Performance Optimization of Microservice Applications under Resource Constrained Environments

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Abstract - **Performance of microservice applications deployed on cloud platforms have a non-linear relationship withresources allocated to each service of the application. Applications can be limited by fixed resource budgets or operation costs. This study presents an automated framework utilizing equality constrained Bayesian Optimization (BO) on CPU, and Memory limits of individual services in a benchmarksingle node microservice application with the objective of minimizing latency and maximizing throughput. The modelfound configurations that achieve over 3 times improvement onlatency and over 2 times improvement on the throughput of thedefault configuration. Particle Swarm Optimization (PSO) achieved similar improvement in performance with a higher number of iterations compared to BO.**

Keywords - *microservices, performance optimization, resource constraints*