

## SURVEY ON LOW ENERGY DATA COLLECTION IN WIRELESS SENSOR NETWORK

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### **Abstract:**

Envisioning many applications are handling important data, a network need reliable and efficient network to collect required data. In wireless sensor network the accurate and low energy utilization during data collection is a great challenge. Now a day, the wireless sensor networks are deployed in different field for different applications. The sensor nodes used to monitor environment, temperature, moisture, oil level in heavy machineries as well as monitoring sensitive areas. Some effective wireless sensor network will be deployed to fulfill these applications. The first requirement is that a network uses less energy. The energy will utilized for several months and years as required. The second is low cost of network. In this paper we solved said issues by studying different techniques.

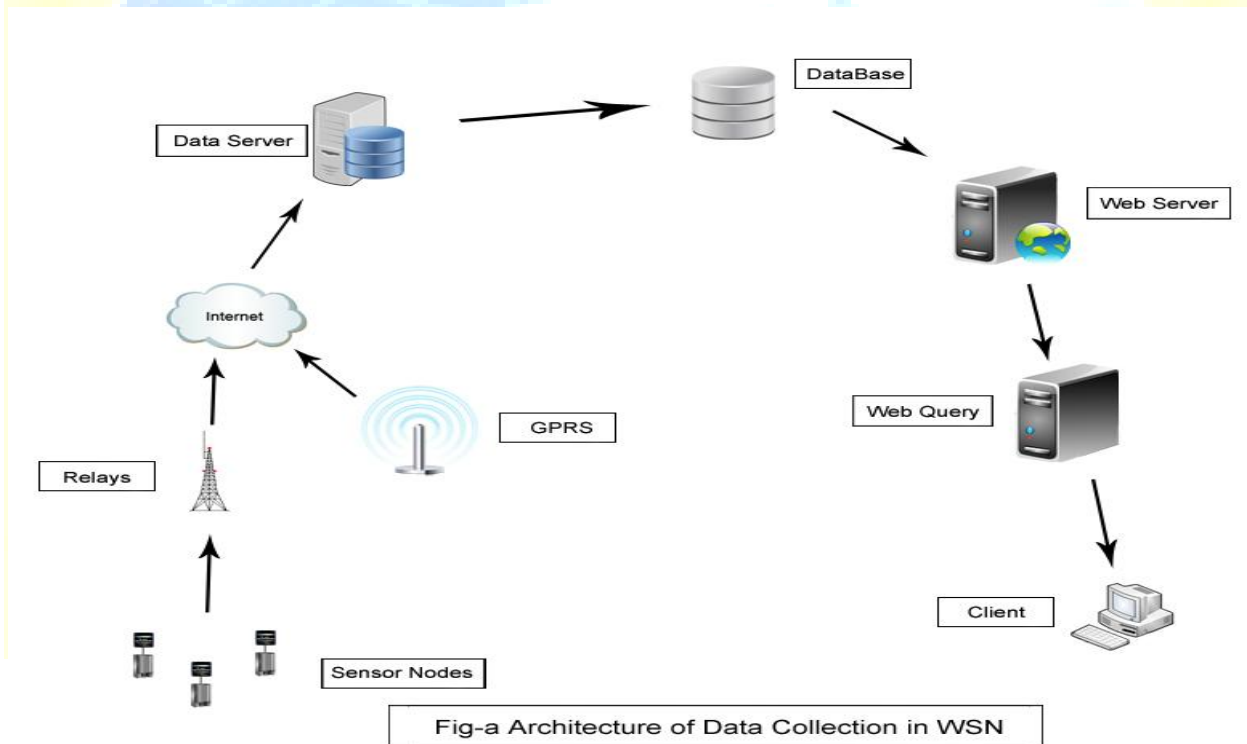
**KEYWORDS:** - WSN, data collection, lifetime, reliability, techniques.

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**Introduction: -**

Many little nodes make a network of WSNs for many applications [20]. These nodes used to monitor their areas where they were deployed. There monitoring is so much important in different applications like in military surveillance, environmental and healthcare monitoring [3]. The current improvement for different application in wireless sensor network is low power wireless technologies for monitoring of critical environments but there are many issues like communication bandwidth and budget of energy. The source of energy should be reliable and not interruptible [13]. In wireless sensor network processing, transceiver and sensitive unit are main units which utilizing more energy. The processor in the WSN used to compute sensor data and enable it to transfer in available channel. The sensor nodes used to monitor oil, gas, environment etc and transceiver gather data for control it. In transceiver more energy required instead of sensor nodes and processor.



**SECTION I****PROBLEM AND ISSUE: -**

Many research activities have been carried out concerning low Energy Data Collection in Wireless Sensor Network but this paper proposed the different protocol routing mechanisms, Routing scheme, techniques and algorithms to improve the network lifetime by using less energy in the network. Our paper is organized in different sections. The energy consumption and network lifetime are discussed in Section II. We briefly discussed network cost increased during data collection in WSN in section III. In section IV reliability and low delay protocols in WSN. In section V we will discussed on security and in section VI we presented analyze chart of Wireless sensor network protocols. In section VII, conclusions of this paper.

**SECTION II****Energy Consumption and Network Lifetime**

Utilize more Energy makes the network life short [13]. RS LPL (Relatively synchronous low power listening) is proposed to utilizes less node energy. It provide listening of low power which shortens the preamble length by receive wake up time between sender and receiver [14]. The dynamic programming and the integer linear programming are proposed to minimize the consumption of energy and data delay in WSN. The mobile sinks insert into fragment and receive information then maintain energy utilization in balance [18]. The wakeup/sleep used to reduce energy consumption and increase network reliability. When the data required then the node wake up otherwise it will remain in sleep mode [20]. The outlier detection technique is proposed to detect the error, noise as well as malicious attacks. It deletes the unwanted data and corrects the wrong data. This effect works dramatically in network [2].

