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Effect of Different Mobility Patterns on AODV and OLSR using Different TCP variants

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Abstract: *In this paper the effect of TCP variant (new reno, tahoe and Sack) is analyzed by using karan's and nagle theorem by moving nodes at different mobility models on OLSR and AODV protocol. In this nagle theorem is set to per-send and karan's theorem is enabled. This effect is analyzed by using GSM silence suppression and without using GSM silence suppression. To analyzed this effect opnet 14.5 modeller is used. This effect is analyzed in terms of Packet end to end delay, traffic received and throughput. The result shows that when random way point is used than performance of sack is better and when static mobility pattern is used than tahoe is better for OLSR protocol and for AODV overall Sack is better for both mobility patterns . Result also shows that performance of AODV is better than OLSR.*

Keywords: *MANET, AODV, OLSR, OPNET*

I. Introduction

Wireless network become a need for communication as wired media is much expensive. Bluetooth, Wi-fi are the cheap mean of wireless communication. There are many type of wireless network which provide communication means over large areas such as Mobile ad-hoc network, MESH network, WWAN. Mobile Ad-hoc network(MANET) is one of the network which provide peer-to-peer communication over wide area. MANET is a network consist of many nodes which communicate to each other without any central control authority, so it is a open network. A MANET consists of mobile nodes, a router with multiple hosts and wireless communication devices. The nodes of MANET are wireless radio type and they are mobile in nature, these Mobile nodes are wireless radio type and wireless communication devices are transmitters, receivers and smart antennas. To communicate with other node, the destination node must lies between the radio range of the source node. Due to security gave by MANET it can be utilized as a part of military battlefields, classrooms and rescue sites.

The mobile nodes are connected to each other and information is route over the wireless network through intermediate nodes, data is needed to be transfer via different routing protocol these routing protocols are AODV, DSR, GRP, OLSR etc.

II. Routing Protocol

Steering in MANET intends to pick a privilege and suitable way from source to destination. Routing terminology is used in various networks such as in telephony technology, electronic data networks and in the internet. When a source node expects to exchange information to a destination hub, bundles are exchanged through the intermediate nodes; these routing protocols are AODV, DSR, GRP, OLSR etc.

III. Ad Hoc On-Demand Distance-Vector Routing Protocol (Aodv)

AODV is a source started on-interest steering convention, it is a novel algorithm for the operation of ad hoc networks. In AODV, if a source node wants to send a data to destination node then firstly it will check the route if route exists than it simply forwards the packets to destination node, if route does not exists, a route discovery process begins.

AODV deals with three important messages for route discovery process. First is RREQ (Route Request) in this, when source node wants to start communication with destination node then it spread the RREQ message through intermediate nodes in network. Second is RREP (Route Response) after receiving RREQ message, destination node reply as a RREP to source node and clarify the route in between source node and destination node, so communication will start in between them. Third one is RERR (Route Error) in this, when the link breakage happens the node must invalidate the existing route in the routing table passage. The hub must rundown the influenced destinations and determine which neighbours can be affected with this breakage. At last the hub must send the route mistake (RERR)message to the corresponding neighbours.

IV. Optimized Link State Routing (Olsr)

Link-state routing algorithms calculations pick best route by estimations pick best way by choosing distinctive qualities like association burden, delay, transmission limit et cetera. Link state route are more trustworthy, consistent and correct in processing best route and more jumbled than hop count. To update topological information in every node, intermediate message is broadcast over the system. Multipoint exchanges are used to support gainful flooding of control message in the system. Route count are conveyed by multipoint exchanges to structure the thrashing from an offered hub to any destination in the system. The OLSR protocol is created to work autonomously from different protocol.

V. Simulation Environment

In this paper the effect of mobility models(random way point and static) on TCP variants is analyzed by using voice application. For voice GSM quality is used. To analyze this effect first scenarios are made without using GSM silence suppression then scenarios are made by using GSM silence suppression. To analyze TCP variant New REHNO, Taheno and Sack is used. For this Nagle and karan's theorems are used together in which nagle is set at . For this in each scenario 60 nodes and two servers are used. This performance is analyzed on AODV and OLSR protocols.

OPNET Simulator 14.5 [8] was used to analyze the performance of AODV and OLSR protocol. We used OPNET modeler, as OPNET modeler provides a comprehensive improvement environment supporting the showing of correspondence network. OPNET modeler provides better environment for simulation, data collection and data analysis [8].

VI. Results

Simulation is conducted to evaluate the performance of Mobile Ad Hoc Network using OPNET version 14.5. In this paper the effect of mobility patterns is analyzed on AODV and OLSR protocol by using TCP varients. The result is compared in terms of Packet end to end delay, Traffic received, throughput.

