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REVIEW PAPER ON DYNAMIC SOURCE ROUTING PROTOCOL FOR MULTI-HOP WIRELESS NETWORKS

Ravi Shrivastava[1], Prof. Hemant[2], Prof. Manish Gujar[3]

Email: rshrivastava477@gmail.com

[1]*M. Tech. Scholar, Dept. of Electronics and Communication ,Technocrats Institute of Technology - Advance, Bhopal, India*

[2]*Assistant Professor, Dept. of Electronics and Communication ,Technocrats Institute of Technology -Advance, Bhopal, India*

[3]*Head Dept. of Electronics and Communication ,Technocrats Institute of Technology - Advance, Bhopal, India*

ABSTRACT:

The multi-hop wireless networks mainly use the physical and medium-access protocols. These networks usually consist of wireless transceivers. The main functionality of these transceivers is store-and forward which they implement on bottom two-layer protocols. In WSNs, the propagation of data is through multi-hop scheme. In this, the sensor node forwards the information to next node, which in turn to the next, there by reaching the destination node. WSNs have its own set of application areas like temperature monitoring, earth-quake detection, etc. it is also used in civil and military surveillance applications. In this paper the studied of dynamic sources routing protocol for multi-hop wireless networks is present. It is an reactive protocol which helps us to eliminate the updating of messages in order to control the amount of bandwidth which is being exhausted by controlled packets in an ad-Hoc wireless networks.

KEYWORDS: *Wireless Networks, Dynamic Source Routing Protocol, Multi-hop.*

1. INTRODUCTION

In the recent past, tremendous growth has been achieved in wireless networks and they have climbed the ladder of growth in the telecommunication industry very rapidly. Since the advent of successful transmission of signals by Guglielmo Marconi, across the English Channel for the time in 1898, wireless communication has shown several advantages over wired communication [1]. In recent years many different wireless communication networks have been significantly developed, few of them are:

1. Cellular Networks.
2. Wireless Local Area Networks (WLAN).
3. Bluetooth network.
4. Ultra-wideband (UWB) networks.
5. Mobile Ad Hoc Networks (MANETs).
6. WiMax.

WLAN and Bluetooth networks are two of the most commonly used technologies among these cellular networks. Since WLANs and cellular networks are centralized networks, it means that it involves the utilization of costly infrastructure and centralized administration [2]. Bluetooth technology enables hosts to establish a connection in an ad hoc fashion and targets at low power short range wire replacement. Due to these advantages, wireless mobile ad-hoc networks and wireless sensor networks have obtained tremendous attention in recent years. MANETs do not require centralized control and hence each and every host gets to act as a source as well as a sink. They also perform the functions of a router. MANETs are specifically used in applications such as military communications or emergency search and rescue operations where a pre-determined infrastructure is not

supported. The fact that ad hoc networks can be simply made, helps us in allotting data in a meeting or in unfavorable terrain makes it convenient. The rapid advancement of various coding technologies such as MPEG-4 [3] and H.264 [4] has made low data rate over wireless feasible. IN order to enable such multimedia or military applications or audio or video communications in MANETs, we require secure quality of service support Providing support for QoS parameters and secured data transmission rules for ad hoc routing is significant challenge in itself, due its limitations. The thesis tries to explain the overall objectives of the research work, that is, to design a Secure and Quality of Service Enabled Communication Support to soft real-time application fields such as defense, multimedia and voice telephony.

2. LITERATURE REVIEW

Wooyeol Choi et al. [1], proposed in a wireless network with multi-hop transmissions and interference-limited link rates. The problem arises when balancing power control in the physical layer and congestion control in the transport layer to enhance the overall network performance while maintaining the architectural modularity between the layers. It can be solved by presenting a distributive power control algorithm that couples with existing TCP protocols to increase end-to-end throughput and energy efficiency of the network. Under the rigorous framework of nonlinearly constrained utility maximization, the convergence of this coupled algorithm to the global optimum of joint power control and congestion control, for both synchronized and asynchronous implementations is established. The rate of convergence is geometric and a desirable modularity between the transport and physical layers is maintained.

L. Han et al. [2], presented the cyclic redundancy encoder for error detection in communication channels. It involves a division of the transmitted message block by a constant called the generator polynomial. The quotient is discarded, and the remainder is transmitted as the block check character or frame check sequence (FCS). The receiving station performs the same computation on the received message block. The computed remainder, FCS is compared to the remainder received from the transmitter. If the two match, no errors have been detected in the message block. If the two do not match, either a request for retransmission is made by the receiver or the errors are corrected through use of special coding technique. Framing protocols employ cyclic redundancy check (CRC) to perform fast detection of errors incurred during transmission. Generally, the whole page is protected using CRC and upon detection of error, retransmission is requested. But certain protocols demand for single bit error correction capabilities for the header part of the frame. This often plays an important role in receiver synchronization. At a speed of 10 Gbps, header error correction implementation in hardware can be a bottleneck.

