New graph processing technology demonstrates significant speed advantages over existing solutions

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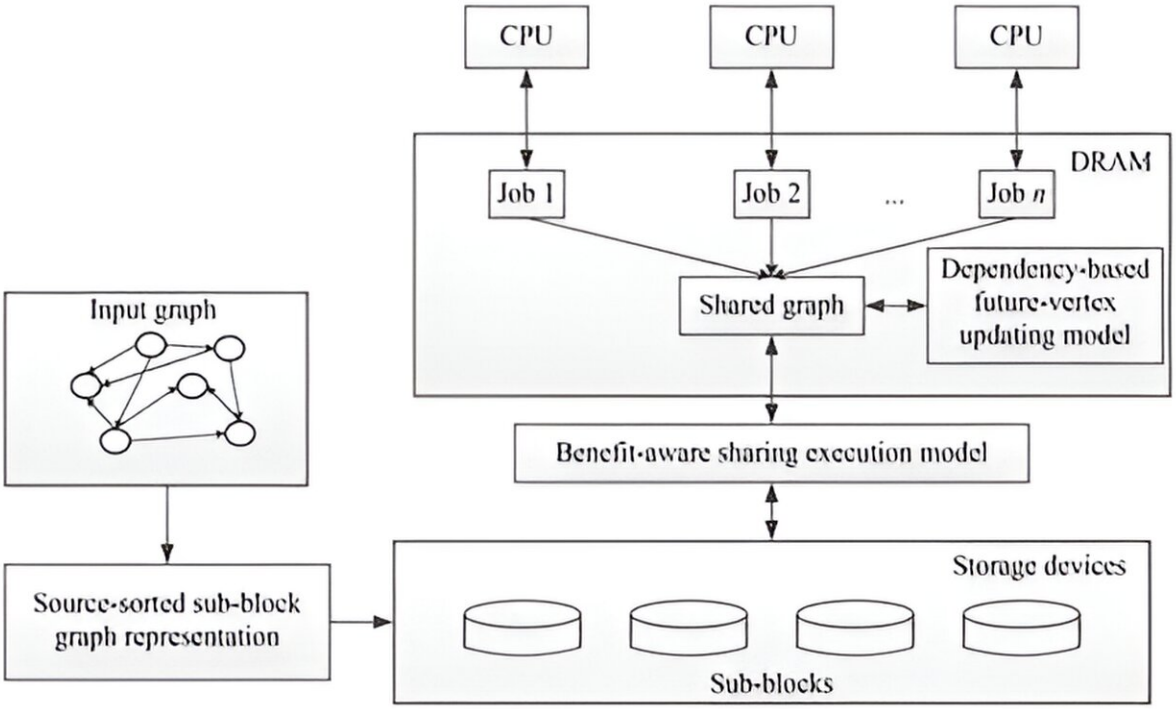

The GraphCP architecture Credit: Yongli Cheng

The need for efficient and fast data processing tools in industries that manage large-scale graph data has led to the development of GraphCP, a technology that dramatically improves processing speeds.

GraphCP not only meets but greatly exceeds the performance of existing graph processing systems:

- GridGraph: GraphCP is 20.5 times faster, making it significantly more efficient in handling large datasets.
- GraphZ: GraphCP outperforms by a factor of 8.9 times, offering enhanced speed that could transform data analysis timelines.
- Seraph and GraphSO: These systems are also outpaced by GraphCP, which is faster by 3.5 times and 1.7 times, respectively.

Such performance improvements position GraphCP as a leading solution for applications that depend on quick and efficient graph data processing.

"GraphCP's advancements in reducing redundant data accesses and improving I/O bandwidth utilization contribute to the development of our field," says Yongli Cheng, the corresponding author of the research.

With its enhanced speed, GraphCP is particularly beneficial in fields like social networks, the Internet of Things (IoT), and neural networks. Industries can leverage this technology to process data more rapidly, enabling better decision-making and increased operational efficiency.

GraphCP addresses common bottlenecks in traditional graph processing, such as disk input/output operations, by introducing innovative execution models and updating mechanisms. These advancements help minimize redundant data access and improve the overall system's efficiency, thereby reducing operational costs.

The research behind GraphCP has been published in *Frontiers of Computer Science*, showcasing the contributions from various experts in the field. This research is a collaborative work between Nanjing

University of Science and Technology, Huazhong University of Science and Technology, University of Texas at Arlington, Fuzhou University, and Huazhong University of Science and Technology.

More information: Xianghao Xu et al, A disk I/O optimized system for concurrent graph processing jobs, *Frontiers of Computer Science* (2024). DOI: 10.1007/s11704-023-2361-0

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