

ADVANCED QUERY TUNING WITH OPTIMIZATION SERVICE CENTER

DESCRIPTION:

This course is designed for the DB2 for z/OS development professional who desires to understand the fundamental issues associated with performance for DB2 SQL applications. Emphasis is placed on new considerations for DB2 Version 8 & 9 and the use of Optimization Service Center (OSC) as an optimization tool. Concepts discussed will be reinforced with appropriate workshops.

DURATION:

Three (3) Days.

COURSE OBJECTIVES:

Upon completion of this course the student should understand:

- When different types of access paths are desirable
- The new statistics available in DB2 Version 8 & 9 and their impact on access path selection
- New optimization techniques available with the DB2 9 optimizer
- How to use the information provided by OSC to improve the performance of DB2 applications

AUDIENCE:

Application Architects, analysts, developers and DBAs involved in the development and support of DB2/SQL applications.

PREREQUISITES:

A basic understanding of SQL optimization is helpful.

TOPICS OUTLINE:

I. Optimization Goals & Tools

- Goals of Optimization
 - Reduce CPU
 - Reduce I/O
 - Reduce Contention
- Deciding what to tune
 - Trace Data
 - Critical path queries
 - Ad hoc query optimization
- What causes CPU and I/O
 - Use of Functions, triggers, etc
 - Keeping too much data too long
- Optimizer overview
- Explain output
 - PLAN_TABLE
 - DSN_STATEMENT_TABLE
 - Additional Explain Tables for OSC
- Explaining and viewing output in OSC

II. Access Paths with OSC

- Single Table Access
 - Tablespace Scan
 - Sequential Prefetch
 - Index Scans
 - Matching
 - Non-matching
 - Index Screening
 - List Prefetch
- Multiple Table Access
 - Join type
 - Inner
 - Left/Right Outer
 - Full Outer
 - Join method
 - Nested Loop
 - Merge Scan
 - Hybrid
 - Sorting
 - Reasons for sorts
 - Avoiding sorts
 - Join order
- Predicate Transitive Closure

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III. Filter Factors & Performance

- Catalog Statistics via OSC
 - SYSTABLES
 - SYSCOLUMNS
 - SYSINDEXES
 - SYSCOLDIST
- What is a filter factor?
- Use in index selection
- Use in join order selection
- Use in join method selection
- How are filter factors calculated?

IV. Predicate Types

- Software levels
- Predicate processing order
- Viewing predicate details in OSC
- Stage 1 vs Stage 2 processing

V. Case Studies in Optimizer Problems

- Case 1: 2 Possible Indexes
- Case 2: Join Order
- Case 3: Range Predicates
- Case 4: Host Variables

VI. Design for Performance

- Index Only Access for screening and data retrieval
- Clustering decisions
- Multiple Index Access
- Sort Avoidance
- Compression
- Index on Expression

VII. OSC In-Depth

- Saving access paths as XML files
- Workload Analysis
- Workload Advisors
- Retrieving statements from the catalog or statement cache

VIII. Top 35+ Tuning Tips for DB2 SQL Developers (and More)