M. Bheemalingaiah et al. [3], is usedpower-aware Node-disjoint Multipath Source Routing (PNDMSR) to execute and break down its execution with particular to Multipath Dynamic Source Routing (MDSR) by utilizing different quantitative execution measurements like, directing control overhead, throughput, packet delivery ratio, packet loss and energy efficiency by shifting different parameters like system's size, versatility of hub, delay time, information rate and load .The fundamental target of the PNDMSR is selecting energy aware node disjoint multipath from source to destination by enhancing the overhead utilizing node’s cost and it increase the system of lifetime.

DoganYildiz et al. [4], in this paper,statisticulated social network routing (SSNR) and Obfuscated social network routing (OSNR) were used. In SSNR the friends list is modified by adding or removing nodes for each message transmission. Hence it is not easy for a node to identify the original friends list of a sender by just interpreting a single message. In OSNR the friends list of source node is embedded in a bloom filter.

Alexandros Ladas et al. [5], is usedself-reported social networks (SRSNs) are used to collect social network data. These SRSNs are utilised to provide reputation for every member node. As the network initialises, the nodes are assigned higher trust values by SRSN. By tracking the history of encounters, selfishness is analysed. This might also include special scenarios where a node might have become power deficient which had resulted in such non-cooperative behaviour. Once a node is detected as selfish the detecting node decrements the value of selfish node by a behaviour constant.

Pengwu Wan et al. [6], in this paper**,** the efficiency of caching protocols lies truly in the selection of sensor nodes which will take special roles in running the caching and request forwarding decisions. For efficient caching, cache discovery, cache admission control, cache consistency and cache data replacement are essential.

Mohammadi K et al. [7],is usedglobal cluster cooperation scheme (GCCS) for caching in wireless sensor networks. WSNs have a finite limited amount of cache and therefore a new replacement policy, called Frequency-Based-First In First Out (FB-FIFO) which outperforms both Least Recently Used (LRU) and First In First Out (FIFO). The fundamental challenge lies in maintaining the cache freshness. The reason is mainly due to the disrupting network connectivity followed by lack of information about cached data.

3. MULTIHOP WIRELESS NETWORK

Multi-hop wireless networks are a combination of devices including wireless transceivers which provide store and forward mechanism and also use physical andmedium access protocols. Further, multi-hop wireless networks are categorized as follows:

Mobile Ad-hoc Networks

Networks that are a combination of mobile nodes that have undergone self-creation and are self-organized and are interconnected by Multi-hop wireless paths are called Mobile Ad hoc Networks (MANETs). The MANETs comprises the following key features such as a varying network topology, multiplexed network, multiple hop communication, bandwidth constraints, limited energy constraints and vulnerability to malicious attacks [5].

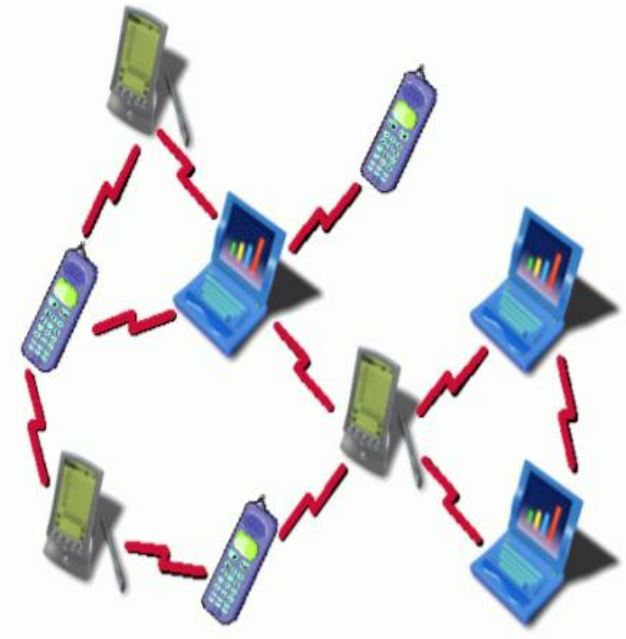

Fig. 1 Mobile Ad Hoc Network

Wireless Sensor Networks

Wireless Sensor Networks (WSNs) consists of a huge number of sensors deployed uniformly or randomly in the field, where the mode of communication between them is air. Sensor nodes can be either mobile or stationary and forms an infrastructure similar to ad hoc networks. These networks generally have a limited amount of power supply, small-sized memory, restricted energy use, low bandwidth, a substantial number of resource-restricted sensor nodes and control nodes which keep varying in number, called base stations [6]. In WSNs, data is routed in a Multi-hop progressive fashion and the sensor node forwards the information collected to another node that is closer to the destination. These networks have limitless applications such as earth quakes detection, object tracking, temperature monitoring,firefighting and numerous other business, military, agricultural, civil and surveillance applications [7].

