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(57) Abstract :
ADAPTIVE QUANTUM-INSPIRED RESOURCE ALLOCATION FOR DYNAMIC WORKLOAD BALANCING IN CLOUD ENVIRONMENTS ABSTRACT The present invention relates to an adaptive quantum-inspired resource allocation system (100) and method for dynamic workload balancing in cloud environments. The system comprises a quantum-inspired computing module (108) configured to generate resource allocation solutions by leveraging quantum algorithms and real-time dynamic workload information. A workload monitoring module (110) continuously observes and analyzes the cloud environment's workload characteristics. An adaptive control module (112) receives the quantum-inspired resource allocation solutions and dynamically adjusts resource allocations based on real-time workload changes. These adjustments are made in an adaptive manner to optimize both resource utilization and workload balancing. The method involves generating quantum-inspired resource allocation solutions based on quantum algorithms and workload characteristics, monitoring dynamic workload changes, and dynamically adjusting resource allocations in real-time to achieve optimal workload balancing and resource utilization in cloud environments. The proposed system and method provide an innovative approach to address the challenges of resource allocation in dynamic cloud environments, combining quantum-inspired computing principles with real-time adaptive control for enhanced efficiency and responsiveness.

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