International Journal of Advances in Engineering and Management (IJAEM)
Volume 4, Issue 6 June 2022, pp: 1977-1982 www.ijaem.net ISSN: 2395-5252

Enhancement of Network Lifetime and Data Security in Underwater Sensor Network Using Leach Protocol.

Divya[1], Mohamed Mubarak[2],Rajapandiyan[3], and Larish regan[4]

[1]K.Divya Ap/EcE, SSMIET,Dindigul, Tamil Nadu.
[2]Department Of Electronics And Communication Engineering,SSMIET,Dindigul,Tamil Nadu.
[3]Department Of Electronics And Communication Engineering,SSMIET,Dindigul,Tamil Nadu.
[4]Department Of Electronics And Communication Engineering,SSMIET,Dindigul,Tamil Nadu.

Submitted: 15-06-2022 Revised: 20-06-2022 Accepted: 25-06-2022

ABSTRACT.
Due to facts of the submerged surround, some negative factors will seriously muck with data transmission rates, responsibility of data communication, communication range, and network throughputs and energy consumption of submerged detector network(UWSN). hence, full consideration of node energy saving, while maintaining a quick, correct and effective data transmission, extending the network life cycle are essential when routing protocols for submerged detector networks are studied. In this paper, we've proposed a two types of fresh routing algorithm for UWSNs. LEACH is extended by searching a cluster head according to the lowest distance from the base station in order to reduced energy consumption in cluster head an in the total enclosing network. To increase energy consumption effectiveness and extend network life span and information security, we propose a time- place grounded routing algorithm(TSR), Hierarchical Clustering Algorithm(HCA). we designed a probability balanced process and applied it to TSR and HCA.

The proposition coding is introduced to TSBR to meet the necessary of another meet the need for information security, reducing nodule energy consumption and extending network life span. Hence, time- place grounded balancing routing algorithm and compared it with other classical aquatic routing protocols. The simulation results show that proposed protocol can reduce the probability of nodule conflicts, abridge the process of routing construction, balance energy consumption of each node and effectively extend the network life span.

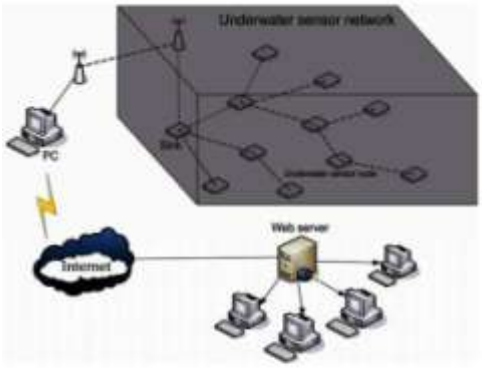
Keywords: Under water sensor, Network, LEACH,TSR,WSN.

I. INTRODUCTION

In lately times, further and further operations have appeared with the development of wireless communication network ways. Aquatic detector networks are an arising and promising network fashion which has attracted considerable attention. In this paper, we present a time- slot based routing algorithm(TSR) by applying a series of advancements of the flooding protocol. Conflict between bumps is avoided when they start to shoot packets only within their own time- places, and they do not need to reply to their parents collectively in the process of establishing routing, rather they directly broadcast the routing dispatches. Meanwhile, to save further time and energy to quicken routing establishing process, the packet could act as the ACK to reply to their parents.

The network topology of aquatic detector networks of this paper searched is a planar centralized- tree construction. This construction has two advantages. One is easy to be extended. Tree construction can extend numerous branches and child branches which can be fluently added into the networks. The other bone is the convenience for segregating malfunctions. We can accessibly separate malfunctions from the rest of the system when bumps or routes in one branch breakdown.

Figure 1: System architecture.



Source:

As Figure 1 shows, there's one aquatic Gomorrah and m aquatic detector bumps. Every knot presents an unique ID(1, 2, 3, …, m). The ID of the aquatic Gomorrah is 0 and the parent knot of the Gomorrah is − 1. All the bumps' ID will notify the aquatic Gomorrah before deployment. The aquatic Gomorrah connects with detector bumps on land through wireless communication, and detector bumps on land connect with a PC through periodical anchorages. therefore, the PC can admit data which is collected by aquatic detector bumps through detector bumps on land and shoot commands through detector bumps on land as well as display the data on the screen and upload it to an Internet garçon which can be viewed and downloaded by experimenters.

1.1 LEACH

LEACH is a hierarchical protocol in which utmost bumps transmit to cluster heads, and the cluster heads total and compress the data and further it to the base station(Gomorrah). Each knot uses a TSR algorithm at each round to determine whether it'll come a cluster head in this round. LEACH assumes that each knot has a radio important enough to directly reach the base station or the nearest cluster head, but that using this radio at full power all the time would waste energy.

