An Energy Efficient Dynamic Clustering Scheme of MSN for Dynamic Skyline Queries

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***Abstract*—**The wireless sensor network environment which is composed of a number of sensor nodes are extended to Ubiquitous application, and sink node are giving mobility and seamless data transmission, This paper is accounting for dynamic clustering focusing on the sink node, After choosing cluster headers, which share base station and data transmission dynamic clustering can transmit the data of the sink node. This paper defines the optimal hop counter and when a cluster is made prolong life time of the network by reducing the whole network energy efficiency. One of the Experiments show that clustering can be achieved within a single cluster by extending 6 hop at the maximum, and life time makes possible dynamic clustering when node remains more than 20% on average.

***Keywords*—**Sensor Network, Dynamic Clustering, Energy Efficiency, Hop Count, Dynamic Skyline Queries

I. Introduction

RECENTLY Recently increased interest in sensor network has led to a lot of active researches in the specific fields such as fire recognition in the forest, weather prediction, the military, and home network. Sensor nodes must achieve its own target by transmitting the collected data to BS accurately and rapidly. The general sensor nodes, however, have disadvantages that they should use the limited energy and memory resources. The longevity and function are the keys to this kind of imperfect environment. That is, the point in the sensor network environments will be how long the network is connected and how accurate the collected data is within the connected network [1][2][5][11][12].

Sink nodes provide Wireless Sensor Network (WSN) environment with mobility. Therefore, they are the most important in Location Tracking skill of the dynamic object in the sensor network environment. Location tracking skill of the dynamic object spends the least energy, detecting the location tracks of the sensor nodes[3][4][6][7]. Also, keeping the highest missing rate, it can reduce the excessive energy waste of a specific sensor Node and extend the life cycle of the whole wireless sensor network as fully as possible. Studies on Location Tracking skill of the dynamic object can be divided into the following:

The first method is one which marks the location of an object approximately with the node location by using the single node which is near an object. Next, many nodes which are near an object make up of dynamic clustering. The last one is to predict the subsequent location and monitor it by using the mobility track and the existing nodes. In spite of these researches, the biggest problem with the existing wireless sensor network environment is that it lessens the life time of the network caused by the unnecessary power exhaustion of each sensor node at the time to solve the battery-dependant Low-power. Therefore, it is urgent that we should build dynamic clustering to make the power exhaustion of each sensor node to a minimum and keep clustering in order that we can prolong the life time of the network. In terms of mobile sensor Node, message-efficient algorithm should be improved because the energy-efficient clustering suitable for the mobile sensor nodes. So this paper suggests an energy-efficient clustering suitable for a mobile sensor Node.

This paper has five chapters: In chapter , a related study will be conducted such as dynamic clustering for sensor network and clustering algorithm of MANET. Chapter is a kind of suggestion, in which I will discuss dynamic predictable clustering. Next, the suggestion will be experimented on the basis of NS-2 in chapter . Lastly, chapter will present a conclusion and further study.

II. Related Work

A. Dynamic Clustering for Sensor Network

A mobile network where the normal nodes send and receive signals through the stations that are responsible for certain regions is the most typical among the communications models based on the clustering of network nodes. In case of dynamic clustering, sensor networks consist of strong cluster header nodes and weak ones. The strongest sensor nodes detecting objects become cluster headers, and form clustering with the surrounding sensor nodes. These sensor nodes send the data to the sensor nodes, which are cluster headers. Then cluster nodes transmit the data again to base stations. In order not to lose track of the objects, all cluster header nodes must keep an eye

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on all the sensor nodes. It is difficult to keep track of objects in the place where the sensor nodes are not evenly distributed, because only sensor nodes can be cluster header nodes

One clustering is done, heads do not rotate and if the objects move at a very slow pace, certain cluster headers will waste too much energy. Consequently, the energy exhaustion between cluster header nodes will be uneven [8][9][10] .

Clustering has a lot of advantages compared to routing protocol. It is a method by which the similar data received from the adjacent regions will be sent to cluster headers by forming local clustering, and the cluster headers deal with the data. This method makes possible the energy-efficient routing over the existing routing protocol. Besides, clustering can prevent non-efficient inquiry flooding because the requested inquires can be made by cluster headers.

When sensor nodes communicate with flood cluster headers either directly or flooding, each sensor node spends a lot of energy. In light of mobile sensor nodes, a large amount of energy exhaustion means non-efficient communications. Hence, while dynamic clustering makes longer the life time of mobile sensor network, we need an efficient routing protocol from cluster headers.

B. Clustering Algorithm of MANET

A cluster is a group of loosely coupled nodes that work closely together so that in many respects they can be viewed as though they are a single node in MANET. The self-organized clustering algorithm is distributed algorithm and each node executes the algorithm independently and the failure of one node does not affect the rest of the network. The goal of the algorithm is to minimize the summation of interference generated by all cluster, subject to the constraints that (1) all nodes within a cluster head's radio range should be considered as potential nodes in the cluster, and (2) there should be at most N_i is calculated based on the result from [3] in which the maximum m\number of nodes that can be supported in a cluster for a given data rate is determined. Different values can be chosen to satisfy different data rate requirements. The first constraint prevents the size of a cluster from getting so small that the network degrades to a fully distributed network, the second constraint prevents a cluster from getting so large that the data rates have to be reduced to undesirable level.

