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Review on Enhanced Energy Efficient Routing Protocol of WSN and Use of IoT

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Abstract— Wireless Sensor Network (WSN) is a highly resource-restricted network class known to be one of the main issues for energy consumption. In many commercialized industrial automation processes and other real-life applications, wireless sensor technology has an essential role to play. The WSN protocol is especially appropriate for harsh environmental applications in which the implementation in the battlefield, in a toxic chemical plant, cloud environment, fog computing, IoT but in a high thermal environment of network infrastructure is difficult and/or almost impossible. In modern years, WSNs have been proposing a wide variety of Energy-Efficient Routing Protocols based on network (NW) organization as well as protocols. This paper describes various WSN routing protocols for energy efficiency. We give a comparative analysis of the Energy Efficient Routing Protocol of WSN. We also describe and comparing enhanced WSN routing protocols that are used in cloud computing, fog computing as well as IoT.

Keywords- WSN, Energy Efficiency, Energy Efficiency Routing Protocols, Cloud Computing, Fog Computing, IoT.

Introduction

WSN is used extensively for ecological monitoring, traffic, & health care, even business & family purposes. This NW form consists of fixed sensor nodes (SNs) & every node is self-organized. SNs may add & procedure & send raw information to the base station (BS) node to transmit information to the internet. Data storage, data processor, power as well as wireless transceiver are closed with a wireless SN. SN in a hostile environment or region with limited node energy is designed to extend the life of WSN by an efficient energy routing algorithm [1].In areas such as engineering and science, WSN systems have attracted considerable attention in an emerging field of research. With IoT advances, the scope for Wireless Mesh Network (WMN) & WSN research & development has grown dramatically. Data routing in an NW is a critical activity, as well as a large amount of energy, which may be accumulated whether routing is efficiently carried out in NW that as direction, node power, the performance of connections, traffic, etc. IoT [2], today's trend technology provides more space for research and development of these components: networks, detectors, new protocols, optimization techniques, etc. Networking plays a significant role in IoT systems, & maximizing these NWs' efficiency is critical to enhancing these systems ' performance. When its lifetime is increased, the network becomes more robust. This can be achieved by optimizing the NW use protocol that allows nodes in the network to save energy. Sensor NWs are used in data collection applications that address various types of network performance, life as well as capacity efficiency. Network Lifetime is time to run off battery for 1st node. Maximizing the network's ability or durability are 2 key objectives [3]. At WSN, energy consumption and delivery time are main issues. In comparison to another hierarchical routing, LEACH (Low energy adaptive clustering hierarchy) routs have a low delivery interruption. LEACH is the most frequently used routing method in WSN implementation. Today extreme conditions like high mobility, busy traffic as well as other conditions affecting QoS are taking place. New technology is required to help [4].In order to decide when to transmit data, the LEACH protocol is dependent upon several access TDMA (Time Division Multiple Access) methods. However, data transmission requires more energy for transmission when a gap between BS and CHs is greater than the threshold gap. The optimization of LEACH by using MS and rendezvous nodes in the RN area is utilized to reduce energy consumption in order to address this disadvantage [5].

A large amount of data is increasing exponentially dependent upon non-stop operational states produced by IoT. Such Internet of things devices produce an avalanche of data that interrupts expected data processing and analytics functionality i.e. managed faultlessly through cloud prior to IoT's explosion development. Fog computing architecture addresses these disturbances with efficient cloud system complement features focused on the use of micro clouds (fog nodes) near the edge

of data sources. Mainly large IoT data analytics through fog computing framework is in the process of evolving & require extensive research to generate more information & intelligent decisions [6].

As in this paper, we are discussing or focusing on promising IoT which has diverse application scenarios by a broad range of heterogeneous devices. Since WSN also has a broad range of requests in different working domains as well as is well-matched to long-term data acquirement, WSN will, therefore, be the best IoT sensor interface tool. Cluster-based routing protocols [7] are implemented when energy efficiency and stability are necessary. Enhance Energy-efficient protocols may be built to respond to different characteristics of WSNs to prolong NW's life [8]. A hierarchical cluster-based protocol is more enhance energy-efficient since high-energy nodes are casual data select to procedure & send data, and low-energy nodes are utilized to detect & transmit information to CH [9].

