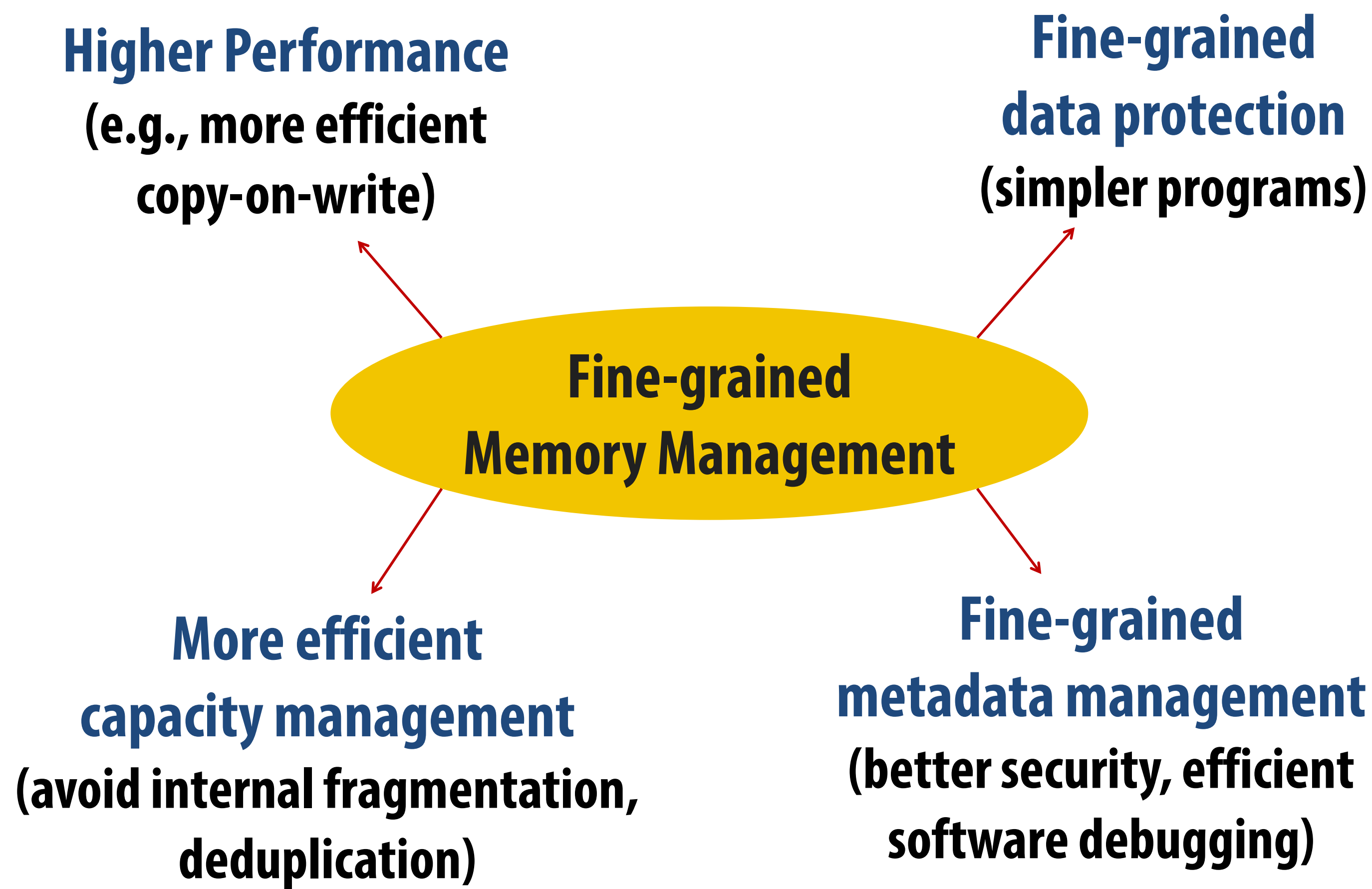
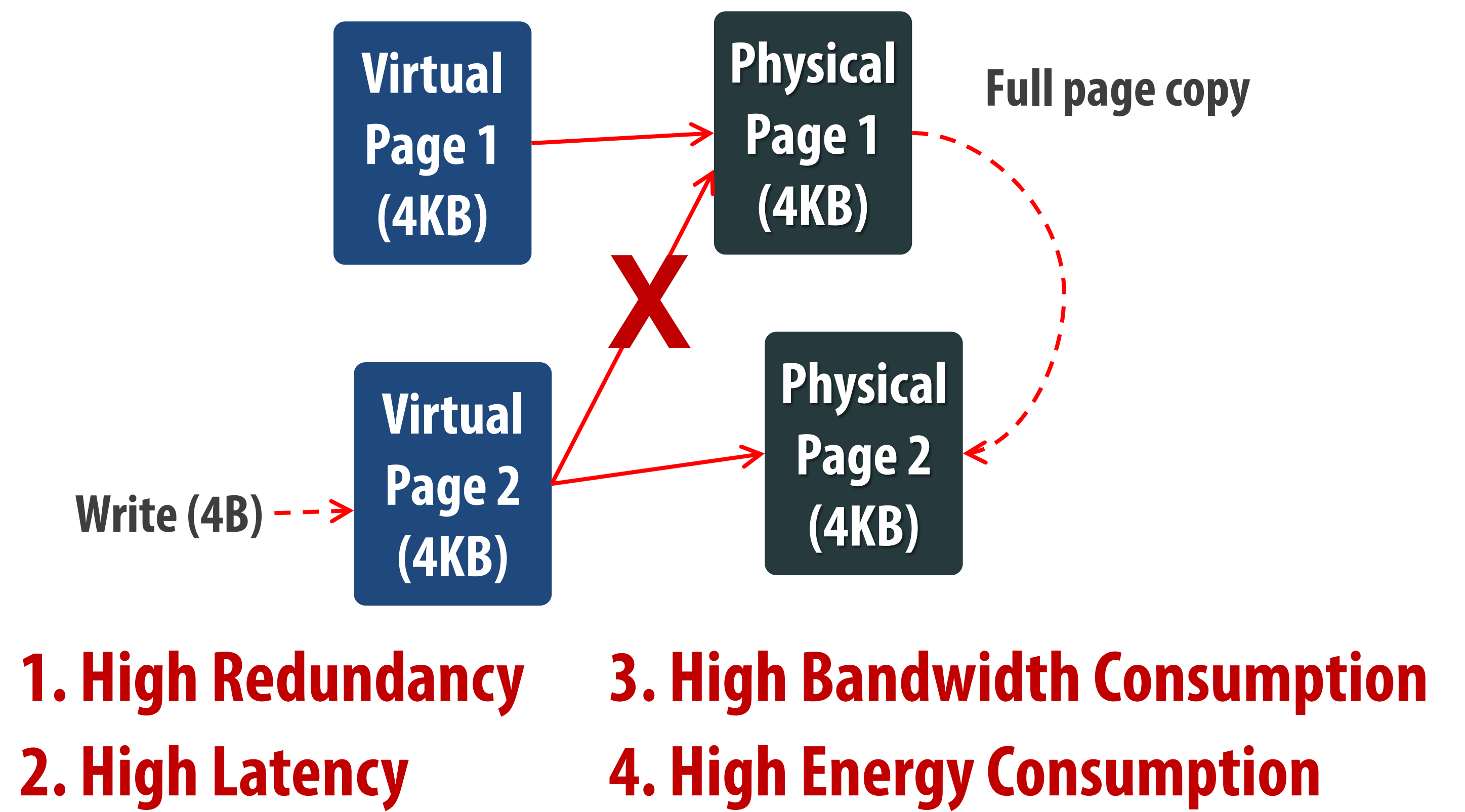


