Effective Performance Tuning Oracle Applications

- Target
- Company profile Invantive
- Why?
- General hints
- Case
- Pointers and Tools

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Target

- Introduction into performance tuning Oracle Applications.
- Interactive session:
  - Feel free to ask questions.
  - Presentation is just a guideline. Feel free to deviate.

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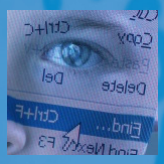
Company Profile Invantive

Invantive BV offers financial reporting, analysis and expertise to financial services providers.



We help our customers with:

- Better proces control.
- Cost reductions and margin improvements.
- Insight in their primary processes.
- Reduce risk image damage.

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General Services

- Datawarehousing: data integration and consolidation based upon uniform definitions, leading to efficiency and risk control.
- Regulatory reporting (IFRS, Basel I, Basel II, Sarbanes-Oxley, WTK, DRA, Dutch GAAP).
- Architecture: designs easy to implement and with a long life-time, even in changing environments.

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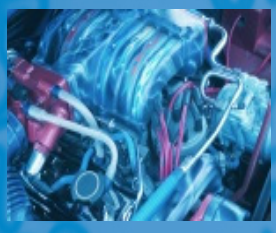
Technical Services

- Invantive Care: administration and monitoring of complex administrative environment such as ERP, financials and CRM.
- Performance tuning: enabling existing environments to handle more transactions in the same time through analysis and changes.



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Products

- Invantive Estate: financial reporting and control solution for real estate projects.
- Invantive Melba: administration and monitoring for UNIX and Oracle platforms.
- Invantive Producer: CASE tool for generation of quality reporting solutions.

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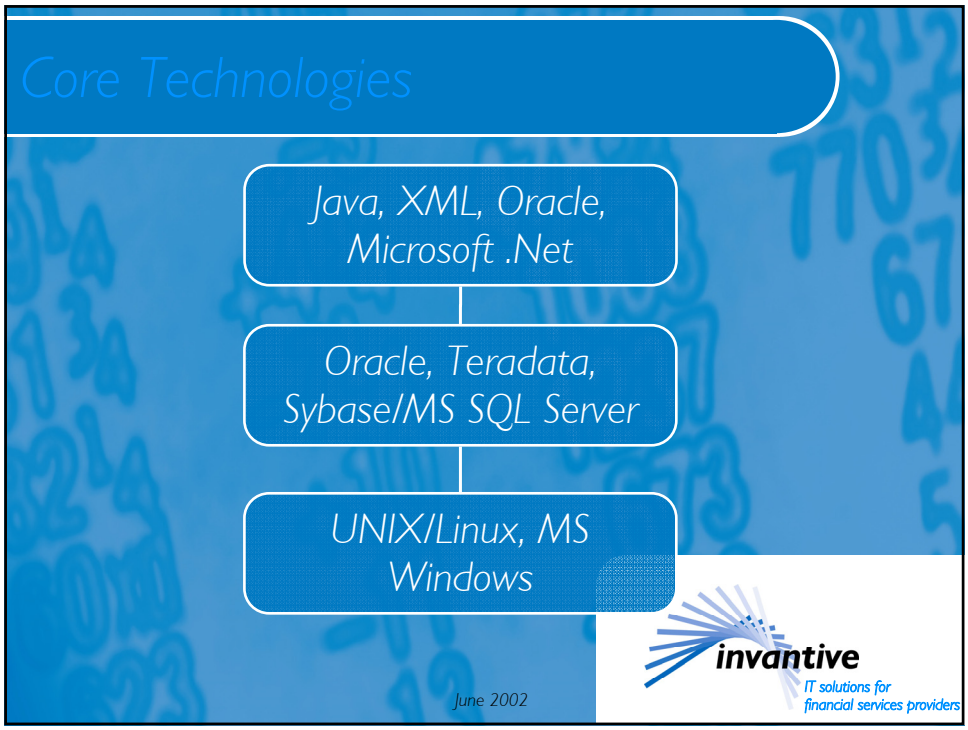

