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IMPROVED COMMUNICATION CONFINING CLUSTERING USING UNCEASING POSSESSION NODE ALLOCATION ALGORITHM IN WIRELESS SENSOR NETWORK

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Abstract: Wireless sensor nodes are fixed in stable environment, so more distance between nodes in network cause packet drop. During transmission period node broadcast data packets there is coverage problem. It affects network lifetime, normal sensor nodes have certain limits for packet exchange, which makes unbalanced load for routing node. It minimizes the packet delivery rate, also consume more energy. Proposed Improved Communication Confining Clustering (ICCC) Method, information is exchanged in cluster member nodes, which are organized by cluster head. Nodes confining with intra clustering, provides the stable link among nodes in cluster achieve effective packet transmission in that node. Unceasing possession Node allocation algorithm is applied to clustering, it merges many feature in cluster members nodes also reduce energy usage range. This method not allows the re-clustering of nodes that reduce time delay.

Keywords: Improved Communication Confining Clustering, Unceasing possession Node allocation, Nodes confining with intra clustering.

I. INTRODUCTION

Improvement of wireless communication the sensors contains sense, calculation and Packet exchange ability are generally applied for different groups in nodes. Wireless Sensor Network having an more Quantity of sensor nodes that organize the Data's on network environment like brightness, moisture, noise, shaking, also a force [1]. The expansion of wireless sensor network was initially stimulated by army uses for battleground observation. It is currently applied to miscellaneous region also used for meteorology and hospital uses [2].

WSN is a network of little energy level sensor nodes of restricted for committed task, storage space and coverage ability. Sensor nodes are frequently arranged in a random manner, also to organize the background data and execute the known task among the assistance with remaining nodes [3]. All sensor node broadcasts the monitored data packets to previous sensor nodes else sink node. Here straight packet transmission to the sink node is unfeasible whether the quantity of sensor nodes is more as a small number of counts [4]. The nodes are classically mobile and restricted in the communication energy, energy contribute, with transmission limit. To effectively manage with this problem, the sensor network should be constructed considering the transmission rate and energy effectiveness, unnecessary to applies the characteristic of sensor nodes, with the particularly energy limits [5].

Every cluster of sensor nodes is analyzed and inhibited by a current sensor processing, is a cluster header node. All cluster head node collects the packet transmitted from the sensor nodes fit in to its

group, also broadcasting data to the sink node [6]. Generating the groups, particularly cluster head chosen; it is difficult process in the organization of wireless sensor network because cluster head get through much more energy level compared with other nodes in network environment [7]. It is predictable method in this consider is low energy cluster construction scheme, also it uses a probabilistic model for cluster head choosing. It is stimulated the construction of numerous succeeding schemes utilize a comparable technique.

Federal grouping scheme when improved LEACH protocol, enhances the Cluster Head choice method [8]. This improved LEACH method for the network contains sequential difference in the data coverage charge transversely different area. It is better to LEACH while organizing the data are lesser else higher cost of the variety of attention, when it use the similar scheme as low energy cluster head allocation for creating groups [9]. It is avoidable to choose a alternative Cluster Head attractive against the responsibility of the present cluster head that expire when communication period.

This scheme indicating by alters the chance of all nodes to happen to cluster head depends on the power need to broadcast data packet to sink node [10]. Present alternative enable Adaptive grouping pecking order that fix the similar technique as LEACH except available to employ a alternative node for restore the Cluster Head and also improving the lifespan of network environment. It is depends on the agreement of strong nodes for identifying and management of breakdown in the cluster head [11]. This scheme is present to improve lifespan of network sensor network by form various quantity of groups in all region of the network considering to the relation reserve to the sink node. This depends on the separation of the network for allocating various chances to the nodes in all division those nodes is sure to be the cluster head [12].

Lasting Rest of the paper is designed as follows. Part II indicates a related works. In Part III, we present the details of proposed Improved Communication Confining Clustering (ICCC) Method obtains the effective packet organization by cluster head node. Part IV provides simulation performance report monitor obtained under different parameters. Last Part V end the paper with future enhancement.

II. RELATED WORKS

Farhan Ami Mondal, *et al.*, [13] proposed energy well-organized and Traffic management ant colony optimization depending historical information organization scheme. The process area is separated into Effective amount of groups using K-means. The nodes in a group form a sequence using ACO- Ant colony optimization with the selection of a chain leader. The Cluster head form an high level sequence using ACO with the selection of a super header to broadcast the final organization of information to the Sink node. Experimental output shows that present performs efficient than existing scheme PEGASIS metrics are lifespan of network, energy usage packet latency and transmission rate. Numerical meaning of output is recognized.

