

ORACLE®

Achieve Order of Magnitude performance improvements

without upgrading your hardware

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Oracle Real-World Performance Team
Oracle Product Development

Safe Harbor Statement

The following is intended to outline our general product direction. It is intended for information purposes only, and may not be incorporated into any contract. It is not a commitment to deliver any material, code, or functionality, and should not be relied upon in making purchasing decisions. The development, release, and timing of any features or functionality described for Oracle's products remains at the sole discretion of Oracle.

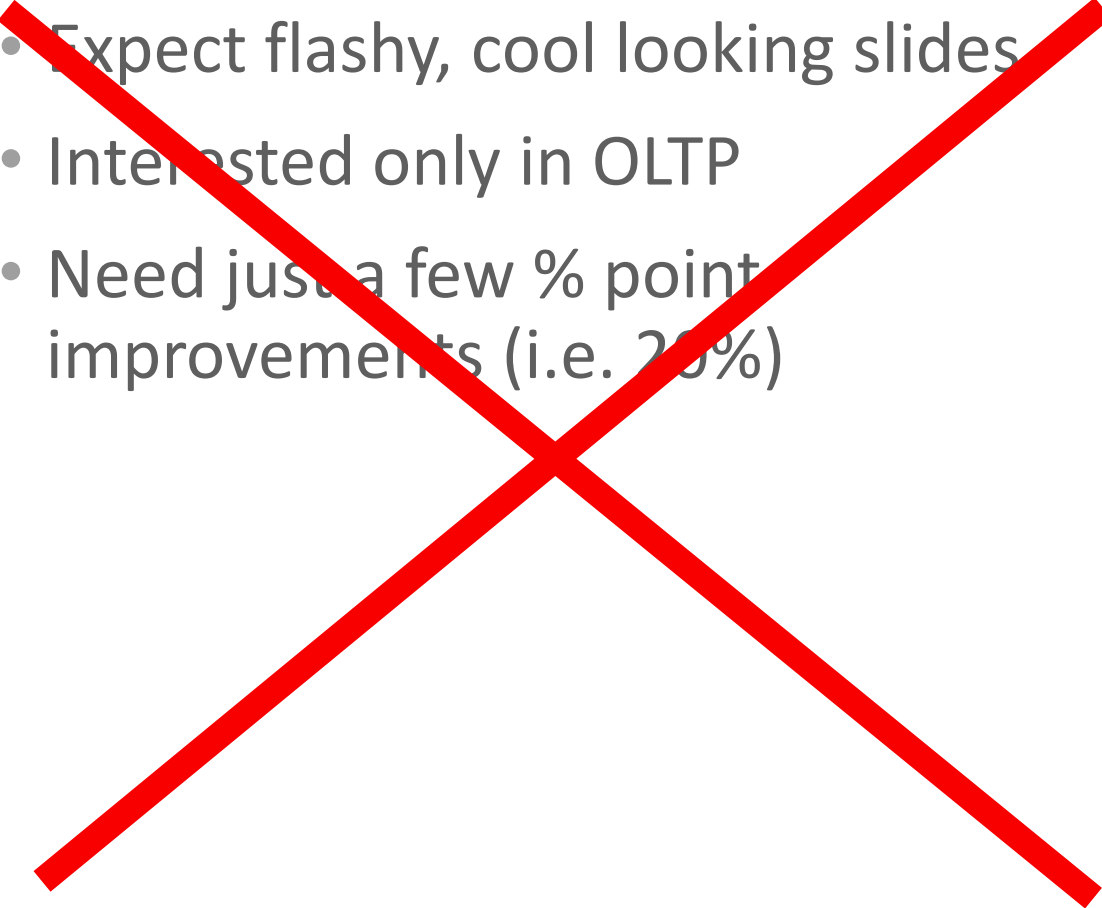
Agenda


- 1 ➤ Is this session for YOU?
- 2 ➤ About the Real World Performance Team
- 3 ➤ Your mission, should you choose to accept it ...
- 4 ➤ Use of Weapons
- 5 ➤ Solution (or How to use a Model S P85D to pickup groceries)
- 6 ➤ 3 takeaways for achieving Extreme Performance

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Is this session for YOU?

- Expect flashy, cool looking slides
 - Interested only in OLTP
 - Need just a few % point improvements (i.e. 20%)
- 

- Design/Develop/Operate Decision support systems (i.e. Data Warehouse/Mart, Big Data,...)
 - Require **orders of magnitude** (10x, 100x, 1000x) improvements
 - Prefer an Interactive Session
 - Reproduce in your own environment
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What is Real-World Performance ?

