We bring information to life
End-To-End Metrics:
Building a performance bridge between the developer & the Oracle DBA
Presenter: Lasse Jenssen
Who am I?

- **Name:** Lasse Jenssen
- **Work:**
  - EVRY, Bank & Finance, Payment
  - Leader of Center of Excellence – Databases (Oracle)
  - New projects
- **Experience**
  - Since Oracle V7
  - Instructor Oracle University, DBA courses 8i, 9i and 10g
  - Used to be a DBA
  - Know some Java

http://www.jcon.no/oracle
Introduction

Who are you?

Please rise your hand if you are a...

• Developer
• DBA
• Project Leader
• Leader
• Someone/something else...
What is this presentation all about?

- End-To-End Metrics
- Building A Bridge
- Personal Experiences
- Oracle DBAs
- Developers
- Some other stuff
“Performance does not happen by accident!”
“Performance is a feature!”

Cary Millsap
Used to work as an Oracle DBA

Installing, configuring, maintenance, backup & recovery, patching & upgrading, monitoring

... and performance problems ... then more and more and more

... and we (most usually) solved the problems

But did we really solve the problem?
My first development project = DISASTER
Performance troubleshooting & performance tuning
Needed some other skills, some other way of thinking
I did definitely not solve the problems?
A lot of reading, seminars, testing and work
Then I started to work in a development department
But did this really solve the problems?
No or very little real performance tuning

COMMUNICATION
My theory

Why did this happen?

“THE DBA” fenomena
A DBA is not a DBA is not a DBA

“If you needed a brain surgery, would you let your regular doctor to do the operation?”
What could we do better?

- Get the right Oracle resource(s) for the job
- As early as possible
- Work/sit together
- Communicate

My theory

A very good starting point is

END-TO-END METRICS
Introduction

Why End-To-End Metrics?

• A bridge between the developer and “DBA”
• A bridge between the developer and the Oracle database
• A bridge between the DBA and the application
• Trace & statistics based on application metrics
• Real-time monitoring
• Historical monitoring
The Java implementation

End-To-End Metrics

```java
Metrics = new String[OracleConnection.END_TO_END_STATE_INDEX_MAX];
Metrics[OracleConnection.END_TO_END_MODULE_INDEX] = "MYAPP";
Metrics[OracleConnection.END_TO_END_ACTION_INDEX] = "MYWEBSERVICE";
Metrics[OracleConnection.END_TO_END_CLIENTID_INDEX] = "BANKID@USERID";
((OracleConnection) connection).setEndToEndMetrics(metrics, (short)0);
```
The PLSQL implementation

End-To-End Metrics

DBMS_APPLICATION_INFO.SET_MODULE (module_name=> ?, action_name=> ?);
DBMS_APPLICATION_INFO.SET_ACTION (action_name=> ?);
DBMS_APPLICATION_INFO.SET_CLIENT_INFO (client_info=> ?);

Hint: ILO package (google it!)
Trace
End-To-End Metrics

exec `DBMS_MONITOR.SERV_MOD_ACT_TRACE_ENABLE` (service_name=>?, module_name=>?, action_name=> ?, waits=>TRUE, binds=>TRUE, plan_stats => 'ALL_EXECUTIONS' -- 11g and later);
exec `DBMS_MONITOR.CLIENT_ID_TRACE_ENABLE` (client_id=>?, waits =>TRUE, binds => TRUE, plan_stats => 'ALL_EXECUTIONS' -- 11g and later);

select * from `SYS.DBA_ENABLED_TRACES`;
**Statistics**

**End-To-End Metrics**

```sql
exec DBMS_MONITOR.SERV_MOD_ACT_STAT_ENABLE(service_name=> ?,
                                           module_name=> ?,
                                           action_name=> ?);

select * from SYS.DBA_ENABLED_AGGREGATIONS;

exec DBMS_MONITOR.SERV_MOD_ACT_STAT_DISABLE(service_name=>?,
                                             module_name=>?,
                                             action_name=> ?);
```
End-To-End Metrics

Demo
DBA skills to become a

“Oracle Developers”

• Core Oracle Internals
• Really know SQL (and possibly PLSQL)
• SQL Optimization
• Schema Development
• Performance Tuning
• Application Development Process
• Problem Solving
What is wrong with this book?
Effective Oracle by Design

Design and Build High-Performance Oracle Applications

THOMAS KYTE
Vice President, Oracle Core Technology Group and author of Oracle Magazine's "Ask the Expert" column.
Now a Java developer could be interested!
Expert Java DAO Developer
Oracle Database 9i, 10g, and 11g Programming Techniques and Solutions
SECOND EDITION

