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Dual sink Routing in Wireless Sensor Network (Vector Based Routing)

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***Abstract*—In wireless sensor network the main important factor of sensor node is energy wastage ,for this reason there are many routing protocol ,power management and data disseminations are specified, currently there are so many issues in (health, military application ,for home applications) wireless sensor network so that researchers are still working on them in WSN sensor node consist of sensing, data transmitting, sensor nodes are densely deployed and the topology of sensor network changes very frequently .in this paper the main focusing point is energy saving by finding the shortest distance from source node to the sink node, by using Dual sink vector based routing protocol (DS-VBF),this protocol has very important role in underwater wireless sensor networks(UWSNs),by using a vector based routing in wireless sensor network we are trying to save the energy by creating dual sinks.**

Keywords—Wireless sensor Networks(WSN);Routing Protocol; Location Based Routing; Energy Efficiency; Multiple Sink Architecture; Under Water Wireless Sensor Networks(UWSN).

I. INTRODUCTION

Wireless communication has an infrastructure which must be consist of some sensing computation, the building block of such infrastructure comprised of thousands of low cost, multidimensional devices which has ability to sense and communicate using short range transverse known as sensor node, these nodes are internally connected called as wireless sensor network[1].Sensor Network they may consist of several sensor nodes so here each node has some specific name ”sensor” because each node may equipped with some smart sensor. Sensor node are small tiny devices they may sense characteristics like Temperature, Pressure, vibration, in fig 1 Represents a how a sensor nodes are to be deployed in a WSN, in this figure a gateway of sensor node is act as a middle data transmitting device thought this a sensor node may transmit a all of the sensed data to the user.

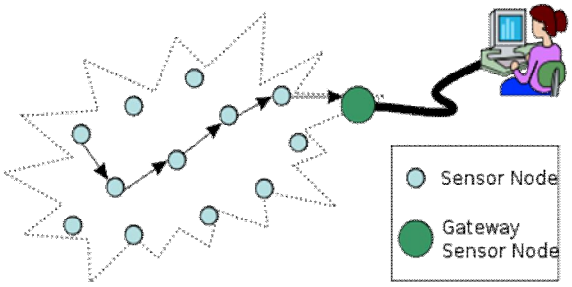

Fig 1: Wireless sensor network

Wireless communication has an infrastructure which must be consist of some sensing **computation**, the building block of such infrastructure comprised of thousands of low cost, multidimensional devices which has ability to sense and communicate using short range **transverse** known as sensor node, these nodes are internally connected called as wireless sensor network[1].

The main basic thing in this paper is vector based routing protocol (VBF), is mainly used in underwater wireless sensor network so that it is also called as novel based routing protocol ,there are number of protocols are used in UWSNs, Under water wireless sensor network is significantly different from any ground based sensor network ,as we know earth is full of water planet now days UWSN has emerging as very Powerful technique so there as so many protocols are used to solve the important coroners in UWSN like energy saving, providing security etc[2].

There are so many routing protocols are used in UWSNs like VBF, DBR, LEACH ,HH-VBF ,ES-VBF ,LE-VBF, where the main important protocol is VBF protocol. all these protocols have their own uniqueness points to prove but also having some disadvantages so to over come from all this problem a newly proposed protocol called Dual sink vector based routing protocol

(DS-VBF),which is mainly used to save the energy, mainly uses in UWSNs but the concept of this DS-VBF protocol we are using WSN ,to save the energy and to providing security.

II. RELATED WORK

Vector Based Forwarding (VBF): it is novel routing protocol, VBF essentially an initialization of localization and routing in the localization, it mainly address the routing problem in UWSN, it is robust against packet loss and node failure [3].VBF most importantly focuses on mobility of the node it is very energy efficient and scalable protocol, where in which the data delivery is not dependent on stable neighbor, but on the density of the node. As its name it creates an vector while transmitting the data so the node which wants to send the data from source node to sink node will send its packets but its not possible for some nodes to receive data packets that time packet loss may occurs so because that VBF is used to control the packet loss, by creating vector the nodes within the vector can transmit the data other nodes cannot so energy will be saved. In VBF and self adoption algorithm is used [3].

