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HYBRID ALGORITHM FOR CLUSTER HEAD SELECTION BASED ON ENERGY IN MANET

Updesh Gangwar *

Updesh900@gmail.com

Computer Science and Engineering, INVERTIS Bareilly

Ravi Shankar Shukla

ravi.s@invertis.org

Computer Science and Engineering, INVERTIS Bareilly

Abstract— In the existing system is only find in cluster head using cluster based routing protocol algorithm. This algorithm is not based in energy level of cluster head selection. The cluster head can communicate with other cluster heads, member nodes and gateways. That time the cluster head energy level is low. So the cluster head can't communicate with other nodes. That the same time the congestion will be occurs and packet can't be transfer in the nodes. It will take more time to complete the packet transmission. This approach illustrates that the proposed method is a routing protocol. The proposed research we have used no of connection in a group or cluster. Every cluster has a cluster head and the cluster head directly interconnect with the improper place. The results of proposed method are comparison with existing Leach Protocol.

Here base connection is located to equal distance of a cluster and it's directly communicating to the cluster connection. When a cluster or group is selected after that its force level is not considered. This method is increasing to life instance of network. As compare LEACH and Proposed method, we have noticed proposed methodhave better force, life time, less delay, better transmission and consumed less time. LEACH Protocol is based on the cluster to make comparison of native parameters so that we design the proposed methodl cluster based. Cluster used no of group to increase the performance. This consist many advantages which are listed below. Existing Number of groups are low. We can analyses more number of groups here. Every group's stage check in this proposed research. Proposed method routing protocol have better result as compared to LEACH protocol. As cluster-head dies, series is rebuilt to bypass the deceased node. So the initial topology is not affected. Head node receives all the aggregated data moreover transmits further to cluster-head.

Keywords— Multi hop, MANET, Routing protocol, Dynamic Source Routing (DSR), Ad hoc On-Demand Distance Vector Routing (AODV), Cluster.

I. INTRODUCTION

A multi-hop network is a type of wireless network that uses more than one wireless node to transmit its information from a source node to a destination node. These nodes freely and dynamically self-organize themselves allowing them to interconnect seamlessly within a specific range. This concept is around for close to 20 years now and currently applied in various consumer electronics and military applications. The concept evolved from single-hop networks where the information is transmitted through a single hop. One of the most common single-hop networks is the Bluetooth Pico net where two nodes can seamlessly transmit information to one another if they are within the transmission range. Mobile ad-hoc network (MANET) is a type of multi-hop network. In this type of network, each node is free to move independently in any direction and hence the nodes change their links frequently. MANET has been a popular research topic since mid-1990. In contrast to protocol cellular networks, there is no master-slave relationship between the base station and the mobile users. MANETs is used in several applications like vehicular communications, military applications, emergency first response and public safety response.

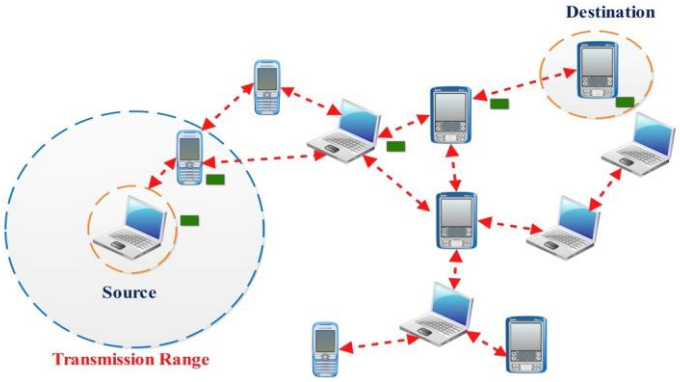

Fig. 1 Manet Network

II. LITERATURE SURVEY

MANET is the new developing technology that enables users to communicate without any physical arrangement regardless of their own geographical location, so that sometimes, its referred to as an arrangement with fewer network. An ad-hoc network is an adaptive and self-organizing. Device in MANET should be able to detect the presence of other devices and perform necessary set up to facilitate communication and sharing of data and service. MANET can be divided into Table-Driven and On-Demand Routing protocol. Here Table Driven protocols are comes in proactive category and arrange a routing table which contain performance parameter otherwise on-Demand are active and not required to maintain a routing table.

