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Research on Energy Efficient In MANET Using MAC Protocol- A Survey

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Abstract

The Protocol of Medium Access Control (MAC) increases the energy level of node. This protocol gives to access the wireless medium reviews the various techniques in the mechanism of efficient energy. Energy efficient design in MANET is a characteristic item due to its limited power supply in distributed power control. Therefore, the limited power supply will not be affected in case of change in the network topology and mobility of nodes. In this paper, the performance of the Medium Access Control (MAC) over energy efficient in MANET is studied. The issues and challenges that are facing MAC in MANET are also identified. The comparative study of existing energy efficient MAC protocol in MANET is described. The advantage & disadvantage of MAC in MANET is also pointed out. Finally it is very much necessary to point out the Future research direction.

Key Words: Manet, Mac, Energy Efficiency

Introduction

MAC layer for each node holds information about the power of transmission level of all the neighbouring nodes. Every node helps to find out the nearest node to the destination and find out the shortest path using greedy algorithm. MAC protocol should attempt to minimize the delay of the power control of transmission which reduces the energy consumption at the node that causes a decrease in neighbouring nodes and increases frequency reuse and supports power control at the MAC layer. It consists of two states of the station called sleep and awake. The sleep state refers to the state where the transceiver neither receives nor sends wireless Signals. Over all power level is minimized when the sender node transmits the signal to the receiver node at dynamically.

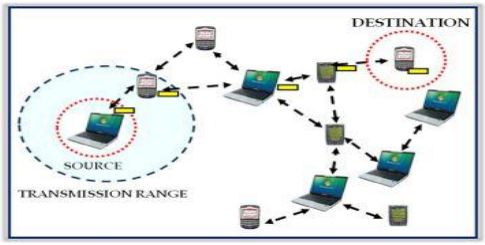

Figure 1: Mobile Ad Hoc Network

The path with the minimum cost is selected and the network nodes using the power management scheme such that the nodes are grouped into cluster. Therefore every node transmits the minimum power level to reach those nodes in the cluster.

Literature Survey

Ajay Dureja [1] after implementing DCF and PCF methods, the DUAL MAC protocol share the medium between multiple stations. That the stations are connected to the network through an access point (AP) in the DCF mode is optional and only very few access points (or) Wi-Fi adapters actually implement it. The Access point sends beacon frame sets regular intervals between these beacon frames whereas DUAL MAC is implemented to increase the throughput with boundary nodes to receive data from other nodes during the CFP Period.

Benjie Chen[2] used multi hop ad hoc wireless networks that reduce energy consumption without significant capacity or connectivity in the MANET. Each node estimate of how many neighbour nodes being awake and the amount of energy available to it. Network Topology is used to increase the energy consumption. Span on top of MAC power saving mode can improve throughput, packet delivery.

Emmanuel A Varvarigos [3] describes energy level and throughput are maximized in RTS/CTS and DATA frame which are helpful to power control technique. This technique power transmission for RTS frame is not constant, CTS frame is maximum transmission power. MANET has focused on the power aware protocol is avoid collision in the MAC Layer. The authors proposed a distributed contention control protocol which uses protocol that uses control packets and carrier sensing as well as slow start mechanism.

K.B.Gurumoorthy[4] proposed Enhanced Medium Access control (eMAC) protocol. This protocol are helpful to find out the link failures, hidden terminal and broadcast problems by using an adaptive mechanism with more energy consumption. Data to be transmit with minimum power level and save wastage of energy. The DHN(Double Hop Neighbourhood) graph of each station gives an estimate how much power needed for every transmission.

Hairong Yan,Jie [5] defined optimistic power MAC (OPCM) protocol that works by increasing power level in the retransmission stage. The BASIC power control MAC protocol uses various transmitting power levels in the handshake frames and DATA, ACK. It should be notified that the maximum level of power is consumed

when a node transmit the signal to any other node at the same time, the consumption of power is reduced to a minimum level when the DATA and ACK frame set is used. The improved version of BASIC protocol and various levels of power control mechanisms are helpful for transmission and retransmission stages.

Hairong Zhou [6] investigate find out the equal power level in a each node. The protocol are helpful to minimize the power level at dynamically when the node transmit the signal (or) data and increase the maximum level of throughput. RAPO protocol are define heterogeneous mobile ad hoc network have a limited quantity of power level for data packet transmitted.

Jehn-Ruey Jiang[7] proposed adaptive protocol and e-tours quorum system are explain neighbour node require minimum power level when the node transmits the signal. The protocol are helpful to beacon interval split up equal length to all the node ATIM(adhoc traffic indication map), non quorum intervals helpful to the host may go to power saving mode if it has no packet send (or) receive.

Krishna Kumar[8] proposed reduced to Node power consumption varying transition time. Power control mechanism works by increase the power level, transmission range. The author introduce one more protocol named as BASIC power control MAC protocol with different transmitting power level. Source node follow the all neighbour node increase the system efficiency and transmission rate. Power allocation of each level and the data rate of each node in the system transmit the date to the node power level is minimum utilize by all the node are interconnected mesh topology since the node level energy is maximized.

