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COORDINATED AND EFFICIENT HUGE PAGE MANAGEMENT WITH INGENS

The paper proposes Ingen, a framework to support “huge pages” by managing contiguity and tracks utilization and access frequency of pages. This approach is able to fix common performance bottlenecks in current systems. This leads to an increase in performance of up to 18% and a 41% reduction in tail latency in experiments on this method. Ingens follow two design principles: First, consider memory contiguity as an explicit resource and allocate it in a reasonable way. Second, maintaining information about spatial and temporal access patterns in order to predict future memory allocation to achieve optimization.

The key strength of this papers is that the author redesigned the outdated hypervisor huge page management system commonly used in current operating systems, which begins to show weakness when the demand for huge page increases. By applying some basic primitives, huge pages are managed in a more coordinated and efficient way. This is a huge improvement on the current design.

Through experiments, the authors also show that Ingens does not hurt performance of applications that has their own solution, while it is beneficial for almost every operating system and applications that has not been optimized.

The weakness: the system is mainly evaluated in Linux. A comparison between different systems like Free BDS, Solaris would provide a more complete picture