Survey of Routing Protocol in Wireless Network

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***Abstract*- . Ad Hoc Networks are complex distributed systems that consist of wireless mobile or static nodes that can freely and dynamically self-organize. In this way they form arbitrary, and temporary "Ad hoc" networks topologies, allowing devices to seamlessly interconnect in areas with no pre-existing infrastructure .In this paper we study about types of routing protocol.**

Keywords :AODV.DSR,DSDV

INTRODUCTION

Wireless network can be classified two ways Infrastructured wireless networks Infrastuctureless (Ad-hoc) wireless networks In Infrasturctured networks each node directly connected to the nearly base station. Every node gets the signals directly from the nearly base station. In this network we need the base stations at very small distance because a base station have limited coverage area .It is very costly network also because the cost of a base station is very higher. Some other problems in this network are we need a specific destination for the base station from where it covers the maximum area. These are the some problems comes in the infastuctured wireless networks . To reduce these anomalies IEEE discovered new network called infrastuctureless wireless networks also called Ad-hoc network. In this network each node connected to the node or nearly base station. This network also called node to node network. This network establishes a peer to peer relationship. An example of the mobile adhoc network is that a group of soldiers move in outdoors while communicating with one another though the radios without a central controller to control the communication in the network.[6]. Compared to wire networks mobile networks have unique characteristics. In this networks node mobility may cause frequent network topology changes, which are rare in wired networks. In contrast to the stable link capacity of wired networks, wireless link capacity continually varies because of the impacts from transmission power, receiver senility, noise, fading and interference. Additionally wireless mobile networks have a high error rate. Power restrictions and bandwidth limitations.[7] Adhoc networks are very useful in emergency search and rescue operations in which the user wants to share quickly information and data

II. Routing Protocol

This adhoc network routing protocols can be divided into two categories.

Table driven routing protocols -> in table driven routing protocols, consistent and up to date routing information to all nodes is maintained at each node.

On demand routing protocols -> in on demand routing protocols, the routes are created as and when required. When a source wants to send to a destination, if invoke the route discovery mechanisms to find the path to the destination [1].

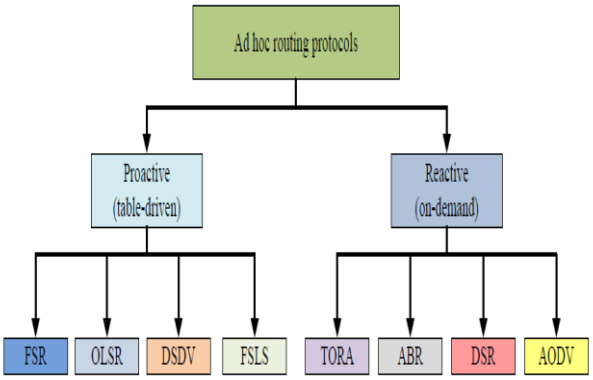

Fig 2.1 Types to Routing Protocols

2.1 Classification of adhoc routing protocols

- **DSDV- Destination Sequenced Distance Vector**
- **DSR- Dynamic Source Routing**
- **AODV- Adhoc On Demand Distance vector**

1.Destination Sequenced Distance Vector – DSDV
DSDV is distance vector routing protocol. Each node has a routing table that indicates for the each destination, which is the next hop and number of hops to the destination. Each node periodically broadcasting

routing updates. A sequence number is used to tag each route. It shows the freshness of the route: a route with higher sequence number is more favorable. In addition, among two routes with the same sequence number, the one with fewer hops is more favorable. If a node detects that a route to a destination has broken, then its hop number is set to infinity and its sequence number updated but assigned an odd number even numbers correspond to sequence numbers of connected paths.

2.Adhoc on Demand Distance Vector –

AODV is a distance vector type routing. It does not require nodes to maintain routes to destinations that are not actively used. As long as the endpoints of a communication have valid routes to each other, AODV does not play a role.

The protocol uses different messages to discover and maintain links: Route Requests (RREQs), Route Replies (RREPs), and Route Errors (RERRs). These message types are received via UDP, and normal IP header processing applies.

AODV uses a destination sequence number for each route entry.The destination sequence number is created by the destination for any route information it sends to requesting nodes. Using destination sequence numbers ensures loop freedom and allow to know which of several routes is more" fresh". Given the choice between two routes to a destination, a requesting node always selects the one with the greatest sequence number.

When a node wants to find a route to another node is found with a "fresh enough" route to the destination (a "fresh enough" route is a valid route entry for the destination whose associated sequence number is at least as great as that contained in the RREQ). Then a RREP is sent back to the source and the discovery routes are made available.

