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A Comparative Analysis on Sonobuoys Routing For Underwater Sensor

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Abstract - Opportunistic Void Avoidance Routing (OVAR) protocol has been proposed for Under Water Sensor Network (UWSNs). OVAR is a multicast, geographic and opportunistic routing protocol that passes information packets from sensor nodes to various sonobuoys (sinks) at the ocean's surface. OVAR protocol switches to recovery mode which depends on the depth conformity of the void nodes. A protocol ways to deal with keep up directing along void region by the utilizing control messages. Under Water Remote Sensor Network appeared as an encouraging innovation to investigate customary undersea wire line instruments. One approach to enhance the information accumulation and the network execution in UWSNs is through considering the qualities of the underwater acoustic correspondence. The OVAR profoundly used in dynamic network topology, even in hard and troublesome mobile situations of extremely inadequate and thick networks. By using the OVAR routing protocol for the speed of the node will increased as well it prevents data loss compared to previous method.

Keywords - *OVAR, UWSN, Sonobuoys.*

1. Introduction

Seas speak to more than 2/3 of the Earth's surface. These situations are critical for human life in light of the fact that their parts on the essential worldwide generation carbon dioxide (CO2) assimilation and Earth's atmosphere control. In this setting, Under Water Sensor Network (UWSNs) has picked up the consideration of the investigative and mechanical groups due their potential to screen and investigate oceanic situations. UWSNs have an extensive variety of possible applications, for example, to observe marine life, toxin content, land forms on the sea depths, oilfields, atmosphere ,waves and seaquakes to gather oceanographic information, sea and seaward testing, route help and acknowledgment being used for strategy observation applications.

Under Water Sensor Networks comprise of number of underwater sensor nodes or just called sensor nodes which are outfitted with acoustic handsets that empower them to each other to perform community oriented detecting assignments over a given territory from shallow water and seabed. UWSNs have numerous potential applications in sea checking. For example - momentum stream, oil contamination, seismic and torrents are observed for supplying the high spatiotemporal determination ability.

Using Opportunistic Routing (OR) paradigm, every packet is communicated to a sending set made out of neighbors. OVAR protocol is a multi cast, that tries to convey a packet from a source node to some sonobuoys(sink). The proposed routing protocol employs the greedy forwarding strategy by means of the position information of the present forwarder node, its neighbors, and the identified sonobuoys. Then the OVAR decides the qualified neighbors to keep sending the packet towards some sonobuoys. For that they have to locate a next-hop forwarder choice to forward the information packet. In OVAR protocols, next hop directing stand out neighbor is chosen to go about as a next-hop forwarder. In Opportunistic Routing paradigms every packet is communicate to a sending set made out of a few neighbors. The packet will be retransmitted just if none of

the neighbors in the set gets the information. In between the transmissions,
every node locally figures out whether it is in a correspondence void area by analyzing its neighborhood. In the event that the node is in a correspondence void area, that is, whether it does not have any neighbor prompting a positive advancement towards some surface sonobuoy, it reports its condition to the area and holds up the area data of two hop nodes keeping in mind the end goal to choose which new depth it ought to move into and the greedy sending procedure can then be continued. After, the void node decides another depth taking into account 2-hop availability with the end goal that it can continue the sending.

2. Literature Survey

Rodolfo W.L. Coutinho, Azzedine Boukerche, et.al [1] has proposed the GEDAR routing protocol for UWSNs. GEDAR is an anycast, geographic and opportunistic routing protocols that courses information packets from sensor nodes to different floats (sinks). At the point when the node is in a correspondence void area, GEDAR changes to the recovery mode methodology which depends on topology control through the depth alteration of the void nodes. Simulation comes about demonstrate that GEDAR fundamentally enhances the network execution when contrasted and the gauge arrangements, even in hard and troublesome mobile situations of exceptionally sparse and extremely dense networks and for high network traffic loads.

The most imperative part of the GEDAR is its novel void node recovery strategy. Rather than the customary message-based void node recovery network, GEDAR proposed a void node recovery depth modification based topology control algorithm. The thought is to move void nodes to new depth to continue the geographic routing at whatever point it is possible. To the best of insight, this work is considered the depth change node capacities to arrange the network topology of a mobile underwater sensor network to enhance routing undertaking. Simulation comes about demonstrated that GEDAR can able to measure the void nodes through the depth adjustment based void node recovery network.

