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ENERGY EFFICIENT DATA GATHERING AND BUNNY HOPPING STRATEGY IN WSN RELAY NETWORK

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Abstract: Energy utilization is a vital factor when it comes to wireless sensor networks. Most of the wireless nodes are battery powered hence there is a need to effectively utilize the energy. Nodes uses almost 40 percent of energy when transmitting data to other nodes. In this paper, we use a Bunny hopping technique to transmit data's only when the data buffer in the node is full. This method of transmission method uses the energy effectively thereby increasing network lifetime. The data collision is minimized since the data's are transmitted between nodes only when the buffer if full which also indirectly improves network lifetime.

Keywords: Bunny hopping technique, data loss minimization, energy efficiency.

I INTRODUCTION:

Wireless network is a ever growing network due to its simple interface and ease of use. There are also certain repercussions that arise when implementing these wireless networks namely, the energy consumption and data collisions. To improve the network life time bunny hopping technique is used. In this technique data's is transmitted only when the buffer memory is full. Unlike normal network where the node start to transmit the data's as soon as it receives a data. This method results in data transmission only at certain times and not at all times. The data collision and network traffic is considerably reduced by this method. In this paper, keeping in mind the end goal to build remote sensor system life time, convention with element bunching is recommended. Since this system have constrained vitality, in this manner the vitality issue is vital. The new convention is proposed in two stages, group setup and enduring state. This stage comprise of making group, dynamic dissemination of bunch head, utilizing dynamic tree structure and turning hubs on and off basis stages which have the reason for dragging out remote sensor system life time. Taking everything into account, results picked up by the utilization of mimicking with MATLAB programming demonstrates that recommended convention expands the life time of remote system 15 percent contrasted with the old conventions[1]. We bring fabricating variety into a force model for a remote sensor system hub. System conventions for the remote sensor systems, for example, media access control and steering ought to be assessed as far as life time in an entire framework. Truth be told, there exists power variety hub by hub because of the assembling variety. In the past examines, in any case, this impact has not been explored at all since it has been gathered that all hubs have a same force. In this paper, we build up a force model for a sensor hub, in which we consider edge voltage variety got from an assembling process. We consider both a chip and a RF part for the model, and actualize it to QualNet so as to assess the effect against an existence time of a remote sensor system. The reproduction results demonstrate that the

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customary model has overestimated the life time longer than our model when hubs are haphazardly sent. Conversely, on the off chance that we make an ideal exploiting so as to send of hubs the force variety, the system life time is reached out by 12.7% contrasted with the instance of the routine model[2]. Remote sensor systems are the arrangement of hubs with helpful nature with the motivation behind detecting and checking. Each hub includes with the detecting, figuring, TV, handling limit, vitality usage and incitation. As the sensors are impart through remote medium the self-sorting out limit being used handle various measures of sensor hubs spread over a gigantic geographic segment for a vast scale environment perception. To accomplish an upgraded scope, more sensors must be dynamic, then more vitality would be used and the system lifetime is lessened. In remote sensor organize, the inclusions and life time are critical and essential concern with respect to the execution of the system.. A strategy for enhancing the scope and system lifetime of an agreeable sensor system is proposed. Closest Neighbour Assertion (NNA) technique decides the closest hubs which are spatially and transiently impacted and obstruction with one another. To show signs of improvement the pursuit time, utilize a n-d tree information structure, information driven paired inquiry tree. A neuro-fluffy based choice making id done in regards to the planning of sensors in different modes[3].Remote sensor system (WSN) comprises of numerous sensors to screen physical or ecological conditions, for example, wellbeing condition observing, military applications temperature, sound, vibration, weight, movement or toxins and to helpfully go the information through system to a principle area. The principle qualities of hubs in Wireless Sensor Network are low power and least preparing. So it is fundamental to streamline the utilization of vitality in WSN application. In this paper we acquaint another calculation with expansion life time of the sensor hubs in the system. Just couple of sensors are in dynamic state in the secured districts and the remaining are in perfect. Every one of the hubs change their status from dynamic to perfect and perfect to dynamic state occasionally. Interim the hubs which are in perfect state empower for a brief period to check whether the dynamic hubs are still dynamic or not. On the off chance that there is any disappointment hubs in the district perfect sensor get dynamic and sense the information. As every one of the hubs changes their status occasionally, couple of hubs just in dynamic state and begin to sense the information utilizing its vitality. So the vitality of perfect hubs is spared and it will be utilized just when it gets dynamic. The proposed calculation gives near ideal improvement in the system life time and the yield performs six times superior to anything existing calculation[4].The group heads transmit the information parcels of their own bunches, and those acquired from their comparing youngster hubs. On the off chance that the bunch heads find critical movement in the courses, they powerfully select option courses expecting less level of clog, to forward the information bundles to the higher guardian hubs. Along these lines, this convention builds up multipath directing plan in the systems. Vitality of the higher guardian hubs in the tree structure get exhausted speedier because of the upstream way of the activity. Subsequently, the thickness of sensor hubs in the higher guardian hubs is made high to amplify the system lifetime. Dependability of this convention is more, as, countless hubs are detecting the parameters of the neighbourhood the agreement choice of the c-uster individuals is sent to the sink[5].Remote sensor systems comprise of various little remote sensor hubs which take estimations and transmit them over remote connections. As remote sensors are asset compelled, the utilization of vitality and memory must be done admirably to expand the lifetime of hubs. It is additionally important to convey information dependably to make any application more helpful to the end client. A dependable and lightweight directing convention for remote sensor systems is exhibited in this paper. The convention indicates

