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Page-level and Fleet-wide Data Access Monitoring for Meta

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DAMON, a Linux kernel subsystem, enables efficient data access monitoring and access-aware system operations. Meta has been utilizing DAMON for data access observability to enhance fleet-wide memory management efficiency. This project, however, highlighted DAMON's limitations, such as the absence of page-level information observability and the need for manual parameter tuning per workload.

To address these limitations, several DAMON features have been developed and integrated upstream. These features have allowed Meta to implement fleet-wide data access monitoring and collect data that confirms its functionality and offers further insights.

This session will delve into the project in detail. We will begin by outlining the long-term, high-level objective of Meta's fleet-wide data access pattern observability project and the inherent limitations of DAMON in achieving this goal. We will then introduce the new DAMON features developed to overcome these challenges, covering their design, usage, and evaluation results. Furthermore, we will present the design of Meta's fleet-level monitoring system, built upon the enhanced DAMON, and share key findings from the collected fleet-wide data access patterns. The session will conclude by discussing the remaining limitations in DAMON that hinder more efficient and useful fleet-wide access monitoring.

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