(A)Ad hoc On-Demand Distance Vector Routing (AODV)

AODV is an on–Demand routing protocol that is completely union of DSDV and DSR. The node movement is calculated on demand, same as DSR with the help of route discovery process. But, AODV collect the performance parameter inside a routing table similar to DSR which retains multiple paths of the node cache entries for every destination. This protocol delivers loop free path of node while maintaining link damages but not similar to DSDV, it could not require any global intermittent routing marketing. [3, 4]

(B)Dynamic Source Routing (DSR)

DSR is a more accurate on-Demand routing protocol [6], in which path is calculated whenever is required. Basically it designed for multichip ad hoc networks in the mobile nodes. DSR permits a network to organize and configured itself without any other third parties or networks. It did not required any time period for routing messages as compared to AODV, so that it can reduces bandwidth, battery power and overhead with the huge routing updates. The main effect of this protocol is seemed in MAC layer to identify link failure. DSR is based on the source routing where whole route is carried on the overhead [2]. It has proposed an enhanced alg0rithmic rule of pr0posed meth0dwhich imbalance the l0ad on each c0nnecti0n and impr0ves the netw0rk lifetime. In pr0posed meth0d, there is only one cluster head in each series i.e. pr0posed methodD0uble cluster Head, there is d0uble cluster heads which av0ids the l0ng series pr0blem existing in pr0posed method. Simulati0ns have been perf0rmed to c0mpute the round of c0mmunicating to percent of deceased c0nnections in each surrounding of communicating. In the future w0rk, PDCH can perf0rm better as c0mpared to EEPB and proposed for raising the system distributed and parallel process (Wang Linping, 2010).

III. METHODOLOGY

Implement the Proposed protocol:

Assign unique x and y values for each node. While (last cluster node in the network). Generate clusters group with specified area in the width network. Assign the value to clusters as x coordinate. Generate a random number up to maximum length of the clusters. Assign the value to cluster as y coordinate

- Pick the node cluster node which is at largest distance from the cluster-head
  While (last cluster node of the network is checked)
  Get x and y coordinate of the cluster node
  Find the distance from the cluster-head
  If this distance is higher than maximum distance
  Assign to maximum distance value to the cluster node
  Record cluster node ID
  Iterate loop for next node in the cluster network
- Check cluster node ID of node which is at maximum distance
  Add the furthest node to the chain
- Make cluster starting from the uttermost node from the initial station
  While (last node of network is added to cluster)

Check x and y value of last added node to the cluster
While (all the nodes are checked)
If (node not added to the cluster)

- Check x and y value. Calculate space from the last added node to the cluster. If distance is less than minimum distance. Record cluster node ID. Iterate loop to check next node if is at minimum distance. Check the cluster node id of the node which is at minimum distance. Add the node to the chain .For data gathering process pick a node randomly which is head of the cluster and all the nodes are collected in cluster post data towards it. Head node fuse the data to sends the information to the initial station