Page Overlays: A New Framework for Fine-grained Memory Management

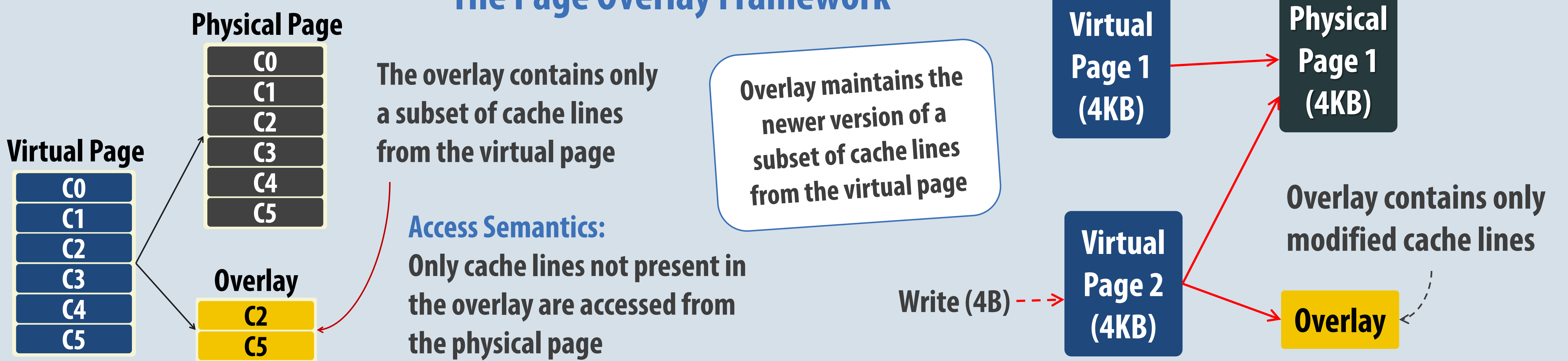
Vivek Seshadri, Gennady Pekhimenko, Olatunji Ruwase*, Onur Mutlu, Phillip B. Gibbons^, Michael A. Kozuch^, Todd C. Mowry, Trishul Chilimbi*
Carnegie Mellon University, *Microsoft Research, ^Intel Labs



