

**A Planning Approach for Reassigning Virtual Machines in IaaS Clouds**

**Abstract:**

Reassignment of virtual machines into clusters is an important task for the good management of cloud resources since it decisively affects the performance of the Service Provider platform. Thus, for a successful reassignment, a clear and careful reassignment plan should be constructed in advance. In this paper, we propose a planning approach to the problem of reassigning virtual machines in IaaS Cloud platforms and we prove that this problem is NP-Hard. First, we use the well-known A\* algorithm to solve this planning problem. Then, we propose two algorithms, called Direct Move Heuristic (DMH) and Iterative Direct Move Heuristic (IDMH), to bridge the space limitation of the A\* algorithm. Also, we suggest two experimental studies that have been conducted on randomly generated problem instances. The first experimental study considers small sized problem instances. It aims to show the applicability of the described modeling and assesses the efficiency of the proposed algorithms. The second experimental study focuses on large sized problem instances. It assesses the scalability performance of the IDMH heuristic. Our obtained results show a good scalability performance on problem instances with up to 800 virtual machines.