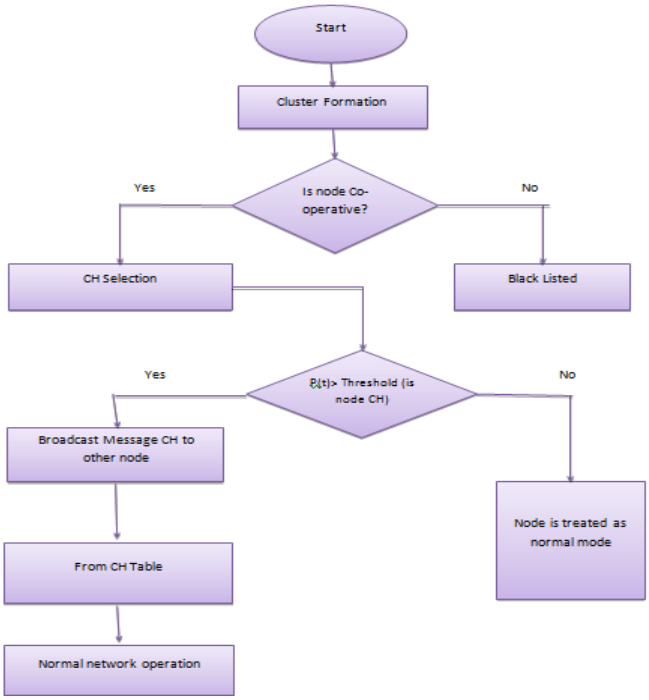

Fig. 2 Purposed block diagram

Implement the PROPOSED PROTOCOL where head node is highest energy node in the cluster:
Instead of picking leader node randomly, iterate through the nodes in the cluster, node with maximum energy level is selected head for the surrounding.
Implement the PROPOSED PROTOCOL where head node is only selected once:
If there are 100 nodes in the network, for each 100 rounds every node get selected only once as a head node for data gathering process.
Implement the PROPOSED PROTOCOL where section of network is picked randomly:
Select a part of the network randomly. Pick the highest energy node in the randomly selected section of the network.

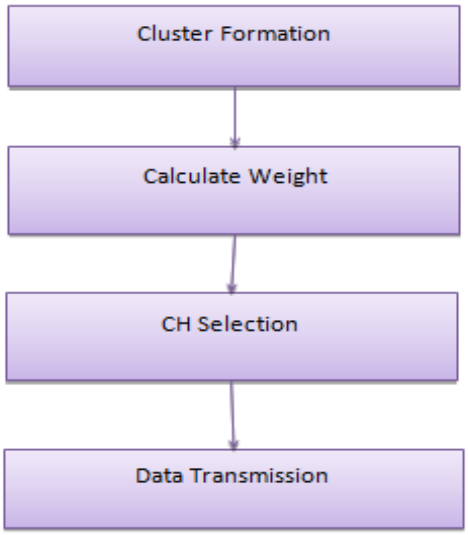

Fig3. Cluster formation process

IV. **RESULT**

A mobile network is formed by the whole of fifty nodes and on outstrip of akin routing protocols are compared intimidation SENSORIA– a Graphical computer position based customarily machine (J. N. Al-Karaki and G. Al-Mashaqbeh, 2007). For the evaluation considered two protocols- LEACH and proposed method is investigated in stipulations of statement wriggle, the energy matching with the same token network period. Simulation parameter table are mention here.

Table I. Simulation Table with parameters values

Parameters	**Values**
No. of nodes	20-100(Variable)
Energy in Joule	0.5J (Homogenous)
Area size	40m x440m
Transmission range	70m
cluster-head position	At origin (0m x 0m)
packet size	200 bits
Control packet	248 bits
transmission speed	100 bits/sec.
Bandwidth	5000 bits/sec.

The performance of Energy Efficient based Cluster protocol in MANETs is being estimated with the help of simulation on network simulator. To estimate the final performance, here consider some parameters that are given below.

- Packet Deliver
- Energy consumption
- End to End Deliver
- Throughput

The network are considered by 40m X 40m with numbers of nodes are 36 that are distributed randomly in mobile field

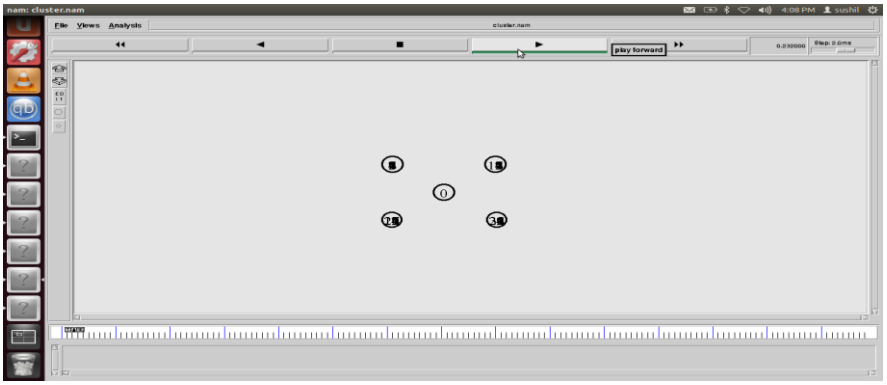

Fig4. X-Window of NS2. Here all the files of project are showing here.

