

Secure and Stable Routing Protocol for Wireless Network: A Review Paper

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Abstract. In this review paper, A lot of work was done on a WSN (Wireless Sensor N/W). The best performance of routing protocols and better energy in wireless ad-hoc network nodes utilizing clustering has been claimed in most circumstances, compared to existing systems available at the time. A mobile ad-hoc network is a non-centralized wireless network. Develop a non-stable network using a series of distributed nodes with any base or central management. Routing is one of the fundamental issues of these networks in this fashion. Until now, different protocols for routing in these types of networks have been available. Stable routing is one of the best routing approaches in these networks. Stable routing aims to use transmission and reception channels which are likely to have a longer lifetime. Because of the clearing of the current path, the data will be sent from a more secure path, and the requirement for new routing will be reduced.

Keywords: Mobile Ad-Hoc network, Routing, Stable routing, Routing Protocol, multi-hop routing.

1 Introduction

Mobile computing has become a vital element of our daily lives as mobile technology and mobile devices have become more innovative. We use wireless networks for our daily needs, whether making a phone call, seeing online news, listening to an audio file, or watching and listening to our favorite songs from numerous sources and utilizing various available devices, such as mobile phones or laptops. The desire to be connected at any time, and in any way has led to the expansion of wireless networks, which has resulted in the opening of a new area of research that is determined and everywhere computing. This emerging field of technological advancement requires a highly secure and stable routing protocol to effectively manage peer communication.

An ad-hoc wireless network is a group of nodes that exchange data wirelessly, either directly or through other nodes. Because there is temporary infrastructure in ad-hoc wireless network, nodes are unusual to roam from time to time at any time. As a result, it is impossible to predict nodes'

behavior, action, or performance or the layouts of nodes in such networks. There is no central controller that permits nodes to communicate with one another. Each node is outside the range of the others. Military operations, rescue missions, academic organizations, institutions, and other ad-hoc networks do not rely on any solid infrastructure.

2 Literature Survey

The wireless network and the Stable Routing Protocol have gotten a lot of attention. In most cases, the best routing protocol performance and improved energy in wireless ad-hoc network nodes utilizing clustering have been claimed, compared to today's systems available at the time. To gain knowledge, the following works were considered.

Long Cheng et al., (2007) proposed the location estimation method without based wireless sensor network techniques. Target/source localization and self-location node are two types of location estimation algorithms. Techniques-based energy has been introduced in the target location. The author then investigates the nodes of self-localization methods. In different settings, there are distinct challenges. The author of the article provides a thorough examination of these issues: location in a non-line-of-sight network, node selection criteria for sensor nodes in a planned energy constraint network to maximize the compromise between performance and location of energy consumption, the position of cooperative nodes, and location algorithm in a heterogeneous network

Sakarindr et al., (2007) In this paper author proposed the group communications in wireless networks have facilitated numerous developing applications that involve data delivery from at least one sender(s) and more then one senders to several receivers, according to the author. Group communications are vulnerable to a variety of attacks due to insecure wireless connections. Although several methods for securing group communications have been proposed, security supplying in group connections in wireless networks remains a vital & difficult subject. In paper the auther examines current advances in group communications security requirements & three tpes of wireless networks services, as well as challenges in provideing secure group transmission in these networks: mobile ad-hoc networks (MAN), wireless infrastructure networks (WIN), and wireless sensor networks (WSN). The number of applications for group transmission via wireless networks has continuously increased, such as group-oriented military systems (in-field commander conference over wireless devices) and educational systems (teacher lectures in a distance learning classroom). On the other hand, wireless communications are inherently insecure and vulnerable to a variety of threats. Many previous attempts have been made to include security in such interactions. Authors have presented known techniques that can severely impair or even shut down group communications in wireless networks to better understand SGC over wireless networks.

Dragan et.al (2008) The author suggested a routing method that accept the network to drastically decrease the amount of entropy spent for transmission and control setup, which is a critical concern in low-data-rate transmission. Other then this transmitting a current from each sensor to the data destination, a single stream of data from a family of sensors is sent to the sink.

Because the same amount of useful data can be transferred with some nodes huge amount packets, this reduces possibility of packet collisions in the wireless network. Data compression can help you receive even more benefits. This is accomplished through lossless data compression and information encoding in the order of sensor packages.