Because the cluster head is the dominant power emitter in a cluster, the total transmission power of the cluster heads has to be minimized to reduce the interference generated by the clusters. Interference emitted by the i th cluster head can be defined as the total transmission power emitted from the cluster head expressed as the summation of the transmission power in each downlink physical channel in the cluster. (Physical channel indexed by k and i)

$$\sum_{k=1}^{M} P_{ik} \tag{1}$$

Here P_{ik} is the transmission power needed for the i th cluster head to reach the k th node in the cluster and N_i is the number of nodes controlled by the i th cluster head.

Interference can be further expressed as follows, assuming perfect power control.

$$\sum_{k=1}^{M} D_{ik}^{n} C \tag{2}$$

Here, n is the radio propagation path loss factor, D_{ik}^{n} is the distance between the i th cluster head and the k th node in the cluster, and C is a constant that relaters to a signal's center frequency.

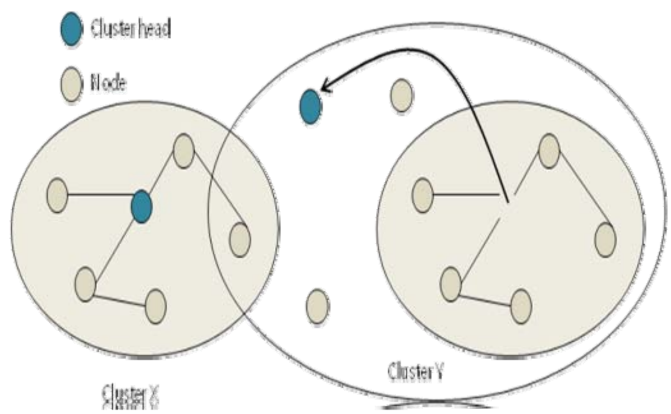

Fig 1 Cluster head moving of a cluster

The proposed work considers reforming cluster after cluster heads move out of the clusters. To reform a self organizing cluster scenario when the cluster head moves out of the cluster in a self organizing of MANET clustering, this work would like to research a self organizing cluster head position.

Fig. 1 depicts a self organizing cluster head position when the cluster head moves out of the cluster. When the cluster Y head moves out of cluster Y , MANET's nodes reform cluster G not including the cluster X head. That is, new-generated cluster which includes bolted cluster head has only one cluster head

C. Wireless sensor network issues

In a wireless sensor network, although the sensors or motes are computationally capable of doing some local processing of the data and possibly exchange of information with their neighbors, aggregating data to more resourceful nodes or base stations remains a more feasible means of processing the information. Many pervious systems have used wireless sensor network approach for context awareness. The approach of wireless sensor network is more feasible if the information is transferred to the base station for the effective operation of sensor nodes, there are two types of architecture that are generally used in indoor location tracking which is active architecture and the other is passive architecture.

In active architecture the users broadcast the signals such that the device installed at the ceilings can know the user context and this information can be transferred to make the context service available to the users. While in the later architecture, the scenario changes, the devices in the ceiling become active and they broadcast the information such that the static or moving nodes can determine their location. Active architect-true provides good precision but external infrastructure. Already existed systems have used active location architecture due to its good precision however there are several constrains like need of external infrastructure privacy concerns and high cost of deployment . to achieve our design goal of low cost and privacy awareness we have used passive architecture by using only the sensor node. However for visualizing the object's location we have used base station where all the computation take palace and further information can be provided to the third party

III. DYNAMIC CLUSTERING ALGORITHM

A. Dynamic Predication Clustering Algorithm

DPCA (Dynamic Prediction Clustering Algorithm) takes sensor node mobility of the sensor network environment into consideration. In this paper DPCA refers to a method to predict where the sensor nodes proceed, and make clusters in advance. This method can reduce the power exhaustion of the sensor nodes due to a frequent message exchange that occurs among sensor nodes. DPCA operates on the basis of hierarchical clustering. Table 1 shows the main environmental factors of this proposed algorithm. S_i is a random variable that represents the distance between base stations from sensors numbering n $((x^i, y^i), i = 1,2,3,...n)$. It is assumed that base station is located in the middle of sensor fields; the sensor field is $a \times a$ square.