Nodes that are part of an active route may offer connectivity information by broadcasting periodically local Hello messages (special RREP message) to its immediate neighbors. If Hello messages stop arriving from a neighbor beyond some given time threshold, the connection is assumed to be lost.

When node detects that route to a neighbor node is not valid it remove the routing entry and sends a RERR message to neighbor that are active and use the route; this is possible by maintaining active neighbor lists. This procedure is repeated at nodes that receiver RERR message. A source that receives an RERR can reinitiate a RREQ message. AODV does not allow handling unidirectional links.

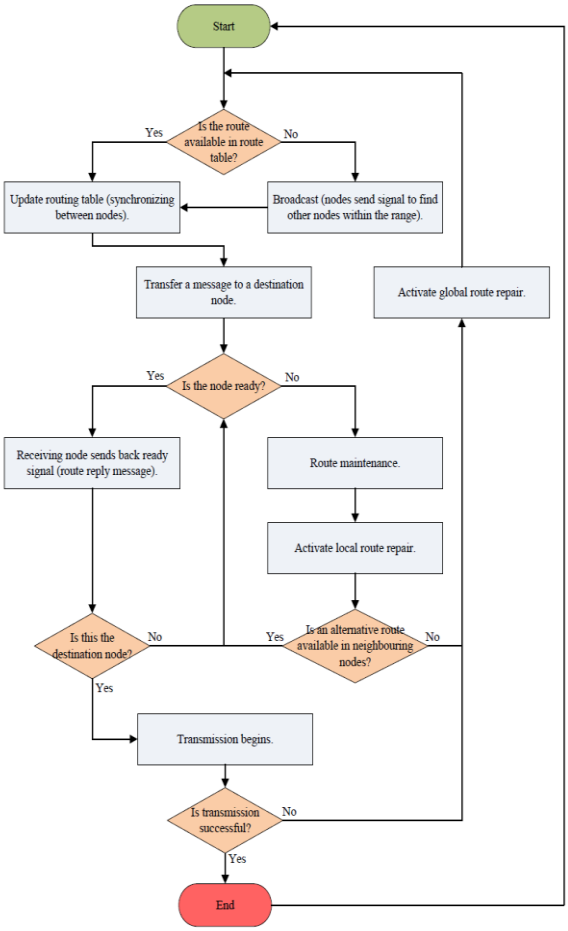

Fig no 2.2 Routing Algorithm AODV

Dynamic Source Routing –DSR

Designed for mobile adhoc networks with up to around two hundred nodes with possibly high mobility rate. The protocol work "on demand", i.e. without any periodic updates. Packets carry along the complete path they should take. This reduces overheads for large routing updates at the network. The nodes store in their cache all known routes. The protocol is composed of route discovery and route maintenance. At route discovery, a source requesting send a packet to a destination broadcasts a Route Request (RREQ) packet. Nodes receiving RREQ is further transmitted and the node adds its own address to the recorded hop sequence. This continues till the destination or a node with a route to the destination is reached. The route back can be retrieved by the reverse hop record. As routes need not be symmetric, DSR checks the Route Cache of the replying nodes and if a route is found, it is used instead. Alternatively, one can piggyback the reply on a RREQ targeted at the originator. Hence unidirectional links can be handled.

Route maintenance: when originating or forwarding a packet using a source route, each node

transmitting the packet is responsible for confirming that can flow over the link from that node to the next hop. An acknowledgement can provide confirmation that a link is capable of carrying data. Acknowledgement are often already part of the MAC protocol in use (such as the link layer acknowledgement frame defined by IEEE 802.11), or are "passive acknowledgment ", i.e. a node know that its packet is received by an intermediate node are since it can hear that the intermediate node further forwards it. If such acknowledgements are not available then a node can request an acknowledgement (which can be sent directly to the source using another route). Acknowledgement may be requested several time (till some given bound), and in the persistent absence of acknowledgement, the route is removed form from the Route Cache and return a "Route Error " to each node that has been sent a packet routed over that link since an acknowledgement was last received. Nodes overhearing or forwarding packets should make use all carried routing information to update its own Route Packet.

