

# Enhancement in AODV Protocol to Provide Best Path According to Signal Strength

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**Abstract-** AODV is used to find out the path of the data transfer. But simple AODV has the problem when the nodes move. Enhancement in AODV is required so that to overcome the problem of link failure during data transfer from host to destination. First of all mutual authentication is required between the mobile nodes to prevent the various inside and outside attacks. When the mobile nodes are mutually authenticated, it leads to the reliable data transmission between the mobile nodes. But the main problem occurs during the failure of the link. Due to link failure packet is lost easily. In proposed work, enhancement in AODV concept is important. This protocol is designed to provide best path according to signal strength. The path which has maximum signal strength will choose as a final path. This work will helps to reduce the problem occur in link failure and packet lost problem. Now the performance degradation problem will also improve. In new AODV, route selection is based upon the signal strength. The maximum signal strength nodes are considered as final routes.

**Index Terms-** AODV, MANET, ROUTING PROTOCOLS, SIGNAL STRENGTH

## I. INTRODUCTION

The glory of communication system seems new but surrounded by different evolution eras, transformations. Enormous approached were adopted and become obsolete from time to time as new technological revolutions make communication systems up to date.

Reliable and unailing transportation of data and information from source to destination is important factor in communication process. The mobile phone technology becomes integral part in the world as it is accessed everywhere. Mobile ad-hoc technology has attracted the attention of communication field. An ad-hoc network can operate in an isolated fashion. In Mobile ad-hoc Networks (MANET) mobile nodes communicate with each other without the need of central architecture. MANET are specific type of networks without infrastructure. In ad-hoc Networks there are no base station and there are no supervisors monitoring performance as a whole. Mobile ad-hoc Networks are divided into two categories: structured and unstructured network. An unstructured mobile ad-hoc network consists of nodes that exchanges information without using a fixed base station. In this network nodes not only performs administrative duties but also acts as host. The mobile nodes that are in radio range of each other communicate directly, whereas other needs the aid of intermediate nodes to route their packets. Networks are composed of wireless devices and besides this form a network

with self organization. In Manet topology is randomly changing and unpredictable because of the mobility of network nodes. In addition new nodes can be added to network at any moment, removed from network at any moment, or may turn themselves off.

Some of the important characteristics of ad-hoc network:

- 1 Nodes are autonomous in behavior.
- 2 Nodes can leave or join the network at anytime make it dynamic in nature.
- 3 Minimum human intervention to configure the network.
- 4 Lower getting-started costs due to centralized administration.
- 5 Nodes in ad-hoc network do not rely on any hardware or software.
- 6 Self healing through continuous re-configuration.
- 7 Self-configuring nodes are also routers.

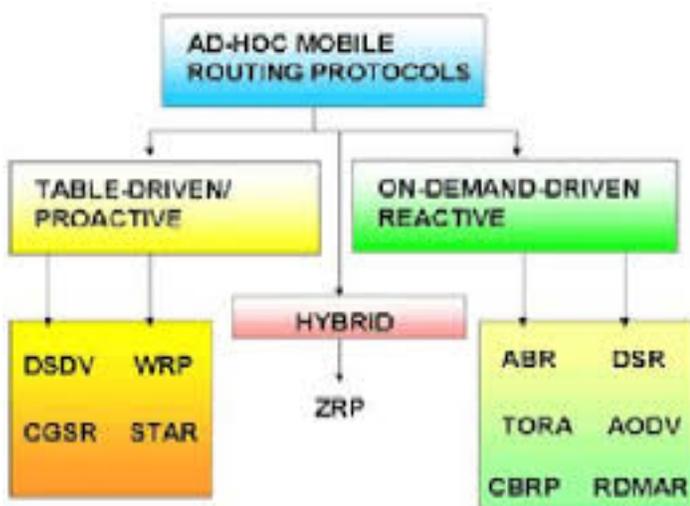
The importance of ad-hoc network is highlighted in many fields. The ad-hoc networking technology is gaining effort with increasing number of widespread applications. The ad-hoc network architecture can be used in real-time business applications, corporate companies to increase the productivity and profit.

## II. ROUTING PROTOCOLS FOR AD-HOC NETWORK.

A routing protocol is needed to discover the route from sender to receiver. The routing protocol should have these characteristics.

- 1 Minimal overhead of control functions.
- 2 Routing functionality over multiple hops.
- 3 Managing dynamic topology
- 4 Preventing loops in discovered routes.

Three basics approaches are taken for routing protocols in mobile ad-hoc network.



