# DB2 Administration for Linux, UNIX and Windows

## Course Summary

**Description**

This course is designed to review the concepts and components of DB2 version 9.5 for LINUX, UNIX and Windows. This course has 3 major sections; basic administration, advanced recovery" and "performance and tuning". DB2 commands and SQL will be used to focus on DB2 administration activities. The relationships between object components will be presented along with communication and security aspects. Design issues of referential Integrity, table check constraints, user defined data types and functions, triggers and large objects will be reviewed. Program design issues will be considered which effect concurrency, integrity and performance. DB2 administration functions and utilities will be reviewed and applied in workshops. Performance and tuning issues will be reviewed and applied in workshops.

**Objectives**
At the end of this course, students will be able to:

- Understand the basic concepts and facilities of DB2.
- Create instances, databases and relational objects to support application development and user data access.
- Understand row compression and range partitioning on tables to improve performance
- Use IMPORT, EXPORT and LOAD utilities to manipulate data.
- Perform basic and advanced database and tablespace recovery
- Understand the basic security features of DB2.
- Understand and control the locking behavior of DB2 and gather snapshot information for analysis.
- Know how the DB2 Optimizer can be influenced to aid performance.
- Use performance enhancing techniques for supporting applications.
- Use EXPLAIN tools and techniques to improve SQL performance.
- Alter the configuration of DB2 to improve performance

**Topics**

- The DB2 Family
- Getting started with DB2 (INSTANCES)
- Workshop
- DB2 and GUI
- Creating databases and tablespaces
- Creating Tables and other objects
- TRIGGERS, UDT and UDF
- DB2 LOCKING
- DB2 Security
- DB2 Data Management
- IMPORT/EXPORT/LOAD utilities
- Basic Database Recovery
- Disaster Recovery for tables and tablespaces
- Incremental backup and recovery techniques
- Data Access Techniques
- The DB2 Optimizer
- DB2 Operational Model
- DB2 Configuration Parameters

**Audience**

This course is designed for database administrators.

**Prerequisites**

Students should have relevant operating systems experience (UNIX, LINUX or Windows), and knowledge of relational database theory and SQL. Previous experience of using DB2 or another relational database is recommended.

**Duration**

Five days

Due to the nature of this material, this document refers to numerous hardware and software products by their trade names. References to other companies and their products are for informational purposes only, and all trademarks are the properties of their respective companies. It is not the intent of ProTech Professional Technical Services, Inc. to use any of these names generically

# DB2 Administration for Linux, UNIX and Windows

## Course Outline

**I. The DB2 Family**
- A. The DB2 family of products
- B. DB2 communications options

**II. Getting started with DB2 (INSTANCES)**
- A. The DB2 hierarchy of objects
- B. TCP/IP Connectivity for DB2
- C. Instance creation and configuration
- D. CLP (command line processor) coding options
- E. The DB2 Administration Server

**III. DB2 and GUI**
- A. Administration (GUI) tools
- B. Configuring a DB2 Client to access remote instances and databases
- C. Using the Command Editor to run queries or commands
- D. Using the Control Center to create a database object

**IV. Creating databases and tablespaces**
- A. Know how to create a database
- B. Create SMS and DMS tablespaces
- C. List tablespace and container information for a database
- D. Get tablespace snapshots
- E. Alter a tablespace and change container sizes
- F. List and change the database and instance configuration files
- G. Introduce Automatic storage

**V. Creating Tables and other objects**
- A. Creating tables and indexes
- B. Using data types and nullity attributes for columns
- C. Defining Referential and table Check constraints
- D. Creating views and nested table expressions
- E. Introduce row compression
- F. Identify concepts of range partitioning

**VI. TRIGGERS, UDT and UDF**
- A. When and how to use DB2 triggers
- B. Create and code triggers
- C. When and how to use UDT's
- D. Define sourced and external UDF
- E. Define table functions

**VII. DB2 LOCKING**
- A. How DB2 controls concurrency and integrity for multiple users
- B. Know the factors effecting data locking
- C. Use commands to affect the behavior of DB2 locking
- D. Use monitors to analyze user locking activity
- E. Review and alter database configuration parameters that effect locking

**VIII. DB2 Security**
- A. How to GRANT privileges
- B. Know of administration Authorities in DB2
- C. How to create tables and other objects for use of groups

**IX. DB2 Data Management**
- A. Identify logging techniques that DB2 uses
- B. Basic features of some DB2 Utilities, that help manage data
- C. When to use these utilities

**X. IMPORT/EXPORT/LOAD Utilities**
- A. When and how to use IMPORT, EXPORT and LOAD
- B. Choose options to improve performance the effects of using LOAD and how to bring a table to normal status
- C. Compare LOAD and IMPORT

Due to the nature of this material, this document refers to numerous hardware and software products by their trade names. References to other companies and their products are for informational purposes only, and all trademarks are the properties of their respective companies. It is not the intent of ProTech Professional Technical Services, Inc. to use any of these names generically

# DB2 Administration for Linux, UNIX and Windows

## Course Outline (cont'd)

**XI. Basic Database Recovery**
- A. When and how to use BACKUP and RECOVERY operations.
- B. Choose a database configuration for "full recovery" after failure.
- C. ROLLFORWARD through the transaction logs to reapply changes to data.
- D. Check the status of a tablespace.
- E. Accomplish point-in-time recovery of a tablespace

**XII. Disaster Recovery for tables and tablespaces**
- A. Complete a redirected restore, to replace lost or changed containers for tablespaces.
- B. Recover from dropped table

**XIII. Incremental backup and recovery techniques**
- A. Why and how to choose an incremental backup activity.
- B. Determine options for database and tablespace recovery, when incremental backup has been used.
- C. Setup for a database for incremental backup activity

**XIV. Data Access Techniques**
- A. Understand strategies that might be used by the DB2 optimizer
- B. Know what happens at execute time for specific strategies.
- C. Use the EXPLAIN tools to analyse access strategy.

**XV. The DB2 Optimizer**
- A. Know the impact of optimizer options on performance
- B. Review multi-table access
- C. Create indexes with varying options to improve performance
- D. Create automatic summary tables
- E. Consider the ways RAID technology may be used
- F. Use lab activities to analyze and influence SQL performance

**XVI. DB2 Operational Model**
- A. Review the architectural concepts for DB2
- B. Look at the behavior of DB2, with respect to I/O operations
- C. Identify important cache and monitoring elements
- D. Lab activities involve extensive performance and tuning of the database to improve overall performance. Analysis of DB2 snapshots will prompt changes in database configuration. This pattern of analysis and change (tuning), will be repeated until performance is optimized.

**XVII. DB2 Configuration Parameters**
- A. Review important configuration parameters for the a database and the database manager
- B. Introduce auto-configuration
- C. Identify the DB2 Design Advisor

Due to the nature of this material, this document refers to numerous hardware and software products by their trade names. References to other companies and their products are for informational purposes only, and all trademarks are the properties of their respective companies. It is not the intent of ProTech Professional Technical Services, Inc. to use any of these names generically