ARC'18
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R&D: FOCUSING ON PRIORITIES, DELIVERING IMPACT
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Computing & Information Technology - Poster Display

http://doi.org/10.5339/qfarc.2018.ICTPD1019

UAVbased flying IoT Gateway for Delay Tolerant Data Transfer

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Many statistics show the number of connected devices (Internet of Things; IoT) worldwide to grow drastically in the next few years, to exceed 30 billion just by 2020. All these devices need to be connected to the internet, to establish tow ways communication with the backend applications. The list of applications and services that can be enabled by using IoT can be endless, covering different areas such as smart cities, smart home, connected vehicles, intelligent transport systems, agriculture, air and weather monitoring, industry 4.0, etc. One of the fundamental requirements of an IoT device is to be connected and reachable at any time. But when we look at the different applications that run on top of IoT, many of them do not require a continuous connection to the internet. For example, the air monitoring IoT devices, normally they sense and report data only once every 15 to 60 minutes. Such devices would not require a continuous connection to the Internet, but only every 15 to 60 minutes. For such devices and use-cases, we propose to use a flying IoT gateway, that can come next to the sensor every e.g. 15 minutes, to take the data that has been collected by the sensor and carry it to the backend. In this contribution we present a prototype of a solution that uses unmanned aerial vehicles (UAVs), aka drones, to provide a delay tolerant data routing solution for IoT devices. In this solution, a drone flies over a set of deployed IoT devices, to retrieve the collected and stored data and then deliver it to the backed. Such a solution can be suitable for sensing devices that do not require a real-time communication, like traffic speed cams. Indeed, the speed cams can collect data and store it locally, until a drone comes to carry and transfer it to the backend.This solution helps does not only reduce the overall cost by eliminating the cost of the Internet connectivity at each IoT device, but it also reduce the security vulnerability as the devices are physically not connected to the

دار جامعة حمد بن خليفة للنشر
HAMAD BIN KHALIFA UNIVERSITY PRESS

Cite this article as: Menouar H et al. (2018). UAVbased flying IoT Gateway for Delay Tolerant Data Transfer. Qatar Foundation Annual Research Conference Proceedings 2018: ICTPD1019 http://doi.org/10.5339/qfarc.2018.ICTPD1019.

internet all the time, nor directly.This work has been been conducted under the R&D project NPRP9-257-1-056 which is funded and supported by QNRF.