
Advanced Technology Seminar 3

Database Replication for the Mobile Era

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Abstract

Recent advances in mobile computing have spurred new interests in data replication. The techniques for data replication originated in early 80's, in the form of snapshots and materialized views, to improve performance of database queries. Later, the efforts were driven by the urge to improve data availability. However, in the mobile world and other weakly connected environments, data replication is really indispensable—it fuels the mobile applications.

The seminar starts with a historical review of data distribution models and copy consistency models. Eager (synchronous) and lazy (asynchronous) replication methods are introduced. Scalability analysis is given. Specific requirements of weakly connected environments are exposed, and concepts of data dissemination, recharging and caching are presented. Approaches to maintaining various levels of data consistency in the context of lazy methods are reviewed. Ways to address the problems of data currency and reliability, context and location awareness, and replication transparency are discussed. A survey of commercial data replication products is given. Latest research efforts in the area are reported. In the conclusion, promising research issues are suggested for study.

Antoni Wolski currently holds a position of a Chief Researcher at the Solid Applied Research Center (SARC) in Helsinki, Finland. Previously, he acted as Chief Research Scientist at VTT Information Technology in Finland, where, for over ten years, he led research in areas like heterogeneous databases, transaction processing, and active and temporal databases. He has published a few tens of papers at conferences, in journals and academic books. He has served on several program committees and editorial boards. He has frequently acted as a consultant in the field of data management in telecommunications and industrial systems. His educator's background includes teaching both in the academia and commercially. He received his Ph.D. in Computer Science from the Technical University of Warsaw, Poland, in 1975.