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# A Brief Study on Various Issues and Challenges in MANET's

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**Abstract:** MANET's consists of many autonomous nodes which can move freely and all the nodes are self configuring nodes which do not have any infrastructure. Each node has to dynamically construct the routing table. There are several issues with Manet's such as routing, security battery and so on. Here all the nodes have to communicate with each to perform network functionalities because of no fixed infrastructure, so it has been very difficult to provide efficient hardware and software support for various applications. In this paper we try to present a study of various issues and challenges which are faced by the researchers in Manet's.

**Keywords**: Manet's, routing, security.

## 1. INTRODUCTION

A mobile ad hoc network consists of multiple nodes which do not depend upon the underlying infrastructure. All the nodes are characterized by the topologies which changes dynamically due to varying of nodes in different directions with a limited bandwidth and battery power. One of the main issues is to design a dynamic routing protocol which should be efficient and has less overhead [1]. Traditional wireless networks were limited by their need for infrastructure and these networks covers a limited area within the infrastructure range. Some time we require a fast dynamic network to be set up without any infrastructure or access point connectivity, in some situation such as battle field, disaster etc, Manet's is the only solution for this type of situation. Here all the nodes communicate with each other through a wireless link which can be established dynamically without a single point contact. Since there is no single point all the nodes can act as a router which can route information to other nodes in the network [2].

The main drawback of the mobile nodes is the battery capacity of each node and increasing the size of the battery is also not recommended, so effective utilization of the existing battery power should be made in order to achieve better performance. Over the years research studies are going on which addresses the issues and the solution to the problems are also been implemented. Most of the researchers are mainly focusing on the energy efficiency of each node and taking measures to overcome the node failure or loosing connectivity [3].

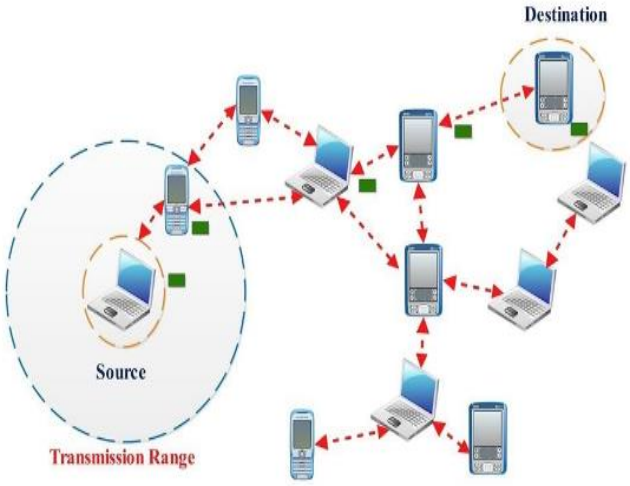


Fig: example of Manet's

## 2. CHARACTERISTICS OF MANET'S

1. **Topology:** In Manet's the topology will change dynamically based on the situation. There should be trust on the nodes in the network any compromise will lead to data loss in the network which is an also a serious concern. Many algorithms are introduced to provide security for the data and also to detect malicious node.
2. **Environment:** The functions in Manet's will be distributed to each and every node in the network and all the nodes cooperate with each other.
3. **Autonomous nodes:** Here all the nodes are autonomous in which the nodes can act as a host or a router and the node can leave the network at any instant of time.

4. **Shared Channel:** The channels is shared by all the nodes in the network.
5. **Bandwidth:** It is the capacity of the channel over which the data can be transferred from one node to another for a given amount of time.
6. **Scalability:** In Manet's many nodes join the network and may leave the network at an instant of time. The problem with this is the sharing of the communication link.
7. **Heterogeneous networks:** In Manet's nodes of varying hardware and capacity are present in the network, which provides any device to communicate with each other at any instant of time.

