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Research Paper Engineering

ANALYSIS OF THROUGHPUT PERFORMANCE OF MOBILE AD-HOC NETWORKS UNDER NS2

S.Bindhu Department of Electronics and Communication Engineering Narayana Engineering College,Nellore-524003, A.P, India

P.Sravan Kumar Department of Electronics and Communication Engineering Narayana Engineering College,Nellore-524003, A.P, India

ABSTRACT *Allowing QoS in the setting of ad hoc networks admits a broad area of application from the view of every layer of the network. In arrange for simulation analyzes to be practicable, it is very crucial that the simulation effects fit as nearly as potential with the work place effects. In this proposal we analyze the throughput performance in MANETS and equates competed work place effects with simulation effects from network simulator. The operation of the MANETs is very sensible to the amount of exploiters and the proposed load. When the amount of exploiters is high than the hit gain effecting in heavier loss of the average and taking down overall throughput. The intention of this research is to equate the throughput of manet applying three unlike assumptions:97, 100 and 120 exploiters using simulator ns2.by examining the graphs in MANETS ,it is resolved when the amount of exploiters 0 clients is enhanced outside the certain boundary, throughput falls.*

KEYWORDS : ad hoc, AODV, manets, throughput, ns2.

I. INTRODUCTION

Manet is one case of ad hoc networks and it is formed by combinding or by treating two or more nodes as a single group. These networks present a new art of network concern and can be well matched for an environment where all the infrastructure is lost or where arrange an infrastructure is not extremely price efficient.[1]In MANET paradigm there is no fixed infrastructure. MANETS are multi hop infrastructure less Wireless networks. This lack of fixed infrastructure in addition to being wireless, Generate new design issues compared with fixed networks. Also, need of a federal article means network administration has to be spread across different nodes, which Brings an extra complexity in fault detection and management. in MANET , each node must be clever to act as a router to find out the finest path to promote a packet. As nodes perhaps mobile, received and exit the network, constantly alter the topology .Since the medium of the communication is wireless, only restricted bandwidth is obtainable.[2] MANET have to satisfy high throughput requirements over a relatively wider bandwidth. A gross estimation of the throughput over that interval can then be computed using the ratio of the sent packet count to the received packet count.this ratio is used to estimate the characterstics of the path between the ingress egress node pair over the opaque network segment over that period of time[3].

Advantages and Applications

The following are the advantages of MANETs:

- Simple, fast and cheap setup of networks
- No license required
- Transmit power can be reduced compared to wireless infrastructure networks

Some of the applications of MANETs

- Mine cite operations.
- Urgent Business meeting

Military applications

- Formations of soldiers, tanks, planes

Civil applications

- Conferences, exhibitions, meetings, lectures
- Telematics applications in traffic

II. LITERATURE SURVEY

Research experiments are performed using different simulators and mobility models across a number of performance metrics. The literature is high focused on Throughput as shown in the following.

To improve routing performances develop routing metrics for path selection in terms of path reliability.

provide classification and survey of existing mobility models. Furthermore, we will review these models concerning the requirements for tactical scenarios.

In this the performance of homogeneous MANET is better than heterogeneous MANET.

Ad hoc on-demand distance vector (aodv) routing.

A proposal on the wireless link qos improvement by utilizing ant colony optimization & soft computing technique.

III. SIMULATION FRAME WORK

Computer simulation has become one of the primary tools for evaluating the throughput performance of Mobile Ad-hoc networks. In this paper we report on simulation results of different scenarios. One of our motivations here is to validate the simulation process and results for Ad-hoc networks using NS2.

The throughput in the Mobile Ad Hoc Network needs to be expressed. Figure 1 The throughput for each active connection in the network is computed as follows: For each connection, the ratio of the sum of the arrival rates of each path used in that connection to the input rate given at each path used in the given connection is computed. Using NS2 a general framework has been developed to test MANET throughput performance for network topologies, and nodal mobilities. However, when optimizations are per-formed on the throughput of each connection, the probability distribution will change as will the input rate of each path.

A. Network simulator-NS2

NS2 is a popular simulator in scientific environment. It is developed by UC Berkeley. The main goal of ns2 is to support networking research and education and to provide collaboration environment. it is written in c++ and otcl as frontend otcl is used to make the network arrangement and topology which is just the surface of your simulation. It is easily to configure your network parameter. NS2: the simulator itself, now version: ns-2.26 We will work with the part mostly.

1. Manet routing protocols:

1.1 Protocol Classifications

MANET routing protocols are classify in to many ways. (Figure 1), depending on how the protocols treat the packet to deliver from source to destination. But Routing protocols are broadly classified into three types such as Proactive, Reactive and Hybrid protocols [5].

