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Review On Congestion Control In Manet

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Abstract- now days, Most of peoples has preferred the mobile ad-hoc network due to its mobility and easy to use everywhere. MANET has not fixed set-up. The maximize use of the MANET, the traffic load has increased on the network and decline the performance of the network like that packet drop, delay and minimize the throughput. Traffic load on the network has major issue to occurrence of congestion. The various techniques has used to congestion control with various protocols like reactive protocols (DSR, AODV), proactive protocols (DSDV.OLSR) & hybrid protocols (ZRP) etc.

Keywords: - MANET, AODV, Congestion control

INTRODUCTION

I. MANET (Mobile Ad-hoc network)

Now days, people has given more preference to mobile Ad-hoc networks[3].Mobile Ad-hoc network has collection of nodes which held asymmetric topology structure for communication without any centralized master administrator. Transmission range of each node has secure as per area. They can travel freely without access point. The selection of route from source to destination has been recognised through routing algorithms of various protocols [5]. Manet has been used various types of algorithms for data transmission like that reactive & proactive, table-driven & on demand, single path & multipath etc. [5]. The routing has critical problem in MANET due to mobility [15].MANET has deal with various problems like that security, scalability, routing ,congestion control and also limited resources & asymmetric topologies etc.[12 & 15] .In MANET, Congestion control has also vast problem deals with routing due to busy routing path or link failure. The advantages of MANET has been included military battlefield, less cost, dynamic or free from infrastructure etc. [5].It has easy to install and use anytime & anywhere.

II. Congestion Control

Congestion has a condition which occurred due to asynchronization of multiple packets ratio arrival at a node but cannot reached at destination due to packet loss [8]. The technique which has used to control the congestion (drop) of packets, called congestion control. The various protocols has been used to control the congestion of packets during the transmission of data like that DSR, ADOV,

AODV-1, EDAODV protocols etc.[16].Contrast of Internet, TCP congestion control has not effectively worked on MANET due to free infrastructure [8].In Manet, congestion effects the transmission of data rates, delayed time & packet loss.

Congestion control has varieties of control mechanisms like that proactive control, reactive control and hybrid control [7]. In Proactive control mechanism, route has calculated in advance from source to destination and used when they needed. For example DSDV protocol. In Reactive control mechanism, Route has established on demand when nodes wants to communicate. For example AODV, DSR etc. In hybrid mechanism have combined features of both control mechanism e.g. ZRP (Zone Routing Protocol) [7 &5]. Due to congestion, routing network system has faced the many challenges like collision of packets and lost data packet, transmission delay etc. [15].

2. Related Work

S.Jain et al. [1] described about adaptive routing protocols for aware about congestion based on various parameters like delay, routing request and traffic load. They defined that CADV has shortest delay time as compare to CARP & CARM but it has not compatible with large networks. CARP has recognised multiple path from intermediate node to destination & also generate large no. of tables which are problematic to maintain. CRAM has improved presentation than other protocols with less delay and low level of congestion. The authors concluded that congestion has been occurred due to heavy traffic load on networks.

S.Yin & X.Lin [3] proposed the multipath adaptive load balancing (MALB) mechanism which has highly compatible with multipath routing protocols. It has used to reduce the end to end delay and control the congestion from multiple disjoint path through load balancing and traffic shifting. Load balancing has play an energetic role to utilization of resources and performance in MANET by using traffic distribution. Source node has recorded the traffic load & its arrival time periodically from disjoint multi path by using probe packets. TCP has comfortable with FTP only due to multi path disjoint nodes and better flow controls.

P.Kusomanen [4] conveyed about the Varity of protocols based upon its network arrangement, functionality, scalability and characteristics so on. In the contrast of other protocols, taxonomy protocols has well performance evaluation and it described the construction and implementation of protocols. The performance of protocols has measured based upon the size of network, degree of mobility and requirements of user facilities or application etc. The structure & size of the networks effected the performance, latency (delay time), and cost etc. Instead of unicast protocols, multicasting protocols has better support of divergent nodes and topology network. For high mobility of nodes, neighbour selection protocols has more demand than partitioning protocols because these protocols has focused on the quality of services as compare to cover the large scale networks nodes. Reactive protocols has easy to maintain due to on demand and less number of routing tables than proactive protocols. Destination based protocols has healthier performance with variable size of networks rather than topologies based protocols.