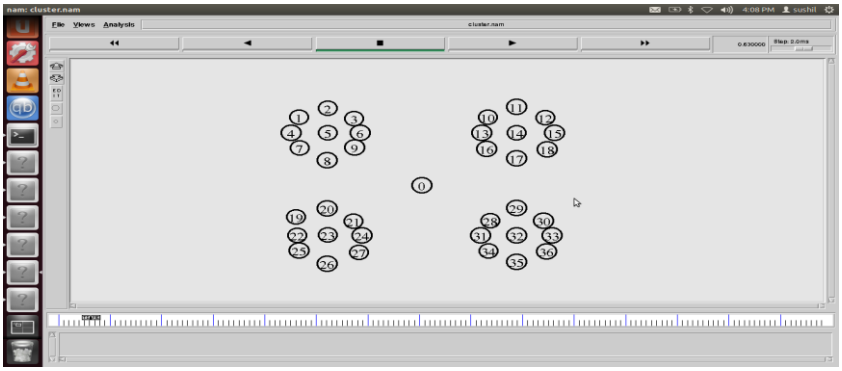

Fig. 5 Run the main file name is wsn.tcl. Run in the NS2 Simulator this file by using command [ns wsn.tcl].

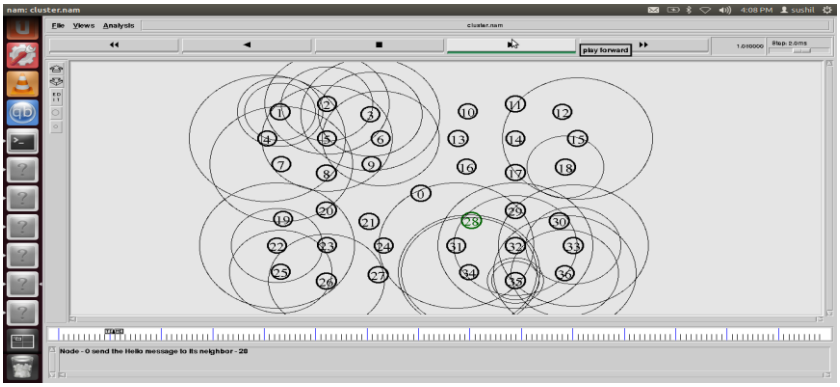

Fig. 6 Run the Network Animator see cluster are forming

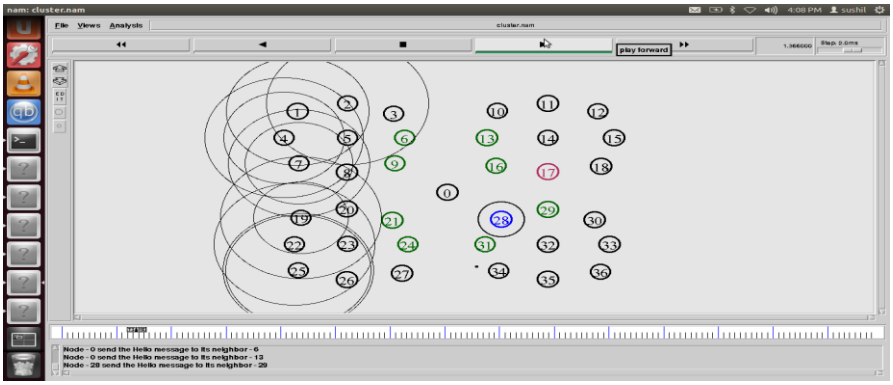

Fig. 7 Run the Network Animator sees cluster group are formed and now ready to make