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more than 90% investment funds in number of transmissions contrasted with the message flooding plan when the same course is utilized to transmit information messages. This sparing increment exponentially as the quantity of transmissions increments over a same course. The convention involves just 16% of aggregate accessible RAM and 12% of aggregate project memory in MICAz stage which makes it extremely lightweight to actualize in remote sensor systems. Its self recuperating capacity to recoup from live lock and stop improves its unwavering quality as a directing convention in remote sensor systems[6].The uses of remote sensor systems are truly compelled by vitality supply. So how to draw out the system lifetime is a vital and testing issue, which is the centre of planning the WSNs steering convention. We propose a methodology of the remote sensor system steering convention in view of insect settlement enhancement. The ACO approach consider the way defer as well as the hub vitality and the recurrence a hub going about as a switch to accomplish a dynamic and versatile directing, which can adequately adjust the WSNs hub power utilization and expansion system lifetime as far as might be feasible. Reproduction results have demonstrate the ACO directing convention fundamentally enhances the system lifetime[7].High conveyance proportion with low vitality utilization and transmission postponement is one of outline difficulties for remote sensor system directing convention. In this paper, we proposed a lattice based dispersed multi-jump directing convention (GDRP) for remote sensor system. At one time there is stand out hub is chosen as lattice head per matrix and the rotating so as to remain hubs perform framework head undertakings progressively. For the sole purpose of diminishing the vitality devoured by lattice heads, the between network correspondence utilizes multi-jump directing example. In GDRP every matrix head executes a dispersed calculation and picks an ideal next h-bounce directing way autonomously as indicated by the steering cost, separation and leftover vitality of neighbouring lattice heads. The analysis results show GDRP parities vitality utilization well, along these lines prompts a high information conveyance proportion, low transmission postpone and delayed system lifetime[8].As the most proper information preparing technique for surrounding insight, remote sensor system has an expansive space of use. A standout amongst the most critical uses of remote sensor system is flame safeguarding in building, and there are numerous unique innovation necessity for this application. Keeping in mind the end goal to determine hubs uneven circulation and precisely estimation the area and force of flame, an objective arranged dispersion steering convention in view of LEACH, which is called LEACH-TOD, is proposed. Drain TOD enhances the group heads selecting procedure of conventional LEACH convention, and balances the deformities of LEACH convention on discernment of bunch heads position and correspondence quality in group in the uneven hubs dispersion. The best possible bunching structure is framed through hub thickness measuring examine and edge impediment to give successful and sane directing structure for data gathering. The investigations demonstrate that the LEACH-TOD convention draws out the entire lifetime of the system and serves to the exactness of flame field parameter model establishment[9].In this paper, we diagnostically assess the normal inquiry reaction time of the Two-level Hierarchical Clustering based Hybrid-directing Protocol (THCHP) proposed as of late for remote sensor systems (WSNs). The exactness of the normal question reaction time examination is checked by means of numerical reproductions. Furthermore, normal inquiry reaction time correlations, in the middle of THCHP and a formerly proposed Adaptive Periodic Threshold-delicate Energy Efficient sensor Network (APTEEN) convention, demonstrate that THCHP is more qualified than APTEEN for deferral touchy WSN applications[10].

