

# INTERNATIONAL JOURNAL OF RESEARCH IN COMMERCE, IT & MANAGEMENT

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## WIRELESS ROUTING PROTOCOLS AND ITS SECURITY ISSUES IN AD HOC NETWORK

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**ROHTAK**

### ABSTRACT

A network is normally a sequence of points or nodes interconnected by communication paths in the information technology. Networks means interconnect networks and also contain sub-networks. The most common topology or general configurations of networks include the Bus topology, Star topology, token ring and Mesh topologies. An Ad hoc network is the network that composed of individual devices that can be communicate with each other directly. Ad hoc network has also had two definitions:-"the first can be using what is on hand," while on the other hand is "for one specific purpose." i.e. members of an ad hoc committee they are studying a specific issue that might discover that they are attending the same event and decide to have an ad hoc meeting. A wireless ad hoc network is a collection of independent nodes or stations which communicate with each other by creating a multihop radio network. A network where nodes are all connected to each other can be called mesh network. A significant fact is that the connection is maintained in a decentralized way. Every node of a wireless ad hoc network is a user terminal and a router at the same time. The management of the network is distributed between all nodes.

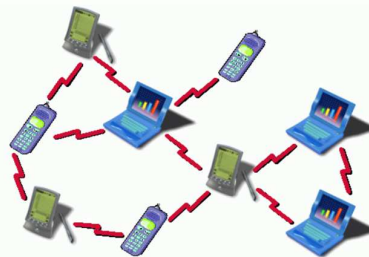
### KEYWORDS

wireless network, routing in ad hoc network, architecture of ad hoc networking, security issues, security attacks.

### INTRODUCTION

Now a day's wireless communication networks are used by millions of people in their daily routine. We use this technology for wireless Internet access with our personal computers, laptop, for data transfer between phones, and even to play multiplayer games with portable game console and so on. However, more of these wireless networks operate in ad hoc mode. These kinds of networks have many advantages over wired networks: ad hoc networks do not require infrastructure, they can be deployed instantly and they are highly flexible. MANET is a collection of two or more devices or nodes or terminals with wireless communications and networking capability that communicate with each other without the aid of any centralized administrator also the wireless nodes that can dynamically form a network to exchange information without using any existing fixed network infrastructure. And it's an autonomous system in which mobile hosts connected by wireless links are free to be dynamically and sometime act as routers at the same time. All nodes in a wireless ad hoc network act as a router and host as well as the network topology is in dynamically, because the connectivity between the nodes may vary with time due to some of the node departures and new node arrivals. The special features of Mobile Ad Hoc Network (MANET) bring this technology great opportunity together with severe challenges.

FIG 1: MOBILE NETWORK



### TYPES OF WIRELESS NETWORK

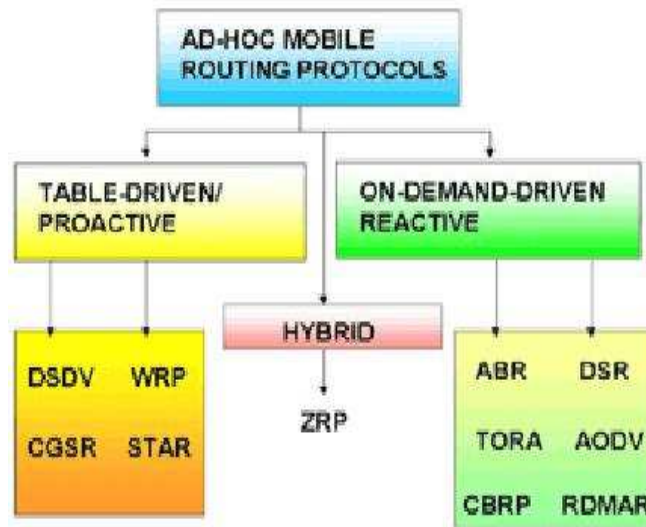
There are mainly three types of wireless network:

1. **Wireless Personal Area Networking (WPAN):-** WPAN describes an application of wireless technology that is intended to address usage scenarios that are inherently personal in nature. The emphasis is on instant connectivity between devices that manage personal data or which facilitate data sharing between small groups of individuals.
2. **Wireless Local Area Networking (WLAN):-** WLAN on the other is more focused on organizational connectivity not unlike wire based LAN connections. The intent of WLAN technologies is to provide members of workgroups access to corporate network resources be it shared data, shared applications or e-mail but do so in way that does not inhibit a user's mobility.
3. **Wireless Wide Area Networking (WWAN) :-** WWAN addresses the need to stay connected while traveling outside this boundary. Today, cellular technologies enable wireless computer connectivity either via a cable to a cellular telephone or through PC Card cellular modems. The need being addressed by WWAN is the need to stay in touch with business critical communications while traveling.

### ROUTING IN AD-HOC NETWORK

The basic routing problem is that of finding an ordered series of intermediate nodes that can transport a packet across a network from its source to its destination by forwarding the packet along this series of intermediate nodes. In traditional hop-by-hop solutions to the routing problem, each node in the network maintains a routing table: for each known destination, the routing table lists the next node to which a packet for that destination should be sent. Steering is a capacity in the system layer which decides the way from a source to a goal for the movement stream. A directing convention is required in light of the fact that it might be important to cross a few hubs (multi-bounces) before a parcel achieves the goal. The steering convention's principle capacities are the choice of courses for different source-goal sets and the conveyance of messages to their right goal. In remote systems, because of host portability, organize topology may change every now and then.