Li, Xiangling, *et al.,* [14] propose a novel energy well-organized Scheme that utilizes the improved redesigned data delivery of the adjacency matrix of an unmanageable. Present algorithm, all quantity is the total of a small number of monitoring information which that is jointly strong-minded by chance example with chance stroll. Throughout calculation we prove that the design double monitor is the adjacency matrix of a traffic occurrence for wireless sensor network with many groups. Experimental output indicates the present HEED is efficient compared with existing method to analyze packet delivery rate and energy usage. When HEED-Hybrid Energy-Efficient dispersed grouping technique is applied, to obtain similar redesigning packet delivery rate.

Gotefode, KaushiQin, *et al.,* [15] Present energy aware historical grouping method with changeable cluster dimension below the condition of harvest ambient energy on all node. Various from the usual cluster depending technique in sensor network, we exclusively merge factor in group count and dimension optimization on energy usage. As to the Cluster Head choosing that is self-governing, the remaining energy with the reserve to others nodes are main feature for nodes to contend for cluster head. The rehabilitated historical grouping technique and the Disruption scheme are adopted in grouping with header node choosing. Grouping and cluster head choosing occur all the time for the alternative remaining energy, though, the disruption scheme to make active the improvement of grouping and cluster head re choosing make the computation difficulty. Experimental output shows that recently constructed grouping technique, make increased lifespan of network distinguish with several conventional clustering method.

Park, Geon Yong, *et al.,* [16] proposed well-organized group header choosing technique using K-means scheme to reduce the energy effectiveness of wireless sensor network. It is depends on the Concept of decision the cluster head reducing the total of Euclidean distance among the header node and cluster member nodes. Experimental result indicates that the present technique allow Effective presentation distinguished with previous schemes. It improves the lifespan of network.

Lin, Mei, *et al.,* [17] proposed a novel twice cluster-head direction-finding scheme depends on grouping hierarchy communicating scheme. Considering to managing the quantity of intermediate nodes, additional energy and detachment capacity, accept first and next group head manner. Cluster heads are dependable for information aggregation with communication correspondingly. It rejects the more energy usage in individual group header and fake loss occurrence. Experimental output that depending on capacity and intermittent group header chosen should improve the entire characteristics of the network environment, minimizing group header energy usage, steadiness energy usage among group member nodes, and improve the whole network lifespan.

Geetha, N., *et al.,* [18] sensors worn in the network countenance most important problems due to the restrictions of energy reserve various users are on the way to generating rules for well-organized usage of energy supply of the sensors. Energy harvest sensor is promising method that generates an eco friendly infrastructure. This EHWSN- Energy Harvesting routing method applied for Wireless Sensor Networks relate solar based energy harvesting method and successfully selects the group header locations with higher harvest rate. Experimental output of the present methods is distinguished with low energy clustering by compute energy usage and transmission rate. Present performance is better compared with previous scheme.

Radani, Zohreh Molaei, *et al.,* [19] proposed volumetric coverage limit that regard as three dimensional as an alternative of plane reporting. A visual sensor network is modelled by means of two undirected graph: a message sharing path which indicates that data transmission connection among nodes, with visualization grid that indicates the adjacency of ground of vision of the sensors. This clusters sensors using the idea diagram. The shaped groups are applied to choose sensors to protect volumetric limits. Important aim of the present group depending technique is reducing energy usage in the sequence operated sensors for network-lifespan improvement.

Albath, Julia, *et al.,* [20] present selecting a cluster header within all group is vital since group heads use extra vigour for their tasks and that load needs to be with awareness passed approximately. Numerous conditions either decide cluster heads arbitrarily or choose nodes with the maximum residual energy level. Proposed the ECDS-energy constrained minimum dominating set to scheme, issue of

efficiently selects the group header nodes with an energy restriction. Present distributed algorithm for the constrained dominating set that executes in cycles with elevated chance. Simulation result indicates that dispersed technique performs well in terms of energy consumption, node lifespan, and grouping time and, it is very appropriate for wireless sensor network environment.

III. OVERVIEW OF PROPOSED SCHEME

Wireless cluster nodes perform essential process, each node frequently arranged in environment that are separated into a stable quantity of group using Cluster formation method. Improved Communication Confining Clustering is proposed technique; information is exchanged within its cluster member nodes those informations are collected and uploaded to base station node. Base station node is placed missing from the particular environment cause packet drop because of more distance. Cluster nodes remaining energy is measured, through the whole lifespan of network, and then to reduce creation of cluster traffic in each communication process. Every cluster with sequence header is chosen depending on feature derivative from residual battery level with distance to Base Station.

