STUDY EXPLORATION ON TABLE - PROTOCOL ROUTING DRIVEN FOR MANET

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Abstract-

In MANET routing protocols are categorized into three types among Proactive routing protocols is one and it is also called table-driven routing protocol, it strives to sustain uniform, current routing report within every pair of connections in the network by disseminating, proactively, route updates at fixed time intervals. The proactive routing addresses intended for ad hoc networks determined from the conventional routing protocols. In the table driven protocol family, nodes manage one or more routing tables about nodes in the system. This routing protocol will renew and improve the routing table report either regularly or correspondingly following an acknowledgement to change in the network topology. So in this paper exploring all routing protocols of table-driven like DSDV, WRP, OLSR, and OSPF.

Keywords- DSDV, WRP, OLSR, OSPF, Proactive routing protocols.

I.INTRODUCTION

The primary characteristic of proactive approaches is that each node in the network sustains a path to every other node in the system at all times. MANET stands for Mobile adhoc Network also called a wireless adhoc network or adhoc wireless network that usually has a routable networking environment on top of a Link Layer ad hoc network.. They consist of a set of mobile nodes connected wirelessly in a self-configured, self-healing network without having a fixed infrastructure. MANET nodes are free to move randomly as the network topology changes frequently. Each node behaves as a router as they forward traffic to other specified nodes in the network.

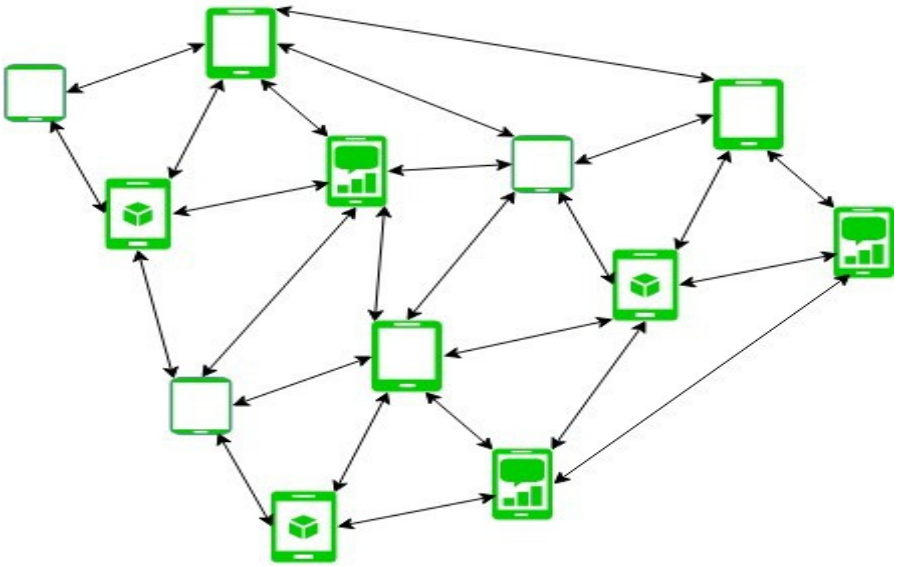

Figure - Mobile Ad Hoc Network

A mobile ad hoc network (MANET) is a network of wireless mobile devices. A node can be a laptop, a PDA, a mobile phone, or any mobile device with the ability to communicate with other devices. The topology of the network keeps on changing over time as nodes may move about, some new nodes join the network, or some other nodes disengage themselves from the network. The network is created, managed, and organized purely by the nodes themselves without the assistance of any centralized third party or fixed infrastructure. Consequently, cooperation of the nodes among themselves is the platform on which this network is built. A node not only uses the network for communicating with other nodes, but also supports the network by performing routing functions. A node that wants to communicate with another node which is not within its communication range takes the help of the intermediate nodes to relay its message. MANETs have distinct advantages over traditional networks in that they can easily be set up and dismantled, apart from providing flexibility as the nodes are not tethered.

