ECE5658: Operating Systems Design – Paper Critique

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이성우

1. Efficient Virtual Memory for Big Memory Servers, ISCA 2013

- This paper proposed the direct segment schemes for mitigating the Translation Lookaside Buffer overhead in big memory workloads. Traditional swapping, page protection or mitigating fragmentation does not affect to big memory workload, so it pays the cost of page-based virtual memory without exploiting its full benefits. It is good paper that exact problem is defined and can be enlarged. I think this paper can be improved with more diverse applications such as fragmentation-intensive, locking-intensive applications. Those will improve that can be more analytic and detail.

2. Coordinated and Efficient Huge Page Management with Ingens, OSDI 2016

- This paper proposed the Ingens which is a framework for huge page support that relies on a handful of basic primitives to provide transparent huge page support in a principled, coordinated way. It first defines the benefits and problems by using huge page. It can achieve increased TLB reach and improvement of TLB coverage. However, it increases memory footprint, fragmentation and page fault latency, etc. Through the Ingens, the problems can be solved and can manage huge page efficiently. Moreover, it makes huge pages widely used in practice too. I think this can be improved with consideration of small updates. This huge page size is weak at small updates, so this consideration can be helped to improve this paper.