Table 1 Variables Environment

Notation	Description
E	Energy Size
C_{CN}^{Tot}	Hop Count from Cluster header to Based Station
R	Communication range of Sensor node
$p\lambda$	Density of cluster header
$(1-p)$	Density of Not cluster header node
CH_n	Count of cluster header

For a hierarchical clustering, we calculate the average total hop count in accordance with distribution density of the whole sensor nodes after the average hop count of the sensor nodes is calculated. Formula 3) shows the calculated hop counts from all cluster headers to base stations.

$$E\left\{C_{CH}^{Tot} \middle| N = n\right\} = \frac{\int_A \sqrt{x_1^2 + y_1^2\left(\frac{1}{4a^2}\right)} ds \cdot np}{R} = \frac{\sum_{CH}^{BS} d}{R} \tag{3}$$

In this paper, use the skyline information.

$$SQ(d, A, c) = \left\{D \middle| d \in Direction, A \middle| a \in aAngle, C \middle| c \in Cost\right\}$$
$$Direction = \{north, west, south, east\}$$
$$aAngle = \{(1,1), (-1,1), (-1,-1), (1,-1)\}$$
$$Cost = \{0,1,2,3...\}$$

[Fig 2] show using the skyline queries of predication clustering in sink node. Usually sink node know where are going to there.

Because every time received massage to skyline queries. We calculate the average energy consumption of the sensor nodes in DPCA as the following Formula 4): here p means the probability of cluster headers, $p\lambda$ density, $(1-P)$ the density of non-cluster headers, and SQ location value for dynamic clustering, respectively.

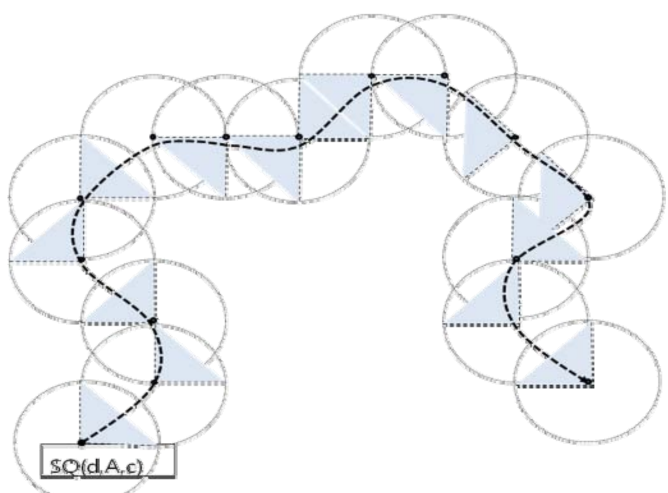

Fig 2 Using the Skyline Queries of Predication clustering in sink node

In this paper, an average uniform model for the spatial distribution of the sensor nodes is considered. In particular, a circular network area CH is assumed, where N sensor nodes are distributed at the vertices of a square grid.

Indicating by *np* the sensor node spatial density can be written as

$$E\left\{C_{CH}^{Tot}\middle|N=n\right\}=\frac{np}{R}\cdot\frac{(1-p)\times SQ}{\sqrt[2R]{p\lambda\times SQ}} \qquad (4)$$

Upon the assumption that the number of hops is uniformly distributed between 1 and the maximum number over a network diameter, the average number of hops is $H_{SN_{i,j}}$

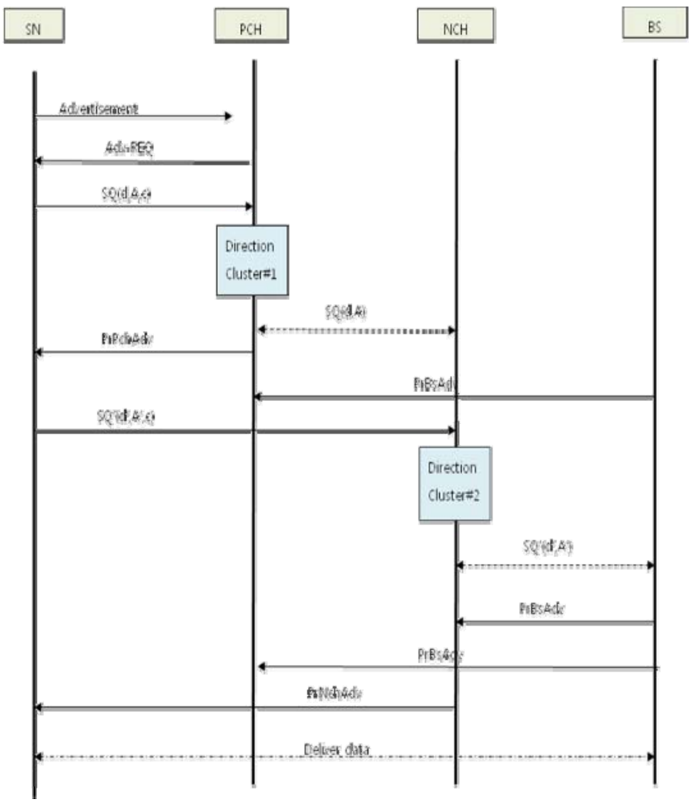

Fig 3 Massage flow of sensor node

With Expression (5) we can solve the clustering problem through the existing identical size, and form clustering in accordance with the density of sensor nodes.

