

Integrating Drone System with SDN framework

Project Abstract

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ABSTRACT

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In recent times, there has been an increasing interest in Internet of Things (IoT) due to its ability to provide improved services by collecting and analysing data. In the IoT environment, multiple devices can be deployed within a network where these devices can capture, analyse and communicate information by themselves. One such example is a Drone System. Work is being carried out to integrate Software Defined Networks (SDN) with drones as SDN technology can reduce the complexity in managing and controlling interconnected drones and enhance the overall efficiency of the system.

The use of drones for commercial and personal purposes is predicted to increase. Thus the airspace is expected to be flooded with these drones and a technique for monitoring and controlling them will become a necessity. All drones in recent times are being implemented on embedded software and there hasn't been a much research carried out on integrating networking concepts with drone system. In this project, we propose an SDN framework to control and monitor a large number of concurrently connected drones. Our project will focus on integrating drone system with SDN framework, in which drones are network elements which sense the data from real world. SDN framework will be implemented above the drone system which will contain SDN controller such as floodlight. This controller can accept, control and manage the data from drones. On the other side of floodlight controller there can be an application. Research concludes that traditional drones are controlled by individual operators; hence a more refined drone system that is controlled by a single centralised entity is needed. This entity should be capable of taking real time decisions, defining flight paths and communicating the drone information over a secured single network. To implement this there is a need to integrate an SDN framework over the IoT based Drone System.

In our project, the communication between drones and controller is very crucial as plenty of drones will be deployed in a network to provide efficiency. Security also plays pivotal role in our project. If any drone within a network becomes malicious then it is always harmful to the whole network. Therefore, Intrusion Detection and Prevention system will be provided by SDN based security modules. We will use a GNU Radio to communicate between drones as the communication can't be provided on wireless basis. By integrating SDN over the drone system, we aim to achieve efficiency in drone system deployed in urban area, secured communication network by introducing IDS and successful implementation of SDN framework over Drone System.