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Research Article

Survey of Routing Protocol used in Vehicular Ad Hoc Networks

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Abstract

VANET (Vehicular ad hoc networks) is a special type of MANET which is mainly used for making Intelligent Transportation System (ITS). This paper presents various routing algorithms/protocols which can be used for implementing VANETs for communication and management of the network. This paper also discusses the advantages and disadvantages of these routing protocols. The routing protocols fall into two noteworthy classes. One is topology-based and the other is position-based routing. The paper talks about the advantages and disadvantages of these routing protocols, explores the motivation behind their design and follow the advancement of these routing protocols. At last, it finishes up the paper by pointing out some open issues and conceivable directions of future research related VANET routing.

Keywords: *VANET, Ad hoc networks, survey, routing protocol, V2V, V2I, classes of routing protocols.*

1. Introduction

The number of vehicles around the world has increased a lot during the last decades and will keep on growing in the following years, driving has turned out to be all the more difficult and risky. Streets are immersed, safety distance and sensible and reasonable speeds are not really regarded, and drivers frequently need enough attention. Due to this, leading automotive industries and car manufacturers decided to work together with national government security agencies to find and develop solution for helping drivers on the streets by foreseeing hazardous occasions and to deal with worst traffic environment. One of the outcomes called Wireless Access for Vehicular Environment (WAVE) dedicated to V2V (vehicle-to-vehicle) and V2I(vehicle-to-infrastructure or vehicle-to-roadside) communications. With the power of WAVE communication devices, cars and roadside units shape a profoundly network called a VANET- a special kind of Mobile Ad-Hoc Networks (MANETs). Despite of having countless routing protocols for MANET, many of them do not apply to VANET due to its challenging characteristics which are discussed in the next section.

2. Network Architectures

Basically, there are three types of architecture of VANET can be classified:

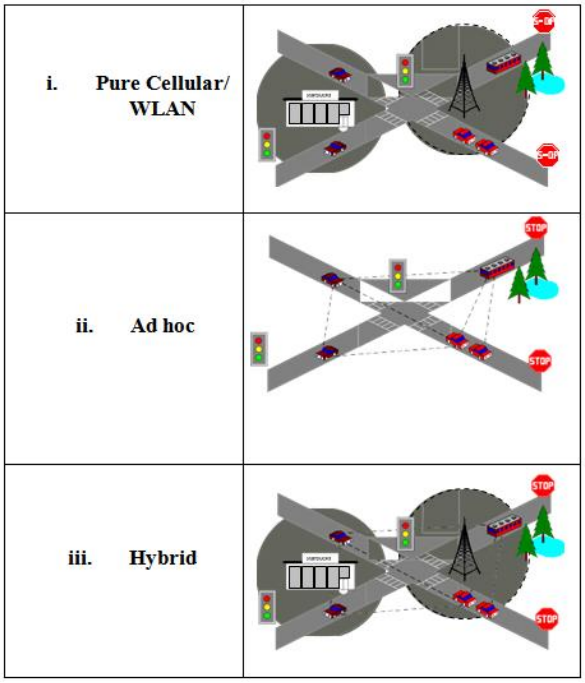

Figure 1: Types of VANET architecture

3. Network Characteristics

3.1 Dynamic topology: Since vehicles are moving very fast, the topology formed by VANETs will be continuously changing.

3.2 Intermittent availability (Frequent disconnection): The exceptionally dynamic topology results in as often as possible separated (disconnected) system since the

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