Sensor nodes are habitually battery-powered and flat to errors. As a few nodes expire due to the fatigue of their power, there could exists holes in the WSN's reporting. In addition, these passing away nodes may split the network connectivity. On the other hand, in many scenarios, it is pretty thorny to refresh sensor nodes or organize new nodes to restore these passing away nodes.3. The WSN may be necessary to support several missions below different setting [2]. For example, in an object tracking application, satisfactory sensor nodes should be deployed along the path of the goal, while in a border line recognition assignment; there should be satisfactory nodes along the pre-described boundary. These dissimilar necessities cannot be simply fulfilled by deploying a huge quantity of sensor nodes, given that provisioning for all potential combinations of assignment necessities could not be inexpensively possible.4. Some applications may require complicated (and thus luxurious) sensors to engage in. For example, one can visualize that in a armed request, heaviness sensors may be deployed along the border line to distinguish whether any adversary intrudes in. However, these sensors can only report amazing transitory but cannot illustrate what passes through them. In this container, additional difficult sensing strategy like cameras should be compulsory to get hold of more information. On the extra hand, it is infeasible to provide camera on every lump because of their outsized numeral. By establishing mobility to a numeral of or all one nodes in a WSN, we can enhance its ability and give to carry multiple missions and to knob the aforementioned problems. even though a WSN is regularly measured as an ad hoc network in which nodes are comprehensive with sensing competence, a mobile WSN and a mobile ad hoc network (MANET) are basically different. Mobility in a MANET is frequently random, whereas mobility in a mobile WSN should be "premeditated". In other words, we can manage the association of mobile sensors to behavior dissimilar missions. In wireless sensor networks geographic navigation is a key pattern that is fairly normally adopted for information release, where the position information of the nodes is accessible. The proposition of geographic routing protocols is competent in sensor networks for numerous reasons. Initially, nodes require knowing only the position information of their straight neighbors in order to onward packets and consequently the state stored is minimized. Secondly, since detection floods and condition broadcast are not compulsory outside a solitary hop therefore, such protocols preserve power and bandwidth [3]. When sensor nodes frontwards communication in the network they use their force in forwarding instrument but at some point when node depletes its all power it fails to broadcast supplementary messages resultant in defeat of data. Habitually, in greedy forwarding, the contiguous neighbor node will be greatly utilized in steering and forwarding messages whereas the additional nodes are fewer utilized. This unreliable load allocation outcome in deeply burdened nodes to expulsion faster when compared to others. This causes the breakdown of few over-utilized nodes which consequences in loss of data, ensuing in augment of abortive messages in the network [4]-[5]. In this paper, the above mentioned troubles faced by greedy forwarding approach will be taken mind of in sensor networks by proposing an power knowledgeable navigation approach that will lessen the data beating and exploit the duration of the network. The relax of this paper is prepared as follows: Section II presents associated work. Section III presents enthusiasm and objectives of the planned investigate. Section IV describes the projected algorithm. Section V describes the information of simulation model.

II.RELATED WORKS

[1] One method key chains and late revelation of keys; although, such a move toward need occurrence harmonization and delayed verification. **[2]**A resourceful signature-based technique to intelligence and damage contagion attacks for the functions accepts linear set of connections regulations procedure. **[3]** Attacks on confidentiality and verification is normal Cryptographic method can defend the confidentiality and validity of declaration channels**[4]** preserving validity in multicast protocols is a much extra multifaceted difficulty than for uncast; in exacting, recognized solutions are prohibitively unproductive in several cases. **[5]** The important advances of hardware developed equipment and the growth of capable software algorithms create strictly **[6]** we learn negligible power broadcast of busty sources in excess of wireless channels with limitation on denote queuing delay **[7]** consumer communicating more than a loss channel with ideal channel state in sequence. Data is unspecified to reach your destination beginning some advanced coating submission and be stored in a barrier awaiting it is transmitted **[8]** active power supervision schemes (also called policies) can be old to manage the authority utilization levels of electronic systems