Anumol Stanly [2] has proposed an Enhanced Bypassing Void Routing protocol in view of Virtual Coordinate Mapping (EBVR-VCM) to tackle the routing void issue. In the ideal way to achieve the goal, hand-off node is moved to the ideal position that can shorten the normal directing way length and decline the transmission delay. Diminishing directing separation can be more temperate and proficient to forward packets to enhance the current land void issue in remote sensor organize, and to improve the execution of network routing. The EBVR-VCM is made out of the greedy mode and the void preparing mode. In this protocol, the hand-off node utilizes the routing a greedy mode to forward information. On the off chance that the greedy mode comes up short, and the routing void shows up, it changes to the void preparing mode. As indicated by the execution arrangement, the void handling is separated into void location, virtual coordination mapping and void area division. Through the void handling, the virtual directions of edge node are built up. In the wake of beginning the greedy mode once more, these edge nodes with virtual coordination can be chosen as transfer nodes.

P. Roselin and G.Annalakshmi [3] has proposed a scheme includes that any packet which cannot meet its due date is dropped. The consequences of the execution demonstrate that the plan performs energy expenses and network goodput by using two-step heuristic algorithm. Here the relay priority is given a set of forwarders which is determined first**.** Then a method for cluster based forwarding set selection that develop a possible forwarding set around each neighbor of the node is taken into the consideration. This method involves for maintain the proper internal priority order during the progressive develop of the cluster. Finally, the forwarding set with the best one hop reliability is selected from the given clusters as the node's actual forwarding set.

Guangjie Han, Na Bao,et.al [4] has proposed the exhibitions of routing protocols which can be assessed during control packets, end-to-end delay, data delivery proportion and total energy utilization. The effect of water streams on the routing algorithm is additionally broke down in this simulation. It gives helpful experiences to choose fitting routing protocols to satisfy distinctive application requirements in Underwater Acoustic Sensor Networks (UASNs). A near examination in light of an arrangement of test calculations which have the same configuration suppositions and targets is sensible. In this segment, different run of the distance routing protocols proposed for UASNs namely, H2-DAB, GEDAR and E-PULRP. H2-DAB manage the node mobility in UASNs and it appoints a dynamic location (called HopID) to every sensor node which depends on the hop count from the sink node. GEDAR takes the benefit of greedy opportunistic sending to enhance data delivery proportion. While the E-PULRP is an Enhanced protocol taking consideration of Path Unaware Layered Routing protocol (PULRP). Not quite the same as H2-DAB and GEDAR, one and only sink node is permitted in E-PULRP.

Table 1 presents the comparative study of various approaches regarding Under Water Sensor Networks in various aspects.

Author(s	Year	Paper Name	Technique	Result
Rodolfo W.L. Coutinho, Azzedine Boukerche, Luiz F.M. Vieira, and Antonio A.F. Loureiro	2016	Geographic and Opportunistic Routing for Underwater Sensor Networks	GEDAR routing Protocol	Efficiently reduces the percentage of nodes in communication void regions to 58%.
Anumol Stanly	2016	A New Approach of Opportunistic Routing for Bypassing Void Region in WSNs	EBVR-VCM routing protocol	- Improves the tree topology - Improves the routing tree by relocating nodes
P.Roselin G.Annalakshmi	2016	Active opportunistic routing in underwater sensor networks	Two-step heuristic algorithm	The energy usage is minimized
Guangjie Han, Na Bao, Li Liu, Daqiang Zhang, and Lei Shu	2015	Routing Protocols in Underwater Acoustic Sensor Networks: A Quantitative Comparison	Hybrid routing protocol	High energy efficiency while Little attention is paid to the node mobility
Kun Hao, Zhigang Jin, Haifeng Shen and Ying Wang	2015	An Efficient and Reliable Geographic Routing Protocol Based on Partial Network Coding for Underwater Sensor Networks	GPNC routing algorithm	Reduce the end to end delay