Bridging the Divide from Today's Performance to What is Possible

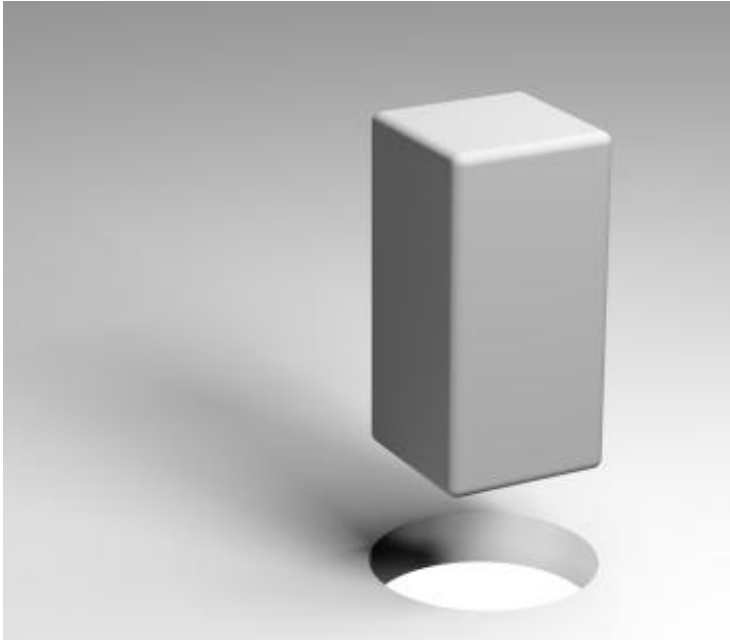


Real-World Performance

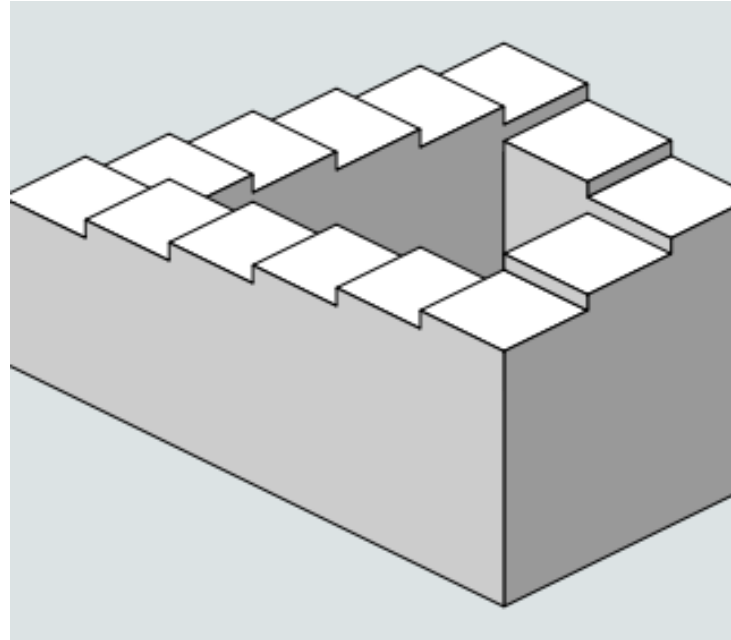
Who We Are

- Part of the Database Development Organization
- Global Team located in USA, Europe, Asia
- 300+ combined years of Oracle database experience
- Innovate to achieve exceptional Database Performance
- Our methods:
 - Use the product as it was designed to be used
 - Numerical and logical debugging techniques
 - Educate others about the best performance methods and techniques
 - Avoid and eliminate “tuning” by hacking/guessing/luck