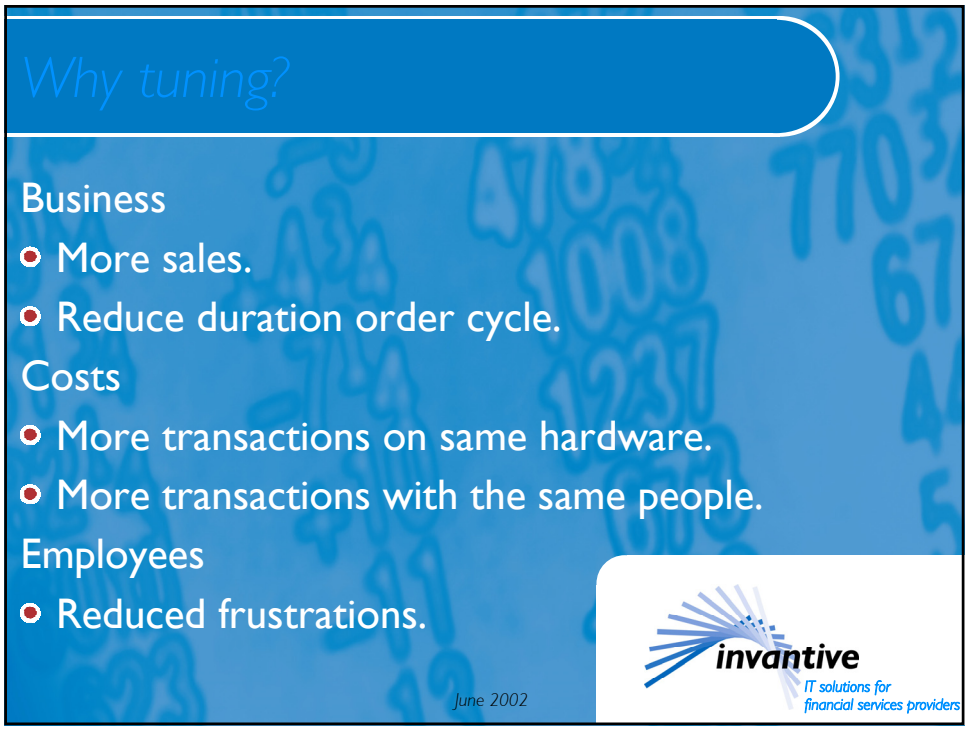

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General Recommendations

- Optimalisation must improve bottom-line.
- Establish clear targets in advance.
- Performance problems are always only located in the application.
- A well-designed Oracle application is never I/O-bound but CPU-bound.

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General Recommendations

- Do you think 100 people can do it faster than your server? Congratulations! You have a candidate for tuning.
- 10% faster is nice, but start of with a 100-fold performance increase as goal.
- Suboptimalisation is no optimalisation at all.
- Ensure you have a representative test environment.

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Always Draw Technology Stack

Client Application

Cache

OS

HW

network

Server Application

Database

OS

HW

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Use

Fact: a function never used never gives performance problems.

Try to workaround the problem:

- Use different reports.
- Use a different way of data entry.
- Abandon use of function.

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Candidates in Application

- Overall: use TOAD to determine heavy queries from SGA. Best sorting is total disk I/O and total concurrent gets (CPU).
- Concurrent requests: use fnd_concurrent_requests to determine which requests take longer than 5 minutes.

Use tracing with tkprof:

- Forms: Trace On.
- Requests: Profile option %trace definition.

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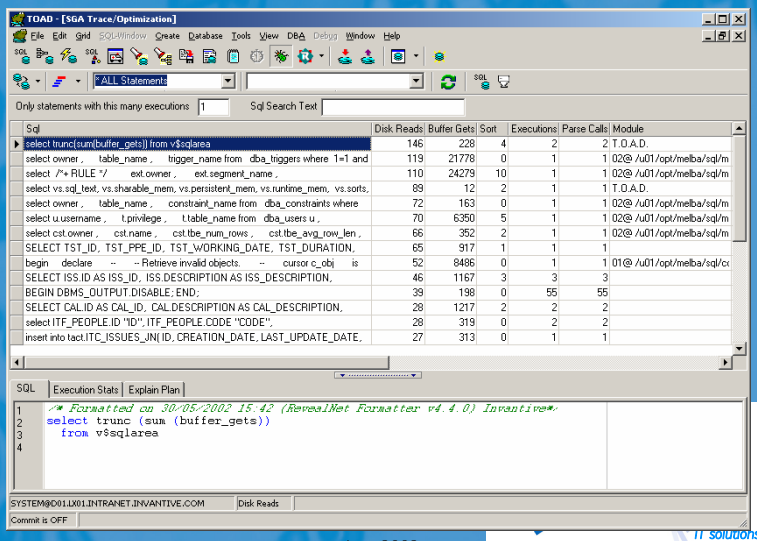
TOAD Gives you Insight



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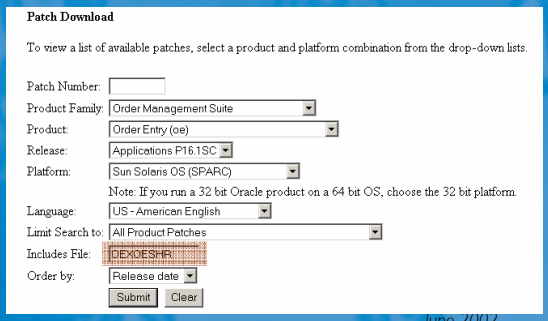
Metalink to Rescue

MetaLink

Is the problem already solved?

