International Journal of Engineering Applied Sciences and Technology, 2016
Vol. 1, Issue 8, ISSN No. 2455-2143, Pages 34-37
Published Online June - July 2016 in IJEAST (http://www.ijeast.com)

HOP COUNT ROUTING ALGORITHM FOR UNDER WATER WIRELESS SENSOR NETWORKS

Miss Laxmi S.Shabadi
Assistant Professor, Dept of CSE, BLDEA's
Dr. Halaktti College of Engineering & Technology
Vijaypur, Karnataka, India

Miss Sneha N.Malegavi, Miss Sushmita G. Nimbal, Miss Veena N. Khombe
UG Scholar, Dept of CSE, BLDEA's
Dr. Halaktti College of Engineering & Technology
Vijaypur, Karnataka, India

***Abstract*— In this paper we present the deployment of sensor nodes. It's just a thought experiment put forward. We create a GUI (Graphical User Interface) to show the creation of the nodes and their selection of cluster heads and then broadcasting it to base station. Underwater acoustic communication is a technique of sending and receiving message below water. There are several ways of employing such communication but the most common is using hydrophones. Under water communication is difficult due to factors like multi-path propagation, time variations of the channel, small available bandwidth and strong signal attenuation, especially over long ranges.**

Keywords— **Sonobouyers, Wireless Sensor Networks**

I. INTRODUCTION

The wireless communication revolution is bringing fundamental changes to data networking, telecommunication, and is making integrated networks a reality. A wireless network enables people to communicate and access applications and information without wires. This provides freedom of movement and the ability to extend applications to different parts of a building, city, or nearly anywhere in the world. Wireless networks allow people to interact with e-mail or browse the Internet from a location that they prefer.

Wireless sensor networks (WSN), sometimes called wireless sensor and actuator networks (WSAN), are spatially distributed autonomous sensors to monitor physical or environmental conditions, such as temperature, sound, pressure, etc. and to cooperatively pass their data through the network to a main location.

The rest of the paper is organized as follows. Existing system is explained in section II. Proposed system is presented in section III. Algorithms used are explained in section IV. Results are provided in section V. Concluding remarks are given in section VI.

II. EXISTING SYSTEM

A. Existing Approach

In the existing approach is proposed all the possible paths for about neighbor set levels are discovered by using the process of flooding and forwarding. For each of the possible paths the routing metrics especially end to end delay is computed which is directly proportional to bandwidth. Finally the path which has the lowest set of hops is used to send the packets.

B. Advantage

Advantage of this approach is the route that is used for sending the packets has the lowest End to End Delay there by reducing the amount of time required for delivery of packets.

C. Disadvantages

1) Complexity is very high because of discovery of huge number of routes and also for each of the routes lot of control packets are wasted.

2) The energy consumed is very high due to fact that the energy required for transmission and Euclidean distance are directly proportional to energy consumed hence as the number of links are high the energy consumed is high.

III. PROPOSED SYSTEM

In Underwater acoustic communication routing of data is a tough task to overcome that we are proposing hop count routing protocol to collect the data from sensor nodes without taking much time and much energy. We illustrate physical concepts and will be available on the World Wide Web. The premise of this paper is to have a gedanken ("thought experiment") on a computer. Instead of imagining objects moving, accelerating, colliding, and bouncing, the computer simulates and animates these objects.

The goals of the paper are to:

1. Facilitate the understanding of physics through virtual tutoring, experiments, and demonstrations.

2. Allow students to do experiments which would be impossible, difficult, costly, or dangerous in real life.

3. Give physics teacher's material which is freely available on the web to supplement their curricula.

4. Create a set of basic objects which allows new Java programs to be written "on the fly", according to the principles of "Just in Time Teaching" (JITT).

Usually for ocean-bottom or ocean column monitoring we approach to deploy underwater sensors that record data during the monitoring mission, and then recover the instruments.

The following are the disadvantages:

1. Here Real time monitoring is not possible. This is critical especially in surveillance (in environmental monitoring applications such as seismic monitoring). Until and unless the instruments are not recovered data cannot be obtained, which may happen several months after the beginning of the monitoring mission.

2. Onshore control systems and the monitoring instruments have difficulty in communication. It is not possible to reconfigure the system after particular events occur.

3. Failure of instruments can easily lead to the complete failure of a monitoring mission.

4. The amount of data that can be recorded during the monitoring mission by every sensor is limited by the capacity of the onboard storage devices (memories, hard disks, etc.).

