Analysis of Various Routing Protocol Based on Quality of Services for Manet and Vanet

Sangeetha Y, Kumar Narayanan

Abstract – The heterogenous network is the computer and other devices connecting networks with the various operating systems and other protocols. In worldwide, the heterogenous network is to be used for various wireless networks using various access technologies. The mobile ad hoc networks are most popular techniques used in real time environment. The quality of services is to be defined as the network ability which is to provide the various services to the various types of the network traffic. The quality of service is to reach more deterministic network behavior so that the data will be stored by the network which can be forwarded and the utilization of better resources. The integration of the MANET with quality of services framework for MANETs gives the effective performance of the networks. The quality of services has the following parts such as user, application and network. The quality of service routing is the process which guarantees to the support to a set of the quality of service parameters during establishing a route. The QoS routing in the MANETs is the communication in real time application like video on demand, news on demand, web browsing, travelling information system etc. In this paper, a survey analysis of various routing protocol which is based on QoS for the MANET and VANET. In the VANET, the quality of service protocols is to be optimized which has various important things such as safety, emergency, and multimedia applications which are to be analyzed in vehicular ad hoc network. There are various optimization algorithm discussed in this paper. There are different routing protocols are to be analyzed based on the quality of service for the MANET and VANET. There are various performances are to be analyzed for the mobile ad hoc network, VANET.

Keywords – routing protocol, MANET, VANET, quality of services, performance analysis, optimization algorithm, multimedia applications

I. INTRODUCTION

The MANET denotes the complex distributed systems which have to various movable nodes that is called mobile node which are interact without help of the central head. In the mobile ad hoc networks, the nodes are to be moved randomly with free manner and the system will work in the standalone manner. The MANETs nodes are to be created with the remote source to destinators which has the different antennas and these antennas are point to point or the Omni directional. The MANETs has the various challenges are to be identified which has the link is presenting as wireless, constrained as a energy, physical protection is less of the node and the hostile environment. The MANET has the limitation like high dynamic environment while the numerous provious. The mobile ad hoc network is applied to the multi homed network because it has the fixing internet points throughout the various MRs. This MR has the various external interfaces and also several addresses based on the extern interfaces. This is the dynamic network which has the collection of the wireless mobile nodes. These are to be communicated with neighbor nodes without help of the any centralized influence. In the MANETs, [19] it affects with the different varieties of security attacks such as black hole, gray hole, rushing attack, and warmhole attack. The MANET is the set of wireless nodes which has the wireless and networking capacity and it has the fewer infrastructures. This network connected wirelessly which is self configuring called as mobile ad hoc network. This is more vulnerable which is to be attacked than the wireless network with the help of the various characteristics. There are two main categories are to be performed in this paper such as passive and active attacks.

The VANET is the vehicular ad hoc network [9] which is changing with dynamic environment manner is to operate the sharing information with the wireless channel to the vehicles. The main objective of the vehicular ad hoc network is to give ever present connectivity among people which are driving on the road. This vehicular ad hoc network is developed by road vehicle which are equipped with some wireless, sensors, and maps. In this method, vehicles are helps to interact with the unit of road side. VANETs are gathering vacant because of it gives multiple applications such as safety from the traffic, accessing on internet, entertainment, automatic toll payment etc. The VANET applications have bi direction parts such as related on comfort and applications related on safety. This has the several specific characteristics such as high topology is to be in dynamic, network will be partitioned, it has enough energy and storage, mobility prediction, and large scale. The VANET is to provide the three major applications such as applications on the street security, observe the traffic flow and the administration applications. There are various challenges are to be taken when the selection of effective communication route such as predict the efficient multi hop path and to provide the reliable of the information will be transferred to the node.

The quality of services is to be estimated based on the network. The quality of services denotes to the capable of the network which is to provide high level of the service to desire the traffic occur on network. The quality of service

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requirement is to be assured by end to end services. In this network, there is unreliable mechanism which helps to give quality of service. The QoS is supplying for wireless networks which is to increase the real time application. The quality of service signaling is to be differentiated as preplanned which is depends on less reservation and these explicit reservations of resources of network for the purpose of the traffic flow. The QoS refers to the various views of wireless network or a system which is the method of promising that ensure the particular degree of service that the system should provide. The figure.1 shows that there is the analysis of the various routing protocols present in the MANET.