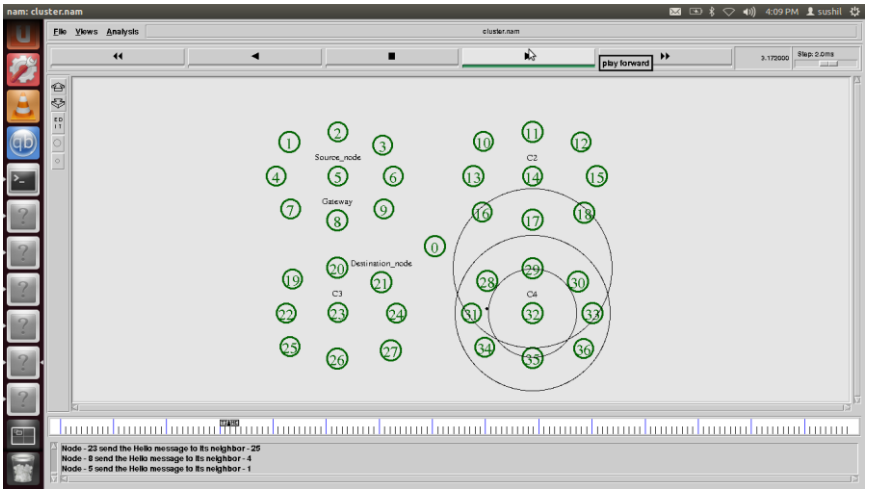

Fig. 8 Cluster-head is active to send the information to nearest node communication with cluster-head.

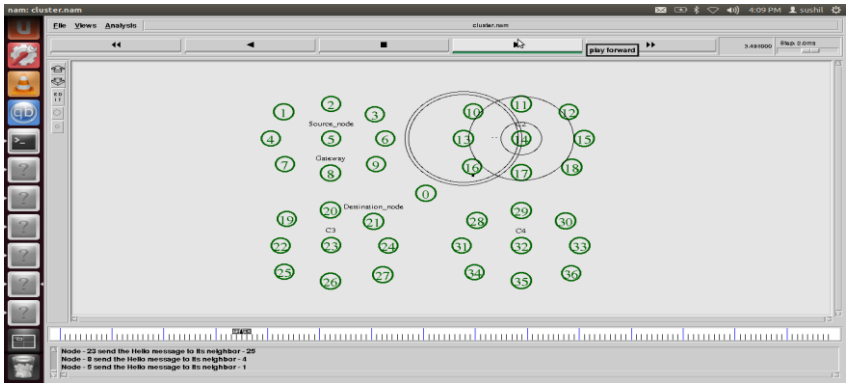

Fig. 9 Cluster-head is active to send the information to nearest node communication with cluster-head.

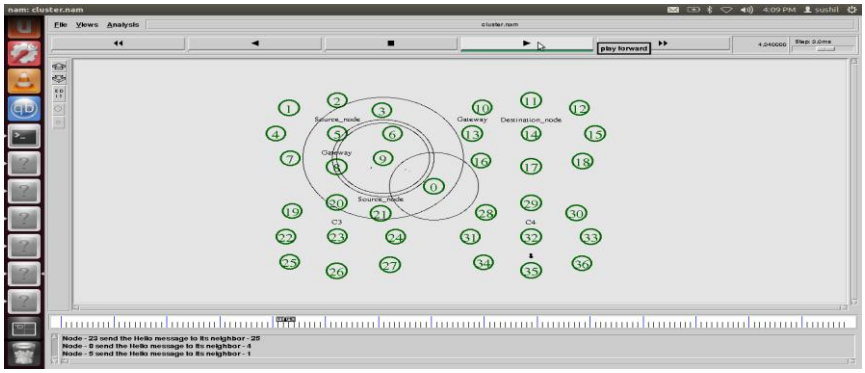

Fig. 10 Cluster-head is active to send the information to nearest node communication with cluster-head.