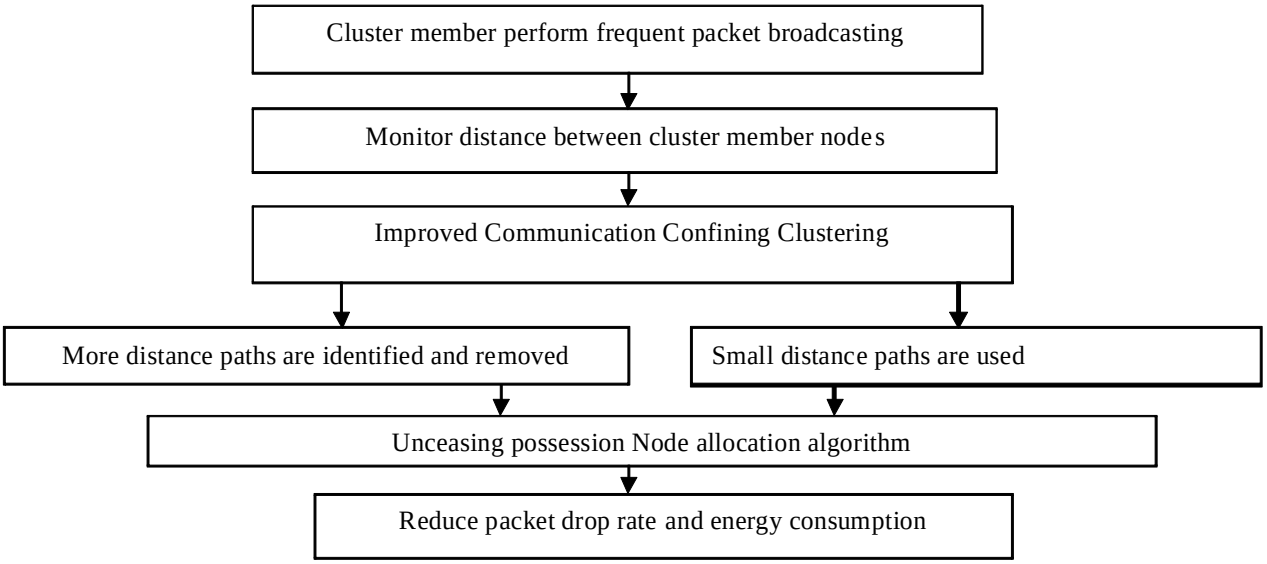

Figure 1: Block Diagram of Improved Communication Confining Clustering

3.1. Monitor distance between cluster member nodes

An altered path in the clustering communication process depends on the joining cluster member nodes that individually regard as energy and position of node. Cluster Head perform process for collecting data packets from non Cluster Head nodes also broadcasting data packets to Base Station node, therefore Cluster Head is usually the node with more remaining energy for maximum lifespan of node. Monitoring the issues for traffic control, create the linked nodes of the clustering connected to the standard remoteness from all previous nodes, standard detachment to Base Station node and remaining energy of groups. Where $D(N)$ is distance between neighbor node.

$$D(N) = T(D) - S(D) \tag{1}$$

The cluster member is determined by the reducing energy usage. Then to the cluster head chosen, usually the nodes with maximum remaining energy is disposed should be selected. The Cluster Head

energy will regularly process away. Threshold level is fixed, if cluster head energy level below to threshold value to re select cluster head. It reduces energy consumption. Monitoring the cluster member position and neighbor node position also measured. After that distance between each sensor nodes are measured. The clusters are creates, node ID digit is allocated to all node of a cluster based to the distance from the cluster head, allocating minimum count nodes to the next neighbor nodes.

$$T(D) = C \prod_{m}^{n} P \tag{2}$$

The remaining energy level of the Cluster Head is verifies all round to maintain the link of network. Whether the energy level of the Cluster Head is lower than fixed threshold level, otherwise to select new cluster head node performs packet transmission. The recently chosen Cluster Head notify previous nodes to altering of the Cluster Head node. It accepts single hop communication method for the Cluster Heads to straight broadcast the data packet to Base station node. The organized data packets are process by the Base Station.

$$C \prod_{m}^{n} P = C * \int_{m}^{n} P \tag{3}$$

$$C * \int_{m}^{n} P = \sqrt[n]{P} * C_{m} \tag{4}$$

This wants to split the observed region into little area earlier than cluster-head chosen. It is valuable to minimize the cost of maintain communication, stay away from the of packet exchange, minimize the error of packet, and guarantee the trustworthiness of packet exchange in minimum energy usage. Examine area can be split into neighbouring and rectangular depends on various packet transmission scheme. Around is some overlapping in coverage range while it uses round separation scheme. Though that scheme has normal coverage range and simple to recognize the coverage range those nodes feel right one. Sequence to keep away from part overlap, it separate the monitor network environment based on distance. Finally minimum cluster path used to broadcast data packets.