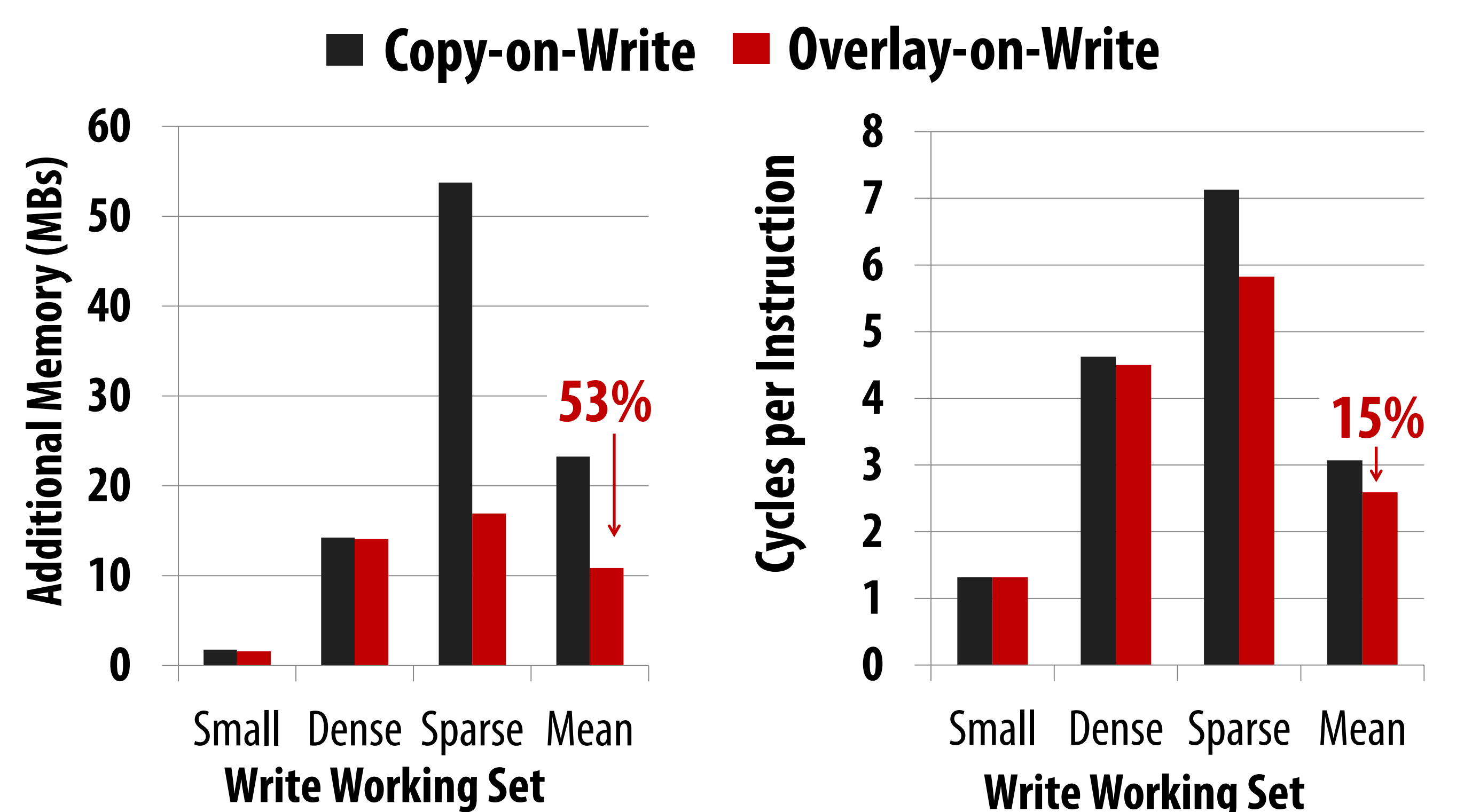
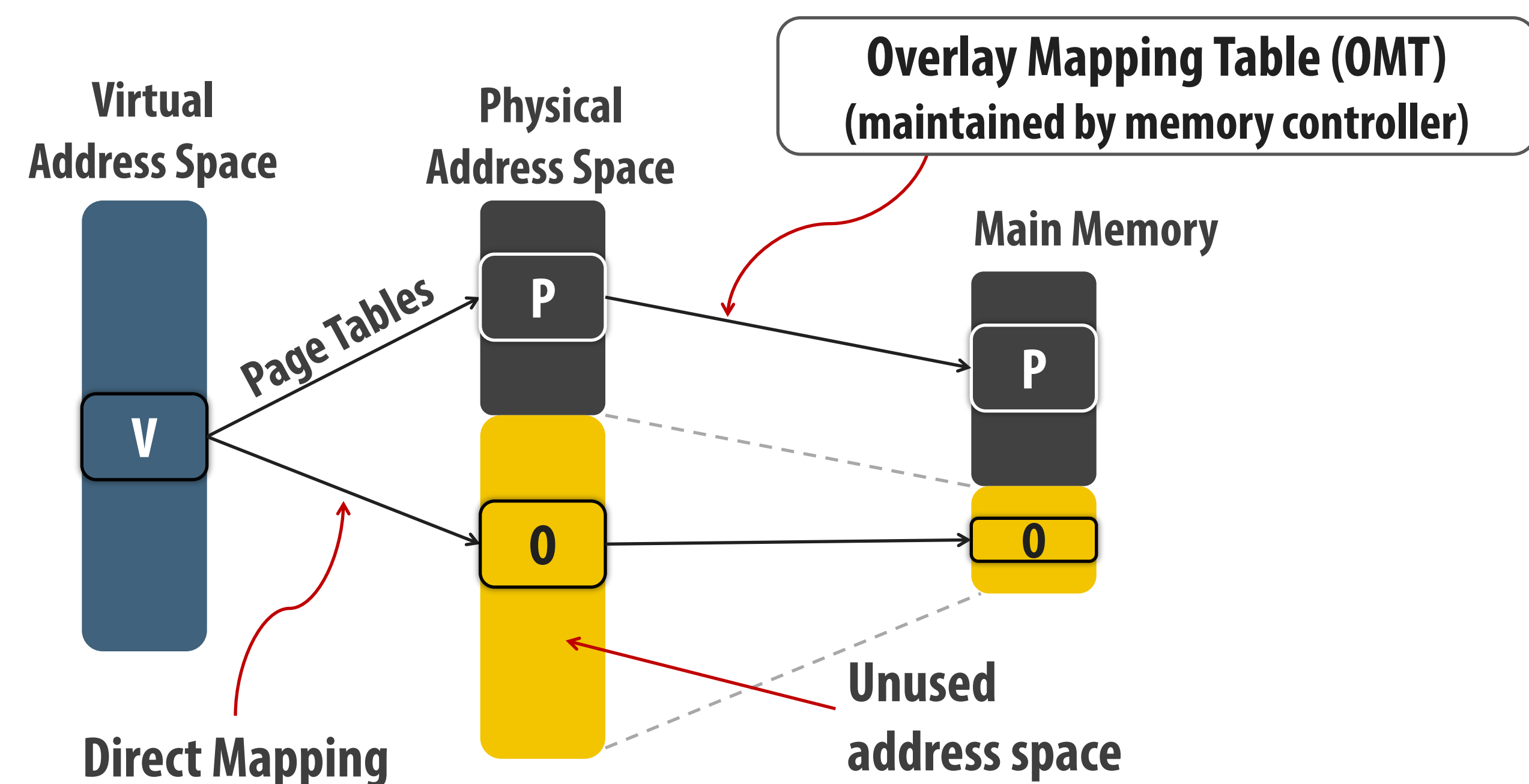
The Copy-on-Write Technique



The Page Overlay Framework



Implementation Overview



Applications for Page Overlays

- Sparse data structure representation
- Virtualizing speculation
- Memory checkpointing
- Fine-grained metadata management

Cloud Computing – Multiple Virtual Machines

- Fine-grained deduplication**
increased memory capacity (difference engine – OSDI'08)
- Flexible superpage management**
get benefits of copy-on-write & TLB miss reduction