1.1.1. Proactive Protocols

These types of protocols are called table driven protocols in which, the route to all the nodes is maintained in routing table. Packets are transferred over the predefined route specified in the routing table. In this scheme, the packet forwarding is done faster but the routing overhead is greater because all the routes have to be defined before transferring the packets. Proactive protocols have lower latency because all the routes are maintained at all the times. Example protocols: DSDV, OLSR (Optimized Link State Routing)

1.1.2. Reactive Protocols

These types of protocols are also called as On Demand Routing Protocols where the routes are not predefined for routing. A Source node calls for the route discovery phase to determine a new route whenever a transmission is needed. This route discovery mechanism is based on flooding algorithm which employs on the technique that a node just broadcasts the packet to all of its neighbors and intermediate nodes just forward that packet to their neighbors. This is a repetitive technique until it reaches the destination. Reactive techniques have smaller routing overheads but higher latency. Example Protocols: DSR, AODV

1.1.3. Hybrid Protocols

Hybrid protocols are the combinations of reactive and proactive protocols and takes advantages of these two protocols and as a result, routes are found quickly in the routing zone. Example Protocol: ZRP (Zone Routing Protocol)

1.2. Overview of Routing Protocols

In this section, a brief overview of the routing operations performed by the familiar protocol AODV are discussed.

AODV

AODV is developed on basing two protocols namely DSR and DSDV. Hear it use the idea of route discovery and route maintenance mechanism for DSR protocol and sequence number along with its hop by hop routing from DSDV protocol .At first in AODV protocol the source node sends the request (RREQ) to all its neighboring nodes, then the neighboring node will broadcast the same to their sub neighboring nodes till the destination node receives a RREQ. After receiving RREQ message from the source at destination node it generates RREQ to its previous node and the same will follows by all the nodes till the source node receives RREP to source node [6]. Then depending upon the distances, three nodes the source node decides to send the data or to transmits the data packets to destination node by constructing a specified path depending upon the obtain values from the table[7].

B. Node density

Node density can be calculated by an important factor of nodes is the percentage of the PEA(economically active population).

The following formula has been proposed for calculating density of nodes

C.Creating scenarios

To create the scenarios we enter via a terminal the following directory: ns-allinone then we will ns2.34/indeputils/cmugen/setdest/setdest to find in order to create a scenario of 120 nodes the following command ./setdest-v 120-2-n-m 2 s 1 m 6-t-150-P-1-p 2 x 1000-and 500 and the example Scenario1 scenario name. This is what makes each type of scenario you need to create.

In the command shown run-v 2 which is the version of the scenario generator, nodes which means the number of nodes, represented Speed Type lowercase s is the kind of speed (1 = Uniform), then min speed represented with lowercase m is the minimum speed in m/s, max speed represented with uppercase m is the maximum speed in m/s,-t simulation time indicating the simulation time in seconds,-P is the pause pause time simulation seconds, max X that Dimenision X determines the area in which nodes move in meters, maxY that determines the size and the area in which nodes move in meters and finally [outdir = file] Filename motion itself scenario name. And to see that was created entered the same directory and must have created the corresponding scenarios.

D.Creating connections

First ns-allinone enters then the next route ns2. 34/ indeputils/ cmugen/ setdest / in this direction is cbrgen.tcl file, this file serves me as a basis to create the connections, it should be emphasized that for this type scenarios we created two types of connections 20 and 40 for the amount of 97, 100 and 120 nodes. To generate the connections in this specific case study we accessed via a terminal ns2.34 and have executed the following command to create the connections, ns cbrgen.tcl-type tcp-nn 120 seed-mc 40-rate rate 2 ¿ scenconextcp40. Where tcp - is the type of traffic, nn - indicates the number of nodes in the simulation, random seed , mc - connections number of connections, - rate indicates the baud rate in pkts/sec and finally [outdir = file] that becomes the file name connections.

IV. Performance evaluation and analysis

In network performance throughput is one of the important parameter. it attracts the thoughts of many researchers. A new application can use as much bandwidth as available in when the gap of small message can be transmission [8]. It is the end-to-end throughput slightly than the per packet end-to-end delay that is the main performance concern Figure 1. In this section we compare the throughput of Mobile Ad Hoc Networks using three different scenarios: 97,100 and 120 users using simulator Ns2.

Figure 1. Throughput of generation packets-AODV

Simulation for 97,100 and 120 usuarios 0 nodes Setup for a MANET model operating at data rate of 10mbps using NS2 with 97 nodes is as shown in figure 2.

Similarly this base line network can be expanded for other scenarios with 100 and 120 nodes.