3.2. Improved Communication Confining Clustering

In Effective path discovering method is used to the node's extra force not allowing for the quantity of Intermediate relay nodes choose the cluster head. These would impact on the performance of network to some extent. Present an Improved Communication Confining Clustering; it depends on quantity and remaining energy of relay nodes available in network environment. Approve separate transmission scheme. Then entire focusing network is separated into small group with identical range. Consider the many sensor nodes disseminated in the entire analyzing environment, with all nodes should drop into significant small groups. A small group containing many sensor nodes also can have none. It maintains the historical information for communication among sensor nodes.

$$C_{m} = \cos\ m \tag{5}$$

It provides end to end communication with applicable group. Nodes in single group contain the similar quantity of intermediate relay nodes. The significance is the same to the group node count increased to its neighbouring four routes small group node count. Monitor the quantity of sensor nodes of all groups; also estimate the amount of intermediate nodes of all nodes depending to the position of node. While small group recline to the edge of all group, Target node should interact with nearest

group depends on estimating the characteristics of sensor node in routing path. Sensors are more battery level, whether same capacity nodes are grouped as cluster.

$$\sqrt[n]{P} = \log n \tag{6}$$

Cluster heads selects but not transmit packet to that head, since packet that have information of environment, cluster head organization data packet with it's in cluster nodes. The remaining nodes in group are also estimate the capacity and then rehabilitated into the space among sensor node, also cluster head node. In Last all cluster member nodes considered to estimate its capacity to perform communication process in particular routing path. Then it broadcast the selected packet to initial header node.

$$\sqrt[n]{P} * C_{m} = \log n * \cos m \tag{7}$$

Whether the sink node within its successful transmission coverage limit, it perform packet exchange in a straight manner with sink node. Previous conditions, the cluster-head need to select a neighbouring cluster head node that makes the high capacity node for broadcasting. Temporarily, the reserve among the selected node with sink node must lesser than the unique cluster head node to sink node. All cluster head rebuild similar process like this awaiting attains sink node. this minimize energy usage for entire network to accept multi-hop packet transmission and select the efficient packet broadcasting node for next nearest neighbor node and also improve the lifetime of network, it establish the stable link connection among sensor nodes.

$$T(D) = \log n * \cos m \tag{8}$$

In Improved Communication Confining Clustering, sink node transmits notice information to cluster head after selecting those cluster head. It estimate the reserve to sink node according to the vigour of data packets, also then decide the efficient route among all available cluster head node and sink node. Cluster heads hand out multiple processes in same time slot allocated to cluster member node. Exchange data packets, initially broadcast data packets to cluster head node for assigned time slot. Cluster head broadcasts combined data packet to sink node. It evermore choose relay node that distance is short to connect sink node, also broadcast packet to sink node. Minimum distance are used otherwise maximum distance paths are rejected.

Improved Communication Confining clustering algorithm

Step 1: For each Analyze stable energy level of nodes.

Step 2: *if energy level == stable*

Step 3: Perform packet transmission among sender to cluster head node.

Step 4: Establish stable link connection.

Step 5: *else if energy level ==unstable*

Step 6: Does not perform packet transmission

Step 7: end if.

Step 8: *If node distance = = maximum*

Step 9: Reject that path

Step 10: *else if node distance == minimum*

Step 11: Choose that path to organize data packet by cluster head.

Step 12: End if

Step 13: End for

3.3. Unceasing possession Node allocation

The minimum distance path is used to perform packet organization by cluster head node. Traffic occurrence is reduced by using unceasing possession node allocation scheme. Cluster head task is allocated with particular time slot. Again grouping should direct to enhance energy consumption, with minimum lifespan of network nodes for packet organization and Path discovering. Cluster header node maintains unstable level of energy. This unceasing possession node is not hacked by any unwanted attacker node those are available in cluster.

$$S(D) = \frac{\delta y}{\delta x} * m \tag{9}$$

$$D(N) = \log\, n * \cos\, m - \log\, n * \cos\, m \tag{10}$$

This algorithm works by cycle, one communication finished, it starts to perform next communication for that path. The sensor node are fixed and assign group, the communication scheme uses maximum energy node selection method is used to choose sensor nodes with higher energy as the cluster head nodes. Establish the relaying nodes for communication between source and base station node. Each sensor nodes begin to organize data packets that are aggregate by group header and relayed to the sink node. At last the sink nodes check out the coverage proportion to make a decision whether the communication is carry on otherwise rejected. It avoids re clustering since it takes so much of energy.

Algorithm for Unceasing possession Node allocation

Step 1: Position of all cluster member nods is monitored.

Step 2: for node search next neighbor perform frequent communication.

Step 3: Monitor distance of routing nodes

Step 4: *if node == Uncease*

Step 5: Packet transmission is frequent.

