ABSTRACT
A Three-layer framework for mobile data gathering in Wireless sensor Networks, which includes the sensor layer, cluster head layer and mobile collector (called SenCar) Layer. The Framework employs distributed Load Balanced Clustering and Dual Data Uploading which is referred to LBC-DDU scheme. At the sensor layer, a distributed load balanced clustering algorithm is proposed for sensors to self-organize themselves into cluster. The Trajectory Planning for SenCar is optimized to fully utilize dual data uploading capability by properly selecting polling points in each cluster. By visiting each selected polling point, SenCar can efficiently gather data from cluster heads and transport the data to the static data sink.

KEYWORD: WSNs, DDU, LBC, MU-MIMO.

I. INTRODUCTION
Wireless sensor Networks gains the world-wide attention in recent years due to the advances creates in wireless communication, data technologies and physical science field. The sensing and transmission of knowledge involves an enormous quantity of energy consumption. Sensor Networks are highly distributed network of small, light weighted wireless node deployed in large numbers to monitor the environment by measurement of physical components (Temperature, Pressure, Humidity). Each network consists of 3 Subsystem. They are sensor subsystem, processing subsystem, communication subsystem. Sensor nodes used in various applications such as Military, Chemical Processing. Sensor Networks are highly distributed network of small, light weighted wireless node deployed in large numbers to monitor the environment by measurement of physical components (Temperature, Pressure, Humidity). Each network consists of 3 Subsystem. They are sensor subsystem, processing subsystem, communication subsystem. Sensor nodes used in various applications such as Military, Chemical Processing, and Disaster relief scenarios. The Load Balance Clustering (LBC) Algorithm is used to achieve the scalability because the sensors form into a cluster the sensor near static sink lose the energy faster than the other sensors. Dual Data Uploading (DDU) is used to achieve the Mobility for energy saving and uniform energy consumption and to exploit Multi User Multiple-Input and Multiple-Output technique for concurrent data uploading to shorten latency. In contrast to clustering techniques LBC algorithm balances the load of intra-cluster aggregation and enables dual data uploading. Different from other hierarchical schemes, cluster heads do not relay data packets from other cluster, which effectively alleviates the burden of each cluster head. Instead, forwarding paths among clusters are only used to route small-sized identification (ID) information of cluster heads to the mobile collector for optimizing the data collection tour.

II. EXISTING SYSTEM
There are several approaches have been proposed for efficient data collection. They are dividing into three categories. The First category is the enhanced relay routing, in which data are relayed among sensors. Besides relaying, some other factors, such as load balance, schedule pattern and data redundancy, are present. In Relay Routing scheme, sensors are loss energy rapidly because the sensors transmitting the data to the sink and due to intra aggregation and inter cluster communications in clustering scheme.

III. PROPOSED SYSTEM
In Proposed System a three-layer mobile data collection framework, named Load Balanced Clustering and Dual Data Uploading (LBC-DDU). The main motivation is to utilize distributed clustering for scalability, to employ mobility for energy saving and uniform energy consumption, and to exploit Multi User Multiple-Input and Multiple-Output technique for concurrent data uploading to shorten latency. In contrast to clustering techniques LBC algorithm balances the load of intra-cluster aggregation and enables dual data uploading. Different from other hierarchical schemes, cluster heads do not relay data packets from other cluster, which effectively alleviates the burden of each cluster head. Instead, forwarding paths among clusters are only used to route small-sized identification (ID) information of cluster heads to the mobile collector for optimizing the data collection tour.
Fig 1 shows that the system architecture of the system. In mobile data gathering first the nodes are initialized and update their local information like percentage of residual energy and priority. Then cluster formation is done before cluster formation the nodes are claim their status. Based on the status and high residual energy the node was elected as cluster head. If the cluster head is running out of battery then re-clustering is done. Then data transmission is take place, packets are sending to the cluster head and SenCar select the polling points to collect a data from cluster head and transferred packets to sink.

**MODULES**

i) INITIALIZATION

The Initialization is done at the sensor layer and using LBC algorithm. The sensor informed the all neighbours within its immediacy. If a sensor has no neighbour exists, it claims itself to be cluster. Otherwise sensor sets its status as tentative and its priority set by the percentage of residual energy. Then it sorts the neighbours with high residual energy as candidate peers.

