ABSTRACT

The basic principles of blockchain, including decentralization, transparency, and immutability, provide a strong foundation for addressing security, privacy, and data ownership challenges. Satellite communication technology is crucial in sectors like telecommunications, defense, navigation, and research. Very Small Aperture Terminal (VSAT) consists of a modem, Block up Converter (BuC), parabolic antenna, and router. By leveraging the unique ID on satellite modems, blockchain and satellite communication networks can be integrated.

Identity Management (IdM) offers three main solutions: ShoCard, Uport, and Sovrin. Cryptographic technologies in blockchain and IdM, like hash functions and Elliptic Curve Digital Signature Algorithm (ECDSA), are essential for blockchain networks. The unique ID on satellite modems is key for integrating communication with a control center via blockchain.

In a simulation of a blockchain network integrated with the unique ID on satellite modems, the average computation time for blocks was 0.207719 seconds and for nodes was 0.266318325 seconds. Various factors can affect computation time. For nodes, the nonce (difficulty level) can be high due to programming complexity, with the highest computation time of 1.199 seconds at nonce 350795. Blocks use PoW consensus and hash security, with the highest computation time of 0.7692 seconds at nonce 212556.

Keywords: Blockchain, *Identity Management* (IdM), Very Small Aperture Terminal (VSAT)