

"A dynamic programming approach to manage virtual machines allocation in cloud computing"

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Abstract:

As a result of the dynamic nature of Virtual Machine allocation in cloud computing, it is not easy to manage system resources or choose the best configuration based solely on the human experience. In this work, we used stochastic modelling instead of comprehensive experiments to evaluate the best resource management of the system. In such complex systems, choosing the best decision is a challenge, for this reason, we have designed a heuristic algorithm, specifically, dynamic programming as resource management and programming tool that finds a way that attempts to satisfy the conflicting objectives of high performance and low power consumption. As a scenario for using this algorithm, we addressed the problem of virtual machine allocation, a subset of physical machines are designated as "reserve", the reserves are actives when the number of jobs in the system is sufficiently high. The question is how to decide when to activate the reserves. The simulation results demonstrated the benefit of using our framework to identify the policy for consolidation or for low energy consumption and in order to have a good quality of service in the system.