Zhao et al., (2008) Entropy conservation is the major goal in WSNs, while throughput and latency are not more important, as the authors argue in this work. As a result, consumed entropy is exchanged for throughput and latency. In WSNs, a sequence of events notion of not completely cooperative game theory is employed to achieve all of the goals at the same time. Every node in the game adapts its balance strategy in response to the estimated game state. Following a discussion of the game's utility function, the balance strategy for the game in Wireless Sensor Networks is offered. Furthermore, for Wireless Sensor Networks, a simplified game-theoretic MAC protocol (G-MAC) is proposed, which employs an easy-to-implement auto digressive back-off mechanism. The simulation findings suggest that the partially cooperative game can boost system throughput while lowering delay and packet loss. while staying within reasonable bounds G-MAC successfully supports the game in terms of energy consumption.

Hailin Zhang et al., (2008) author describes that in sensor networks, conservation of energy is the important goal, whilst they go with flow fee and extend are much less important. So, the strength used is negotiated for a rate and delay. In this paper, new thinking of the idea of cooperative games is incompletely used in sensor networks to reap every goals simultaneously. In game, every node unit its balance country coverage of the estimated game. After introducing the utility feature of the game, the balance environment for the game in sensor networks is presented, in addition, an idea of simple G-MAC is scheduled for sensor networks, the use of an autoregressive backward mechanism that is easy to implement. The uncompleted cooperative game can increase system throughput and limit prolonged and data progress loss rates while preserving acceptable power consumption that G-MAC takes to support the game effectively.

O. Goussevskaia et al., (2008) The complexity of nearby broadcasting in manikin physical intervention is analyzed thru the manner of the method of the authors. The authors presented randomized algorithms allotted: An individual stated that every node is privy to the shape of nodes that exist inside the geographic technique and another, no speculation of records Link structure. They presented that, if the transmission opportunity of each node encountered some positive characteristics, the evaluation can be separated with the global nature of the physical noise model and each button performs an effective software The cost is proportional to the scope of friends near. The authors furthermore offer ensures at the maximum green optimization for each set of rules and show their conduct inside aspect the commonplace area situations through the simulation. The author's reason is to provide new statistics about the complexity of a primitive Wi-Fi conversation, which incorporates broadcasting neighborhoods in physical interference models. The normal overall performance of allotted stochastic algorithms has been analyzed and tested that irrespective of constrained topology statistics provision, near-most high-first-rate everyday normal overall performance can be achieved. Their assessment is

predicated upon drastically on the remark that, if the possibility of node transmission is carefully determined, the overall nature of the noise inside the body interference model can be separated into "near" and "distant" regions. ", which permits evaluation to keep with inside the identical way as assessment in graph-based definitely models, which incorporates protocol models. They favored revealing that the assessment in this artwork determines the asymptotic limits. However, accurate modeling of a way flung interference is more of a state of affairs and will have a huge impact on the actual normal overall performance of any MAC protocol.

Soonmok Kwon et al., (2011) Author describe that community statistics cluster is a overlap layer routing method that is necessary for wi-fi sensor networks with a massive range of nodes. Granting the method enhances electricity adeptness using dropping packet transmissions, it might also require routing-layer delay time which presents extra delay in data delivery. This indicate that there exist entropy-delay tradeoffs that can be manage depending on the lengthen level software can tolerate. The authors first operate an detailed evaluation of the facts accumulation method and authorise the strong association between the quantity of presently accrued statistics in a node & data accumulation timeout to achieve electricity effectivity with little lengthen overhead. Then, a novel timeout management scheme that dynamically adjusts timeout by the amount of presently accrued statistics in a node has been proposed. Their pattern is based on native data with no involving control messages so, it is not solely robust but additionally lightweight. Evaluation outcomes primarily based on an implementation of the wireless sensor network show that our scheme facilitates environment-friendly exchange off among entropy & delay. Thus, excessive energy effectivity can be done with not more overhead in delay and vice versa.