Example: shipment report (OEXOESHR) slow when given date range.

Query: search for patches with OEXOESHR.



Patch Download

To view a list of available patches, select a product and platform combination from the drop-down lists.

Patch Number:
Product Family: Order Management Suite
Product: Order Entry (oe)
Release: Applications P16.1SC
Platform: Sun Solaris OS (SPARC)
Note: If you run a 32 bit Oracle product on a 64 bit OS, choose the 32 bit platform.
Language: US - American English
Limit Search to: All Product Patches
Includes File: OEXOESHR
Order by: Release date
Submit Clear

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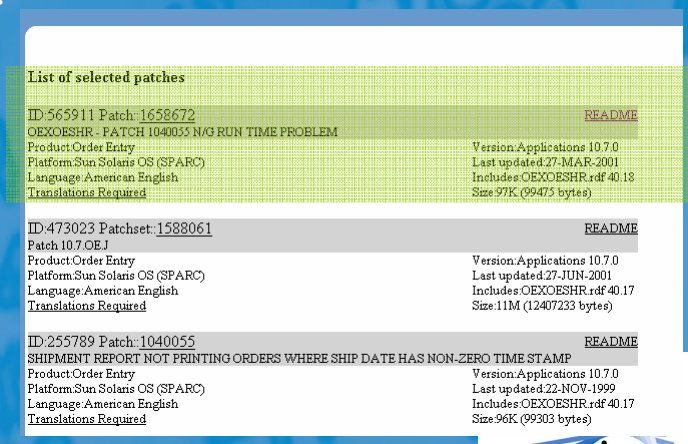
Metalink to Rescue

MetaLink

Result:



List of selected patches

ID:565911 Patch::1658672 README
OEXOESHR - PATCH 1040055 N/G RUN TIME PROBLEM
Product:Order Entry — Version:Applications 10.7.0
Platform:Sun Solaris OS (SPARC) — Last updated:27-MAR-2001
Language:American English — Includes:OEXOESHR.rdf 40.18
Translations Required — Size:97K (99475 bytes)

ID:473023 Patchset::1588061 README
Patch 10.7.OE.J
Product:Order Entry — Version:Applications 10.7.0
Platform:Sun Solaris OS (SPARC) — Last updated:27-JUN-2001
Language:American English — Includes:OEXOESHR.rdf 40.17
Translations Required — Size:11M (12407233 bytes)

ID:255789 Patch::1040055 README
SHIPMENT REPORT NOT PRINTING ORDERS WHERE SHIP DATE HAS NON-ZERO TIME STAMP
Product:Order Entry — Version:Applications 10.7.0
Platform:Sun Solaris OS (SPARC) — Last updated:22-NOV-1999
Language:American English — Includes:OEXOESHR.rdf 40.17
Translations Required — Size:96K (99303 bytes)

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Oracle Optimizer (not GL optimizer)

25% of problematic queries give excellent results with the other optimizer:

- 10.7 en 11.0 reports: try /*+ all_rows */.
- 10.7 en 11.0 forms: try /*+ first_rows */.
- 11i: try /*+ rule */.

Example, from 16 minuten to 15 seconds hint:

```
select /*+ rule */ distinct wsh.delivery_id delivery_id
from   wsh_new_deliveries wsh
,      wsh_deliverables_v wd
where  1=1
and    wsh.delivery_id          = wd.delivery_
and    wsh.status_code          = 'OP'
and    wsh.asn_date_sent        is null
and    wd.released_status_name = 'Staged'
```

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Concurrent Managers

Check setup:

- Reduce number of normal managers to at most twice the number of processors.
- Reduce number to 95-percentile of concurrent running requests.
- Every concurrent manager less saves 20 Mb.
- Tune all concurrent programs running longer than 5 minutes and a run-frequency of at least weekly.
- Finally and not earlier: make a d between long running request a concurrent managers.