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II METHODOLOGY:

To improve network lifetime Bunny hopping technique is used to make the nodes to work accordingly so that the entire energy in the network is used effectively. To simulate wireless nodes on NS2 the nodes are initially created and data transmission is simulated. The nodes are created such that a group of node act as slave nodes and the other as router nodes which transmit data's to the slave nodes. For example there are three nodes namely node 1, node 2 ,node 3 and node 4 Since the data's are transmitted by nodes only when the buffer is full there

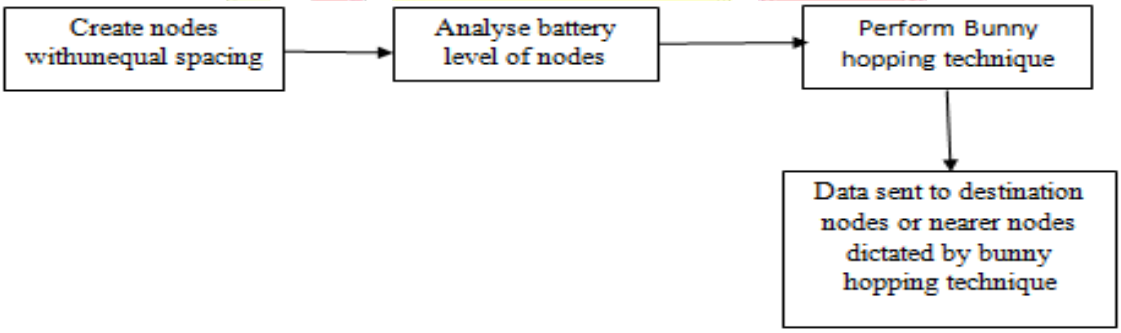

Figure 1: Block diagram.

If node 1 needs to send some data to node 4 then the data from node will be transmitted on to node node 3 which is at the final coverage area of node 1. Node 3 will continuously start to receive data from node 1 and as well as from other nodes. The data from node 3 buffer will be transmitted only when its buffer is full. if the buffer in node 3 is full then the data's will be sent to their respective recipients or the node which is closer to the recipient node's shown In Figure 2

Figure 2: Data bounced by nodes between node 1and node 0.

won't be much activity from all nodes except from nodes which have a full data in buffer. Considering networks which uses other algorithm, nodes will transmit data when other nodes send data to it. This results in frequent utilization of energy by the node. The network activity

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will also be more since there is constant sharing of data between the nodes. With the proposed method the data will only be transmitted when buffer is full resulting in optimal use of energy than compared to other networks. The network activity will also be less than compared to other network.

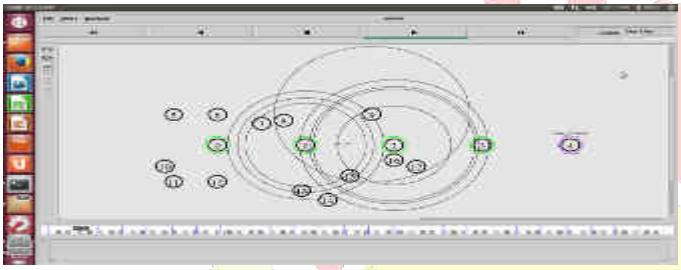

Figure 3: data transmission from node 1 to node 2 when buffer is full.

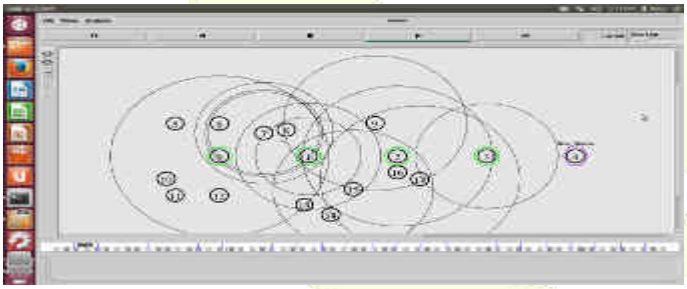

Figure 4: data transmission between slave node 7 and router node 1.

The complete flow chart of how node communication takes place is shown below

Node parameters:

Simulation area	1000*1000
Number of nodes	50
Maximum group size	10
Channel	Wireless
Radio propagation model	Shadowing
Antenna type	Directional antenna
Mac protocol	IEEE802.15.4

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Traffic model	CBR/TCP
Packet size	100 bytes
CBR interval	CBR interval-0.05ms
Initial energy	1000 mj()IJ

Table 1: Node parameters

Number of nodes	50
Maximum group size	10
Channel	wireless
Radio propagation mode	shadowing
Antenna type	directional antenna
Mac protocol	IEEE802.15.4
Traffic model	CBR/TCP
Packet size	100 bytes
CBR interval	0.05ms
Initial energy	1000 mj()IJ

III RESULTS AND DISCUSSION:

The proposed system was simulated on NS2 simulator based on Linux platform. The nodes and their network activity were recorded. Using the bunny hopping technique the overall network life time was increase by 20% as shown in figure 4. The overall network performance is also increased as a result. The packet delivery ratio was 99.02% with minimal losses. The packet loss ratio were reduced by 17 % shown if figure 6. The throughput of the network is also increased than compared to existing system as shown in figure 7. The residual energy of the node is increased than compared to other networks.

