

# Comparative Analysis of Distributed Structure of WSN

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**Abstract**— A developing class of Wireless Sensor Network (WSN) applications includes the procurement of a lot of sensory information from battery fueled, low calculation and low memory remote sensor nodes. The topology of the WSNs can change from a straightforward star system to a progressed multi-hop wireless mesh network. The propagation technique between the hops of the system can be routing or flooding. In software engineering and broadcast communications, wireless sensor systems are a functioning exploration region with various workshops and meetings arranged every year. The aim of this dissertation work is to improve the performance of the network by using the suitable routing algorithm. Evaluating the utilization of asymmetric key generation by and large and that of hybrid routing approaches that can find the verified connection, increment the energy productivity, increment the quantity of alive nodes and broaden the system life time of WSN using the Cluster Head Selection Algorithm to convey information in a WSN.

**Key words:** Topology, Acquisition, Wireless Sensor Network, Routing, Flooding

## I. INTRODUCTION

The information assembled from wireless sensor networks is normally spared as numerical information in a base station (Server). On the off chance that a centralized architecture is utilized in a sensor network and the central node fails, at that point the whole system will fail, anyway the consistency of the sensor system can be expanded by utilizing distribute control architecture. This architecture utilizes the idea of packet switching. This design has a downside that there might be a great deal of congested path through nodes sending the packet towards the base station. It prompts a great deal of lot of propagation time and energy consumption during the propagation of information. Numerous protocols were proposed to utilize the ideal way to limit the propagation time and to expand the information rate of the wireless sensor architecture.

When wireless sensor is conveyed in a disaster areas, polluted environments or high radiation region, battery energize or replacement is not possible for human and wireless sensor works until battery of the whole sensor node get die. Thus the power utilization by the poor planed routing algorithm should be uninvolved. I would like to create an idea which would be successful in this type of situation [2]. This will help to transmit the data through wireless sensor network whenever time management is the primary goal. I want to also give the idea for increasing the transmission rate.

## II. WIRELESS SENSOR NETWORKS

A wireless sensor network (WSN) is basically a network where sensors are distributed to monitor physical or environmental conditions such as humidity, temperature, sound, radiation, pressure, etc. and to co-operatively pass their data values through the network to its main location. Today's modern networks are usually bidirectional; they have

the ability to control sensor activity [4]. The vision is to create an intelligent environment by letting hundreds or thousands of sensors and embedded processors interact with each other. This would have the way for novel solutions in areas such as environmental monitoring, early disaster warning, and remote monitoring of patients, machines and plants, room climate control or the management of energy consumption in buildings and River pollution monitoring etc. In the network, each such sensor network device has basically several parts: a radio transceiver, an external antenna, an electronic circuit for interfacing with the sensors and a power source, usually a main battery backup or an embedded form of energy harvesting [8]. The sensed data records from all sensors are sent to gateway sensor node or base station from where user or observer can receive data records as shown in figure 1.

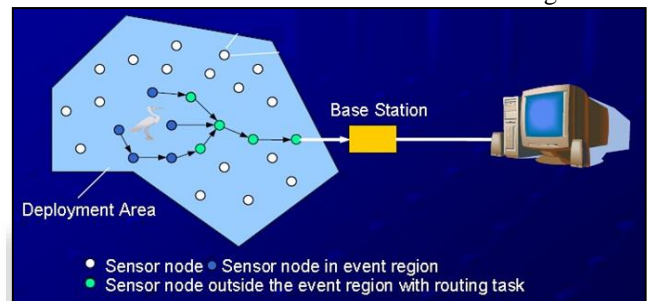


Fig. 1: Wireless Sensor Networks [10]

A sensor node might vary in size from that of a one cube feet box to the size of a one cube centimeter box. The cost of sensor nodes is similarly variable, depending on the complexity, application and functionality of the individual sensor nodes [6]. Size and cost limitations on sensor nodes result in corresponding limitations on resources such as computational speed, energy, memory, range and communications bandwidth. The geographical topology of the wireless sensor networks (WSN) can vary from a simple star network to an advanced multi-hop wireless mesh network. The signal propagation technique between the hops of the network can be called as routing.

## III. EXISTING ROUTING MODELS IN WSN

The entire existing routing algorithm and data delivery model is based on the various models. Every model have different data delivery algorithms and used for specific purpose. Various routing mechanism is used to design a new routing protocol [9]. Every model has its own advantage and characteristics. Main Types of communication model in wireless sensor network are:

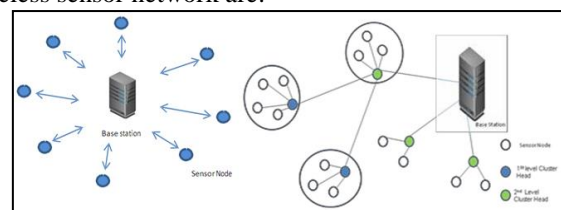


Fig. 2: Direct Communication and Clustering Model of WSN

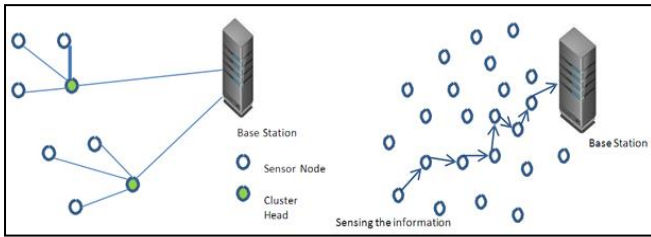


Fig. 3: One hop and Multi hop model of WSN

A. Description

Wireless Sensor Network (WSN) comprises of spatially circulated independent sensors to screen physical or ecological conditions, for example, temperature, sound, Pressure and so on and to helpfully go their information through the system to a fundamental area. The more current systems are bi-directional, likewise empowering control of sensor movement [7]. The advancement of remote sensor systems was roused by military applications, for example, front line observation. In Indian - Pakistan outskirt there is an issue related with the unlawful passages of the fear based oppressors and armed force of enemy that is the reason I have chosen this thesis for my nation. Today such systems are utilized in numerous modern and shopper applications, for example, mechanical process checking and control, machine wellbeing observing, etc.

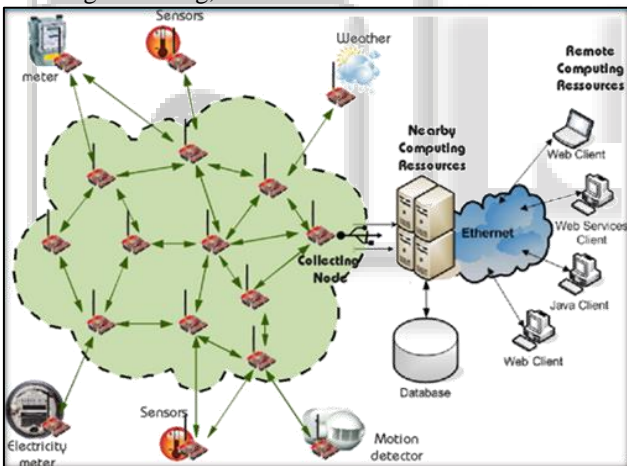


Fig. 4: Typical Multi-Hop Wireless Sensor Network Architecture

Kamil Samara and Hossein Hosseini presented a paper in 2016 in which he describes that Directed diffusion is a well know routing algorithm for Wireless Sensor Networks (WSNs) that was designed in 2003 [1]. As a push to attempt to beat this weakness, we propose a system mindful convention. The proposed convention gathers information about the accessible ways and utilizations these information to authorize more advantageous ways utilizing machine learning. Yunxia Chen and Qing Zhao exhibited a paper in 2005 in which they determine a general equation for the lifetime of remote sensor systems which holds autonomously of the hidden system demonstrate including system design and convention, information accumulation inception, lifetime definition, channel blurring qualities, and vitality utilization show.

This equation distinguishes two key parameters at the physical layer that influence the system lifetime: the channel state and the remaining vitality of sensors. Subsequently, it gives not just a measure to execution assessment of sensor organizes yet additionally a rule for the plan of system conventions. In view of this recipe, we propose a medium access control convention that abuses both the channel state data and the lingering vitality data of individual sensors [2].

Xukai Zou, Byrav Ramamurthy and Spyros Magliveras, exhibited a paper in 2017 in which he depicts that Routing (and sending) is a center issue in systems for conveying information starting with one hub then onto the next. Today remote systems are getting to be famous in view of their "3 Anys"- Any individual, anyplace and whenever. Remote impromptu systems are named as versatile disseminated multi jump remote systems without foreordained topology (previous settled framework) or focal control. In this paper, we present an extensive audit for directing highlights and procedures in remote specially appointed systems. For in excess of twelve normal existing steering conventions, we contrast their properties concurring with various criteria, and classify them as indicated by their directing procedures and connections [3].

IV. COMPARATIVE ANALYSIS

Algorithm used	Kamil Samara	Yunxia Chen	Xukai Zou
Objective	Load Balancing	Lifetime Maximization	Classification of Protocols
Protocols Studied	TMAC	MAC (CSI, REI)	DSDV, CGSR, DSR, AODV, TORA, WRP, DST, ABR, SSA, GSR, FSR, CEDAR, ZRP, ZHLS, HSR
Architecture or Structure	Distributed	SENMA	Ad-Hoc (Flat or Hierarchical)
Channel Used	CC2420	Rayleigh Fading Channel	Wireless Ad Hoc Channel

Table 1: Literature Work Comparison

The aim of this Paper is to improve the performance of the network by using load balancing therefore the improved lifetime will be obtained. Table no.-1 will be very helpful for this purpose. All the nodes carry equal load, so that there is no energy mismatching among them. The measurement may be done by any of the nodes. All the nodes will be dead almost simultaneously. It means the expected wasted energy level is almost zero. Hence the deployment may be done once.

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