Life time extended –vector based forwarding protocol (LE-VBF).as we know the nodes are powered by battery so saving energy is an important corner ,in LE-VBF the energy and position information is very impotent corner where each node carries the position and energy information, after receiving a packet a node computes its relative desirableness factor, after receiving a packets if a noted computes its desirableness its, suppose node factor is best then node puts its own computed position and reaming energy in the packet and it keep on continue forwarding the packet otherwise it simply discard the packet. In LE-VBF each packet may consist of hops when a node receive the packet It first get the hop(H)and then energy(E_r)from packet passed through.

Energy calculation:

$$E = \frac{E_v \times H + E_r}{H+1}$$

Where E_r is energy of the node, E_v is average energy fetched from packet, H is hops of packets passed thought[4].

LEACH :is an adoptive clustering routing protocol, while the implementation process include many rounds, each round consist of step phase and study data transmission phase .where as in step phase CH is elected and where as in study phase all the members of the cluster must send the data to its cluster head CH, in which CH compress the data and sends it to the sink node .the main this advantage of LEACH protocol is that protocol select two cluster head that are very nearer to each other then specially when CH ratio is increased, the CH will waste its energy by sending similar data to its base station (BS)[5].

III. PROPOSED PROTOCOL

In wireless sensor network there are several routing protocols are to be used, because of popularity of wireless sensor network and because of its emerging technology WSN is also be used in under water sensor networks (UWSNs), where UWSN is one of the main attractive area for researcher to do searches in it, underwater sensor network is one of the most important corner or application in wireless sensor networks, so in which there are several routing protocols are to be used in both underwater sensor network and also in wireless sensor networks .

There are so many routing protocols are used in UWSNs like VBF ,DBR,LEACH,HH-VBF,ES-VBF,LE-VBF,DSR where the main important protocol is VBF protocol. all these protocols have their own uniqueness points to prove but also having some disadvantages so to over come from all this problem a newly proposed protocol called Dual sink vector based routing protocol (DS-VBF), which is mainly used to save the energy, mainly uses in UWSNs but the concept of this DS-VBF protocol we are using WSN, to save the energy and to providing security. Dual Sink Vector Based Forwarding protocol is one of the most important and new protocol in under water wireless sensor network, in UWSN there are several protocols are used to transmit packets or data from one node to other nodes or to its destination ,some protocols are also used to saving of energy, improving packet delivery ratio, and some are for decreasing the delay of packets but still those are not up to the mark means some algorithms that are not perfect all those algorithms techniques are used in protocols are having some less resources in their field so to overcome from all those problem a dual sink vector based routing protocol is used in short called as DS-VBF[6]. DS-VBF is the extended version of vector based forwarding protocol so in VBF protocol is novel based routing protocol is also used in UWSNs, VBF is also called as position based routing vector because this protocol may have its next forwarder or called destination address in it so that while transmitting data each node may creates its own vector to transmit data from source node to its sink node the main unique thing about VBF is in which it uses only one source and one destination point. so the each node

must transmit data to that destination while transmitting data each node has a rights to create its own vector path from it so ,the nodes which are far away from the vector they are not able to participate in data transferring so energy of those nodes is wastage and packets are going to be lost .so because of that a dual sinks are used in DS-VBF protocol because of using dual sink nodes which are so far from the destination they will choose its nearest sink as its destination to transmit a data from source node to sink node. While transmitting packet first each node will choose its nearest node as forwarder to the nearest sink so like this source node will choose its nearest sinks to transmit data and it will put its destination, forwarder address and destination address in to its transmitting packets den it will send it to its destination point so like this each nodes which are near to destination and which are far away from the destination are able to transmit a data from source node to the sink node so by using this technique that energy of each node is going to be save and packet reception ratio will be increased and delay is decreased so that dual sinks helps to save packet drops in network The main important corner of DS-VBF is that it will take the residual energy of the each node.

IV. RESULTS

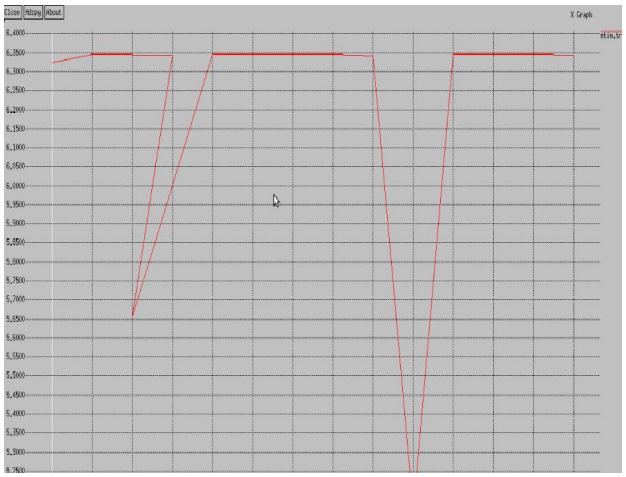

Fig 2: Graph of existing energy

Whare as in fig:2 represents a grapg of existing system ,means in existing it must takes a residualenergy value between 6.3200jauls to 6.3400 this enrgy grapg will be obtained aft exicutaion on existing system by using single sink ,

