**Convex Project Proposal**

**Topic**: Minimizing Service Interruption during Multiple VM Migration

***Abstract***: Cloud computing is a platform allowing users to request for various resources such as compute, storage and services on-demand basis and are basically fulfilled by large cloud providers like Amazon and Microsoft. Cloud is nothing but a large datacentre having these resources and are located at preferred destination, these resources and services are available globally through internet. Lot of challenges are involved in allocation of these resources to users. The challenge to efficiently migrate VM (Virtual Machine) both within and between datacentre has gained lot of attention in recent years. VM migration could be triggered due to the decrease in user perceived QoS as the load or network parameters (BW and Latency) degrades and migration will help solve this issue by moving VM close to user or to a better place where there is no such congestion. With the advent of 5G, these migrations will be so common due to the large deployment of edge clouds and hence triggering frequent migration as user moves from one location to another. Seamless VM migration involves 2 stages, pre-copy phase and stop-copy phase. Memory and dirty (recently modified) pages are copied from source to destination during these stages. These pages can be of varied size and our goal is to minimize total migration time (pre-copy time + VM downtime). If multiple VMs must be migrated, then the problem becomes more complicated as we must allocate optimal bit rates between source and destination for these machines individually. The optimization problem can be formulated as a geometric programming problem, where the main moto is to find the trade-off between pre-copy time and downtime during stop-copy stage.

***Problem****:* Optimal bandwidth (rate) allocation during migration of multiple VM’s to minimize the total migration time or service interruption.

***Optimization Technique:*** Geometric Programming

***Dataset:*** Self-generated with MATLAB (using gaussian, normal and bimodal distribution)

***Tools:*** MATALB GGPLABS

***Analysis:*** Perturbation and performance analysis

***Reference*:**

1. Cerroni, Walter, and Flavio Esposito. "Optimizing live migration of multiple virtual machines." *IEEE Transactions on Cloud Computing* (2016).\*
2. Liu, Haikun, et al. "Performance and energy modeling for live migration of virtual machines." *Proceedings of the 20th international symposium on High performance distributed computing*. ACM, 2011
3. Boyd, Stephen, et al. "A tutorial on geometric programming." *Optimization and engineering* 8.1 (2007): 67.

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