The remainder of the paper is structured as pursues: Section 2 gives an outline of RP & analysis of taxonomy. Section 3 defines EERP, Improve EERP in WSN and use of different emerging fields such as IoT, Cloud Computing (CC) and Fog Computing (FC). Section 4 provides a comparative study based on their parameters on EERP & EEERP in WSN. Section 4 addresses potential context and complexities of these routing protocols in specific emerging fields such as IoT, FC, & Cloud Computing. Finally, in Section 6, the conclusion is presented.

Taxonomy

In WSNs, the transmission of data is the most energy-consuming body and requires the lowest possible transfer to a Base Station (BS) and all decision-making is done on a node level. Scalability also proves important when no. of nodes is growing and network size is increasing. Entire NW here is categorized into several virtual layers (clusters), as well as there will be the same role for nodes in the same layer. Some of the nodes are used to manage tasks between the nodes as CH of each cluster. By using correlation among data, clustering reduces load over a network or aggregates it, resulting in more energy efficiency. CHS collects as well as aggregate information by nodes also then forwards it to BS [10].

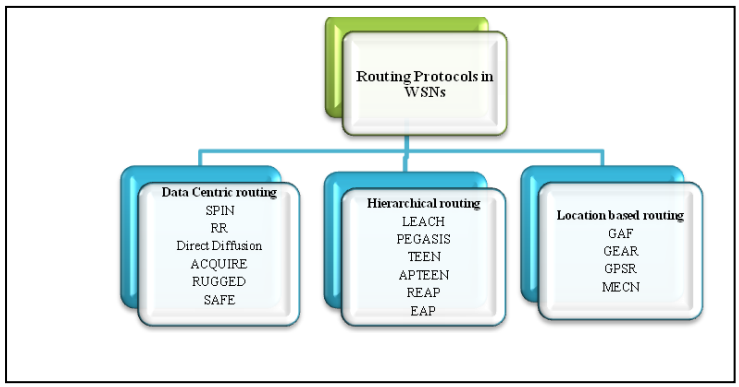

Figure 1. Routing Protocols.

RPs in WSNs are widely categorized under network structure as shown in Figure into 3 major categories: Location-based Routing Protocols (LRPs), Hierarchical- based Routing Protocols (HRPs) & Flat-based Routing Protocols (FRPs). All WS nodes are assigned parallel functions and roles by flat routing protocols. Various roles & functions are given to multiple nodes in hierarchical routing while the location of wireless sensor nodes is utilized for data transmission in local routing [11].

Routing in the Internet of Things

Because of nodes on the IoT network function as hosts or routers, it is essential to a path. For sensor networks and applicable in IoTs, several routing protocols have been suggested. The data transfer from source to destination affects transmission node electricity consumption. IoT has become a hot topic in wireless communication in recent years. The incorporation into a large range of other devices and objects, portable transceivers for short-range are rapidly being created to enable new forms of communication with things and people and between them. IOT nodes are composed of a sensor module, the processor module, module for wireless communication and control module. Nodes have the same position and

the network does not have any central control node. Nodes in a network must be able to adapt in the shortest possible time to complex position changes and locate network routing. A unified IoT routing protocol standard has not yet appeared. Finding a suitable IoT routing protocol is of great importance. The overview routing, average end-to-end speed or performances of these protocols were compared by adjusting the total number or percentage of nodes [33].

Related Work

In this section describe the detail of EERP (Energy Efficient Routing Protocol) in WSN and further EEERP (Enhance Energy Efficient Routing Protocol) which are used in another emerging field.