$$\begin{aligned}
&E\left[C_{/CH}^{Tot}\right] \\
&= E\left[\left\{C_{CH}^{Tot}\middle|N=n\right\}+E\left\{C_{SN}^{Tot}\middle|N=n\right\}\right] \\
&= E[N]\left[\frac{\sum_{CH}^{BS} d}{R}+\frac{(1-P)\cdot SQ}{\sqrt{p\lambda}\cdot SQ}\right] \\
&= \lambda S\left[\frac{\sum_{CH}^{BS} d}{R}+\frac{(1-P)\cdot SQ}{\sqrt{p\lambda}\cdot SQ}\right]
\end{aligned} \qquad (5)$$

Cluster #1: the case of one hop and two hop

$$\begin{aligned}
E\left[N_{CH}^{1}\right] &= \upsilon\lambda\int_{0}^{R} 2\pi a da \\
&= \pi p\lambda R^{2} \\
&= 1\bullet E\left[N_{CH}^{1}\right]=\pi p\lambda R^{2} \\
E\left[N_{CH}^{2}\right] &= \upsilon\lambda\int_{0}^{2R} 3\pi a da \\
&= 3\pi p\lambda R^{2} \\
&= 2\bullet E\left[N_{CH}^{2}\right] \\
&= 2\bullet 3\pi p\lambda R^{2}
\end{aligned} \qquad (6)$$

Here how density can be achieved is a key matter. Next, on the basis of the average energy consumption of the sensor nodes, we can derive the average energy consumption rate $\left(E\left\lfloor C_{CH}^{Tot}\right\rfloor\right)$ like Expression (7)

$$\begin{aligned}
&E\left[C_{CH}^{Tot}\right] \\
&= 1\cdot E\left[N_{CH}^{1}\right]+2\cdot E\left[N_{CH}^{2}\right]+3\cdot E\left[N_{CH}^{3}\right].+n1\cdot E\left[N_{CH}^{n}\right] \\
&= \pi p\lambda\left(R^{2}+2\cdot 3R^{2}+3\cdot 5R^{2}+....\right) \\
&= \pi p\lambda\sum k\cdot(2k-1)R^{2} \\
&= \pi p\lambda R^{2}\left(2\sum_{k=1}^{H}k^{2}-\sum_{k=1}^{H}k\right) \\
&= \pi\rho\lambda R^{2}\,\frac{H(H+1)(4H-1)}{6},\ (H={}^{a}\!/\!_{R})
\end{aligned} \qquad (7)$$

This method can lead to the total energy consumption rate $\left(C_{CH}^{Tot}\right)$, which is transmitted from all cluster headers within a network to base stations.

Sensor node uses limited energy considering mobility in sensor network environment and energy expenditure differs in transfer path of sensor node. That is, sensor node consumes energy that is fixed independently in data amount and has fixed sensing power level for data collection. Therefore, in this paper, wish to form Clustering that use entropy of each sensor node and offer continuous network connectivity of sensor node. Transmit information collected to BS moving for collection of information if consider characteristic of sensor node that compose sensor network. Status information for BS writes by Power (IR 1, IR 2) and this includes remainder quantity of available power of sensor node.

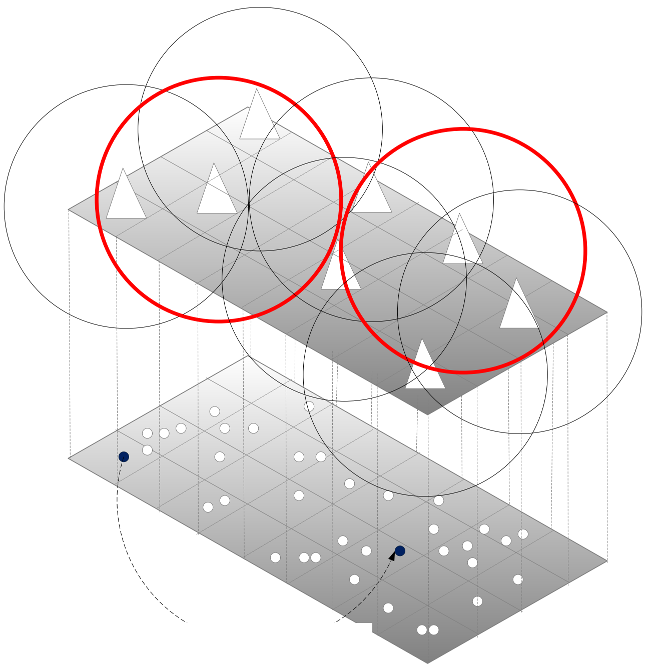

Fig 4 Moving Decision of Sensor Node

Assume that N sensor nodes are placed at the vertices of a square grid inside a circular area A. Considering a global circular network area A, in a realistic wireless communication network scenario, sensor nodes could organize themselves in randomly shaped clusters.

