

DESIGN OF CLUSTER NETWORK MANAGEMENT PROTOCOL FOR UNDERWATER WIRELESS SENSOR NETWORK

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Abstract

Wireless sensor network is a clustered form of network with comprises of large number of sensor nodes .Nodes that are controlled by clustered node are very efficient for data transmission. Sensor nodes are continuously monitored by the network. The detection of sensor finds the way for the data transmission from the sender to the receiver. A sensor node has the less consumption of energy with it retain or transmit the data in the network.

1. Introduction

The advancement in the technology of wireless communication .Recent trends has been developing day to day. Wireless sensor nodes perform the operation of transmitting the data from the source to the destination which should be made in an efficient way so that the data transmission between the sender and the receiver will be in an effective manner. Node will does the signal processing and it also does the operation of self-configure during the data transmission. Nodes are formed or grouped into a cluster. Every six nodes that are nearer to the cluster node are joined into the cluster group for the continuous monitoring of the node for efficiency. SNMP protocol will does the operation of managing and monitoring the entire network with the help of the cluster nodes. Certain application are also been developed for this protocol which made successful with some of the drawback in that network. In this paper the advancement in technology is used and the drawback of the existing SNMP protocol is been compromised by this protocol.

1.1 Motivation

Simple Network Management 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 management protocol. The major aim of this project is to provide a network managing protocol which continuously monitor the nodes while the data transmission in the network.

1. To design a network managing protocol that monitors the network with help of the cluster nodes.
2. To detect the failure nodes in the clustered group.
3. To design a managing protocol that has less data loss in the network

1.2 Our Contribution

Network Management Protocol which defines the network for managing the data transmission from the sender to the receiver node. The packet from source is get monitored by the cluster node. Each node in the network are monitored by the properties like battery life, node state, node status, it is continuously monitored by the cluster node in the network for the efficient data transmission. When the node reaches its dead state. The information is found by the cluster node then the route of transmission is changed. So that it reduces the data drop or data loss in the network. Once the node is found to be in dead state then Cluster nodes will not allow the data packet to travel through that path. It also provides good data transmission timing.

2. Background and proposed scheme

This section describe the clustered network management protocol And the existing work.

2.1 Clustered Network management

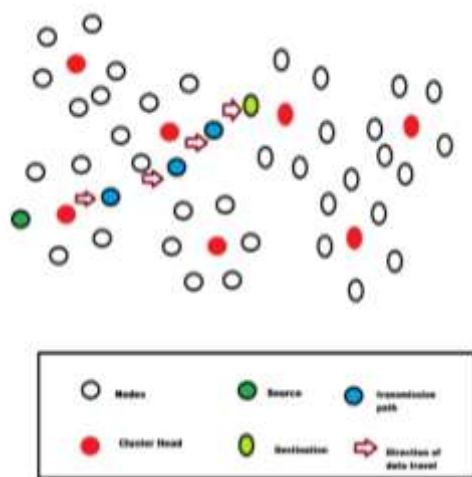


Figure 1

In this paper Figure 1 shows the Example of clustered network management. The clustered nodes are the header nodes and it monitors the sub nodes in the network. Data which has been send from the sender is noticed by the network. Routing is fixed by the cluster head and the remaining sub-node will be in ideal state unless the cluster head fixes the path to the remaining nodes. 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 cluster nodes in the network for efficient and reliable data packet transmission. It should also provide the less amount of data drop and message transmission delay in the network. Path of the packet transmission is varied depend on the status of the nodes. It also provides the easy monitoring of the network. Proposed protocol may also suit for some critical application such as landslide detection, forest fire monitoring. Existing protocol is developed based on the topology mechanism where the transmission path from the source to destination is static and message transmission time is increased

2.3 Assumption

Clustered network management protocol is designed for some mechanism

- Efficient and reliable data packet transmission
- Time duration for data packet transmission is less
- Dynamic path fixing
- During a particular time the transmission path is static
- Entire network is managed

2.4 Network management Scheme

A monitoring node request the topology of the network initiates a request. This request diverges thought-out the network reaching all active nodes. A response action is set up which converges back to the initiating node with the information. Proposed scheme consists of a number of monitoring process is done to activate all the nodes. Nodes get made-up into its cluster group. Information which is transmitted is converged into the receiver end.

The different phases of the proposed algorithm are follows

- Activate the node and its location
- Cluster head development
- Check the Cluster head for node selection
- Selection of routing path
- Data transmission

I. Activate the node and its location

Node is activated when the network is active .Corresponding location of that particular node is get build up automatically in the network. Source and Destination node is also get generated.

