

A Study on Types of Different Routing Protocols for Mobile Ad hoc Networks

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ABSTRACT: In Mobile ad hoc network (MANET) Routing is the practice or process of creating a path or establishing connection between neighbor nodes towards end in a network for sending a packets from source to destination. Mobile ad hoc networks designed for hostile environments such as military, in ad hoc network nodes are deployed in unattended area and here each node sense and forward the data towards destination. In order to transmit the data the node should have required energy, so to save the energy and effective transmission towards destinations MANET needs effective routing protocols, and it is difficult to predict routing protocol performance, in this paper we are analyzing various types of MANET protocols, Based on these analysis the user might get knowledge on various MANET protocols. And we are also discussing advantages and disadvantages of various MANET routing protocols.

KEYWORDS: Routing overhead, Route discovery, Proactive, Reactive, Hybrid protocols.

I. INTRODUCTION TO ROUTING PROTOCOLS

In recent years research on Routing in MANET most attracted and studied, so many routing protocols are proposed for MANET and the deployment of nodes in a network have lot of drawbacks and challenges why because due to limited physical resource such as processor power, bandwidth and storage, these issues will effect to the performance issues in MANET routing. Ad hoc routing protocols decides the flow of control how nodes select navigation from which nodes to which node the packets has to transfer in a network, in ad hoc network nodes are not familiar with topology, basically topology is a arranging nodes in a network and topologies are two types one is physical topology and another one is logical topology. Due to unfamiliar with topology the nodes are unable to discover it. But instead a new node announces its visibility in the way of it listens from its neighbor, in ad hoc network each node well-read about other nearby nodes and how to reach them, and it announces is that too can reachable.

The following are some of the ad hoc routing protocols

1. Table driven routing protocols
2. On demand routing protocols
3. Hybrid routing protocols
4. Hierarchical routing protocols

II. OVERVIEW OF MANET ROUTING PROTOCOLS

TABLE DRIVEN PROTOCOL:

These protocols are also called as proactive protocols since they maintain the routing information even before it is needed. Each and every node in the network maintains routing information to every other node in the network. Routes information is generally kept in the routing tables and is periodically update as the network topology changes.

ON DEMAND ROUTING PROTOCOLS:

In order to overcome limitations of the proactive protocols in mobile environments, reactive protocols such as AODV, TORA, DSR, and ABR are used. These protocols are also called reactive protocols since they do not maintain routing information or routing activity at the network nodes if there is no communication. If a node wants to send a packet to

International Journal of Innovative Research in Science, Engineering and Technology

(An ISO 3297: 2007 Certified Organization)

Vol. 5, Issue 11, November 2016

another node then this protocol searches for the route in an on-demand manner and establishes the connection in order to transmit and receive the packet. The route discovery usually occurs by flooding the route request packets throughout the network. In on demand protocols, query/response packets are used to discover (possibly more than) one route to a given destination. These control packets are usually smaller than the control packets used for routing table updates in proactive schemes, thus causing less overhead.

HYBRID ROUTING PROTOCOLS:

Hybrid routing protocols combine table based routing protocols with on demand routing protocols. They use distance-vectors for more precise metrics to establish the best paths to destination networks, and report routing information only when there is a change in the topology of the network. Zone Routing Protocol (ZRP) is an example of a Hybrid routing protocol.

HIERARCHICAL ROUTING PROTOCOLS

With this type of protocol the choice of proactive and of reactive routing depends on the hierarchic level in which 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 attribution for respective levels.

- Cluster Based Routing Protocol
- Fisheye State Routing protocol
- Zone-based Hierarchical Link State Routing Protocol

III. REACTIVE ROUTING PROTOCOLS

AD HOC ON DEMAND DISTANCE VECTOR

Ad hoc On-demand Distance Vector (AODV) is a reactive routing protocol. Reactive routing protocols are also called on-demand routing protocols. AODV is loop-free, self-starting, and scales to large numbers of mobile nodes. AODV allows for the construction of routes to specific destinations and does not require that nodes keep these routes when they are not in active communication. AODV avoids the “counting to infinity” problem by using destination sequence numbers.

Advantages:

- 1) On-demand route establishment
- 2) Destination sequence numbers to find the latest route to the destination.
- 3) Less connection setup delay

Disadvantages:

- 1) In order to detect the unidirectional link. Bidirectional link is required.
- 2) Delay is caused by discovery process.

Dynamic source routing: DSR is one of the purest examples of in demand routing protocol that is based on the concept of source routing. DSR use no periodic routing message like AODV. DSR is a self-organizing and self-configuring on demand routing protocol. The protocol is composed of two main mechanisms of “Route Discovery” and “Route Maintenance.

Advantages

- 1) Eliminate the periodic table update message (hello packet beckon)
- 2) Routes maintained only between nodes who need to communicate (on demand) thus reduces overhead of route maintenance

Disadvantages

- 1) Flood of route requests may potentially reach all nodes in the network.
- 2) Potential collision between route requests propagates by neighboring nodes.

International Journal of Innovative Research in Science, Engineering and Technology

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Vol. 5, Issue 11, November 2016

IV. CONCLUSION

In this work, we are focused on four different routing protocols of MANETS and we discussed reactive routing protocol with their advantage and disadvantage, and their examples: Reactive (AODV, DSR), Proactive (OLSR, DSDV), Hybrid (ZRP) routing protocols. We have analyzed various research papers related to this routing protocol and conclude that it is critical issue to select an efficient and reliable protocol. Each protocol in MANET have unique feature and advantage, and depending on the network conditions.

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