A MANET is an attractive and cost-effective solution for providing communication in areas where fixed infrastructure is not available, not reliable, or setting up fixed infrastructures is not a viable option due to constraints such as geographical location and financial implications. Since they are self-organized and self-managed, ad hoc networks can be rapidly deployed with minimum user intervention. Apart from being operable as a stand-alone network, ad hoc networks can also be attached to the Internet or other networks, thereby extending connectivity and coverage more importantly to areas where there are no fixed infrastructures. Present and future MANET applications cover a variety of areas. An overview of these applications adapted from [1] and [2] are given in Table 1.

Table 1 . MANET Applications

Applications	Descriptions/Services
Tactical networks	• Military communications, operations • Automated battlefields
Sensor networks	•

Applications	Descriptions/Services
	• Home applications: smart sensor nodes and actuators embedded in consumer electronics • Environmental applications including tracking movements of animals, chemical/biological detection, precision agriculture, tracking of weather and earth activities, etc. • Body area networks (BAN)
Emergency services	• Search and rescue operations, as well as disaster recovery • Replacement of fixed infrastructure in case of earthquakes, hurricanes, fire, etc. • Supporting doctors and nurses in hospitals
Commercial and civilian environments	• E-Commerce: electronic payment anytime from anywhere • Business: dynamic databases, mobile offices • Vehicular services: inter-vehicle network for road or accident guidance, transmission of information regarding weather and road conditions • Community network in areas where setting up fixed infrastructure is not a viable solution due to financial and geographical considerations • Sports stadiums, trade shows, shopping malls, network of visitors at airports
Home and enterprise networking	• Home/office wireless networking • Personal area Network (PAN) • Conferences and meeting rooms
Education	• Universities and campus settings • Virtual classrooms • Ad hoc communication during meetings and lectures
Entertainment	• Multiuser games • Outdoor Internet access • Robotic pets

Applications	Descriptions/Services
Location aware services	• Follow-on services: call-forwarding, mobile workspace • Information services: location-specific services and time-dependent services • Infotainment: touristic information
Coverage extension	• Extending cellular network access • Linking up with Internet, intranets, etc.

Although MANET is turning out to be a technology with a wide variety of application areas, securing MANET is a still a challenging issue. Due to the wireless mobile ad hoc nature of MANET, it is more vulnerable to information and physical security compared with fixed wired networks. Moreover, security solutions for fixed wired networks are not easily adaptable to mobile wireless networks. This chapter attempts to present the inherent security challenges of MANET and the approaches that are currently adopted or proposed to address these challenges.

Route creation and maintenance succeeded through some combination of periodic and event-triggered routing updates. Periodic updates consist of routing information exchanges between nodes at set time intervals. The updates occur at specific intervals, regardless of the mobility and traffic characteristics of the network. Event-triggered updates, on the other hand, are transmitted whenever some event, such as a link addition or removal, occurs. The mobility rate directly impacts the frequency of event-triggered updates because link changes are more apparent to happen as mobility increments. Proactive methods have the benefit that routes are accessible the significance they are needed. Because each node consistently maintains a current path to every other node in the network, a source can just check its routing table when it has data packets to send to some destination and create packet delivery. Despite, the fundamental limitation of these protocols is that the control overhead can be vital in large networks or networks with rapidly moving nodes. Further, the amount of routing state maintained at each node. Proactive protocols tend to perform well in systems where there is a significant number of data sessions within the network. In these networks, the overhead of maintaining each of the paths is justified because many of these paths comprised. Proactive routing protocol [7] Includes Destination-Sequenced Distance-Vector (DSDV) [3][6] protocol, Wireless Routing Protocol (WRP), Optimized Link State Routing Protocol (OLSR) [1][2] and Fisheye State Routing (FSR).