II. Cluster Head Development

Each six node comprises of a cluster head which monitor and manages the sub-nodes in the cluster group. Continuously the Heads will be in the process of monitoring the nodes and managing the network.

III. Check the Cluster head for node selection

After the node is get activated. Cluster nodes will check for the sub-nodes whether it is active and it is easy for transmission from the source to the destination. Cluster node will select the way for data transmission path

IV. Routing path

Cluster head responses to the network which defines the selection of node for transmission. This routing path will be fixed after the monitoring of nodes.

V. Data transmission

Once the routing path is get selected by the network. The transfer of message is started in the network. Data packets are get forwarded one node to another node with a less amount of data drop.

2.5 Parameter

Channel	Wireless
Propagation	Two Way Ground
Antenna	Omni Antenna
Queue Size	1000
Slot Time	20us
SIFS	10us
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 maximum at the level of 11Mb per second and the lowest speed of the transmission of data packet is about 1 Mb per second.

2.6 Network Management Process

Step 1: The node is get generated and it becomes to the active state.

Step 2: Cluster head is get developed with group of six nodes in a cluster.

Step 3: Source and the Destination is get detected in the network.

Step 4: Base station send the data request to the network.

Step 5: Network will be assigning the path of transmission which is monitored.

Step 6: Source node starts its transmission from the base to destination node. Where the data packet will be transferring from the one node to another node till the data packet reaches the destination successfully.

Step 7: The continuously monitoring process of the heads of the node will be repeatedly processing the network till the message transmission is completely done.

2.7 Network Management Analysis

The proposed mechanism is explained below with the network management analysis and the transmission process in the network

Network Topology

The Clustered mapping of nodes has been comprised in the network and the routing of path and dynamic allocation is done

Energy Map

This gives the energy levels of the nodes at different parts of the network. The cluster head nodes are identifying the usage of nodes in the network so that the energy of node is managed.

Usage Pattern

This describes the network activity in terms of continuously monitoring activity of nodes and the node is get selected by the cluster head for the usage of transmission.

State of sensors

Typically sensors would be choosing a node at random with no priority. Future selection of path for transmission would depend upon the present state of the network.

Network Monitor States

Take continuous measurements to obtain various states like network connectivity, energy map and path allocation.

Network Maintenance

By monitoring the network, the network performance can be tracked with respect to the performance. Corrective measure like selection of new node or new path fixing can be performed.

2.8 Comparison

Comparison Parameter	Existing	Proposed
Speed Of Transmission	8 Mbps	11Mbps
Data Drop	15%	10
Time Delay	20%	10%
Channel	Wireless	Wireless
Basic Transmission	500Kbps	1Mbps
Successful Data Transfer	90%	98%
Path Fixing	Static	Dynamic

Table 2

2.9 Performance Result

The three parameter which has taken as the comparison for the existing and the proposed graphs are Delay, Throughput, and Energy

DELAY

The delay is defined as the amount of time the data packet needs to transfer from the source to the destination. Delay must be less for a network for an efficient data transfer.

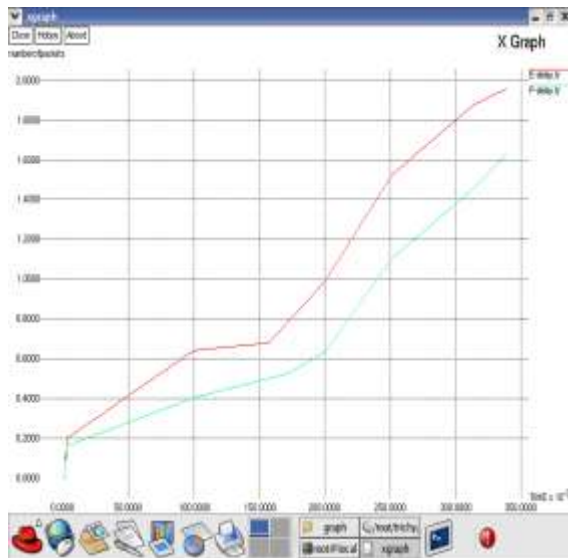


Figure 2

Throughput

Throughput must be high in a network which means that the total amounts of data packets in the network have successfully reached the destination. The total amount of data packet sent in a network is calculated. The proposed protocol provides a high throughput. The below figure 3 shows the graph of proposed and existing protocol.