Soundararajan et al [9] described about the multipath load balancing & rate based congestion control for MANET. In that method, intermediate node has generated the congestion status and its estimated rate through queue length and channel utilization. Instead of XRCC technique, it has less packet drop and better end to end transmission of data packet.it has better performance than previous load & rate balancing techniques but it has consumed more energy.

J.Fing & H.Zhou [10] represented the self-repair algorithm for AODV routing, in which intermediate node self-repair the weak and failure link to destination node by modify pervious node to stop communication of data. After repair, it has message to pervious node to update its routing table. Instead of AODV, SAODV has high throughput and less delay.

T.S Kumaran et.al [11] defined about the early detection of congested nodes in Manet. In this method, the EAODV algorithm has detected the congestion of data in advance by sending the congestion status message to whole network nodes. If congestion has found at any node then find out the alternative path by using bi-directional path detection and generate alternative table to store the updating of nodes. The alternative table has not inter-related to primary table. The Alternative table has only data about by pass source and destination.

Li Xia et.al [12] represented an improved AODV routing protocol which automatically repair the route to avoid the congestion in Manet. In that mechanism, the source node has found the path to destination by avoiding the busy nodes through sent message to whole nodes in network. It has generated the sequence number itself and matched with RREQ number while both number has matched then route has selected to intermediate node to destination node and update the routing table. On the other hand, if next node has found congestion node or un-arrival node then it has repaired the nodes automatically and found new path. AODV-I has not efficient with multicasting networks.

3. AODV (Ad-hoc On-Demand Distance Vector)

AODV has reactive control based on demand protocol. It has established the connection when nodes desired to communicate or broadcast of data. It has loop free routing protocol which used for dynamic infrastructure and multicasting networks. For multicasting environments, it has required some special message to activate multicast environment e.g. multicast validation message. It required less memory than other protocols due to fundamental nodes data has stored and exclude the duplicate nodes from virtual table. It has used at large scale of networks [6].

Basically, AODV has three types of messages during transmission of data e.g. RREQ (route request), RREP (Route reply), RERR (Route error). RREQ message has used to initiate the nodes for originate the route from source to destination. RRER message has used to send reply to source node from destination when it initiate a path. REER message has used to indicate the error and link failure in network [6-13]. When source node needed to transfer data to destination then it propagate RREQ message in whole networks. Each node of network has collected the RREQ message and found the path from source to destination and sent message back to source, source has received the all node messages and select the shortest path to transfer the data whose sequence number is greater and equal to destination node [6&13].

4. Comparison table of various protocols for congestion control

Authors name	Year	Description Of Method	Outcomes
C.E.Perkin et.al	**2003**	**DSDV(**destination sequenced Distance vector, proactive algorithm **)**	-not effectively used for large networks. -Large number of tables maintains
R.Misra et.al	**2005**	**DSR (**Dynamic source routing, Reactive algorithm, support multi-hop environment**)**	-unidirectional -low throughput -difficult to manage tables
J. Feng et.al	**2006**	**AODV(**Ad-hoc On-demand distance vector, reactive protocol)	-long delay -many packet loss -low throughput
J. Feng et.al	**2006**	**Self-repair algorithm for AODV(**intermediate node has used to self-repair the link failure by sent link failure indicate message**)**	-Throughput some times less than AODV in some cases. -packet loss
L.Xia et.al	**2009**	**AODV-I(**improved AODV, avoid the busy node, generates sequence number itself **)**	-not more efficient for multicasting system
T.S.Kumaran et.al	**2010**	**EDAODV(**early detection of AODV, alternative path selected through advance detection of congestion**)**	-alternative table has disjoint to primary route table -time consumed data transmission due to long alternative path
S.S et.al	**2012**	**Multiple load balancing & rate control (**congestion status & rate estimation calculated through intermediate node by generating the queue length & utilization %)	Energy consumption

Conclusion

Congestion has major issue in MANET. Congestion has occur due to bottle neck of receiver, resource replacement and increase traffic load etc. The various technique has applied to control congestion by using various techniques with protocol. It predict the shortest and efficient path before transmission of data to avoid congestion problem. AODV has better performance, high throughput and less packet problem than other protocols.

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