

-Week 11-

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1. Efficient Virtual Memory for Big Memory Servers

In many big-memory server workloads, TLB miss occurs over 10% on runtime. This paging overhead affects performance seriously. To address this problem, this paper proposes direct segment that is mapping part of a linear address space for process. direct segment eliminates the paging overhead by loading some data to memory from storage beforehand. This scheme effectively reduces paging overhead, but It seems to require other optimizations than database workloads. Therefore, I propose to analyze the other workloads first.

2. Coordinated and Efficient Huge Page Management with Ingens

As needs for memory usage is increased, hardware providers increase TLB entries. Under these circumstances, This paper proposes fundamental design for huge paging system, called Ingens. Ingens relies on basic semantic to transparent huge pages in various ways. Ingens manages accesses according to first-class resource and tracks utilization and access frequency for pages. So, Ingens improve many performance, especially up to 18%. I think this scheme is very good idea. But Ingens didn't suggest a solution for the hypervisor, so I wished to deal with it.