In figure 2,it is experimental that the highest throughput when 97 nodes are employed is 427 packets/sec. In this case it increases and decreases relative to collision count and traffic at that time[9]. The rate of collision count increases during the large traffic which further affects the throughput of the system. similarly with 100 nodes is as shown in Figure 2.when the number of nodes is increased to 100, the throughput is increased.The performance and throughput of the network is increase when the number of users will increased. similarly with 120 nodes is as shown in Figure 2. When the number of nodes is increased to 120, its throughput will be more as compared to that of 100 nodes.

By analyzing these graphs, it is observed that the throughput of Mobile Ad Hoc Network increased when the number of nodes is increased.

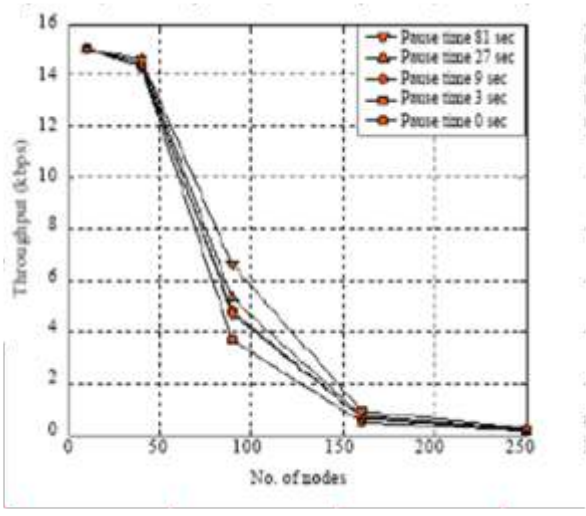


Figure2. Throughput aodv with 97,100,120 nodes

V. Conclusion

By examining the charts, it is found that throughput of MANETS is enhanced when the number of node is enhanced at transmission speed of 10 mbps. The MANETS throughput starts with the little value, after that it holds on increasing and decreasing with in some particular range. At the same prison term, the throughput of MANETS starts with prominent value. After some time it decrements aggressively, and again enhance aggressively among some particular range. The cause for this enhancing and falling is extension delay and smash collisions regarding at that time [10]. Throughout large dealings, the rate of hit number enhances which encourage regards the throughput of the system.

REFERENCES

[1] Ali, N. Z., Ahmad, R. B., and Aljunid, S. A, (2008). Link Availability Estimation for Routing Metrics in MANETs : An Overview. Time, pages 6 – 8. | [2] Aschenbruck, N., Gerhards-Padilla, E., and Martini, P. (2008). A survey on mobility models for performance analysis in tactical mobile networks. | [3] Bagwari, A., Jee, R., Joshi, P., and Bisht, S. (2012). Perfor-mance of aodv routing protocol with increasing the manet nodes and its effects on qos of mobile ad hoc networks. In Communication Systems and Network Technologies (CSNT), 2012 International Conference on, pages 320 – 324. | [4] Chenchen, Y., Xiaohong, L., and Dafang, Z. (2010). An obstacle avoidance mobility model. In Intelligent Computing and Intelligent Systems (ICIS), 2010 IEEE International Con-ference on, volume 3, pages 130 – 134. | [5] Fazeli, M. and Vaziri, H. (2011). Assess- ment of throughput performance under opnet modeler simulation tools in mobile ad hoc networks (manets). In Computational Intelligence, Communication Systems and Networks (CICSyN), 2011 Third International Conference on, pages 328 – 331. | [6] Ismail, Z. and Hassan, R. (2011). A performance study of var-ious mobility speed on aodv routing protocol in homogeneous and heterogeneous manet. In Communications (APCC), 2011 17th Asia-Pacific Conference on, pages 637 – 642. | [7] Johnson, D., Hu, Y., and Maltz, D. (2007). The Dynamic Source Routing Protocol (DSR) for Mobile Ad Hoc Networks for IPv4. Number 4728 in Request for Com- ments. Internet Engineering Task Force, IETF. | [8] Kurkowski, S., Navidi, W., and Camp, T. (2007a). Constructing manet simulation scenarios that meet standards. In Mobile Adhoc and Sensor Systems, 2007. MASS 2007(a). IEEE Internatonal Conference on, pages 1 – 9. | [9] Kurkowski, S., Navidi, W., and Camp, T. (2007b). Discovering variables that affect manet protocol performance. In Global Telecommunications Conference, 2007(b). GLOBECOM 07. IEEE, pages 1237 – 1242. | [10]Perkins, C., Belding-Royer, E., and Das, S.(2003).Ad hoc on-demand distance vector (aodv) routing. United States. RFC Editor. | [11]D.Kanimmozhi, M.Hemalatha., "QOS improvement in wireless sensor network using ant colony optimization". International journal of applied engineering research, 2014. | [12]T.Jayasri, M.Hemalatha, "Link quality estimation using soft computing techniques" Middle East journal of scientific research.