CS4331/5331: Wireless Networks and Mobile Computing

Fall 2021

Write a ONE-PAGE (10 font size and single space) summary using your own words:

• Homework number: 5

• Paper title: Ad-hoc On-Demand Distance Vector Routing

• Your name: Chen Zhang

Summary

An ad hoc network is a set of mobile end users forming a local network and each device working as a host, this mechanism offers convenient communication between many mobile devices without having a centralized organizer or infrastructure. The author stated several reasons why an ad hoc network became popular these days, like smaller computers or mobile devices can be equipped with bigger storage and memory, high-performance CPU, better visual effect display monitor, also the high mobility of those devices allow themself to have a wireless networking environment. In this paper, the author presents an ad hoc on-demand distance vector routing that allows each device in the ad hoc network to work as a specialized router, and routes are obtained as needed with little or no reliance on periodic advertisements. The AODV avoids problems with DSDV, and also has many advantages. The author claimed that AODV is an excellent choice for ad-hoc network establishment.

Major Contribution

The author proposed a Ad-hoc On-Demand Distance Vector Algorithm, the devices within the network (nodes) do not maintain a full routing path nor exchange routing tables in a periodic way. In section 2.1 the author explained how the path discovery works, the path discovery process is initiated if there is no routing information in source node’s routing table. Every node keeps track of two separate counters, a node sequence number and a broadcast id. It starts with source node broadcasting a route request packet to it’s neighbors, as the packet travels from the source to various destinations, it automatically sets up the reverse path from all nodes back to the source, finally, the route request packet will arrive at a node that possesses a current route to the destination. The source node can start sending data once the first request route packet is received. Nodes manage local connectivity by sending hello messages, it not only effectively updates its neighbors, but also ensures that only nodes with bidirectional connectivity are considered to connect. In short, the AODV has following features: nodes store only the routes that are needed, only broadcast when needed, reduces memory requirements, fast response to link breakage in active routes, no loop routes, scalable to large populations of nodes. Based on above features, the AODV are more suitable for high mobility and large scale ad-hoc networks, where DSR (dynamic source routing) fits for low mobility and small amounts of devices.

Weak Aspects

The author listed a number of components that can be improved in section 4, such as multicast, intermediate node route rebuilding, elimination of hello messages and locality of association and QoS.Besides of above aspects, this paper did not mention any security issues related to this protocol, and design. In reality, the security problem could be a crucial part and any modification related to the security issue could lead to performance problems. Also the symmetric connection between each node may break in practice environments, plus the propagation range of each node may differ in reality. The author assumes an ideal environment in this paper, and those aspects may have potential problems if developers implement this AODV into the production world.