Horizons of Composability (Keynote Talk)

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Abstract

Composability is coming up for many parts of the data management stack. At the same time, data volumes keep growing and AI is becoming the main customer of data. Data management and accelerators have been on the table for years. Are we approaching an inflection point where data management becomes cost competitive on accelerators? What about colocating it with GPUs already used for AI? Composability, on its side, is maybe best established in query optimization with Calcite and coming to execution with projects like Arrow, Velox and Tril. How does composability address the inflections in data center architectures, AI and workloads? We discuss the composability efforts at Meta, including Velox, and Velox Wave, a new approach for portable, composable hardware acceleration for query. We briefly cover Verax, an early concept for a query optimizer companion for Velox. We point out interesting research outcomes and future/ongoing collaborations for strengthening the composability field, as in file formats and abstracting query engine design. Drawing on our experience and insight into workloads and the evolution of the data center, we outline wins, challenges and opportunities for the composability movement.

Speaker Biography: Erling co-founded the Velox composable query execution project at Meta. Prior to this, he worked on Google's F1 and before then created OpenLink Virtuoso, a relational/graph store, best known for its applications in linked data and knowledge graphs. Research interests include benchmarking and generalizing query processing to fuse with neighboring graph, AI and HPC domains. The mission is to create a line of components from execution to query optimization to distributed computing.

Joint Workshops at 49th International Conference on Very Large Data Bases (VLDBW'23) — Second International Workshop on Composable Data Management Systems (CDMS'23), August 28 - September 1, 2023, Vancouver, Canada