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

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Summary

- Main memory is a limited shared resource
- **Observation**: Significant data redundancy
- **Old Idea**: Compress data in main memory
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- **Solution**: Linearly Compressed Pages (LCP): fixed-size cache line granularity compression
  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)

| 64B | 64B | 64B | 64B | ... | 64B |
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4:1 Compression

Compressed Data (1KB)
Linearly Compressed Pages (LCP)

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Exception Storage
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Tomorrow, 8:30am, Session 3A