

# **Firmware Over-The- Air Update in FreeRTOS**

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## **ABSTRACT**

This project is focused on developing a system that enables Firmware Over-The-Air (FOTA) updates for embedded systems running FreeRTOS. The proposed solution aims to improve the security and reliability of the firmware update process by utilizing the robustness of FreeRTOS and modern OTA update techniques. The system consists of an OTA server and client that communicate over the internet, the target embedded device running FreeRTOS that requires the firmware update. The OTA server stores the latest firmware version, which is downloaded and transferred to the target device. The firmware update process is executed in a secure and reliable manner by using FreeRTOS features such as task management, inter-task communication, and memory protection.

The system will include several key features, such as the ability to revert back to the previous firmware state in case of a failure during the update process. Additionally, the system will store the old firmware in a separate location to ensure that it is available in case of any issues. The project will make use of FreeRTOS's real-time operating system to ensure that the update process does not interfere with the normal operation of the device. The system's feasibility is demonstrated through experimental testing on a FreeRTOS-based embedded device. The results indicate that the proposed solution can provide a reliable and secure FOTA update process for FreeRTOS-based embedded systems. The ultimate goal of this project is to provide a robust and reliable FOTA update mechanism that can be used in a wide range of embedded systems.