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D7: Systematic Review on Stateful Hash-Based Digital Signature Scheme

Bello Zainab Lapai, Ismail Idris, Joseph A. Ojeniyi, A. O. Isah, and S. O. Subairu Department of Cyber Security Science Federal University of Technology, Minna. Nigeria zainabbellolapai@gmal.com

Abstract:

This research presents a systematic review and analysis of stateful hash-based digital signature schemes, focusing on their security properties, potential vulnerabilities, and integration with emerging technologies like block chain and IoT, and the current regulatory landscape. The study aims to comprehensively evaluate the strengths and weaknesses of these quantum-resistant signature algorithms, explore their applications in securing modern digital transactions, and identify gaps and future research directions. Through a rigorous selection process, 15 relevant studies were identified and critically analyzed. The findings highlight the inherent security advantages of stateful hash-based signatures, including resistance to quantum computing attacks and strong nonrepudiation properties. However, challenges such as state management, sidechannel vulnerabilities, and performance trade-offs are identified. The integration of these schemes with block chain, IoT, and cloud computing is explored, presenting opportunities for enhanced security and scalability, along with interoperability and state synchronization issues. The review also examines existing standards and regulations. underscoring the need for comprehensive, unified guidelines to facilitate widespread adoption. Recommendations are provided for strengthening security through sidechannel resistant implementations, robust state management mechanisms, and formal verification techniques. Additionally, strategies for seamless technology integration, standards updates, and future research directions are proposed to address emerging threats and challenges in the digital signature domain

Key word: Block chain integration, Cloud computing, IoT, Security analysis, Stateful hash-based signature

D8: Optimising Building Energy Consumption Using Deep Whale-Based Recurrent Neural Networks (DWO-RNN)

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Abstract

The increasing global demand for energy, particularly within the building sector, necessitates the development of advanced techniques for optimizing energy consumption. This paper presents a novel approach—Deep Whale Optimization-based Recurrent Neural Network (DWO-RNN)—designed to optimize building energy consumption by leveraging the