



## External memory Graph Processing System

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**Abstract** - In the era of big data, graph analysis has become a critical tool for uncovering hidden patterns and relationships in complex networks, ranging from social media interactions to biological systems. However, the sheer size of these graphs often exceeds the capacity of conventional in-memory processing techniques. This survey presents an overview of external memory systems designed to address this challenge, enabling efficient graph analysis on disk-based storage. We explore the motivation behind leveraging external memory systems, particularly focusing on their ability to handle massive graphs that are otherwise infeasible to process in-memory. The applications of such systems are vast, including real-time recommendation engines, fraud detection in financial networks, and large-scale scientific simulations. We highlight the advantages of external memory graph analysis, such as scalability, cost-effectiveness, and the ability to process graphs with billions of nodes and edges. Furthermore, we delve into a variety of solutions employed by these systems, including graph partitioning techniques, asynchronous I/O operations, and other innovative approaches to optimize performance and resource utilization. By providing a comprehensive review of current methodologies and technologies, this survey aims to offer insights into the future directions and potential improvements in the field of graph analysis using external memory systems.