Root Causes of Suboptimal Database Performance



The database is not being used as it was designed to be Used



The application architecture/code design is Suboptimal

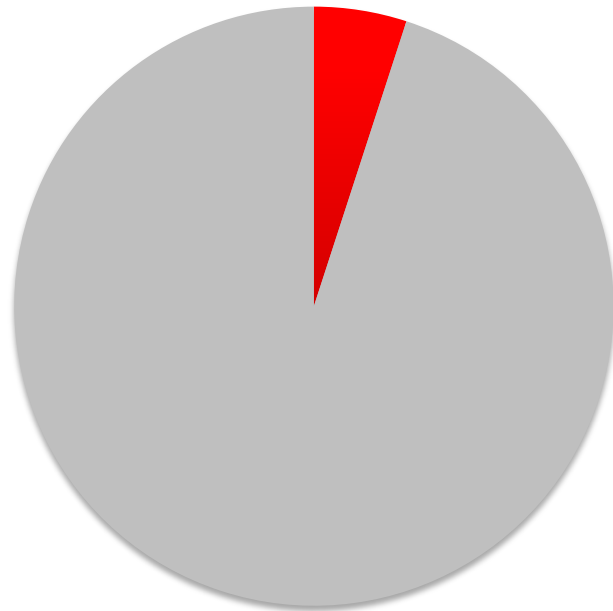


There is a suboptimal algorithm in the database

The Real World Performance Perception Problem

Where database users look for performance improvements

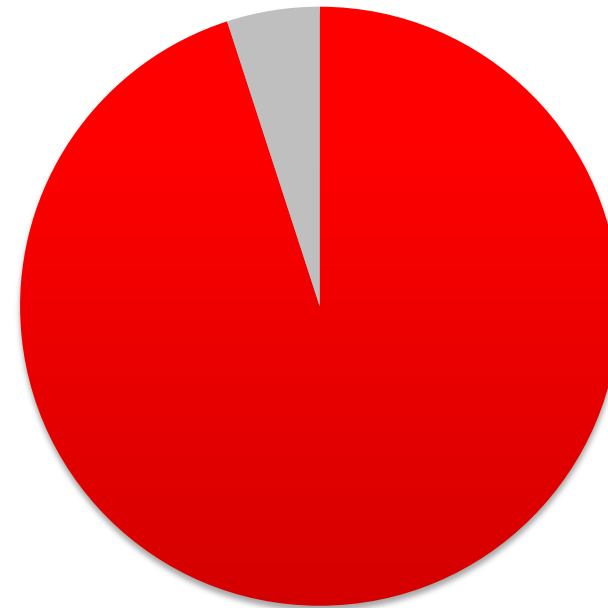
Perception



- Application Algorithms and Correct Product Usage
- Database Platform

The best place to look for performance Improvements

Reality



- Application Algorithms and Correct Product Usage
- Database Platform

Recent Results 1000X Projects



Baseline: ~ 4.3 Hours

Code Changes: 4.3 Hours

Correct Usage: 29 secs

Bug Fixes: 11.5 secs

Final: 11.5 secs

Speed up: **1346x**



Baseline: ~ 2.4 Days

Code Changes: 27 Mins

Correct Usage: 7.5 Mins

Bug Fixes: 3 Mins 27 Secs

Final: 3 Mins 27 Secs

Speed up: **1002x**



Baseline: 4.06 hours

Code Changes: 3.65 Secs

Correct Usage: 3.65 Secs

Bug Fixes: 3.65 Secs

Final: 3.65 Secs

Speed up: **4007x**



Real-World Performance Education Programs



Oracle Open World

Real-World Performance

Oracle Open World 2014 Sessions

What the Real-World Performance Team Learns from Your Automatic Workload Repository Report

Real-World Performance of Star and Snowflake Schemas, Part 1: The Theory

Real-World Performance of Star and Snowflake Schemas, Part 2: The Reality



Online Education

Real-World Performance

Online Video Series

- Real-World Performance Engineers discussing and demonstrating performance issues, root causes and when to apply the correct techniques
 - The Optimizer
 - Core DB Performance
 - Extreme OLTP
 - Extreme DW
- <http://www.oracle.com/goto/oll/rwp>



Real-World Performance Training

Real-World Performance Classroom Training

Classroom Training

- 4 Day Class of Intensive Performance Training
 - Topics: The Optimizer, Core DB Performance, Extreme OLTP and DW
 - Classroom, Demos, Hands On, Test and Quizzes
 - Training given by Real-World Performance Engineers
 - Designed for Architects, Developers and DBAs
 - 4 months training in 4 days
- Contact RWP or your local Oracle team to apply

Real-World Performance Training

What you will learn

- Understand how the optimizer works and how it is influenced
- Learn the fundamentals of core database performance
 - Database Computer Science
 - Application Algorithms
 - When to apply the correct tools and techniques
- Extreme OLTP
 - Connection Management, Contention and Tools
- Extreme Data Warehousing
 - Working with large data sets
 - DW Techniques: Set based processing, Exadata, Database In-Memory, Parallel