There are various types of Table Driven Protocols such as

- Destination-Sequenced Distance Vector routing (DSDV)
- Wireless routing protocol (WRP)
- Optimized Link State Routing protocol (OLSR)
- Open Shortest Path First Routing Protocol (OSPF)

Destination-Sequenced Distance Vector routing (DSDV)

DSDV is a unicast [5], table driven, proactive MANET protocol which comprises for routing based on the Bellman-Ford algorithm with improved routing mechanisms to obtain a good performance. DSDV routing table entry consists of information about next hop destination address, a total cost metric of destination routing path and sequence number. Destination creates a sequence number in DSDV to

distinguish between the stale and the additional routes for avoiding loops. DSDV is more efficient than the link state algorithm due to less computation and storage space; however, this algorithm might cause short and long-lived loops since nodes select the next hop in a distributed fashion that can be incorrect due to stale routes. The modification can imply in the algorithm that reduces some looping problems by explicitly implementing an inter-nodal coordination protocol for nodes. The routing report is mainly achieved through multicasting or broadcasting in a periodical packet updates if any differences in the topology are likely to be discovered. DSDV needs each node to communicate its routing table to its every contemporary next-door-neighbor from time to time based on the assessment such that every node always locates another node in the network when required. In wireless networks, the broadcasting includes a restricted range because of wireless medium physical properties as correlated to wired networks.

Wireless routing protocol (WRP)

WRP uses distributed Bellman-Ford algorithm and providing routing knowledge between all the nodes in the network is acknowledged to be the surpassing goal. Each node in the system is accountable for maintaining four tables; they are the Distance table, Routing table, Link Cost table, and Message Retransmission List (MRL) table. The MRL table consolidates the sequence number of the update message, a retransmission counter and a list of updates which signify in the update message. To improving the dependability in the manner of delivering update messages, it becomes compulsory on the part of every neighbor to send Acknowledgments (ACKs) for each update packet received obtained. When no update messages are needed to comprise, it involves periodical exchanges of the empty "HELLO" messages. When no "HELLO" messages happen received in a specified period, it calls for the need to check if the link is still reachable. If the node receives a "HELLO" message from a new node, the node proceeds to the routing table. The four routing tables cause memory as overhead, and to support individual connectivity, the "HELLO" messages produced. It follows route finding algorithm which determines the problem of count-to-infinity with correspondence check which is performed by each node on predecessor information reported by its entire neighbor. Also, it provides a faster route convergence when a link failure in the network occurs [4].

Optimized Link State Routing protocol (OLSR)

OLSR is a proactive routing protocol with all nodes constituting a routing table which encompasses routing information of every node in the network. The routes can signify if and when they are required. OLSR can be deemed to be the most advantages version of a general link state protocol, and so the topological changes are found to instrumentalize a volley of topological information to all available nodes in the network.

The two fundamental concepts used in this protocol are:

a) Multipoint Relay Selection - Multipoint Relay (MRP) [8] broadcasts the message to the nodes which comprised during the flooding process. In comparison to flooding, it can be observed that it paves the way for the reduction message overhead. In the flooding mechanism, every node conveys each message again on obtaining the first copy of the communication. In OLSR, the link state information remains about only nodes chosen as MPRs.

b) Optimized link state - Optimization is accomplished by the number of control messages which signify flooded in the network. OLSR provides an optimal route to the hops. This protocol can be suitable for an extensive and dense network.

Open Shortest Path First Routing Protocol (OSPF)

The shortest path first is widely applied in network routing protocols, and the most notable is the OSPF dynamic routing protocol. Which is observed to be a link state routing protocol and it is a part of interior

gateway protocols group. OSPF involves the complete network topology. The essential performances of the OSPF routing protocol shown in the following steps:

A. Startup: When a router is turned on it will send the Hello packets to all neighboring devices, and the router receives the Hello packets in response. (From here the routing connections are synchronized with adjacent routers which are inclined to synchronize).

B. Update: Respective router determines to send an update message which transpires as "link state" it can be depended upon to report its database to all other devices. So that all the routers equated contemporaneously have an up to date description of each topology denoting linked to the specific router.

C. Shortest path tree: Each router will calculate a mathematical data structure known as the "shortest path tree" it is observed to be describing the shortest path to the destination address in all probability. It will investigate to open the shortest path first.

CONCLUSION

In this paper discussed about table-driven routing protocol, in MANET there are three types routing protocol and proactive routing protocol maintain routing information in table, in order to understand different table driven routing protocols explorative study is required so in this every protocol explained like DSDV, WRP, OLSR, and OSPF. And to this extension in next paper I will explain another MANET routing protocol.

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