K. Maraiya et al., (2011) A wi-fi sensor network is an aid limitation network, in which all sensor nodes have partial resources has been discussed in paper by the author. To store assets and energy, information ought to be accumulated, to escape amounts of site visitors in the network. The purpose of facts combination is to eliminate redundant data transmission and enhance the lifetime of power in the wi-fi sensor network. Data aggregation manner has to be executed with the help of a tremendous bunching structure. A new scheme associated with clustering for records aggregation referred to as "Efficient cluster head choice scheme for records aggregation in wi-fi sensor network" (ECHSSDA) has been given, also authors examine their suggested structure to the LEACH clustering algorithm. Evaluation is primarily based on the energy feeding, cluster head determination, & cluster formation, where they expect that their advocate procedure is superior than LEACH in the case of consuming much fewer electricity by way of the cluster node and cluster head sending packet to the BS eat fewer electricity as higher than LEACH.

Sonam et.al (2013) An environment-friendly direction-finding protocol energy, which is categorised and primarily based collection has been proposed. The CH is selected by the BS. The determination process is carried out in two parts. In the first part, all candidates to become nodes CH are listed based on considerations such as the relation space of the nominee points from the base station, remaining strength level, the probable variety of neighboring sensor nodes

nominee points can have, and the quantity of times the nominee points cluster has already come to be the head. The cluster head generates two schedules for the cluster participants to comprehend sleep and TDMA transmission function. The overall performance of the proposed protocol is in contrast with that of LEACH by simulation experiments. It is stated that the proposed protocol outperforms LEACH on all occasions considered in the simulation.

Elramly et al., (2013) To shield the user's privateness as nicely as the community used security support is mandatory for any conversation has been described via the author. Autonomous certification between the subscriber and BS was one of hibernating safety leaks. According to Mobile Broadband Wireless Access System, some safety flaws are resolved, while there are scarcities of lookup on Mesh topology safety as some helplessness are still present. A quantity of securities holes and proposes a novel protocol intended to beautify security in Mesh mode has been pointed out in this paper. The protocol is primarily based on bio crypto-systems offering explanations to impenetrable primary network entry, & obtaining confidentiality between two dissimilar nodes in the network. Additionally, the protocol used the integration of Advance Encryption Standard and Biometric Digital Key (AES-BDK) to impervious in addition network messages and key distribution.

Muhammad Akram et al. (2016) fostered another fluffy rule-based induction model for network security in which the framework chooses a few halfway and check hubs that are versatile regarding information conveyance. They considered the three organization boundaries specifically the remaining energy, the closeness of the transitional hub to the first bunch, and the assault recurrence in the organization as assessment boundaries and demonstrated that their model is more effective for energy preservation and ensured adequate security against network assaults.

Umesh Prasad Rout et al., (2017) overall performance analysis of load balancing protocol as properly as compares with other similar protocols and gives the simulation effects which make certain better performance of the electricity environment-friendly protocols in phrases of throughput, lengthen and community life has been evaluated in this paper through the authors. An extensive simulation has been carried out in the above lookup work to consider the performance of the Power environment-friendly protocol. The appropriate decision of nodes for forwarding the packets in such a route which takes care of the strength efficiency and delay optimization has been applied here and the overall performance has been checked using evaluating with one of the main MANET protocols and every other proposed electricity efficient protocol based on the comparable method.

Santosh V. Purkar et al. (2018), the main limitation facing the author is the power available at the sensor node. To extend the life of the sensor node, or HWSN, you need to build an energy-capable operating scheme. One of the the majority appropriate methods to improving energy capable is a clustering scheme that improves WSN implementation parameters. The new answer proposed in this white paper is to purpose an energy-efficient clustering protocol for HWSN to

improve the performance parameters of EECPEPHWSN. The proposed protocol is builded with three levels of nodes: super, normal & advanced. The clustering procedure considers the various parameters available on the sensor node at run time when choosing a cluster head. H. Hop count, initial energy, & keep on energy. This protocol improves the energy efficiency of the HWSN and increases the energy remaining in the network, strength, durability, and therefore throughput.

Jin Wang et al. (2019) A special clustering technique called ECPSO is presented to keep away from these energy holes and search for energy centers for CH selection. In the 1st period, CH is selected using a geometric method. After the network energy becomes non-uniform, ECPSO is adopted for clustering. The energy center is searched using the improved PSO algorithm and the node near the energy center is selected as the CH. It uses protection mechanisms to stop low-power nodes from enhancing forwarders and deploys mobile data collectors to collect data. Numerous simulations have been performed to show that the proposed ECPSO is superior to similar tasks in terms of network life extension and power utilization.