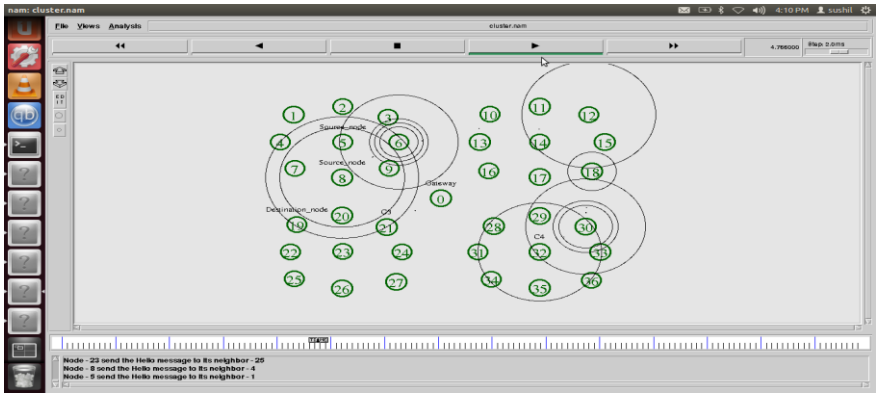

Fig. 11 Cluster-head is active to send the information to nearest node communication with cluster-head.

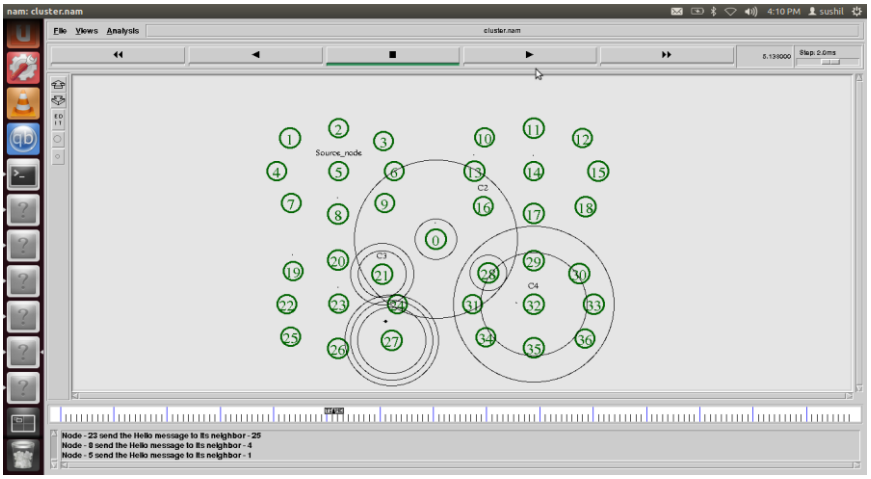

Fig. 12 Cluster-head is active to send the information to nearest node communication with cluster-head.

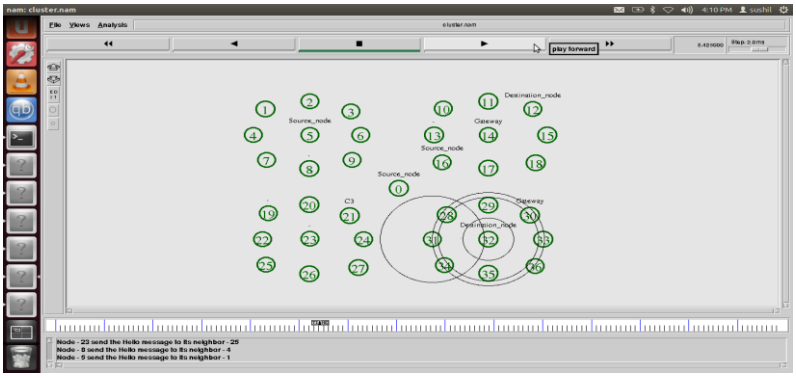

Fig. 13 Cluster-head is active to send the information to nearest node communication with cluster-head.