III.PRELIMINARIES

A. Dipole Antenna

Dipole antenna is the simplest and the majority widely used class of antenna. It consists of two equal conductive elements such as metal wires or rods, which are typically bilaterally symmetrical. The powerful current as of the transmitter is useful, or for receiving antennas the output signal to the receiver is in use, between the two divide of the antenna. Every side of the feed line to the transmitter or receiver is linked to single of the conductors. This difference with a monopole antenna, which consists of a only pole or conductor with one surface of the feed line connected to it, and the additional side connected to some type of ground.

The majority ordinary shape of dipole is two directly rods or ropes leaning end to end on the similar axis, through the feed line connected to the two neighboring ends. Dipoles are resonant antennas, introduce that the essentials serve up as resonators, with standing waves of radio current graceful back and forward among their ends. So the distance end to end of the dipole essentials is resolute by the wavelength of the radio waves second-hand. The the majority normal form is the half-wave dipole, in which every of the two rod basics is in the region of 1/4 wavelength extended, so the entire antenna is a half-wavelength long.

B. TDMA

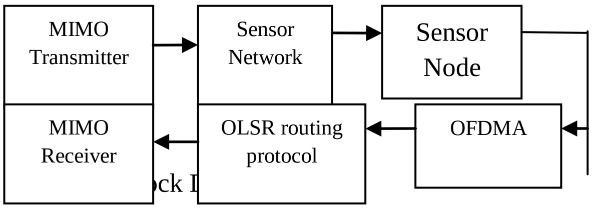
Wireless sensor networks (WSNs) consist of a great number of wireless sensor nodes that categorize themselves into multi hop radio networks. The sensor nodes are typically prepared by power-constrained batteries, which are frequently difficult and limited to be put back once the nodes are deployed. Therefore, it is a serious consideration on reducing the power consumption inside the network designed. In fact, it can consume nearly the same amount of energy as required for receiving. Therefore, nodes are usually planned to sleep when the data lines modules are not in use TDMA protocols split time into slots, which are allocated to sensor nodes that can turn on the broadcasting through the allocated time slots, and turn off the radio when not transmitting or receiving in the sleep scheduling. In arrange to be interference free, A simple move toward is to allocate each communication link a time slot, and thus, the quantity of time slots is equal to the number of communication links of the network. These systems need much additional occasion slots than necessary, which increases the wait and reduces the direct operation significantly. This is because multi-hop networks are able to make space reuse in the shared channel, and multiple transmissions can be scheduled in one moment in time slot without any interference.

C. EGP Routing Protocol

Exterior Gateway Protocols (EGP) are used for inter-autonomous system routing-routing between autonomous systems. Routing protocols, and more specifically the algorithm used by that routing protocol, use a metric to determine the best path to a network. The metric used by the routing protocol RIP is hop count, which is the number of routers that a packet must traverse in reaching another network. OSPF uses bandwidth to determine the shortest path.EGPs on the other hand, are designed for use between different autonomous systems that are under the control of different administrations. BGP is the only currently-viable EGP and is the routing protocol used by the Internet. BGP is a path vector protocol that can use many different attributes to measure routes. At the ISP level, there are often more important issues than just choosing the fastest path. BGP is typically used between ISPs and sometimes between a company and an ISP. BGP is not part of this course or CCNA; it is covered in CCNP.EGP is a simple reach ability protocol, and, unlike modern distance-vector and path-vector protocols, it is limited to tree-like topologies. During the early days of the Internet, EGP version 3 (EGP3) was used to interconnect autonomous systems. Currently, BGP version 4 is the accepted standard for Internet routing and has essentially replaced the more limited EGP3.