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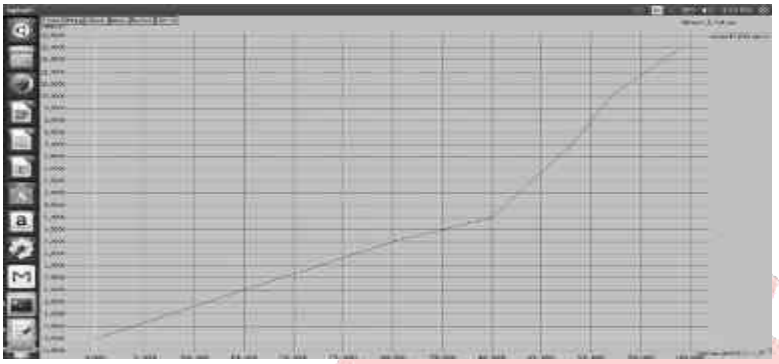

Figure 5: Network lifetime

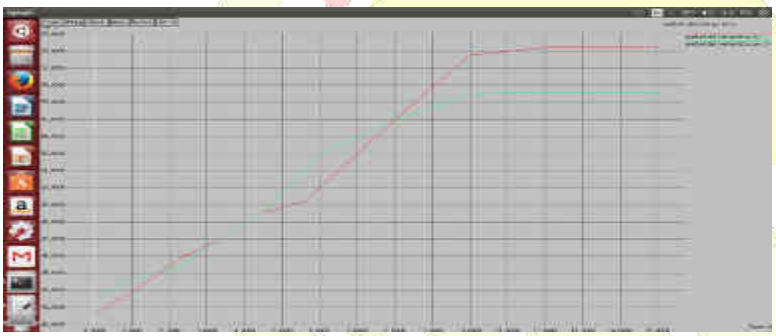

Figure 6: Packet delivery ratio.

Figure 7: Packet loss ratio

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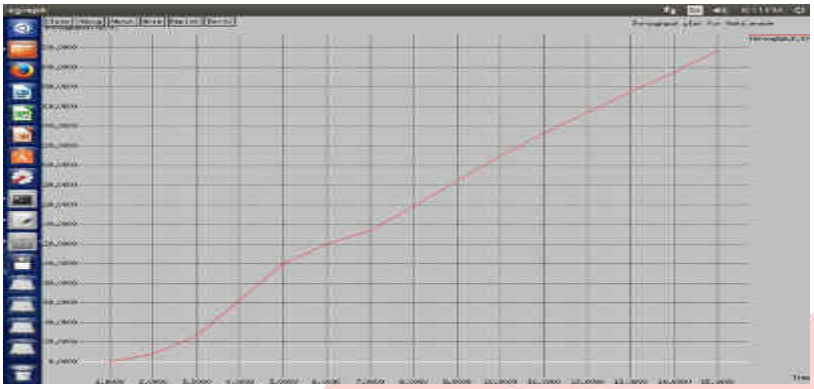

Figure 8: Throughput.

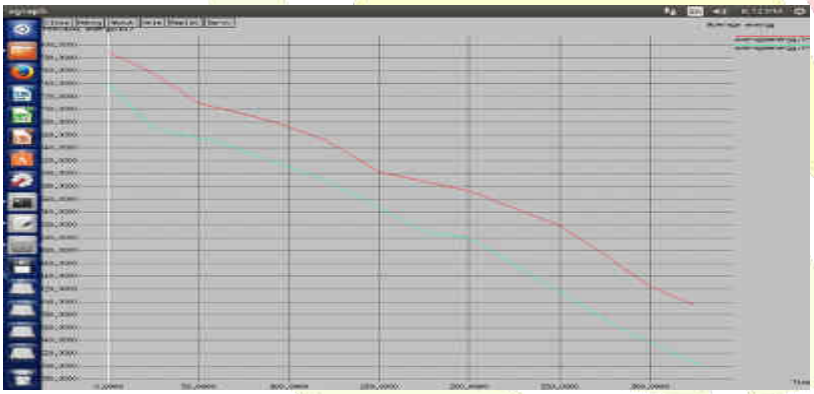

Figure 9. Residual energy

IV CONCLUSION:

Wireless sensor network are proliferating in all applications ranging from wireless data transfer to wireless control of devices. The implemented algorithm improves the network stand time than compared to other network. The data loss in the network is also minimized which improves data reliability in the network. The packet delivery ratio and packet loss ratio are improved to improve the throughput of the network as a whole. The network activity is reduced considerably than compared to other networks.

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