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REVIEW ON MOBILE AD HOC NETWORK (MANET)

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ABSTRACT

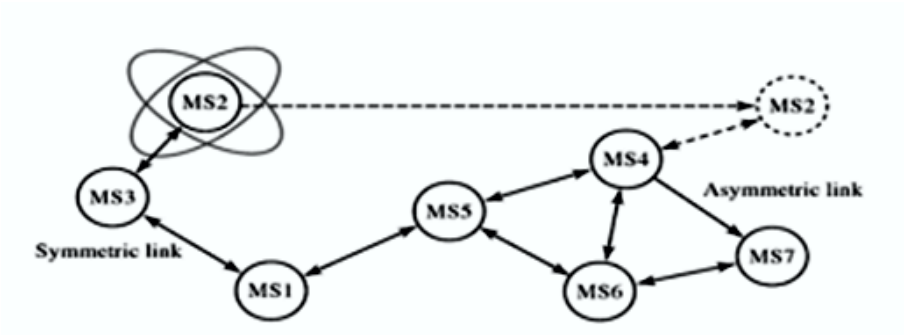
A mobile ad hoc network (MANET) is a collection of mobile nodes that are dynamically and arbitrarily located in such a manner that the interconnections between nodes are capable of changing on a continual basis. In order to facilitate communication within the network, a routing protocol is used to discover routes between nodes. The primary goal of such an ad-hoc network routing protocol is correct and efficient route establishment between a pair of nodes so that messages may be delivered in a timely manner. Route construction should be done with a minimum of overhead and bandwidth consumption. This paper examines routing protocols for ad-hoc networks and evaluates these protocols based on a given set of parameters. The paper provides an overview of eight different protocols by presenting their characteristics and functionality, and then provides a comparison and discussion of their respective merits and drawbacks.

Key Words: Features of MANET, Characteristics of MANET, Challenges, Applications of MANET.

1. INTRODUCTION

MANET is an infrastructure less, independent or self directed wireless system, consist of many mobile nodes which are connected and communications via wireless links .It is dynamic and multi-hop technology, which is complied with the bandwidth, restricted wireless links.

MANET is an ad hoc network which does not require any infrastructure support for carrying data packets between two nodes. MANET is an ad hoc network for mobile or much simply called as mobile ad hoc network which is a continuous self ordered, infrastructure-less network of mobile devices connected wirelessly. Mobile ad hoc networks possess a flat network infrastructure. It has a shared medium which is highly demandable for radio communication. In MANET architecture every computer or node means any device is a router as well as end host. The nodes or devices in the MANET architecture are in general autonomous. MANET has a dynamic topology architecture which highly promotes mobility. In the MANET architecture, every node also works as a router since they route packets for other nodes.



2. FEATURES OF MANET

There are various features of MANET as listed below:

Partitioned operations

Autonomous terminal

Multi hop routing

Dynamic network topology

Fluctuating link capacity

Light weight terminals

3. CHARACTERISTICS OF MANET

Some characteristics of ad hoc network are as follows:

Dynamic topologies: nodes are free to move arbitrarily; thus the network topology may be changed randomly and unpredictably and primarily consists of bidirectional links. In some cases where the transmission power of two nodes is different, a unidirectional link may exist.

Bandwidth-constrained and variable capacity links: wireless links continue to have significantly lower capacity than infrastructure networks.

Energy-constrained operation: some or all of the MSs in a MANET may rely on batteries or other exhaustible means for their energy. For these nodes or devices, the most important system design optimization criteria may be energy conservation.

Limited physical security: MANETs are generally more prone to physical security threats than wire line networks. The increased possibility of eavesdropping, spoofing, and denial of services (DoS) attacks should be considered carefully. To reduce security threats, many existing link security techniques are often applied within wireless networks.

4. CHALLENGES OF MANET

Limited Bandwidth

Dynamic Topology

Routing Overhead

Hidden terminal problem

Packet losses due to transmission errors

Mobility-induced route changes

Battery constraints

Security threats

5. APPLICATIONS OF MANET

Some specific applications of ad hoc networks include industrial and commercial applications involving cooperative mobile data exchange. There are many existing and future military networking requirements for robust, IP-compliant data services within mobile wireless communication networks, with many of these networks consist of highly dynamic autonomous topology segments. Advanced features of Mobile ad hoc networks, including data rates compatible

with multimedia applications global roaming capability, and coordination with other network structures are enabling new applications.

Defense applications

Crisis management.

Telemedicine

Tele-geoprocessing applications

Virtual Navigation

Education via the internet

Vehicular area network

Personal area networking

Collaborative and Distributed computing

Emergency operations

CONCLUSIONS

A tremendous advancement has been witnessed in the field of mobile communication in the past few years. Thus various opportunities are opened up in the field of ad hoc networks these days. MANET is a group of wireless mobile hosts which builds a temporary network without the requirement of any centralized administration or backbone support services. MANET proved itself a versatile network nowadays but is quite unreliable due to its less attack handling capability i.e. it is less immune to attacks. Routing is the utmost part of any network which also retains its significance in MANET architecture. Various types of routing protocols are used for different types of MANET architectures to ensure the desired path for transmission of message packets between source and destination.

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