And fig 3 represent the packet delivery ration of existing same as by using single sink to transmit data because they are so far way from sink they are not able to transmit the data so there is lose of packet dropping occurs at time when data lost so that is shown in above figure

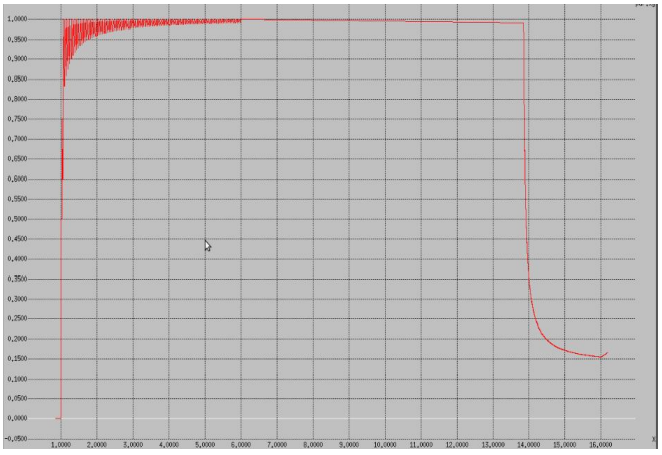

Fig 3:Graph of existing packet reception ratio

Where in proposed protocol as its name indicates we we are using a dual sink vector based routing protocol so here we are using

two sink whare in which each node takes its residual energy and the nodes which are far away from the sink can choose their nearest sink and tose can transmit a data by its forwarder nodes.like this campareing to the existing energy saved and the paraposed energy(in fig 4) saved is more ,praposed protocol may save more residual energyand camaring to fig 3 in fig 5 the packet delivery ratio is less.

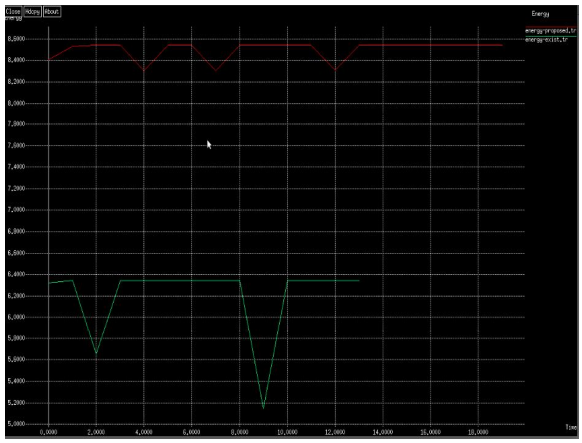

Fig 4: Graph of proposed energy

In above fig 4 both existing and residual energy is shown in existing the residual energy is 6.3200 joules but in propose is of about 8.400 joules, so totally maximum 2.2 joules of energy is saved

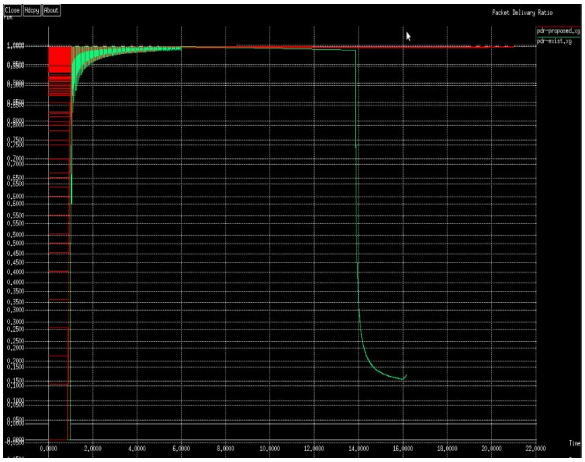

Fig 5: Proposed packet reception ratio

V. CONCLUSION

In VBF protocol there is only one sink is used to transmit data or packets to the destination, but the major problem in VBF is are going to lose their packets and their energy too because they are not able to find its proper destination sink to transmit their packet so because of that we are introducing a new concept called dual sink vector based forwarding protocol (DS-VBF) ,by using dual sink each node nodes which are losing its energy and packet now they can send packets to its other sink like this a dual sink has some advantages compare to other protocols, it may widely we can use in many application like forest fire detection any wireless sensor related application, and we can also do the enhancement in future like by saving more residual energy, and by providing some security enhancement