IV. PROPOSED WORK

The energy consumption rate for sensors in a wireless sensor network varies greatly based on the protocols the sensors use for communications and analyzed. An assessment by means of additional models intended for energy consumption is made and suggestions for future work are presented. The information in this section concerning the Optimized Link State Protocol is taken from its RFC 3561 [2]. Optimized Link State Protocol (OLSR) is a proactive routing protocol, so the routes are always immediately available when needed. OLSR is an optimization version of a pure link state protocol. So the topological changes cause the flooding of the topological information to all available hosts in the network. To reduce the possible overhead in the network protocol uses Multipoint Relays (MPR). The idea of MPR is to reduce flooding of broadcasts by reducing the same broadcast in some regions in the network, more details about MPR can be found later in this chapter. Another reduce is to provide the shortest path. The reducing the time interval for the control messages transmission can bring more reactivity



A. MIMO

MIMO can make available diversity gain and multiplexing increase. Mainly, variety gain is attaining by distribution signals that carry the same in order from end to end diverse paths among broadcast antennas and receiver antennas. Multiplexing increase can be obtained by transmitting autonomous in series streams in similar from end to end the spatial channels. Both help increase network throughput and decrease energy consumption. The collision of diversity gain and multiplexing increase on of MIMO transmission in wireless sensor networks is investigated. Through MIMO transmission, more antenna strategy will consume more route power. Therefore, MIMO is not forever additional energy-efficient than single-input and single output (SISO). A power consumption model of MIMO in considers all signals giving out bump at the source and the recipient. Based on this representation, the association between energy consumption and broadcast distance with SISO, SIMO and MIMO is investigated. It is shown that, at a short distance, SISO may outperform MIMO circuit energy consumption dominates the total energy require. The exchange among circuit power and broadcast power consumption to attain higher in MIMO systems the optimal MIMO mode with a required transmission rate is known. In a similar context, the adaptive MIMO switching strategy based on the available CSI, link energy efficiency. Cooperative MIMO and data aggregation techniques are combined to reduce the energy consumption in wireless sensor networks; this is accomplished by falling the quantity of transmitted data and by better allocating resources through cooperation.

The difficulty of energy-efficient MIMO previous is considered for a point-to point communication system with multiple antenna terminals power allocation in wireless ad hoc networks is structured as a non-cooperative game to maximize and, a link shut-down mechanism is proposed to reduce co-channel interference. In many practical systems, user terminals are usually equipped with only one antenna. Thus, traditional MIMO cannot be implemented. To overcome the limitation, multiuser MIMO (MU-MIMO), also called virtual MIMO, has been proposed. In MU-MIMO, multiple users cooperate for distributed transmission and information processing. Thus, local information exchange is indispensable for MU-MIMO. This causes additional energy consumption compared with traditional single-user MIMO (SU-MIMO). The local energy consumption for cooperation is considered, MU-MIMO is still more energy-efficient than SISO over a certain transmission distance. It is also shown that optimizing the constellation size can further increase .For both SU-MIMO and MU-MIMO, knowledge of the CSI is required. However, most of the mentioned work ignores the energy consumption of CSI signaling information. Thus, when the energy consumption of signaling information is measured, here strength is swap between the CSI accuracy and total energy efficiency.

B. Sensor Node

One major challenge in a WSN is to produce low cost and minute sensor nodes. There is a mounting quantity of minute companies producing WSN hardware and the profitable condition be able to be compared to residence computing inside the 1970s. a lot of of the nodes be silent in the investigate and growth stage, mainly their software. Also natural to sensor network adoption is the use of very low power methods for data acquisition.

