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A Review on MANET Performance Enhancement by Congestion Control based on Time Thresholding

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ABSTRACT: MANET is infrastructure less wireless network. Wireless nodes inter communicate to each other either directly or considering other node as switch node. This type of network due to less infrastructure encounters various constraints like security, congestion etc. MANET has various routing protocols identifies the path from source to the destination. Their main objectives of each protocol is to identify the shortest and least hops path. This objectives of shortest path can results in congestion. Congestion can lead to the performance deterioration. Large amount of packets can either be dropped or delayed due to congestion. In this research review various techniques are being scanned for identifying and avoiding congestion. In result one technique can stops congestion. This technique includes identifying the path which has congestion by getting the acknowledgement. Frame with time stamp value. If the acknowledgement. Packet is received within the fixed time stamp value then path will be considered congestion free else will be considered to have congestion. Immediately corrective action has to be taken.

KEYWORDS: routing protocol; MANET; proactive; AODV.

I. INTRODUCTION

Mobile Ad hoc network (MANET) provides extremely flexible technology for communication between the mobile wireless devices (nodes). The infrastructure less network is supported by the MANET and it has no requirement for the fixed infrastructure. MANET have very enterprising use in emergency scenarios like military operations & disaster relief operation or some temporary requirement like conference & seminar at new place where there is no earlier network infrastructure exist and need alternative solution. In MANET each mobile node acts as an intermediate switch and extends the transmission range of mobile nodes and act as transceivers also .The routing is the primary task by all mobile nodes for transmission of packets to the destination nodes. In MANET, routing packets in an efficient manner is the challenging task .It is very important and complicated one. In the last decades wireless technology has tremendous growth in all fields. The wireless communication technology takes two forms of communication between the devices; Fixed (infrastructure) wireless communication and ad hoc (infrastructure less) wireless communication. In Fixed (infrastructure) wireless communication as shown in Fig. 1, the packet transmission and communication is done between the wireless nodes by the Access Points (AP), but not directly between in wireless nodes. The AP act as a bridge for both of the wired and wireless networks.

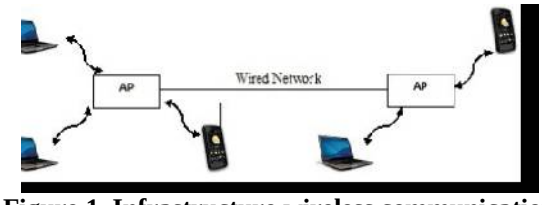

Figure 1. Infrastructure wireless communication

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Each of these wireless nodes has their own logical link to the Access Point (AP) as shown in the Fig. 1. The AP plays a major role, because it controls all of the network functionality. In the Ad hoc wireless networks, it is shown in Fig. 2, there is no AP and each node communicates directly with each other and does not needing any infrastructure. In this network complexity to each node is very higher. Each node needs to implement the medium access mechanism, mechanism for hidden/terminal problem, priority mechanisms, providing QOS, forwarding data.

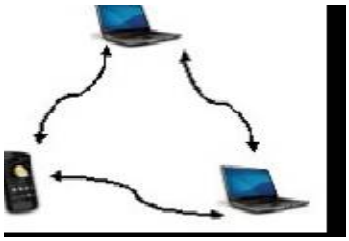

Figure 2 Packet Forwarding

The direct communication between the mobile devices is allowed in ad hoc network as shown Fig.2, but it not provided by the fixed infrastructure network.Hence in the direct communication the routing plays main role for data packet transmission to the destination. In the next section it is discussed about various types of routing protocols and their routing functionalities about how well Mobile ad hoc networks (MANETs) are networks without infrastructure and having mobile nodes communicating with each other through multi hop wireless links. In mobile ad hoc networks, devices are self-organizing which makes its communication setup and maintenance completely different from other networks. Each node in MANET's can act as both a router and a host. Hence mobile ad hoc network can be deployed easily with a high degree of freedom and low cost.

MANETs are considered to be resource limited, for example, low wireless bandwidth, limited battery capacity and computing power and dynamic in nature, for example topology changes and channel fading. Recent advances in wireless technologies have resulted in a large number of wireless devices participating in the ad hoc network. Some real time scenarios like military, civil applications and sensor networks may involve thousands of nodes. These applications may take advantages of self-organization of large-scale ad hoc networks. Scalability is a crucial property under such application environments. The conventional **routing protocols** for fixed networks are no longer appropriate for MANETs due to heavy routing overheads that consume too many resources such as bandwidth and energy and the convergence time of the protocols which is too long compared with dynamics of MANET.

II. LITERATURE SURVEY

[1] **Timestamp Based Multipath Source Routing Protocol for Congestion Control in MANET(Advance Computing Conference, 2009. IACC 2009. IEEE International) :** In this paper, they have proposed a new routing protocol for ad hoc wireless networks, which is based on DSR (Dynamic Source Routing) on-demand routing protocol. Congestion is main reason for packet loss in mobile ad hoc networks. If the workload is distributed among the nodes in the system based on the delay of the paths, the average execution time can be minimized and the lifetime of the nodes can be maximized.