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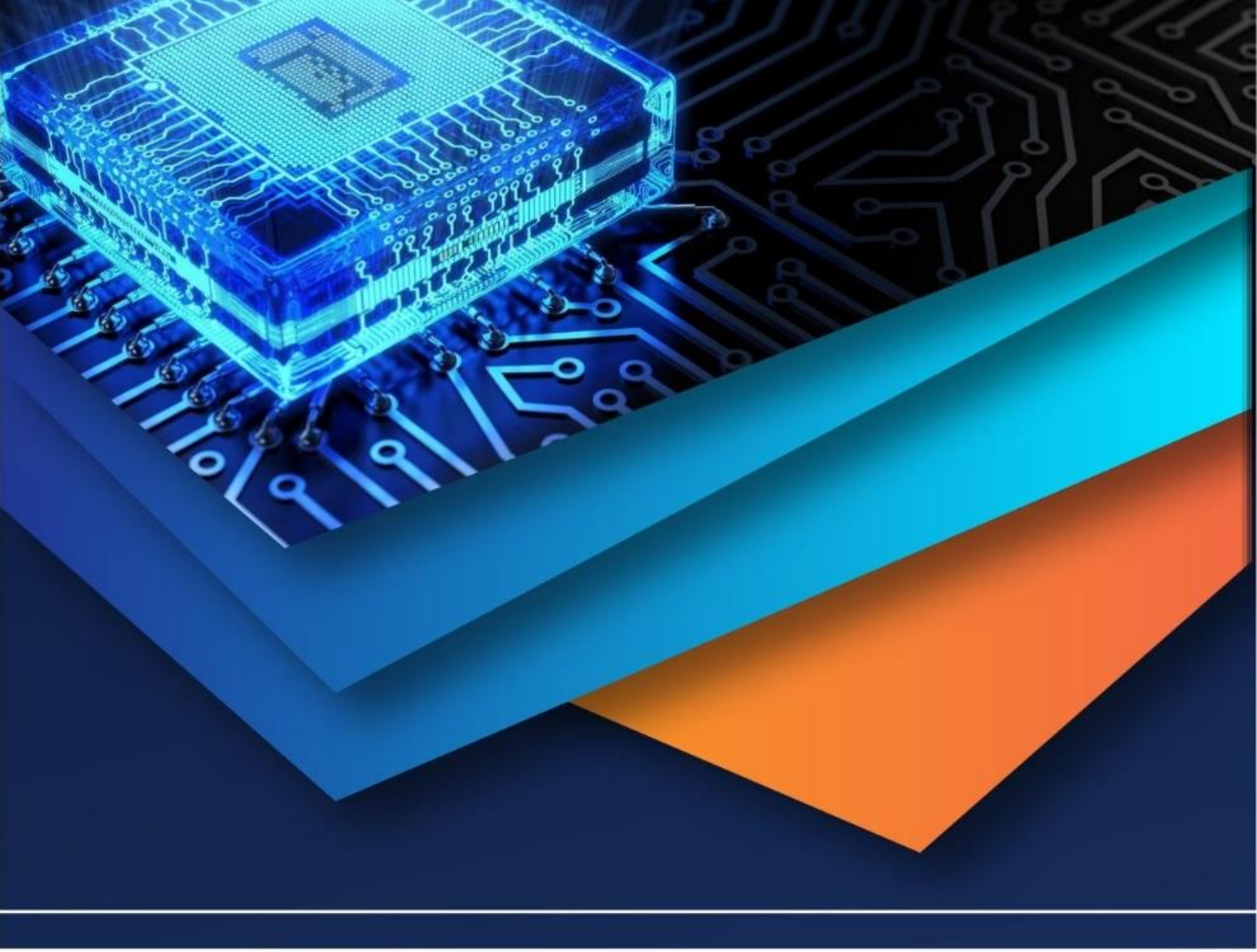

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