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**AN ADAPTIVE AND FUZZY RESOURCE MANAGEMENT**

**APPROACH IN CLOUD COMPUTING**

**Abstract:**

Resource management plays a key role in a cloud environment in which applications face with dynamically changing workloads. However, such dynamic and unpredictable workloads can lead to performance degradation of applications. To meet the Quality of Service (QoS) requirements based on Service Level Agreements (SLA), the resource management strategies must be taken into account. The question addressed in this research includes how to reduce the number of SLA violations based on the optimization of resources applying an autonomous control cycle and a fuzzy knowledge management system. In this paper, an adaptive and fuzzy resource management framework (AFRM) has been proposed. In the AFRM, the last resource values of each virtual machine have been gathered through the environment sensors and have been sent to a fuzzy controller. Then, the AFRM analyzes the received information to make decision about how to reallocate the resources. All the membership functions and rules are dynamically updated based on workload changes to satisfy the defined QoS requirements. Three sets of experiments were conducted to test the AFRM in comparison to a rule-based approach. Experimental results demonstrate that the AFRM outperforms the other competitive algorithms.