

## **Mobile Ad-Hoc and Sensor Network**

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### **ABSTRACT**

The mobile ad hoc refers to a multi hop packet based wireless network. it is a self configuring infrastructure less network of mobile devices connected by wireless. It is also called as MANET (MOBILE AD-HOC AND SENSOR NETWORK). Each device in MANET is free to move independently in any direction.

A mobile Ad hoc network is an autonomous system of mobile routers connected by wireless links and that's union form an arbitrarily graph. Such a network may operate in a standalone fashion, or may be connected to the large internet. Main aim of this paper is to make review of mobile ad-hoc and sensor network.

**Key word:** Traffic sensor, Mobile-IP, MANET, macro mobility.

### **1. INTRODUCTION**

Ad hoc is a Latin word and means "for this purpose.[1] MANET s are a kind of wireless ad hoc networks that usually has a routable networking environment on top of a link layer ad hoc network. Mobile ad hoc network are the temporary networks which can be displayed anyplace and any time with the need of pre-existing infrastructure. A mobile Ad hoc network is an autonomous system of mobile routers connected by wireless links and that's union form an arbitrarily graph. Such a network may operate in a standalone fashion, or may be connected to the large internet.

### **2. MOBILE AD HOC AND SENSOR NETWORK**

Mobile ad hoc and sensor network is a self organized and adaptive network that can be formed and deformed on the fly without the need of any centralized administrator. A wireless sensor network consist of spatially distributed autonomous sensor to monitor physical and environmental condition such as temperature, sound, vibration, pressure motion and to cooperatively pass their data through the network to a main location. A wireless sensor network can be considered as a MANET of autonomous devices, which are spatially distributed. Sensor network cooperate with each other to disseminate the sensed or other data in the network.

### **3. CLASSIFICATION OF AD HOC NETWORKAN**

Ad hoc network can be classified into two main parts:

3.1 Mobile ad hoc network

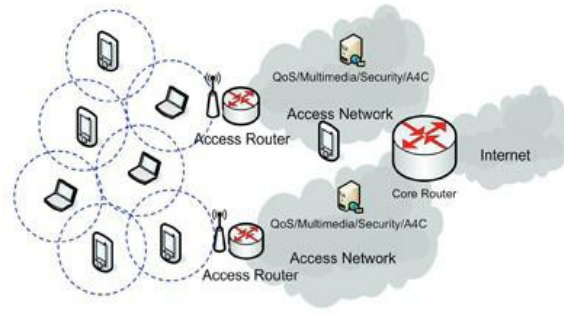
3.2 Mobile ad hoc sensor network

Unlike typical sensor networks, which communicate directly with a centralized controller, a mobile ad hoc sensor network follow a broader sequence of operational scenarios, thus demanding a less complex setup procedure. A ad hoc sensor consist of a number of sensor spread in a geographical area. Each sensor capable of mobile communication and has some level of intelligence to process signal and to transmit data.

#### 4. SOME EXAMPLE



**Fig: Mobile Sensor Network**



**Fig: Mobile Ad-hoc Network**

#### 5. DATA MONITORING AND MINING USING MANETs

MANET can be used for facilitating the collection of sensor data for data mining for Variety of application such as air pollution monitoring and different types of architecture can be used for such application [2]. A key characteristic of such application is that nearby sensor nodes monitoring an environmental feature typically registers similar values. The kind of data redundancy due to the spatial correlation between sensor observations inspires the technique for in-network data arrangement and mining. By measuring the spatial correlation between data sampled by the different sample by different sensor a wide class specialized algorithms can be developed to develop more efficient spatial data mining algorithms as well as more efficient routing strategies [3].

#### 6. CHALLENGE IN THE DESIGN OF MOBILE AD-HOC AND SENSOR NETWORK

- 1 No infrastructure
2. Peer to peer architecture with multi hop routing
3. Wireless medium
4. Node mobility
5. Stringent resource constrains

## **7. CLASSIFICATION OF ATTACKS ON MANET**

Attack on MANETs challenge the mobile infrastructure in which node can join and leave easily with dynamics request without a static path. Following attack are given below [1,4].

**7.1 Application layer:** Repudiation, malicious code

**7.2 Transport Layer:** Flooding, session hijacking.

**7.3 Network layer:** Sybil, Grey Hole, Location Disclosure, black hole

**7.4 Data link layer:** Selfish behavior, Malicious Behavior, Active, Passive.

**7.5 Physical:** Interference, Traffic Jamming.

## **8. PROBLEMS FOR MOBILE AD-HOC AND SENSOR NETWORK**

Following problems are in mobile ad hoc networks:

### **8.1 Battery-operated entities:**

- .Not always participants in an ad hoc network draw energy from batteries.
- . Desirable: long run type
- . Individual device

### **8.2 Mobility of participants:** In many ad hoc network applicants, participants move around:

- . In cellular network hand over to another base station
- . In ad hoc networks (MANET)
- . Complicated by scale

### **8.3limited range of wireless communication**

For many scenarios, communication with peers outside immediate communication range is required.

