Routing In Mobile Ad-Hoc Networks

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***Abstract*- Y As mobile networking continues to experience increasing popularity, the need to connect large numbers of wireless devices will become more prevalent A mobile ad hoc network (MANET), is a self-configuring network of mobile devices connected by wireless links. Each device in a MANET is free to move independently in any direction, and will therefore change its links to other devices frequently. Each must forward traffic unrelated to its own use, and therefore be a router. The primary challenge in building a MANET is equipping each device to continuously maintain the information required to properly route traffic. Such networks may operate by themselves or may be connected to the larger Internet. MANETs are a kind of wireless ad hoc networks that usually has a routable networking environment on top of a Link Layer ad hoc network.**

Keywords- Manets, routing, wireless,protocol.

I INTRODUCTION

The growth of laptops and 802.11/Wi-Fi wireless networking have made MANETs a popular research topic since the mid- to late 1990s. Many academic papers evaluate protocols and abilities assuming varying degrees of mobility within a bounded space, usually with all nodes within a few hops of each other and usually with nodes sending data at a constant rate. Different protocols are then evaluated based on the packet drop rate, the overhead introduced by the routing protocol, and other measures. In ad hoc routing protocol is a convention, or standard, that controls how nodes decide which way to route packets between computing devices in a mobile ad-hoc network . In ad hoc networks, nodes do not start out familiar with the topology of their networks; instead, they have to discover it. The basic idea is that a new node may announce its presence and should listen for announcements broadcast by its neighbours. Each node learns about nodes nearby and how to reach them, and may announce that it, too, can reach them. Note that in a wider sense, ad-hoc protocol can also be used literally, that is, to mean an improvised and often impromptu protocol established for a specific purpose In our paper we concentrate on different routing protocols which are extensively used in MANETS.

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Advantages

DSDV was one of the early algorithms available. It is quite suitable for creating ad hoc networks with small number of nodes. Since no formal specification of this algorithm is

We can list the routing protocols as follows:

i. Pro-active (table-driven) routing
ii. Reactive (on-demand) routing
iii. Flow-oriented routing
iv. Adaptive (situation-aware) routing
v. Hybrid (both pro-active and reactive) routing
vi. Hierarchical routing protocols
vii. Geographical routing protocols
viii. Power-aware routing protocols

II PROACTIVE ROUTING

This type of protocols maintains fresh lists of destinations and their routes by periodically distributing routing tables throughout the network. The main disadvantages of such algorithms are:

Respective amount of data for maintenance.
Slow reaction on restructuring and failures.
Examples of pro-active routing are
Destination-Sequenced Distance-Vector Routing (DSDV) is a table-driven routing scheme for ad hoc mobile networks based on the Bellman-Ford algorithm. It was developed by C. Perkins and P.Bhagwat in 1994. The main contribution of the algorithm was to solve the Routing Loop problem. Each entry in the routing table contains a sequence number, the sequence numbers are generally even if a link is present; else, an odd number is used. The number is generated by the destination, and the emitter needs to send out the next update with this number. Routing information is distributed between nodes by sending full dumps infrequently and smaller incremental updates more frequently.

For example the routing table of Node A in this network is

Dest	Next Hop	No. of Hops	Seq Number	Install Time
A	A	0	A 46	001000
B	B	1	B 36	001200
C	B	2	C 28	001500

Selection of Route

If a router receives new information, then it uses the latest sequence number. If the sequence number is the same as the one already in the table, the route with the better metric is used. Stale entries are those entries that have not been updated for a while. Such entries as well as the routes using those nodes as next hops are deleted.

present there is no commercial implementation of this algorithm. Many improved forms of this algorithm have been suggested.

Disadvantages
DSDV requires a regular update of its routing tables, which uses up battery power and a small amount of bandwidth even when the network is idle.
Influence
While DSDV itself does not appear to be much used today[citation needed], other protocols have used similar techniques. The best-known sequenced distance vector protocol is AODV, which, by virtue of being a reactive protocol, can use simpler sequencing heuristics. Babel is an attempt at making DSDV more robust, more efficient and more widely applicable while staying within the framework of proactive protocols.

III REACTIVE ROUTING

This type of protocols finds a route on demand by flooding the network with Route Request packets. The main Disadvantages
High latency time in route finding. Excessive flooding can lead to network clogging.
Examples are AODV,DSR

IV FLOW BASED ROUTING

This type of protocols finds a route on demand by following present flows. One option is to unicast consecutively when forwarding data while promoting a new link.
Disadvantages
Takes long time when exploring new routes without a prior knowledge. May refer to entitative existing traffic to compensate for missing knowledge on routes.
Examples are LBR- LINK LIFE BASED ROUTING

V ADAPTIVE ROUTING

This type of protocols combines the advantages of proactive and of reactive routing. The routing is initially established with some proactively prospected routes and then serves the demand from additionally activated nodes through reactive flooding. Some metrics must support the choice of reaction.
Disadvantages
It depends on amount of nodes activated
Reaction to traffic demand depends on gradient of traffic volume.
Examples are TORA (Temporally-Ordered Routing Algorithm) (Temporally-Ordered Routing Algorithm), LRR(Link Reversal Routing)

VI HYBRID ROUTING

This type of protocols combines the advantages of proactive and of reactive routing. The routing is initially established with some proactively prospected routes and then serves the demand from additionally activated nodes through reactive flooding. The choice for one or the other method requires predetermination for typical cases.
Disadvantage
Reaction to traffic demand depends on gradient of traffic volume.
Examples are ARPAM, HRPLS, HSLS, OORP, ZRP.

VII HIERARCHICAL ROUTING

This type of protocols the choice of proactive and of reactive routing depends on the hierarchic level where a node resides. The routing is initially established with some proactively prospected routes and then serves the demand from additionally activated nodes through reactive flooding on the lower levels. The choice for one or the other method requires proper attributation for respective levels.
Disadvantages
Advantage depends on depth of nesting and addressing scheme.
Reaction to traffic demand depends on meshing parameters.
Examples are CBRP, CEDAR, DART, DDR, HSR.

VIII GEOGRAPHICAL ROUTING

This type of protocols acknowledges the influence of physical distances and distribution of nodes to areas as significant to network performance.
Disadvantages
Efficiency depends on balancing the geographic distribution versus occurrence of traffic.
Any dependence of performance with traffic load thwarting the negligence of distance may occur in overload.
Examples are ALARM, BGR, DREAM, LAR.

IX POWER-AWARE ROUTING

Energy required to transmit a signal is approximately proportional to $d\alpha$, where d is the distance and is the attenuation factor or path loss exponent, which depends on the transmission medium. When $\alpha = 2$ (which is the optimal case), transmitting a signal half the distance requires one fourth of the energy and if there is a node in the middle willing spend another fourth of its energy for the second half, data would be transmitted for half of the energy than through a direct transmission - a fact that follows directly from the inverse square law of physics.
Disadvantages
This method induces a delay for each transmission.
No relevance for energy network powered transmission operated via sufficient repeater infrastructure.
Examples are ISAIAH, PARO, EADSR, DSRPA.

X CONCLUSION

This is a list of existing definitions or even implementations of Ad hoc network routing protocols.In the above paper we tried to compare and contrast different routing protocols in MANETS. In future, we would like to study the performance of ADV and the on-demand protocols for real-

time traffic. With ADV providing lower latencies it should be a more suitable protocol for real-time traffic scenarios. It will be also interesting to investigate the effect of ADV and the on-demand protocols on TCP performance. As routes are frequently refreshed using updates in ADV, it helps maintain route connectivity all the time as required in TCP.

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