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REACTIVE AND PROATIVE ROUTING IMPACT OF DIFFERENT NETWORK SIZE WITH HTTP & VOICE METRICS USING OPNET TOOL

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Abstract: *Mobile Ad hoc network is known as multi-hop wireless connectivity, infrastructure less environment and frequently changing topology. The nodes acts as router and communicate to each other. This paper aims to provide a means of understanding the issues and protocol (AODV, GRP, OLSR) of MANET and investigating behaviour of these protocol. For this Research paper Networks size are implemented with Respective 25, 50, 75 Nodes and Results are obtained from these Networks with Respective Performance Metrics Http Page Response Time ,Jitter, Voice End to End Delay .we have presented a comparative analysis of selected Routing protocols such as AODV, GRP, and OLSR. The comparative analysis has been done Respectively 25, 50, 75 Nodes Networks in the same network with different protocols for real time applications. Performance has been measured on the basis of some parameters that aimed to figure out the effects of routing protocols. In our paper work, The simulation result has shown that In 25 nodes and 50 nodes and 75 nodes Networks GRP Provides us best Results with Respective performance metrics – Http Page Response Time , Jitter, Voice End to End Delay. In future, research work can be done on the hybrid protocols and some others Performance metrics also can be taken . The Behaviour analysis has been done by using simulation tool OPNET 14.5*

Keywords: Http, Voice, Jitter, Delay, Metrics.

1. Introduction

A MANET consists of mobile platforms e.g., a router with multiple hosts and wireless communications devices—here in simply referred to as "nodes"--which are free to move about arbitrarily. The nodes may be located in or on airplanes, ships, trucks, cars, perhaps even on people or very small devices, and there may be multiple hosts per router. A MANET is an autonomous system of mobile nodes. The system may operate in isolation, or may have gateways to and interface with a fixed network. In the latter operational mode, it is typically envisioned to operate as a "stub" network connecting to a fixed internetwork. Stub networks carry traffic originating at and/or destined for internal nodes, but do not permit exogenous traffic to "transit" through the stub network. MANET nodes are equipped with wireless transmitters and receivers using antennas which may

be (broadcast), highly- directional (point-to-point), possibly steerable, or some combination thereof. At a given point in time, depending on the nodes' positions and their transmitter and receiver coverage patterns, transmission power levels and co-channel interference levels, a wireless connectivity in the form of a random, multihop graph or "ad hoc" network exists between the nodes. This ad hoc topology may change with time as the nodes move or adjust their transmission and reception parameters. in this research paper we are taking Reactive and as well as proactive Routing Protocols AODV ,GRP and OLSR .we took three different Network size 25,50,75 Nodes Respectively for performance metrics we have choose Http Page Response Time MOS value ,JITTER, Voice End to End Delay.

Figure 1.1 MANET NETWORK

2. MANET Routing Protocols:

Routing protocols is Responsible to deliver the networks packets from source to destination over internet. MANET routing protocol working mechanism is based on its algorithm. In MANET, it has various types of routing protocols each of them is applied according to the network circumstances. on the base of Routing Protocols charchertstic like Reactive ,Proactive and Hybrid .

2.1 GRP(Geographic Routing) Protocol also called Geo routing or position-based routing is a routing principle that relies on geographic position information. It is mainly proposed for wireless networks and based on the idea that the source sends a message to the geographic location of the destination instead of using the network address. The idea of using position information for routing was first proposed in the 1980s in the area of packet radio networks and interconnection networks. Geographic routing requires that each node can determine its own location and that the source is aware of the location of the destination. With this information a message can be routed to the destination without knowledge of the network topology or a prior route discovery.