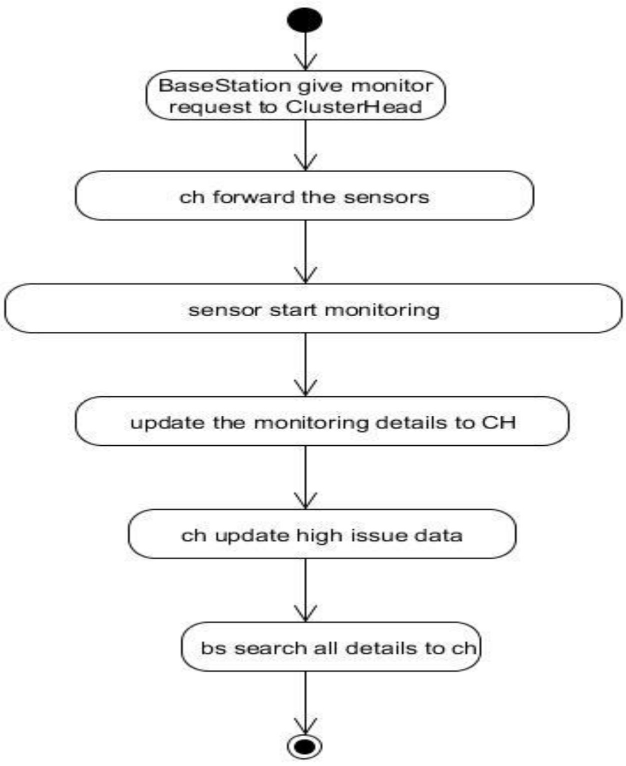

Fig 3.1 Activity diagram of the system

The sensor network forms what is known as a SEA Swarm (Sensor Equipped Aquatic Swarm), where each individual node is capable of moving with the underwater jet streams and currents. The swarm is escorted by sonobuoys at the sea surface which are equipped with both acoustic and radio modems (Wi-Fi or satellite) and GPS. In this architecture, each sensor monitors local underwater activities and reports time-critical data to any one of the sonobuoys using acoustic multi-hopping; then the data are delivered to a monitoring center using radio communications. The main focus of this paper is to design an efficient anycast routing protocol from a mobile sensor to any one of the sonobuoys on the sea level. However, this is challenging because geographic greedy routing causes a data packet to be dispatched to a node which is not the destination, but closer to the destination than all of its neighbors. This node is known as a local maxima node. In such situations, it becomes necessary to recover from this dead end path by routing around the perimeter of the region.
The Fig 3.1 shows the activity diagram of the system which gives the dynamic behavior of our system. In our system we are going to divide the network into clusters to reduce the communication overhead and to save energy. One of the nodes will elect as a head node and other nodes will be considered as member nodes. Member nodes are joining with the nearest head node by identifying the distance with head node once network establishment is done. Each sensor nodes are going to

International Journal of Engineering Applied Sciences and Technology, 2016
Vol. 1, Issue 8, ISSN No. 2455-2143, Pages 34-37
Published Online June - July 2016 in IJEAST (http://www.ijeast.com)

collect the data based on the collected data situation under the sea is identified if any abnormal condition is identified immediately it will be intimated to head. Head node considers this message as emergency situation and it will send beacon message to base station. From their user will get the notification about abnormal condition. apart from this emergency situation normal data monitoring will be done by member nodes and it will be collected by head nodes.

IV. ALGORITHMS USED

A. **Node Deployment Algorithm**

The Node Deployment is the algorithm which is used to place the nodes in the network across a given area. Each of the router topology is based on randomized placement of nodes using node deployment algorithm

B. Neighbor Discovery Algorithm

The algorithm can be described as below:

1) The input to the algorithm are routing table and transmission range
2) Each row of the routing table is scanned and then distance is extracted
3) The condition is checked whether distance is less than transmission range and the distance is zero. Add the node to the neighbour list.

C. HCR Algorithm

The algorithm can be explained as,

1) Source Node, Destination Node and Coverage area acts as an input
2) The source node routing table is fetched
3) The neighbours are discovered
4) For each of the neighbour acting like a source node. Route is discovered using individual HBR algorithm
5) The routes are cached

.

D. VAPR Routing Algorithm

The algorithm can be explained as,

1. Sonobuoy, source node, destination node and range acts as an input
2. The Sonobuoy will send a beacon signal to all the nodes in the network
3. The source node finds its neighbours
4. If the neighbours have destination node stop the process
5. If the neighbours do not have destination then find the matrix based on hop count , RE and direction
6. Find the node which has lowest hop, highest residual energy and destination direction
7. If the time has not got expired then continue process from step1 to step6
8. If the time has expired then form clusters and move forward

V. RESULTS

Some of the snapshots of the working system are given below.

Fig 5.1 Sensor process details

Fig 5.1 gives the snapshot of the sensor node after starting the monitoring of the network. All the nodes and their values will be displayed in the cluster head and the variations of the current status of the node whether it is active or in sleep mode will be updated depending on the wake up time provided.

Fig 5.2 gives the snapshot of the base station after monitoring of the environment. All the details of all nodes will be updated. Along with that we provide a Mail sending button using which people living offshore can be intimated regarding the current status of the environment.