Related work of EERP (Energy Efficient Routing Protocol)

Reeta Bhardwaj&Dinesh Kumar [2019] Proposes energy, delay, traffic rate, distance, and cluster density non-objective fitness function. The energy-conscious route is based on the Multi-objective Lion Parcel Algorithm (MOFPL) that is proposed. MOFPL algorithm proposed is an optimal cluster head in various cluster head nodes in WSN. The optimal routing route can then be set on the basis of the multi-objective function suggested. For the WSN with 50, 75, or 100 nodes, the proposed MOFPL method contains 5, 8, 10 live nodes for 2000 rounds of iteration. MOFPL proposed algorithm consists of 5, 8, 10 live nodes with 50, 75 or 100 nodes for the 2000 iteration round. In addition, for WSN 50 and 100 nodes, the proposed MOFPL algo achieved greater standard network energy of 0.05877 and 0.06022, respectively [12].

Liu & P. Zhang [2018]suggest a new load balancing (LB) approach to WSN data communication, specifically super-connection-based data drainage, which takes occupied advantage of supernodes by stronger hardware & increased communication capacity to redistribute data traffic. It is positive as well as early intrusion strategy, as it is different from conventional passive late remedies. In particular, an estimation function is intended to choose the right start& finish points for super links, & the core idea is for send data to people with little data traffic from relatively distant locations on the sink by a jump of data traffic [13].

A. Singh et al. [2016] discusses CH & vice CH selection and presents an energy-efficient routing method based on V-LEACH & V-Part Swarm optimization methods. Compared to existing leaching protocols, the proposed protocol has shown better efficiency for minimizing energy dissipation and increasing the life of WSNs. It also provides better performance compared to existing relative performance metrics such as end-to-end delays, data transmission & total energy consumption, and presents [14].

K. Tikhe and N. Sohni[2016] Discuss SN network coverage as well as proposed energy efficiency, target tracking as well as an optimization algorithm. We must avoid long-distance communication within the WSN network to achieve high energy efficiency. With the optimized deployment of sensors & targeting for optimizing energy consumption, we may use target motion data. We may give attention to disseminated deployment optimization. Particle filter (PF) may be considered for the extraction of prior information. Takes account of sensor deployment energy optimization and WSN target tracking. The main focus of our proposal was on optimizing energy efficiency or dynamic energy management in parallel. The optimization task is distributed between CHs [15].

M. Umale and S. D. Markande [2015] utilize improved Floyd-Warshall's algorithm (FWA) that finds good throughput, packet delivery ratio (PDR) & reduced energy consumption. By adding an acknowledgment mechanism, novel modified FWA computes the shortest path by a node to node. For parameters such as PDR, throughput & energy optimization for various nodes, we have performed a relative study of Dijkstra, algo of Floyd-Warshall, as well as improved FWA. Simulation results indicate that modifiable FWA works better in the relation of packet delivery ratio (PDR), output & energy utilization than Dijkstra& FWAs [16].

Related work of EEERP (Enhance Energy Efficient Routing Protocol)

S. N. Mishra et al. [2018] in a large network, the performance of its protocols becomes ruined. The SSPR protocol is proposed to address this problem. The protocol utilizes the clustering technique based on a weight, which takes into consideration the energy and node degree available in two parameters to calculate nodes' weight and selects the node with maximum weight as its CH simulation results indicate that SSPR is better than existing large network algorithms [17].

K. Manzoor et al. [2018] focused primarily on the use of WSN protocol as well as robust communication between nodes. In order to enhance the energy efficiency of TL- LEACH & Extended LEACH (ETL-LEACH), a new CH selection mechanism has been introduced. Simulation results (SRs) given that ETL-LEACH enhances its energy efficiency, node life, & communication delay significantly [18].

S. Sharma and N. Mittal [2018] Considers LEACH-Mobile Fuzzy (LEACH-MF) to be the basis for suggested work. This project develops a LEACH Fuzzy Inference System (FIS) by threshold-based data transmission concept. The main goal of this work is the effective use of energy allocated to SNs. In 2 ways, the proposed model is divided. Limited Communication-LEACH-MF (LC-Leach-MF) parameter is modified. LC-LEACH-MF is reactive, while first is a periodic protocol. The analyses are done in conjunction with the comparison analyze by traditional LEACH, LEACH-MF and LEACH-Mobile (LEACH-M) are evaluated to ensure work efficiency, parameters like Half Node Dead (HDN), Last Node Dead (LDN), and PDR. It was concluded after analysis of results obtained that LC- LEACH-MF exceeds all traditional energy efficiency clustering techniques [19].

