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Literature survey of network reconstruction, reconfiguration & QOS optimization approach in case of link failure in existing SSA protocol in Mobile Ad-Hoc Network

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Abstract: In this research paper the work done by the earlier researchers is discussed, literature related to the work is collected to find the direction of research work. To start the work author has studied more than 22 research papers. Here author has defined these papers with brief information about the topic and the results of earlier researchers. Here author has discussed the papers related to Routing in Ad-Hoc Networks, its problems etc. The papers also cover the problem of broken link and the network stability problem. Finally the earlier work related to SSA protocol is discussed.

Keywords-Routing Protocol, Ad-Hoc, MANET, TCP/IP, SSA, DSDV, AODV, DSR, SRMP, NS2, OPRR, QOS

1. INTRODUCTION

To start the work author has studied more than 22 research papers. Here author has defined these papers with brief information about the topic and the results of earlier researchers. Here author have discussed the papers related to Routing in Ad-Hoc Networks, its problems etc. The papers also cover the problem of broken link and the network stability problem. Finally the earlier work related to SSA protocol is discussed.

2. WORK DONE BY EARLIER RESEARCHERS

The author in [1] performed a work, "Performance of TCP over Different Routing Protocols in Mobile Ad-Hoc Networks". TCP/IP is the standard networking protocol on the internet and is also the most widely used. Due to these reasons, its use over Mobile Ad-Hoc networks is a certainty. Ad-Hoc networks are prone to Link failures due to mobility. TCP is unable to distinguish between losses due to route failures and losses due to congestion. As a result, throughput degrades significantly when nodes move. It is therefore essential to study how TCP performs over ad-hoc networks. Author have used simulations in the cpu

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extension tons to analyze the performance of TCP to over a set of routing protocols including the Signal Stability Adaptive routing protocol which Author have implemented in ns-2. Author identity characteristics in each of these routing protocols that determine the behavior of TCP over them.

The author in [2] performed a work, "Route Maintenance in a Wireless Mobile Ad Hoc Network". In this paper, Author considers the route maintenance problem, which includes two parts: route deterioration and route breakage. In a MANET, a route may suddenly become broken because only one host roams away. Even if a route remains connected, it may become worse due to host mobility or a better route newly being formed in the system. Existing protocols, however, will stick with a fixed route once it is discovered, until it is expired or broken. In this paper, Author shows how to enhance several existing protocols with route optimization and local route recovery capability. So the routing paths can be adjusted on-the-fly while they are still being used for delivering packets and can be patched in minimum wireless bandwidth and delay while route errors occur.

The author in [3] performed a work, "Routing Protocols for Wireless Ad Hoc Wireless Networks: A Review of the On-Demand Routing Protocols". Wireless Ad hoc networks have it very specific nature of the dynamically changing topology and the relatively limited resources of the transmission medium and the mobile nodes. On demand routing protocols depends on the highly dynamic selecting of routes to adopt with this nature of the ad hoc network. This paper reviews this class of protocols.

The author in [4] performed a work, "Dynamically Adaptive Multipath Routing based on AODV". Mobile ad hoc networks are typically characterized by high mobility and frequent link failures that result in low throughput and high end-to-end delay. To reduce the number of route discoveries due to such broken paths, multipath routing can be utilized so that alternate paths are available. To overcome this problem, Author present an adaptive multipath solution. In this approach, multiple paths are formed during the route discovery process. All the paths are maintained by means of periodic update packets unicast along each path. These update packets measure the signal strength of each hop along the alternate paths. At any point of time, only the path with the strongest signal strength is used for data transmission. In this paper, Author present two variations of Presented protocol and evaluate both with respect to two previously published multipath routing protocols.

The author in [5] performed a work, "On Route Lifetime in Multihop Mobile Ad Hoc Networks". One wireless network architecture that has received a lot of attention recently is the mobile ad hoc network (MANET). It is attractive because the network can be quickly deployed without the infrastructure of base stations. This paper presents a formal model to predict the lifetime of a routing path based on the random walk model. Route lifetime is derived based on a probabilistic model. Through such investigation, Author hope to provide further insight into issues such as route selection, route maintenance, and network scalability related to MANETs.

The author in [6] performed a work, "Classification of Self-Organizing Hierarchical Mobile Adhoc Network Routing

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Protocols". In this paper Author present four routing algorithm, classifications, discuss their advantages and disadvantages.

The author in [7] performed a work," A Survey of Mobile Ad Hoc network Routing Protocols". Emerging ubiquitous computing needs "anytime and anywhere" network connections. Mobile ad hoc networks are well suited for this application area because they are self-organizing networks without depending on any network infrastructure. Due to the improved flexibility and reduced cost of mobile ad hoc networks, they promise to play an important role in future mobile applications. An important and essential issue for mobile ad hoc networks is routing protocol design. Because of the dynamic network features, it is a major technical challenge. During the last years, active research work resulted in a variety of proposals. A large number of protocols, each with a particular property and often optimized for a specific application area, have been designed. They follow different design principles and exhibit substantial variations in performance depending on network size or node mobility patterns.