[2] Mobile agent based congestion control using aodv routing protocol technique for mobile ad-hoc network", (International Journal of Wireless & mobile Network ,April 2012). In Mobile Ad hoc Networks (MANETs) obstruction occurs due to the packet loss and it can be successfully reduced by involving congestion control scheme which includes routing algorithm and a flow control at the network layer. In this paper, they have proposed to agent based congestion control technique for MANETs. The information about network congestion is collected and distributed by mobile agents (MA) A mobile agent based congestion control AODV routing protocol is proposed to avoid congestion in ad hoc network. Some mobile agents are collected in ad-hoc network, which carry routing information and nodes congestion status. When mobile agent movements through the network, it can select a less-loaded neighbor node as its next hop and update the routing table according to the node's congestion status. With the support of mobile agents, the nodes can get the dynamic network topology in time. By simulation results, we have

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shown that our proposed technique attains high delivery ratio and throughput with reduced delay when compared with the different existing technique.

[3]Congestion Control Routing Protocol Using Priority Control for Ad-hoc Networks in an Emergency(IEEE,International conference on ITS telecommunications) : The ad-hoc network is paid to attention aiming at the achievement of the ubiquitous society. In ad-hoc network, multi-hop communication is used and source node constructs routes to destination. Applications of ad-hoc network are intervehicle communication and sensor network and so on. Among them, wireless sensor network is attractive in an emergency such as disasters. In this application, one of the problems is congestion for increasing of traffic of the urgent and medical data packets on wireless communication routes. It is a problem to be solved to guarantee quality of service in ad-hoc network in an emergency.

[4] A study of congestion aware Adaptive routing protocols in MANET", International Journal of Advanced Technology & Engineering Research(IJATER) Ad-hoc networks are useful for providing communication support where no fixed infrastructure exists and movement of communicating parties is allowed. Mobile ad-hoc network shows unexpected behavior with multiple data streams under heavy traffic load when it is send to common destination. Congestion is one of the most important restrictions of wire-less ad-hoc networks. Because of congestion the problems like long delay, high overhead and low throughput occurred. To overcome these problems in certain degree many congestion aware and congestion adaptive routing protocols are proposed. These protocols can greatly improve the network performance. In this paper, we present a survey of congestion aware routing protocols for mobile network.

III. CONCLUSION

As in MANET there are various protocols exists on which work has already taken place. In our research we can under-take the work based on only timing. In this detection of the congestion based on timing difference between sending a packet and acknowledgement received. If the timing difference is infinity then it may be interpreted as there is congestion. For a while traffic may be stopped on this route. Other way may be taken where time(t) is less than infinity. The packet sent through this path will be sent again through some alternative route. It will save the system from packet loss. Also provide the information about the route that on which route their is congestion. On those paths where congestion is interpreted will be stopped from transmission of packets. So that packet delay can be minimized. Through timing difference like t1 is the time for sending and t2 is the time for receiving the acknowledgement. The difference (t1-t2) will be considered difference of timing delay for packet. Those path which imparts more difference will be considered more busy. So those paths may be given less priority for transmission of packets.

Source Destination

Difference is (t1-t2) .

In existing research papers the work has been taken on DSR.

1. In DSR (dynamic source routing) the source to destination path is identified dynamically. Major consideration is to identify the path which is shortest. But how many packets have been dropped it will not be known because acknowledgement never be send.
2. Some times each source identify the same route that may be shortest will unnecessarily generate congestion.
3. In another paper when congestion occurs at certain route the congestion information is distributed amongst all the nodes. So that information can be used by each node to stop transmitting on that route. This technique requires large no. of unnecessary traffic to send information on to each node.
4. In DSR with time stamping, that identifies the route dynamically. Also considers time of delivery of the packet. But it does not store this information for further use. i.e. not to transmit on same route. It will again unnecessarily grow the traffic on the same route and packet drop.

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In current research considering only time as basic parameter to identify the packet delivery and congestion on specific route. Because we are considering time of sending(t1) and time(t2) of receiving the acknowledgement on same route. This will give us three time slabs.

1. The packet has been sent with in time range. Then this path may be considered successful path for the time being till time parameter worsen.
2. The packet has taken more time than the average. It will be considered it is longest path or start of congestion. Now for further packet transmitting this will route will be restrained.
3. As far as packet drop is concerned it will be known from acknowledgement. If time t2 is 0 or (t1-t2) is infinity then it will be considered that packet has been dropped and there requires retransmitting of the packet on the another route.
4. Now once specific path is taken that path will be considered tested path and being adapted for future packet transmitting.

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