In order to derive an analytical model, a geometric regularity is considered in the cluster formation. In particular, assume that all the clusters are circular and have the same dimension and the centers of the clusters are at Figure 5, and the corresponding sensor node distribution will he referred to as uniformly clustered sensor node distribution.

$$Power\left(R_{x,y}\right) = Power\left(N_{x,y}^{(1)}, N_{x,y}^{(2)}\right) + Power\left(N_{x,y}^{(n-1)}, N_{x,y}^{(n)}\right) = \sum_{i=1}^{n-1} Power\left(N_{x,y}^{(n-1)}, N_{x,y}^{(n)}\right)$$

$$Pwoer\left(IR_x\right) = \forall_{x \le L_{(x)}}^{\min} Power\left(R_{x,y}\right)$$
$$CP\left(R_{c,y}\right) = \forall_{x \le z}^{\min} \left\{CP\left(N_{x,y}^{i}, N_{x,y}^{(i+1)}\right)\right\}$$
$$CP\left(R_x\right) = \forall_{x \le L(x)}^{\max} \left\{CP\left(R_{x,y}\right)\right\}$$

R=2
Cluster header

We can yield entropy of sensor node using relative speed between sensor nodes. Sensor node SN_i 's velocity vector (SN_i, t) in time (t) appears, and sensor node SN_j velocity vector relative speed vector between $V(SN_i, t)$, sensor node SN_i and SN_j as following define.

$$V(SN_i, SN_j, t) = V(SN_i, t) - V(SN_j, t)$$

This time, if N appears by intervals of time Δ_t discrete factor variable $MSN_{i,j}$

Can define as $MSN_{i,j} = \frac{1}{N}\sum_{i=1}^{N}\left|V\left(SN_i, SN_{j,t}\right)\right|$

Relative speed $V(SN_i, SN_j, t)$ and variable $MSN_{i,j}$ in intervals of time Δ_t to basis sensor node SN_i entropy $H_{SN_{i,j}} = (t, triangle_t)$ increased

$$H_{SN_{i,j}}\left(t, \Delta_t\right) = \frac{-\sum_{L \in N_{SN_i}} PL\left(t, \Delta_t\right) \log P_L\left(t, \Delta_t\right)}{\log D\left(N_{SN_i}\right)}$$

Can define as $PL\left(t, \Delta_t\right) = \dfrac{M_{SN_{i,j}}}{\sum T \in N_{SN_i} M_{SN_{i,T}}}$

MSN_i defines sensor node SN_i 's neighbor sensor set in upside expression and $D\left(N_{SN_i}\right)$ defines set N_{SN_i} Degree. Define that sensor node SN_i was stabilized if $H_{SN_{i,j}}\left(t, 4_t\right)$ value is small here. Also, sensor node SN_i defines as unstable thing if $\Delta_{SN_i}(t, \Delta_t)$ value is big. Usually, stability (Cluster Stability) of cluster for communication of sensor node can define as

R=2
Cluster header

R=2
Cluster header

R=2
Cluster header

$$\partial = CS_{\alpha,\beta}\left(t, \Delta_t\right)$$

Is as following if define solving this.

R=2
Cluster header

$\partial_1 = CS_{\alpha,\beta}^{1}\left(t, \Delta_t\right) = \prod_{i=1}^{N_r}\left[H_i\left(t, \Delta_t\right)\right]$ and

$\partial_2 = CS_{\alpha,\beta}^{2}\left(t, \Delta_t\right) = \min_{i=[1,2,3,\ldots N_r]}\left[H_i\left(t, \Delta_t\right)\right]$

Because sensor nodes in Lord Signal section of cluster header are linked each other, communication is available. Cluster A exists within sensor node a 's communication radius. Also, sensor node has number to leave with participation (join) at communication circle autonomously. Sensor node plain has sensor node entropy value that represent each sensor node own power, speed, cluster header choice ability for specification work. $H_{SN_{i,j}} = (t, \Delta_t)$ has the sensor node speed and display entropy value of sensor node. Sensor node forms sensor node plain clustering that accept Clustering if speed individual entropy sends sensor node reply message sensor node plain fewer than threshold (E_{th}) after sensor node SN_1 produces request message

In this paper, a efficient clustering scheme is examined which combines packet retransmission and user cooperation. When the received packet can be decoded successfully with only the direct link, the overhead to form cooperative transmission and cooperating signals to the destination will be wasteful. Therefore, user cooperation without considering the quality of the direct link decreases network efficiency. In the proposed cooperative retransmission scheme, the erroneous data packet is retransmitted to the destination via cooperative nodes only when it is requested by the destination. Cooperating nodes are self-selected by overhearing the packet exchange when the destination receives a data packet and requests retransmission via a feedback message. The proposed approach requires no initial setup and no information sharing between neighboring nodes for cooperation. Furthermore, only those neighboring nodes which have good channels to the destination will be involved in retransmission. Multiple cooperating nodes are involved in retransmission by using distributed beam forming where carrier phase and frequency information for cooperating signals is obtained independently at each cooperating node by observing the retransmission request message from the destination.