**Algorithm . Phase I: Initialization**

1. $\mu_{v/v} N \quad \{v/v \text{ lies in my transmission range, } v \in S\};$
2. if $My.N = \emptyset$ then
3. Set $My.cluster\_head \to My.id;$
4. Set $My.status \to cluster\_head;$
5. else
6. $My.init\_prio = E_{v/v}/E_{\text{tot}};$
7. $My.cluster\_head = \emptyset ;$
8. $My.status = \text{tentative};$
9. $My.A \leftarrow \cup/v \text{ Can\_Peers (N)} ;$
10. $My.prio = My.init\_prio + \sum_{v \in My.A} v/\text{init\_prio} ;$
12. Iter $\leftarrow 0 ;$

ii) STATUS CLAIM

In second phase each sensor claims its status iteratively by updating its local information. The number of iterations is controlled based on the sensor degree. The priority is partitioned into two thresholds $\tau_0, \tau_d$ this is used to declare a sensor as either cluster head or cluster member.

iii) CLUSTER FORMING

The cluster formation is done by following criteria. The sensor with tentative status or being a cluster member, it arbitrarily choose as the cluster head from its candidate peers for load balancing purpose. If no sensor with tentative status then it chooses itself as the cluster head. The re-clustering is performed when the chosen cluster head is running on low battery. The Initialization phase is done by sending re-clustering messages to all sensors. The following algorithm explains about how clustering is done and how they receive packets from the other sensor.

Algorithm: Cluster Formation
1: if $My.status=\text{cluster\_head}$ then
2: $My.cluster\_head \leftarrow My.id;$
3: else
4: $My.B \leftarrow \text{End (My.B)} ;$
5: if $My.B \neq \emptyset$ then
6: $My.status \leftarrow \text{cluster\_member};$
7: $My.cluster\_head \leftarrow \text{rand\_one (My.B)};id;$
8: $\text{send\_pkt (3, My.id, My.cluster\_head,}$
9: $\text{cluster\_member, My.init\_prio)} ;$
10: else
11: $My.status \leftarrow \text{cluster\_head};$
12: $\text{send\_pkt (2, My.id, ID\_List (My.A),}$
$\text{cluster\_head, My.prio)} ;$

iv) SYNCHRONIZATION AMONG CLUSTER HEADS

The synchronization Among cluster head is done because to perform data collection by time division. This is done by sending beacon messages to cluster heads in CHG. the message contains the local clock information and initial priority. This is done only when sencar is going to collect data. The following LBC Algorithm is used for synchronization.

Algorithm: Synchronization between cluster heads
1: if $My.\text{status}=\text{cluster\_head};$ then
2: $\text{send beacon msg with}$
$\text{My.init\_prio, My.clock, etc};$
3: receive beacon msg b from others nodes in CHG;
4: if $b.\text{init\_prio} > My.\text{init\_prio};$ then
5: $My.\text{clock} \leftarrow b.\text{clock};$

VI. PERFORMANCE

The performance of the proposed framework is reduce the average energy consumption and latency when compare with the other data collection schemes. The MIMO scheme results in least energy consumption so the lifetime of the network also extended, because the sensor sends the data transmission by multi hop fashion. The low latency is achieved because using SenCar the routing
burden is reduced. The following graph shows that comparison of our proposed technique with many existing techniques like SISO & relay routing, collection tree protocol for energy consumption and evaluation of time

VII. CONCLUSION AND FUTURE WORKS

The load balanced clustering-dual data uploading framework for data gathering in WSN is proposed in this paper. It consist of sensor layer, cluster head layer and SenCar layer. It employs distributor load balanced clustering for sensor self-organization, adopts collaborative inter-cluster communication for energy-efficient Transmission among cluster Head Groups, uses, dual data uploading for fast data collection, and optimizes sencar’s mobility to fully enjoy the benefits of MU-MIMO. Our performance study demonstrates the effectiveness of the proposed framework. The result shows that LBC-DDU can greatly reduce energy consumptions by alleviating routing burdens on nodes and balancing workload among cluster heads.

VIII. REFERENCES