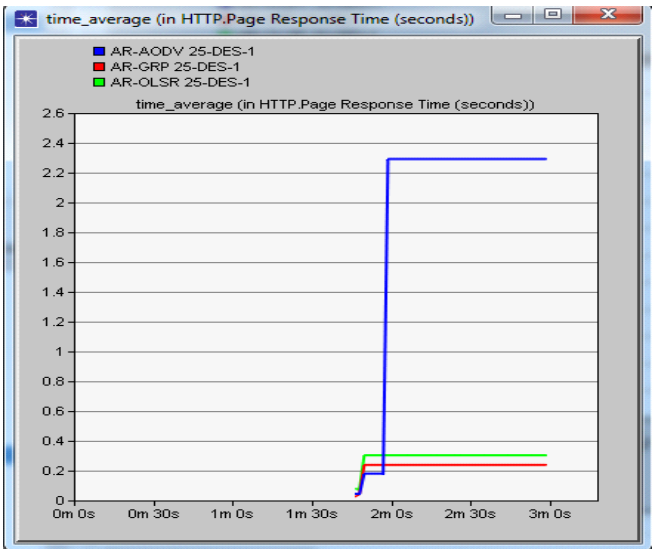
2.2 OLSR (Optimized Link State Routing) It is a proactive routing protocol and is also called as table driven protocol because it permanently stores and updates its routing table. OLSR keeps track of routing table in order to provide a route if needed. OLSR can be implemented in any ad- hoc network. Due to its nature OLSR is called as proactive routing protocol. Multipoint relay (MPR) nodes are shown in the given figure 5.3. All the nodes in the network do not broadcast the route packets. Just Multipoint Relay (MPR) nodes broadcast route packets. These MPR nodes can be selected in the neighbour of source node. Each node in the network keeps a list of MPR nodes. This MPR selector is obtained from hello packets sending between in neighbour nodes. These routes are built before any source node intends to send a message to a specified destination. Each and every node in the network keeps a routing table. This is the reason the routing overhead for OLSR is minimum than other reactive routing protocols and it provide a shortest route to the destination in the network. There is no need to build the new routes, as the existing in use route does not increase enough routing overhead. It reduces the route discovery delay.

2.3 AODV (Ad-Hoc On-Demand Distance Vector Routing) The philosophy in AODV, like all reactive protocols, is that topology information is only transmitted by nodes on-demand. When a node wishes to transmit traffic to a host to which it has no route, it will generate a route request (RREQ) message that will be flooded in a limited way to other nodes. This causes control traffic overhead to be dynamic and it will result in an initial delay when initiating such communication. A route is considered found when the RREQ message reaches either the destination itself, or an intermediate node with a valid route entry for the destination. For as long as a route exists between two endpoints, AODV remains passive. When the route becomes invalid or lost, AODV will again issue a request .AODV avoids the ``counting to infinity'' problem from the classical distance vector algorithm by using sequence numbers for every route. The counting to infinity problem is the situation where nodes update each other in a loop. Consider nodes A, B, C and D making up a MANET. A is not updated on the fact that its route to D via C is broken. This means that A has a registered route, with a metric of 2, to D. C has registered that the link to D is down, so once node B is updated on the link breakage between C and D, it will calculate the shortest path to D to be via A using a metric of 3. C receives information that B can reach D in 3 hops and updates its metric to 4 hops. A then registers an update in hop-count for its route to D via C and updates the metric to 5. And so they continue to increment the metric in a loop.

3.Simulator: In this paper, Network Simulator, Optimized Network Engineering Tools (OPNET) 14.5 has been used as a simulation environment. OPNET is a simulator built on top of discrete event system (DES) and it simulates the system behaviour by modelling each event in the system and processes it through user defined processes. OPNET is very powerful software to simulate heterogeneous network with various protocols. The protocols used in this thesis are AODV, OLSR ,GRP MANET Routing protocol. The proposed Routing protocols are compared and evaluated based on some quantitative metrics such as Http Page Response Time ,Jitter, Voice End to End Delay, Different Network size with Mobile Nodes are taken like for small medium and large Network as 25, 50, 75 Nodes.

4 Results Network (25 Nodes)

4.1 Http Page Response Time: GRP protocol gives us best Response among others protocols. AODV Response Time is worst which over 2.29 seconds OLSR protocols Response Time is better than AODV.we obtained that GRP Response Time is 0.23 seconds that is best among others Protocols.



