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ANALYSIS AND PROCESSING OF ROUTING PROTOCOL FOR LARGE DATA TRANSFER OVER WIRELESS SENSOR NETWORK

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Abstract: In wireless networks, where nodes have limited power and processing resources, energy efficiency is a critical consideration. The Adhoc on Demand Distance Vector Routing Protocol is specifically intended for low-overhead mobile adhoc networks. As a result, the source node employs some mechanism to control the network-wide broadcast of RREQs (routing requests). Many energy efficient protocols, such as AODV, DSR, and DSDV, have been created to extend the lifetime of nodes in wireless networks. Using NS2, we offer an energy-efficient AODV HPR (High Power Route) Protocol route finding process. By minimizing duplicate rebroadcasting of route request packets, our technique saves energy for

the nodes. The node's relaying status is determined by its neighbor's broadcasting of its RREQ packets, which helps to reduce routing overhead during the route discovery process.
Keywords : *Ad-hoc On-Demand Distance Vector Routing Protocol, AODV HPR (High Power Route), RREQ (Routing Request), RREP (Routing Reply), Route Discovery*

1. INTRODUCTION

I.Historical Development

Wireless Sensor Networks are considered as the wireless state network which consists of mainly the isolated free tools using the sensors to verify the corporal and the ecological terms. WSN system integrates the opening which also gives wireless level attachment rear to the wired level world and circulated knots.

Wireless Sensor Networks (WSNs) can be defined as a self-configured and infrastructure-less wireless networks to monitor physical or environmental conditions, such as temperature, sound, vibration, pressure, motion or pollutants and to cooperatively pass their data through the network to a main location or sink where the data can be observed and analyzed. A sink or base station acts like an interface between users and the network. One can retrieve required information from the network by injecting queries and gathering results from the sink.

The first wireless network that can be defined as modem WSN is known as the Sound Surveillance System (SOSUS). SOSUS was developed to detect Soviet submarines by the U.S. Military in the 1950s. SOSUS network is designed to have submerged sensors and hydrophones which are scattered in the Atlantic and Pacific Oceans .U.S. DARPA has pioneered the Distributed Sensor Network (DSN) initiative in 1980s to find out the unique challenges of implementing WSNs. The potential of DSN and its progression in academia have attracted researchers' attention. These factors led the explore potential of WSN has started to be searched in academia and in civilian scientific researches.

As an example for WSN researches, [1] IEEE has noticed the following fact: The low cost and high capabilities of these tiny devices. IEEE organization has defined a standard for this fact - the IEEE 802.15.4; to cover low data rate wireless personal area networks. Based on this standard, ZigBee Alliance has published the ZigBee standard that can be used in WSNs.

WSNs are collection of nodes and these nodes are individual small computers. These tiny devices work cooperatively to form centralized network systems. There are some requirements for nodes to be used in these networks such as efficiency, multi-functionality and being wireless.

Each node in any network has a predefined goal. In a network, nodes should have a centralized and synchronized structure for communicating and data sharing. The sensor nodes are placed in a connected network according to a certain topology such as linear, star and mesh. Nodes of the network in any topology have a limited broadcast range which is generally 30 meters. In WSNs, data collection and data transfer are accomplished in 4 steps: collecting the data, processing the data, packaging the data and transferring the data.

II.Area of Research and its Contribution

Major characteristics of Wireless Sensor Networks consist of:

1. Consumption of Power limits for nodes that use batteries and energy harvesting.
2. It has Ability to handle node failures.

3. Nodes are Heterogeneous.
4. Nodes are mobile.
5. It has capability to stand in strict environmental conditions.
6. Scalable for huge development scale.
7. It supports Cross-layer design.
8. It is simple and easy of use.

Cross-layer design has become a significant study part for the wireless communications. Traditional layer approach has presented by the three major problems. Previous layer approach cannot exchange the information between different layers due to this layer did not have the entire information. Traditional layer approach does not guarantee optimization of entire network. It didn't accept to environmental change.

Traditional layer approach for the wired network is not considered and valid to the wireless level networks owed to management of environment in to the WSN. So cross-layer is measured to create the best inflection in order to expand the programme performance. These are data rate, power effectiveness and Value of Service.

Nodes consist of a processing unit which is having a restricted computational energy and imperfect memory. Sensors have exact conditioning circuitry and a communication device. It also has the energy source in the figure of a battery. One or exceeding components of Wireless Sensor Networks are Base Stations which are more calculation, energetically and communicational. Routing based other main components are routers, which are designed to calculate, compute and dispense routing tables.

The routing table consists of suitable route to transfer the data. It allows transmission of data without any issue to different routes. There are multiple routes for the transmission of data. This table chooses the shortest path to transfer the data. The shorter path selection helps in fast data transmission as well as it reduces the probability of loss of data during transmission.

III. Institutions Involved in the Research

Governments and universities eventually began using WSNs in applications such as air quality monitoring, forest fire detection, natural disaster prevention, weather stations and structural monitoring. Then as engineering students made their way into the corporate world of technology giants of the day, such as IBM and Bell Labs, they began promoting the use of WSNs in heavy industrial applications such as power distribution, waste-water treatment and specialized factory automation.

While the market demand for WSNs was strong, moving beyond these limited applications proved to be a challenge. The military, science/technology and heavy industrial applications of previous decades were all based on bulky, expensive sensors and proprietary networking protocols. These WSNs placed a premium on functionality and performance, while other factors such as hardware and deployment costs, networking standards, power consumption and scalability fell to the wayside. The combination of high cost and low volume prevented the widespread adoption and deployment of WSNs into a broader range of applications.

IV. Trends in Area of Research

Trends in Area of Research are in the field of:

Industry Trends:

i. Precision Agriculture and Animal Tracking
ii. Environmental Monitoring

iii. Urban Terrain
iv. Tracking and Civil Structure Monitoring

International Trends:

i. Health care Systems
ii. Transportation and Logistics
iii. Security and Surveillance

V. Current Challenges in Area and Research Issues

The most challenging objective in Wireless Sensor Networks is generating minimum costing as well as small sensor nodes. Counting of small companies which produce Wireless Sensor Networks hardware is increasing as compared to counting in 1970s. Intrinsic to the sensor networks implementation is in use of the least amount of power methods for the two way radio communication and data attainment. The Wireless Sensor Network converses with Local Region Network or Wide Region Network by a gateway in many applications. This gateway plays an overpass between other networks with Wireless Sensor Networks. Now data is able to be processed as well as stored by devices with added resources, example, in any server located at a distance.

The scarcest causes of Sensor Networks that are wireless nodes are energy. Survival time of Networks that are wireless sensor based is also resolute by it. Wireless Sensor Networks could also be deployed in a large number in the several environments, which consists of hostile as well as remote areas, where ad hoc communications are the main component.