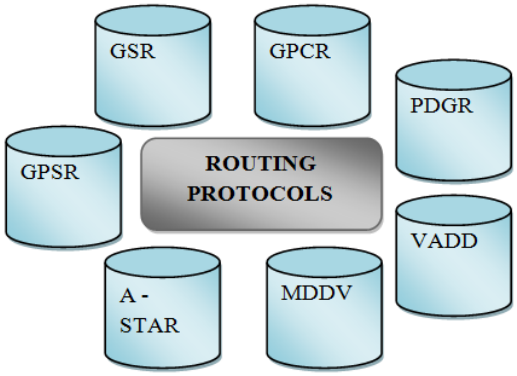

Figure.1 various routing protocols in MANET

II. QUALITY OF SERVICES IN MANET

In the wireless networks, the quality of services is provisioning which is improving the important in the real time applications and this is migrating to environment on wireless. In MANET, the quality of services is the challenging one during the mobility of nodes, lack of the fixed structure, wireless channel limitations and the restricted resource allocation [1]. In this paper, we analyze the distance routing [18] quality of service protocol's resistance mechanism is to be used for the purpose of the flooding, overreservation and the state table exhaustion of the attacks. This method is to be used for prevention of the denial of service attack (DOS). This method is to be implemented with the tool like NS2. In this method, the flooding attack performance is to be analyzed based on the distance routing quality of services. The overreservation attack is to be analyzed based on the network topology. The distance routing quality of service protocol has each node which is to keep the state details for the each total in out traffic stream traversing an input and output pair. [2] The quality attributes are to be affected in the mobile ad hoc network which has the following information about the parameters of quality of services such as functionality, reliability, usability, efficiency, maintainability, portability and quality. In this method, the performance will be analyzed based on the AODV and DSR [20]. These protocols are to be analyzed for the purpose of the quality of services and assurance metrics. The performance has the various parameters such as packet delivery ratio, various numbers of nodes, pausing time and speed analysis. The performance parameters are to be analyzed based on the protocols like AODV and DSR protocol. These results are to be given the better result and also the reliability of the network. The adhoc on demand distance routing protocol helps to analyze the denser medium and the distance routing vector helps to analyze the sparse medium. These protocols are to be given the better result based on the performance parameters. [3] The quality of services is the important one which helps to estimate the network performance with better manner. This refers the ability of the network which helps to provide the peak level of the services to the required over traffic the different following technologies. In this paper, the quality of service is to be estimated with the help of the AOMDV protocol. This protocol is to be picked from the earlier protocol for the purpose of the routing mechanism which helps to absorb the mechanism like priority aware because this is the AODV without help of the global periodic routing advertisement. The priority aware AODV has the own priority mechanism. In this network, the congestion occurs the low priority packets are to be travelled faster compare than the higher priority packets as a result of the packet dropping is higher than the low priority data packets. During the dropping of packets mechanism there is no priority fairness occurs which is directly throughput will be affected of the network and also it affects the delay of the network. So the quality of service will be enhanced based on the AODV routing mechanism. In this mechanism have the three steps such as setting on threshold, assignment based on priority, and transmission rate. This method is the best suitable for the little networks under the mobility of low networks. [4] The quality of service has the various challenges such as capacity of computation on the mobile nodes which are not very high so this paper is to be applied with the low complex scheme and low computational overhead. The algorithm is the flexible and it is configured based on the purpose of the network application. This method is to be derived depends on the various assumptions such as planar network, nodes are to be linked and the node is aware of the whole network, the coordinator node has the duty like to network partition is to be hold back, that quality of various parameters are to be configures with weightage, each and every node is aware of sum of the other nodes present in the network and the nodes will move the direction of bilateral manner.