. Figure 4.1 Http Page Response Time

4.2 Voice Jitter

GRP protocol provides us best service in voice jitter that is 0.16 other hand OLSR is providing worst that is 1.1 and AODV is better than OLSR that is 0.16

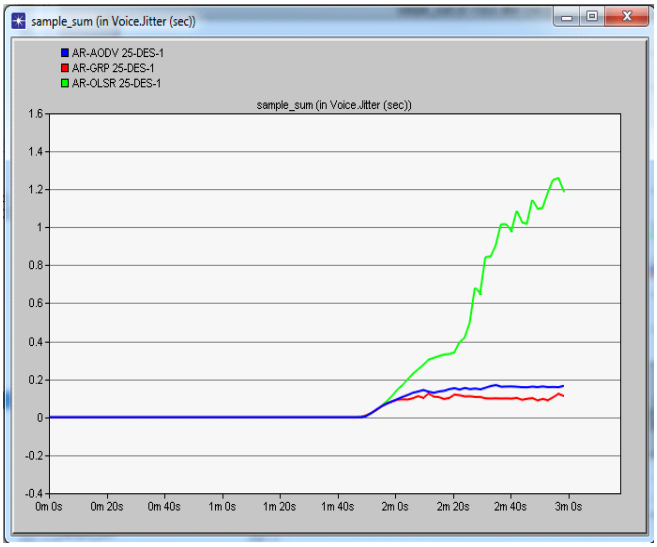


Figure 4.2 Voice Jitter

4.3 Voice End to End Delay: In Voice End to End Delay Time GRP provides minimum delay time .GRP packets End to End Delay is That is 3.9 ,OLSR delay is worst that is 10.4

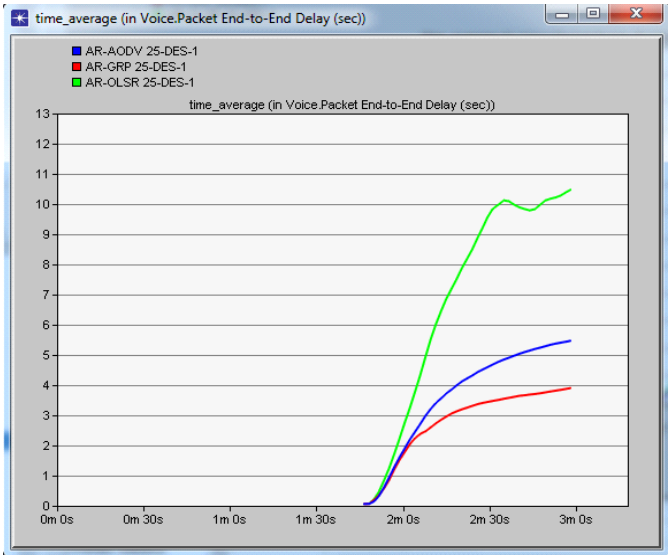


Figure 4.3 Voice End to End Delay

5 Results Network (50 Nodes)

5.1 Http Page Response Time GRP protocol gives us best Response among others protocols. OLSR Response Time is worst which is over 1.89 seconds. AODV protocols Response Time is better than OLSR .we obtained that GRP Response Time is 0.26 seconds that is best among others Protocols.

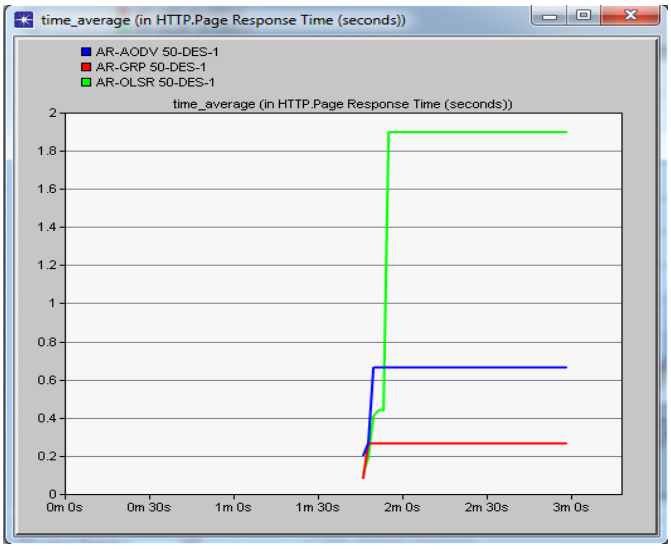


Figure 5.1 Http Page Response Time

5.2 Voice Jitter: GRP protocol provides us best service in voice jitter that is 0.40 other hand OLSR is providing worst that is 1.27 and AODV is better than OLSR that is 0.75