Step 6: Cluster head collect the packets

Step 7: else if *node == cease*

Step 8: Packet transmission is infrequent.

Step 9: search another efficient path

Step 10: End if

Step 11: End For

Wireless nodes are linked with each using this proposed method so it easy to perform packet transmission efficient in that path. It improve packet delivery ratio and network lifetime. Unceasing possession Node allocation algorithm reduces the energy consumption and time delay.

Packet ID: Packet ID having every sensor nodes, historical information. It also has extra details of location and node capacity.

Source ID	Destination ID	Monitor distance between cluster member nodes	Improved Communication Confining Clustering	Unceasing possession Node allocation	Improve lifespan of network
3	3	5	3	2	3

Figure 2: Proposed ICCC Packet format

In figure 2: the proposed packet format is shown. Here the source and destination node ID field occupies 3 bytes. Third one is Monitor distance between cluster member nodes contains 5 bytes. This analyzes every node distance between neighbouring nodes in clustering. In fourth field occupies 3 bytes. Improved Communication Confining Clustering obtains effective cluster head chosen to organize data packets frequently. In fifth occupies 2 bytes, Unceasing possession Node allocation is applied to get better transmission path from sender to sink node. The last filed Improve lifespan of network, which offers minimum distance routing path with higher network lifetime occupies 3 bytes, to separates the nodes based on characteristics.

VI. PERFORMANCE EVALUATION

A. Simulation Model and Parameters

The proposed ICCC is simulated with Network Simulator tool (NS 2.34). In our simulation, 100 sensor nodes deployed in 830 meters x 620 meters square region for 44 milliseconds simulation time. All sensor nodes deployed in random manner among the network. All nodes have the same transmission range of 250 meters. CBR Constant Bit Rate provides a constant speed of packet transmission in network to limit packet overload. LEACH Low-energy adaptive clustering hierarchy is used to monitor the network node behavior with its energy usage to obtain efficient communication using unceasing nodes. Table 1 shows Simulation setup is Estimation.

Table 1
Simulation Setup

No. of Nodes	100
Area Size	830 X 620
Mac	802.11g
Radio Range	250m
Simulation Time	44ms
Traffic Source	CBR
Packet Size	150 bytes
Mobility Model	Random Way Point
Protocol	LEACH

Simulation Output

Simulation Result: Figure 3 show that the proposed ICCC method performs better packet transmission using unceasing nodes compared with existing ACOHC [13] and UEBC [14]. ICCC provides the efficient routing path with unceasing nodes are selected for cluster organization of data packets it improve network lifetime and packet delivery ratio.

Performance Analysis

In simulation to analyzing the following performance parameters are using X graph in ns2.34.

Path Connectivity: Figure 4 shows path connectivity is estimated by radio range with number of packet sent, all node connectivity stored by routing table. In proposed ICCC method path connectivity is improved compared to existing method ACOHC, UEDC, RLEECRS, and ETCMIMO.