The author in [8] performed a work, "Stability and Hop-Count based Approach for Route Computation in MANET". In this paper, Author present an approach for MANET routing based on stability and hop-count, where the stability metric considered is the residual lifetime of a link. Author view stability based routing not as a separate routing protocol but as an enhancement to a hop-count based routing protocol (e.g. DSR or AODV), so that the expected residual lifetime as well as hop count of a route are taken into account. First, Author investigates how residual link lifetime is affected by parameters such as speed and mobility pattern using simulation. The result shows that residual link lifetime is a function of current link age, mobility speed and mobility pattern and does not vary monotonically with age.

The author in [9] performed a work, "Simulation Study of AODV&DSR". Mobile ad hoc network (MANET) is an autonomous system of mobile nodes connected by wireless links. Each node operates not only as an end system, but also as a router to forward packets. The nodes are free to move about and organize themselves into a network. These nodes change position frequently. A comparative analysis has been done using network simulator NS2. As per Presented findings the differences in the protocol mechanics lead to significant performance differentials for both of these protocols.

The author in [10] performed a work, "Source Routing-based Multicast Protocol for Mobile Ad hoc Networks". In this paper, Author focus on one critical issue that is multicast routing. Actually, most existing multicast protocols face lot of problems in tree maintenance and frequent reconfiguration when link failures occur. In this context, Author propose a new on-demand multicast routing protocol, named Source Routing-based Multicast Protocol (SRMP). It constructs a mesh to connect group members, providing robustness against mobility. SRMP uses the concept of "forwarding group" nodes during its mesh construction. Author evaluated the performance of SRMP via simulations carried out in ns2. A comparison with DSR shows that SRMP provides higher throughput in intermediate mobility, although it exhibits a little impact on the delay without affecting the network overload.

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The author in [11] performed a work, "Link Stability in Mobile Wireless Ad Hoc Networks". By growing the use of real-time application on mobile devices, there is a constant challenge to provide reliable and high quality routing algorithm among these devices. In this paper, Author proposed a reliable routing algorithm based on fuzzy-logic (RRAF) for finding a reliable path in Mobile Ad Hoc Networks. In this scheme for each node Author determine two parameters, trust value and energy value, to calculate the lifetime of routes. Every node along route discovery, records its trust value and energy capacity in RREQ packet. In the destination with the aid of fuzzy logic, a new parameter is generated from inputs trust value and energy value of each route which is called "Reliability Value".

The author in [12] performed a work, "A Performance Enhancement of an Optimized Power Reactive Routing based on AODV Protocol for Mobile AD-HOC Network". In this paper, Author described an optimized power reactive routing based AODV protocol by using concept of cognitive function. It ensures data packet is transferred in the shortest and most reliable mode. In order to that improve the scalability of network management and provide a way of transmission with an energy efficient manner in the path of every node. Author proposed a novel way of transmission with stability using a technique called Optimized Power Reactive Routing (OPRR) and for more splendid performances. This proposed protocol avoids new route discovery process in AODV with low power consumption and maintain the stability of node and to improve scalability of the network. Preliminary the simulation using GloMoSim simulator were provided and the result shows the performance enhancements of the Optimized Power Reactive Routing.

The author in [13] performed a work, "Path Set Selection in Mobile Ad Hoc Networks". This paper proposes a multipath routing algorithm, called Disjoint Pathset Selection Protocol (DPSP), based on a novel heuristic that, in nearly linear time on average, picks a set of highly reliable paths. The convergence to a highly reliable path set is very fast, and the protocol provides flexibility in path selection and routing algorithm. Furthermore, DPSP is suitable for real-time execution, with nearly no message exchange overhead and with minimal additional storage requirements. This paper presents evidence that multipath routing can mask a substantial number of failures in the network compared to single path routing protocols, and that the selection of paths according to DPSP can be beneficial for mobile ad hoc networks, since it dramatically reduces the rate of route discoveries.

The author in [14] performed a work, "The Mobility-based Reliable Routing in VANET". The information that is not available when you need it is almost as bad as none at all. To improve the information availability and reliability, Author proposed a reliable routing scheme based on mobility features in VANETs. The scheme selects and maintains stable wireless links which create a routing path. Inspired by the classic DSR and AODV protocol, Author combines the advantages of the DSR and AODV. The proposed scheme disseminates packets among the links which has longer expiration time. Moreover, the proposed scheme is gracefully maintained by switching to a new optimal routing path before the current routing path broken.