C. OFDMA

Orthogonal frequency division multiple access (OFDMA) will be the leading multiple access method for subsequent to through the generation wireless networks since both of the two accepted 4G standards (Long Term Evolution-Advanced and 802.16m) have accepted OFDMA as the multiple access technology. OFDMA is distinguished by its simplicity and high spectral competence. In this approach, multiple accesses are achieved by allocating unusual sets of orthogonal subcarriers to different users. The benefit is that subcarriers can be adaptively allocated to the users that understanding high SNR. Hence, system capacity can be greatly increased. This is also recognized as multi-user diversity. Clearly, in OFDMA systems, multi-user diversity can be browbeaten not only to augment network capacity but also to decrease energy consumption. When a "good" channel is owed to the equivalent user, the transmit power can be radically reduced. Based on the over surveillance, an optimal subcarrier, bit, and power allotment algorithm reduced the total broadcast power is calculated in. The best store allotment scheme is shown to reduce the broadcast authority by about 5-10 dB difference with conventional schemes if circuit energy consumption is not considered. The impact of transmission rate, transmit energy and circuit energy consumption as well as channel gain on the OFDMA systems is analyzed, where flat fading channels are considered. It is proved that, for a given channel gain and constant circuit energy consumption, there exists a unique globally optimal transmission rate in terms of It is also proved that EE increases with the channel gain and the number of sub channels, while decreasing with the circuit energy consumption.

Based on these observations, the authors further propose energy-efficient link adaptation (rate and corresponding transmit power) and resource allocation (subcarriers) scheme for OFDMA systems. Simulation results show that the scheduler performs approximately 50% better than a round-robin scheduler in terms of EE. The work is later extended to the case of frequency-selective channels. Specifically, in an energy-efficient water-filling power allocation scheme is proposed, where it is proved that the maximal EE can be achieved by adapting both overall transmit power and its allocation according to the channel states and the circuit energy consumption. a closed-form solution of energy-efficient link adaptation is obtained with a time-averaged bits-per-Joule metric, where it is shown that this scheme can achieve almost the same performance as the global optimum which is obtained by exhaustive search, and with much less complexity. An energy-efficient link adaptation strategy for MIMO-OFDM based wireless communications is presented in where the optimal mode is chosen to maximize with QOS constraint In OFDMA systems, fairness among users is an important design standard. Adaptive resource allocation without considering fairness may cause poor service to some users since resource is always distributed to users with relatively high channel gains. Hence, when adaptive strategies are used to maximize energy efficiency, fairness should be taken into account. The fairness issue is considered a geometric-mean metric is proposed to guarantee that the sub channels are allocated to maximize the geometric average of the energy efficiency of all the users. Note that in the above discussion, the energy consumption of the signaling overhead is not measured. On the additional give, designed for an adaptive system, accurate CSI is imperative. Thus, the effect of signaling overhead on energy-efficient OFDMA design should be further studied. Additionally, when relay strategies are used in an OFDMA system, energy-efficient resource allocation may become more intricate; this will also require further investigation.

V.ALGORITHM DESCRIPTION

In the Algorithm Description method, a routing protocol is a protocol that identify how routers converse through every additional, distribute in arrange so as to allows them to choose ways between some two nodes on a processor arrangement, the alternative of method life shape total by navigation algorithm. The in order within this part about the Optimized Link State Protocol is in use as of its RFC 3561. Optimized Link State Protocol (OLSR) is a proactive routing protocol, so the routes are for all time right away obtainable at what occasion wanted. OLSR is an optimization account of a clean link state protocol. So the topological modify reason the flooding of the topological in order to all obtainable hosts in the system. To decrease the probable overhead in the system procedure uses Multipoint Relays (MPR). The thought of MPR is to decrease flooding of broadcasts by falling the similar broadcast in some regions in the network, more details about MPR can be found. Another reduce is to provide the shortest path. The falling the occasion gap for the manage messages broadcast can carry additional reactivity 4 OLSR uses two kinds of the control messages: Hello and Topology Control (TC). Hello messages are used for finding the in order concerning the link position and the host's neighbors. Through the Hello message the Multipoint Relay (MPR) Selector set is constructed which explains which neighbors has selected this host to act as MPR and as of this in order the host can analyze its own set of the MPRs. The Hello messages are throw only one hop away but the TC messages are broadcasted throughout the entire network.TC messages are used for broadcasting information about own advertised neighbors which includes at least the MPR Selector list. The TC messages are broadcasted periodically and only the MPR hosts can forward the TC messages. There is also Multiple Interface Declaration (MID) messages which are used for informing other host that the announcing host can have multiple OLSR interface addresses. The MID message is broadcasted throughout the entire network only by MPRs. There is also a "Host and Network Association" (HNA) message which provides the external routing information by giving the possibility for routing to the external addresses. The HNA message provides information about the network- and the net mask addresses, so that OLSR host can consider that the announcing host can act as a gateway to the announcing set of addresses. The HNA is considered as a generalized version of the TC message with only difference that the TC message can inform about route cancelling while HNA message information is removed only after expiration time. The MID and HNA messages are not explained in more details in this chapter, the further information concerning these messages can be found.