The outage probability of cooperative retransmission is analyzed first with perfect synchronization and latter with offset estimation. The residual phase and frequency offsets of cooperating signals can diminish the benefits of cooperative retransmission especially for long data packets. Thus, phase adjustment via a low-rate feedback channel is examined to reduce the effect of the residual offset. It is how that outage probability and packet error rate performance is substantially improved at the cost of a small feedback bandwidth.

IV. EXPERIMENTATION AND RESULT

Chapter 4 deals with the evaluation from simulations in the NS2 environment for DCPA. Table 2 shows the parameters to perform the simulations in the NS-2 environment.

The scenario for the experiment is like this: we divide the grid-pattern topology, which is measured 100×100, into 100, 500, and 1,000 nodes, respectively. In the three cases, 2J values, the initial energy of each sensor, have been given equally, and the density of the sensor nodes changed to 5m within communications range. Then we measure and compare the energy consumption rates from 1 count to 4 counts. These repetitive tests based on this scenario led to the following results.

Table 2 The Parameters of Experiment

Notation	Description	
n	Node Count	100,500,1000
a	Radius of network	1000
M	Network measure	1000×1000
BS	Base Station	(100,100)m
IE	Initial Electric	2J
CP_p	Probability of Cluster header	0.05
R	Communication area	5m
SB_{iE}	Average Energy consumption of sensor node	
SNC_{EA}	Average Energy consumption of Cluster header	
DC_{EA}	Average Energy consumption of Cluster header when it is data transmit	

This paper has suggested DPCA for the energy-efficient dynamic clustering for the mobile nodes. Taking the mobility of such nodes into account, DPCA forms clusters in search of the informed courses with the knowledge on destinations. After clustering, DPCA selects cluster headers considering the remaining energy.

Table 3 case of one hop

	100		500		1000	
	[SB]	Proposal	[SB]	Proposal	[SB]	Proposal
SN_{iE}	1.24	0.95	0.26	0.93	0.002	0.84
SNC_{EA}	1.34	0.53	1.02	0.42	0.57	0.36
DC_{EA}	3.78	1.39	1.98	1.34	2.84	1.20

Table 4 Case of two hop

	100		500		1000	
	[SB]	Proposal	[SB]	Proposal	[SB]	Proposal
SN_{iE}	2.00	1.43	1.98	1.22	1.65	1.23
SNC_{EA}	3.56	1.02	2.65	0.95	2.10	0.90
DC_{EA}	4.68	1.20	4.01	1.34	3.78	1.39

SN_{iE} : Initial energy of sensor node, SNC_{EA} : average energy consumption of sensor node, DC_{EA} : average energy consumption

of cluster header when it is data transmit

Finally DPCA seeks the dynamic clustering, going over the selected cluster headers and the mobility of those nodes. If the mobile sensor nodes cannot cooperate with communications due to the energy depletion in dynamic clustering, it sometimes occurs that clustering and communications are disconnected, and network doesn't work. Such disconnected nodes are called dead node. Up to now we experimented from one count to the period when dead nodes happened from simulations. Because the dead nodes affect the life time of network, and further the network's clustering.

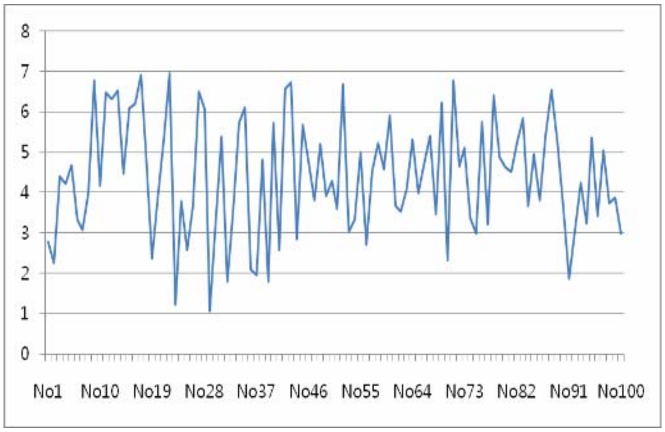

Fig 5 In case of 1 hop

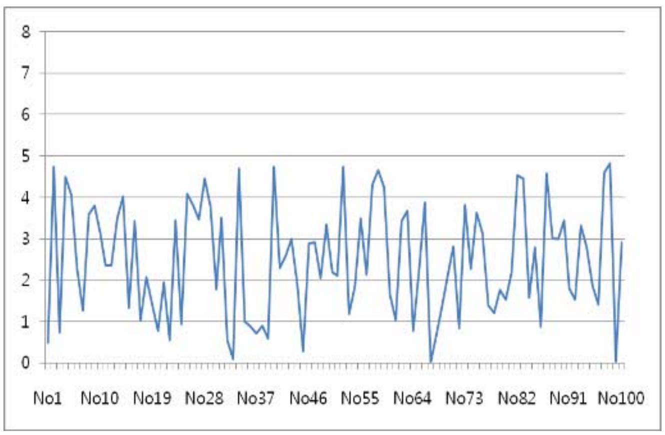

Fig 6 In case of 2 hop

In [Fig 5] and [Fig 6] the energy consumption of one hop and two hops.