$$Path\ connectivity = radio\ range * number\ of\ packet\ sent$$

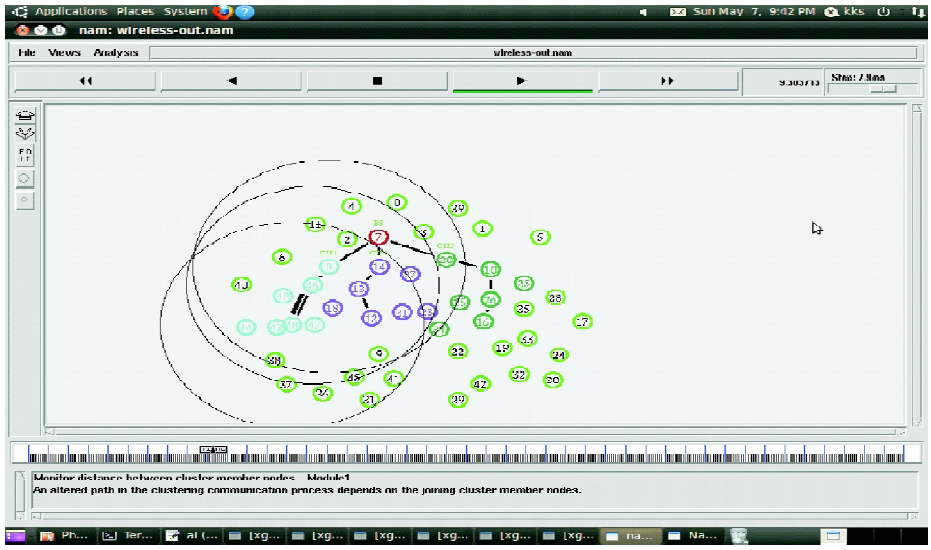

Figure 3: Proposed ICCC Result

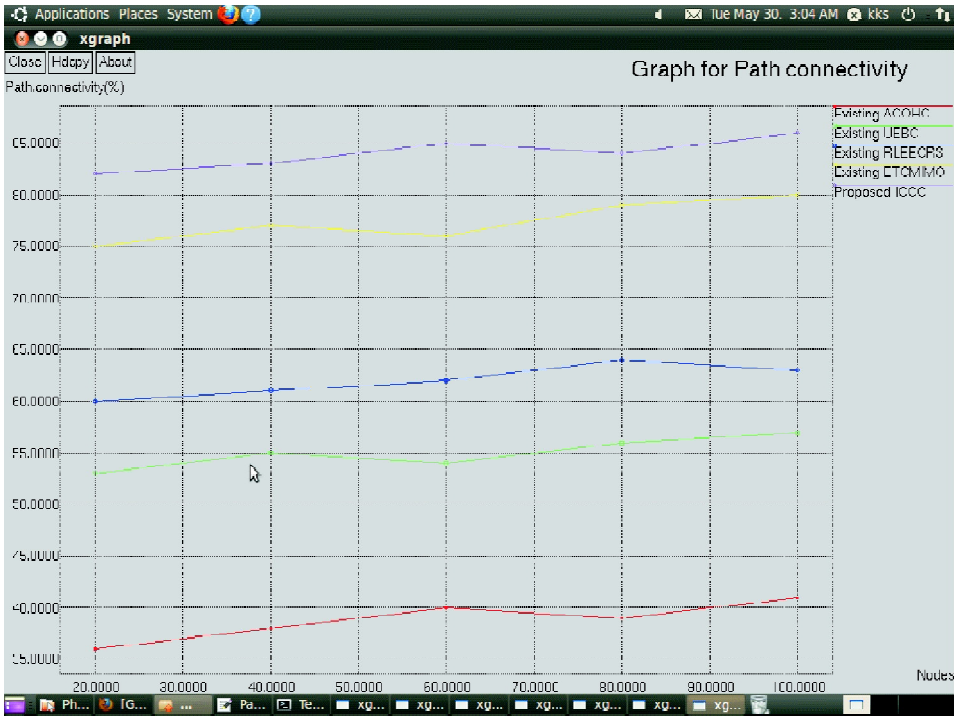

Figure 4: Graph for Nodes vs. Path connectivity

Network overhead: Figure 5 shows Network overhead is minimized in which sender transmit data packet to neighbor using Unceasing possession Node allocation scheme provides an efficient packet transmission, so there is no packet overload. In proposed ICCC method network overhead is reduced compared to Existing method ACOHC, UEDC, RLEECRS, and ETCMIMO.

$$\textit{Network overhead} = (\textit{Number of Packet Losses/Received}) * 100$$

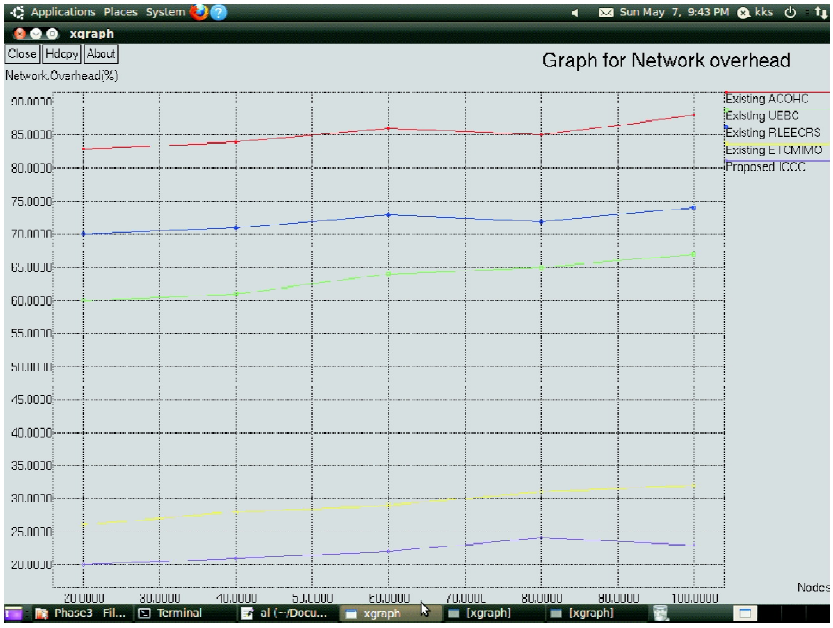

Figure 5: Graph for Nodes vs. Network overhead

Packet Delivery Ratio: Figure 6 shows Packet delivery ratio is measured by packet received from packet sent in particular rate. Speed of node is constant in sensor network; simulation rate is fixed at 100. In proposed ICCC method Packet delivery ratio is enhanced compared to existing method ACOHC, UEDC, RLEECRS, and ETCMIMO.