### 1 PROACTIVE routing protocols:

- Each node maintains route to other node.
- Periodically and/or event-based exchange of routing information.
- Unnecessary bandwidth wastage in sending control packets.
- Not suitable for large networks, as it needs to maintain route information every node's routing table.,
- Examples: DSDV(Destination Sequence Distance Vector Routing),OLSR(Optimized Link State Routing).

### 2 REACTIVE routing protocols(On demand)

- Sources initiate route discovery on demand.
- It does not need to search for and maintain the routes on which there is not route request.
- Very pleasing in resource limited environment.
- Only active routes are managed
- Less control overhead and better scalability than proactive routing protocols.
- Examples: AODV, DSR

### 3 HYBRID routing protocols

- Combination of both protocols.
- Example: ZRP

The reactive routing protocol (AODV) are now in the process of being standardized and implemented .AODV is designed for ad- hoc networks that vary in wide range of sizes from very small one enabled nodes to thousands of enabled nodes.

## III. AODV PROTOCOL

AODV protocol allows mobile nodes to quickly obtain routes for new destinations and it does not require nodes to maintain routes to destination that are not in active mode. AODV routing permits the mobile node to respond to link breakages and changing in network topology in timely manner. The routes are maintained as long as required by the sources. They also form trees to connect multicast group members. AODV make use of sequence number to ensure freshness of routes. AODV is considered as on demand algorithm that does not create any extra

traffic for communication along links. In AODV networks are silent until connections are established. In AODV control messages used are:

- Route Request Message(RREQ)
- Route Reply Message(RREP)
- Route Error Message(RERR)
- Route Reply Acknowledgement Message(RREP-ACK)

These messages are used to discover and maintain routes across the network from source to destination by use of UDP packets. Whenever there is need to create a new route to the destination, the node which is requesting broadcasts Route Requests. A Route is determined when this message reaches the next hop node (intermediate node with routing information to the destination) or the destination itself and the RREP has reached the originator of the request. Routes from the originator of the RREQ to all the nodes that receive this message are cached in these nodes. When a link failure occurs, Route Errors (RERRs) message is generated.

Source node broadcasts the packets to its neighbor nodes with RREQ and updates its table. Then these nodes further forwards packets to its neighbor until the destination find out and fresh route find out. Each node maintains its sequence number and broadcast ID. For every RREQ the node initiates broadcast ID which is incremented and together with the node's IP address uniquely identifies an RREQ. At last that route will be the final route that has the minimum hop count from source to destination.

## IV. PROPOSED METHODOLOGY

But in our proposed work, enhancement of AODV network is deployed same as in AODV networks. Nodes are free to move anywhere. There is no central controller in the system. Data transfer from source to destination.

Similarly with the help of RREQ message data is broadcast. RREQ message is sent from destination to source as a response. But main difference in Enhancement AODV is RREQ message than simple AODV. Header part is added in RREQ message which helps to find out the destination. To find out the best path first assumption is based upon the signal strength. Destination nodes check the vicinity of the adjacent nodes and those nodes further checks the vicinity of their adjacent nodes. After that source find out the average of the path. The path which has the maximum average value is selected as the final path. This value lies between 1 to 10. So this will overcome the problem of link failure. We will follow that path only which has the highest signal strength. Second assumption is based upon the hop count similar as AODV protocol. The path which has the minimum hop count is considered as the final path. Third assumption is based upon the sequence number.

## V. SIMULATIONS

Network Simulator (version 2), is known as NS2, it is an event driven simulation tool that has proved useful in studying the dynamic nature of communication networks. Simulation of

wired and wireless network functions and protocols like TCP, UDP and routing algorithms, can be done using ns2. The simulation is the technique which shows us the behavior of modal when actually embedded into the network. Figure 4.1 shows the basic architecture of ns2. NS2 provides users with an executable command ns which takes on input argument, the name of a Tcl simulation scripting file. Users are feeding the name of a Tcl simulation script as an input argument of an ns2 executable command ns. In most of the cases, a simulation trace file is created, and is used to plot graph and or to create animation.

## VI. RESULTS

### Throughput:

The efficiency of the AODV increase with the help of signal strength. The throughput the network is enhanced through the use of new proposed technique because the packet loss in the network is reduced. The results help to improve the performance of the system.

### Packet Loss:

During link failure problem packet loss occur in old AODV. But this problem can be overcome signal strength in enhanced AODV.

### Delay Graph:

Delay graph represents that old AODV has more delay than new AODV. Thus transmission is fast in new AODV which helps to improve performance.

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