. Packet end to end delay

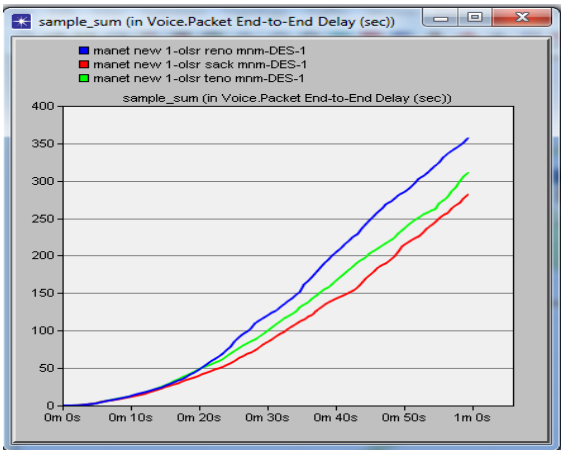

Fig1: result of OLSR for 60 nodes without using GSM silence suppression using with Static mobility pattern

Fig 1 shows the result of OLSR. Fig show that when static pattern is used than delay of sack is more which is 360 sec and new reno is 310 sec and teno is 270sec when GSM without silence suspension is used and when not used respectively.

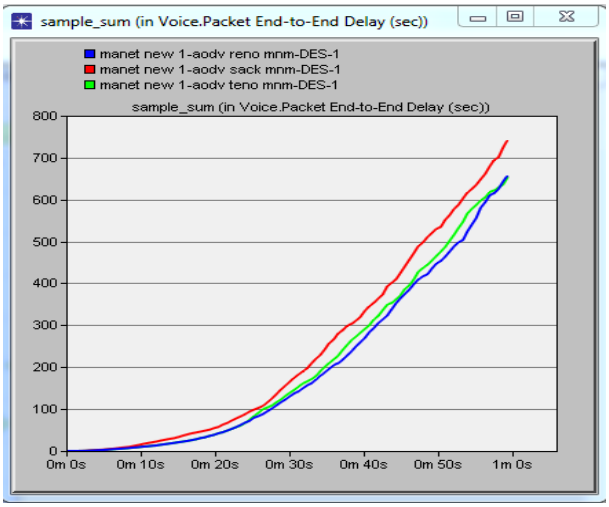

Fig2: result of AODV for 60 nodes without using GSM silence suppression using with Static mobility

Fig 2 shows the result of AODV. Fig show that when static pattern is used than performance of new reno and teno is more which is same which is 650 sec and 620 sec and for static pattern delay of Sack is more which is 750 sec when GSM without silence suspension is used and when not used respectively.

. Traffic received

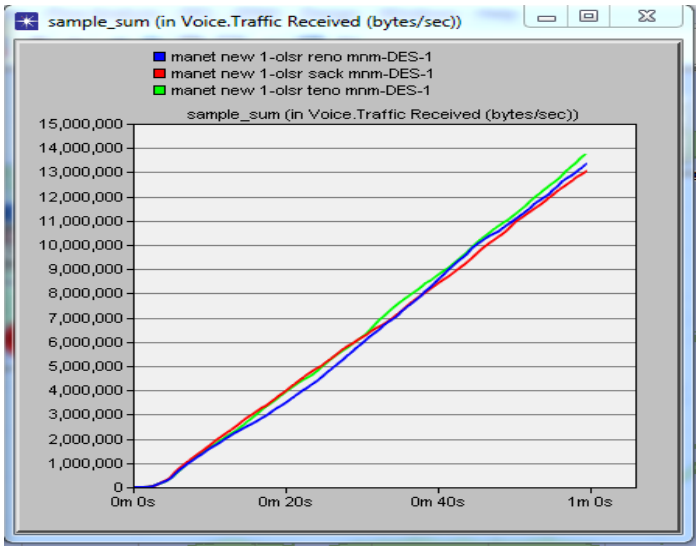

Fig3: result of OLSR for 60 nodes without using GSM silence suppression using with Static mobility pattern

Fig 3 shows the result of OLSR. Fig show that when static pattern is used than performance of teno is better which is 13900000 bits/sec without using GSM silence suspension and the performance of sack and reno are 12900000bits/sec and 13600000bits/sec when GSM without silence suspension is used and when not used respectively.

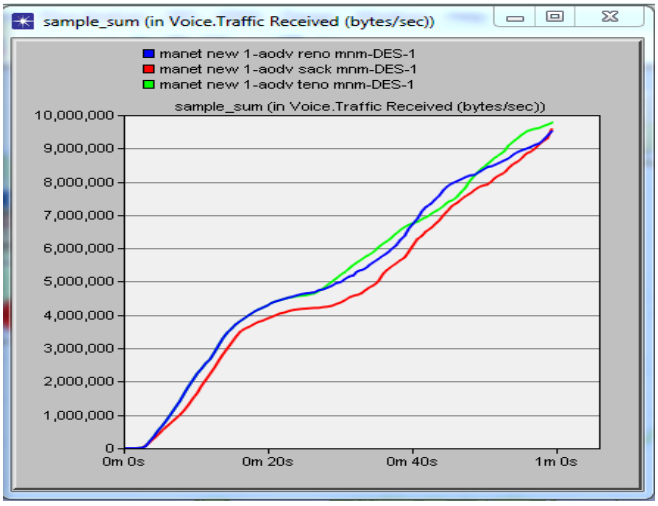

Fig4: result of AODV for 60 nodes without using GSM silence suppression using with Static mobility