2. ROUTING

2.1 Neighbor Sensing

The link in the ad hoc network can be either unidirectional or bidirectional so the host must know this information about the neighbors. The Hello messages are transmit occasionally intended for the neighbor intelligence. The Hello messages are only broadcasted one hop away so that they are not forwarded added. What time the primary host receives the Hello message as of the next host, it sets the second host status to asymmetric in the routing table. When the first host sends a Hello message and includes that, it has the connection to the next host as asymmetric, the second host set first host status to symmetric in own routing table. Finally, when second host send again Hello message, where the status of the link for the first host is indicated as symmetric, then first host changes the status from asymmetric to symmetric. In the end both hosts knows that their neighbor is alive and the corresponding link is bidirectional. The Hello messages are used for getting the information about local links and neighbors. The Hello messages episodic distribution is second-hand for connection sensing, neighbor's discovery and MPR collection procedure. Hello message have: in order how frequently the crowd sends Hello messages, readiness of crowd to take action as a Multipoint Relay, and in order concerning its fellow citizen. In order about the neighbors include: border address, connection type and national type. The connection type point to that the link is symmetric, asymmetric or presently misplaced. The neighbor per is immediately symmetric, MPR or not a neighbor. The MPR type end to that the connection to the neighbor is symmetric and so as to this crowd has selected it as Multipoint Relay.

2.2 Multipoint Relays

The Multipoint Relays (MPR) is the key plan following the OLSR protocol to decrease the information replaces transparency. in its position of uncontaminated flooding the OLSR develop MPR to decrease the amount of the host which broadcasts the information throughout the network. The MPR is a host's single hop neighbor which may promote its messages. The MPR set of host is reserved miniature in arrange for the procedure to be competent. In OLSR merely the MPRs are capable to forward the information all through the network. Each host must have the information regarding the symmetric one skip and two skip neighbors in order to compute the finest MPR set. Information about the neighbors is taken from the Hello messages. The two skip neighbors are establishing from the Hello message since every Hello message contains all the hosts' neighbors. Selecting the lowest number of the one skip neighbors which covers all the two skip neighbors is the purpose of the MPR assortment algorithm. Also every host has the Multipoint transmit Selector position, which indicates which hosts has preferred the contemporary host to perform as a MPR When the host gets a innovative transmit message, which is require to be broaden throughout the network and the message's dispatcher boundary address is in the MPR Selector position, then the host must promote the message. Due to the potential changes in the ad hoc network, the MPR Selectors sets are modernized incessantly using Hello messages.

2.3 Multipoint Relays Selection

In this segment the proposed algorithm for the assortment of Multipoint dispatch locates is described. This algorithm is established. The algorithm constructs the MPR position which includes lowest number of the one skip symmetric neighbors from which it is achievable to contact all the proportioned severe two skip neighbors. The host must have the information about one and two skip symmetric neighbors in organize to begin the desired computation for the MPR set. All the replace of information are broadcasted using Hello messages. The neighbors which have category of excitement dissimilar than WILL_NEVER in the Hello message can be chosen to act as MPR. The neighbor must be symmetric in regulate to become an MPR.

