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Fuzzy C-Means Clustering Based Energy-Efficient Protected Optimal Path-Routing Protocol for MANET

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Abstract: A Mobile Ad Hoc Network (MANET) protocol must be appropriately configured to maximize data flow. Use the appropriate routing protocol and the default settings for the routing protocol parameters to resolve this issue. Manet is a dynamic communication network worldwide, and Routing is the risk task for the communication network; routing optimization was the biggest problem in Manet. The existing energy-efficient algorithm has issues with increasing the maximum throughput network life, network energy consumption, minimum routing performance, less security, and minimum packet delivery ratio on Manet. The proposed Fuzzy C-Means Clustering-based Energy-Efficient Protected Optimal Path-Routing Protocol system can increase routing performance, consume less energy, and maximize network lifetime with less error rate, less time delay performances, and security using the TACIT technique has increased the Encryption and Decryption level key performances. The TACIT approach has based on advanced AES based encryption and the random key generation, HMAC algorithm using key authentication or verification for the proposed system. The system routing performance is the performance of Adov 50 nodes performance is 69%, OLSR 50 nodes performance is 72%, OLSR 50 nodes performance is 72%, BTSNADS 50 nodes performance is 82%, and DSR 50 nodes performance is 92%, and proposed 50 nodes performance is 97%. Finally, the proposed system of Fuzzy C-Means clustering-based Energy-Efficient Protected Optimal Path-Routing Protocol has good performance routing optimization.

Keywords: *TACIT ((E-TACIT), Fuzzy C-Means Clustering based Energy-Efficient (FCCEE) Protected Optimal Path-Routing Protocol, HMAC (Hash-based Message Authentication Code)*

1. Introduction

Mobile ad hoc networks are quite common in research because of their transient nature and efficiency during catastrophe management when infrastructure support is not available. Nodes may need to make several network hops in order to share data across the network since wireless network interfaces have a restricted transmission range. Each mobile node in such a network serves as a router, transmitting packets to other mobile nodes that are not in close proximity. Wired vector or link-state protocols, which were developed for wired networks, are insufficient in this aspect because they frequently not only assume fixed topologies but also have substantial overhead costs. This prompted the development of numerous routing algorithms for ad hoc networks. We discuss MANET-compatible routing protocols and their study of several performance metrics, such as throughput, control overhead, power, and packet delivery speed, delay, and throughput.

One of the varieties of data communication networks that uses wireless links to link devices for information exchange is a wireless network. The expensive process of laying cables for data communication between devices in multiple places is avoided by wireless networking technology. Wireless networks and Wi-Fi local area networks are two types of wireless networks. Wireless networks can be divided into two categories: those with infrastructure and those without. In the first, access points or routers are used to set up and manage data connections. Mobile networks are an illustration of this kind of network. Ad hoc networks are essentially the name for this last category. The stations in such a network can communicate with one another and are self-generated in the form of numerous hops without established infrastructure. Such a flexible infrastructure is beneficial in less networked areas.

The continuous and capricious changes in the network topology and geography brought about by the very unique nature of portable, specially appointed networks make

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