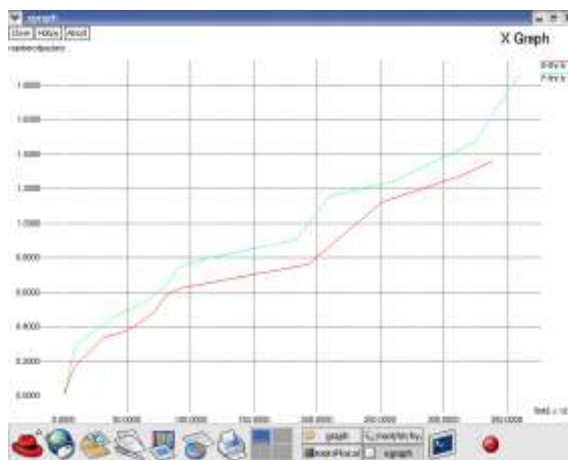


Figure 3

Energy

The total amount of energy consumed by the network has been calculated and the amount of energy consumption of a network must be less and the proposed protocol has been achieved the same and the sensor nodes are placed in the underwater so that it must have a low consumption of energy and it is hard to take the sensor node from the underwater and replace it with another one

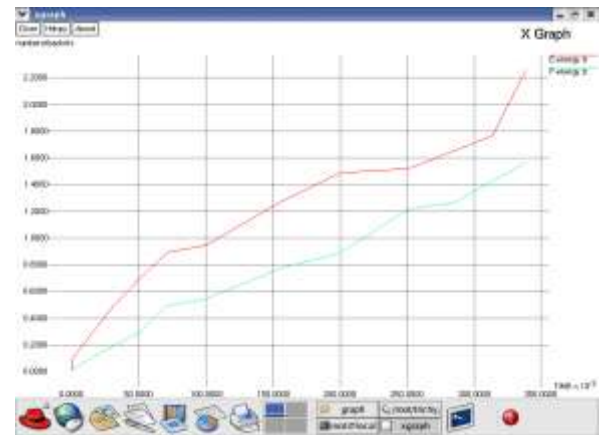


Figure 4

3. Simulation Performance Evaluation

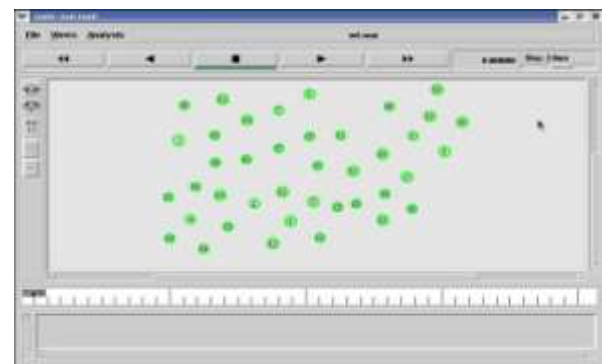


Figure 5

The Figure 5 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.

The below Figure 6 shows the monitoring of the node and nodes are get activated. The cluster nodes are getting developed for the management of the network while the transmission of the data packets. During the development of the cluster node 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. Cluster nodes are also monitoring the sub node of the cluster group to find its state.

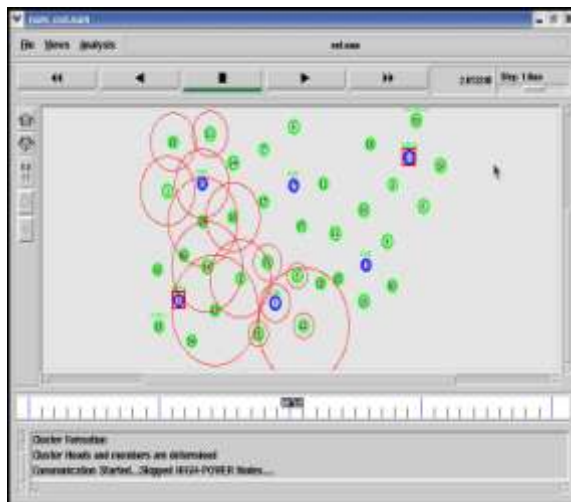


Figure 6

The below Figure 7 shows the monitoring process of the nodes which is done in the network. This Existing protocol will not find any path when the data drop occur in the network but the proposed network management protocol will be continuously monitor the network when the data is been in the mode of transmission . The monitoring of the nodes is made frequently in the network to reduce the data drop and the efficiency of data transmission and to reduce the delay of data transfer in the network. Cluster head will be always in the state of monitoring the sub nodes in the network. Each six nodes is called as a group or Each six node is controlled by the cluster head and that head will only decide the way of data packet transfer. When a node is changing to it dead state then the head will be identify that defective node. When the data packet transfer is done through that node then the network will be changing the path of the transmission in the network.



Figure 7

4. Conclusion

Cluster network management protocol. This paper has expressed the management and monitoring 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. Clustered network management protocol is developed in the NS-2 simulation software. A number of algorithms has been studied and reviewed before implementing this Clustered Network Management Protocol.

5. References

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