Proposed algorithm for selecting Multipoint Relay set:

1. Take all the symmetric one hop neighbors which are willing to act as an MPR.2. Calculate for every neighbor host a degree, which is a number of the symmetric neighbors, that are two hops away from the calculating source and does not include the source or its one hop neighbors. 3. Add the neighbor symmetric host to the MPR set. If it is the only neighbor from which is possible to get to the specific two hop neighbor, then remove the chosen host neighbors from the two hop neighbor set. 4. If there are still some hosts in the two hop neighbor set, then calculate the reach ability of the each one hop neighbor, meaning the number of the two hop neighbors, That is yet uncovered by MPR set. Choose the node with highest willing value, if the values are the same then takes the node with greater number of reach ability. If the reach ability is the same, then take the one

with greater degree counted in the second step. After choosing the neighbor for MPR set remove the reachable two hop neighbor from the two hop neighbor set. 5. Repeat previous step until the two hop neighbors set is empty. 6. For the optimization, set the hosts in the MPR set in the increasing order basing on the willingness. If one host is taken away and all the two hop neighbors, covered by at least one host and the willingness of the host is smaller than WILL_ALWAYS, then the host may be removed. The possible improvements of this algorithm are needed, for example, when there are multiple possible interface addresses for one host.

2.4 Topology Information

In order to exchange the topological information and build the topology information base the host that were selected as MPR need to sent the topology control (TC) message. The TC messages are broadcasted throughout the network and only MPR are allowed to forward TC messages. The TC messages are generated and broadcasted periodically in the network. [2]The TC message is sent by a host in order to advertise own links in the network. The host must send at least the links of its MPR selector set. The TC message includes the own set of advertised links and the sequence number of each message. The sequence number is used to avoid loops of the messages and for indicating the freshness of the message, so if the host gets a message with the smaller sequence number it must discard the message without any updates. The host must increment the sequence number when the links are removed from the TC message and also it should increment the sequence number when the links are added to the message. The sequence numbers are wrapped around. When the hosts advertised links set becomes empty, it should still send empty TC messages for specified amount of time, in order to invalidate previous TC messages. This should stop sending the TC messages until it has again some information to send. The size of the TC message can be quite big, so the TC message can be sent in parts, but then the receiver must combine all parts during some specified amount of time. Host can increase its transmission rate to become more sensible to the possible link failures. When the change in the MPR Selector set is noticed, it indicates that the link failure has happened and the host must transmit the new TC message as soon as possible.

2.5 Routing Table Calculations

The host maintains the routing table, the routing table entries have following information: destination address, next address, number of hops to the destination and local interface address. Next address indicates the next hop host. The information is got from the topological set (from the TC messages) and from the local link information base (from the Hello messages). So if any changes occur in these sets, then the routing table is recalculated. Because this is proactive protocol then the routing table must have routes for all available hosts in the network. The information about broken links or partially known links is not stored in the routing table. The routing table is changed if the changes occur in the following cases: neighbor link appear or disappear, two hops neighbor is created or removed, topological link is appeared or lost or when the multiple interface association information changes. But the update of this information does not lead to the sending of the messages into the network. For finding the routes for the routing table entry the shortest path algorithm is used

IOSR Journal of Computer Engineering (IOSR-JCE)
e-ISSN: 2278-0661, p-ISSN: 2278-8727
PP 48-57
www.iosrjournals.org

OLSR Packet Format
Table : packet format

```
 0                   1                   2                   3
 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
|         Packet Length         |    Packet Sequence Number     |
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
|  Message Type |     Vtime     |         Message Size          |
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
|                      Originator Address                       |
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
|  Time To Live |   Hop Count   |    Message Sequence Number    |
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
|                                                               |
:                            MESSAGE                            :
|                                                               |
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
|  Message Type |     Vtime     |         Message Size          |
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
|                      Originator Address                       |
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
|  Time To Live |   Hop Count   |    Message Sequence Number    |
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
|                                                               |
:                            MESSAGE                            :
|                                                               |
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
:                                                               :
         (etc.)
```

