CHAPTER – 1

1. Introduction

1.1 Aim

The actual aim of the proposed study is to perform the performance evaluation process of AODV under the black hole attacks by making use of the OPNET simulation in order to simulate the results.

1.2 Objectives

The main objectives of this study are

- To analyze the information on ad-hoc networks in association with routing protocols
- To evaluate the information on different MANET attacks within ad-hoc networks
- To design the scenarios of OPNET for evaluating the AODV performance under black hole attacks
- To use the OPNET simulation tool for developing the design scenarios
- To evaluate and analyze the scenarios of simulation by comparing them under the black hole attacks[1].
To test and examine the results by evaluating the AODV performance under the black hole attacks

1.3 Overview of Ad-hoc networks

According to the views of David A. Maltz (2001) nowadays, ad-hoc networks are playing significant role in the networking processes which includes different types of routing protocols that are used for managing the routing process within the mobile adhoc networks. The Unicast as well as multicast are the two different routing processes that take place in adhoc networks and this particular process is performed by the adhoc networks with use of the AODV- adhoc on demand distance vector protocol. This AODV protocol involves a basic algorithm that performs different tasks such as on demand process through which the main routing processes will be managed by using different nodes that are present in the networks.

Parikshit Machwe [2] stated that in order to add or change the predefined rotes associated with the different types of network parameters such as bandwidth as well as congestion the different rules are passed to the adhoc networks. In order to connect the nodes within the networks, the AODV protocol will make use of the tree based structure that contains different groups related to multicast routing
process. In general, the AODV protocol is a type of reactive protocol which is having similar characteristics of the proactive routing protocols.

The DSSR- dynamic routing protocol is been used for the purpose of implementing the AODV protocol within the adhoc networks that performs the route discovery process with use of DSDV- destination sequence distance vector that transfers the hello messages within the networks. This AODV protocol performs each and every activity in a timely manner and replicates the new nodes by replacing the old nodes in the ongoing process. The AODV protocol will even update all the nodes present in the network regarding the changes that take place in the routing process of the networks which regularly uses the destination nodes.

Clifton Lin (2008) opined that routing protocols will make use of the routing tables for the purpose of managing the routing process because they appear in static nature which has fixed routing process through which there are not capable of managing the configuration changes that take place in the network topology. Reactive routing protocols are known as the on demand routing protocols which appear in dynamic nature and are highly capable of managing the entire configuration changes that take place in the network topology. Whereas, hybrid routing protocols are integrated with the proactive as well as reactive routing protocol characteristics and will work on multiple conditions and performs the both tasks done by proactive and reactive protocols.
Nevertheless, among the existing MANET protocols, reactive protocols which are even known as on demand routing protocols are been widely accepted and used in the mobile ad-hoc networks because they are present in dynamic nature and are able to manage all the tasks that are to be performed in the network topology. Among the total number of reactive routing protocols, AODV- Ad hoc on demand vector is widely used within the ad-hoc networks. This AODV protocols has many internal characteristics through which it performs wider range of network activities such as building work nature of the protocol by which the network will be able to manage and detect the threats or attacks that take place in the networks [2,3].

1.4 Way to achieve the Objectives

In order to achieve the research objectives, different tasks are performed which are explained in detail as follows:

- Different types of published articles, peer reviewed journals and web document will be gathered from the internet and college library sources which are used as the secondary data sources over the study.
- The existing literature reviews related to adhoc networks will be taken into consideration and will be analyzed critically in order to get the final expected outputs.
• Different types of routing protocols of mobile adhoc networks will be analyzed and evaluated critically.

• The network setup will be designed by making use of the OPNET scenarios.

• Different routing attacks especially black hole attacks will be identified and verified by using OPNET simulation tool.