Marco Valero[9] identified the problem of MANET due to energy efficiency in MAC protocol handling DEEP protocol. The proposed protocol which is usually in the form cluster to increase the node level energy. This protocol is used to reduce unnecessary energy. CSMA/CA reduce the collision when the node transmit the data.

Ren-Hung Hwang [10] defined power level of IEEE 802.11 for single hop mobile ad hoc network to reduce the power consumption at the time of transmission. A novel efficient power-saving MAC protocol for multi-hop MANET implemented to ATIM window with active path minimize the transmission delay, power consumption and increase the throughput.

Radu Stoleru[11] analyzed the problem in MANET a MAC protocol for finding the location of a wormhole secure neighbour discovery technologies and can be roughly divided into solution based on location time to ensure that transmission nodes within the local neighbourhood.

Vikas Kawadia[12] investigated power control in MAC Protocol. Every node select that equal power level and find lowest power level of node within the cluster and keep the energy consumption. Every node has the lowest power level to reach the destination by using greedy algorithm. Compow power control protocol is helpful to maximize the node level energy. Each station independently establishes a periodic sleep or awake cycle.

Yongsheng shi[13] investigated energy efficient in MANET such as distributed control, changing network topology and mobile user with limited power supply. The proposed EE-MAC Protocol to elect master node forms all nodes in the network master nodes stay awake all the time and act as a virtual backbone to route packets at

the ad hoc network other node slave node and wake up periodically to check whether they have packets to receive.

Challenges & issues of MAC Protocol

Lack of infrastructure support to MANET for centralized system with Energy efficiency for different topology may change from time to time transmission and MAC protocol are helpful to distributed channel can Improve the throughput , minimize the packet transmission delay. The MAC protocol maximize the bandwidth efficiency in a real time applications. Energy utilization in a heterogeneous network is a vital problem depending on whether they function in a free standing mobile Ad hoc network. In a network needed to select a best path from sender to receiver node for data transmission. Packets must not consume to nodes of network bandwidth Hidden and Exposed Terminal problems, Collision of packets receiving of node due to the simultaneous transmission of those nodes that are not within the direct transmission range of the sender. Power control order to efficiency mange energy consumption of the nodes.

Comparative Study of Existing Energy Efficient MAC Protocol

Large amount of energy has been wasted due to power save MAC protocol node transmit the packet continuously so the packet get corrupted and discarded at the end collision will occur. IEEE 802.11 protocol to allows receiver node , sender node choose packets are sent at the highest power level and degrade the throughput.

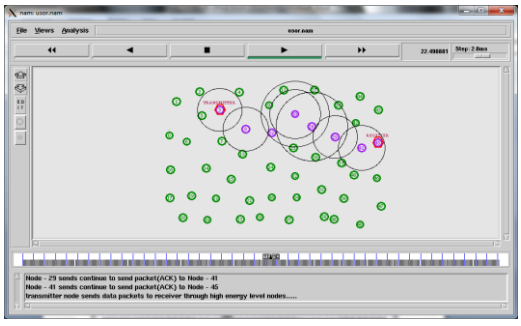

Figure 2: Energy Level Is Maximized

The system are modified source node transmits the data to the destination with find out the neighbour node distance of dynamically using shortest path algorithm. Each node transmission independently among three state, sleep, discovery, active node , it is periodically wake up from the sleep state and transmission to the discovery state it is listen for other node if the transmission to the active state otherwise it transmission back to the sleep state. A link is broken in to several shortest links the total energy used in transmission can be saved.

Advantage & Disadvantage of MAC Protocol

Collection of node form a network without any infrastructure at dynamically and increase the packet delivery ratio, collision avoidance. BTMA (busy tone multiple access) protocol helpful for solve the hidden-terminal problem. Memory overflows at nodes as number of packets sending increases and packet delivery ratio. Node is generally constrained by limited power supply compared to nodes in the wired networks. The directional transmissions must be limited in the coverage maximum distance between the two stations is defined by the smaller coverage range.

Discussion

In this paper, various protocol and techniques used in the design and development of MAC protocol for MANET are discussed. It is looked into a few protocol developed for Ad hoc that can be deployed in MANET environment with minor adjustments. Some of the protocols and techniques are proposed to node level energy is maximize. MAC solution that interacts with data link layer provides buffer result with energy level is maximized and also increased the throughput. Various protocol any various intervals are defined to discuss the energy level with MAC protocol it denotes their high energy consumption and the fact.

Conclusion & Future work

In this paper literature survey it is seen that the analysis of the various MAC protocols, techniques implemented for how to minimize the energy level and increase the throughput .Adaptive protocol that allows to find out the neighbour node are transmits the data uses shortest distance are energy level is maximize.

This protocol can be further extended by performing simulations on different parameters like improving Network topology is dynamically change due to mobility. MANET provides a dynamic environment, thus for minimizing data packet loss. MACA protocol can be improving the length of data packets and additional power saving in Physical layer. Chain topology and grid topology can be added to further boost performance for maximize the energy level and increase the number of nodes, aggregate throughput.

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