The operating system complexity of the WSN knobs is characteristically fewer than the common purpose working schemes. Due to the two reasons, these are the extra strong resembled implanted systems. The first motive is that the WSNs have been organized with unique client in to the brain, besides the common platform. The other one is needed of low cost as well as low power. It leads to that the mainly WSN knobs should also have the low-control consuming micro-controllers which ensure that the essential memory mechanisms moreover pointless or the most costly for the implementation.

2. LITERATURE REVIEW

A wireless sensor network (WSN) consists of large number of low power, low cost, and tiny communication devices, called sensors. Like nodes (i.e., computers, laptops, etc.) in traditional wireless networks such as mobile ad hoc networks, sensors have energy, storage, processing, and communication capabilities. Also, sensors have a sensing capability by which they sense phenomena and perform in-network processing on the sensed data before sending their results to a central gathering node, called the sink. WSNs can be used in a variety of monitoring, control, and surveillance applications [2].Particularly, the sensors possess several scarce resources, with battery power (or energy) being the most critical one. One way to extend the lifetime of a WSN is through load balancing so that all the sensors deplete their energy as slowly and uniformly as possible. Also, the behavior of the sink has an impact on the network lifetime. Indeed, sensors in the proximity of a static sink act as the traffic hot spots have significantly reduced lifetime than all other sensors in the network. Those sensors nearer a static sink would suffer from a severe depletion of their battery power, which may result in possible network disconnection and disruption of the data from reaching the sink.

2.1 Sariga Arjunan et. al. ELSEVIER, (2017). [3] Objective: A survey on unequal clustering protocols in Wireless Sensor Networks

Abstract: Energy awareness is a critical design issue in WSN. Clustering is the most popular energy efficient technique and provides various advantages like energy efficiency, lifetime, scalability and less delay; but it leads to hot spot problem. To overcome this, unequal clustering is proposed. In unequal clustering, the cluster size varies proportionally to the distance to Base Station (BS).A comprehensive survey of various unequal clustering approaches with their objectives, characteristics etc., is presented. Also, the classifications of unequal clustering approaches are made and compared based on various cluster properties, Cluster Head (CH) properties and clustering process.

Conclusion: various unequal clustering protocols are classified into three main categories: probabilistic, deterministic and preset clustering algorithms. These protocols are explained with their objectives, characteristics, classification, merits and demerits. The probabilistic methods are simple and faster convergence; it performs well in large scale WSNs like environmental monitoring. For more reliable and robust applications, deterministic algorithms can be used. Achieving optimal solution in application specific environment, heuristic approach is the better option. Clustering is the popular energy efficient technique but it suffers from hot spot problem and minimizes the network lifetime significantly. Unequal clustering evenly distributes the load, eliminates the hot spot problem and maximizes the network lifetime.

2.2 Mohamed Elshrkawey et. al ELSEVIER (2018) [4] Objective: An Enhancement Approach for Reducing the Energy Consumption in Wireless Sensor Networks

Abstract: An efficient approach to enhance the routing procedures in the LEACH protocol for WSN has proposed. The first method aims to select the proper cluster head node for each cluster at each round. It's done by modifying the cluster head selection threshold. The second method has targeted to avoid the process of some sensor nodes, which send more data packets than other nodes in the entire network. The problem is solved by rescheduling the TDMA schedule for each sensor node by its cluster head to balance all nodes to send an almost same amount of data.

Conclusion: Two proposed methods will enhance the energy consumption of the wireless sensor nodes. So, the lifetime of the wireless network has extended compared with LEACH protocol. Through the implementation, the proposed approach has compared with LEACH and other improvements preceding protocols in terms of network lifetime, number of cluster head, energy consumption and number of packets transferred to BS which yields better outcomes than others.

2.3Sonam Maurya et. al. IEEE (2016) [5] Objective: Threshold Sensitive Region-Based Hybrid Routing protocol for precision agriculture

Abstract: The paper explores the potential use of wireless sensor network in precision agriculture. An energy efficient network layer routing protocol is required to maximize the lifetime of sensor network. The proposed Threshold Sensitive Region-Based Hybrid Routing (TS-RBHR) protocol uses region-based static clustering approach to provide efficient coverage of agricultural area. The fuzzy based hybrid routing approach is used for transmitting sensed data to base station which minimizes the energy consumption of nodes. Sensor nodes

continuously sense temperature and soil moisture content of agricultural field and if sensed value exceeds the desired threshold, a data packet is sent to the base station which reduces the continuous transmission rate. Proposed protocol has a significant increase in network lifetime due to reduction in frequent data transmission.

Conclusion: Threshold Sensitive Region-based Hybrid Routing scheme to measure two parameters required for irrigation, one is the temperature and the other one is the soil moisture content of field. According to the temperature and soil moisture value, a decision can be taken as to when irrigation needs to be done. Proposed threshold sensitive region-based hybrid routing protocol the deployment of heterogeneous sensor nodes within fairly divided fixed regions, ensure proper coverage of entire network field. The Type-2 nodes die slower than Type-1 nodes due to balanced deployment of nodes in different regions. When we compare the proposed protocol with SEP and RBHR, network lifetime of TS-RBHR is increased as compared to both the other protocols, because data is sent to BS only when sensed attributes reach to rigid or mild thresholds. These thresholds can be set to receive information according to user's need. The TS-RBHR protocol minimizes the energy consumption of sensors by reducing the number of frequent data transmission which enhances the overall lifetime of the network.

2.4 R.Balamurali et. al. IEEE (2015) [6] Objective: An analysis of various routing protocols for Precision Agriculture using Wireless Sensor Network

Abstract: Precision Agriculture is the concept of real-time monitoring of environmental conditions of a farm like temperature, humidity, soil PH etc. And to convey the monitored parameters to the remote server in order to take appropriate action, instead an actuator or an automated system can also be used to take appropriate action based on the measured parameters over a period of time. Wireless Sensor Networks is a promising technology for real-time monitoring and control. Routing protocols like AOMDV (Ad-hoc on demand Multipath Distance Vector Routing), AODV (Ad-hoc on demand Distance Vector Routing), DSR (Dynamic Source Routing) and Integrated MAC and Routing protocol (IMR) for precision agriculture using WSN are analyzed.

Conclusion: Integrated MAC and Routing Algorithm is best suitable for multi-hop routing for precision agriculture using Wireless Sensor Network (WSN) in-terms of Network life time. Here network lifetime is considered as the time at which the first node in the WSN dies. The work may be enhanced to analyze other network parameters like throughput and end-end delay.

