

Chapter 4

Establishment of FANETs Using IoT–Based UAV and Its Issues Related to Mobility and Authentication

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ABSTRACT

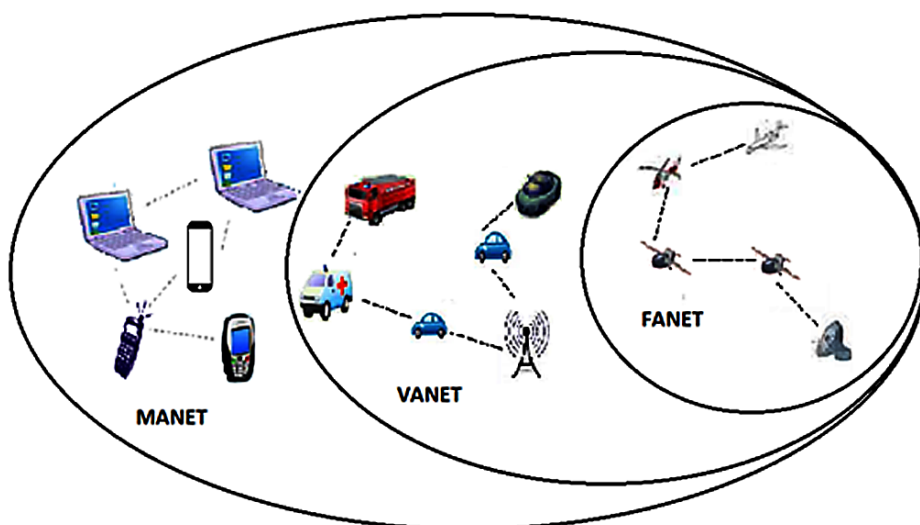
The tremendous evolution of wireless communication as well as the drastic adoption of technology by the latest computing devices known to be IoT, makes it possible for emerging applications to providing ubiquitous services. This technique transformed the quality of present lifestyle of the people. When compared with all other technologies, the mobile adhoc networks become widely adapted in many fields because of the non-requirement of centralized infrastructure support. Adopting this nature, it became easy to establish networks like WSN and also form networks using IoT devices. As FANET (flying/fast adhoc network) is known for its mobility and instant formation of network with the help of available nodes within its communication range, there is a great challenge related to mobility and authenticity of the participating devices by exempting malicious nodes. FANETs incorporate unmanned aerial vehicles and drones as a part of their communication networks. In this chapter, deployment of IoT-based FANETs along with mobility and security is handled.

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INTRODUCTION

Basically, wireless networks are categorised into infrastructure-based and infrastructure-less networks. To avoid the limitations and challenges faced by infrastructure-based networks related to range and other support constraints, the concept of UAV came to exist which works as same as ad hoc fashion and support to form a network known to be FANET (Lakew et al., 2020). Flying Ad-Hoc Networks (FANETs) are the networks formed with the nodes that support high mobility in air and the network formation is adopted from the existing ad hoc networking structure. The devices participating in the network formations are usually known to be unmanned aerial vehicles (UAVs) in the form of drones which are known to be a form of Internet of Things (IoT) device. Due to the advancement in the field of electronic, sensor and communication technologies, the design of IoT based UAV systems are playing their roles in various fields. These IoT based UAV can fly unconventionally as well as function remotely without need for any human intervention. Because of features like versatility, flexibility, easy installation and relatively small operating expenses, the usage of UAVs promises new ways for both military and civilian applications, such as search and destroy operations, border surveillance, disaster monitoring, remote sensing, and traffic monitoring etc. Nowadays multi-UAV are used for performing tasks like monitoring and have the capability to work in the corporate fashion (Bekmezci et al., 2013). The figure 1 shows the transformation of MANET to VANET and to the existing FANET.

Figure 1. Adaptation of MANET towards VANET to FANET



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