Bumps that have been cluster heads can notcome cluster heads again for m rounds, where m is the asked chance of cluster heads. later, each knot has a 1/ P probability of getting a cluster head again. At the end of each round, each knot that isn't a cluster head selects the closest cluster head and joins that cluster. The cluster head also creates a schedule for each knot in its cluster to transmit its data.

All bumps that aren't cluster heads only communicate with the cluster head in a TDMA fashion, according to the schedule created by the cluster head. They do so using the minimal energy demanded to reach the cluster head, and only need to keep their radios on during their time niche.

1.2 Time-slot routing (TSR)

A time- slot routing(TSR) switch is a network switch that stores data in RAM in one sequence, and reads it out in a different sequence. It uses RAM, a small routing memory and a counter. Like any switch, it has input and affair anchorages. The RAM stores the packets or other data that arrive via its input terminal.

When a packet(or byte, on telephone switches) comes to the input, the switch stores the data in RAM in one sequence, and reads it out in a different sequence. Switch designs vary, but generally, a repeating counter is incremented with an internal timepiece. It generally wraps- around to zero. The RAM position chosen for the incoming data is taken from a small memory listed by the counter. It's generally a position for the asked affair time- niche. The current value of the counter also selects the RAM data to further in the current affair time niche. also the counter is incremented to the coming value. The switch repeats the algorithm, ultimately transferring data from any input time- niche to any affair time- niche.

To minimize connections, and thus ameliorate trust ability, the data to reprogram the switch is generally programmed via a single line that vestments through the entire group of integrated circuits in a published circuit board. The software generally compares the data shifted- in with the data shifted- out, to corroborate that the ICs remain rightly connected. The switching data entered into the ICs is double- softened. That is, a new switch set- up is shifted- in, and also a single palpitation applies the new configuration incontinently to all the connected ICs.

II. LITERATURE SURVEY

1. Enhanced LEACH Protocol for increasing a lifetime of WSNs - AmerO.AbuSalem , Noor Shudifat – Springers – 2019.
2. Robust Harmony Search Algorithm Based Markov Model For Node Development In Hybrid WSNs - AbdulQader Mohsen, WalidAlijoby - International Journal of (GEOMATE) - Vol.11,Issue 27 – 2016.
3. Lifetime Improvement in WSNs Using Hybrid Differential Evolution and Simulated Annealing(DESA) - T.Shankar , A.Rajesh - Ain Shams Engineering Journal – 2016.
4. A Comparative Study Of Clusterhead Selection Algorithtms In Wireless Sensor Networks - K.Ramesh ,Dr.K.Somasundaram - (IJCSES) Vol.2,No.4 – 2011.

III. BODY OF PAPER

In lately times, further and further operations have appeared with the development of wireless communication network ways. Aquatic detector networks are an arising and promising network fashion which has attracted considerable attention. In this paper, we present a time- slot based routing algorithm(TSR) by applying a series of advancements of the flooding protocol. Conflict between bumps is avoided when they start to shoot packets only within their own time- places, and they do not need to reply to their parents collectively in the process of establishing routing, rather they directly broadcast the routing dispatches. Meanwhile, to save further time and energy to quicken routing establishing process, the packet could act as the ACK to reply to their parents.

The network topology of aquatic detector networks of this paper searched is a planar centralized- tree construction. This construction has two advantages. One is easy to be extended. Tree construction can extend numerous branches and child branches which can be fluently added into the networks. The other bone is the convenience for segregating malfunctions. We can accessibly separate malfunctions from the rest of the system when bumps or routes in one branch breakdown.

```
                    if(strcmp(argv[1], "hacker") ==
0)
                    {
                              malicious=true;
                              return TCL_OK;
                    }

………………………

          // For Successfully forwarding the packet
( Inc by 0.05 )
trust[index][hdcmn->prev_hop]+=0.15;
……………………….
// For Successfully receiving the packet ( Inc by
0.05 )
trust[index][hdcmn->next_hop_]+=0.05;
malicious=false;
          for(int i=0;i<NN;i++)
                    for(int j=0;j<NN;j++)
                    {
                              ftrust.push_back(0);   //
Initializing the final trust
                              ft.push_back(0);
                              trust[i].push_back(0);
                    }
//
```

3.1 EXISTING SYSTEM

The routing protocol can borrow an being routing protocol and we take the shortest route protocol as an illustration. knot A in the route will choose the neighbour that's nearer the Gomorrah and has high trust as the cominghub. However, it'll report to the upper knot that there's no path From a

to the Gomorrah, If there isn't a knot among all neighbours nearer the Gomorrah that has trust above the dereliction threshold. The upper knot, working in the same manner, will re-select a different knot from among its neighbors nearer the Gomorrah until the data are routed to the Gomorrah or there's conclusively no path to the Gomorrah.
Therefore when selection it'll make all the bumps run.also the energy in the knot will drop and therefore all the budgets will lose power snappily and the general public will be affected a little bit so that the records in it'll be stolen. I am going to try to figure out how to fix this and get it under control