III. ROUTING PROTOCOLS IN VANET

The feature of the node movement of the VANET is to be resembled with the MANET but it has the peak mobility speed and the unpredictable characteristics movement which are the features on key constructing from the MANET. There are the various performance of the reactive protocols are to be analyzed such as DSR, AODV and AOMDV present in the VANET which helps to different mobility models which are to be provided in the vehicular ad hoc network mobile framework. There are various performance are to be evaluated with the help of the mobility variance, number of sources and the speed of node. [5] The performance parameters are to be analyzed such as delivery of packet function, end to end delay and the routing load will be normalized which are to be used for performance

analysis. In this paper, there are following reactive protocols are to be analyzed such as DSR, AODV and AOMDV. The VANET is the primary component present in ITS which is to be envisioned towards the road safety and the comfort zone to their users. This technology develops the communication between the vehicle drivers which is to estimate the acute situation for example accidents on roads, roadblocks, speed control and the unrestricted way for connected obstacles. The VANET has utilized various protocols are to be categorized such as topology based routing protocol, reactive routing protocol, proactive protocol routing, position based protocol routing, broadcasting routing protocol, clustering based routing protocol, and geo cast dpeends routing protocols. [8] The VANET is the self configure network which has the characteristics such as ever altering network, unstable connectivity, high mobility, limitless network size have the made the development of the efficient routing protocol and the network partitioning. The figure.2 shows that there is the analysis of the various protocols routing present in the VANET. [7] The VANET is the dynamic moving environment which is pursues to derivate the information is to be shared with the help of the wireless links to the vehicles. In this paper, the AODV protocol is helps to present in the VANET. This method helps to optimize the selection of the route and maintain the routes which is to give the best stability of the route and less overhead mechanism. This method helps to increase the network performance based on the parameter like throughput and broken links.

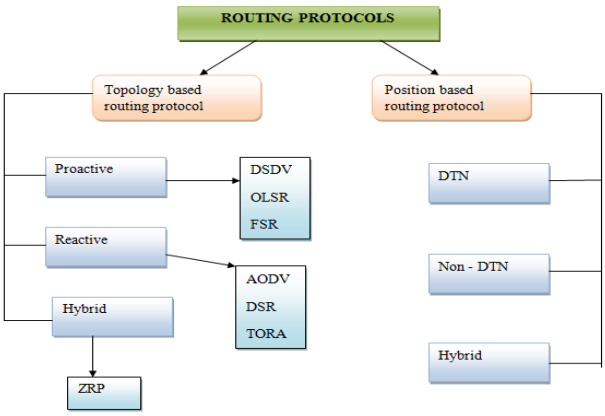

Figure.2 Routing protocols in VANET

IV. ROUTING PROTOCOLS IN MANET

The MANET is the complex distributed system which has the lot of mobile nodes which communicate without any centralized support. [10] In this paper, there are two routing mechanisms are to be proposed such as evolutionary algorithm (EA) and the analytical hierarchy process (AHP). These methods are to be used for route optimization which is to be encrypted with the help of the cryptographic techniques. There are various parameters are to be analyzed such as energy, latency and the bandwidth allocation based on the following algorithm such as AODV, analytical hierarchy process and evolution algorithm. [11] In this paper, the MANET has been proposed the various protocols like DSDV, LAR, DYMO and TORA and which are to be classified with various approaches such as table driven that is proactive, on demand that is reactive and the geographic approach that is based on GPS. The performance is to be estimated with following protocols such as LAR, DYMO and AODV [16]. The protocol parameters are to be evaluated such as PDR, packet drop, end to end delay and throughput analysis. [12] MANET has the several energy related issues are to be presented in the wireless network. In this paper, the route detection mechanism based on the routing protocol with full of energy efficient manner. This routing protocol helps to improve the lifetime of the network. The AOMDV protocol is to be used for the allocation of routing metrics. The ad hoc on demand multi path distance vector routing has the various parameters such as IP address of the destination node, destination sequence number, advertisement hop count, path list and the expiration route. This method helps to prevent the network failure problem with the help of the nodes non availability method due to its battery. This method helps to reduce the computational and storage overhead.

