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MCLOCK: HANDLING THROUGHPUT VARIABILITY FOR HYPERVISOR IO SCHEDULING

In this paper, the authors propose mClock, an algorithm for IO resource allocation that supports proportional-share fairness subjected to minimum reservations and maximum limits on the IO allocations for virtual machines. To evaluate the algorithm, it is implemented inside the VMware ESX server hypervisor. The results show that mClock increase performance of virtualized servers.

In traditional virtualized servers, the hypervisor is used to multiplex the underlying resources of virtual machines as well as enforcing isolation between resources. However, support for IO resource allocation is limited in current hypervisors. The proposed method provides a rich control over IO resource allocation of single virtual machine, which helps providing better performance. A version of mClock for distributed storage environment is also created to support distributed systems.

Through the results of this paper, the authors show that hypervisor are effective for IO scheduling, which extends the usage of traditional hypervisors.

One limitation of this approach is that it groups reservation, limit and share into one place, which may cause some bottleneck in performance when scaled.