DB2 for z/OS Database Administration

Course Summary

Description

This course is designed to provide the student with the knowledge to effectively and efficiently design, create and maintain DB2 databases using up to and including version 10 of DB2 for z/OS. The student will learn how to use Entity Relationship Modeling techniques to design and normalize a relational database. They will demonstrate how to define DB2 objects, including Databases, Storage Groups, Tablespaces, Tables, including Temporal and Hash organization, Indexes, Views, Synonyms, Materialized Query Tables, Clone Tables and Aliases. The student will also develop skills to load, modify, backup, and recover DB2 data using DB2 utilities. This course includes features up to and including version 10 of DB2 for z/OS.

Topics

- Relational Database Design, including Entity Relationship Modeling techniques and Data Normalization
- DB2 Overview and Storage Concepts
- Referential integrity
- DB2 objects
- Creating Databases, Storage Groups, Tablespaces, including segmented and partitioned, Tables, Clone Tables, Materialized Query Tables, Indexes, including cluster and non-cluster, Views, Synonyms and Aliases
- VSAM file allocation options
- Overview of Global Resource Serialization Concepts
- Use of DB2 utilities to load, reorganize, perform backup and recovery operations
- Utility Performance Considerations
- Program Preparation, Bind and Locking
- Implementing Security

Audience

This course is intended for entry level or future DB2 database administrators or application programmers who need to acquire the essential skills required to administer a DB2 database.

Prerequisites

The student should:

- Be familiar with DB2 concepts
- Have experience with SQL data manipulation language
- Have experience using TSO/ISPF and JCL

Duration

Five days

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Course Outline

I. Entity Relationship Modeling
- A. Introduction to Database Design
- B. Defining the Mission
- C. Entity Relationships – Modeling and Diagrams
- D. Entity Relationship Diagrams - Notational Conventions
- E. Association Entities
- F. Drawings Guidelines
- G. EXERCISE - Entity Relationship Diagrams
- H. Data Elements and Primary Keys
- I. EXERCISE – Assign Data Elements and Primary Keys

II. Normalization
- A. Introduction to Normalization
- B. First Cut
- C. Overview of Normal Forms
- D. First Normal Form (1NF)
- E. Second Normal Form (2NF)
- F. Third Normal Form (3NF)
- G. Derived Columns
- H. Logical Design Evaluation
- I. Benefits of Normalization
- J. Denormalization
- K. Referential Integrity
- L. DELETE Concepts
- M. INSERT and UPDATE Implications
- N. Summary
- O. Transition From Logical to Physical
- P. EXERCISE - Normalization

III. DB2 Overview and Storage Concepts
- A. What is DB2?
- B. What is the History behind DB2?
- C. What are DB2's Objectives?
- D. What is a Relational DBMS?
- E. What are DB2's Features?
- F. Operational Environment
- G. Global Resource Serialization
- H. SQL
- I. Program Preparation Process
- J. Unit of Recovery
- K. Commit / Rollback
- L. DB2 Terminology
- M. Physical Hierarchy of DB2 Objects
- N. Naming Conventions
- O. Object Naming Conventions
- P. Databases
- Q. DB2 and VSAM
- R. Storage Groups
- S. Page Management
- T. Tablespace
- U. Segmented Tablespaces
- V. Partitioned Tables
- W. Base Tables
- X. View Table
- Y. Synonym
- Z. Indexes
- AA. Stored Procedures and Functions
- BB. DB2 String Data Types
- CC. DB2 Numeric Data Types
- DD. Data and Time Data Types
- EE. Display Formats
- FF. ROWID Data Type Versus Identity Column Attribute
- GG. User-Defined Data Type
- HH. DB2 Catalogs

IV. Create and Maintain DB2 Objects
- A. Structured Query Language (SQL)
- B. Create a Storage Group
- C. Managing Your Own VSAM
- D. Create a Database
- E. Create a Tablespace
- F. Implicit Creation
- G. VSAM Managed by DB2
- H. VSAM Managed by User
- I. Segmented Tablespaces
- J. Partitioned Tablespaces
- K. Alter a Tablespace
- L. Create a Base Table
- M. Identity Column
- N. Create a Materialized Query Table
- O. Alter a Table
- P. Check Constraints
- Q. Clone a Table
- R. Synonyms
- S. Aliases
- T. Indexes
- U. Index Structure

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Course Outline (cont'd)

V. Unique versus Non-Unique Indexes
W. Cluster versus Non-Cluster Indexes
X. Cluster Index
Y. Index Create
Z. Indexspace
AA. Alter an Index
BB. Views
CC. Deleting DB2 Objects

V. Referential Integrity
A. Referential Integrity
B. Delete Rules
C. Insert and Update Implications
D. Referential Integrity Summary
E. DDL - Referential Integrity
F. Primary Key Characteristics
G. Foreign Key Characteristics

VI. Utilities
A. Utility Execution
B. LISTDEF
C. LOAD
D. UNLOAD
E. CHECK DATA
F. COPY
G. DB2 Logging
H. QUIESCE
I. REPORT
J. RECOVER
K. RUNSTATS
L. REORG
M. REBUILD INDEX
N. DSN1COPY

VII. Program Preparation, Bind and Locking
A. Overall Procure
B. Precompile
C. Conversion
D. Bind Procedure
E. Bind Panel
F. Rebind and Free
G. Validate Option
H. Timestamp
I. Program Isolation
J. Lock Table
K. Lock Duration

VIII. Security
A. Structured Query Language (SQL)
B. Security Overview
C. Resources and Users
D. Privileges
E. Implicit Versus Explicit
F. Grant/Revoke
G. Grant
H. Revoke
I. Secondary Auth-ID
J. Role

IX. Appendix A - DBA Lab
A. General Information
B. Lab Introduction
C. Notes Used to Produce the Logical Design
D. Logical Design Documentation
E. Normalized Data Groups
F. Keys
G. Lab 1: Physical Table Design and Specifications
H. Lab 2: Load and Check Data
I. Lab 3: Backup and Recovery
J. Lab 4: Runstats and Reorg
K. Lab 5: DB2 Security & Authorization

X. Appendix B - DB2 Catalogs
A. Catalog Tables - Overview
B. SYSIBM.SYSTABLES
C. SYSIBM.SYSCOLUMNS
D. SYSIBM.SYSFOREIGNKEYS
E. SYSIBM.SYSINDEXES
F. SYSIBM.SYSKEYS
G. SYSIBM.SYSRELS
H. SYSIBM.SYSSYNONYMS
I. SYSIBM.SYSTABLESPACE
J. SYSIBM.SYSVIEWS
K. SYSIBM.SYSVIEWDEP

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