National Institute of Technology Rourkela

Departmental Seminar

Seminar Title	: A New VMP Approach Based on CPU and Memory Using Bin Packing
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Venue	: CS231 (Conference Hall)
Date and Time	: 03 Jan 2025 (11:00 AM)
Abstract	: Cloud computing is one of the demanding technologies that provide services with flexibility in terms of pay as per use, access to the module from anywhere, etc. To meet the growing demand from users, cloud providers are developing extensive data centers. The core technology behind cloud computing is virtualization, which delivers computing services through virtual machines (VMs). In the dynamic cloud computing environment, numerous users request various services, making it essential to implement efficient resource allocation policies to meet user demands. The goal is to maximize resource utilization while minimizing energy consumption by optimizing the use of physical server resources. Simulations conducted using the CloudSim simulator demonstrate that this approach maximizes resource utilization by selecting the minimum number of hosts. The algorithm treats the three parameters as dimensions in a 3D bin packing (BP) model, with the workloads for the data center generated from PlanetLab leftovers. In a scenario with 50 VMs and 40 hosts, the proposed algorithm reduces energy consumption from 0.98 kWh to 0.38 kWh, which shows a significant improvement. The novelty of this paper is the development of a dynamic bin-packing algorithm that optimizes both resource utilization and energy consumption by efficiently managing virtual machine placement in cloud data centers.