DB2 for z/OS Tuning & Performance (5 Days)

Description: The student will learn how to tune applications that use the DB2 environment, as well as design data bases to minimize the use of system resources.

Audience: Technical personnel who need to optimize the performance of a DB2 application system

Prerequisites: The student should have experience in using DB2, either in the areas of applications development or data base administration.

Course Content:

- DB2 architecture
- Application program tuning
- Access Strategies
- EXPLAIN, PLAN_TABLEs, DSN_STATEMNT_TABLEs, and DSN_STATEMENT_CACHE_TABLEs
- Indexable, Stage 1, and Stage 2 predicates
- Catalog tables and filter factors
- Catalog table modification
- Join and subquery access strategies
- BIND parameter considerations
- Concurrency and locking
- Batch issues
- Security issues and strategies
- Sequential and list prefetch
- Visual Explain
- Attachment facility issues, RCT parameters, and thread reuse
- Data base design considerations
- Utility issues
- DB2 traces and Instrumentation Facility
- DB2 system parameters
- z/OS issues

There are twelve machine exercises, and one optional machine exercise.

DB2 Tuning and Performance - Course Objectives

On successful completion of this course, the student, with the aid of the appropriate reference materials, should be able to:

- Understand and explain the major components of the DB2 architecture.
- Use EXPLAIN output to determine DB2 access strategies and diagnose potential concurrency and performance difficulties.
- Understand and analyze DB2's strategy for performing joins, accessing cursors, and implementing subqueries.
- Understand DB2's strategy for selecting and using Indexes in data access.
- Arrange for efficient batch and utility processing using DB2.
- Use SQL to modify DB2 System Catalog Tables to influence DB2's choice of access paths.
- Understand the performance implications of using the DB2 security facilities.
- Understand and specify the parameters for the CICS and IMS attachment facilities
- Understand the performance implications of Data Base Design decisions and Data Definition parameters.

Course Outline

DB2 Architecture
- DB2 Objects
- Physical Storage Structures
- DB2 Catalog And Directory
- Address Spaces
- Connecting to DB2: Threads
- Logging, The Boot Strap Data Set, and Checkpoints
- Pools: Buffer, Hiper, And EDM
- Computer Exercise: Course Setup

The DB2 Sample Application

Application Programming Tuning
- Access Strategies Overview
- EXPLAIN and PLAN_TABLE
- Computer Exercise: Access Strategies and EXPLAIN

Access Strategies Details
- Application of Predicates
- Indexable, Stage 1, and Stage 2 Predicates
- Catalog Tables and Access Strategies
- Filter Factors
- Catalog Table Modification
- Computer Exercise: Access Strategies in Aggregated Queries

Join Access Strategies

Star Joins
- Computer Exercise: Access Strategies in Joins

Subquery Access Strategies

View and UNION

Query Parallelism
- Computer Exercise: Access Strategies in Subqueries

EXPLAINing Plans and Packages

Optimization Hints

DSN_STATEMNT_TABLE and DSN_FUNCTION_TABLE

Predictive Governing

DSN_STATEMENT_CACHE_TABLE
- Computer Exercise: Hints and Costs

BIND Parameter Performance Considerations

Concurrency and Locking
- Claim/Drain Processing
- Lock Avoidance: Commit LSN and PUNC Bits
- Computer Exercise: Bind parameters and locking

Other Programming Considerations
- Sequential and List Prefetch
- Dynamic SQL
- Batch Issues
- Computer Exercise: Plans, Indexes, and Views

Security and Performance
- CICS Security
- IMS Security
- Table Access Issues
- Authorization Exits
- Security Strategies

Visual Explain
- Computer Exercise: Visual Explain

Attachment Facilities and Performance
- CICS Attachment
- IMS Attachment
- TSO Attachment
- Call Attachment
- Recoverable Resource Services Manager Attachment
- Computer Exercise: Attachment Facility Parameters

Data Base Design Considerations
- Referential Integrity and Normalizing
- Data Bases, Storage Groups, Table Spaces, Tables, and Indexes
- Creating new Indexes
- REORG Implications
- Computer Exercise: Index Support Activities

Utility Considerations
- Utility Partition Independence
- LOAD
- COPY, MERGECOPY, and RECOVER
- Partial Recovery
- REORG, RUNSTATS, and QUIESCE
- Computer Exercise: A Study in Partial Recovery

Other Topics
- Bufferpools and Hiperpools
- Distributed Processing Issues
- DB2 System Parameters
- DB2 Instrumentation Facility
- z/OS Issues
- Computer Exercise: The Real World