Kun Hao, Zhigang Jin, Haifeng Shen ,et.al [5] has presented GPNC (Geographic Partial Network Coding), a novel geographic routing protocol for UWSNs that consolidates partial network coding to encode the information packets and uses sensor nodes' area data to greedy forward information packets to sink nodes. GPNC can adequately lessen network deferrals and retransmissions of repetitive packets bringing on extra network energy utilization. Simulation comes about demonstrate that GPNC can altogether enhance network throughput and packet delivery proportion, while reducing energy utilization and network latency when contrast with other routing protocols. GPNC routing algorithm utilizes the geographic data on nodes for directing and partial network coding for information transmission. To forward a packet, it attempts to choose a sending node that is closest to the goal node by considering the packet progression. At the point when a sending node needs to transmit information, it encodes the packet utilizing incomplete network coding. When the sink node has gotten N straight freely encoded information packets, it performs packet decoding to recover the packets.

3. Methodology

OVAR Routing protocol is a multicast, that tries to convey a packet of information from a source node to some sonobuoys(sink).The proposed routing protocol utilizes the greedy sending methodology for the position data of the present forwarder node, its neighbors, and the identified sonobuoys. The OVAR protocol decides the qualified neighbors to keep sending the packet towards some sonobuoys. For that it has to locate a next hop

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forwarder selection to forward the information packet. In protocol multi hop routing, one and only neighbor is chosen to go about as a next-hop forwarder. While the opportunistic routing takes shared transmission medium, every packet of information is communicate to a sending set made out of a few neighbors. The packet of information will be retransmitted just if none of the neighbors in the set get the information. In between the transmissions, every node locally figures out whether it is in a correspondence void region by looking at its neighborhood. On the off chance that the node is in a correspondence void region, that is whether it does not have any neighbor leading a positive advancement towards some surface sonobuoy. OVAR declares its condition to the void area and holds up the void area data of two hop nodes with a specific end goal to choose which new depth it ought to moved and the greedy sending methodology can be continued. After, the void node decides another depth in view of 2-hop network with the end goal that it can continue the greedy forwarding.

4. Proposed Work

From this comparative study, it has been analyzed that underwater sensor can be further enhanced. This can be achieved by using opportunistic routing protocol it utilizes the greedy sending procedure by method for the position data of the present forwarder node, its neighbors, and the identified sonobuoys. The OVAR protocol decides the qualified neighbors to keep sending the packet of information towards some sonobuoys. It is compatible in hard and troublesome mobile scenarios of exceptionally sparse and very dense networks and for high network activity loads. It enhances the network execution when contrasted and the information routing in Under Water Sensor Networks.

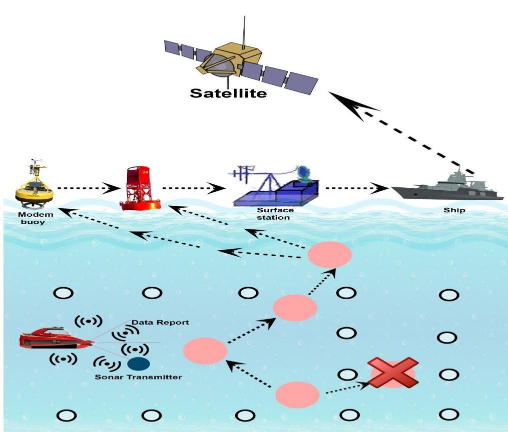

Fig.1: Proposed Architecture Diagram for Underwater Sensors Networks

5. Conclusion

From this literature survey, it is found that the techniques supporting multiple tables are not very efficient. OVAR protocol is proposed to improve the data routing in Under Water Sensor Networks. OVAR is a simple and scalable geographic routing protocol that uses the position information of the nodes and takes advantage of the broadcast communication medium to greedily and opportunistically forward data packets towards the sea surface sonobuoys. Furthermore, OVAR provides a novel depth adjustment based topology control mechanism to move void nodes to new depths for overcoming the communication void regions. Simulation results shows that opportunistic routing protocols based on the position location of the nodes are more efficient than other routing protocols. Moreover, Opportunistic routing proved crucial for the performance of the network besides the number of transmissions required to deliver the packet. The use of node depth adjustment to manage with communication void regions improves significantly with network performance.

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