V.RESULTS AND DISCUSSION

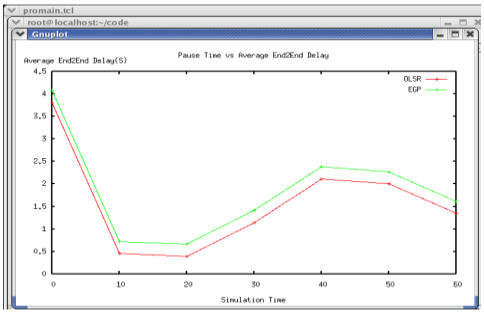


Figure: 5.1. End2End Delay

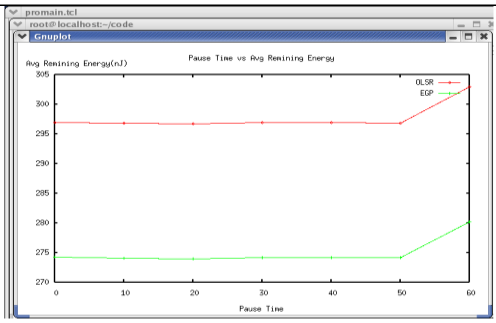


Figure: 5.2. Energy Consumption

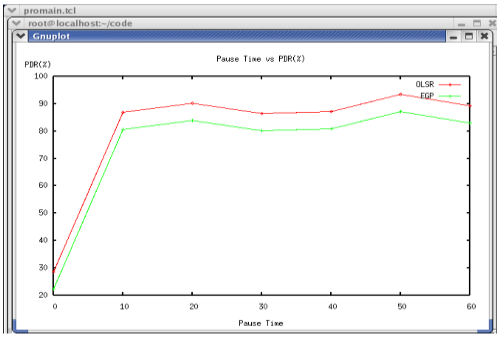


Figure: 5.3. PDR

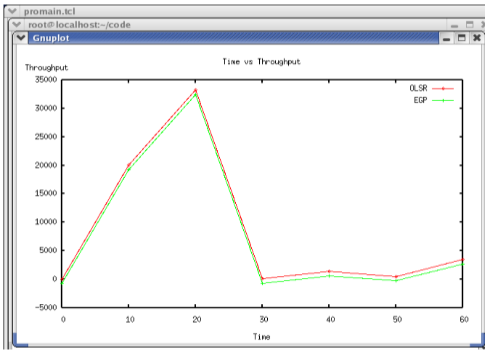


Figure: 5.4. Throughput

VI.CONCLUSION

In wireless network is widely minimize transmit power and minimize the energy consumption. The OLSR routing protocol is used to minimize the energy conception. MI-MO technology minimized the transmission power .they get the original output. In wireless networks, a widely studied approach are to minimize transmit powers subject to some Qos constraints. However, minimizing the transmit powers is not equivalent to minimizing the energy consumption. In this paper we addressed the problem of minimizing the overall energy consumption in wireless networks including the energy consumption for hardware. Therefore, we first pointed out some basic properties of the optimal power allocation. In order to give some insights, we then discussed the general energy minimization problem that depends on system parameters as the number of antennas *N*, on the transmission strategy represented by beam formers and number of parallel data streams and on transmit powers. Due to the fact that the general problem is quite complex we focused on a restricted problem. Considering the relation between transmission time and transmit power, we optimized both jointly to find an energy-optimal power-time tradeoff. More precisely, we proposed an algorithm that determines the energy-optimal number of data streams per link for a certain SIR requirement. To gain further insights into the energy minimization problem, it has to be considered for assumptions that may be more general or give another perspective on the problem. Further, note that the notion of energy minimization is not restricted to sensor networks.

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