## **9. SIMULATION IN MANET**

There are several ways to study MANETS. One solution is the use of simulation tool like OPNET, Net Sim and NS2.

## **10. SECURITY CRITERIA FOR MOBILE AD HOC AND SENSOR NETWORK**

For secure mobile ad hoc network following criteria's are used

**1. Integrity:** it is the guarantees the identity of the message when they are transmitted [5].

A message can be removed, replayed by an adversary with malicious goal, which is regarded as malicious altering; on the contrary, if message is lost or its content is changed due to some benign failures.

**2. Availability:** The term availability means the node should maintain its ability to provide all the desired services regardless of the security state of it.

**3 Authorization:** Authorization is a process in which an entity is issued a credential which specifies the privilege, permission it has and can not be falsified by the certificate authority.

**4. Confidentiality:** Confidentiality means that certain information is only accessible to those who have been authorized to access it.

## **11. AD HOC NETWORKS AND INTERNET SECURITY:**

In order to provide Internet connectivity to the node in ad hoc networks, routers or one or more node in an ad hoc network can serve as gateway to an external network, where external network can be LAN, internet or cellular network. As shown in fig.

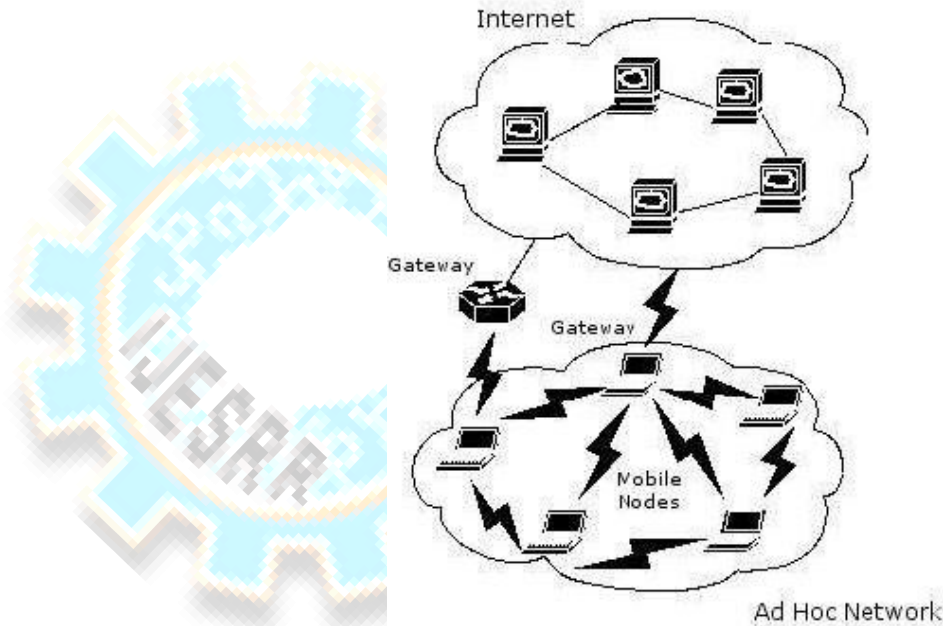


Fig: Internet connectivity in ad hoc network

Mobile IP provides macro mobility and ad hoc routing protocol provides micro mobility. Micro mobility is also called intra Domain mobility, is the moment of mobile node within its own network, while macro mobility is also called Inter domain mobility, is the moment of mobile node between different nodes or networks.

## 12. CONCLUSION

The rapid evolution in the field of mobile computing is driving a new alternative way for mobile communication, in which mobile devices form a self-creating, self-organizing, self-administrating wireless network called a mobile ad hoc network. Its intrinsic flexibility, lack of infrastructure, auto configuration, low cost and potential application makes it an essential part of future pervasive computing environments. As a consequence, the seamless integration of mobile ad hoc network with other wireless network will be an essential part of the evolution towards future fourth generation communication system network. The concise discussion in this paper shows that, despite the large effort in the MANET research community and rapid progress made during the last years, a lot of challenge technical issues remain unanswered. From an economical point of view, mobile ad hoc network opens up new business opportunities for telecom operators and service providers.

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