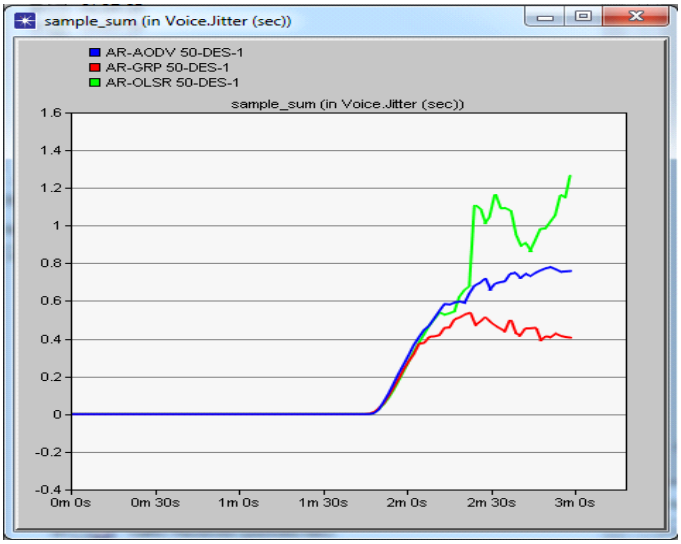


Figure 5.2 Voice Jitter

5.3 Voice End to End Delay: GRP protocol gives us best Response among others protocols. AODV Response Time is worst which over 10 seconds is. OLSR protocols Response Time is better than AODV .we obtained that GRP Response Time is 8.3 seconds that is best among others Protocols.

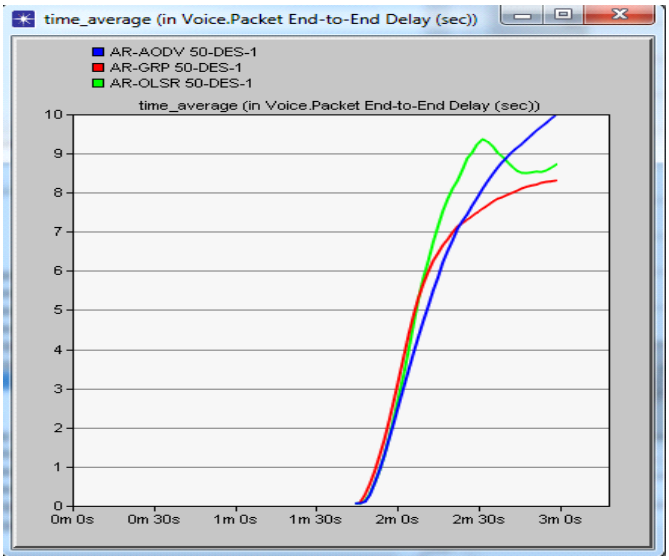


Figure 5.3 Voice End to End Delay

6.1 Http Page Response Time: GRP protocol gives us best Response among others protocols. OLSR Response Time is worst which is over 0.76 seconds . AODV protocols Response Time is better than OLSR .we obtained that GRP Response Time is 0.10 seconds that is best among others Protocols.

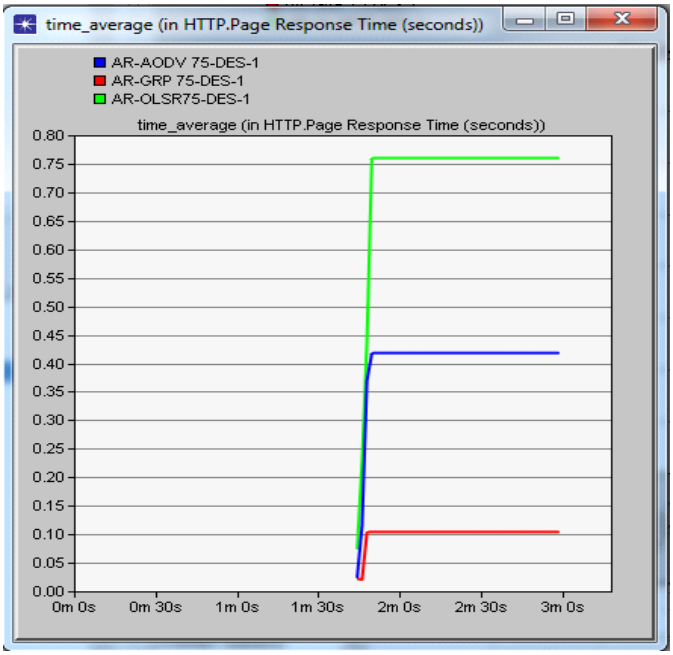


Figure 6.1: Http Page Response Time

6.2 Voice Jitter GRP protocol provides us best service in voice jitter that is 1.4 other hand OLSR is providing worst that is 4.3 and AODV is better than OLSR that is 1.9

