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An Effective Approach of Various Routing Mechanisms to Optimize the MANET and VANET Performance

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A Mobile Adhoc Network (MANET) is a collection of nodes with dynamically changing topology, It uses wireless links without existing infrastructure, Randomly changing and Elastic data applications which are used in networks to communicate with each other. The MANET characteristics have to ensure the QoS performance and improve the communication between nodes. The quality of service can be measured by means of reduced delay and increasing throughput in multicasting network. In this Novel approach, AODV routing protocol is used to improve the performance of MANET and to optimize the QOS parameters, i.e. Average end to end delay, available bandwidth and packet delivery ratio requirements used to enhance the MANET performance level. By using MAC protocol we are maintaining the routing table to enhance the existing AODV and also it can perform the multicast routing performance between nodes as well as minimizing the control overhead. The Enhanced Routing protocol called as NQoS-MAODV(Multicast Ad-hoc On-demand Distance Vector Routing

protocol) is used to maintain and optimize the QoS information in MANET.

The proposed NQoS AODV routing protocol performs better than traditional AODV during high mobility and high network load. As NQoS ADOV always maintains a routing table,most often it can provide so me routes quickly. So the average delay is reduced significantly. Packet delivery ratio is improved as it maintains the QoS information and looks for a path satisfying the QoS requirements of the applicants. Moreover it sends smaller number of control packet to handle route discovery and route failure. As a result, the control overhead is reduced. The trade-off is that each node requires more memory to store the neighbor information and comparatively larger routing table. The nodes also need more processing power to manipulate the neighborhood information and calculate the routes based on QoS information.

So it can be said that, NQoS MAODV performs better than AODV at all conditions; expect very low loads when the performances are very similar. So, MAC layer information can be used to construct the neighbor table which will allow enhancing the performance in terms of delay and packet delivery as well as minimizing the control overhead and MAODV (Multicasting AODV Routing protocol) performing better than the traditional AODV routing protocol.

[A Cross Layer Architecture Between Reactive(AODV and DSR) routing protocol and Proactive (OLSR) routing protocol to optimize MANET QoS parameters.]

This paper evaluates the cross layer routing mechanism to improve Quality of service (QoS) in MANET by combining Network layer and MAC layer protocols with Transport layer congestion control scheme to optimize the performance in Adhoc networks. MAC layer used to maintain routing table, Network layer is used in monitoring the packet data rate. These two layers helps to optimize the performance in MANET. So, combine mechanism of slow start and Arithmetic Increase mechanism of TCP helps to improve the QoS drastically. We examine the effects of different Reactive Routing protocols (AODV and DSR) with MAC Protocols used to enhance the QoS levels for MANET. MAC protocols uses distributed coordination function (DCF) and enhanced distributed coordination function (EDCF). Specifically, we access the impact of multiple wireless hops

and node mobility on the throughput performance of TCP on each MAC protocol with two routing algorithms.

Application Layer **(This layer generate multimedia packets and assign priority)**
Transport layer **(Implement Slow start & AIMD mechanism)**
Network layer **(Implement OLSR Protocol)**
MAC layer **(Implement EDCF&DCF algorithm)**

Similarly we examine the results in all constrained QoS parameters improvement in bandwidth-delay product, Throughput, Packet delivery ratio, and packet loss is reduced drastically to 20-25% in Enhanced DCF with AODV routing protocol in network layer and transport layer by using AIMD mechanism. But if DSR algorithm is used in the network layer instead of AODV it affects the QoS parameters. So we enhance the performance by combining cross layer architecture between proactive and reactive Protocols, hence we have taken Optimized Link State Routing (OLSR) proactive routing protocol to Optimize the QoS in MANET. The proposed OLSR routing protocol performs better than AODV and DSR during high mobility and high network load. So it can be said that, OLSR performs better than AODV and DSR at all conditions; expect very low loads when the performances are very similar.