Fakhrosadat et al. (2019) Some factors are displayed to evaluate the possessions of various methods. After that, the way of the student from the fact of view of the procedure is classified into four categories: Classic approaches, fuzzy-based approaches, meta-anarchic approaches, and hybrid mechanism sticks & fuzzy-based approaches. Each category of classification shows the reference and parameters according to the type of procedure to evaluate the process. ANDER, all methods of each class are evaluated for clustering-based parameters and method-based parameters and are finally described. To provide truthful & useful information and to induce the viewer, this assessment is tested by using parameters based on methodology such as functions and limitations, investment in each method, investment in each method It is intended to propose a new approach to the method. Methods Considerations, types of algorithms used in the method are the purpose of using algorithms.

Jibreel et al. (2020) the author described the Gateway Stable Election Protocol (GSEP). GSEP This scheme changed the election probability of choosing a cluster head, taking into account the distance, ordinary distance, and outstanding energy of superior nodes. For this auther is use the MATLAB simulator to improved the GSEP performance Coverage stability period, & extend the life of our networks.

Zhao et al. (2020) A HWSN routing protocol founded on the modified Gray Wolf Optimizer (HMGWO) has been suggested. 1st, the protocol chooses the appropriate opening cluster by describing various capability function for dissimilar energy nodes. The node's goodness-of-fit value is then calculated and treated by GWO as the initial weight. At the time, the weights are with passion updated according to the distance between the wolf and its prey and coefficient vector, improving the optimization capability of the GWO and ensuring that the optimal cluster head (CH) is selected.

Abdulazeez et al. (2021) Communication systems must be robust, quick to deploy, and easy to maintain to provide better service. Ad hoc wireless networks may be an option for establishing communications using existing infrastructure in post-disaster scenarios. Optimizing the performance of mobile ad hoc networks requires addressing challenges that can lead to undependable presentation. One of the most important challenges is the routing of data from the sender to the receiver. Due to the nature of the disaster environment, such as signal attenuation, communication links established between rescue workers are short-lived, suffer from frequent disconnections, and can lead to unreliable end-to-end services. Many routing protocols have been proposed and evaluated in various network environments. This document describes the basic classification of mobile ad hoc networks and the latest technologies in routing categories (Proactive, Reactive, Geographical Awareness, Delay-Tolerant Networking (DTN)). Comparing existing routing protocols in mobile ad hoc networks, we find that the overhead of proactive and geographic routing competes with the delays of reactive and DTN routing.

Benelhourri et al. (2022) The network split into several fields. The sensor node in the 1st field communicates directly with the BS. A sensor in the center of the network sends the data to the gateway. The gateway performs data merging and propagates to the BS. The remaining nodes are split into two equal regions, wherein each region the sensor nodes are combine into a cluster & the 1st node is the cluster head. At the heart of our approach is to select the cluster head based on the ratio of the remaining energy of each sensor node to the mean energy of the section to which it be appropriate. To distribute the load & extend the life of the sensor, the possibility of cluster head election is calculated round by round according to remaining energy of each sensor node.

Swapna et al. (2022) To improve WSN performance, sensor nodes with different power levels, features, and features are installed to create HWSNs. Initial energy, energy consumption, and residual energy vary from node to node in a heterogeneous WSN. Many algorithms have been proposed to achieve energy-efficient and stable HWSN, but the level of performance is not sufficient. This white paper introduces a new integration approach, Energy-Aware Optimal Clustering & Securing Routing (EAOCSR). This algorithm combines three techniques: optimal clustering, reliable routing, and secure transmission, with energy savings and network life as important parameters. This shows that the proposed routing protocol, EAOCSR, outperforms existing protocols in terms of power consumption, throughput, network life, stability, and security.

H. Wheeb et al. (2022) UAVs form a flying Ad-Hoc network (FANET) when communicating & collaborating wirelessly. With FANET, you can quickly complete composite operations. FANETs are often deployed in three unit, & mobility models are resolute by the work designed to perform so that characteristics and attributes are created between vehicle ad hoc networks (VANET) and mobile ad-hoc networks (MANET). it's different. In addition, various flight restrictions and FANET's highly dynamic topology complicate the design of routing protocols. The paper provides a complete overview of UAV networks, various transmitting links, routing protocols, mobility models, key research topics, and FANET simulation software. Learn more

about FANET-specific topology-based routing protocols, along with detailed classification, description, and qualitative comparative analysis.

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