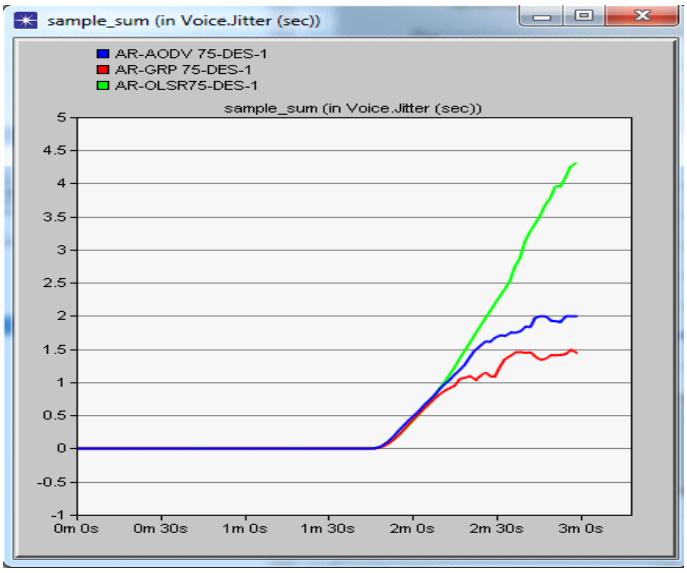


Figure 6.2 Voice Jitter

6.3 Voice End to End Delay:

GRP protocol gives us best Response among others protocols. OSLR Response Time is worst which is over 26.6 seconds . AODV protocols Response Time is better than OLSR .we obtained that GRP Response Time is 11.23 seconds that is best among others Protocols.

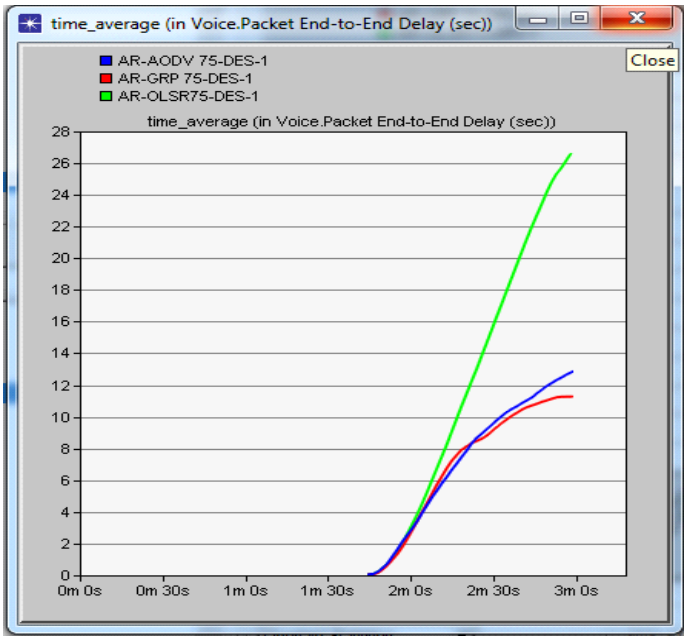


Figure 6.3 Voice End to End Delay

7. CONCLUSION AND FUTURE WORK

In this paper, we have presented a comparative analysis of selected Routing protocols such as AODV, GRP, and OLSR. The comparative analysis has been done Respectively 25, 50, 75 Nodes Networks in the same network with different protocols for real time

applications. Performance has been measured on the basis of some parameters that aimed to figure out the effects of routing protocols. In our paper work, The simulation result has shown that In 25 nodes and 50 nodes and 75 nodes Networks GRP Provides us the best Results with Respective performance metrics – Http Page Response Time ,JITTER, Voice End to End Delay.In future, Research work can be done on the hybrid protocols and others Performance metrics also can be taken .

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