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Optimizing Virtual Machine Downtime in Live Migration using the Least Frequently Used Service-based Pre-copy Algorithm

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C. P. Shabariram ; N. Shanthy ; P. Priya Ponnusamy ; R. Prema ; R. S. Sowmiya Priya All Authors

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Abstract:

Cloud computing has been considered the most reliable and safe technology among many cloud users. Virtual machine migration is a crucial component of cloud computing technology. A Virtual machine is transferred from one host machine to another during the migration process, which is accomplished by repeatedly copying the memory pages available in the virtual disk. The time required for the movement of secondary storage, main memory, process states, and network connectivity, as well as the maintenance of their accuracy, must be considered for the efficient migration of virtual machines from one physical host to another in the cloud service provider. The most robust mechanism for system maintenance, resilience system, balancing the load of the service provider, and power-saving is the live migration of virtual machines between the nodes in the data center. So many services are running in the virtual machines during live migration; thus, it needs to take place with the least amount of downtime possible to prevent service degradation. The memory pages in the virtual storage must be copied to the other host using the least frequently used service-based pre-copy algorithm to optimize the downtime. The effectiveness of the suggested solution was evaluated in comparison to OpenNebula and OpenStack, two cloud computing platforms. The least frequently used service-based pre-copy algorithm reduces the amount of virtual machine downtime during live migration.

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