2.5Wan Aida Nadia Wan Abdullah et. al. (2019) [7] Impact of clustering in AODV routing protocol for wireless body area network in remote health monitoring system

Abstract: Proper selection of routing protocol in transmitting and receiving medical data in Wireless Body Area Network (WBAN) is one of the approaches that would help in ensuring high network performances. However, a continuous monitoring of health status through sensing of various vital body signals by multiple biosensors could produce a bulk of medical data and lead to the increase of network traffic. Occurrence of high traffic could result to network's congestion which have high tendency to loss some of important (critical) data and cause longer delay that would lead to false diagnosis of diseases.

Conclusion: Ad-Hoc on Demand Distance Vector (AODV) which is known as reactive routing protocol is evaluated in WBAN scenario through varying number of nodes and clusters. The presence of clustering helps in reducing the burden of the sink nodes in handling high traffics.

The network's performances of this protocol are measured in terms of end to end delay, percentage packet loss, and throughput and energy consumption using Network Simulator (NS-2). Based on the experimental results, the presence of cluster helps in improving network performances by achieving reduction in delay, packet loss and energy consumption. Low throughput is achieved as number of clusters are increase due to low duty cycle of the nodes.

2.6 Huang-Chen Lee et. al. IEEE (2015) [8] Objective: An Open-Source Wireless Mesh Networking Module for Environmental Monitoring

Abstract: Wireless mesh networking extends the communication range among cooperating multiple low-power wireless radio transceivers and is useful for collecting data from sensors widely distributed over a large area. This study introduces an open-source wireless mesh network (WMN) module, which integrates the functions of network discovery, automatic routing control, and transmission scheduling. This design is provided in an open-source format in order to promote the use of wireless mesh networking for environmental monitoring applications.

Conclusion: In this research, the design and implementation of a prototype WMN module were presented, and its performance in an actual experiment was evaluated. The proposed WMN module was evaluated and compared to XBee, an off-the-shelf product. The average PDR and standard deviation of the proposed. The results support that the proposed WMN module can offer comparable or even better performance than commercial products. Further investigating the performance and power consumption of the proposed WMN module, and keep improving this design to aid scientists in implementing monitoring applications with less efforts on wireless networking issues.

2.7 Haibo Liang et. al. Springer (2019) [9] Objective: Research on routing optimization of WSNs based on improved LEACH protocol

Abstract: An approach to optimize the routing protocol. The optimal number of cluster head is calculated according to the overall energy consumption per round to reduce the probability of excessive cluster head distribution

Conclusion: The paper proposes a method that uses improved LEACH protocol and the Voronoi diagram principle to cluster the optimal number of cluster head is calculated to the overall energy consumption per round. Voronoi diagram is established. The ant colony algorithm is added to the protocol to optimize the multi-hop routing protocol. The experimental shows that the proposed approach can control cluster headcount to fluctuate. Increases the life cycle of WSNs and reduce the energy consumption of data transmission.

2.8 Habib M. Ammari et. al. IEEE transactions (2008) [2] Objective: Promoting Heterogeneity, Mobility, and Energy-Aware Voronoi Diagram in Wireless Sensor Networks

Abstract: Wireless sensor networks (WSNs) are affected by the energy sink-hole problem, where sensors nearer a central gathering node, called the sink, suffer from significant depletion of their battery power (or energy). It has been shown through analysis and simulation that it is impossible to guarantee uniform energy depletion of all the sensors in static uniformly distributed always-on WSNs with constant data reporting to the sink when the sensors use their nominal communication range to transmit data to the sink. The energy sink-hole problem can be solved provided that the sensors adjust their communication ranges. This solution, however, imposes a severe restriction on the size of a sensor field.

Conclusion: A sensor deployment strategy based on energy heterogeneity with a goal that all the sensors deplete their energy at the same time. Simulation results show that such a deployment strategy helps achieve this goal. To solve the energy sink-hole problem for homogeneous WSNs, a localized energy-aware-Voronoi-diagram-based data forwarding (EVEN) protocol. EVEN combines sink mobility with a new concept, called energy-aware Voronoi diagram.

2.9 Zareei et al., (2019.) [10] Objective: Sensor networks for environmental monitoring applications improve energy harvesting efficiency.

Abstract: Output enhancement and measurement in different circumstances of EH-sensors. To allow us to analyze different scenarios, a network model is created. We use a clustering approach as an established method for improving energy efficiency in the traditional sensor networks to investigate its effect on network output in different scenarios in EH sensor networks. In addition, in both networks with and without clustering the impact of network end-to - end output power equalization is proposed and evaluated in a dynamic and distributed transmission power management for captors.

Conclusion: Energy harvesting is a reliable way to extend the life of a sensor network to bring us to targeted applications with battery-powered sensors, which are not feasible. However, there are design problems because of uncertainties regarding the amount of energy available. This paper examined the impact of using adaptive power controls in clustered and non-clustered networks for energy collection sensors. The adaptive transmission power control adapts the transmission power of each node to the residual power of the node and the energy condition of the neighboring nodes independently.

2.10 Del-Valle-Soto, et al.(2020) [11] Objective: The main objective of this work is to illustrate and evaluate increased energy costs in the sensors based on the type of tasks carried out in the network and its use in the optimization of routing protocols. This paper proposes a simple energy model that quickly illustrates improvements in network efficiency, is easy to introduce and does not reflect increased processing demand. There are few energy models and protocols in WSN literature to optimize the network capacity.

Abstract: By specifying the energy consumption at every node, the energy model of Wireless Sensor Network (WSN) is proposed. The energy of each node is determined by estimating the energy of the principal functions established during the execution of the routing protocol in the sensing and transfer of data. These functions apply to wireless communications and equate them to the most significant impacts on the energy point of view and efficiency assessment. As a proof of concept, the energy model is tested using a system-on - chip (SoC) from Texas Instruments CC2530.

Conclusion: Wireless Sensor Network (WSN) consists of low-cost devices that transmit information to a collector node or base station, unlike other types of wireless networks (coordinator node). Because of the small size of nodes, energy saving is important, as recharger batteries are very difficult and these networks strive to achieve maximum information transmission efficiency in the harder environment.

2.11 Liu et al., (2019) [12] objective: An enhanced Wireless Sensor Network Energy-Efficient Routing Protocol. The LEACH Routing Protocol designates one CH node in every cluster, and selects the CH on a rotational basis with the intention of minimizing the consumption of energy by WSNs. Although the LEACH method is extensively studied, there are still disadvantages

which require improvement, on the one hand because the CH is chosen using a random round robin, in each round, the number of CHs is irrational and the node at the network border is chosen as the CH.

Methodology: Methodology including a single hop, multi-hop and hybrid network of communication to reduce the gap. The cluster head node is expected to send data to BS (N−1) hops, and in the network of wireless sensors with a free-space path, the distance from each hop is r.

