

Linearly Compressed Pages: A Main Memory Compression Framework with Low Complexity and Low Latency

Gennady Pekhimenko,

Vivek Seshadri , Yoongu Kim,

Hongyi Xin, Onur Mutlu,

Todd C. Mowry

Phillip B. Gibbons,

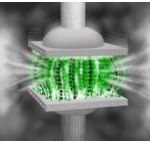
Michael A. Kozuch

Carnegie Mellon University



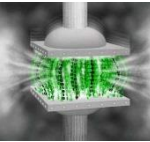
Summary

- Main memory is a limited shared resource
- **Observation**: Significant data redundancy
- **Old Idea**: Compress data in main memory



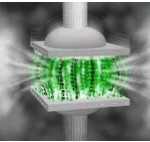
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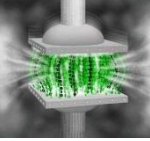


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 1. Increases capacity (**62%** on average)
 2. Decreases bandwidth consumption (**24%**)
 3. Improves overall performance (**13.9%**)

Linearly Compressed Pages (LCP)

Uncompressed Page (4KB: 64***64B**)

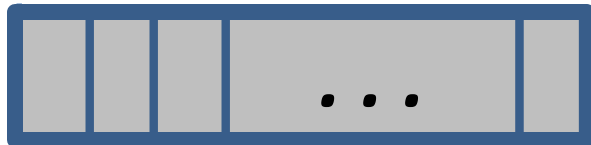


Linearly Compressed Pages (LCP)

Uncompressed Page (4KB: $64 \times 64B$)



4:1 Compression



Compressed
Data (1KB)

Linearly Compressed Pages (LCP)

Uncompressed Page (4KB: $64 \times 64B$)