### SECTION III

#### Network Cost Increased

The Self-Organizing Data Collection (Sodac) protocol is proposed to compute the shortest paths as well as load balancing in the wireless sensor network for minimizing the cost of communication. It creates the route between data collection node (DCN) to data processing node (DPN). If the data not received to DCN due to network failure then the data collection node raise the new query packet in shape of mesh. By this process the new route will be discovered and data will be sent on this new route [1]. The probabilistic communication method provides to reduce the network cost and provide long range communication in wireless sensor network. In this approach according to function nodes are divided into three categories. The sensor node collect information in respective area then transmitted to neighbor relay node. The relay node will transmit data to near relay or to base node. The function of base node is to transmit data to workstation where data is stored and analysis for beneficial use [15]. The disseminated acknowledgment protocol proposed to give information about data loss in the network and recover data loss automatically.

### SECTION IV

#### Reliability and Data Delay

The DACK protocol provides end-to-end connection when the collection protocol sends the large number of packets to base station and dissemination protocol disseminates data from base station to every node in the wireless sensor network. The main purpose of this protocol is to retrieve lost data by the help of collection protocol [2]. The greedy protocol is used for bandwidth. By using this algorithm we are in this condition that we can reduce congestion in network. In this protocol the nodes are divided into clusters. Discover local data correlation on every head of the cluster and collect data on sink node as we pre-adjusted our parameters [3]. The cross-layer diffusion is proposed to increase data delivery rate and reduce transmission delay during data collection in wireless sensor network. The magnetic field is used to calculate the distance between hop-to-hop. If the strength of field is strong it means the distance between hop-to-hop is less and if the field strength is less it means the distance between hop-to-hop is greater. The data will move from low charge to high field strength [5]. The stop point

selection and path point identification protocol compute the shortest path during data collection in wireless sensor network. The protocol select short path by approaching minimal points of existing network and establish virtual network. This process helps to select stop point selection to compute shortest path [7]. An efficient distributed protocol provides to control collision during data collection in wireless sensor network. The unit disk program (UDG) used as center of topology as root of BFS tree [17].

## SECTION V

### Network Security

To provide confidentiality in wireless sensor network the homomorphic secret sharing and encryption method is proposed. Before finally result the nodes are grouped into  $n$  and  $m$  sets. The  $m$  transfer information to  $n$  and  $m$  after collection of data send to upper layer heads. The collector establishes summation whenever result not alters. The data send to  $n$  sets before sending to sending nodes and sender not found the content of information. The data confidentiality can be provided during data collection in wireless sensor network [6]. The secure data collection technique is provides good information confidentiality and data integrity by detecting and evaluating the attacks of packet dropping in the wireless sensor network. The SDC protocol monitors the neighbor activities regarding data forwarding by providing FR communication of sensor node. The only sink node is used to monitor packet dropping from victim node. The sensor node shares this information to its neighbor node or agent which use for storage of data [12]. The outlier detection technique is proposed to detect the noise, errors, events, and malicious attacks which increase the reliability of WSN. The outliers technique provide normal behavior of sensor node. If the wrong data is detecting then it will be corrected for beneficial use [19].

SECTION VI

PROTOCOLS ANALYSIS CHART

PAPER NO	PROPOSED ROUTING PROTOCOL	Low energy	Low Cost	Low Delay	SCALEABILITY	Security
[1]	Self-Organizing Data Collection (Sodac)	NO	YES	NO	NO	YES
[2]	Disseminated Acknowledgment protocol (DACK)	NO	NO	YES	NO	NO
[3]	Greedy algorithm	NO	NO	NO	YES	NO
[4]	Randomized Multipath Routing	YES	NO	NO	YES	NO
[5]	Cross-Layer Diffusion (XD)	NO	NO	YES	NO	NO
[6]	homomorphic secret sharing and homomorphic encryption	NO	NO	NO	YES	NO
[7]	Stop Point selection and Path points identification	NO	NO	YES	NO	NO
[8]	Service-Oriented Middleware (SOM)	NO	NO	NO	YES	NO
[9]	L3SN	NO	NO	NO	NO	YES
[10]	Intra-cluster Node Scheduling	YES	NO	YES	NO	NO
[11]	Bayesian network and stochastic process	NO	NO	NO	NO	NO
[12]	secure data collection (SDC)	NO	NO	NO	YES	NO
[13]	Relatively synchronous low power listening RS-LPL method	YES	NO	YES	NO	NO
[14]	dynamic programming and the integer linear programming	YES	NO	YES	NO	NO
[15]	probabilistic communication protocol	NO	YES	NO	NO	NO
[16]	Sink mobility schemes	YES	NO	YES	NO	NO
[17]	efficient distributed algorithm	NO	NO	YES	NO	NO
[18]	sleep/wakeup scheduling protocols	YES	NO	YES	NO	NO
[19]	outlier detection technique	NO	NO	NO	YES	NO
[20]	Hop-based Energy Aware Routing (HEAR)	YES	NO	NO	NO	NO

## SECTION VII

### Conclusions

This survey on low energy data collection in wireless network provide the technique, protocol as well as routing which used to low energy consumption as well as lifetime, low delay, low cost, reliability and security during Data Collection in Wireless Sensor Network. By using Sleep/Wakup algorithm and choosing shortest path in the network. We can make our network more efficient with low energy utilization during Data Collection in Wireless Sensor Network.

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