

# Db2 12 for z/OS SQL Performance and Tuning (CV964G)

ID CV964G Prix CHF 2 400,— (Hors Taxe) Durée 3 jours

### A qui s'adresse cette formation

This course is for Db2 12 for z/OS application developers, Db2 12 for z/OS DBAs, and anyone else with a responsibility for SQL performance and tuning in a Db2 12 for z/OS environment.

### Pré-requis

- · Familiarity with SQL
- Familiarity with Db2 12 for z/OS
- Familiarity with Db2 12 for z/OS application programming

### **Objectifs**

After completing this course, students will be able to:

- Understand and design better indexes
- Determine how to work with the optimizer (avoid pitfalls, provide guidence)
- Optimize multi-table access
- Work with subqueries
- Avoid locking problems
- Use accounting traces and other tools to locate performance problems in existing SQL
- and more

### Contenu

Introduction to SQL performance and tuning

- Performance issues
- Simple example
- Visualizing the problem
- Summary

### Performance analysis tools

- · Components of response time
- Time estimates with VQUBE3
- SQL EXPLAIN
- The accounting trace
- The bubble chart

Performance thresholds

#### Index basics

- Indexes
- Index structure
- Estimating index I/Os
- · Clustering index
- · Index page splits

### Access paths

- Classification
- · Matching versus Screening
- Variations
- · Hash access
- Prefetch
- Caveat

### More on indexes

- Include index
- Index on expression
- Tandom index
- Partitioned and partitioning, NPSI and DPSI
- Page range screening
- · Features and limitations

# Tuning methodology and index cost

- Methodology
- Index cost: Disk space
- Index cost: Maintenance
- Utilities and indexes
- Modifying and creating indexes
- Avoiding sorts

# Index design

- Approach
- · Designing indexes

### Advanced access paths

Prefetch

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- · List prefetch
- Multiple index access
- Runtime adaptive index

### Multiple table access

- · Join methods
- Join types
- · Designing indexes for joins
- Predicting table order

## Subqueries

- · Correlated subqueries
- Non-correlated subqueries
- ORDER BY and FETCH FIRST with subqueries
- · Global query optimization
- · Virtual tables
- · Explain for subqueries

### Set operations (optional)

- UNION, EXCEPT, and INTERSECT
- Rules
- More about the set operators
- UNION ALL performance improvements

# Table design (optional)

- Number of tables
- Clustering sequence
- Denormalization
- Materialized query tables (MQTs)
- Temporal tables
- Archive enabled tables

### Working with the optimizer

- Indexable versus non-indexable predicates
- Boolean versus non-Boolean predicates
- Stage 1 versus stage 2
- · Filter factors
- Helping the optimizer
- Pagination

# Locking issues

- The ACID test
- Reasons for serialization
- · Serialization mechanisms
- Transaction locking
- · Lock promotion, escalation, and avoidance

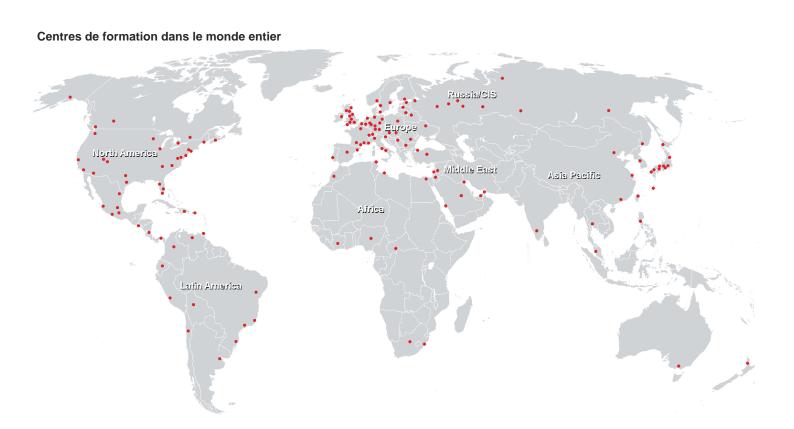
## More locking issues (optional)

- · Skip locked data
- · Currently committed data
- · Optimistic locking
- Hot spots
- Application design
- Analyzing lock waits

## Massive batch (optional)

- · Batch performance issues
- · Buffer pool operations
- Improving performance
- · Benefit analysis
- Massive deletes

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