Abstract: Cluster-based hierarchical protocols play a key role in lowering wireless network (WSN) energy consumption. As an application-specific protocol architecture for WSNs, a low energy adaptive clustering hierarchy (LEACH) was suggested. The LEACH Protocol can, however, increase the energy consumption of the network without taking account of the distribution of the Cluster heads (CHs) on a rotation basis.

Conclusion: The goal of this paper is to reduce energy consumption and improve the life of WSNs by developing a novel clustering protocol called IEE-LEACH. The proposed IEE-LEACH protocol threshold contained four parameters compared to the current routing protocols: initial node energy, node residual power, network total power and average node energy. This device will increase the network's robustness and prolong the life of the network. The proposed protocol can also optimize the number of CHs and their distributions, thereby reducing energy consumption effectively.

2.12 Sinde, et al., (2020) [13] Objective: "Refining the network's lifetime using energy-effective clusters of Wireless Sensors Network and DRL-based sleep programming," and finding that reducing energy consumption during data aggregation for effective cluster head selection and clustering in WSN. Plan for the state of a single node sensor to minimize power usage.

Abstract: Wireless Sensor Network (WSN), due to its contributions to various applications, including military monitoring, environmental monitoring etc., has provided significant excess to industrialists and researchers. However, reducing network latency and boost network life are still major issues within the WSN domain.

Conclusion: To improve network life and reduce the network delay, we are proposing energy-efficient sleep programming using the DRL-algorithm (E2 S-DRL) to improve network life and reduce the network delay and our proposed solution involves three main phases, clustering, task cycling and routing.

2.13 Vancin et al., (2018) [14] Objective: Performance review of wireless sensor network energy efficient clustering models.

Abstract: Energy-driven routing and data aggregation methods are built in wireless sensor networks because sensor nodes possess limited energy and memory space. A common portion of the routing technology has proved successful for topology management, energy consumption, data collection or fusion, reliability and stability in a distributed sensor network, using clusters-based heterogeneous routing protocols.

Conclusion: In this analysis, the LEACH, Mod-LEACH and PEGASIS clusters are contrasted as homogeneous networks with heterogeneous SEP, DEEC, CEEC and SEED protocols in distributing WSNs. We evaluated the performance of the SEED protocol in the sense of parameters, live nodes through the network life, packets sent to the network to BS in the MATLAB simulation setting in comparison with the SEP, DEEC and CEEC protocols.

2.14 Praveena, et al.,(2017) [15] Objective: "DIFFERENT ROUTING Common PROTOCOL USING WIRELESS WIRELESS NETWORK IN NS3" was the key goal of this paper to extend the reliability of the sensor nodes in the network. The protocol offers some acceptable alternate routes in the case of node or connection failure on the current route for the forwarding of packets. The protocol guarantees the reliability of routes for energy efficiency.
Abstract: A network sensor is a device with very tiny stations known as sensor nodes. Wireless nodes communicate and WSN has a wide range of applications and nodes communicate with each other through many routing protocols. They are known as reagent, constructive and hybrid routing protocols depending on the update mechanism.
Conclusion: The simulations and graphical results compare four protocols AODV, DSR, DSDV and OLSR based on energy consumption, throughput, jitter, and end-to-end delay. AODV is the best solution for static nodes, and for mobile nodes DSR is the best solution. The findings will assist designers and engineers to incorporate and improve these protocols in real life in the wireless network.
2.15 Kouassi, et al. (2013) [16] Objective: " The main aim is to determine the efficiency of the new RCRR protocol under different conditions, considering various factors such as the size or effects of the location of the Beacon nodes, originally positioned along the horizontal and vertical lines of the four cardinal points. Performance Analysis on the improved Routing Algorithm of the Wireless Sensor Networks
Abstract: In recent decades, the advancement of the Wireless Sensor Networks (WSNs) is a significant feature. Wireless Sensor Networks consist of autonomous sensors, spatially dispersed and which track conditions physical or environmental conditions, including the sensing temperature etc.
Conclusion: This paper presents the performance evaluation of the Associated Coordinates Rumor Routing (RCRR) which has been carried out in terms of energy consumption and the simulations have been performed using NS-2 simulator network. Different scenarios were taken into account in this study.
2.16 Dash, et al. (2020) [17] objective: Wireless sensor network applications survey using cloud computing.
Abstract: In the distributed computing world, the popularity of cloud computing grows daily. Cloud systems are widely used to store and process data. Cloud computing offers internet applications, networks and infrastructure. It is a new age in which shared computer resources are being accessed. Wireless sensor networks, on the other hand, is considered one of the most significant technology in the 21st century, where spatially linked sensor node automatically forms a transmission network and is popularly known as the Sensor Network to receive data.
Conclusion: The communication between sensor nodes using the Internet is a difficult task since sensor nodes have limited band width, storage and batteries of small size. Cloud computing technology can solve storage space problems. We addressed a few cloud computing & network sensing issues in this article. The specific application-oriented scenarios are essential for the creation of a new protocol in the sensor network.
2.17 Abdullah, et al. (2018) [18] Objective : Hybrid Cryptography algorithm for new security protocol for WSN.
Abstract: In recent years the networks of Wireless Sensors (WSNs) have grown quickly. In many leading technologies, they were key. They have been an important part of a number of

fields, including emergency services, military, traffic enforcement, environmental protection and medical services. But the rapid growth of WSN technology meant that a large amount of facilities had to deal with the challenge of deploying the technology without the safety required; hence the need to upgrade the protection systems of the WSN arises.

Conclusion: The suggested hybrid (HCA) algorithm incorporates the features of public key cryptography that are easier to measure and quicker to transmit the key and symmetric cryptograph. This provides a good and easy way to secure the transmission of information. Overall, HCA provides some positive benefits, including the simplicity and protection concept. It also reduces the number of packets dropped. Compared with many other algorithms, the hybrid algorithm proposed has proved to be the best overall result for HCA.

2.18 Aguilar et al.,IEEE (2012) [19] objective: A monitoring system to define and verify a building's energy model using wireless sensor networks.

Abstract: Wireless Sensor Networks (WSNs) is a suitable technology for this project, since it is easy to mount, low cost, and high efficiency, and is a key element in this phase, as a whole, to measure a variety of variables about energy usage, the environment and building operating conditions. In this paper, an application layer was built on top of a ZigBee protocol in order to define and validate the building's energy-efficiency model. In reality, 100 sensors have been mounted in one part of the building at the 20.000 m 2 School of Engineering of the University of Seville. To cover this wide area using the current infrastructure, a hybrid network (wired and wireless) has been used.

Conclusion: A surveillance system has been implemented to monitor and verify a building's energy model. The system proposed consists of a ZigBee wireless sensor network which, with high scalability, can be extended to cover a wide area via TP gateways. An application layer was developed along with a particular data model that offers a high versatility for the monitoring system.

