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**A REVIEW OF CHALLENGES IN MULTIPATH
ROUTING FOR ADHOC NETWORKS**

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A Review of Challenges in Multipath Routing For ADHOC Networks

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Abstract – Mobile ad hoc networks countenance different challenges in routing. Various routing protocols has been assessed for enhanced recital in terms of delays, throughputs, load balancing and overcrowding control in multipath routing which is widely used in MANET. This paper discusses challenges in multipath routing for adhoc networks.

Keywords: Multipath Routing, Adhoc Networks, Packet, Communications Technologies

INTRODUCTION

Routing is the process of forwarding of a packet in a network so that it reaches its intended destination. The main goals of routing are:

1. **Correctness:** The routing should be done properly and correctly so that the packets may reach their proper destination.
2. **Simplicity:** The routing should be done in a simple manner so that the overhead is as low as possible. With increasing complexity of the routing algorithms the overhead also increases.
3. **Robustness:** Once a major network becomes operative, it may be expected to run continuously for years without any failures. The algorithms designed for routing should be robust enough to handle hardware and software failures and should be able to cope with changes in the topology and traffic without requiring all jobs in all hosts to be aborted and the network rebooted every time some router goes down.
4. **Stability:** The routing algorithms should be stable under all possible circumstances.
5. **Fairness:** Every node connected to the network should get a fair chance of transmitting their packets. This is generally done on a first come first serve basis.
6. **Optimality:** The routing algorithms should be optimal in terms of throughput and minimizing mean packet delays. Here there is a trade-off

and one has to choose depending on his suitability.

MANET stands for Mobile Ad Hoc Network. The Ad Hoc network that is used for mobile communication is called MANET. It is an infrastructure less IP based network of mobile and wireless machine nodes connected with radio. In operation, the nodes of a MANET do not have a centralized administration mechanism. It is known for its routable network properties where each node act as a "router" to forward the traffic to other specified node in the network.

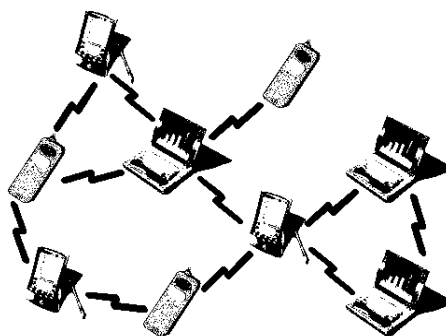


Fig 1: Mobile Ad hoc Network

Source [1]

REVIEW OF LITERATURE:

With recent performance advancements in computer and wireless communications technologies, advanced mobile wireless computing is expected to see increasingly widespread use and application, much of which will involve the use of the Internet Protocol (IP) suite. The vision of mobile ad hoc networking is to support robust and efficient operation

in mobile wireless networks by incorporating routing functionality into mobile nodes. Such networks are envisioned to have dynamic, sometimes rapidly-changing, random, multihop topologies which are likely composed of relatively bandwidth-constrained wireless links. Within the Internet community, routing support for mobile hosts is presently being formulated as "mobile IP" technology.

In MANET, it has observed that in transport layer level the application running on wireless nodes. There is technique by which a secret message is divided into multiple packets and through the use of multipath routing; the packets can be delivered to the destination via multiple paths. This enhances data confidentiality in MANET and reducing the probability of message negotiating and eavesdropping. This is done by the delivery of a secret key among multiple free paths although it has communicated to the network. Disadvantage is more collision occurs among correlated routes due to multipath routing and degrades network performance like packet delivery ratio [2, 3, 4, and 31].

MANET CHALLENGES: [1]

A MANET environment has to overcome certain issues of limitation and inefficiency. It includes:

- The wireless link characteristics are time-varying in nature: There are transmission impediments like fading, path loss, blockage and interference that add to the susceptible behavior of wireless channels. The reliability of wireless transmission is resisted by different factors.
- Limited range of wireless transmission – The limited radio band results in reduced data rates compared to the wireless networks. Hence optimal usage of bandwidth is necessary by keeping low overhead as possible.
- Packet losses due to errors in transmission – MANETs experience higher packet loss due to factors such as hidden terminals that results in collisions, wireless channel issues (high bit error rate (BER)), interference, and frequent breakage in paths caused by mobility of nodes, increased collisions due to the presence of hidden terminals and uni-directional links.
- Route changes due to mobility- The dynamic nature of network topology results in frequent path breaks.
- Frequent network partitions- The random movement of nodes often leads to partition of the network. This mostly affects the intermediate nodes.

CONCLUSION:

Various issues associated with routing protocol such as energy consumption, routing discovery, load balancing and security of multipath routing has been analyzed as a major challenges in multipath routing for mobile adhoc networks.

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