ECE5658: Operating Systems Design – Paper Critique

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이성우

1. mClock: Handling Throughput Variability for Hypervisor IO Scheduling, OSDI 2010

- This paper proposed a novel IO scheduling algorithm which provides per-VM quality of service in overall throughput. It also supports the throughput proportionality for minimum reservations and maximum limits on the IO allocations for VMs. It allows stronger isolation between VMs by two main ideas: multiple real-time clocks and dynamic clock selection. This paper can be improved with configuration of container mechanism. Container with docker does not work as normal VMs. It just pulls image from the server and utilize it. So, it can be optimized with this mechanism and can be improved.

2. FlashFQ: A Fair Queueing I/O Scheduler for Flash-Based SSDs, ATC 2013

- This paper proposed a novel Flash I/O scheduler, FlashFQ, that attains fairness and high responsiveness at the same time. The characteristic of SSD motivates the FlashFQ: restricted parallelism with interference on SSDs, decreased benefits of I/O spatial proximity on SSDs. It improves the SSD proportionality by throttling the SSD dispatch. It achieves better fairness and responsiveness than other schedulers. Moreover, it minimizes the performance overhead by the scheduler. I think this paper can be improved with consideration on other layers such as page cache. The I/Os go through not only storage but also in many layers including page cache layer. So It must consider and build designs for other layers to improve itself.