ECE5658: Operating Systems Design – week10 critique

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1. Traffic Management: A Holistic Approach to Memory Placement on NUMA Systems

(1) Modern NUMA hardware has much smaller remote wire delays. But, congestion on memory controllers and interconnects hurts performance a lot more. So, Balance is more important than locality. Carrefour is a new memory traffic management algorithm. Carrefour provides balance memory pressure on interconnect and MC and improve locality.

(2)

(+): Carrefour solved the locality problem well

(-): Very little performance improvement in MG, SP workloads.

(3) I think energy consumption will increase.

2. Regularities Considered Harmful: Forcing Randomness to Memory Accesses to Reduce Row Buffer Conflicts for Multi-Core, Multi-Bank Systems

(1) M^3 allocator has the characteristics of memory container and randomizing allocation. Memory container helps each core achieves bank parallelism as much as possible. And randomizing allocation helps each thread's access pattern is randomized. These M^3 features can be leveraged to significantly improve overall performance for memory-intensive workloads.

(2)

(+): A novel kernel-level memory allocator for multi-core, multi-bank systems