2.19Dayananda et al., (2017) [20] objective: A zone-based hybrid solution for wireless sensor networks clustering and data collection

Abstract: A new hybrid algorithm for the cluster head selection (CH) involves both distributed and centralized algorithms. The first two CHs are chosen by the BS, with the aid of a centralized algorithm according to this algorithm. The CHs are chosen using a distributed algorithm for the third round. For the previous cluster heads.

Conclusion: It is very important to extend the network life to optimize the benefit from WSNs that users will receive. In this article, an algorithm was presented that attempts to optimize the longevity of the cluster through the management of individual node power consumption and control where power has become exhausted (facilitating the use of power on knots with higher power storage or which are simple or rechargeable). This algorithm employs a hybrid method for data transfer and the creation of clusters.

2.20 Mehta, et al.,IEEE (2019) [21] objective : A comparative study of Wireless Sensor Networks' energy-efficient hierarchical routing protocols

Abstract: The growing use of WSNs has been observed in recent years in applications such as security surveillance, structural health surveillance for buildings, monitoring of occupants, health and disaster management. The biggest drawback with WSNs is insufficient energy from participating sensor nodes and it is almost impossible to adjust or replenish a node battery as sensor nodes which could be theoretically deployed in harsh environments. The long-term

sustainability is a key challenge for WSNs and hierarchical routing protocols are a friendly approach for the energy-efficient data routing. Sensor nodes can be distributed in non-overlapping clusters in such protocols.

Conclusion: Wireless sensor networks today have their applications in many aspects of human life, from habitants to systemic health monitoring, to the interpretation of different physical parameters such as temperature / blood pressure and so on. The main priority for WSN is energy saving, since these battery powered devices cannot be replaced and because of harsh environmental conditions the battery cannot be substituted or replenished. Paper categorizes protocol routing in data-oriented, hierarchical and oriented location and further addresses hierarchical protocols of routing in a chorological order with their basic characteristics.

2.21 Nandhini et al.,IEEE (2018) [22] Objective : A Safe Environmental Monitoring System hybrid routing algorithm in WSN.

Abstract: The most influential group of recently created sensor nodes are wireless sensor networks. In many applications, they play a large part, such as environmental monitoring, agriculture, structural and industrial monitoring and protection. One of the absolutely necessary techniques is WSN routing. It enhances the life of the network. This can be achieved using bio-inspired algorithms to provide added priority and device protection. The combination of organic and routing algorithms offers a simple way to transmit data and enhances the existence of the network. We present a new hybrid algorithm for encircle monitoring in wireless areas that is called firefly algorithm with localizability enabled routing prototype.

Conclusion: Users can easily track environmental variables in many application areas by using this hybrid routing algorithm. Here the network of link failure can be easily restored. This helps users to maximize their network life and reduce the packet drop. The firefly algorithm in this article helps to find the best way to secure data transmission. It meets the balance between energy and lifespan of the network. The selection of cluster heads leads to power consumption and a wireless delay.

2.22 Song, et al., IEEE(2018) [23] objective : Wireless sensor networks: water quality survey.

Abstract: Monitoring of water quality is thus essential for the provision of clean and safe water. Conventional monitoring process is followed by laboratory testing and analysis, involving manual collection of samples from different parts of the distribution network. This process proved ineffective since it takes time to proactively respond to water contamination and lacks real-time results. Wireless sensor networks (WSN) are a promising alternative to traditional monitoring processes since then. These networks are relatively affordable and permit remote, real-time and minimal human intervention measurements.

Conclusion: The wireless sensor networks offer municipal water quality monitoring and monitoring infrastructure that is promising. Its greatest advantage is that measurement is affordable and can be done remotely and in real time. Nevertheless, these networks have limited resources for power, memory, bandwidth and energy / power processing. These limitations can hinder the efficiency and effectiveness of WSN use in surveillance applications if not correctly addressed.

2.23 Kunst, et al.,ELSEVIER (2019) [24] objective: Improving wireless networking systems in Industry 4.0.

Abstract: In the background of Industry 4.0, the Internet of Things (IoT) and the cyber physical system technology (CPS) play a significant role. These innovations introduce the idea of

intelligent manufacturing, leading to smart services and goods, through cognitive automation. The support of large data cloud based applications that need QoS-enabled Internet connectivity to store, share and process information is one of the technical challenges of Industry 4.0. A QoS-aware cloud based solution is presented in this article to meet this challenge by adapting to the IoT scenario a newly developed streamlined architecture for sharing resources.
Conclusion: The solution to this problem seeks to improve cloud communications devices, especially within the field of Industry 4.0, given the coexistence of various wireless network technologies. Simulations of three industrial QoS challenging applications are used to achieve the performance. The simulation results show that the delay and jitter QoS metrics in VoIP applications for distributed handler finish controls are kept below their particular thresholds. When the production control is video-based, the jitter is controlled to satisfy application demands and even the effective HTTP access to supervisory systems is guaranteed.
2.24 Olufemi, et al., (2020) [25] objective : Wireless Sensor Networks (WSNs): Problems and Solutions of protection and privacy.
Abstract: One of the latest fields of research is the Wireless Sensing (WSN) networking, which proves to be very useful for a wide range of applications, such as environmental, military, medical, home and office. The WSN can either be a MWSN or a mobile wireless network sensor (SWSN). MWSN is a sophisticated mobile sensor wireless network, but its topological instability presents a variety of performance issues during data routing. Static nodes with static topology, SWSNs, due to some constraints associated with sensor nodes, also have some security problems in MWSNs. The major challenges for WSNs, in particular during routing, are stability, safety, computing, energy constraints and reliability.
Conclusion: Wireless Sensor Network (WSN) is a wireless network of interconnected devices that track the conditions of their surroundings by sensor. WSNs are used in a number of applications, including safety monitoring, environmental monitoring, target tracking, military protection, intrusion detection, etc. Wireless sensor network safety is increasing mainly not due to the lack of efficient protection systems, but because of the particularities of WSNs, most of the existing systems are not adequate. That is, the nodes of WSN are low in terms of processing power and energy limitation. In WSN, sensor nodes are capable of interacting, but their prime task is the sensing, processing and computation of data.
2.25 Hingoliwala, et al., (2016) [26] objective: Improving QoS settings in the network of wireless sensors.
Abstract: Wireless sensor network is a set of sensor nodes for environment sensing and data transmission to the base station. In WSN there are many quality-services that are used to improve network capacity including energy consumption, reliability, delays, congestion management etc. The various routing protocols in the network are used to find the shortest path from source to destination. Different rutting protocols, such as AODV, DSDV and MAC, are included in the DSR. Wireless Sensor network. Send the packet to the destination node in the wireless sensor network source node. The QoS parameters for the network's wireless sensor are end-to - end delay, packet transmission ratio, packet loss rate, performance, energy consumption, blocking power, etc.
Conclusion: Authors implement IH-MAC by using a parallel transmission Connection and Broadcast programming framework. In that paper, however, we have developed and implemented the CSMA and TDMA MAC protocols for RH-MAC. RH-MAC to achieve

service quality (QoS) such as PDR, PLR, performance, end-to - end delay, congestion control and reliability. For congestion management, the nodes which are hop away from the sink node are subject to the TDMA protocol. The remaining nodes are CSMA. We need to incorporate the distribution of data based on the cluster in the second model.