III.Related Work

Mayank Aggarwal "literature review of communication protocol in vehicular network" In the year 1998, the team of engineers from Delphi Delco Electronics System and IBM Corporation proposed a *network vehicle* concept aimed at providing a wide range of applications . With the advancements in wireless communications technology, the Concept of network car has received an immense amount of attention all over the world. This has resulted into a strong interest in developing vehicular network (VANET) techniques, to enable communication between vehicles, or between vehicles and fixed Infrastructures. Now an increasing number of car manufacturers are equipping vehicles with an on-board computing and wireless communication devices, in-car sensors and GPS systems, in preparation for the deployment of large-scale vehicular networks. Federal Communication Commission (FCC) has allocated 75 MHz of spectrum at 5.9GHz for Dedicated Short-Range Communications (DSRC). In the recent years, quite a few projects have been initiated, targeting on realizing the dream of network car and successful implementation of vehicular networks. The project Network on Wheels (NOW) is a German research project founded by DaimlerChrysler AG, BMW AG, Volkswagen AG, Fraunhofer Institute for Open Communication Systems, NEC Deutschland GmbH and Siemens AG in 2004. The main objectives of this project are to solve technical issues related to communication protocols and data security for car-to-car communications. The Car2Car Communication Consortium is founded by six European car manufacturers. Its goal is to create a European industrial standard for car-to-car communication spanning all brands. Fleet Net was another European program which ran from 2000 to 2003 and developed platforms for inter-vehicle communications with ad hoc networking to support applications including emergency warnings and unicast communications between vehicles.

PROKOPIOS C. KARAVETSIOS AND ANASTASIOS A. ECONOMIDES "Performance comparison of Distributed Routing Algorithm in Ad Hoc network" Most previous work on routing protocols for ad hoc networks analyses the performance of only a single algorithm. The performance of the DSDV routing protocol, which is one the most famous routing protocols for multi-hop ad hoc networks, is analyzed in Its Packet Delivery Fraction (PDF) and Routing Overhead are evaluated. No comparison is made to other routing protocols. ZRP (Zone Routing Protocol) is described and demonstrated in this protocol is suitable for highly versatile networks, characterized by a large range of nodal mobility and large network diameters according to the related paper. AODV-UU differs from others since it is exclusively for Linux. DSDV and AODV appear to be the most appropriate routing algorithms for small networks with few nodes. They achieve high PDF (Packet Delivery Fraction), low routing overhead and low Average Delay. They are efficient algorithms because they can easily find routes that approach the optimal routes. Comparisons among the routing algorithms in ad hoc mobile networks are very difficult to be done because the advantages for one protocol constitute disadvantages for others considers Packet Delivery Fraction (PDF) and Routing Overhead, as the main performance metrics for DSDV, AODV and DSR without measuring the Average Delay Time. However, they do not suggest the most appropriate routing algorithms for different network conditions. In this paper, we provide an extensive comparison of DSDV and AODV under various network situations.

YACHUAN CHEN "Episodic perspective of Wireless Network Dependability" Dependability has a number of different attributes. According to Laprie 1995, the concept of dependability and includes attributes like availability, reliability, maintainability, safety, confidentiality and integrity. In this work, we study wireless network survivability in additional to reliability, maintainability and availability. The reason to include network survivability is simply because it is so important to measure how many customers can still receive services when a network is experiencing significant disturbances. The higher the survivability, the better chance a carrier has of satisfying customers in times of network stress. Integrity and confidentiality are not in the scope of this study. The purpose of this section in to review the literature, and define the dependability attributes and metrics used in this research.

Michele Nogueira Lima, Aldri Luiz dos Santos, Guy Pujolle " A Servey of sarvivability in Mobile Ad Hoc Network This section describes several initiatives on building survivable mobile ad hoc networks. Despite many of them do not present a complete survivable proposal; they have goals, characteristics and mechanisms more correlated to properties and requirements of survivability than just preventive or reactive schemes. Since some papers survey conventional security defense lines this work focuses on security propositions that aggregate more than one defense line and apply some technique of tolerance as redundancy or recovery. Initiatives found in the literature are categorized on three main groups: route discovery, data forwarding, and key management and access control. The route discovery group consists of approaches trying to make route discovery phase of routing protocols more resistant and tolerant to different kinds of attacks and Intrusion. The data forwarding group is composed of initiatives specialized on data forwarding using preventive or reactive security schemes and some tolerance techniques, as redundancy. The last one includes cryptographic key management and access control approaches built to be more tolerant to at- tacks.

CONCLUSIONS

Ad hoc networks inherit several features of these networks, in particular high bit error rates and path asymmetry, and add new problems that come from mobility and multi-hop communications, such as network partitions, route failures, and hidden (or exposed) terminals.. We studied for different types of routing .

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