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SQL Tuning

- Check whether candidates can be assisted by an extra index.
- Check whether the correct index is used.
- Keep future growth in mind, an index on a date column might last longer.
- Try to reduce frequency of execution when reaching optimal level of query performance.

A case…

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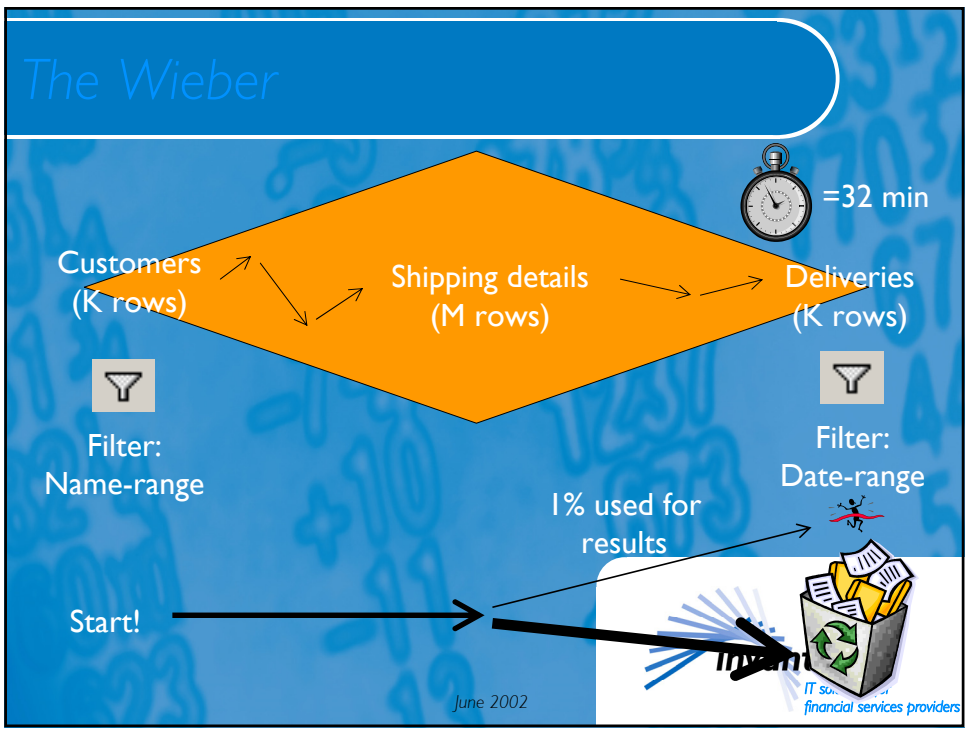
The Wieber



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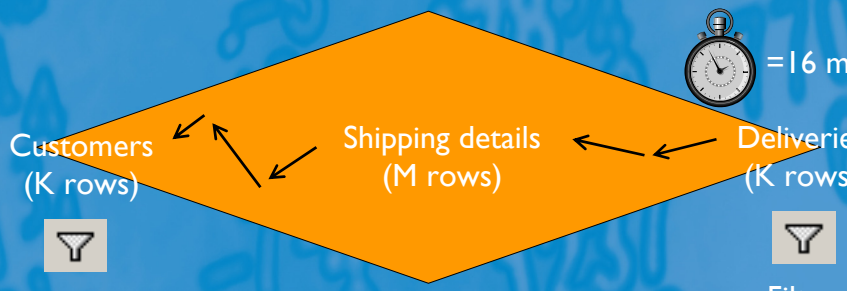
Change 1



=16 min

Filter:
Name-range

Filter:
Date-range

Advantages:
- Doubled performance.
- Less sensitive for increased datavolume.

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Change 2

Still not within target of 5 minutes. Further analysis showed that multiple similar queries are used:
- Full list.
- Group by location.
- Group by customer.

Solution:
Fill temporary table with full list and use group by-s.

Result:

=6 sec

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Database

- Causes solely 10% of performance problems.
- Keep statistics up-to-date including column histograms.
- Use capacity management and purging procedures (e.g. 10.7: so_exceptions, 11i: po_wf_debug)

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Operating System

- Causes 5% of performance problemen.
- Check OS Cache methods.
- See example in next section for analysis tools.

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Hardware

- Causes 5% of performance problems.
- Memory, memory, memory: monitor memory usage with 'top' and 'memtool', monitor paging-out using 'vmstat'.
- CPU: monitor with 'top'.
- Capacity management: discover trends with 'MRTG' or 'sar'.