2.26 Kumari, et,al.(2019) [27] objective: Wireless sensor network energy-efficient routing protocols: ICSCSP procedures.

Abstract: The key downside in wireless sensor networks (WSNs) is the energy depletion. Sensor nodes use small batteries that cannot be replaced or recharged. The energy in battery-operated networks must therefore be optimally stored. The clustering is one of the common way to maximize energy efficiency. All sensor hubs are installed into various groups in the clustering process and the head of the cluster (CH) is assigned to each group. As for collecting and transmitting data, the CH is consuming high energy than other sensor nodes (SNs).

Conclusion: A large number of dead nodes, alive nodes and packets transmitted to the BS via MATLAB are used to evaluate the stability and lifetime of the network. For 200 nodes the simulation of 10,000 iterations is carried out. The output is focused on SNs' energy depletion and node death. The simulation neglects interference and node collisions. The results indicate that nodes in DEEC are 53.8 percent faster dead in 10,000 iterations than in EDEEC. This greatly improved the stable period and the life of the network

2.27 Jiang et,al. (2019) [28] Objective: Analysis of node deployment in wireless sensor networks in the monitoring system warehouse environment.

Abstract: The warehouse environment monitoring device implementation of wireless sensor network nodes addresses the warehouse environment implementation algorithm for the network wireless sensor nodes and describes the node deployment scheme with enhanced network efficiency by way of comparison. The implementation of a network node wireless sensor is the basis for a wireless network of sensors in the storage area. The key issue that needs to be addressed is to control the output of the entire network. This paper explores the advantages of the WLAN for storage control, in particular the deployment and simulation study of sensor nodes in the warehouse. This document proposes a node deployment model of collective perception based on the perceptive model 0-1 and exponential model, based on the impact of sensor perception on effectiveness in the node deployment plan.

Conclusion: The implementation of wireless network nodes in warehouse environment monitoring systems for sensing networks is the basis for a wireless network application that affects the performance of the entire network and is the key problem that must be addressed in network applications. The key line in this paper is the implementation of wireless sensors in the storage area. The theory and algorithm are studied in the application of storage environment monitoring system for the use of wireless sensor nodes.

2.28 Raisinghani ,et,al. (2017) [29] abstract: The Wireless Sensor Network (WSN) was used to track an environment for events: "Energy efficient coverage protocols in wireless sensor networks. The sensory range and contact range of any node in the WSN. The sensor cover of a sensor node is the sensor range of the sensor node. The sensing network coverage is the cumulative sensor node coverage in a WSN.

Objective: The goal is to maintain a number of working nodes while switching off the redundant nodes for efficient coverage and energy efficiency. The coverage protocols Energy

efficiency can be accomplished by reducing duplication of coverage and efficient planning for the node and network life.

Conclusion: Wireless network sensor coverage overlap can be minimized by various protocols for coverage optimization. In this paper, we gave a short introduction and basic knowledge of sensor networking coverage concepts. We have considered energy-efficient coverage protocols based on area cover and defined the coverage mechanism with a thorough review

2.29 Gandhi, et,al. (2018) [30] objective: Aquaculture wireless sensor network: Aquaculture practices in western Godavari area analysis, survey and case study.

Abstract: Aquaculture is one of the busiest occupations in India's coastal areas besides agriculture. Aquaculture provides thousands of farmers' lives, and so this is a significant impact on the socio-economic status of the country. It is a consequence of aquaculture activity. But current practices in developing countries adopted by these farmers are very conventional and must be changed to increase yields and production.

Conclusion: An exhaustive analysis of the WSN (Wireless Sensor Network) architecture in aquaculture is presented in this text. Aquaculture scenario is presented in the Indian area of Godavari and Andhra Pradesh, by means of surveys and case studies are carried out. It proposes a device design based on a wireless sensor network that allows remote surveillance of aquaculture farms and warnings to farmers when any deviation in tank water quality is detected.

2.30 Manjeshwar , et al. IEEE (2015) [31]objective : APTEEN: hybrid protocol on wireless sensor networks for efficient routing and robust retrieval of data

Abstract: The broad application and increase deployment in the coming years are expected in wireless sensor networks with tens of thousands of small sensor nodes as they allow for accurate environmental monitoring and analysis. We propose here a hybrid routing protocol (APTEEN) for the extensive retrieval of data. The nodes in such a network not only respond to situations which are time-critical, but also provide a very energy efficient overview of the network at periodical intervals.

Conclusion: This paper presents Hybrid APTEEN protocol which combines the best features of proactive and reactive networks and provides periodic data collection as well as near-real-time critical event alerts. We also showed that the question is sufficiently flexible to answer a number of queries. While our query pattern can be applied further to sensor networks that have uneven node distributions, it is appropriate for the network with evenly distributed node.

3. RESEARCH ISSUES

The issues of existing researches are performance, routing issue, security issues. In previous protocol due to large sized packet there is probability of congestion and the transmission delay occurs. There is issue of network lifetime and energy.

1) From some references, it is found that uncertain delays in communication is occurring, it should be avoided.

2) The criteria for selecting the Routing protocol was lengthy in fact, thus by new/an advanced algorithm it can be simplified/reduced.

3) Time Complexity may be reduced.

4. GAPS IN RESEARCH

Wireless Networks are self-organizing, infrastructure less and multi-hop packet forwarding networks. There is no concept of fixed base station. So, each node in the network acts as a

router to forward the packets to the next node. Wireless networks are capable of handling of topology changes and malfunctions in nodes. It is fixed through network reconfiguration. The major problem in wireless network is link failure which ultimately results in data loss.

Each node in a sensor network is typically equipped with one or more sensors according to the requirement, a radio transceiver or other wireless communications device, a small microcontroller, and an energy source, usually a battery. The size a single sensor node can vary from shoebox-sized nodes down to devices the size of a grain of dust. The cost of sensor nodes is similarly variable, ranging from hundreds of dollars to a few cents, depending on the size of the sensor network and the complexity required of individual sensor nodes.

Size and cost constraints on sensor nodes result in corresponding constraints on resources such as energy, memory, computational speed and bandwidth.

5. MOTIVATION

After considering existing research and finding their limitation it is concluded that there is need to introduce mechanism that should be capable to resolve the issues related to routing, energy efficiency, performance and security in case of wireless sensor network. The exiting research works have motivated the enhancement of WSN.

