A Case for Core-Assisted Bottleneck Acceleration in GPUs

Enabling Flexible Data Compression with Assist Warps

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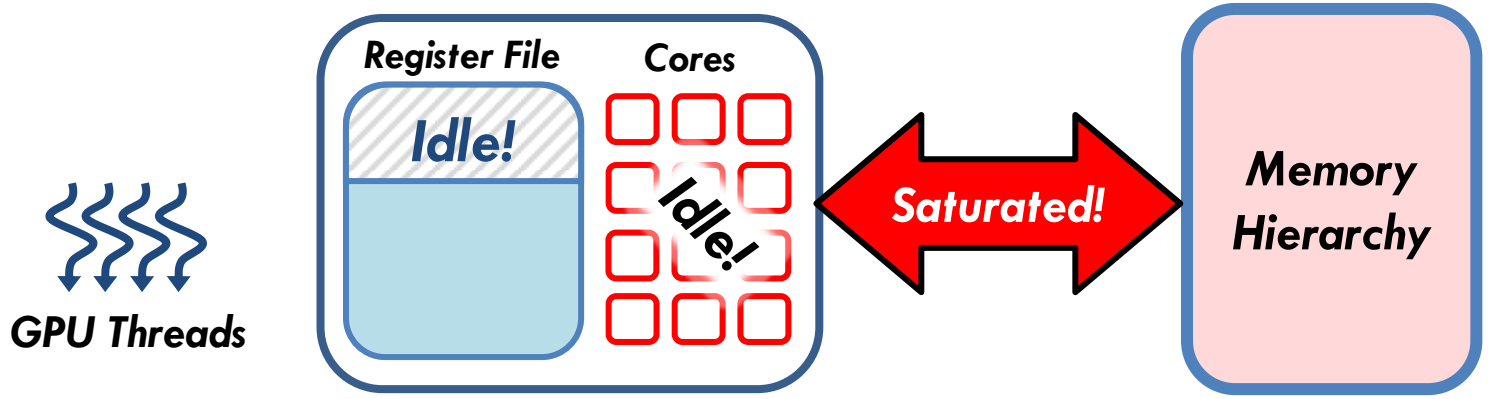
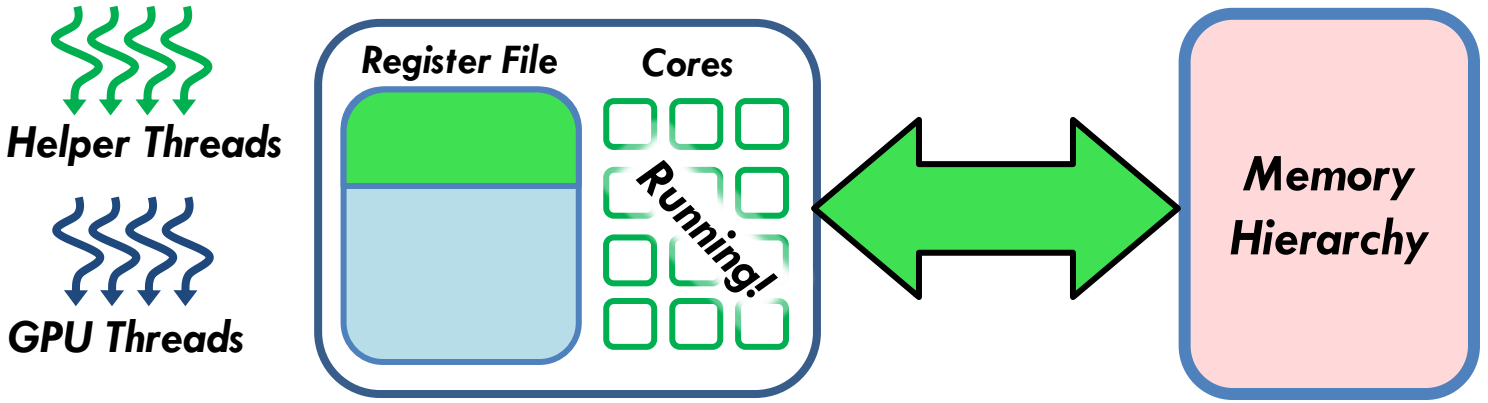
Observation: Imbalances in execution leave GPU resources underutilized



Our Goal: Employ idle resources to do something useful: **accelerate the bottleneck – using helper threads**



Challenge: How do you **manage and use** helper threads in a **throughput-oriented** architecture?

Our Solution: CABA

- **A new framework** to enable helper threading in GPUs
  - **CABA (Core-Assisted Bottleneck Acceleration)**
- **Wide set of use cases**
  - Compression, prefetching, memoization, …
- **Flexible data compression** using CABA alleviates the memory bandwidth bottleneck
  - 41.7% performance improvement