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PERFORMANCE ANALYSIS OF AODV AND OLSR ROUTING PROTOCOLS BASED ON IPv6 MOBILE AD-HOC NETWORKS

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ABSTRACT

Mobile Ad-hoc Networks (MANETS) are self-configuring and infrastructureless networks which have no dependency on any centralized computer supporting wireless communication in between several mobile nodes. In recent years the number of wireless communication devices had a very fast increase. Moreover, each of these mobile ad-hoc network nodes in order to communicate with each other over the internet, need to be identified by a unique IP address, and the depletion in the number of available pool of unallocated IPv4 internet addresses, has made the IPv6 based Mobile Ad-hoc Networks' Technology progressively important.

Mobile Ad-hoc Network routing protocols such as Ad-hoc On-demand Distance Vector (AODV), Optimized Link State Routing protocol (OLSR), Zone Routing Protocol (ZRP), and Destination Sequenced Distance Vector (DSDV) are standards which control how nodes decide which way to route packets between mobile devices in a MANET.

In this research we analyzed the impacts of transition from an IPv4 Mobile Ad-hoc Network to an IPv6 Mobile Ad-hoc Network on the overall performance of the network. We created scenarios in which we simulated mobile ad-hoc networks running both IPv4 and IPv6 MANET, using AODV and OLSR routing protocols. Furthermore, we compared the performance of OLSR and AODV routing protocol in IPv4 and IPv6 networks. We observed in our in our simulation that IPv6 Mobile Ad-hoc Networks provide better results in the performance of the network. Moreover, AODV routing protocol has better performance results in an IPv6 Mobile Ad-hoc Network in comparison to OLSR routing protocol.

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1 INTRODUCTION

1.1 Overview

Today's living environments are emerging based on resources which are provided by the means of connecting different communication networks for users. New small mobile devices have enhanced accessing and processing of information abilities along with mobility. Enabling devices with the ability to communicate and access to the information have increased the number of mobile computing nodes within a small area. On the other hand, having these capabilities have maximized the peoples' quality of life. In order for a mobile node to exchange packets with other device over the internet, Internet Protocol must be assigned to each node. With such rapid increase in number of wireless communication devices in recent years, the necessity for sufficient IP (Internet Protocol) addresses to meet the demand in the number of mobile devices is considerable. The usage of IPv4 has approximately reached 4.3 billion addresses, but with the increase in use of internet and number of mobile devices, IPv4 allocation pool has been dramatically depleted. Moreover, IPv4 enabled network architecture will be replaced with the current IPv6 architecture very soon.

In the past years much attention has been paid to IPv6 extension for MANETs. IPv6 auto-configuration mechanism allows a node to generate a link-local IP address (Narten, 1998). MANET node can acquire a global IPv6 address from an Internet gateway, and then access to the Internet through the gateway. Routing in MANETs and the IPv6 network is based on existing ad-hoc routing protocols, such as Ad-hoc