3.1.1 DISADVANTAGES OF EXISTING SYSTEM

- Only Detect the Packet Drop.
- Time Consumption High
- Packet Loss

SIMULATION PERAMETERS :

Parameters	Default value(pkts/ms)
AODV Sent	2934
AODV Received	21592
Data Sent	2301
Data Received	153
Router Drop	2340
Drop Ratio	0.000664928292046
Throughput	0.01224
Delay	0.588235294117647
Overhead	34.2156862745098

IV. PROPOSED SYSTEM

We'll introduce the routing protocol of aquatic sensor networks. originally, we present TSR also extend to TSBR by adding a probability balanced medium to TSR. likewise, we add network rendering proposition into TSBR and have therefore attained a more effective routing protocol. WSNs that stand for wireless sensor networks and include multiple low- cost and low power- seeing tools, original processing, and the capacity of wireless communication face some problems in two aspects the life span of the network and its energy.

Thus, the goal of this paper is to overcome these limitations through enhancing the LEACH(low energy adaptive clustering scale) protocol, the protocol of cluster routing, in which, LEACH is extended by linking a cluster head according to the littlest degree of distance from the base station in order to downscale power consumption in cluster head nodules and in the whole network. Hence, the results clarify the capability of LEACH in enhancing the network continuance as well as in reducing and minimizing the consumption of power and Information Security.

So, we consequently bring it under control. We can maintain the records and energy in it. I've anatomized this with the help of LEACH through Simulation.

4.1 ADVANTAGES OF PROPOSED SYSTEM

- Packet send to reroute
- Time Consumption Low
- High Security

V. DATABASE DESIGN

Nodes in UWSNs have to shoot route packets to establish a route tree. The first step is to check the format of the route packet. Bumps don't have to reply to their parent knot, rather of broadcasting the route packet directly. The route packet also can be seen as the affirmance of the parent knot, as well as taking route dispatches of all bumps to the Gomorrah. thus, we divide packets into broadcast- route packets and feedback- route packets during the process of route establishment.

Broadcast- route packets are substantially used to find the coming hop directly and can be transferred to a parent knot as ACK. They contain five fields in the format shown in Fig 2.

Type	Source	Dest	Level	CRC

Figure 2.

International Journal of Advances in Engineering and Management (IJAEM)
Volume 4, Issue 6 June 2022, pp: 1977-1982 www.ijaem.net ISSN: 2395-5252

Format of a broadcast-route packet.

Feedback- route packets are substantially used by lower layers to report to the parent knot the construction of a route and be transferred to a Gomorrah. A Gomorrah stores route packets in its buffer to check each state of each knot. Feedback-route packets contain seven numeric fields, in the format shown in Fig 3

Type	Source	Dest	Level	CRC	CRC

Figure 3.

Format of feedback-route packets.

The meanings of the route format fields are shown as the following

• Type type of packet, 0 denotes broadcast packets, 1 denotes feedback packets

• Source ID of knot which sends a packet

• Birth tree ID of knot which creates a packet, and starts to shoot it back to a Gomorrah

• BT Parent ID of Birth tree's father knot

• Destination Packet destination

• Position subcaste the knot which creates a packet belongs to

• CRC circulating redundancy check communication.

VI. SIMULATION RESULT AND ANALYSIS

Integration testing is a systematic technique for constructing the program structure while conducting test to uncover errors associate with interfacing. Objectives are used to take unit test modules and built program structure that has been directed by design.

The integration testing is performed for this project when all the modules where to make it a complete system. After integration the project works successfully.

Table 1: results

parameters	Values(pkts/ms)
AODV Sent	5442
AODV Received	50419
Data Sent	2302
Data Received	1850
Router Drop	449
Drop Ratio	0.0080364900086881
Throughput	0.148
Delay	0.0486486486486487
Overhead	4.18594594594595

VII. CONCLUSION

Underwater sensor networks are a freshly rolled out methodology compared with traditional wireless network applications, and it's hoped that they will be randomly used in the near future. This paper studied in depth the routing problems of underwater sensor networks and presented new routing protocols to answer these problems. originally, we presented TSR by having done a series of enhancements on the flooding protocol. Secondly, we presented TSBR by adding a probability balanced operation to TSR. After that, we proposed TSBNC by introducing network encrypting theory into the TSBR algorithm.

Eventually, we valuated the performance of TSBNC. The results showed that our proposed protocols can reduce the probability of node conflicts, shorten the process of routing construction, balance energy consumption of each node and effectively extend the network life span. Underwater sensor networks are complex screenplay which needs to be studied insistently and our future work will further concentrate on mobile underwater sensor networks to make up a practical environment and to test our protocols.

