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The Effects of Transfers from IPv4 to IPv6 Using AODV Routing Protocol for VANET and MANET

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Abstract: ***The transfer and changes from IPv4 to IPv6 has become unavoidable certain with really vital Consequently, its necessary to check and examine the effects with this change in all of the communication practices, certainly within a mobile Ad-hoc Network(MANET) and with VANET as portion, that topology in the Ad-hoc may well switch immediately with all of the sudden as a result of capability to move with nodes. Direction-finding practices use in different ways with distinctive surroundings. Consequently, necessary to investigate that habit with several direction-finding practices with distinctive surroundings. in this paper examine may be executed relating to the effectiveness with Ad-Hoc On-Demand Distance Vector AODV For MANET with IPv4 and IPv6 environment applying OPNET Modeler For simulation. We perform analysis For AODV Routing protocol with WLAN, throughput, delay, Routing and packets loss.***

Keywords:. MANET,IPv6,IPv4, Routing Protocols, AODV, OPNET

1. Introduction

Wireless ad-hoc network is becoming one of the most animated and dynamic field of communication and networks because of fame of movable device and wireless networks that has increased significantly in recent years. A mobile ad-hoc network is formed by collecting portable devices like laptops, smart phones, sensors, etc. that communicate through wireless links with one another. mobile Ad-hoc(MANET) is a wireless network contain several devices or many nodes it can communicate to each other without any central control point. Bandwidth, energy, physical security and other resources are limited in mobile ad hoc network. In mobile ad hoc network every mobile node acts as a host and also as a router, Ad hoc networks are heavily used in emergency situations where no infrastructure is available, for e.g. battle fields, disaster mitigation etc. The main limitation of ad-hoc systems is the Availability of power. In addition to running the onboard electronics, power consumption is governed by the number of processes and overheads required to maintain connectivity [1]. There is always a need in mobile ad hoc network to search a good path for the routing of data packets from source to destination. In mobile ad hoc network every mobile node acts as a host and as a router. Due to the limited transmission range of wireless networks, multi-hops are needed to exchange data packets between source to destination in network. Bandwidth, energy, physical security and other resources are limited in mobile ad hoc network. Congestion in network may arise due to the limited bandwidth of mobile ad hoc networks and to avoid this problem efficient routing in mobile nodes is essential [2], the necessity for sufficient Internet protocol (IP) addresses to meet the demand of mobile devices, as well as flexible communications without infrastructure, are especially considerable. The next-generation IP, Internet Protocol version 6 (IPv6) [3], [4], the primary challenge in building a MANET is equipping each device to continuously maintain the information required to properly route traffic. Therefore, nodes are required to relay packets on behalf of other nodes in order to deliver data across the network. A significant feature of ad hoc networks is that changes in connectivity and link characteristics are introduced due to node mobility and power control practices. Reactive routing protocol is a type of routing protocol in which route is established when it is needed by source node to send data packets to the destination node. In reactive routing protocol flooding technique is used for route discovery. Once routes are discovered the routes are stored and maintained in route cache. The main advantage of this type of routing protocols is to save precious bandwidth of ad hoc network, AODV is a type of reactive protocol in which route is created when it is needed [2].

2. AODV

AODV (Ad-Hoc On-Demand Distance Vector) direction-finding method can be a reactive direction-finding method that will functions a few factors with into action direction-finding practices. Territory are generally well-known on-demand, as they simply are essential. Nevertheless, when well-known some sort of journey is usually looked after providing it can be vital. Reactive (or on-demand) direction-finding practices discover a route relating to the origin along with the spot as long as the way should be applied (i. i., when there are actually info to remain sold relating to the origin along with the destination). [5].This is an on demand routing protocol for wireless ad hoc mobile networks that uses Hop By Hop routing. It works by constructing routes between nodes on demand by source nodes, and are kept until they are not needed. There is only one main route to the destination unlike DSR. Requests for routes have a time to live which stop's flooding of route requests, and there is a time limit of double the TTL before it can be re-requested.[6]

3. Methodology

To make a test for this transfer from IPV4 to IPV6 for mobile Ad-hoc network there is many simulation software but we use

opnet simulator on pc running Microsoft windows (7) professional service pack1 and cofig all the environment variable to make this test. In this paper we used discrete event simulation (DES)software called OPNET (Optimized Network Engineering Tool) Modeler version 14.5. It is one of the most widely used commercial simulators based on Microsoft Windows platform and incorporates more MANET routing parameter as compared to other commercial simulator available. It not only supports MANET routing but also provides a parallel kernel to support the increase in stability and mobility in the network. [6] The simulations focused on the impact of the transition from IPv4 to IPv6 on the performance of AODV routing protocol. For our study there are two simulation scenarios consisting of 4 nodes in the first scenario used IPv4 as addressing protocol and the second scenario used IPv6

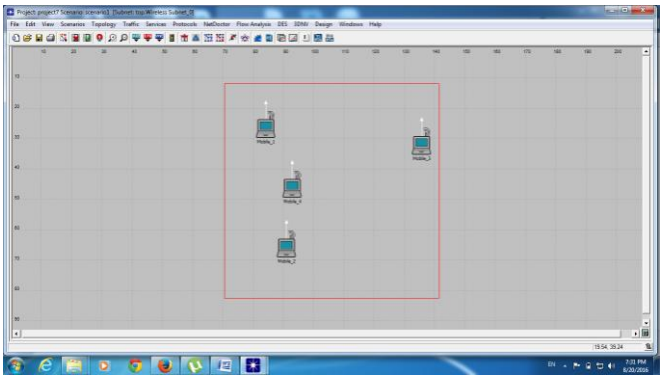

Figure 1: The 4 nodes in MANET in OPNET modeler

as shown in the figure above we implement the MANET network very simple four node scenario to show the features of AODV, SOURCE starts exponential traffic at 100 sec, and continues till end of simulation (600 sec).