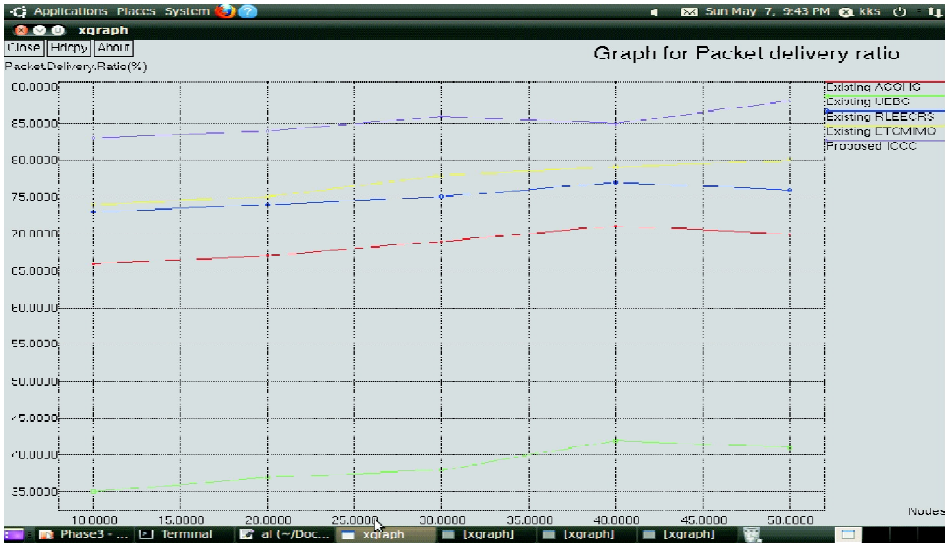

Figure 6: Graph for Nodes vs. Packet Delivery ratio

Network Lifetime: Figure 7 show that Lifetime of the network is calculated by entire process of network, resource utilized to make efficient communication. In proposed ICCC method Network Lifetime is increased compared to Existing method ACOHC, UEDC, RLEECRS, and ETCMIMO.

$$\textit{Network Lifetime} = \textit{length of energy usage/overall energy}$$

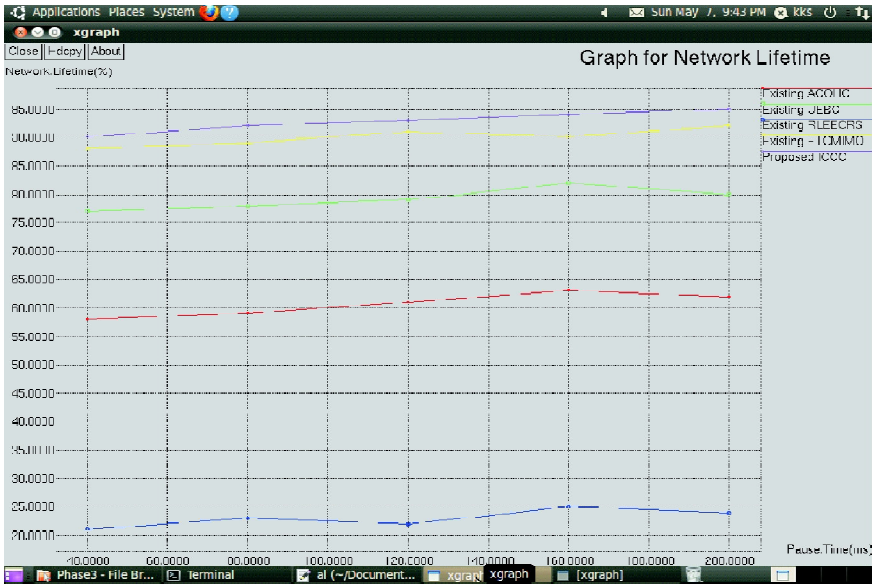

Figure 7: Graph for Pause Time Vs. Network Lifetime

Energy Consumption: Figure 8 shows energy consumption; evaluate total energy used for starting node to ending node. In proposed ICCC method are Unceasing possession Node allocation applied for packet transmission, so energy consumption is minimized compared to Existing method ACOHC, UEDC, RLEECRS, and ETCMIMO.

$$\textit{Energy Consumption} = \textit{Initial Energy} - \textit{Final Energy}$$