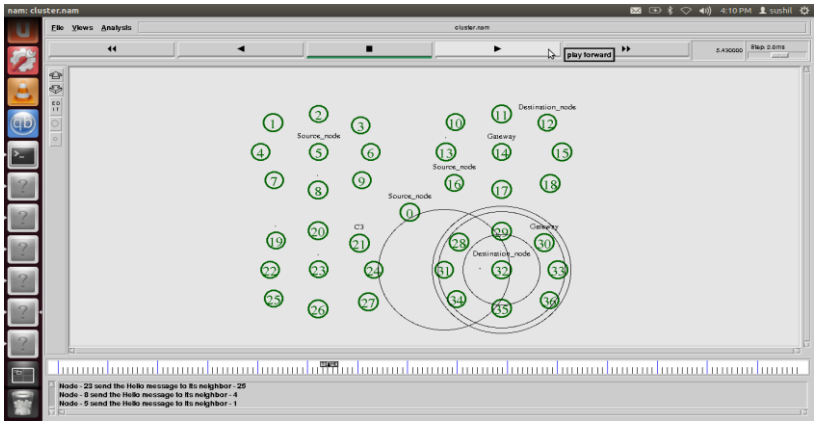

Fig. 14 Cluster-head is active to send the information to nearest node communication with cluster-head

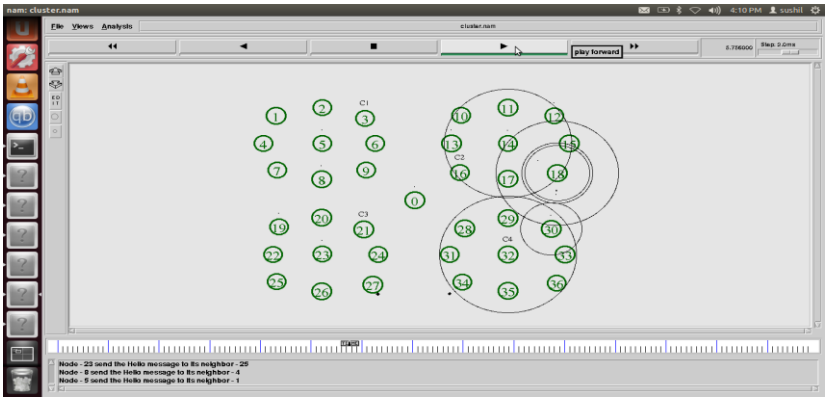

Fig. 15 Cluster-head is active to send the information to nearest node communication with cluster-head.

Following are the results, calculated by using performance.awk script. Using the output we plotted the bar graphs of following parameters .The result is carried out by NS-2Simulator using following Parameters.

Throughput, Packet Delivery Ratio, Energy Consumption, Average End to End Delay

(a)**Packet Delivery Ratio**: - It is the ratio of the number of data packets received by the CBR sink at the final destinations to the number of data packets originated by the application layer at the CBR sources.

(b)**Throughput**:- It is one of the dimensional parameters of the network which gives the fraction of the channel capacity used for useful transmission selects a destination at the beginning of the simulation i.e., information whether or not data packets correctly delivered to the destinations.

(c)**Energy Consumption**: - The energy consumption comparison graphs between calculate the total energy using in whole scenario.

(d)**Delay**: - Number of rounds vs. Delay graph shows the comparison between the reading of cluster-head selection and choosing a new cluster head