International Journal of Engineering Applied Sciences and Technology, 2016
Vol. 1, Issue 8, ISSN No. 2455-2143, Pages 34-37
Published Online June - July 2016 in IJEAST (http://www.ijeast.com)

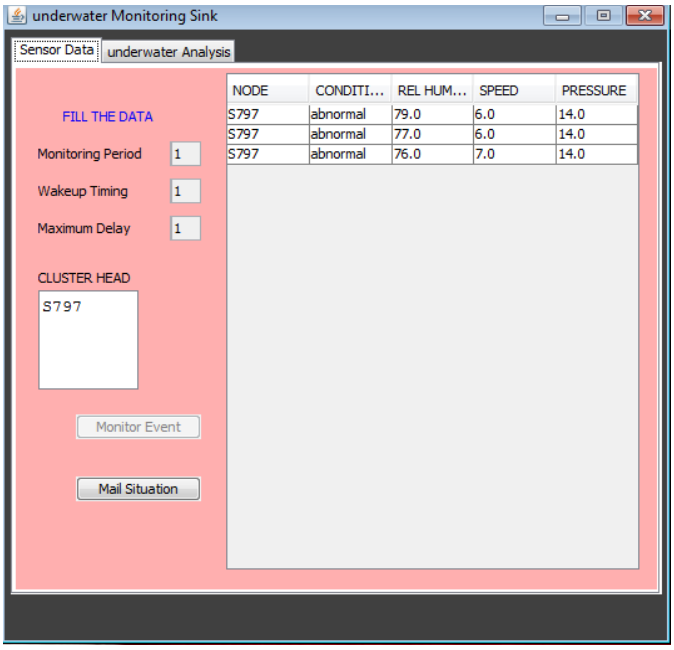

Fig 5.2 Underwater analysis after monitoring

VI. CONCLUSION AND FUTURE SCOPE

A. Conclusion

We developed a GUI interface for showcasing the deployments of sensors and their working for underwater environment with acoustic communication. Here we show deployment of underwater networks that will enable real time monitoring of the selected ocean areas, remote configuration and interaction with onshore human operators.

Here we collect the data based on the assumptions of the set threshold values considering the real time configurations. The collected data includes : relative humidity , speed , pressure , o2 level , pH level and turbidity along with the current status of the underwater environment conditions like sustained , abnormal ,up normal and normal .

The collected data is of no use if it's not broadcasted to the people living offshore. So we have made an effort to make this information reachable via the mail service.

B. Future Scope

The presented work here is limited only to the GUI interface or the simulations. This can be extended to real world implementations by devising the sensors to be able to sustain the underwater obstacles.

The work is limited to graphical user interface. Practical implementations are harder due to the following major challenges in the design of underwater acoustic networks:

- Battery power is limited and usually batteries cannot be recharged, also because solar energy cannot be exploited.
- The available bandwidth is severely limited.
- Channel characteristics, including long and variable propagation delays, multi-path and fading problems.
- High bit error rates.
- Underwater sensors are prone to failures because of fouling, corrosion, etc.
- These all above challenges cannot be determined until and unless they are deployed in the real world.

VII. REFERENCES

[1] Jan Erik Faugstadmo and Jens M. Hovem ,*"Underwater wireless sensor networks"* in 2010 Fourth International Conference on Sensor Technologies and Applications.

[2] LucaGhelardoni,Member,IEEE,AlessandroGhio,Member, IEEE,andDavideAnguita,SeniorMember,IEEEDITEN,UniversityofGenoa,ViaOperaPia11A,I-16145Genoa,Italy"*Smart Underwater wireless sensor networks".*

[3] U. Lee, P. Wang, Y. Noh, L. F. M. Vieira, M. Gerla, and J.-H. Cui, "Pressure routing for underwater sensor networks," in *INFOCOM, 2010 Proceedings IEEE*, March 14-19 2010, pp.

[4] *"VAPR- Void Aware Pressure Routing for Underwater Sensor Networks*" Uichin Lee†, Paul Wang, Youngtae Noh, Luiz F. M. Vieira‡, Mario Gerla, Jun-Hong Cui Bell Labs, University of Connecticut.

[5] "Underwater Sensor Network: Challenges And Applications" , By Himanshi Bambri

[6] "Channel-awareRoutingfor Underwater Wireless Networks" byStefano Basagni_,

[7] "Interference And Bandwidth Aware Depth Based Routing Protocol For Underwater Wireless Senose Network" by Hamza Fahim.

[8] "QELAR: A Q-learning-based Energy-Efficient and Lifetime-Aware Routing Protocol for Underwater Sensor Networks" Tiansi Hu and Yunsi Fei Department of Electrical & Computer Engineering University of Connecticut.