

ABSTRACT

The Internet of Things (IoT) is a new perspective in which objects are connected via the Internet and have the ability to intelligently interact, understand and exchange data. As the number of IoT devices circulating in various sectors increases, the issue of data communication responsiveness and device security is growing. IoT device connectivity and security issues are more prevalent in devices that are always on the move and require regular real-time requests from various sensors. This makes them vulnerable to eavesdropping during the process of connecting to the IoT device's server provider.

Based on these problems, a scheme is needed to increase responsiveness and reduce response time in the IoT authentication process by utilising the fog computing scheme in integrating IoT microcontrollers with smartcontract blockchain NFT technology to authenticate so that connectivity is faster and more secure between IoT microcontrollers and fog nodes that are placed locally on the user side. The Ethereum NFT blockchain smart contract-based microcontroller authentication mechanism with decentralised services (DApps) on this fog node achieves authentication response time through scalability, consisting of three microcontrollers. The first microcontroller (token ID 16) obtained an average authentication response time of 196.8 milliseconds, the second microcontroller (token ID 32) 197.45 milliseconds, and the third microcontroller (token ID 128) 198.46 milliseconds.

Keywords : *Authentication, IoT, Blockchain, NFT, Fog Node*