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DESIGN OF CROSS LAYER PROTOCOL FOR UNDER WATER WIRELESS SENSOR NETWORK

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ABSTRACT: Cross layer protocol is applicable for wireless sensor network for the purpose of better coordination interaction and efficient data transmission of protocol crossing different layers. Since it enriches the data transmission it provides a better performance in data transmission among the sensor nodes. To overcome the issue of cross layer network, we use transport layer, physical layer and data link layer in wireless medium in order to provide reliable data transmission in underwater.

1. INTRODUCTION

Growing interest and penetrations of technologies is underlining new challenges and designs in communication protocols. Generally, communication protocol architecture follows strict layering in principles, which provide fast deployment and efficient implementation. Cross layer protocol is one among the proposed protocol with better optimizations, effective implementations and interactions in the sensor network but has certain limitations which lack coordination in resource sharing and data transferring this degrades the network functionality.

To overcome such limitations cross layer design was proposed the core idea is to maintain functionalities associated to the original layer but to allow coordination, interaction and optimization of protocol crossing different layers.

1.1 OBJECTIVE

Cross layer Protocol which does the operation of managing the network and efficient data transfer. The transmission of data is into the water so the data should be reliable, efficient, and delay of packets and less drop of data in a network which entirely degrade the performance of the cross layer protocol. The major aim of this project is to provide a cross layering protocol which continuously monitor the nodes while the data transmission in the network.

1.2 CONTRIBUTION

Cross layer Protocol which defines the protocol for managing the data

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transmission from the sender to the receiver node. Where the route to the destination node is found by using AODV protocol. When the node reaches its dead state the information is found by the SMAC layer then the route of transmission is changed. This provides a new path with good data transmission timing. So that it reduces the data drop or data loss in the network. Once the node is found to be in dead state then this will not allow the data packet to travel through that path.

2.0 BACKGROUND AND PROPOSED SCHEME

This section describes the cross layer protocol and the existing work.

2.1 DATA TRANSFER MANAGEMENT

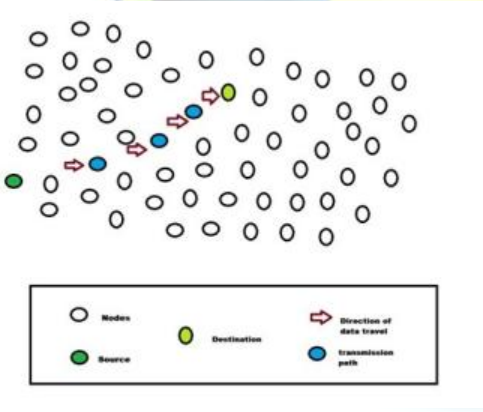

Figure 1

Figure 1 shows the example of Cross layer protocol. Data which is sent from the sender node is noticed by the network. Routing is fixed by the AODV protocol and the remaining node will be in ideal state. Monitoring of the network is a continuous process. It also find's the easiest way for data packet transmission. It reduces the delay of message travel form the source to the destination.

2.2 REVIEW

Proposed protocol will continuously monitor the network with the help of the layers for efficient data packet transmission. It also provides the less amount of data drop and less message transmission delay in the network path of the packet transmission. And is developed based on the topology mechanism where the transmission path from the source to destination is static and message transmission time is increased. Here the route for data transmission is identified by AODV routing protocol

2.3 ASSUMPTION

Cross layer protocol is designed for some mechanism

- Efficient data packet transmission
- Time duration for data packet transmission is less
- Dynamic path fixing

2.4 PARAMETER

Channel	Wireless
Propagation	Two Way Ground
Antenna	Omni Antenna
Queue Size	1000
Slot Time	20us
SIFS	10us

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Data Rate	11Mbps
Basic Rate	1Mbps

Table 1

The above Table describes the parameters which are used in the network for data packet transfer from the source node to the destination node. The Network which is developed in this proposed network is a wireless which can be used for data packet to travel from one place to the place without the connection of any wired medium. The speed of the data transfer in the network is maximised at the level of 11Mb per second and the lowest speed of the transmission of data packet is about 1 Mb per second.

2.5 ALGORITHM

Step 1: Start the simulation.

Step 2: The sender and the receiving nodes are marked.

Step 3: The AODV routing protocol allocates the path for data transfer.

