



Tanel Poder: Advanced Oracle Troubleshooting for DBAs and Performance Engineers

Exclusively for Trivadis

After the big success of the Performance Days in April 2008 in Zurich we are pleased to introduce a special Seminar with Tanel Poder.

This seminar is concentrated entirely on Oracle *troubleshooting* - understanding what *exactly* is Oracle doing right now or what was it doing when the problem occurred. You will gain the skill to systematically work out the reasons for crashes, hangs, bad performance or other misbehaviour.

The seminar takes a holistic approach for end-to-end troubleshooting. It will explain the full lifecycle of a database request, from database client libraries and network to Oracle database kernel and underlying OS. For each layer a troubleshooting technique is provided, along with advice on using the right tool for the right problem at the right time.

The two days are full of intensive learning, reading dumps, stack traces, network packet captures and Oracle SGA directly. You will be using debuggers and custom tools provided to you for real-time and post-mortem diagnosis.

The emphasis is put on practical troubleshooting, the safety comes first and many techniques are designed to require no change to database schemas or instance parameters.

The participants will be taught in topics such as:

- Systematic approach to troubleshooting and tuning
- End to End lifecycle of a database request
- Oracle, OS and hardware interaction
- Oracle kernel core services
- Oracle Wait Interface and kernel instrumentation framework

- Lifecycle of a cursor
- SQL execution row source operators and data flow
- Logical and physical IO internals
- Lifecycle of a transaction

Target Audience and Requirements

Target audiences of this event are performance analysts and Engineers, database administrators who want to improve their skills in managing performance. Participants are expected to have a working knowledge of the Oracle database engine.

Venue

- Vienna: 03-04 November 2008
- Düsseldorf: 06-07 November 2008
- Munich: 10-11 November 2008
- Zurich: 13-14 November 2008

Prices

CHF 1'840.- / EUR 1'160.-

This price includes a set of training material, lunches and refreshments during the breaks.

Seminar outline: Day 1

Session 1 - End to End lifecycle of a database request

This session gives an overview of the core hardware layers and software code paths a database request has to pass through. For every relevant layer a commonly available diagnosis technique or tracing tool is proposed.

- End to End call execution flow
- OCI, Oracle Net (SQL*Net) and direct wire protocol client libraries

- TCP, IPC and network services for Oracle
- Upper Oracle kernel: TNS protocol and Two-Task Common layer
- Lower Oracle kernel: From OPI to OSD

The sessions following will give you the skill and knowledge of using the *right tool for the right problem at the right time*.

Session 2 - Oracle, OS and hardware interaction

This session concentrates on what happens at OS and hardware level when Oracle needs to use operating system services or OS needs to interact with Oracle.

Both Unix derivatives and Windows server family internals are discussed.

- Oracle OSD layer
- Unix/Windows private and shared memory allocation for Oracle
- Dynamic SGA and realfree PGA internals and gotchas
- OS scheduling challenges for Oracle
- IO services and system call interface
- Context switching and TLB misses

Session 3 - Oracle kernel core services

This session covers in detail the kernel services and components most of database calls interact with - and often get in trouble with.

- Granule, heap and frame memory management
- Process startup, session creation
- State objects, task cleanup
- Latching, locking, enqueues
- Sleeping, interprocess communication

Session 4 - Oracle Wait Interface and kernel instrumentation framework

This session concentrates on Oracle wait interface internals, shortcomings and workarounds. Also the 10g+ new End-to-End instrumentation framework is covered.

- Oracle waits, sleeps, timeouts and uninstrumented time
- Getting the most out of Oracle performance counters
- Oracle Time Model statistics improvements
- Modules, actions and client_ids in end-to-end instrumentation framework

- Diagnostic event internals
- Oradebug diagnostics and when to not use it
- Oracle 11g diagnosability framework

Seminar Outline: Day 2

Session 5 - Lifecycle of a cursor

Most of the application code execution in Oracle is done via cursors - this includes calling PL/SQL stored procedures. Different workloads require different cursor management strategies, getting it wrong may cause your system not scale regardless the amount of hardware thrown in. Getting it right requires understanding the library cache data structures and concurrency mechanisms, which this session will deliver.

- Library cache lookup and data structures
- Cursor management, parsing and execution
- Library cache latching, locking, pins and mutexes
- Bind variable strategies, overcoming bind peeking problems
- Cursor caching benefits and problems
- Diagnosing library cache bottlenecks and inefficiencies

Session 6 - SQL execution row source operators and data flow

This session gives you detailed understanding of what a server process has to go through when looking up records and generating result sets based on our SQL. This will be crucial for reading and really understanding SQL execution plans. You will also be introduced to a way for diagnosing where a statement has got stuck if the conventional diagnostics methods like tracing and V\$/X\$ queries fail to reveal it.

