An Efficient Approach for Routing in Mobile Adhoc Network (A Review Paper)

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ABSTRACT: Wireless Network is very attracted area for researchers for providing new capabilities. One important challenge is to design sensor networks that have long system lifetimes. In recent years, a broad research has been done in the domain of Mobile Ad-hoc Networks(MANETs). Due to the bounded resources in MANETs, to develop a reliable and efficient routing approaches still a threat or issues. There are distinct aspects appropriate for research like synchronization, power consumption, routing, bandwidth consideration, etc. This paper concentrates on routing approach which is the major challenging concern due to the change in topology of ad-hoc networks. Under a number of network scheme, such as network topology and size, it is difficult to figure out which routing protocol may perform well. In this paper we contribute an outline of broad range of the current routing approaches, with aspecial focus on their comparison, functionality and characteristics.

KEYWORDS:Introduction, Routing, comparison of algorithms, challenges, conclusion.

I. INTRODUCTION

Manet is a continuously self configuring, infrastructure less network of mobile devices which are connected without wires.Wireless network is divided into two categories:- Infrastructured network and Adhoc network .A mobile ad hoc network is an autonomous system of various mobile routers connected by wireless links . There are various Sensor nodes which consist of sensing, data processing, and communication components and typically form ad hoc networks.MANETs are mainly constructed to support cooperative work in environments without network infrastructures. The main challenge in building a MANET is equipping each device to continuously maintain the information required to properly route traffic. The objective of Manet is to support robust and efficient operation in mobile . Ado network does not rely on any certain topology and coordination point. Routers may be move freely so wireless topology can be change rapidly, so it is a very difficult task to sending and receiving a packet to the destination node. Manet works on the dynamic topology ,it is having limited source of energy.

II. LITERATURE REVIEW

In MANETS the mobile nodes are connected by multi-hop without any infrastructure requirement. The main aim of the MANETs is to provide robust and efficient operation in mobile environments. In ad-hoc networks all the mobile nodes are dynamically connected in an arbitrary manner. Nodes in such network maintain their own routes to other nodes in the network. An Ad hoc wireless network is a collection of two or more devices with wireless communications and networking capability. An Adhoc wireless network is self-organizing and adaptive. This means that a formed network can be de-formed on-the-fly without the need for any system administration. The term "ad hoc" tends to imply "can take different forms" and "can be mobile, standalone, or networked".

2.1 Characteristics of Manet:-

Manet is having various features and characteristics' which makes it popular among all. some of them are:
➢ Nodes can perform the task of both host and the routers. No need to make the routers and host different.
➢ It basically work on the dynamic topology. Manet can move in any direction independently.
➢ Communication via wireless, no need to take the burden of wires.
➢ Network can be extended to that places which cannot be wired
➢ It provide more flexibility and the adapt easily to change in configuration of the network.
➢ Limited physical security: More prone to physical security threats than fixed cable networks.

2.2 Application:

➢ *Virtual navigation*: Data from a remote database is transmitted periodically in small relevant blocks using links present in the path of the automobile. This database may contain the graphical representation of streets, buildings, maps and the latest traffic information, which may be used by the driver to decide on a route.
➢ *Tele-medicine*: Conference assistance from a surgeon for an emergency intervention.
➢ *Tele-Geo processing*: Queries regarding location information of the users.
➢ *Crisis-management*: Natural disasters, where the entire communication infrastructure is in disarray.
➢ *Education via the internet* is the main application

2.3 Broadcasting Techniques Used In Manet:

➢ **Unicasting:** In this techniques the information(data) is send from source to single destination.
➢ **Multicasting**: In this techniques the information is send from source to assets of destination.
➢ **Broadcasting:** in this technique the messages are flooded from a source to all other nodes in the specified Adhoc networks.
➢ **Geocasting:** In this technique the information is send from the source to all other nodes inside a geographical region.

2.4 Routing in MANETS – Goals:

➢ To provide the maximum possible reliability - use alternative routes if an intermediate node fails.
➢ To choose a route with the least cost metric.
➢ Give the nodes the best possible response time and throughput.
➢ Route computation must be distributed. Centralized routing in a dynamic network is usually very expensive.
➢ Routing computation should not be involve the maintenance of global state.
➢ Every node must have quick access to routes on demand.
➢ Each node must be only concerned about the routes to its destination.
➢ Broadcasts should be avoided (highly unreliable).
➢ It is desirable to have a backup route when the primary route has become stale.