Fig 4 shows the result of AODV. Fig show that when static pattern is used than performance of teno is better which is 9900000 bits/sec and when GSM without silence suspension is used and when not used respectively and for static pattern performance of performance of reno and sack are 9500000 bits/sec and 9600000 bits/sec without using GSM silence suspension teno is better which is 99000000 bits/sec .

. Throughput

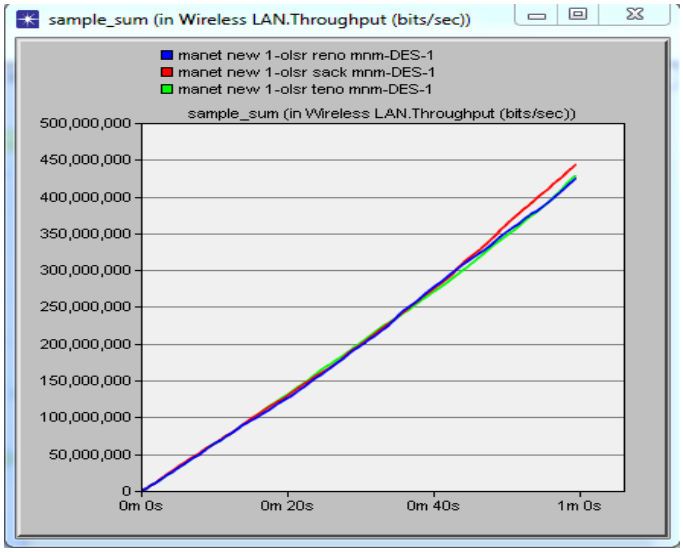

Fig5: result of OLSR for 60 nodes without using GSM silence suppression using with Static mobility

Fig 5 shows the result of OLSR. Fig show that when static pattern is used than performance of two TCP variant is same reno and teno which is 1420000000 bits/sec and for without using GSM silence suspension but sack is better which is 440000000 bits/sec when GSM without silence suspension is used and when not used respectively.

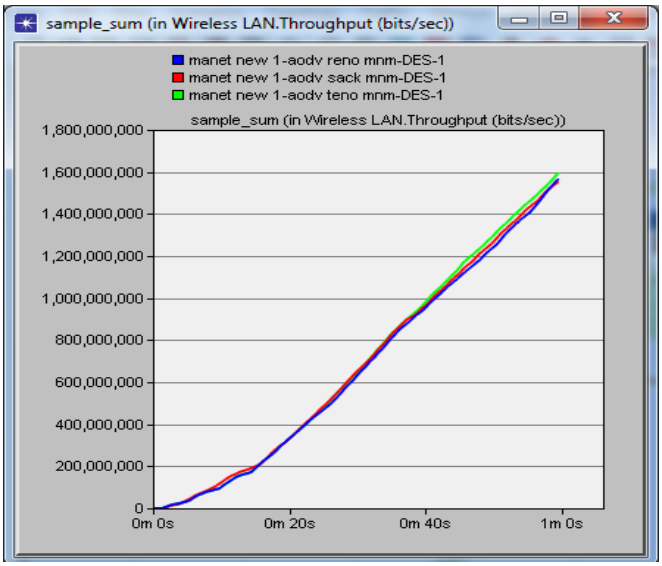

Fig6: result of AODV for 60 nodes without using GSM silence suppression using with Static mobility

Fig 6 shows the result of AODV. Fig show that when static pattern is used than performance of teno is better which is 1600000000 bits/sec bits/sec and performance of sack and reno are same which is 1480000000bits/sec when GSM without silence suspension. In which the teno is better result for GSM without silemce suspension.

VII. Conclusion & FUTURE SCOPE

In This paper the effect of mobility models is analyzed on AODV and OLSR protocol. To analyze these effect TCP variants is used. This effect is further analyzed by using nagle and karna's theorm. In each scenario Karan is set at enable and Nagle is set to per-send. This effect is analyzed by using GSM voice quality. For this first GSM silence suspension is used and in another scenario without GSM silence suspensions used**.** For this in each scenario 60 nodes is used and 2 servers is used. The result shows that when random way point is used than performance of sack is better and when static mobility pattern is used than tahoe is better for OLSR protocol and for AODV overall Sack is better for both mobility patterns . Result also shows that performance of AODV is better than OLSR. In future one can see effect by using multiple parameters like traffic sent.

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