Val´erio Rosset et al.[2017] Describes a novel bio-inspired routing protocol, CB-RACO, which combines metaheuristic Ant Colony Optimization (ACO) to computer-cheap and distributed mark propagation population detection technique. CB-RACO creates WSN communities or complies with a balance of energy consumption through swarm intelligence, routing data within communities. CB-RACO, therefore, requires low memory and overheads in routing route construction and maintenance. Therefore, CB-RACO provides high reliability through an inter-community identification retransmission approach. For large-scale scenarios, we model CB-RACO based on goods output, distribution delays, and energy consumption measurements. The results showed that the proposed strategy would significantly improve compared to ant-based strategies not based on community structures [20].

Abdulasik and K. Suriyakrishnaan [2017] main goal of project design is good scalability and the lifespan of the networks. Sensor networks are exposed to consequences such as inadequate resources as well as are vulnerable to environmental circumstances, reducing the lifespan of SN. multi-user multiple input/output (MU-MIMO) structure is designed to resolve these problems by implementing multi- CHs in every cluster to ease the upload of dual data & to balance workloads. The data is sensed in WSNs which function as sensor nodes &SenCar gathers environmental data. Formerly information is sent via single/multiple hops to the Sensar sink node. The authentication sink produces questions dependent upon SenCar node selection. In every cluster, an intruder can come &accept whole information. To prevent as an intruders ' arrival, sink uploads SenCar node reply for questions based on several CHs [21].

Related work of Use of EEERP in an emerging field like IoT

Z. Sun et al. [2019] Propose Mobile Intelligent FC: a Cross-layer Clustering Model (ECCM) i.e. energy efficient. Next, the proposed algo uses a sensing-event-driven method to project fog nodes onto the sensing layer, according to cross-layer projection theory, & creates a strong virtual control node. Cluster-based RP control procedure in sensor NWs is then uploaded for fog layer & fog computation is applied to get distributed clustering of event-field nodes. 2nd is optimized data aggregation routing, which centers fog nodes of a projectile. It replaces information in sensor NW's bottom layer routing & balances and reduces NW load. The third, in optimizing RP, we present Particles Swarm Optimization (PSO) algorithm & choose optimal nodes group as CHs, except the cost of some overhead competition, NW's above energy may be effectively reduced & balanced, reducing node's rapid exhaustion & prolonging the lifetime of network. Finally, simulation results show that the routing structure is small in construction & maintenance, which could optimize the efficiency of data aggregation & improve the NW routine [22].

K.Thangaramyaet al. [2019] In this post, the latest IoT based sensor network routing algorithm that uses a Clustering model based on neuro-fuzzy rules to perform cluster-based routing in order to increase network performance. Cluster creation in WSNs used energy modeling to efficiently route packets using a co evolutionary neural network with smooth weight adjustment rules and thus extend network life in this approach. In addition, four components were considered, namely, the residual CH energy, space among CH and sink node, space within sensor node and CH and the CH level which are important factors for energy usage as well as network service life. The proposed algorithm was tested with the use of MATLAB simulations, using NFIS as fluid variables in the above-mentioned elements. The NFIS value for the CH for the membership node was used to calculate the CH. From the results achieved in this study, the proposed protocol is shown to perform better in terms of energy consumption and machine life compared to LEACH, FLCFP or HEED due to the use of neuro-fuzzy rules obtained through learning as well as the application of cluster-based routs [23].

N. Javaid et al. [2017] Suggest 2 novel UWSN RPs, one of the clouds ends. 1st protocol is to stop void node by vector-based adaptive hop-by-hop forwarding (AVN-AHH-VBF), whilst 2nd is AVN-AHH-VBF (CoAVN-AHH-VBF) dependent on cooperation. In both methods, within a virtual pipeline, SNs forward data packets in multihop fashion. Nodes outside the pipeline are not transmitting data packets to evade NW flooding. By using 2 hop data, switching to the void region of NW is avoided at every hop. Outcomes of general simulations illustrate which our proposed methods extensively recover NW performance as compared to the selected existing scheme (AHH-VBF) in terms of delivery ratio, energy expenditure as well as delay [24].