[Fig 7] indicates the status of average energy each step. As a result, we found out that the more the nodes are, the more the dead nodes increase. In other words, there will be an increase in nodes which cannot participate in communications. This leads to disconnection in communications. Consequently, it might be difficult to form clustering.

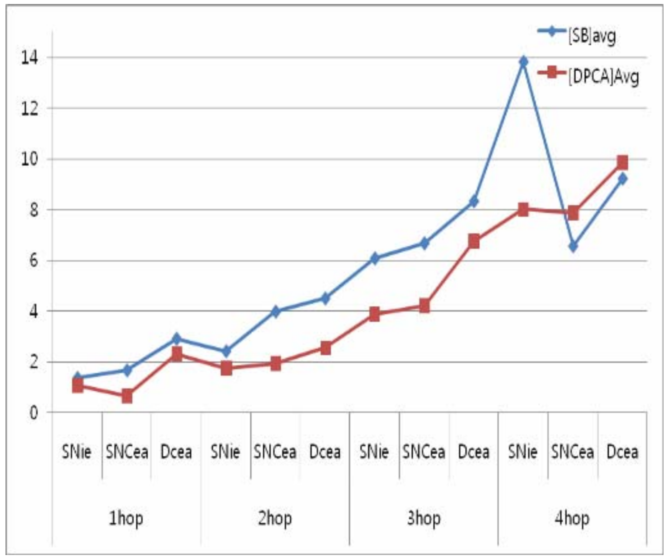

Fig 7 Average Energy each Step

In light of the average energy consumption rates of each sensor nodes, we noticed that the frequency of the dead nodes are relatively secure until 3rd count, but the dead nodes begin to occur from the fourth count.

In case of the fourth count, the average energy consumption rates accounted for 20%, that of cluster headers 28.1%, that of cluster headers in data transmission 28.9%, respectively. Also, 80% of the mobile nodes had the remaining energy and took part in network communications, making possible dynamic clustering. However, the situation has changed from the sixth count. The occurrence rate of the dead nodes increased sharply. This accounts for 57% of the whole dead nodes and have difficulty in network communications. Specifically, we had communications disconnection in 58.2% of the 500 nodes and 82.1% of the 1,000 nodes, respectively.

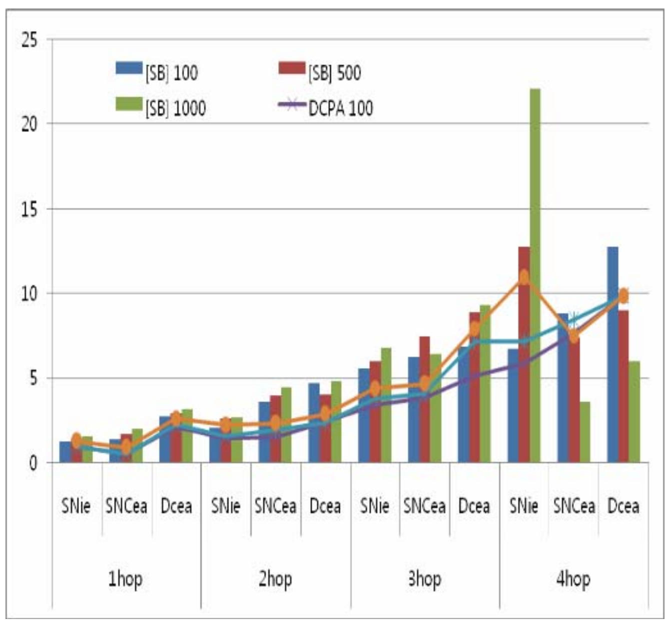

Fig 8 Average Energy Consumption

[Fig 8] shows the average energy consumption rates of the mobile nodes. DPCA makes clustering possible by the sixth count at the most. Still, as the number of nodes at the sixth count increased, there was very high energy consumption. As a result, to build a safe network, clustering by the fifth count at the maximum is a method to prolong the whole network.

V. CONCLUSION

Wireless sensor networks have limited resources and tight energy budgets. These constraints make in network processing a prerequisite for scalable and long lived applications. The technology enables and long lived applications. The technology enables the design of low-power, small-sized, low-cost wireless products that can be embedded in existing portable devices.

Eventually, theses embedded wireless products will lead toward ubiquitous connectivity and truly connect everything to everything. Wireless sensor networks represent a new and exciting communication paradigm which could have multiple applications in future wireless communication systems. Fundamental performance limits of such a communication paradigm need to be studied. The concept of average bit error rate has been introduced to quantify the achievable transmission performance of information in the network. Multi-hop wireless sensor networks are attracting the attention of man researchers. For their to be a train of position arriving spikes of low probability and very high amplitude.