## 3. ISSUES IN MANET'S

i. **Routing:** Routing is one of the major issue in Manet's because of the dynamic nature and infrastructure less network.The nodes may join or leave the network so maintain the routing table is one of the biggest concerns in Manet's. Routing algorithms are divided into three main categories :

a) Table driven routing protocols
b) On demand routing protocols
c) Hybrid routing protocols

ii. **Multicasting:** Multicast communications means a group of nodes which communicates with each other. It is also known as one node communicating with much number of nodes. Multicast routing can be classified as

a) Application dependent: In which the multicast routing algorithms are designed for specific applications.
b) Application Independent: Here the routing algorithms are designed for general purpose.
c) The issues in multicasting are: i) Robustness ii) Efficiency iii) Overheard iv) Scalability v) Group Management

iii. **Medium access scheme:** Here the channel must be used effectively and the channel has to be shared among all the nodes in the network. The bandwidth should be shared among all the nodes effectively.
Some of issues are:

a) Bandwidth effectiveness
b) Quality of service (QoS)
c) Synchronization
d) Hidden nodes
e) Shared medium

iv. **Transport control Protocol:** The main task of TCP is to provide end to end connectivity and also to provide flow control, error control in the network.
Some of the issues are:

a) Traffic control
b) Throughput fairness
c) Congestion control
d) Flow control
e) Error control
f) Power and Battery control

v. **QoS:** It is the capacity of the network to provide better service in the network and effective utilization of the network resources. Because of the unique characteristics the quality of service depends upon the application.
Issues in QoS :

a) Dynamic topology
b) Lack of center authority
c) Shared medium
d) Hidden terminal
e) Insecure medium

vi. **Security:** Due to dynamic topological characteristics of Manet's, insecure medium allows the attacker to access the data which may cause loss, damage of data. It is very difficult to achieve the confidentiality, integrity, authentication over the data.
The security issues are:

a) Shared broadcast medium
b) Insecure environment
c) No central control
d) Limited resources

vii. **Unpredictability of the environment:** the nodes in Manet's may be deployed in unknown locations and areas where there is lot of chance for the node to fail and can easily be attacked by the attacker.

viii. **Limited Bandwidth:** In Manet's the bandwidth is low when compared to infrastructure networks. Since the bandwidth is limited effective utilization of the bandwidth is needed for better quality of service.

ix. **Topology:** The dynamic topological nature of the Manet's plays a very important role network communication. Since the nodes may change the location of it frequently, there is a chance for loss of information or compromising with other nodes in the network.

x. **Hidden channel problems:** This refers to the loss of data occurred during continuous transmission and collusion of packets in the

network of the nodes which are not in direct connection with the other node.

xi. **Packet loss:** In Manet's huge packet loss will occur, since the nodes will be changing the location dynamically maintaining the routing table is the biggest issue which causes huge loss of packets.

xii. **Battery:** Because of the limited battery generally the life time of the nodes are limited which is one of the major issues in Manet's and needs to be handled.

## 4. APPLICATIONS OF MANET'S

With the huge increase in mobile devices Manet's are gaining very significant and increase in various applications. Manet's allow users to access and communicate with each other irrespective of the location or the infrastructure, Since Manet's are infrastructure less it provides dynamic flexibility and more robust networks.

1) **Military sectors:** Now days each and every military device make use of computer component. Manet's provides a way for providing communication between the soldiers, vehicles and base camps etc. Such that they can transfer the information about the situation of the war field to intending users.

2) **Commercial sectors:** Whenever there is an emergency or an disaster occurred then there may be a chance of infrastructure network been collapsed in such situation Manet's plays an very important role, by automatically organizing with the network and transfer the information to the rescue teams.

3) **Home networks:** In home network there may be many devices connected together, in which the devices can easily communicate with each other and directly can exchange information.

4) **Sensor networks:** In this kind of topology, consists of very minute sensors which can be used to get some live data such as temperature, pressure, pollution and so on. Mobile adhoc sensor networks play key role in house hold applications.

## 5. CONCLUSION

The evolution of portable devices has led a new way for communication. MANET's play an very important role in this era. Besides the benefits of Manet's there are many issues and challenges which are been faced day to day. In this paper a brief study of various issues and challenges of Manet's were discussed.

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