S. Santiago and L. Arockiam [2017] Articulates energy-efficient IoT routing design & implementation. To optimize NW performance, routing metrics are combined. The proposed methodology uses the fuzzy inference method to combine energy-conscious metrics to pick preferred direction & extend NWs' lifetime. Results are achieved for MATLAB as well as output performance for a given scenario is 63.4 percent [25].

S. Nisha and S. P. Balakannan [2017] implement the ESMR to the internet of things NW. Nodes are categorized under 2 sorts, according to ESMR: one is the node of NW & the other is a node of non-network. The highest weight node will be selected like a sink node. Then non-network node sends requests for entry into NW to sink node. Hence a tree-structured NW may be a built-in series of layer approaches. By conducting an automatic tree pruning process, the network architecture is slowly optimized to adjust energy consumption as well as draw out device lifetime [26].

Comparative Study

In this section, we provide EERP in wireless sensor networks on the basis of its classifications and various parameters are shown in Table I [11] and also comparing with EEERP on the basis of protocols, application and their pros and cons in Table II [27].

TABLE I. COMPARISON OF ENERGY EFFICIENT ROUTING PROTOCOLS (EERP)

Routing protocols	Classification	Mobility	Power Usage	Aggregation of data	Localization	Scalability	Query-based
SPIN	Flator Negotiation based	Yes	Limited	Yes	Yes	Limited	Yes
DD	Flat or Diffusion based	Limited	Limited	Yes	Yes	Limited	Yes
RR	Flat or Diffusion based	No	N/A	Yes	No	Good	Yes
COUGAR	Flat or Data-Centric	No	Limited	Yes	No	Limited	Yes
ACQUIRE	Flat or Data-Centric	Limited	N/A	Yes	No	Limited	Yes
LEACH	Hierarchical or Block based	Fixed BS	Maximum	Yes	Yes	Good	No
TEEN	Hierarchical or Block based	Fixed BS	Maximum	Yes	Yes	Good	No
PANEL	Hierarchical or Grid-	Yes	Limited	No	Yes	Low	No

	based						
TTDD	Hierarchical or grid-based	Yes	Limited	No	No	Low	No
PEGASIS	Hierarchical or Chain based	Fixed BS	Maximum	No	Yes	Good	No
CCS	Hierarchical or Chain based	Fixed BS	Maximum	No	Yes	Good	No
GAF	Location-based or area partition	Limited	Limited	No	No	Good	No
GRID	Location-based or repartition	No	Limited	No	Yes	Good	Yes
GPSR	Location-based or OptimalPath	Limited	Limited	No	No	Limited	No
GEAR	Location-based or OptimalPath	Limited	Limited	No	No	Limited	No

TABLE II. COMPARISON OF ENHANCED ENERGY EFFICIENT ROUTING PROTOCOL (EEERP) IN WSN

Protocol	Pros	Cons	Applications
ELBSEP	It decreases transmission time.	The SNs will never communicate when threshold values are not reached.	To time-critical tasks, it is most appropriate.
Z-SEP	Low energy consumption.	Other complexity and long interruption.	This may be utilized in both time non- critical & time-critical applications.
SEP	It enhances network life, stability as well as network performance	It doesn't support nodes' multi-level heterogeneity.	This may be utilized for supervising machinery to diagnosis and fault detection.
TAG	It decreases the amount of traffic transmitted through sensor NW	Overhead enhances.	This may be utilized for supervising machine
REEM	Fault-tolerant and reliable.	Overhead costs, as well as energy consumption, may increase due to	It may be utilized where reliability & security are very important.

