An Energy-Efficient VM Prediction and Migration Framework for Overcommitted Clouds

We propose an integrated, energy-efficient, resource allocation framework for over committed clouds. The framework makes great energy savings by 1) minimizing Physical Machine (PM) overload occurrences via VM resource usage monitoring and prediction, and 2) reducing the number of active PMs via efficient VM migration and placement. Using real Google data consisting of a 29-day traces collected from a cluster containing more than 12K PMs, we show that our proposed framework outperforms existing overload avoidance techniques and prior VM migration strategies by reducing the number of unpredicted overloads, minimizing migration overhead, increasing resource utilization, and reducing cloud energy consumption.