6. PROBLEM SELECTION

In WSN, nodes typically have inadequate data processing, data storage capabilities and limited energy resources .Sensors in WSN are sensitive to energy consumption because they require energy during many phases such as environment sensing, data processing and communication phases. If one node or some percentage of nodes dies in a network then the entire network can become non-functional. Thus, in designing of energy efficient protocol, limited energy consumption is a critical issue for WSN to increase network lifetime. Hence, for this reason many of the data routing protocol have been anticipated for data transmission in WSN. Most of the protocol use clusters in order to reduce energy consumption and to increase network lifetime. A protocol is working on principle of chain and uses double CHs. This protocol distributes the workload amongst two cluster heads, nodes are selected in suitable ways to transmit the fused data to BS to balance the energy depletion in the network and preserve the robustness of the sensor web as the node dies at any random location.

Based on the Gaps in the research problem is selected to develop a hybrid Protocol for energy efficient and lifetime maximization wireless sensor network.

7. PROBLEM STATEMENT

In WSN there are various routing protocols suggested. Various applications require different types of routing protocols having different grades of reliability. Even though efforts have been made on the routing problems in WSNs, there are still some challenges that need to be addressed for an effective solution of the routing problem. Based on the literature review, energy efficiency and QoS are the main challenges in the design and development of routing protocols for WSN. All of the above observations motivate the need for evaluating new versions of protocol and derive various QoS parameters.

The Problem Statement for the Research Work to be carried out is "Performance Analysis of energy efficient lifetime improvement hybrid protocol wireless sensor network using environmental monitoring system"

8. AIM

The basic aim of this research is to propose an advances algorithm to select cluster head and thus to design the wireless sensor network in such a way that it should consume less energy in-turn increase the lifetime since there is indirect relation between energy consumption and lifetime of wireless sensor network.

9. OBJECTIVES

The objectives of Proposed Research Work are:

1. To study basic wireless sensor networks.
2. To study different topologies for wireless sensor networks.
3. To study wireless sensor network power utility and consumption issues.
4. To study routing protocol in wireless sensor networks.
5. To study the different radio propagation method within physical layer in wireless sensor networks.
6. To study strategies to minimize the delay.
7. To study different protocols to minimize the energy consumption.
8. To study different protocols to increase lifetime.
9. To study various simulation tools in wireless communication.

10. SCOPE

The same implemented system can be studied with other head node changing in WMN and the performance can be studied. Other hybrid approach can be utilized with the implemented model to optimize the performance of the system. By using IPv4 technology in WSN, data transmission consumes maximum energy over long distance, which reduces the lifetime of hardware and a battery it also require large bandwidth. To overcome this problem, Internet of thing technology uses IPv6, which can transmit large data in small bandwidth using minimum energy. The newest generation of sensor nodes offers enough performance to realize the idea of the Web of Things with minimal energy consumption. Nowadays, Wireless Sensor Networks (WSNs) employ proprietary communication protocols, making it therefore difficult to connect the nodes to the Internet. The recently launched IPv6 over Low power Wireless Personal Area Networks (6LoWPAN) standard proposes a solution to use the Internet Protocol (IP) on sensor nodes and to integrate these low-power devices into the Internet. Unfortunately, no implementation of 6LoWPAN exists for the newest generation of sensor nodes. With IPv6, everything from appliances to automobiles can be interconnected. But an increased number of IT addresses aren't the only advantage of IPv6 over IPv4. Six more good reasons to make sure your hardware, software, and services support IPv6.

1. More efficient routing
2. More efficient packet processing
3. Directed data flows
4. Simplified network configuration

5. Support for new services
6. Security

11. LIMITATIONS

There are a lot of limitations placed by the deployment of sensor networks which are a superset of those found in wireless ad hoc networks. Sensor nodes communicate over wireless, lossy lines with no infrastructure.

Additional limitations, usually non-renewable energy supply of the sensor nodes. In order to maximize the lifetime of the network, the protocols need to be designed from the beginning with the objective of efficient management of the energy resources

Some of the issues are:

Fault Tolerance: Sensor nodes are vulnerable and frequently deployed in dangerous environment. Nodes can fail due to hardware problems or physical damage or by exhausting their energy supply. The protocols deployed in a sensor network should be able to detect these failures as soon as possible and be robust enough to handle a relatively large number of failures while maintaining the overall functionality of the network. This is especially relevant to the routing protocol design, which has to ensure that alternate paths are available for rerouting of the packets. Different deployment environments pose different fault tolerance requirements.

Scalability: Sensor networks vary in scale from several nodes to potentially several hundred thousand. In addition, the deployment density is also variable. For collecting high-resolution data, the node density might reach the level where a node has several thousand neighbors in their transmission range. The protocols deployed in sensor networks need to be scalable to these levels and be able to maintain adequate performance.

Production Costs: Because many deployment models consider the sensor nodes to be disposable devices, sensor networks can compete with traditional information gathering approaches only if the individual sensor nodes can be produced very cheaply.

Hardware Constraints: At minimum, every sensor node needs to have a sensing unit, a processing unit, a transmission unit, and a power supply. Optionally, the nodes may have several built-in sensors or additional devices such as a localization system to enable location-aware routing. However, every additional functionality comes with additional cost and increases the power consumption and physical size of the node. Thus, additional functionality needs to be always balanced against cost and low-power requirements.

Sensor Network Topology: Although WSNs have evolved in many aspects, they continue to be networks with constrained resources in terms of energy, computing power, memory, and communications capabilities. Of these constraints, energy consumption is of paramount importance, which is demonstrated by the large number of algorithms, techniques, and protocols that have been developed to save energy, and thereby extend the lifetime of the network. Topology Maintenance is one of the most important issues researched to reduce energy consumption in wireless sensor networks.

Transmission Media: The communication between the nodes is normally implemented using radio communication over the popular ISM bands. However, some sensor networks use optical or infrared communication, with the latter having the advantage of being robust and virtually interference free.

Power Consumption: As we have already seen, many of the challenges of sensor networks revolve around the limited power resources. The size of the nodes limits the size of the battery.

The software and hardware design needs to carefully consider the issues of efficient energy use.

12. CURRENT TECHNOLOGY

Present research on WSN has been carried out using NS2 simulator. Moreover NS3 is also used for simulation purpose. AODV protocol used in WSN is suffering from black hole attack. That could be managed using fuzzy logic. Artificial intelligence could play significant role in making WSN nodes able to take decision themselves.

