

## SQL Transactions workshop at IT College on 16 May 2014 10:00-

Database products are among the most advanced software providing the reliable storage and fast data access services for any business applications. However, the reliability doesn't come for free – to avoid *losing or messing with data* the database services need to be accessed using transactions i.e. application developers need to design the transactions for the used database product. Since the database products behave differently from each other, and from SQL standard and textbooks, developers need to understand the behavior of the used product and know the special features of the transaction protocol supported by the product.

For easy experimenting with the transactional use of the mainstream DBMS products, DBTech VET project has built a virtual database laboratory consisting of Debian Linux and the readily installed DBMS products DB2 Express-C, Oracle XE, MySQL/InnoDB (or MariaDB), PostgreSQL and Pyrrho, with typical programming languages and developer tools. The laboratory is freely downloadable from [www.dbtechnet.org/download/DebianDBVM06.zip](http://www.dbtechnet.org/download/DebianDBVM06.zip) and can be imported into a virtual machine in VirtualBox or VMware software.

In the workshop we use the handbook “SQL Transactions – Theory and hands-on exercises” available for free from [www.dbtechnet.org/download/SQL-Transactions\\_handbook\\_EN.pdf](http://www.dbtechnet.org/download/SQL-Transactions_handbook_EN.pdf). Scripts for the exercises have been adopted for all supported DBMS products are available in the virtual machine.

### Workshop agenda:

Introduction of DBTechNet <http://www.dbtechnet.org> and DBTech VET project

Introduction and demonstration on use of the **Database Laboratory** - [Quick Start Guide](#)

**Concepts** of Client/Server architecture

**Diagnostics** and SQL exception handling

**Transaction protocol** needed for reliable database accessing

“Big Pictures” of the [server-side transaction processing and recovery](#)

Experimenting with selected transactions in **single-user environment**

[Break]

**Concurrency problems in multi-user environment**

- lost update, dirty read, non-repeatable read, phantom/phantom read, ghosts

**Isolation levels** of SQL standard and database products

**Concurrency control mechanisms** used by the products

- multi-granular locking, row-stamping and multi-versioning

**Experimenting** with selected transactions in multi-user environment

**SQL stored routines** and triggers in the context of transactions

- [www.dbtechnet.org/papers/SQL\\_StoredRoutines.pdf](http://www.dbtechnet.org/papers/SQL_StoredRoutines.pdf)

Best practices in transaction programming

Presentation copies at [www.dbtechnet.org/download/SQL-Transactions\\_Intro.pdf](http://www.dbtechnet.org/download/SQL-Transactions_Intro.pdf)

Workshop evaluation at <webform> has timeout

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Recommended reading after basics of SQL transactions :

[www.dbtechnet.org/papers/SQL\\_ConcurrencyTechnologies.pdf](http://www.dbtechnet.org/papers/SQL_ConcurrencyTechnologies.pdf)

[www.dbtechnet.org/papers/RVV\\_Paper.pdf](http://www.dbtechnet.org/papers/RVV_Paper.pdf)