Further, our scheme improves both the energy effectiveness and the network security performance. It has important significance for wireless sensor network security.

In compliment to future work, we will originally further research the dynamics of the late stage. further details of the findings are anticipated to be beyond studied, similar as the length of the exponential tail of a power law distribution at the late stage. Secondly, protectors may look out further about their own network,e.g., the distribution of a given malware at their ISP disciplines, where the conditions for the two subcaste model may not hold. We need to seek applicable models to address this problem.

International Journal of Advances in Engineering and Management (IJAEM)
Volume 4, Issue 6 June 2022, pp: 1977-1982 www.ijaem.net ISSN: 2395-5252

Eventually, we're interested in studying the distribution of multiple malware on large- scale networks as we only concentrate on one malware in this paper. We believe it isn't a simple direct relationship in the multiple malware case compared to the single malware one.

REFERENCE

[1]. Lloret J., Garcia M., Atenas M., Canovas A. A QoE Management System to Improve the IPTV Network. Int. J. Communication. Syst. 2011;24:118–138.
[2]. Lloret J., Sendra S., Coll H., Garcia M. Saving Energy in Wireless Local Area Sensor Networks. Computer. J. 2010;53:1658–1673.
[3]. Ge X., Huang K., Wang C.-X., Hong X., Yang X. Capacity Analysis of a Multi-Cell Multi-Antenna Cooperative Cellular Network with Co-Channel Interference. IEEE Trans. on Wireless Communication. 2011;10:3298–3309.
[4]. Humar I., Ge X., Xiang L., Jo M., Chen M., Zhang J. Rethinking Energy—Efficiency Models of Cellular Networks with Embodied Energy. IEEE Network Mag. 2011;25:40–49.
[5]. Pompili D., Akyildiz I.F., A Multimedia Cross-Layer Protocol for Underwater Acoustic Sensor Networks. IEEE Trans. Wireless. Communication. 2010;9:2924–2933
[6]. Heidemann J., Mitra U., Preisig J., Stojanovic M., Zorzi M. Guest Editorial: Underwater Wireless Communication Networks. IEEE J. Select. Areas Communication. 2008;26:1617–1619.
[7]. Stabile T.A., Zollo A., Vassallo M., Iannaccone G. Underwater Acoustic Channel Properties in the Gulf of Naples and Their Effects on Digital Data Transmission. Ann. Geophy. 2007;50:313–328.
[8]. Xie P., Cui J.-H. An FEC-Based Reliable Data Transport Protocol for Underwater Sensor Networks. Proceedings of16th International Conference on Computer Communications and Networks (ICCCN); Honolulu, HI, USA. 13–16 August 2007; pp. 747–753.
[9]. Ahlswede R., Cai N., Li S., Yeung R.W. Network Information Flow. IEEE Trans. Info Theory. 2000;46:1204–1216.
[10]. Xu J., Li K., Min G. Multi-Path Division Transmission for Improving Reliability and Energy Efficiency in Underwater Acoustic Networks. Procedia. 2011;CS 4:86–95
[11]. Partan J., Kurose J., Levine B.N. A Survey of Practical Issues in Underwater Networks. SIGMOBILE Mob.Comput.Commun. Rev. 2007;11:23–33.
[12]. Pompili D., Akyildiz I. Overview of Networking Protocols for Underwater Wireless Communications. Commun.Mag. IEEE. 2009;47:97–102. [Google Scholar]
[13]. NS2 Available online: http://en.wikipedia.org/wiki/NS2 (accessed on 20 March 2012)
[14]. Carbonelli C., Chen S.-H., Mitra U. Error Propagation Analysis for Underwater Cooperative Multi-Hop Communications. Ad Hoc Networks. 2009;7:759–769.
[15]. Akyildiz F., Pompili D., Melodia T. Underwater Acoustic Sensor Networks: Research Challenges. Ad Hoc Networks. 2005;3:943–958.
[16]. Heidemann J., Li Y., Syed A., Wills J., Ye W. Research Challenges and Applications for Underwater Sensor Networking. Proceedings of IEEE Wireless Communication and Networking Conference (WCNC); Las Vegas, NV, USA. 3–6 April 2006; pp. 228–235.
[17]. Partan J., Kurose J., Levine B.N. A Survey of Practical Issues in Underwater Networks.Proceedings of First ACM International Workshop Underwater Networks (WUWNET); Los Angeles, California USA. 25 September 2006; pp. 17–24.
[18]. Chitre M., Shahabudeen S., Stojanovic M. Underwater Acoustic Communication and Networks: Recent Advances and Future Challenges. Marine Technol. Soc. J. 2008;42:103–116.
[19]. Zhou Z., Cui J.-H., Zhou S. Efficient Localization for Large-Scale Underwater Sensor Networks. Ad Hoc Networks. 2010;8:267–279.