2.5 Types of wireless networks:

Infrastructured network:-A network with fixed and wired gateways. When a mobile unit goes out of range of one base station, it connects with new base station.
Infrastructureless (ad hoc) networks:-All nodes of these networks behave as routers and take part in discovery and maintenance of routes to other nodes.
Two Main categories of Protocols:
1.Table Driven Routing Protocols:-Pro-active, learn the network's topology before a forwarding request comes in.
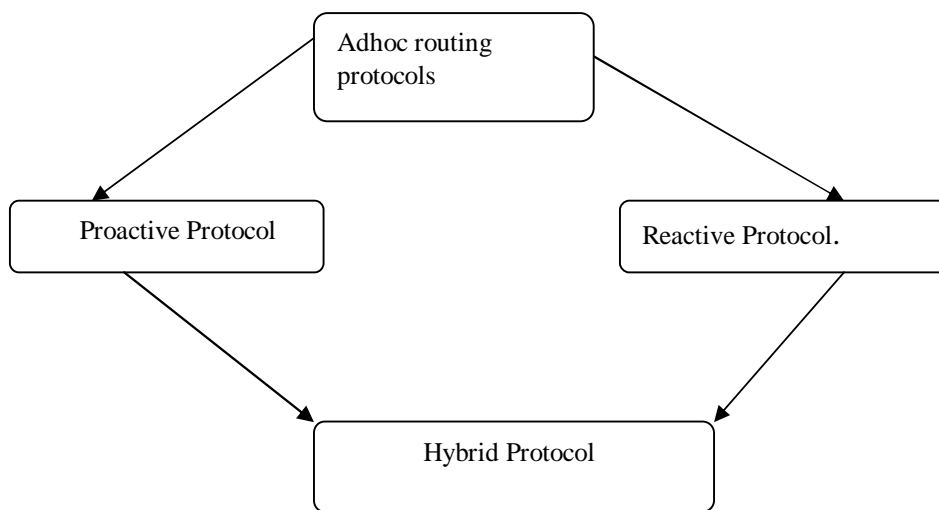2.On-Demand Routing Protocols:-Re-active, become active only when needed.

III. RELATED WORK

1.   ROUTING CLASSIFICATION

The family tree:
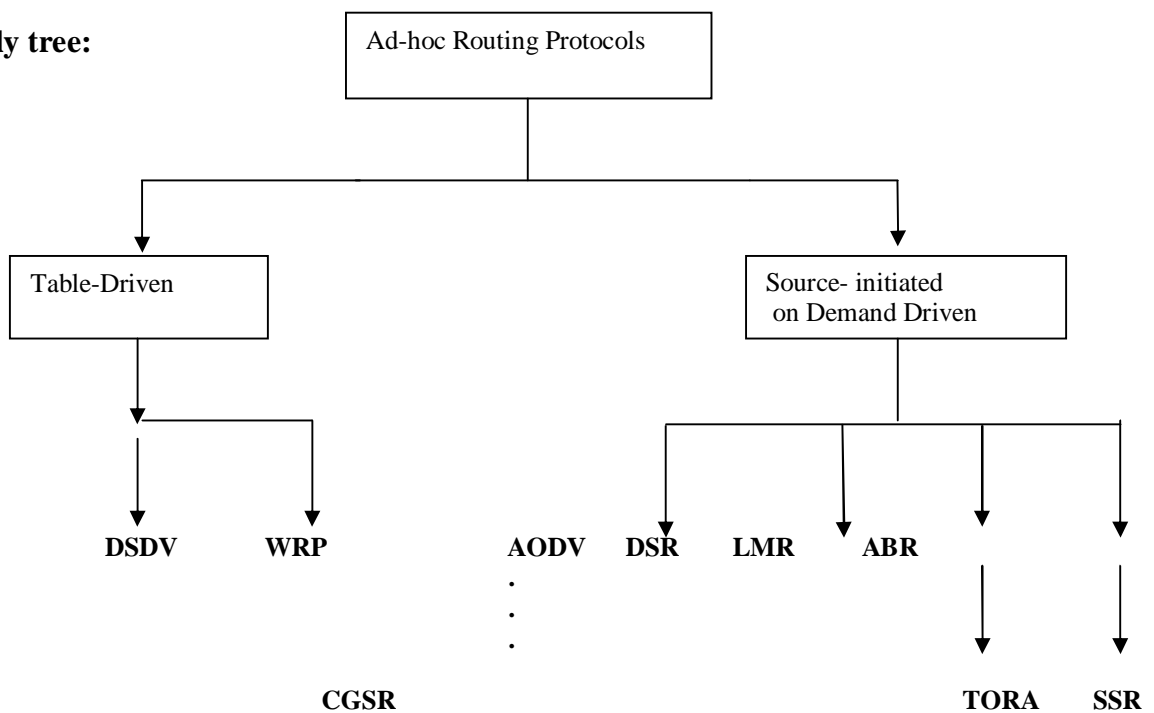
TABLE 1: COMPARISON OF PROACTIVE ROUTING PROTOCOLS