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Network

- Causes 5% of performance problems.
- Monitor round trip times using 'ping' and 'traceroute'.
- Analyse #round-trips for one transaction.
- Capacity management (MRTG)
- Monitor using 'ethereal', 'lsof' and 'trace'.
- Example network monitoring o
  from dual':

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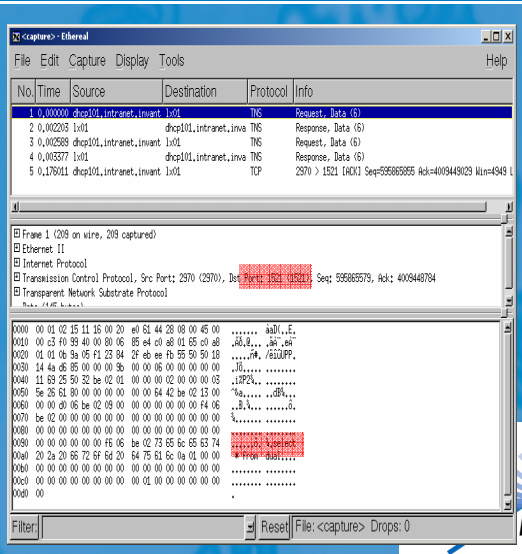
Use Ethereal to Analyse Activity



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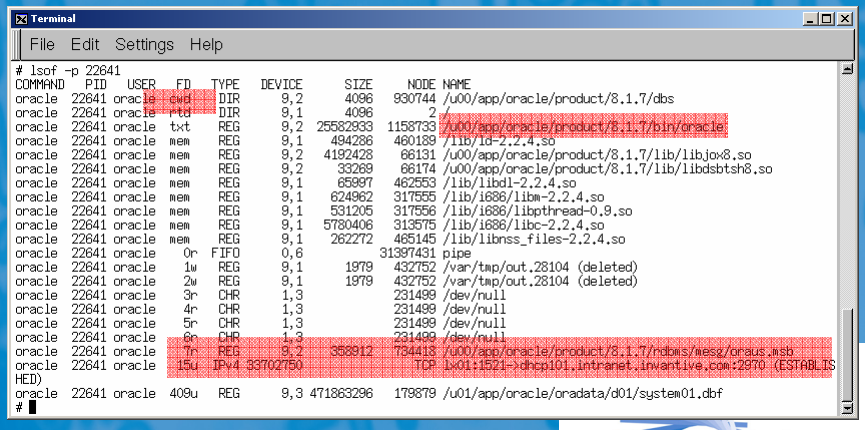
Use Lsof to Determine File Numbers



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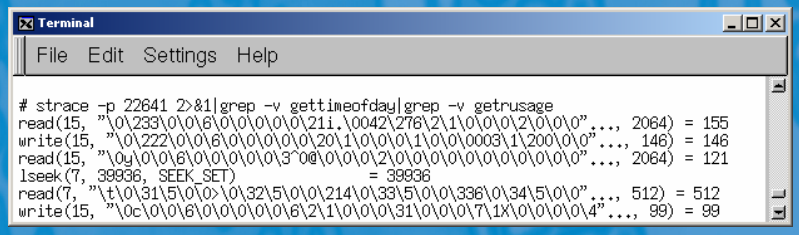
Use Trace/strace/truss for Kernel Calls



- Read(15, / Write(15,: data by SQL*Net
- Lseek(7,): ORA-01403 in or

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Pointers

- Oracle Concepts manual
- Oracle Tuning manual
- Oracle Performance Tuning, ISBN 1-56592-048-1
- Database Design, ISBN 0-07-Y66638-5
- Java Platform Performance, ISBN 0-201-70969-4
- Theorie en praktijk van besturingssystemen, ISBN 90-6233-198-X
- Linux TCP/IP Network Administration, ISBN 0-13-032220-2

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Tools

- Tkprof: $ORACLE_HOME
- TOAD: www.toadsoft.com
- Top: http://www.groupsys.com/top/
- Memtool (Solaris): http://playground.sun.com/pub/memtool/
- Lsof: ftp://ftp.cerias.purdue.edu/pub/tools/unix/sysutils/lsof/
- Trace/truss/strace: OS vendor
- MRTG: www.mrtg.org
- Ethereal: www.ethereal.com (UNIX en Windows)
- Tcpdump: www.tcpdump.org
- Invantive Melba: guido.leenders@invantive.com

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