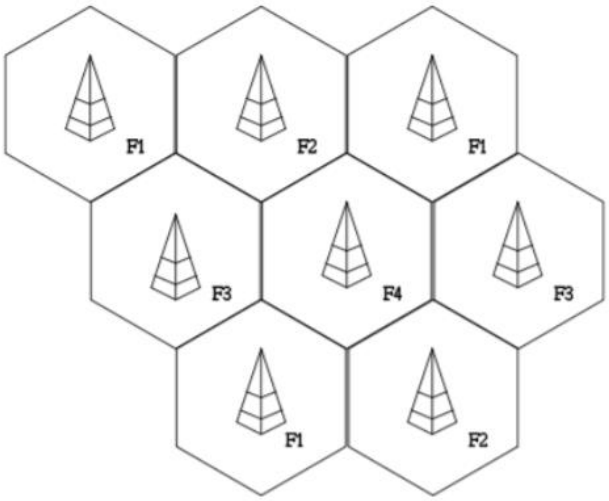

Fig. 2 Cellular Network

4. PROPOSED METHODOLOGY

It is an reactive protocol which helps us to eliminate the updating of messages in order to control the amount of bandwidth which is being exhausted by controlled packets in an ad-Hoc wireless networks (5).DSR being direction-less does not need cyclic beacon packet (hello) broadcasting, that is used by a node to let their neighboring nodes to know about their presence while the other reactive protocols do not do the same. The essential part of this and other reactive protocols is that they need to set-up a path by flooding the network with numerous route requests for their route establishment. On receiving the message the destination needs to send the acknowledgement to the source carrying route traversal information by the packet it had received for requesting the route. The protocol consists of:

a. Route Discovery
b. Route Maintenance

Route Discovery: In case source does not have information regarding the target node, it forwards route hunt packets that contain the information regarding destination node. This packet contains the route record in a sequence of traversal of all nodes by the packet. If intermediate node contains the route record or had received a RREQ before, it drops the packet else it updates the table and broadcast the RREQ to the nearest node which is

mentioned in the packet header depending on the route traversed. Once the destination gets the RREQ it sends RREP back to the source containing this route.

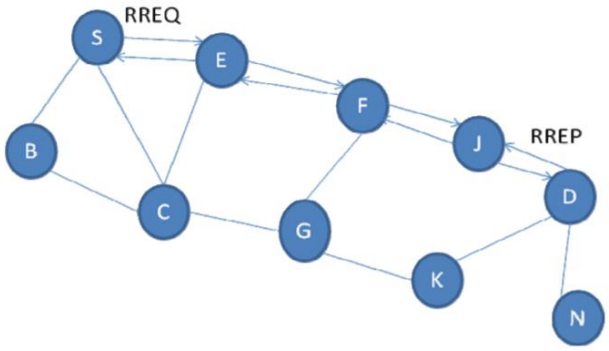

Fig. 3 Route Discovery in DSR

Route Maintenance: It involves the monitoring of the current route so as to be sure of its correct operation. Route Error Packet and Acknowledgement are used for route maintenance by DSR. An route error packet (RERR) is generated in case of any problem in the link. Acknowledgement packet ensures that the route links are operating correctly.

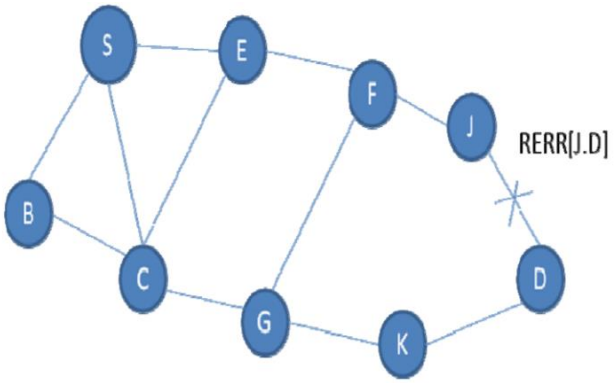

Fig.4 Route Maintenance in DSR

5. CONCLUSION

DSDV performance is not up to mark and not satisfactory under all parameters due to the table driven approach and the frequent tables interchange. The consumption of total energy and the progress in the wireless Adhoc network has been strongly affected by the mobility, number of nodes and transmission range. The objective of the research work is to find out an appropriate range of radio transmission by varying the mobility rates for the table driven routing protocol (DSDV), On demand protocols (AODV, DSR) and hybrid routing protocol(ZRP) in wireless ad hoc networks without degrading the system performance. After analysis of above said simulation work, it has been observed that AODV is having highest ratio of packet delivery and highest average throughput and being directly proportional to the transmission range. Besides this if in AODV protocol routing overhead increases, transmission range decreases and if routing overhead decreases, transmission range increases it concludes that when the transmission range is maximum the overhead on routing is minimum.

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