Step 4: The nodes starts to transfer the data.

Step 5: The nodes in the network are checked frequently for its condition.

Step 6: If a node in the network is dead or if energy is low. SMAC layer find a new path to continue the data transfer.

Step 7: The program ends after the time is finished.

3.0 SIMULATION PERFORMANCE EVALUATION

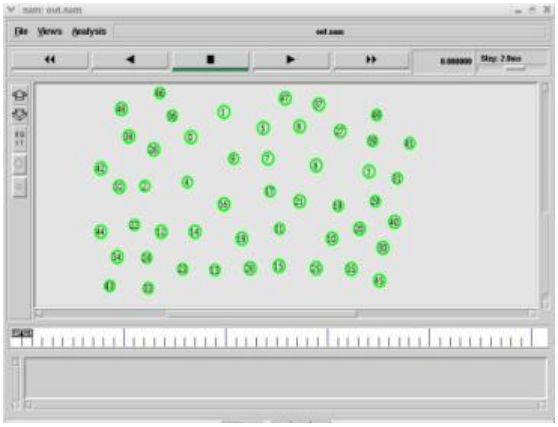

Figure 2

The Figure 2 shows the simulation of the network which is developed. In this network we have generated about 50 nodes in a network. In this Figure 2 the starting of the network has been shown and the number of the nodes are been created. All the nodes in the network are placed in the appropriate location which is assigned in the network.

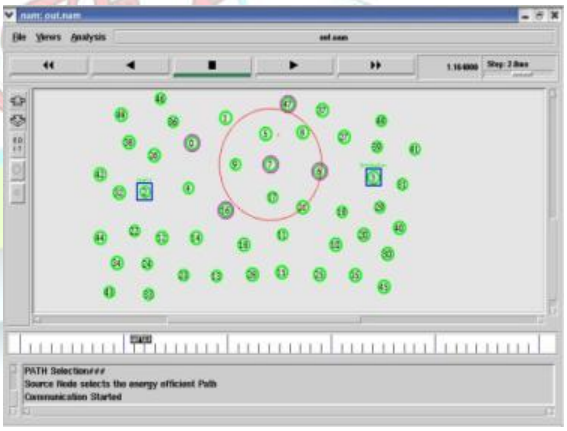

Figure 3

The Figure 3 shows the monitoring of the node and nodes are get activated. The source node and the destination nodes are also get created in the network. The network finds the path for the transmission of data packet while the monitoring process is done in the network.

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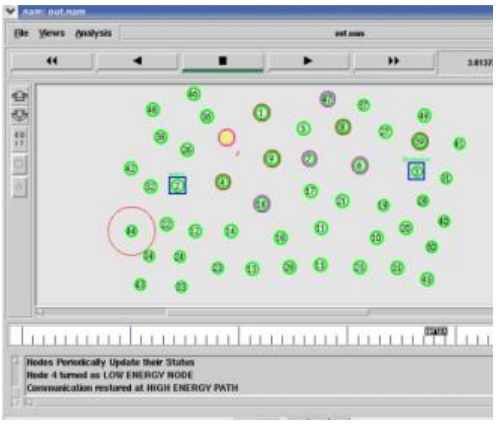
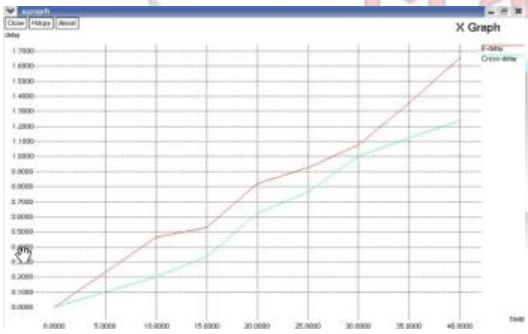


Figure 4

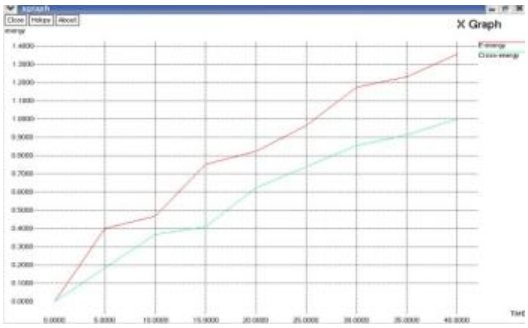
The Figure 4 shows the monitoring process of the nodes which is done in the network. This Existing protocol will not find any path when the data energy is dead in the network but the proposed protocol will be continuously monitor the network when the data is in mode of transmission . The monitoring of the nodes is made frequently in the network to reduce the data loss, maintain the efficiency of data transmission and reduce the data transfer delay in the network.