4:1 Compression

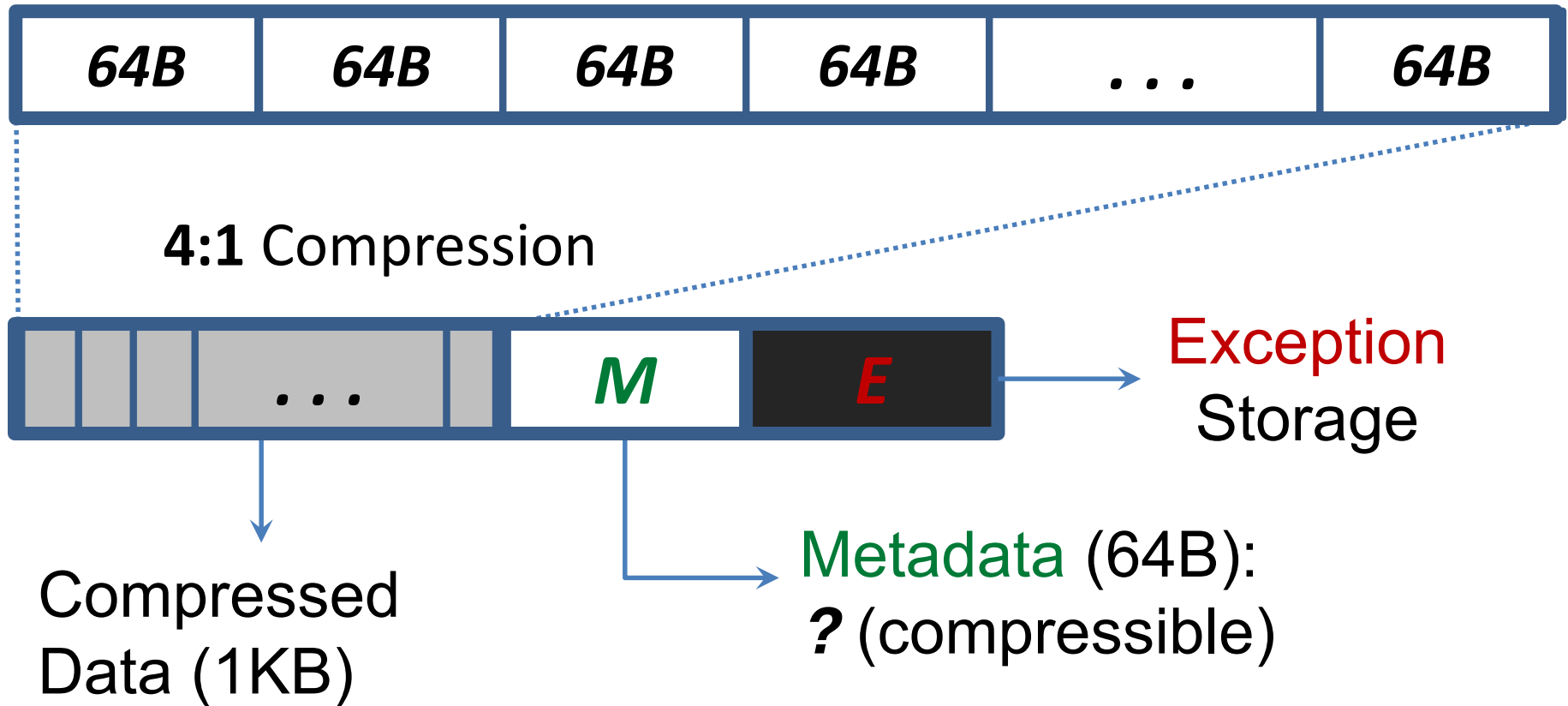


Compressed
Data (1KB)

Metadata (64B):
? (compressible)

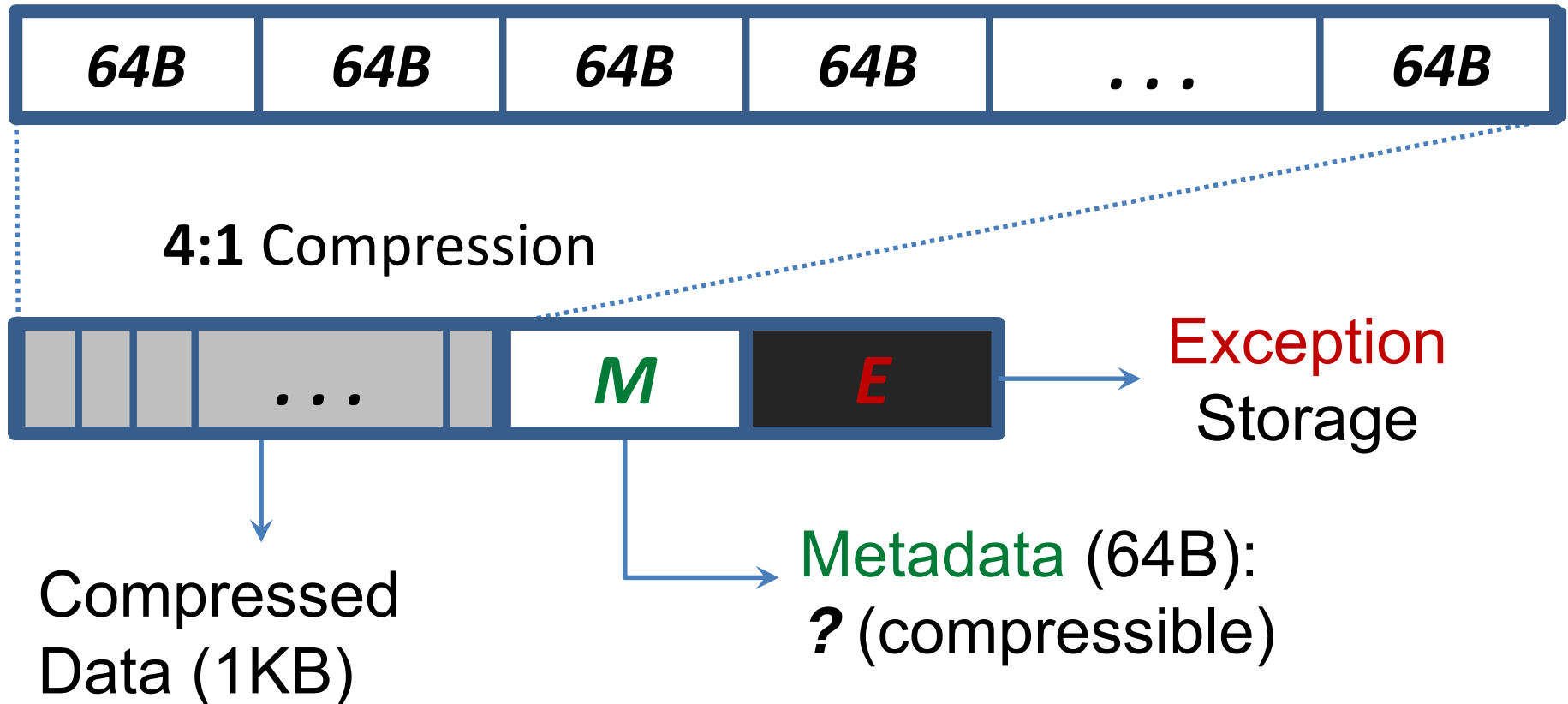
Linearly Compressed Pages (LCP)

Uncompressed Page (4KB: $64 \times 64\text{B}$)



Linearly Compressed Pages (LCP)

Uncompressed Page (4KB: $64 \times 64B$)



Tomorrow, **8:30am**, Session 3A