National Institute of Technology Rourkela

Synopsis Seminar

Seminar Title	: Dynamic Authentication in Internet of Things
Speaker	: Manabhanjan Pradhan (Rollno : 518cs1004)
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Venue	: Convention Hall, Department of CS
Date and Time	: 21 Nov 2024 (4:30 pm)
Abstract	: The rapid expansion of the Internet of Things (IoT) has created significant security challenges, particularly in ensuring secure communication and authentication across diverse applications, fromsmartcitiestohealthcare. Thisthesisproposesacomprehensiveframeworkforauthentication within IoT environments, leveraging fog computing and blockchain technology to address these challenges. The research introduces multiple authentication schemes across various IoT domains, such as the Internet of Vehicles (IoV) and the Internet of Medical Things (IoMT), using approaches that integrate cryptographic protocols and blockchain-enabled fog nodes to achieve secure, lightweight, and scalable solutions. An authentication scheme tailored for the IoV environment is proposed, employing Elliptic Curve Cryptography (ECC) for lightweight implementation. Formal security analyses conducted using ProVerif and informal assessments demonstrate the scheme&rsquos resilience against attacks, such as Man-in-the-Middle and Denial-of-Service. The research further introduces a multifactor authentication protocol for IoMT, addressing privacy and security challenges in medical applications. Formal verification through tools like ProVerif and BAN logic, combined with performance evaluations, establishes the protocol&rsquos suitability for resource-constrained devices. The findings highlight the potential of blockchain and fog computing in enhancing IoT security and underscore the importance of adaptable solutions for various IoT applications. Future research directions include optimizing protocol scalability, integrating artificial intelligence for real-time threat detection, and advancing cryptographic methods tailored to IoT&rsquos unique constraints.