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Science SQL

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SQL has been lingua franca for any-size data services in business, and has been tremendously successful in delivering flexible, scalable technology. Not so, however, in scientific and engineering environments. The main reason is data structure support: While flat tables are suitable for accounting and product catalogs, science needs substantially more complex information categories, such as graphs and multi-dimensional grids ("arrays"). The consequence has been a historical divide been "data" (large, only for download, no search) and "metadata" (small, agile, searchable).

This is changing now. In june 2014, ISO has commenced work on an extension to SQL which embeds any-size multi-dimensional arrays in tables and extends the query language with declarative operators. This standard, which will go by the official title ISO 9075 Part 15: SQL/MDA (for "Multi-Dimensional Arrays") can be expected to be a game changer in Big Science Data: With so-called Array Databases, users enjoy the well-known query flexibility on all spatio-temporal data, servers can transparently scale by utilizing parallelization, distribution, and new hardware, and the information integration achieved abolishes the data/metadata distinction once and for all. SQL/MDA can be expected to become the lingua franca for data access in and across data centers worldwide.

We present the SQL/MDA concepts and their scalable implementation based on real-life services with 130+ TB individual offerings and introduce to the state of the art in the research field of Array Databases where in 2014 a single array query has successfully been distributed automatically to 1000+ cloud nodes.

The presenter is member of the ISO SQL working group and co-editor of SQL/MDA. With his work on rasdaman he has coined the field of Array Databases.

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