

# Oracle9i Performance and Tuning (5 Days)

## Custom Training Institute

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## Oracle9i Performance and Tuning (CTI 156)

*ORACLE is the most widely used relational database in the world, running on PCs, Macintoshes and UNIX minicomputers. This class will introduce students to a series of tuning steps that can be used to improve the performance of the Oracle9i Server. The focus is on Database and Instance tuning rather than specific operating system performance issues. Students will gain practical experience tuning an Oracle database. Using the available Oracle tools, students also learn how to recognize, troubleshoot and resolve common performance related problems in administering and Oracle database.*

*Prerequisites: Course CTI 154, Oracle9i DBA Fundamentals I – Architecture and Administration; Course CTI 155, Oracle9i DBA Fundamentals II – Networking and Backup and Recovery.*

*Minimum hardware requirements (per student): 500 MHz Pentiums (or comparable), 128 or 256 Mb RAM, 700 Mb to 1 gig free hard disk space; Macintosh running System 7, 8 Mb RAM, 200 Mb free hard disk space; or single UNIX workstation, plus one terminal per student.*

*Software requirements: Oracle9i Enterprise and Microsoft Windows 2000 installed on each PC (instructor and students). PLEASE NOTE THESE INSTALLATION INSTRUCTIONS: Do NOT install the networking option. Install only the sample database and SQL\*PLUS with the Enterprise options ON. Turn everything else OFF (unchecked).*

*Microsoft PowerPoint and Internet access on Instructor's workstation for presentation purposes.*

### Module 1: Overview

- Job Roles in Tuning
- Tuning Phases
- Tuning Goals and Service Level Agreements
- Common Performance Problems
- Tuning Methodology

### Module 2: Diagnostic and Tuning Tools

- Alert Log File
- Background Process Trace Files
- User Trace Files
- Dictionary Views Providing Statistics
- Dynamic Performance Views
- TIMED\_STATISTICS Parameter to Collect Statistics
- Statistics Package
- STATSPACK Procedures

### Module 3: Sizing the Shared Pool

- Overview of the Shared Pool
- Library Cache Tuning
- Reuse Statements
- Using Reserved Space
- Keeping Large Objects
- Data Dictionary Cache (DDC) Tuning

### Module 4: Tuning the Database Buffer Cache

- Characteristics of Buffer Cache
- Managing Buffer Cache
- Monitor Buffer Cache
- Dynamically Resizing Buffer Cache
- Buffer Cache Advisory Parameter
- Granules of Allocation
- Calculate Hit Ratio Using V\$SYSSTAT

### Module 5: Sizing Other SGA Structures

- Sizing the Redo Log Buffer
- Detecting Contention
- Resolving Contention
- Sizing the Java Pool
- Monitoring Java Pool Memory
- Sizing Java Pool Memory
- Limiting Java Session Memory Usage

### Module 6: Database Configuration and I/O Issues

- Distributing Files Across Devices
- Tablespace Usage
- Detecting Improper Tablespace Usage
- Oracle Object Striping
- Tuning Checkpoints

# Oracle9i Performance and Tuning (CTI 156) - continued

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## **Module 7: Optimizing Sort Operations**

- What is the Sorting Process?
- Sort Area Parameters (New and Old)
- Tuning Sort Operations (DB Configuration)
- Tuning Temporary Segments
- Reducing Sort Operations (Application Tuning)
- Identify Sort Operations
- Diagnostic Tools
- Materialized Views

## **Module 8: Latches**

- Discuss Latches
- Latch Request Types – Willing-to-wait
- Reducing Latch Contention
- Significant Latches
- Shared Pool and Library Cache Latches

## **Module 9: Tuning Rollback (or UNDO)**

### **Segments**

- Describing Rollback Segment Usage
- Usage and Configuration
- Detecting Problems with Rollback Segments
- Resolving Problems with Rollback Segments
- Creating Rollback Segments and Bringing Them Online
- Allocating Transactions to a Rollback Segment
- Resolving RBS Problems
- Describing System Managed Undo

## **Module 10: Locking**

- Concepts of Locking
- Overview of Locking Issues
- Types of DML Locks
- Types of DDL Lock Modes
- Detecting Blocking Locks
- Scripts to Aid in Solving Locking Issues
- Deadlocks

## **Module 11: Tuning Oracle Shared Server**

- Introducing Oracle Shared Server
- When Shared Servers are Required
- Monitoring Dispatcher Processes
- Monitoring Shared Server Processes
- Increasing or Decreasing the Number of Dispatchers
- Increasing or Decreasing the Number of Shared Servers
- Monitoring Process Usage
- Monitoring Memory Usage

## **Module 12: Tuning Considerations for Different Applications**

- Oracle Data Structures
- Storage Structures
- Clusters
- Indexes
- B-Tree

## **Module 13: Using Oracle Blocks Efficiently**

- Database Storage Hierarchy
- Allocating Extents
- Monitoring Space Usage in Data Segments
- Recovering Space from Sparsely Population Segments
- Database Blocks
- Chaining and Migration
- Detecting Row Chaining and Migration
- Resolving Row Chaining and Migration

## **Module 14: SQL Statement Tuning**

- Cost-based, Rule-based Optimiser Modes
- New Cost Based Optimiser Option
- Plan Stability
- Plan Equivalence
- Trace
- Stored Outlines
- Creating Stored Outlines
- Maintaining Stored Outlines
- Hints

## **Module 15: Generic Operation System Tuning Issues**

- Different System Architectures
- Virtual and Physical Memory
- Paging and Swapping
- CPU Tuning Guidelines
- Process vs Threads
- Resource Manager

## **Module 16: Summary and Review**