RESEARCH METHODOLOGY AND PROCEDURE

Metrics for performance Evaluation

The Metrics used for Performance comparison will be:

- **Packet Delivery Ratio**: The fraction of successfully received packets, which survive while finding their destination is called packet delivery ratio. This performance measure also determines the completeness and correctness of the routing protocol.

- **End-to-End Delay**: Average end-to-end delay is the delay experienced by the successfully delivered packets in reaching their destinations. This is a good metric for comparing protocols. This denotes how efficient the underlying routing algorithm is, because delay primarily depends on optimality of path chosen.

- **Throughput**: This declares overall throughput in terms of packets received and helps in performance evaluation of the proposed scheme.

A new protocol has been developed which has been incorporated on AODV. As the topic of the research is to provide security and stability in MANET, so in the proposed algorithm both these issues are taken into account. It is basically the enhancement of the existing AODV algorithm as it provides better stability in normal working and provides security from massage dropping attack (malicious attack) and wormhole attacks in network.

The proposed algorithm has been simulated extensively using NS2 and various metrics used are:

a) **Packet Delivery Ratio**

b) **Throughput**

c) **Average end to end delay**
d) **Control packet overhead**

Mostly results are favorable as per theory and the objectives also work according to this research. In the simulation of AODV and Modi_AODV stability in PDR, throughput and end to end delay ratio is very good. In the case of control packet overhead it is high in the case of Modi_AODV. But it is tolerable at the cost of security in routing protocol.

**Overall conclusions are**

1. The effect on working of various mobility models has been investigated in different routing protocol. The choice of mobility model is determined to give relatively better performance of different routing protocols.

2. Studied various results to consider AODV as one of the best routing protocol for providing secure routing because there exist best results in every scenario of the simulation.

3. Introduced a novel secure routing protocol, termed as **Modi_AODV**. The proposed protocol is based upon hop count method from sender to target node. The scheme has been illustrated for AODV protocol and could easily be adopted for other on-demand routing protocols for providing stability, integrity and nonrepudiation. The proposed algorithm has been evaluated with different network parameters under a simulated environment. This is the first reported work for securing ad hoc networks using hop count technique and selected route is compared with the longest alternative route to target which is second hop node.