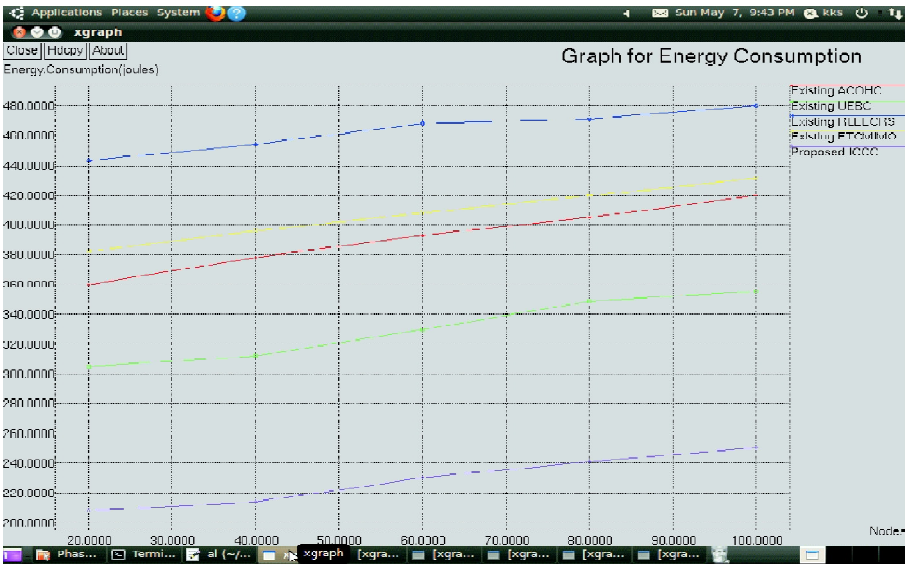

Figure 8: Graph for Nodes vs. Energy Consumption

Packet Loss rate: Figure 9 show that Packet loss of all transmission in network is planned by nodes loss the packet because of data packet traffic that are reject by using Unceasing possession Node allocation, obtains better packet transmission. In proposed ICCC method Packet loss rate is reduced compared to Existing method ACOHC, UEDC, RLEECRS, and ETCMIMO.

$$\textbf{\textit{Packet loss rate}} = \left(Number\ of\ packet \frac{lossed}{Sent} \right) * 100$$

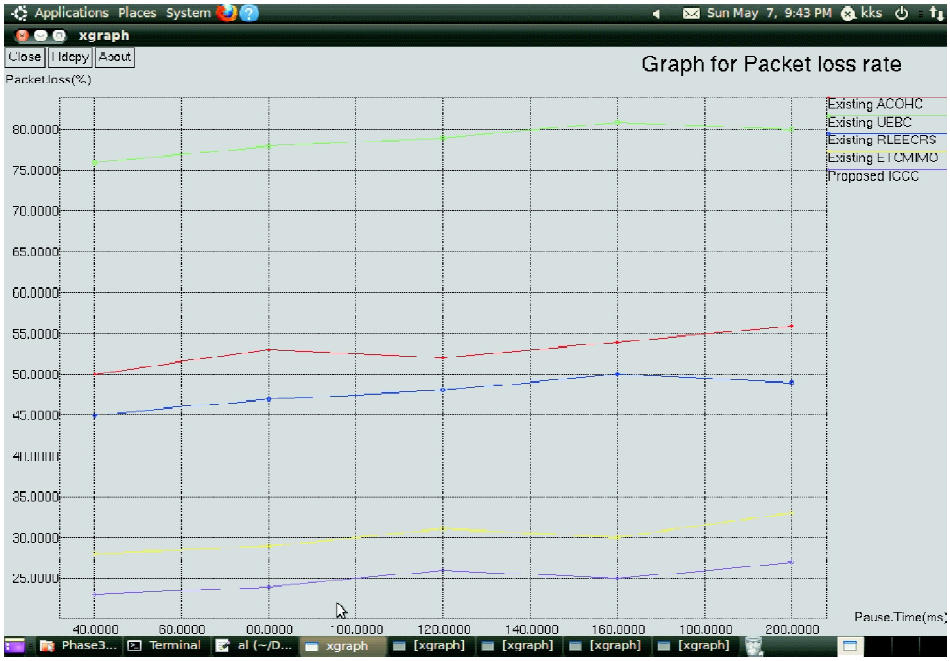

Figure 9: Graph for Pause Time vs. Packet loss rate

V. CONCLUSION

Sensor network nodes are not having same capacity, because it is unstable energy level, then behavior of each nodes are also varied, it cause network depletion, it does contain historical information of node but it does not update current information so packet loss made. Present ICCC method to monitor the node behavior like current situation, it perform best communication with support of Communication Confining clustering, it analyze energy level and distance. This method chooses minimum distance routing path**.** Unceasing possessions node allocation method gives traffic free communication, it improve network lifetime and packet delivery ratio, also minimize energy consumption. In future present cross layer based abnormal load balancing to measure different parameters.

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