- Reading execution plans
- Row source operators, RSO/DFO trees
- Filter operators
- Join methods
- Sorting, grouping, aggregations, analytics
- Measuring SQL performance at execution plan line level

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Session 7 – Logical and physical IO internals

This session gives you an understanding of Oracle's internal buffer cache management and key differences between many OS level IO configuration options. Also the different costs of different LIO operations are discussed along with tuning advice. Cache layer - datafile and datablock structure

- Buffer cache management, multiversion read consistency
- The varying cost of logical IOs
- Single block, multiblock physical IO, data block pre-fetching
- Asynchronous IO, unbuffered direct, concurrent and raw IO
- IO troubleshooting

Session 8 - Lifecycle of a transaction

In addition to covering Oracle transaction management core internals, this session wraps up the topics learnt, by studying a case of a transaction life cycle, from its initialization to post-commit cleanout.

- Oracle row-level locking and transaction management
- Undo segments, ITLs and write consistency
- Undo vectors, in-memory undo
- Cache layer - redolog structure, private redo strands
- Commit processing, commit cleanout
- Gotchas with LGWR and log file sync

Registration

You may either register online at www.trivadis.com (German and French homepage only) or by sending an e-mail to training@trivadis.com

Speaker

Tanel Poder is a researcher and database engineer, focusing mainly on designing Oracle Database based solutions for high performance, scalability and availability. He gets often involved in advanced end-to-end system troubleshooting, which has taken him to work for clients in Asia, US and Europe. He hosts an Oracle performance tuning site at <http://www.tanelpoder.com> and has published useful Oracle troubleshooting tools like PerfSheet, Sesspack and Session Snapper. In addition to delivering training and seminars, Tanel is a frequent speaker at major conferences such as OracleWorld, UKOUG, Hotsos Symposium, IOUG-A Live and many regional ones. Tanel is also one of the first Oracle Certified Masters in the world and an OakTable Network member.



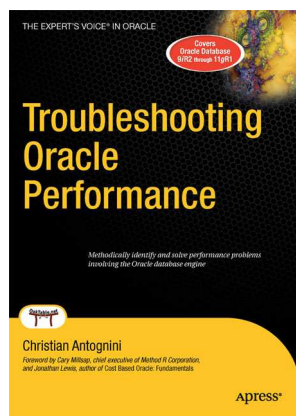
Book Presentation: Troubleshooting Oracle Performance

Meet the author of the last OakTable Press book

During a one-hour presentation the author shares his experience and view about troubleshooting performance problems of applications based on the Oracle database engine. It goes without saying that in a short presentation is not possible to thoroughly cover such a topic. Therefore, the focus will be to go over the key methods and techniques that are fully described in the book.

Book Synopsis

What do you do when your application isn't running fast enough? You troubleshoot, of course. Finding the slow part of an application is often the easiest part of the battle. The difficult part is finding a solution or, even better, avoiding the performance problem in the first place. *Troubleshooting Oracle Performance* helps by providing a systematic approach to addressing the underlying causes of poor performance of applications based on the Oracle database engine.



This book shows you how to do the following:

- Identify performance problems using a systematic and repeatable approach.
- Configure the query optimizer to meet your application performance goals.
- Obtain and interpret execution plans as well as assess whether they are inefficient.
- Apply SQL tuning techniques such as hints, SQL profiles, stored outlines and SQL plan baselines.
- Minimize the impact of parsing without jeopardizing performance.
- Optimize data access, joins and the physical design.
- Improve performance through parallel processing, materialized views, and result caching.

Target Audience

The book, and therefore this presentation, is intended for performance analysts, application developers and database administrators who are involved in troubleshooting performance problems of applications based on the Oracle database engine.

Venue and Agenda

The event takes place at the same locations and dates as Tanel Poder's seminar. It is planned the evening of the first day at 5pm. From 6pm the participants are invited to continue the discussions with the presenters and other participants in a less formal atmosphere as we meet over drinks.

Prices

Free of charge.

Registration

You may register by sending an e-mail to training@trivadis.com.

Speaker



Since 1995, **Christian Antognini** has focused on understanding how the Oracle database engine works. His main interests include logical and physical database design, the integration of databases with Java applications, the query optimizer and basically everything else related to application performance management and optimization. He is currently working as a principal consultant and trainer at Trivadis in Zürich, Switzerland.

In addition to classes and seminars organized by Trivadis, Christian regularly presents at conferences and user-group meetings. He is a proud member of the Trivadis Performance Team and of the OakTable Network.

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