13. TOOLS

Network Simulator (NS-2) is a tool that is used for simulation of networks. This tool has created a strong hold in research field. This tool is generally used for designing various topologies, different networks, etc and then to simulate such networks for results of the activities that happen in network. Our all modules of WSN network can be built using this tool. But all versions NS don't provide facilities for wireless simulation. But all the version of NS-2 support wireless simulation. So any version of NS-2 will work. We are using NS-2.34 for simulation purpose. The outputs of this tool after simulation are generally two files- A trace file that contains all the information of the simulation done by the tool, while another is a NAM file that contains all the information for a nam animator to animate the simulation of network for which the file was created.

Operating System

Network simulator needs a Linux platform or environment to run. It can also run on windows but need some tools to create a Linux environment in windows like that of VMware. The Fedora-8 Project is a Red Hat sponsored and community supported open source project. Its goal is the rapid progress of free and open source software and content. The Fedora Project makes use of public forums, open processes, rapid innovation, meritocracy, and transparency in pursuit of the best operating system and platform that free and open source software can provide.

Hardware Requirement

A system must be capable to simulate networks and store results. In case memory required is not sufficient for simulation and simulation is started there are good chances of system to crash down. So keeping safer side into consideration RAM of 512 MB or higher and secondary storage of 160 GB or higher is necessary.

14. DATABASES

Wireless Sensor Networks (WSNs) have attracted the interest of industries and they have been used in several application areas (military, health, transportation, agriculture). . [32]WSNs are ad hoc networks, composed of sensor nodes, which are deployed in an area of interest, in order to monitor and to return information requested by users. Sensor data is transmitted to users over a central station, named base station. Data collection becomes more difficult when the number of sensors increases. The database which we require is simulation based data which will be analyzed by QoS parameter. Comparison of QoS Protocols would be done through protocols

15. EXISTING METHODOLOGIES AND ANALYSIS

Research methodology is a method which is followed to conduct the research work of a topic. There are different research methodologies. Quantitative researches are systematical investigation on defined topic whereas qualitative researches provide the study of research subject. These researches are descriptive and apply reasoning. The Researchers can use qualitative and quantitative research methodology together in their research work. The experiments based researches are systematic, scientific approach and provide results whereas the survey based research provides us review on a topic.

Fundamental Research:

These types of researches are technical. In order to get improved knowledge about organic process these researches are executed. In these researches, academic concepts are improved. Due to this reason it becomes famous in the form of academic research. .

Applied Research:

It has been observed that such types of researches are proposed to provide the solution related to practical problems. These researches might be a form of product, a form of process and protocol development. This kind of investigation becomes useful in the favor of existing work.

Quantitative Research:

In this work visible situations are examined practically in a very systematic way. These researches are carried out by practical, arithmetical or computerized modes. The basic intention of this research work is to form and arranged arithmetical design. At the time of this work, ideas and principles of situations which is under examination are also kept in mind. The objective of quantitative methods is to verify the authenticity of forecasted circulars is the fundamental aim of this research method.

Qualitative Research:

In this type of work, the topics which are put under research work are thoroughly examined. At the time of work volume does not matter. Thus these are not dependent to measurement and quantitative analysis.

Conceptual Research:

Conceptual researches consist of investigation of new ideas and mechanisms to deal with existing working modules. On the basis of sensible philosophy these researches always try to create a fresh ideology or try to explain those concepts which are developed in past.

Descriptive Research:

In this research qualities of those human beings are described which are examined in advance. Here you will not obtain all the answer of this qualities. Here you will only know about what types of qualities are contained by people.

Practical Research:

A research which is carried out in a technical and systematic way is called practical research. In this work various type of parameters undergone through a change. Whenever a change takes place in any parameter, this change is examined and managed by the researchers. They control and check any modification in different variables. In this work output obtained when trails are performed in normal manner. It is said that the consequences of this research work is very appropriate.

The Case study method:

In this, a definite building block of society is examined this research considered small number of cases but it focuses all aspects of social unit.
This research is conceptual as well as experimental research. Proposed work has considered the security of cloud.

16. PROPOSED APPROACH OF METHODOLOGY

In most wireless sensor network (WSN) applications nowadays the entire network must have the ability to operate unattended in harsh environments in which pure human access and monitoring cannot be easily scheduled or efficiently managed or it's even not feasible at all. Based on this critical expectation, in many significant WSN applications the sensor nodes are often deployed randomly in the area of interest by relatively uncontrolled means (i.e., dropped by a helicopter) and they form a network in an ad hoc manner. Moreover, considering the entire area that has to be covered, the short duration of the battery energy of the sensors and the possibility of having damaged nodes during deployment, large populations of sensors are expected; it's a natural possibility that hundreds or even thousands of sensor nodes will be involved. In addition, sensors in such environments are energy constrained and their batteries usually cannot be recharged. We have surveyed different routing algorithms along with advantageous and disadvantageous comparison with LEACH protocol. LEACH and its advanced protocols reported in the literature of WSNs till today and presented the comparison of some advancement in LEACH protocol. We have found that some energy efficient algorithms increases the network lifetime and also consumes energy in routing. Although every effort has made to provide complete and accurate state of the art survey on energy efficient clustering algorithms along with LEACH and its advanced protocols as applicable to WSNs.
In view of the above observations and from the review of current literature it is proposed to investigate as follows:

- Literature Survey and analysis for different protocols related to WSN.
- Study of various wireless sensor networks and their performances, Data Routing and Clustering Schemes.
- Study of various environmental applications with power consumption.
- Study the performance of each node & lifetime in WMN by NS 2
- Study various transmitter – receiver elements and 802.15.4 standard
- Implementation of the proposed system and performance comparison.

17. EXPECTED RESULTS

The corresponding hierarchical routing and data gathering protocols imply cluster-based organization of the sensor nodes in order that data fusion and aggregation are possible, thus leading to significant energy savings. In the hierarchical network structure each cluster has a leader, which is also called the cluster head (CH) and usually performs the special tasks referred above (fusion and aggregation), and several common sensor nodes (SN) as members. The cluster formation process eventually leads to a two-level hierarchy where the CH nodes form the higher level and the cluster-member nodes form the lower level. The sensor nodes periodically transmit their data to the corresponding CH nodes. Because the CH nodes send all the time data to higher distances than the common (member) nodes, they naturally spend energy at higher rates. A common solution in order balance the energy consumption among all the

network nodes is to periodically re-elect new CHs (thus rotating the CH role among all the nodes over time) in each cluster. [8]

So to propose an advanced algorithm for cluster head selection for increasing life span of WSN is the expected outcome of the proposed work.

18. IMPLICATIONS

Implications are the conclusions that can be drawn from something. Specialized energy-aware routing and data gathering protocols offering high scalability should be applied in order that network lifetime is preserved acceptably high in Wireless Sensor Network. Grouping sensor nodes into clusters has been widely adopted by the research community to satisfy the above scalability objective and generally achieve high energy efficiency and prolong network lifetime in large-scale WSN environments.

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