

- COURSE CODE:** DZOPTP
- COURSE TITLE:** DB2 Performance & Tuning for Production DBAs
- ENVIRONMENT:** Non-data sharing
- AUDIENCE:** Production DBAs, Capacity Planners, Database Administrators and System Administrators.
- PREREQUISITES:** A working knowledge of DB2 objects, architecture and basic SQL.
- DURATION:** 4 days
- SUMMARY:** This course is designed mainly for DB2 Production DBAs in particular and DB2 DBAs in general. It imparts the necessary knowledge to monitor and tune areas that have a medium-to-high impact on DB2 subsystem performance:
- Application and SQL design
 - DB2 subsystem and operating system dependencies
 - Workloads in terms of threads, etc.
 - Data set placement and management
 - Index design and usage
 - Buffer pool usage
 - Locking and concurrency
 - Controlling sorts
 - Batch application design
 - Online (CICS) application design
- OBJECTIVES:** Upon completion of this presentation, the participant should be able to use DB2 related accounting, statistics and EXPLAIN reports to monitor and tune:
- SQL
 - Index usage and design
 - The DB2 subsystem in general
 - The DB2 I/O subsystem
 - The DB2 buffer pools
 - Sort pools
 - IRLM (lock manager)
 - Applications
- LAB:** Workshops and numerous desk exercises involving outputs from performance monitors: DB2 PM and DB2 EXPLAIN

1. DB2 ARCHITECTURE & OBJECTS

- Address spaces
- Optimizer
- I/O system
- Storage groups
- Databases
- Table spaces
- Tables
- Indexes
- Views
- Aliases vs. synonyms

2. INTRODUCTION TO PERFORMANCE & TUNING

- What is performance?
- How to set performance goals
- What may cause performance problems?

3. MONITORING TOOLS

- DB2 PM
- Other

4. ZPARAMs

- High performance parameters
- Medium performance parameters
- Low performance parameters

5. TRACES

- Starting
- Stopping
- Types (e.g., accounting, statistics)
- Scope
- Class types
- Output destination

6. RESPONSE TIMES

- Classes (e.g., Class 1, Class 2, Class 3)
- In application
- In DB2
- Suspensions (e.g., Class 3, Class 8)

7. SQL TUNING

- DB2 EXPLAIN facility
- Accounting reports
- How to use RUNSTATS
- How to use catalog tables
- Workshop

8. BUFFER POOL TUNING

- Virtual pools
- Expanded storage
- Hiperpools
- Data spaces
- Buffer stealing algorithms
- Workshop

9. I/O TUNING

- Synchronous I/O
- Asynchronous I/O
- Prefetch (sequential & dynamic)
- List prefetch
- CP vs. Sysplex parallelism
- Read engines vs. Write engines
- I/O scheduling priority
- Workshop

10. VIRTUAL BUFFER POOL THRESHOLDS

- Data set deferred write (VDWQT)
- Deferred write (DWQT)
- Virtual pool sequential steal (VPSQT)
- Hiperpool sequential steal (HPSEQT)
- Virtual pool assisting parallel sequential (VPXPSEQT)
- Virtual pool parallel sequential steal (VPPSEQT)
- Sequential prefetch (SPTH)
- Data manager (DMTH)
- Immediate write (IWTH)
- Monitoring -- statistics, accounting & commands
- How to monitor and tune
- Workshop

11. EDM POOL TUNING

- Usage
- Sizing
- I/O activity
- How to monitor and tune
- Workshop

12. TUNING SORTS

- What causes sorts?
- Clustered vs. non-clustered indexes
- Role of sort workfiles
- How to monitor and tune
- Workshop

13. LOCKING & CONCURRENCY TUNING

- Transaction locks
- Lockable objects
- Claims and drains
- Latches
- Bind option
- Application considerations
- How to monitor (e.g., -DISPLAY DATABASE LOCKS, -DISPLAY THREAD, statistics of accounting reports)
- How to tune
- Workshop

14. DATABASE SERVICES (DBM1) ADDRESS SPACE MONITORING (V7)

- 31-bit addressing limit
- Structure and contents (e.g., VP, EDM pool, threads)
- IFCIDs
- Storage usage statistics report
- Major storage consumer (e.g., VP)
- Storage manager pools
- Tuning options

15. BATCH APPLICATION DESIGN

- Index lookaside
- Prefetch
- Controlling sorts
- Clustered indexes
- Parallelism
- Locking

16. ONLINE DESIGN

- Hot spots and concurrency
- Deadlocks
- Thread reuse
- Indexes
- Locking