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OLAP performance of distributed PostgreSQL and MongoDB on OpenStack. Preliminary Results on Smaller Scale Factors

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Traditional relational or SQL database servers and document/JSON database servers are part of state-of-the-art data architectures. Comparing the database query (OLAP) performance of relational and document data stores is challenging because of myriads of options in data modeling, query features, data distribution, processing distribution, etc. Based on the TPC-H benchmark tools, this paper presents the initial findings of converting the relational TPC-H schema deployed in a PostgreSQL/Citus cluster into a denormalized JSON schema deployed in a MongoDB cluster and subsequently mapping a 296-query set from SQL to MongoDB Aggregation Framework. The success of each query execution within a 10-minute timeout was collected for both PostgreSQL and MongoDB in six scenarios defined by two small-scale factors (0.01 and 0.1 GB) and three values of nodes (3, 6 and 9) for data distribution and processing. Results show that the database server is associated with the success of query execution.

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