DELAY



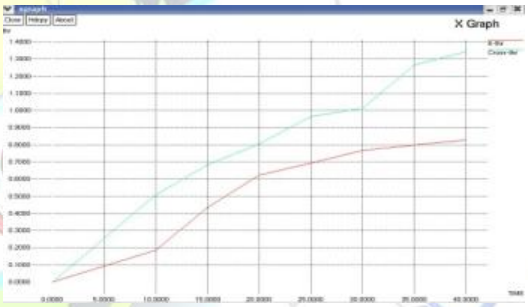
Delay is the difference between the time at which the sender generated the packet and the time at which the receiver received the packet. The delay time is less when compared to the existing protocol.

ENERGY



Energy is a key element in wireless network simulation. Its goal is to identify energy consumption of a node or a particular component of a node. Here the energy consumed by the existing protocol is higher when compared to proposed protocol.

THROUGPUT



Throughput is the number of successfully received packets in a unit time and it is represented in bps. It is calculated using awk script which processes the trace file and produces the result.

3.1 COMPARISON TABLE

Existing	Proposed
High energy consumption	Low energy consumption
Delay time is more	Delay time is less
Data loss occurs	No data loss
It cannot identify new path	New path is identified

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Speed-11mbps	Speed-15mbps
Low throughput	High throughput

4.0 CONCLUSION

This paper has expressed the optimization, interaction and coordination of the network. It comprises of alternate solution for the disadvantages of the existing scheme .This proposed scheme is also been modified in the way of data packet transmission path. This mechanism reduces the data packet drop and the delay of message in the network. Cross layer protocol is developed in the NS-2 simulation software. A number of algorithms has been studied and reviewed before implementing this Cross Layer Protocol.

REFERENCES

[1] T. S. Rappaport, A. Annamalai, R. M. Buehrer, and W. H. Tranter, "Wireless communications: Past events and a future perspective," *IEEE Communications Magazine*, vol. 40, pp. 148–161, May 2002.

[2] T.Rappaport, *Wireless Communications: Principles and Practice*. Upper Saddle River, NJ: Prentice Hall, 2002.

[3] S. Floyd, "TCP and explicit congestion notification," *ACM Computer Communication Review*, vol. 24, pp. 10–23, October 1994.

[4] H.Balakrishnan, V. Padmanabhan, S. Seshan, and R. H. Katz, "A comparison of mechanisms for improving TCP performance over wireless links," *IEEE/ACM Transactions on Networking*, December 1997.

[5] S. Shakkottai, T. S. Rappaport, and P.C. Karlsson, "Cross-layer design for wireless networks." WNCG Technical Report TR-2003-04-00001, Wireless Networking and Communications Group, Department of Electrical and
Computer Engineering, the University of Texas at Austin. Available for download at http://www.wncg.org.

[6] K. Kilkki, "Differentiated Services for the Internet," Indianapolis, IN, USA, Macmillan Technical Publishing, 1999.

[7] "Internet protocol," RFC 791, 1981.*57+ IEEE Std. 802.11e, "Local and metropolitan area networks - Specific requirements Part 11: Wireless LAN Medium Access Control (MAC) and Physical Layer (PHY) specifications Amendment 8: Medium Access Control (MAC) Quality of Service Enhancements," IEEE Press, 2005.

[8] J. A. Stine, "Cross-Layer Design of MANETs: The Only Option," Military Communications Conference, pp. 1-7, 2006.

[9] V. Firoiu, J.-Y. Le Boudec, D. Towsley, and Z.-L. Zhang, "Theories and models for Internet quality of service," IEEE Proceedings, vol. 90, no. 9, pp. 1565 – 1591, 2002.

[10] H. Zhu, M. Li, I. Chlamtac, and B. Prabhakaran, "A survey of quality of service in IEEE 802.11 networks," IEEE Wireless Communications, vol. 11, no. 4, pp. 6 – 14, 2004.