The proposed OLSR routing protocol performs better than AODV and DSR during high mobility and high network load. OLSR always maintains a routing table; most often it can provide some routes quickly. So the average delay is reduced significantly. Packet delivery ratio is improved as it maintains the QoS information and looks for a path satisfying the QoS requirements of the applicants. Moreover it sends smaller number of control packet to handle route discovery and route failure. As a result, the control overhead is reduced. The trade-off is that each node requires more memory to store the neighbor information and comparatively larger routing table. The nodes also need more processing power to manipulate the neighborhood information and calculate the routes based on QoS information. So it can be said that, OLSR performs better than AODV and DSR at all conditions; expect very low loads when the

performances are very similar. So, MAC layer information can be used to construct the neighbor table which will allow enhancing the performance in terms of delay and packet delivery as well as minimizing the control overhead. The results show that the interaction between transport layer with the Network and MAC protocols has a significant impact on the achievable throughput, Packet Delivery Ratio, Bandwidth Delay Product and packet loss in Adhoc networks. These three layers know the status of other layers and collectively improve the QoS performance in Adhoc networks. The OLSR protocol enhances the quality of service.

[An Ad-Hoc On demand Multipath Distance Vector Routing protocol used to predict the path failure for fading avoidance]

In Mobile Ad-hoc network, Communication is accomplished over a wireless media directly between the base stations. MANETs are characterized by dynamic topology, frequent link failures, self-configuring, infrastructure less and decentralized networks. Based upon the reliability of wireless channel successful routing can be achieved. In this paper, we evaluate the flexible and diverse routing mechanism to avoid the fading of the carrier signal attenuation. The combination of on-demand approach and adaptive routing mechanism forfeits to revise the path to the destination. Multiple paths to the destination remain perfectly valid to prognosticate the average fading duration and average non fading duration to ascertain the traffic load and harmonizes to an extremely reliable channel. Our proposed literature implements Adaptive Fading Avoidance – Ad-hoc On-demand Multipath Distance Vector (AFA-AOMDV) conceptualization to sustain signal fading, quickly reclaims the path after fading and preserves alternate paths by predicting path failures thereby avoiding unnecessary route discovery, optimizing scarce resources of the MANET.

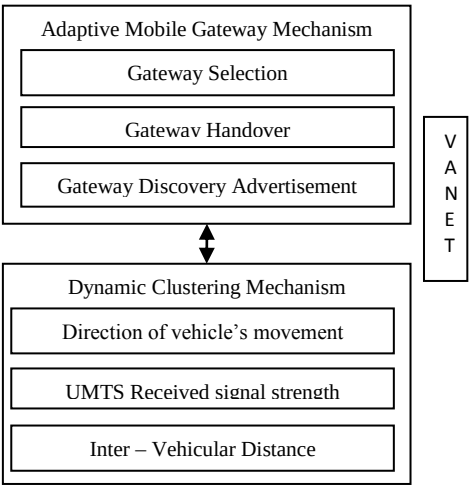
Destination IP address
Destination Sequence Number
Advertized Hop-count
Path list **{(next hop IP 1, hop-count 1),** **(next hop IP 2, hop-count 2),…}**
Expiration Time

Adaptive Fading Avoidance – Adhoc On-demand Distance Vector (AFA-AOMDV) proposed in this project work is a combination of on-demand strategy and adaptive mechanism. It dynamically adapts to the change in topology by maintaining the alternate paths and avoids fading, which is commonly prevalent in mobile Adhoc networks. The channel state information, average fading duration prediction, average non fading duration prediction and signal strength prediction allow successful routing without disrupting communication between the adjacent nodes. It never discards a path on failure but reuses the path after recovering from fade, thus avoiding unnecessary route discoveries. The alternate paths are validated periodically; thus path maintenance phase provides information on the quality of paths. Based on this information the source can choose the best available path for data transmission. Moreover the traffic load on the channel is determined with the help of the channel state information. In the presence of high traffic, routing takes place through an alternate path, avoiding congestion and delay. The simulations were done using NS2. The results from simulation were analyzed for performance in comparison with AOMDV. The performance analysis indicates that AFA-AOMDV has improved the network performance by increase in the packet delivery ratio, reduces the average end-to-end delay, increases the network throughput and decreases the routing overhead.

