Embedding Forecasting Techniques in Database Systems

Prof. Dr. Wolfgang Lehner
TU Dresden

Time series forecasting is a fundamental prerequisite for decision-making processes and crucial in a number of domains such as production planning and energy load balancing. In the past, forecasting was often performed by statistical experts in dedicated software environments outside of current database systems. However, forecasts are increasingly required by non-expert users or have to be computed fully automatically without any human intervention. Furthermore, we can observe an ever increasing data volume and the need for accurate and timely forecasts over large multi-dimensional data sets. As most data subject to analysis is stored in database management systems, a rising trend addresses the integration of forecasting inside a DBMS. Yet, many existing approaches follow a black-box style and try to keep changes to the database system as minimal as possible. While such approaches are more general and easier to realize, they miss significant opportunities for improved performance and usability.

In this talk, we introduce a novel approach that seamlessly integrates time series forecasting into a traditional database management system. In contrast to flash-back queries that allow a view on the data in the past, we have developed a Flash-Forward Database System (F2DB) that provides a view on the data in the future. It supports a new query type - a forecast query - that enables forecasting of time series data and is automatically and transparently processed by the core engine of an existing DBMS. We discuss necessary extensions to the parser, optimizer, and executor of a traditional DBMS. Hereby, our goal is to increase the efficiency of forecast queries while ensuring high forecast accuracy.

Thursday, 23th January 2013, 15:00
Room 001
Albert-Einstein-Straße 22, 18059 Rostock