When wireless sensor networks represent a new communication paradigm and could be an important means of providing ubiquitous communication in the future.

In the sensor network that features mobility, it is not efficient to make clustering in the same way as the existing sensor network does. The main feature in the operation of the sensor network is to extend the life time of the network longer than before, and make communications durable. Because the existing one wastes too much unnecessary energy for clustering.

As nodes of existing sensor net work environment change to Mobile environment, we must consider node this mobility. Constructs cluster for efficient use of sensor network that mobility is supported and chooses cluster header. Is apt to construct by suitable method in dynamic node solving problem that is constructed to silence node of existing method if do Clustering. Constructed cluster because uses method of existing continuous skyline quality for dynamic node and chooses cluster header and constructed efficient environment of sensor net work. Construct cluster after chooses cluster header that consider power of node in this paper than cluster header choice method of existing sensor net work environment and improves survival rate of network. Also, solved cutting problem of network by power problem of node that consider entropy of sensor node and was restriction point of sensor node. The purpose of this paper is to set the maximum counts from the cluster headers until boundary nodes in order to select the optimal clustering among the different clustering techniques, in the mobile sensor network environment for reduction in energy.

REFERENCES

[1] S. Z. Roussopoulos, "K-Nearest Neighbor Search for Moving Query Point".*In Proc, SSTD, 2001*.
[2] Z. B., Lee, "Semantic Cachng in Location - Dependent Query Processing", *In Proc, SSTD, p.97-116, 2001*.
[3] M. X Gong, S. F.Midkiff, and R. M.Buehrer, "A new piconet formation protocol for UWB ad-hoc networks", *in Proc, IEEE Conf. Ultra Widebad Syst. Technol. 2003, No.v 2003.*
[4] W. Heinzelman, A. Chandrakasan, and H.Balakrishnan; "Energy-Efficient Communication Protocol for Wireless Microsensor Networks". *In Proc of the Hawaii Conference on System Sciences, Jan. 2000.*
[5] A. Manjeshwar, "TEEN: A Routing Protocol for Enhanced Efficiency in Wireless Sensor Networks". *In Proc of Wireless Networks and Mobile Computing, 2001.*
[6] A. Manjeshwar , "APTEEN: A Hybrid Protocol for Efficient Routing and Comprehensive Information Retrieval in Wireless Sensor Networks". *In Proc of Parallel and Distributed Processing Symposium (IPDPS'02), pp.195-202.*
[7] S. Balasubramanian, I. Elangovan, S. K Jayaweera, and K. R. Namuduri, "Distributed and collaborative tracking for energy-constrained ad-hoc wireless sensor networks", *In Proc of WCNC 2004. Page(s):1732 - 1737 Vol.3*
[8] J. Xiang, H. Y Zha, J.J Metzner, and G. Kesidis, "Dynamic cluster structure for object detection and tracking in wireless ad-hoc sensor networks", *In Proc of Communications, 2004 Page(s):3807 - 3811 Vol.73*
[9] W. P Chen, J.C Hou, and L. Sha, "Dynamic clustering for acoustic target tracking in wireless sensor networks",*In Proc of Mobile Computing, IEEE Transactions 2004 Page(s):258 - 271*
[10] W. .P Chen, J. C. Hou, and L. Sha, "Dynamic clustering for acoustic target tracking in wireless sensor networks", *In Proc of Network Protocols 2003 Page(s):284 - 294*
[11] T. Vercauteren, D. Guo, and X.D Wang,"Joint multiple target tracking and classification in collaborative sensor networks", *In Proc of Selected Areas in Communications, IEEE Journalon Volume 23, Issue 4, 2005 Page(s):714 - 723*
[12] Y. Xu, J. Winter, and W-C Lee, "Prediction-based strategies for energy saving in object tracking sensor networks", *in Proc of Mobile Data Management, 2004 Page(s):346 - 357*
[13] P. Santi., " Topology Control in Wireless Ad Hoc and Sensor Networks", *in Proc WILEY*
[14] B. Seema, E.J. Coyle.,"An Energy Efficient Hierarchical Clustering Algorithm for Wireless Sensor Networks", *in Proc Infocom 2003, IEEE Vol 3, 30 Mar-3 April 2003 Page(s):1713-1723*
[15] Y. H. S.B,"A protocol for tracking mobile targets using sensor networks", in Proc of the First IEEE. 2003 Page(s):71 - 81
[16] Z. Song, N. Roussopoulos," K-Nearest Neighbor Search for Moving Query Point", *in Proc 2001. SSTD 2001 ;10th International Conference on , Volume1, pp:597 - 603*
[17] B. Zheng,, D. Lee, "Semantic Cachng in Location - Dependent Query ",*in Proc 2001. SSTD 2001,pp.97-116.*
[18] J. Zhang, M. Zhu, D. Papadias, Y. Tao, and D. L. Lee, "*Location-based spatialqueries*", in Proc 2003, SIGMOD 2003, pp.443-454.

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