Real-World Performance Classroom Training

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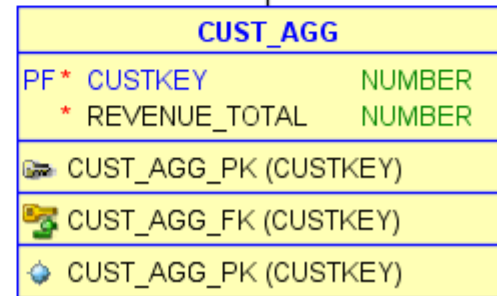
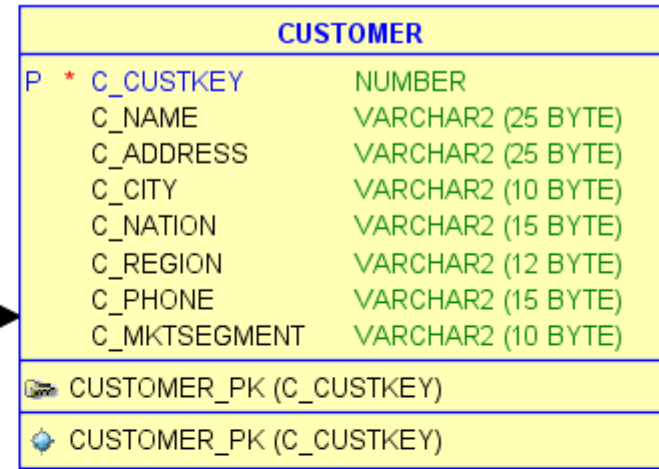
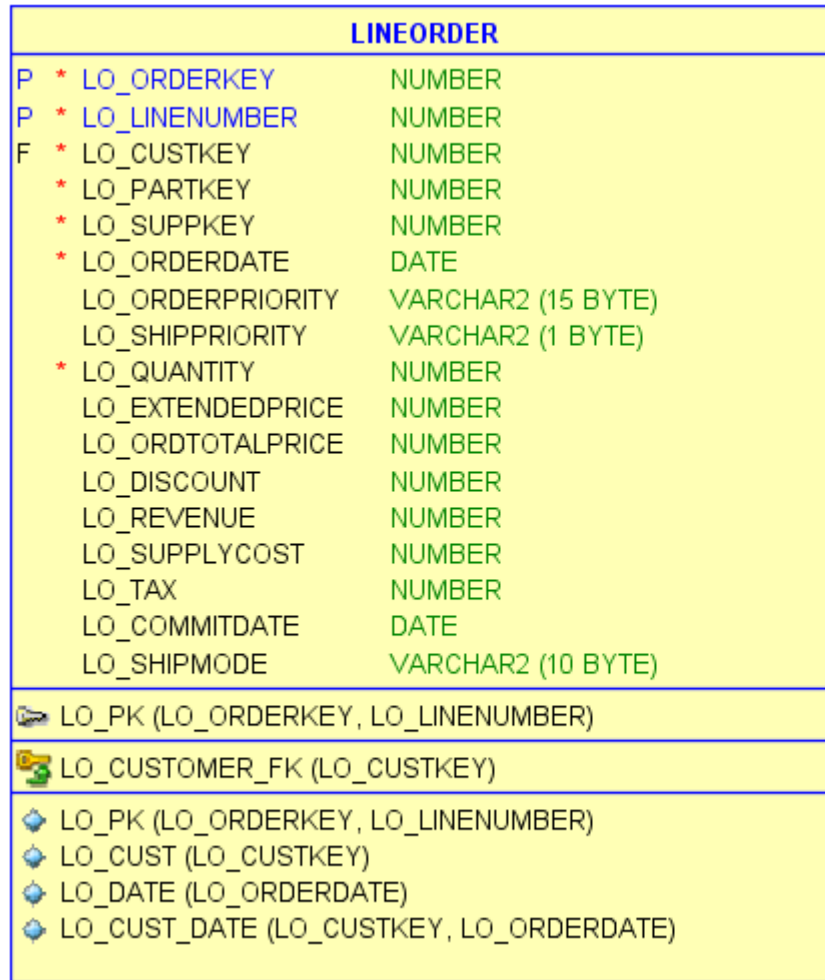
Your mission, should you choose to accept it ...

- Current environment does not meet SLAs
- Business expects data volume to increase drastically in the future
- Legacy application and DB migrated to new powerful hardware but performance/scalability goals have not been reached
- Business expects 1000x better performance for a mission-critical BI process
- Your mission, should you choose to accept it, is to meet the 1000x goal *without* hardware upgrades

BI process details

- Identifies the most valuable customers for each month
- Currently the process takes about 26 minutes
- Implemented in Java, data in Oracle 12.1.0.2 on Exadata x3-8
- Uses 3 tables

ERD



1,500,000 rows

300,005,811 rows

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End of preview ...

- This will be an interactive session, where the presenter and the audience will work together in diagnosing the root cause of the performance degradation
- Thus, to not spoil the interactive experience and participation in this challenge, the preview ends here
- The complete set of slides will be available on-line after the session

Hardware and Software Engineered to Work Together

ORACLE®