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Optimization Techniques for Query Processing in Distributed Big Data Environments

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Abstract: *With the exponential growth of data, distributed big data systems have become essential for managing, processing, and analyzing massive datasets efficiently. Query processing in such environments presents significant challenges due to data heterogeneity, network latency, and resource constraints. This paper presents a comprehensive review of optimization techniques for query processing in distributed big data environments. Various strategies, including query decomposition, cost-based optimization, data partitioning, and parallel processing, are discussed along with their strengths and limitations. A comparative analysis is provided in tabular form, and relevant formulas are presented for understanding performance evaluation metrics.*

Keywords: Query Processing, Distributed Systems, Optimization Techniques