Parameters	DSDV	WRP	OLSR
Route Updates	Periodic	Periodic	Periodic
Loop Free	Yes	Yes	Yes
Routing Overhead	High	High	Low
Caching Overhead	Medium	High	High
Throughput	Low	Low	Medium
Routing Tables	2	4	4

TABLE 2: COMPARISON OF REACTIVE ROUTING PROTOCOLS

Parameters	AODV	DSR	TORA
Route Creation	By source	By source	Locally
Periodic updation	No	No	No
Performance metrics	Speed	Shortness	Speed
Routing overhead	High	High	High
Caching overhead	Low	High	Medium
Throughput	high	Low	Low
Multipath	No	Yes	Yes
Route updation	Non-periodic	Non-periodic	High routing overhead

TABLE 3: COMPARISON OF HYBRID ROUTING PROTOCOLS

Parameters	ZRP	ZHLS	DST	DDR
Routing Structure	Flat	Hierarchical	Hierarchical	Hierarchical
Multiple routers	No	Yes	Yes	Yes
Beacons	Yes	No	No	Yes
Route information stored in	Intrazone & Interzone tables	Intrazone & Interzone tables	Route tables	Intrazone & Interzone Tables
Route metric	Shortest path	Shortest path	Forwarding using the tree neighbours	Stable Routing
Advantage	Reduced transmissions	Low control overhead	Reduced transmission	No zone coordinator or zone map
Disadvantage	Overlapping zones	Static zone map required	Root node	Neighbors may become bottlenecks

TABLE 4: COMPARISON BETWEEN THE THREE CATEGORIES OF ROUTING

Parameters Table-	Driven (Proactive)	On-Demand (Reactive)	Hybrid
Storage Requirements	Higher	Dependent on no. of routes maintained or needed	Depends on size of each zone or cluster
Route Availability	Always Available	Computed As Per Need	Depends On Location Of Destination
Periodic Route Updates	Required Always	Not Required	Used Inside Each Zone
Delay	Low	High	Low For Local Destinations And High For Inter zone
Scalability	100 Nodes	> 100	> 100
Control Traffic	High	Low	Lower That Other Two Types
Routing Information	Keep Stored In Table	Doesn't Store	Depends On Requirement
Routing Philosophy	Mostly Flat	Flat	Hierarchical

Comparisons Of Protocol

In this section we have presented a comparison between existing routing protocols. TABLE 4 below provides an overall comparison of the three categories of routing protocols. The hybrid routing protocols employ both reactive and proactive properties by maintaining intra-zone information proactively and inter-zone information reactively. Another way to reduce routing overheads is by using conditional updates rather than periodic ones. In on demand routing protocols, the flooding-based routing protocols such as DSR and AODV will also have scalability problems. Hybrid routing protocols such as the ZHLS may also perform well in large networks. ZRP is another hybrid routing protocol which is designed to increase the scalability of MANETs. It maintains strong network connectivity (proactively) within the routing zones while determining remote route (outside the routing zone) quicker than flooding. Table 4 shows the comparison of all the three categories of ad hoc routing protocols.

IV.FUTURE RESEARCH AREA

Routing is a process of finding an efficient, reliable and secure path from a source node to a destination node via intermediate nodes in a network. Routing in MANET is a challenge due to dynamic topology in network as mobile nodes can move in any direction in the MAMET. In our algorithm we have created a algorithm which will calculate the shortest route on the bases of the shortest path count ,the algo is named as SPCR(Shortest path Counting Routing).

Each node will send a DR packet to the source node .First check the type of a node, whether it is gateway node or a normal node. If, it is a normal node mark it as a sleep node ,and if it is a Gateway node then it will broadcast a message until the destination is achieved and path is incremented by +1. Also check the each node weather they are destination node or not. If the path Count will be same from both the path then we will consider the path having the shortest distance from the source to destination. We can also consider the path which covers the less no of nodes.

V.CONCLUSION

In this paper, we have presented and discussed the taxonomy of routing protocols in mobile ad hoc networks and provided comparisons between them. The protocols are divided into three main categories: (i) source-initiated(reactive or on-demand), (ii) table-driven (pro-active), (iii) hybrid protocols. The analysis of the different proposals has demonstrated that the inherent characteristics of ad hoc networks, such as lack of infrastructure and rapidly changing topologies, introduce additional difficulties to the already complicated problem of secure routing. Still mobile ad hoc networks have posed a great challenge for the researchers due to changing topology and security attacks, and none of the protocols is fully secured and research is going on around the globe.

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