FIG 2: AD HOC ROUTING PROTOCOLS



1. **TABLE DRIVEN ROUTING PROTOCOLS:-** In the Table Driven Routing Protocol the information from each node to every node in the network which are maintains up-to-date. When a node needs to forward a packet, the route will be readily available; thus there is no delay in searching for a route. However, for a highly dynamic topology, the proactive schemes will spend a significant amount of scarce wireless resource in maintaining the updated routing information correct. The areas where they differ from the other are the number of necessary routing-related tables and the methods by which changes in network structure are broadcast. The main disadvantage of table driven implementation algorithm is- They react slow on any restructuring and if there are failures.
2. **ON DEMAND ROUTING PROTOCOLS:-** A different approach from table-driven routing is source-initiated on-demand routing. This type of routing creates routes only when desired by the source node. When a node requires a route to a destination, it initiates a route discovery process within the network. This process is completed once a route is found or all possible route permutations have been examined. Once a route has been established, it is maintained by some form of route maintenance procedure until either the destination becomes inaccessible along every path from the source or until the route is no longer desired.
3. **HYBRID ROUTING PROTOCOLS:-** In hybrid strategies, this protocol divide the network into zones (clusters) and run a proactive protocol within the zone and a reactive approach to perform routing between the different zones. This approach is better suited for large networks where clustering and partitioning of the network is very common.

**ARCHITECTURE OF ROUTING**

This refers the directing design must thoughtfully be on the level, that is, every address serves just as an identifier and does not pass on any data around one host to another that is topologically situated, concerning whatever other hub. The steering overhead increments quickly when the system gets to be bigger. The thought behind various leveled steering is to separate the hosts of a self-composed system into various covering or disjoint groups. One hub is chosen as bunch set out toward every group. This group head keeps up the enrollment data for the team. Hubs that are not group heads will, from this time forward, be alluded to as "customary hubs." When a standard hub needs to send a bundle, the hub can send the parcel to the bunch head that courses the bundle towards the goal." Team head Gateway Switch Routing (CGSR) and Cluster-Based Routing Protocol (CBRP) have a place with this kind of directing plan. Various leveled directing includes bunch, address, and portability administration."

**SECURITY ISSUES**

The security of any network is very important issue. In the security issues versatile remote systems are by large more inclined to security dangers than are altered link nets. The expanded probability of listening in, parodying, and dissent of administration assaults ought to be deliberately considered. Existing connection security strategies are frequently connected inside remote systems to lesson security dangers. Snooping is unapproved access to someone else's information. It is like listening in however is not really restricted to accessing information amid its transmission. Snooping can incorporate easygoing recognition of an email that shows up on another's PC screen or watching what another person is writing. More modern snooping utilizes programming projects to remotely screen action on a PC or system gadget. In system layer wormhole assault, a malevolent hub gets parcels at one area in the system and passages them to another area in the system, where these bundles are hate into the system. In Black gap assault, an assailant uses the directing convention to promote itself as having the most limited way to the hub whose parcels it needs to capture. An aggressor listens the solicitations for courses in a flooding based convention. At the point when the aggressor gets a demand for a course to the goal hub, it makes an answer comprising of a greatly short course.

**SECURITY ATTACKS**

Securing wireless ad hoc networks is a highly challenging issue. Understanding possible form of attacks is always the first step towards developing good security solutions. Ad hoc networks have to cope with the same kinds of vulnerabilities as their wired counterparts, as well as with new vulnerabilities specific to the adhoc context. Securing and designing an efficient routing protocol for wireless ad-hoc network is one of the most challenging tasks. Due to dynamic nature and no infrastructure of MANET demands a new set of networking strategies to be processed in order to provide effective and protected overhead free end-to-end communication. Because of lack of predefined centralized administration for route discovery procedure, results in the decrease in the performance of network. There are several types of attack that affect the MANET and its security. These attacks can be divided into two types:

- 1) Passive attack
- 2) Active attack

**Passive attack:** In passive attack, an unauthorized node controls and goals to search out information about the network. Attackers do not damage data in the network in place of it he examines traffic like recognizing communicating nodes, control data which is changed between them and steal important information. Passive attackers do not shatter the operation of routing protocols but try to discover the important information from routed traffic. Passive attack is used to achieve the information for future harmful effects. They do not examine to adjust or change the data packets. Some of the examples of passive attack include:

- Traffic monitoring
- Snooping
- Eavesdropping
- Traffic analysis

➤ Release of message contents

**Active attack:** Active attack can alter or change the state of the data in the network such as message modification, denial of services, message fabrications, congestion etc. it shatter the normal functionality of the network and launched by the nodes with authorization to process with in a network. Active attacks are divided into four groups i.e. *dropping, modification, timing attacks and fabrication*. Active can be of two types may be internal or external. An external active attack can be brought out by any outside source that do not belong to the network. An internal active attack is malicious nodes that are part of a network. They are hard to find out as compare to external attack. Some of the active attack includes:

- Spoofing
- Modification
- Denial of service
- Masquerade
- Network Jamming
- Impersonating
- Message reply

There are numerous sort of shortcoming in any system. Powerlessness is a shortcoming that is inborn in a security framework or a system gadget, for example, switch, switch, desktop, server or security gadget itself. Any framework associated with the system might be helpless against unapproved information control as it doesn't confirm the client's character to get to the information. As MANET is a remote adhoc arrange it is substantially more inclined to assaults contrasted with a wired system. A portion of the vulnerabilities are talked about beneath.

## CONCLUSION

Through this paper I got a conclusion that Ad hoc networking is at the center of the evolution towards the 4<sup>th</sup> generation wireless technology. Its intrinsic flexibility, ease of maintain and also require lack of infrastructure, automated-configuration, self-administration and also its capabilities, and significant costs advantages make it a prime candidate for becoming the stalwart technology for personal pervasive communication. The opportunity and importance of ad hoc networks is being increasingly recognized by both the research and industry community.

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