National Institute of Technology Rourkela

Synopsis Seminar

Seminar Title	: Performance Enhancement Strategies in Fog Computing Environment
Speaker	: Hemant Kumar Apat (Rollno : 519cs3009)
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Venue	: Convention Hall (CS-208), CSE Department
Date and Time	: 17 May 2024 (5.00PM)
Abstract	: In recent years, the proliferation of Internet of Things (IoT) devices has led to an unprecedented surge in data generation and processing demands. Fog computing has emerged as a promising paradigm to address these challenges by extending cloud capabilities to the network edge, enabling faster processing, reduced latency, and enhanced scalability. To enhance the performance of Fog computing, the identification of performance parameters becomes crucial for understanding and improving various applications. This analysis requires robust and adaptive Fog computing systems capable of meeting the demands of real-time applications in diverse IoT scenarios. To meet service level objectives of various time-sensitive and compute-intensive tasks, effectively allocating these tasks across fog nodes directly impacts latency, throughput, resource utilization, and overall system performance. The thesis proposes a novel Fog computing environment consisting of a hierarchical three-layer model. The application placement problem and its complexity analysis are presented for a fog computing environment. The placement phase focuses on allocating computing resources to various computing tasks. The research contributions are related to the allocation of resources in the fog computing environment. First, a heuristic-based Dynamic Cluster algorithm is proposed to address the challenge of efficient resource allocation and task scheduling in distributed IoT systems by dynamically determining the optimal placement of application components across fog nodes. Second, a hybrid meta-heuristic algorithm for IoT application placement optimizes resource allocation and task scheduling in fog computing environments. Third, a priority queue-based approach has been suggested to monitor the arrival and departure of requests. The fourth is a Blockchain-assisted secure storage scheme tailored for IoT application placement.