ABSTRACT

The Internet of Things (IoT) has become a part of everyday life with wide applications in various industries. One of the essential elements of IoT devices is firmware updates, which are required to improve functionality and fix bugs. However, manually updating many devices is costly and time-consuming. This research designs and builds a web-based application for firmware update management of IoT devices using the Over-the-Air (OTA) method. The application is developed using Flask and MySQL, with an HTML, CSS, and JavaScript-based interface. Firmware is updated by registering the MAC address of the device to the application, which automatically downloads and installs the latest firmware when available. Tests were conducted in two scenarios: single-device and multi-device updates. The test results showed that the average update time ranged from 9.398 to 17.750 seconds for a single device, and 11.317 to 13.108 seconds for multiple devices. Tests were conducted 20 times on each device to ensure consistency of update success.

Keywords: *Internet of Things, Over-the-Air, Firmware, Web Application, Flask*