V. INTEGRATION OF MANET AND VANET

The vehicular ad hoc network is to be attracted in the domain of the credible system on transportation. There are various properties in vehicular ad hoc network which develop it different from the MANET which has the high speed vehicles and high moving present in the topologies of the network. [13] The broadcast flooding is the fabulous method in the vehicular ad hoc network which is to transmit the information among the movable nodes. This paper gives the information about the SMT algorithm that is safety message transmitting which is depends on the committed short range communications. The DSRC networks utilize the short message wave protocol which is to interchange information about safety among vehicles and infrastructure. [14] The vehicular ad hoc network has the two structures such as vehicle to vehicle (V2V) communication and vehicle to infrastructure (V2I) communication. The vehicle to vehicle communication is anchored in IEEE 802.11p and the V2I communication is based on the GPS, 3G and common packet radio with increased data rates for the GSM development. The vehicular ad hoc networks are to be emerged with detachment of the MANET with their architecture, challenges, characteristics and applications. In the VANET, it is interface with UTRAN and UMTS. This method is to be done based on the clustering mechanism which helps to arrange the gateway [17] candidates into clusters. The hybrid gateway discovery algorithm is to be used for the gateway mechanisms.

VI. SIMULATION AND RESULT DISCUSSION

There are various quality of service parameters are to be analyzed with various routing protocols present MANET and VANET. The figure.3 shows the analysis of the throughput reliability of the network with respect to the pause time.

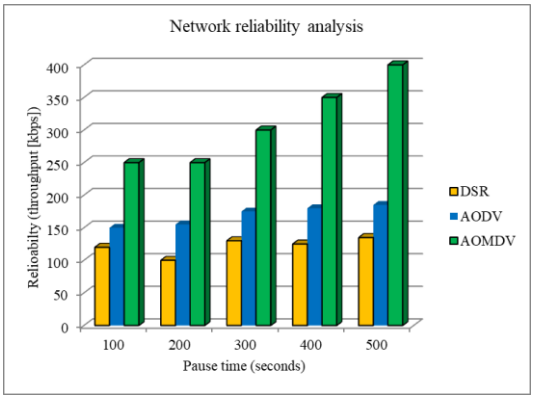

Figure.3 Reliability (throughput) analysis

The figure.4 represents the PDR analysis and the figure.5 denotes the time delay analysis. The packet delivery ratio is to be analyzed based on the protocols like ad hoc on demand multi path distance routing vector (AOMDV) and priority aware ad hoc on demand multi path distance routing vector (PA - AOMDV).

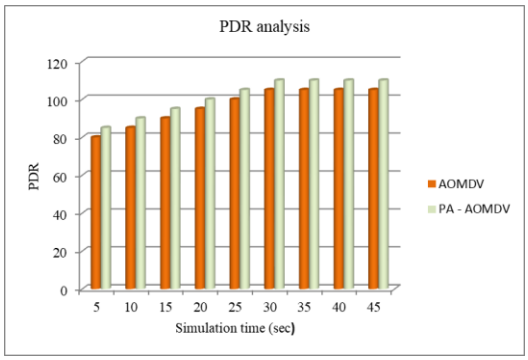

Figure.4 packet delivery ratio analysis

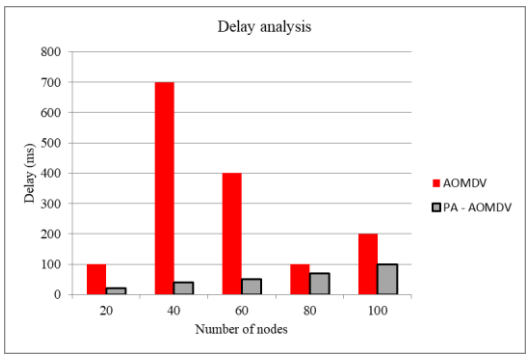

Figure.5 delay analysis

VII. CONCLUSION

A survey analysis of various routing protocol depends on quality of services for the MANET and VANET. In the VANET, the QoS protocols is to be optimized which has various important things such as safety, emergency, and multimedia applications which are to be analyzed in vehicular ad hoc network. There are various optimization algorithm discussed in this paper. There are different routing protocols are to be analyzed based on the quality of service for the MANET and VANET. There are various performances are to be analyzed for the MANET and VANET. The simulation and results gives the analysis of the various protocols which are to be proposed in various existing papers.

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