We run the simulation for ten minute and get the results for both scinareos.

4. Results and Discussion

On such basis as several variables are measure the effects for MANET and Ad-Hoc On-Demand Distance Vector (AODV) with IPv4 and IPv6 surroundings, that's following On the basis of four parameters we evaluate the performance of one of the MANET routing protocols (AODV) under IPv4 and IPv6 environments, that is, WLAN delay, throughput , routing traffic received and total packets drops as shown in figure 2 and figure 3 and figure 4.

The results shown below:

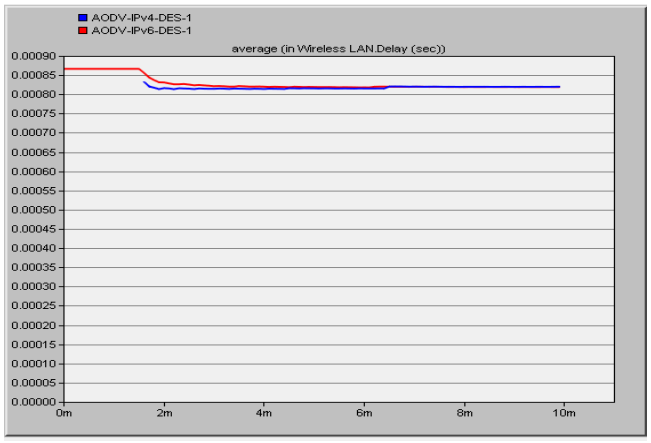

Figure 2: The Average WLAN Delay(sec)

In fig.2 we observe that the delay in IPv4 is less than the delay when using IPv6

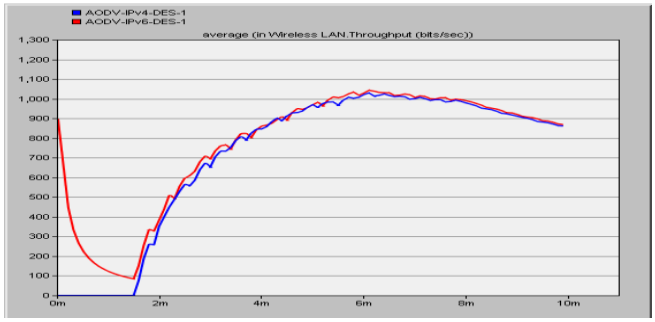

Figure 3: The average WLAN throughput (bit/sec)

in fig.3 we observe that the transion from IPv4 to IPv6 enhance the performance by increasing throughput in WLAN

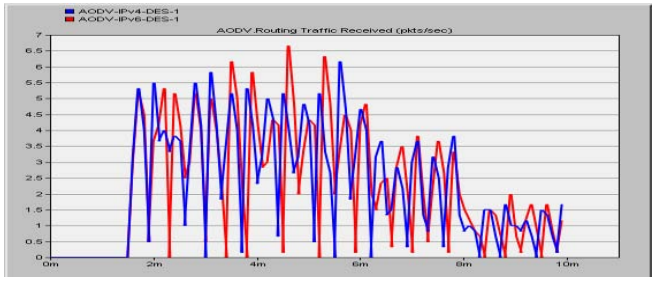

Figure 4: AODV routing traffic received (pkts/sec)

In fig 4 we observe that AODV in IPv4 is better than the ipv6 in term of routing traffic received

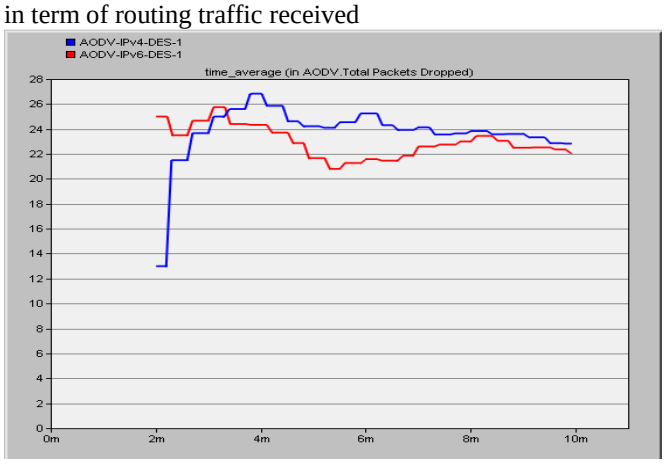

Figure 5: The total packets dropped

In fig 5 we observe that AODV in IPv6 has less number of packet drops.

Table 1: AODV in IPv4 &IPv6

AODV	IPv4	IPv6
Wireless LAN delay(sec)	0.686x10-3	0.828x10-3
Wireless LAN throughput(bit/sec)	710	765
Routing traffic received (packet/sec)	2.58	2.56
Total packet dropped	23.72	22.95

5. Conclusions

From this examine there is an effects on the transfer from IPv4 to IPv6 with AODV VANET, MANET direction-finding method applying OPNET. On such basis as shown in the result, we say that AODV with IPV6 undergoes quite as good as IPv4 but the throughput together with comprehensive packets fallen and for the delay and traffic routing we seen IPv4 is most effective, as shown in the table1 above.

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