National Institute of Technology Rourkela

Defence Seminar

Seminar Title	: Dynamic Authentication for Internet ofThings using Blockchain
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Venue	: Convention Hall, Department of CS Meeting Link : https://meet.google.com/rgh-cnqi-cko
Date and Time	: 25 Jul 2025 (4pm)
Abstract	: The rapid expansion of the Internet of Things (IoT) has created significant securitychallenges, particularly in ensuring secure communication and authentication across diverseapplications, from smart cities to healthcare. This thesis proposes a comprehensiveframework for authentication within IoT environments, leveraging fog computing andblockchain technology to address these challenges. The research introduces multipleauthentication schemes across various IoT domains, such as the Internet of Vehicles (IoV)and the Internet of Medical Things (IoMT), using approaches that integrate cryptographicprotocols and blockchainenabled fog nodes to achieve secure,lightweight, and scalablesolutions.This thesis reviews IoT authentication mechanisms, emphasizing blockchain&rsquos role in enhancing security. It proposes a fog-based model for mutual authentication and data integrity, with an ECC-based scheme tailored for IoV. Formal analyses using ProVerif and informal assessments confirm resilience against key attacks. A multifactor authentication protocol for IoMT is introduced, ensuring privacy and efficiency in medical applications. The study also addresses secure, efficient communication in IoD environments.Overall, this thesis contributes to developing secure, efficient, and resilientauthentication schemes for IoT systems. The findings highlight the potential of blockchainand fog computing in enhancing IoT security and underscore the importance of adaptablesolutions for various IoT applications. Future research directions include optimizingprotocol scalability, integrating artificial intelligence for realtime threat detection, andadvancing cryptographic methods tailored to IoT&rsquos unique constraints.

Keywords: AuthenticationAVISPA Tool BAN Logic Biometric ECC RoR Model Smart card.

All are Cordially Welcome