Fine-grained management of I/O optimizations based on workload characteristics

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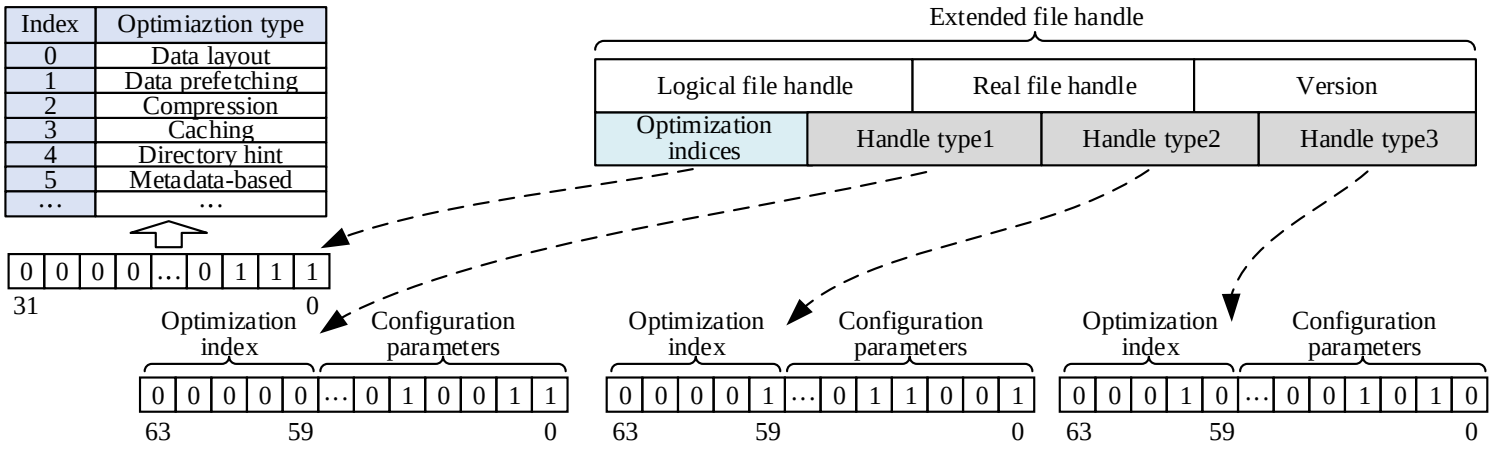
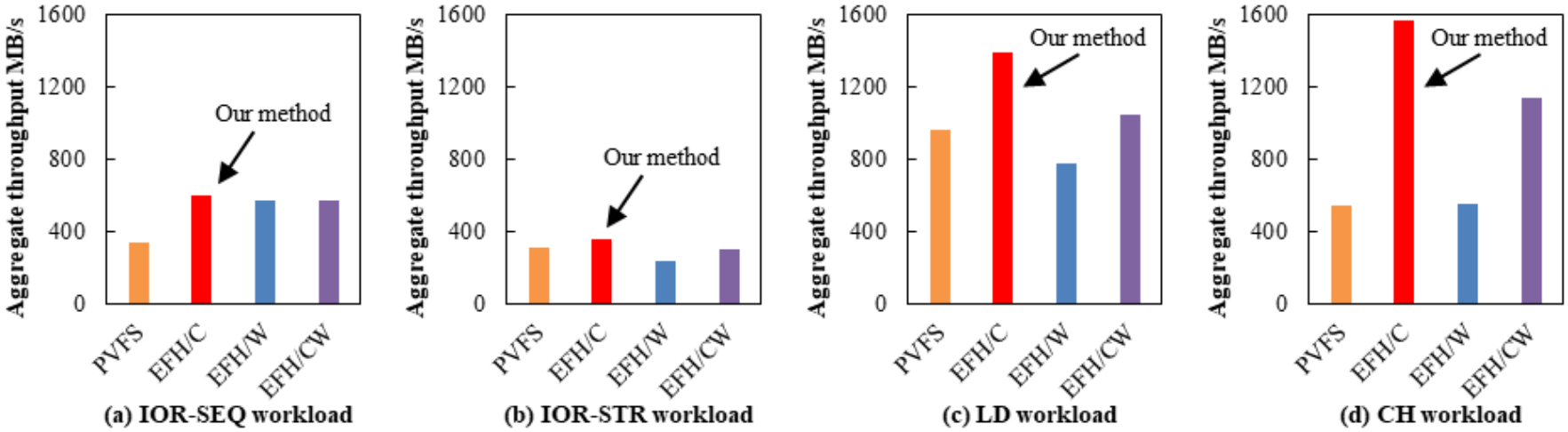
Problems & Ideas

- Problems of I/O optimizations for files in parallel file systems
  - Flexible management, dynamical selection, and adaptive adjusting of I/O optimizations cannot be met
  - Selection of metadata optimization strategies cannot be satisfied
- Ideas: Extended file handle
  - Original file handle is extended to record I/O optimization information
  - Selecting I/O paths based on extended file handles
  - Adjusting I/O optimizations based on workload characteristics at run time
    - **Extended file handle structure**



Main Contributions

- **Aggregate throughput of different prefetch methods for multiple workloads**



- **Aggregate throughput of different small file optimization methods**