Simon, J Comput Eng Inf Technol 2022, 11:9

Journal of Computer Engineering & Information Technology

Commentry

A SCITECHNOL JOURNAL

Study of Performance of Routing Protocols for Mobile Ad Hoc Networking

Fitouchi Simon*

Department of Computer Engineering, University of Sathyabama, Chennai, Tamil Nadu, India

***Corresponding Author:** Fitouchi Simon, Department of Computer Engineering,University of Sathyabama, Chennai, Tamil Nadu, India.E-mail: simonouchi@gmail.com

Received date: 23 August, 2022, Manuscript No. JCEIT-22-61686;

Editor assigned date: 26 August, 2022, Pre QC No. JCEIT-22-61686(PQ);

Reviewed date: 31 August, 2022, QC No. JCEIT-22-61686;

Revised date: 16 September, 2022, Manuscript No. JCEIT-22-61686 (R);

Published date: 29 September, 2022, DOI: 10.4172/jceit.1000249

Description

Ad hoc networking allows portable devices to establish communication independent of a central infrastructure. However, the fact that there is no central Infrastructure and that the devices can move randomly gives rise to various kind of problems, such as routing and security. In this thesis the problem of routing is considered. This paper addresses issues pertaining to two different routing protocols Destination Sequenced Distance vector (DSDV) and Dynamic Source Routing (DSR) protocols, which are used for efficient routing under different scenarios in Mobile Ad-hoc Network (MANET), which plays a critical role in places where wired network are neither available nor economical to deploy. Objective of this paper to show the implementation of two routing protocols using Network Simulators and run it for different number of nodes. Then compared the two routing protocols for different network parameters and studied the efficient protocol under a particular scenario on the basis of two metrics. Packet delivery ratio Routing load DSDV is a Proactive gateway discovery algorithm where the gateway periodically broadcasts a gateway advertisement message which is transmitted after expiration of the gateways timer. DSR is a Reactive gateway discovery algorithm where a mobile device of MANET connects by gateway only when it is needed.

Wireless Cellular Systems

Wireless cellular systems have been in use since 1980s. We have seen their evolutions to first, second and third generation's wireless systems. Wireless systems operate with the aid of a centralized supporting structure such as an access point. These access points assist the wireless users to keep connected with the wireless system, when they roam from one place to the other. The presence of a fixed supporting structure limits the adaptability of wireless systems. In other words, the technology cannot work effectively in places where there is no fixed infrastructure. Future generation wireless systems will require easy and quick deployment of wireless networks. This quick network deployment is not possible with the existing structure of current wireless recent advancements such as Bluetooth introduced a new type of wireless systems known as mobile ad-hoc networks. Mobile ad-hoc networks or "short live" networks operate in the absence of fixed infrastructure. They offer quick and easy network deployment in situations where it is not possible otherwise. Ad-hoc is a Latin word, which means "for this or for this only." Mobile ad-hoc network is an autonomous system of mobile nodes connected by wireless links; each node operates as an end system and a router for all other nodes in the network. Nodes in mobile ad-hoc network are free to move and organize themselves in an arbitrary fashion. Each user is free to roam about while communication with others. The path between each pair of the users may have multiple links and the radio between them can be heterogeneous. This allows an association of various links to be a part of the same network. A mobile ad-hoc network is a collection of mobile nodes forming an ad-hoc network without the assistance of any centralized structures. These networks introduced a new art of network establishment and can be well suited for an environment where either the infrastructure is lost or where deploy an infrastructure is not very cost effective. The popular IEEE 802.11 "WI-FI" protocol is capable of providing ad-hoc network facilities at low level, when no access point is available. However in this case, the nodes are limited to send and receive information but do not route anything across the network. Mobile ad-hoc networks can operate in a standalone fashion or could possibly be connected to a larger network such as the Internet. Mobile ad-hoc networks can turn the dream of getting connected "anywhere and at any time" in to reality. Typical application examples include a disaster recovery or a military operation. Not bound to specific situations.

Reactive routing technique is also known as on-demand routing. It takes a different approach of routing which overcomes the disadvantages of proactive routing. In reactive approaches those nodes which require connectivity to the Internet reactively find Internet gateways by means of broadcasting some kind of solicitation within the entire ad hoc network. This approach reduces the overhead of maintaining the route table as that of proactive. The node dynamically checks the route table, and if it does not find an entry for its destination or it finds an outdated entry it performs route discovery to find the path to its destination. The signaling overhead is reduced in this method, particularly in networks with low to moderate traffic loads. However it has a drawback of route acquisition latency. That is when corresponding entry is not found the route discovery mechanism occurs which takes a very large amount of time. This protocol is based on classical Bellman-Ford routing algorithm designed for MANETS. Each node maintains a list of all destinations and number of hops to each destination. Each entry is marked with a sequence number. It uses full dump or incremental update to reduce network traffic generated by rout updates. The broadcast of route updates is delayed by settling time. The only improvement made here is avoidance of routing loops in a mobile network of routers. With this improvement, routing information can always be readily available, regardless of whether the source node requires the information or not. DSDV solve the problem of routing loops and count to infinity by associating each route entry with a sequence number indicating its freshness.

Broadcast of Route Updates

Protocol is based on classical Bellman-Ford routing algorithm designed for MANETS. Each node maintains a list of all destinations and number of hops to each destination. Each entry is marked with a sequence number. It uses full dump or incremental update to reduce network traffic generated by rout updates. The broadcast of route updates is delayed by settling time. The only improvement made here is avoidance of routing loops in a mobile network of routers. With this improvement, routing information can always be readily available, regardless of whether the source node requires the information or not. DSDV solve the problem of routing loops and count to infinity by associating each route entry with a sequence number indicating its freshness. In DSDV, a sequence number is linked to a destination node, and usually is originated by that node (the owner). The only case that a non-owner node updates a sequence number of a route is when it detects a link break on that route. An owner node always uses even-numbers as sequence numbers, and a non-owner node always uses odd-numbers. With the addition of sequence numbers, routes for the same destination are selected based on the following rules: a route with a newer sequence number is preferred; in the case that two routes have a same sequence number, the one with a better cost metric is preferred. The list which is maintained is called routing table. The routing table contains the all available destinations' IP address, Next hop IP address, Number of hops to reach the destination, Sequence number assigned by the destination node, Install time. The sequence number is used to distinguish stale routes from new ones and thus avoid the formation of loops. The stations periodically transmit their routing tables to their immediate Neighbors. A station also transmits its routing table if a significant change has occurred in its table from the last update sent. So, the update is both time-driven and event-driven. As stated above one of “full dump" or an incremental update is used to send routing table updates for reducing network traffic. A full dump sends the full routing table to the neighbors and could span many packets whereas in an incremental update only those entries from the routing table are sent that has a metric change since the last update and it must fit in a packet. If there is space in the incremental update packet then those entries may be included whose sequence number has changed. When the network is relatively stable, incremental updates are sent to avoid extra traffic and full dump are relatively infrequent. In a fast-changing network, incremental packets can grow big so full dumps will be more frequent. Each route update packet, in addition to the routing table information, also contains a unique sequence number assigned by the transmitter. The route labelled with the highest sequence number is used. If two routes have the same sequence number then the route with the best metric is used. Based on the past history, the stations estimate the settling time of routes. The stations delay the transmission of a routing update by settling time so as to eliminate those updates that would occur if a better route were found very soon. Each row of the update send is of the form. After receiving an update neighbouring nodes utilizes it to compute the routing table entries. To damp the routing fluctuations due to unsynchronized nature of periodic updates, routing updates for a give destination can propagate along different paths at different rates.