		multiple pathways.	
SAR	It keeps several paths to the destination.	The wide overhead for each SN to maintain tables as well as the state.	It may be utilized where QoS is the biggest problem.
SWE	It creates a minimum hop spanning tree (MHST)	This is a composite protocol.	This may be utilized for supervising machine.
MWE	Reduce the energy path of every source node within every network SN is set.	Greater overhead Less scalability more time.	It may be utilized to supervise machine.
SIO	It extends the lifetime of the NW	More Delay	May be utilized in the medical field.
MIP	Useless energy.	More Delay	Utilized in big Scale NWs.
EESRA	Although the increase in NW size, EESRA will range the life of the network. EESRA reduces the load of the CHs and CH selection randomly.	EESRA performance is reflected by average waste energy per round as well as energy consumption rate for all active SNs.	To carry out a hybrid WSN MAC protocol, EESRA utilizes multi-hop transmissions intra-cluster communication

Future Scope and Challenges

Future work focuses on various routing directions. Compared to above-named RPs, energy variance in LEACH, HUMS, as well as AERP, is modest, and CBCA is small. Whilst CBCA is comparably better than other RPs, there is a need to re-adjust energy variance. Due to resource limitations in WSNs, it was also of great interest to extend network life. There should be important research to improve wireless sensors ' lives. Work needs to be done to reduce energy consumption in nodes more effectively [28].

The sensor network is primarily responsible for sensing & transmitting data to BS, which leads to physical events. Routing is an important tool for tracking and data transfers in a power limit sensors network. Initially, node-defined routes enable nodes to send or receive data via such paths. If some network segments have sensed data available, it cannot be transferred to a destination because in certain segments power consumption of SNs is not enough.

Routing Protocol in IoT Applications

WSNs play astarring role in creating as well as expanding IoT, making it possible for low-end devices by restricted resources to connect to the Internet as well as to give life change services. IEEE standard 802.15.4, which forms WSNs backbone like IoT part, is one of the key standards that help low energy &lossy networks (LLNs). This standard describes the network's physical & data-link layers and provides a low cost operating framework. The IoT has proven an interesting as well as a promising paradigm in the last few years that is meant to contribute to numerous applications through linkage of

additional physical "things" to the Internet. Though it has become the main facilitator to numerous applications in the upcoming generation, this has also presented novel challenges for saturated networks. In particular, in healthcare as well as smart environments IoT is already being developed and a big number of low-power sensors & actuators have been added to increase the way we reside & introduce new services for the community. RPL is an RP for LLNs developed by Internet Engineering Task Force (IETF), standardized in 2012 in RFC6550. RPL rapidly increased interest and multiple research papers were presented for assessment & performance improvement in different applications [29].

TABLE III. THE SECURITY REQUIREMENTS AT A DIFFERENT LAYER OF IOT [34]

IoT Layer	Security Requirements
Application	• Application-specific Data Minimization • Privacy Protection & Policy Management • Authentication • Authorization, Assurance • Application specific encryption, cryptography
Services support	• Protected Data Management & Handling (Search, Aggregation, Correlation, Computation) • Cryptographic Data Storage • Secure Computation, Innetwork Data Processing, Data aggregation, Cloud Computing
Network layer	• Secure Sensor/Cloud Interaction; • Cross-domain Data Security Handling • Communication & Connectivity Security
Smart object/sensor	• Access Control to Nodes • Lightweight Encryption • Data Format & Structures • Trust Anchors & Attestation

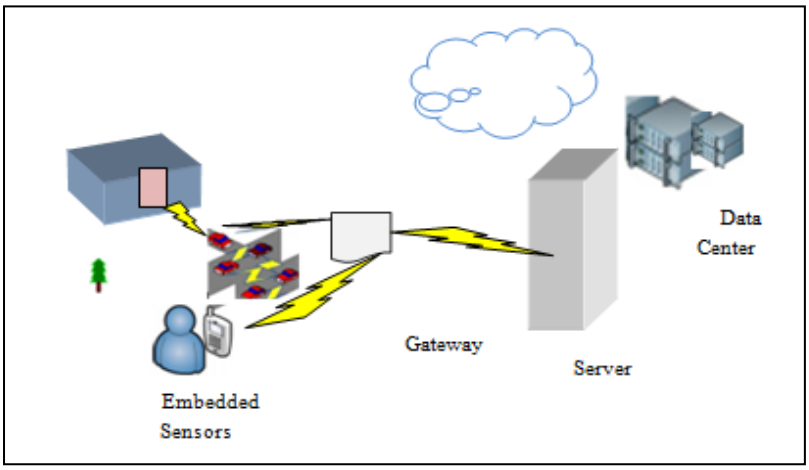

Figure 2. Routing in the Internet of Things.