[A Dynamic Property of MANET to provide a lossless communication between vehicles with integration Vehicular Adhoc Network and 3G Networks]

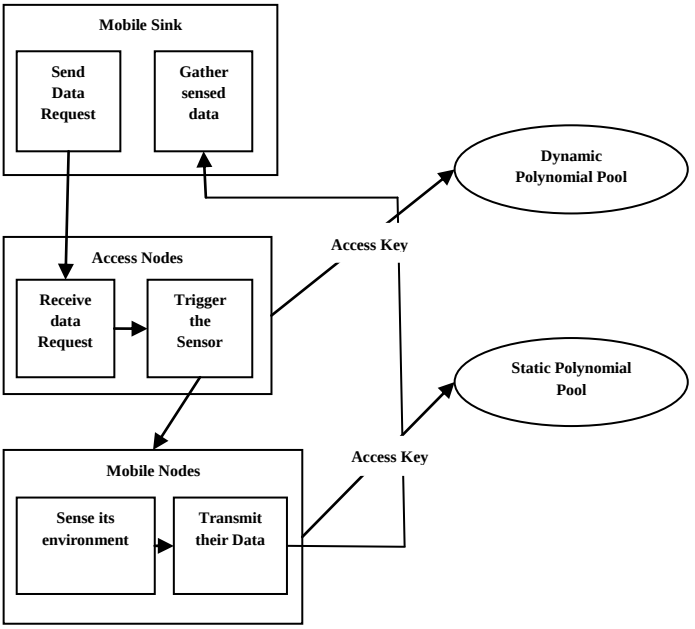
Vehicular ad hoc networks are a part of mobile ad hoc networks with the dynamic property that the nodes are vehicles like cars, buses and motorcycles. VANETs are used for short range, high-speed communication among nearby vehicles, and between vehicles and roadside infrastructure units. Vehicle-to- Vehicle (V2V) communication supports services such as vehicle collision avoidance and road safety purpose by exchanging warning messages across vehicles and also that the VANET should increase the features by means of value-added services like navigation and location based services on road. We enhance the vehicular access technology to performing the high speed communication between vehicle to vehicle communication environments. In these technologies we proposed the

three techniques used to provide a proper communication. I.e. DSRC (Dedicated Short Range Communications), WAVE (Wireless Access in Vehicular Environments) and IEEE 802.11p. An integration of VANET and 3G networks using mobile gateways is an integral part of the architecture offering a wide range of communication between vehicles.



The 3G-VANET integrated network with minimum number of gateways is expected to prevent frequent handoffs at UMTS base stations and the associated signaling overhead; an event more likely to occur when all vehicles connect directly to the UMTS network. By using this integrated VANET-3G network and having minimum number of optimal gateways at an instance, even vehicles without 3G interface can access the UMTS network. On other hand, by allowing more than one gateway to operate at an instance, bottlenecks and congestion across the path towards a single gateway can be eliminated. The performance analysis indicates that AOMDV in CMGM has improved the network performance in terms of high data packet delivery ratios and throughput, reduced control packet overhead, and minimized delay and packet drop rates. Our future work is in the sense of deploying our research in an effective real-time application to enable QoS for differentiating the services according to vehicular priorities and providing group communications, alongside vehicular collision avoidance.

[A Three Layer Security scheme to provide authentication and data communication between mobile nodes to avoid the mobile sink using one- way hashing algorithm for aunthentication and pair wise key establishment for lossless inter-vehicular communication]



Conclusion:

In this review paper we are discussed some types of routing protocol which provides performance in mobile ad-hoc network by different types of Routing mechanism. Some routing protocols provide better performance compare then other routing protocol to discover the neighbor's node and shortest path destination without any delay but our conclusion prefer the few routing protocol like AOMDV DSR and OLSR. Some of these routing protocols provide better performance in dynamic network with increase throughput, less delay and less control overhead. Some of Cross layer architecture between various reactive and proactive routing protocols to enhance a MANET QoS parameters and also we establish the MANET characteristics for inter-vehicular communication using 3G network to provide an authentication and lossless communication between vehicle to vehicle

to improve the VANET performance, When we compare the different routing protocol in mobile ad-hoc network and vehicular adhoc network find some work better in less dynamic mobility and provide the multicast performance between nodes with lossless communication, less delay, available bandwidth and increase throughput used to enhance the MANET performance with various routing mechanisms.

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