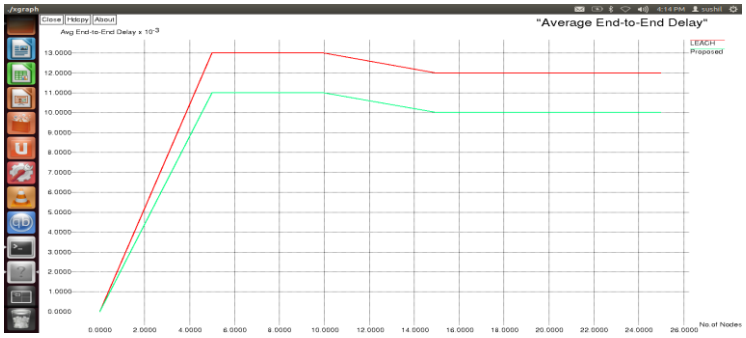

Fig. 16 Average End-to-End Delay

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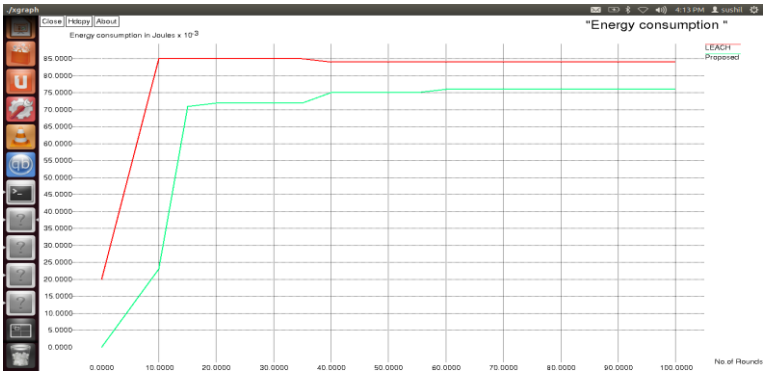

Fig. 16 Average Energy Consumption

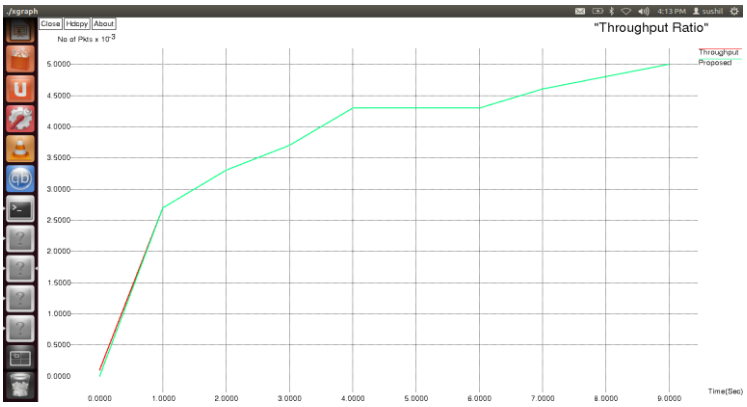

Fig. 17 Throughputs Ratio

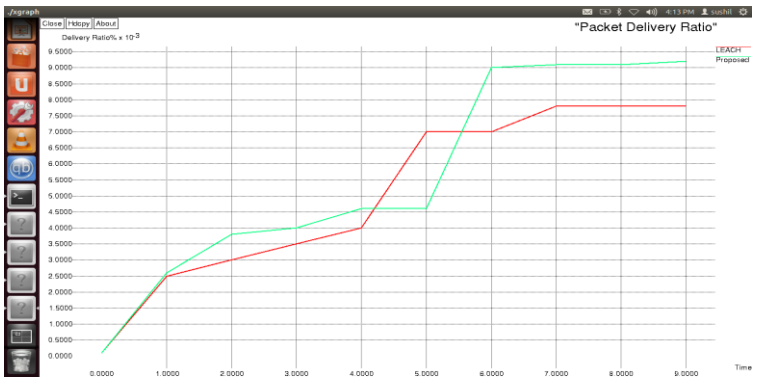

Fig. 18 Packet Delivery Ratio

V. CONCLUSION

The proposed protocol is energy based on packet transmission in cluster. The proposed system is when the new node is entered the cluster in sometimes the new node will be the cluster head. Because the head node can communicate to gateway in every transmission at the time cluster head energy level is decrease. When the cluster head reached in minimum energy level doesn't to transmit the packets so the new node will become a cluster head. Because new node has maximum level of energy. So the proposed algorithm is increased the throughput that is better than the existing algorithm. Here showed the graphical and numerical value comparison between the existing and proposed protocol as clearly seemed here proposed protocol having the best performance as compared to existing because of the high energy protocol based cluster head selection, so that simple energy comparison measure the cluster head and rest node working as a cluster.

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