Fig. 2 demonstrates the versatility of IoTs. 30] In general, IoTs have 3 stages [30]. Tier I has many built-in sensors that monitor objects and their environment. Level II is a portal node that collects information from built-in apps. Superior apps than embedded sensors are traditional portals for smartphones. Tier III includes servers or data centers that store data

obtained from gateway nodes for processing. Servers or data centers use gateway nodes to conduct complex analysis by building models.

Routing Protocol in Fog Computing (FC)

This technology is utilized in today's modern environment by the growing popularity of WSNs every day. In IoT, all objects are connected, WSNs may be used efficiently. The capabilities of current WSNs may enable difficult tasks such as data fusion to be carried out. For various applications, SNs can be equipped with various components. The major disadvantage of WSNs is that their consumption, computing capabilities as well as memory capacity are restricted. The extending of sensor network life in WSN protocols is also a major issue. So as to less energy utilization & extend the life of NW in WSNs, there are several ways. Many protocols such as this will enhance and extend the lives of WSNs. These protocols deliver data to the sink node as well as send information to the cloud from the sink node. These protocols are used to deliver information to the sink node as well as to forward data to the cloud. However, in WSN routing protocols, the concept of FC is utilized. CH selections are organized in this protocol in every round. This helps to prevent the use of heterogeneity energy by choosing nodes by low energy CH. Optimizing minimum distance among CHs and FN, selecting certain CHs for FN data, and reducing the overall overhead of each FN could help extend a network's lifetime.

This paper contains a few FNs to cover certain clusters as well as CHs which send/receive data to and from FN networks in-network on our fog-based energy-efficient RP. Beyond one FN is placed on the edge of our proposed NW. Once FNs accept CH data, they filter, process & prepare data packets to cloud sending. You use a routing method to do this. For this purpose, we are representing 2 routing algorithms. Therefore, optimized as well as effective fog computing is an important priority in this study within WSN so that intelligent devices or objects integrated within WSN can increase their potential.

IoT has made much progress in the modern world by using WSNs benefits. Since the use of energy by WSNs is restricted, live nodes must be saved. FC is a good alternative to limit WSNs ' ability to comply with IoT applications ' requirements. Fog computing brings end-users closer to computing or storage resources. To reduce power consumption as well as improve network lifetime, P-SEP is using fog-based architecture [31].

Routing Protocol in Cloud Computing

Old days mobile phones have evolved into modern, powerful Smartphones supporting many apps, and smartphones feature a no. of tasks. The limitation of mobile batteries is a major problem on smartphones and is resolved by unloading and storing mobile cloud data for battery preservation. Security is challenging in a cloud environment to secure critical data against opponents. Communication protocols are an important issue in the cloud environment. The standard communication protocol is required for secure data transmission.

The fundamentals of cloud computing and various routing algorithms used to develop their performance for cloud networks. JSQ algorithm presents optimum results in those algorithms and a shorter path scheduling algorithm presents region route to reach. Optical NWs utilize multicast routing while WSNs use methods of optimization [32].

Conclusion

A WSN consists of autonomous spatially distributed sensors for reliable monitoring of various military and civil environments and for cooperative transmission of their data to the main site through a network. RPs have a major impact on overall sensor network energy consumption. An adequate energy-efficient routing algorithm for these types of networks is required. It was of great interest to extend network life because of resource constraints in WSNs. With the growth of IoT, we have more & more energy-efficient protocols as well as algorithms to enhance the system as a whole. Whether it is data routing in NW, energy utilization of NW nodes, extend NW's lifetime, as well as making NW smarter so that it may make its individual decisions dependent upon prior data collected. For transmission of data to the base station, most SNs are used for their energy. Therefore, it makes them much faster to consume their energy. Due to resource limitations in WSNs, extending network life was of great interest. We did a proportional analysis of EERPs.

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