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The author in [15] performed a work, "A Link Stability based Multicast Routing Protocol for Wireless Mobile Ad hoc Networks". Recently, several studies have been conducted to design mobility-based multicast routing protocols for wireless mobile ad hoc networks (MANET). These protocols assume that the mobility parameters of the network are fixed, and so they cannot perform well under real MANET scenarios in which the mobility parameters of the hosts vary over time at random. Finding the optimal solution to the multicast routing problem is incredibly hard, if the mobility parameters are assumed to be random variables. This becomes more difficult when the probability distribution function of these random variables is assumed to be unknown. In this paper, Author propose a weighted multicast routing algorithm for MANET in which the mobility parameters are supposed to be random variables with unknown distribution. In this method, the multicast routing problem is first transformed into an equivalent stochastic Steiner tree problem in which the random weight associated with a communication link is its expected duration time.

The author in [16] performed a work, "Congestion Aware and Adaptive Dynamic Source Routing Algorithm with Load-balancing in MANETs". The explosive growth in the use of real-time multimedia applications in mobile devices requires quality of service (QOS) support for effective communication. Network congestion is the main reason for packet loss, longer delay and jitter in streaming multimedia applications. Most of the present routing protocols are not designed to adapt congestion. In this paper, the original DSR protocol is modified to define the occurrence of congestion by monitoring and reporting multiple resource utilization thresholds as QOS attributes and use multi-path-routing and load-balancing during the periods of congestion to improve QOS in MANETs for CBR multimedia applications.

The author in [17] performed a work, "A Practical View on Quality-of-Service Support in Wireless Ad Hoc Networks". This paper examines the practical applicability of approaches to QOS with respect to the differences between wired and wireless ad hoc networks. Furthermore, a novel approach for service differentiation in wireless networks is proposed and early simulation results on the performance are presented.

The author in [18] performed a work, "Non uniform Grid-Based Coordinated Routing in Wireless Sensor Networks". A non uniform grid-based coordinated routing design in wireless sensor networks is presented. The conditions leading to network partition and analysis of energy consumption that prolongs the network lifetime are studied. Author focus on implementing routing in densely populated sensor networks. By maintaining constant values for parameters such as path loss exponent, receiver sensitivity and transmit power, and varying between uniform and non-uniform grids, Author observe energy consumption patterns for each of the grid structures and infer from the network lifetime the better suited grids for uniformly and randomly deployed sensor nodes.

The author in [19] performed a work, "An Improved Routing Algorithm to Enhance Energy Efficiency in Multicast Ad Hoc Networks". In this article a new energy efficient algorithm is proposed with the aim to find a stable energy multicast host against host mobility. This is done by initially identifying the energy level of individual host in MANET and

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then transmitting the data packets. Experimental output confirms the power of the proposed method over the existing multicast routing protocols in terms of the packet delivery ratio and mobility.

The author in [20] performed a work, "Study of Various Routing Protocols in VANET". Vehicular Ad Hoc Networks (VANET) is a subclass of Mobile ad hoc networks which provides a distinguished approach for Intelligent Transport System (ITS). The survey of routing protocols in VANET is important and necessary for smart ITS. This paper discusses the advantages/disadvantages and the applications of various routing protocols for vehicular ad hoc networks. It explores the motivation behind the designed, and traces the evolution of these routing protocols. This paper discusses the main 5 types of protocols for VANET Topology Based, Positioned Based, Geo Cast, Broad Cast, Cluster Based Protocols.

The author in [21] performed a work, "Stability and Hop-Count based Approach for Route Computation in MANET". In this paper, Author present an approach for MANET routing based on stability and hop-count, where the stability metric considered is the residual lifetime of a link. Author view stability based routing not as a separate routing protocol but as an enhancement to a hop-count based routing protocol (e.g. DSR or AODV), so that the expected residual lifetime as well as hop count of a route are taken into account. First, Author investigate how residual link lifetime is affected by parameters such as speed and mobility pattern using simulation.

The author in [22] performed a work, "Performance Evaluation of Two Reactive Routing Protocols of MANET using Group Mobility Model". In this paper Author have compared the performance of two reactive MANET routing protocol AODV and DSR by using Group mobility model. Both share similar On-Demand behavior, but the protocol's internal mechanism leads to significant performance difference. Author have analyzed the performance of protocols by varying network load, mobility and type of traffic (CBR and TCP). Group Mobility model has been generated by IMPORTANT (Impact of Mobility Patterns on Routing in Ad-hoc Network) tool.

3. CONCLUSIONS

In this research paper the earlier work and the problem faced by earlier researchers is discussed. The main focus of study is on Network reconstruction and the network reconfiguration in case of link failure. In these papers we have studied the work related to Network Stability in case of SSA protocol. Here we discussed the problems related to energy efficiency and the route configuration. Some author provided there suggestions and work to improve the network life in case of low power networks. They suggest the approach to improve the energy utilization. Some author defined the approach to identify the problem in network in terms of bad node or the broken link. Some suggested the routing and reconfiguration approaches to perform the reliable deliver over the network.

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