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Oracle 10g Advanced Performance Tuning with Kyle Hailey

3 Days, Hands-On

Course Description

This Oracle 10g Performance Tuning course will teach attendees how to fully harness the powerful new performance tuning and diagnostic tools in Oracle Database 10g.

In this class, students will learn how to use the Oracle Enterprise Manager (OEM) Performance page, most notably how to interpret the “average active session” (AAS) chart to identify problems and then how to drill down to find resolution either through the Automatic Database Diagnostic Monitor (ADDM) or through direct investigation of the data in the drilldowns. Students will learn an invaluable lesson by learning what AAS is, how to interpret it, how see identify a problem and how to drill down for further analysis and resolution.

However, unlike most performance classes, this training will provide students with advanced detail on how the data is collected, aggregated, displayed and analyzed. This advanced knowledge will deepen the student’s understanding, giving students the ability to manually collect and analyze performance data independently of the Oracle 10g tools and features. This is particularly useful for persons tuning Oracle when auto-data collection is not available (for example Oracle 8i, 9i, 10g Standard Edition, or Enterprise Edition without the Management Packs installed).

The training will include detailed explanations, analysis and solutions of the top 30 wait events. Some of these solutions are only possible with the revolutionary data collection technique of “active session history” (ASH). As with AAS, the training will demonstrate how to collect ASH manually on any version of Oracle (even Oracle 9i) and how to analyze the collected data to solve performance bottlenecks.

Hands-on case studies (workshops) are included in the class. Students are provided workloads containing a performance issue. Students are tasked with using the provided performance tools to discover the root cause of the problem and recommend a solution.

In summary, students will gain the necessary skills and knowledge to finally conquer their database woes, thus allowing more time and freedom while still looking brilliant to management and end-users!

Training Topic Summary

- Oracle Enterprise Manager (OEM 10g)
  - This lesson provides an explanation of OEM performance features and a demonstration of the powerful hidden features in OEM. Though OEM is not required to take advantage of AAS and ASH, OEM provides an easy-to-use graphical interface.

- Active Session History (ASH)
  - ASH represents a paradigm shift in Oracle performance tuning. ASH is a rich mutli-dimensional data source for all Oracle Database performance issues. For the first time ever, find solutions to wait event bottlenecks quickly, accurately and without wading through a mountain of statspack reports. This lesson explains ASH

Contact: www.SkillBuilders.com
gary@SkillBuilders.com | 1 (888) 803-5607

concepts, demonstrates how to access and interpret ASH data.

- Average Active Sessions (AAS)
  - AAS is the single most powerful metric used to track database performance. AAS is the ultimate summary of ASH data. This lesson explains AAS, demonstrates how AAS can be used to quickly ascertain the overall health of the database and how to drill down to uncover performance issues.

- 10g New Features
  - Oracle 10g added many new performance related statistics, data and advisories. This lesson explains what's new and demonstrates how to best use them. Topics include metrics, time model statistics, wait classes, Automatic Workload Repository (AWR) and the Automatic Database Diagnostics Monitor (ADDM). Also covered are the new client tracking and services reporting capabilities.

- The remaining lessons leverage ASH, AAS, AWR and ADDM to explain, demonstrate and provide solutions for all major wait events. This includes:

  - buffer cache
    - latch: cache buffers chains
    - latch: cache buffers lru chain
    - latch: cache buffer handles
    - Free Buffer Wait
    - Buffer Busy Wait
    - Write Complete Wait
    - Buffer Exterminate

  - IO
    - db file sequential read
    - db file scattered read
    - db file parallel read
    - read by other session
    - direct path read
    - direct path write
    - direct path read temp
    - direct path write temp
    - direct path write (lob)
    - file open
    - file identify
    - Local write wait
    - data file init write
    - sort segment request

  - Redo
    - Log Buffer Space
    - Log File Sync
    - Log File Switch Completion
    - Log File Switch (checkpoint incomplete)
    - Log File Switch (private strand flush incomplete)
    - Log File Switch (archiving needed)

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        - Switch Log File Command

    - Enqueues
        - Part I - user locks
        - TM – table modification
        - TX – Transaction locks
        - UL – user lock
        - Part II - internal locks
        - CI – Cross Instance
        - CU – Cursor Bind
        - HW – High Water
        - RO – Reusable Object
        - ST – Space Transaction
        - TS – Temporary Space

    - Library Cache/Shared Pool
        - Latch: Library Cache
        - Latch: Shared Pool Latch
        - Library Cache Pin
        - Library Cache Lock
        - Library Cache Load Lock
        - Row Cache Lock
        - Cursor:mutex X
        - Cursor:mutex S
        - Cursor:pin X
        - Cursor:pin S
        - Cursor:pin S wait on X

    - SQL*Net
        - SQL*Net more data from client
        - SQL*Net more data to client
        - SQL*Net break/reset to client
        - SQL*Net more data from dblink
        - SQL*Net break/reset to dblink

Audience

Database Administrators and any personnel charged with tuning an Oracle Database.

Prerequisites

Students must be proficient in SQL and database administration as well as some familiarity with Oracle database performance tuning including some knowledge of locks, latches and wait events. The prerequisites can be met by attending SkillBuilders' Oracle Database Administration class and SkillBuilders' Oracle Wait-Event Performance Tuning Workshop.

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Objectives

The class will enable students to rapidly assess the performance of an Oracle database using new and revolutionary techniques introduced in Oracle 10g. As well as learning the new techniques, students will learn about the internal structures involved in database performance problems that are identified by wait events.

Instructor BIO

As a former employee of Oracle Corp, Kyle Hailey recently made significant contributions to the redesign of the Oracle Enterprise Manager 10g performance pages to be graphically oriented and wait-interface centric. He has long and distinguished career with Oracle, having worked at Oracle in support, porting, benchmarking, and kernel development. He has also worked at Quest and Embarcadero as well as other companies on performance tuning and optimization of Oracle. He has designed various tools to improve high end performance monitoring such as direct SGA attach and interactive graphic displays of performance data. He has spoken at Hotsos, NoCOUG, RMOUG, NYCOUG, Oracle World, and DB Forum, and teaches classes around the world on Oracle performance tuning.

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