Rough Set Based Ad Hoc Network:
A Review

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ABSTRACT

The ad hoc routing protocol's design has received a huge attention due to the unpredictable and rapid mobility of a node. It is created dynamically without any infrastructure. In ad hoc each node is responsible for routing the information between them. To improve the performance of unused information and to overcome the overhead in maintaining this information the protocols were designed. MANET (Mobile Ad hoc Network) is the collection of wireless mobile nodes which can dynamically form a network. By this definition we can conclude that there is no centralized administration, permanent topology and standard support services. Rough set theory is a computing technique to deal with uncertainty and vagueness. The notion of the thresholds and the temporal extensions to Rough Sets was applied in several protocols. The successful routing in MANETs using the Random Waypoint mobility model was based on various rough sets based protocol.

*Keywords: Ad hoc network, AODV, DSR, MANET, Rough set, Routing protocol*

1. INTRODUCTION

The basic requirement of modern communication system is unlimited mobility, from this requirement the concept of mobile communication is coming. There are two types mobile communication network is considered one is foxed infrastructure network and a second one is infrastructure-less network where no fixed backbone is present. Mobile ad hoc network is the example of infrastructure-less networks. Here the network consists of ad hoc nodes and all the nodes acts as routers and as well as hosts. Anywhere and anytime communication is possible in this network and the communication is done by multi-hop transmission. There are two types of wireless networking- Infrastructure networking and Ad

Figure 1. Ad hoc routing
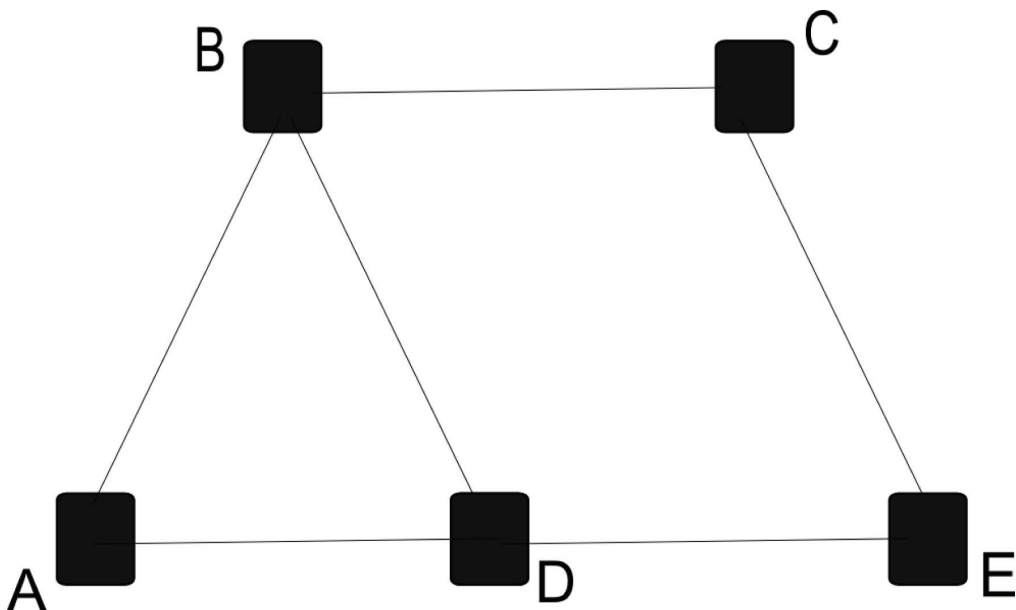
hoc networking. A fixed and wired backbone is present in infrastructure networking. Here the mobile communicates directly to an access point. This cellular network is perfect for the area where access points can be stationed. But ad hoc network has no base stations, means it is infrastructure less or it has multi hop. It is a collection of more than one device which is equipped with the wireless communications and network capability. It supports the computing anytime and anywhere. In ad hoc each mobile host acts as a router and supports peer-to-peer and peer-to-remote communications. It also reduced the administrative cost.

Figure 1 depicts a peer-to-peer, multi hop ad hoc network. Here the mobile node A directly communicates with single hop B whenever the channel is available. If the channel is not available, then the multi hop communication is necessary like *A->D->B*. To work in the multi hop communication, the intermediate nodes should route packet like a router. For the mobile ad hoc networks (MANETs), the routing packet between any pair of nodes is a challenging task. It is mainly because the nodes

can move randomly throughout the network. An approach that was accounted optimal at a specific point in time might not work at all in other situations. Furthermore, the stochastic attributes of the wireless channels add to the unpredictability of path quality. The operating environment as such might also create complication for indoor situations - as the closing of a door might cause a path to be disrupted. Traditional routing protocols are proactive in that they maintain routes to all nodes, including nodes to which no packets are being sent. They respond to any difference in the topology even if no traffic is affected by the change, and they need periodic control messages to maintain routes to every node in the network. The rate at which these control messages are sent must display the dynamics of the network in order to maintain authentic routes.

The main challenge in MANET is routing. The research is going on in the field of the shortest path algorithm from source to destination by applying different methods. There exist a large number of routing paths from source to destination node for the data transfer. A packet

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