Thomas Kyte

Forewords by Jonathan Lewis and Ken Jacobs (aka “Dr. DBA”)
Needed skills for the Java developer

• Sorry people... it’s not enough to know some SQL
• If you work on an enterprise solution, you really should avoid the big mistakes.
• If you don’t, your application will not scale
• If you don’t, some Oracle expert will find it for you – And get credit for it in the taskforce
• There is no such thing as database independence

“I don’t need Oracle anymore. I use NoSQL databases”

JavaZone 2012
Effects of the bridge

Java Monitoring Tool: Java Melody

• DBAs are not the only ones doing monitoring
• Monitoring done in the application can be very useful from a DBA perspective
Statistics of JavaMelody monitoring taken at 6/3/10 9:45 PM from 5/1/10 9:35 AM on

- Used memory - 1 week:
  - Mean: 3 G
  - Maximum Mean: 3 G

- % CPU - 1 week:
  - Mean: 50

- Active threads - 1 week:
  - Mean: 27
  - Maximum Mean: 1933

- Active jdbc connections - 1 week:
  - Mean: 1.0
  - Maximum Mean: 1.0

- Http sessions - 1 week:
  - Mean: 155

- Http hits per minute - 1 week:
  - Mean: 31

- Http mean times (ms) - 1 week:
  - Mean: 127

- Sql hits per minute - 1 week:
  - Mean: 1.0

- Sql mean times (ms) - 1 week:
  - Mean: 2790

- % of http errors - 1 week:
  - Mean: 5

- % of sql errors - 1 week:
  - Mean: 0

Our brand story
### Statistics http - 1 week

<table>
<thead>
<tr>
<th>Request</th>
<th>% of cumulative time</th>
<th>Hits</th>
<th>Mean time (ms)</th>
<th>Max time (ms)</th>
<th>Standard deviation</th>
<th>% of cumulative cpu time</th>
<th>Mean cpu time (ms)</th>
<th>% of system error</th>
<th>Mean size (Kb)</th>
</tr>
</thead>
<tbody>
<tr>
<td>http global</td>
<td>100</td>
<td>304,820</td>
<td>50</td>
<td>343,784</td>
<td>914</td>
<td>100</td>
<td>13</td>
<td>0.67</td>
<td>18</td>
</tr>
<tr>
<td>http warning</td>
<td>3</td>
<td>452</td>
<td>1,218</td>
<td>21,140</td>
<td>1,134</td>
<td>6</td>
<td>618</td>
<td>0.00</td>
<td>172</td>
</tr>
<tr>
<td>http severe</td>
<td>55</td>
<td>4,443</td>
<td>1,916</td>
<td>342,784</td>
<td>7,202</td>
<td>5</td>
<td>54</td>
<td>3.56</td>
<td>516</td>
</tr>
</tbody>
</table>

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Our brand story
## Our brand story

![Evry Logo](image)

<table>
<thead>
<tr>
<th>Requête</th>
<th>Hits par requête parente</th>
<th>Temps moyen (ms)</th>
<th>Temps max (ms)</th>
<th>Écart-type</th>
<th>Temps CPU moyen (ms)</th>
<th>% d'erreur système</th>
<th>HIts sql moyens</th>
<th>Temps sql moyen (ms)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Referentiel.createContexteUtilisateur</td>
<td></td>
<td>30</td>
<td>844</td>
<td>126</td>
<td>10,00</td>
<td>0,00</td>
<td>5,00</td>
<td>7,00</td>
</tr>
<tr>
<td>Referentiel.getUtilisateur</td>
<td></td>
<td>1,00</td>
<td>0</td>
<td>0</td>
<td>0,00</td>
<td>0,00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>select utilisateur0_USR_ID as USR1_4, utilisateur0_USR_DATEDEDERNIERCHANGEMENTMOTDEPASSE as USR2_4, utilisateur0_USR_IDENTIFIANT as USR3_4, utilisateur0_LGE_LANGUE_ID as LGE2_4, utilisateur0_USR_MAIL as USR4_4, utilisateur0_USR_MOTDEPASSE as USR5_4, utilisateur0_USR_NOM as USR6_4, utilisateur0_USR_PERMISSION as USR7_4, utilisateur0_USR_PRENOM as USR8_4 from UTILISATEUR_USR_utilisateur0 where utilisateur0_USR_IDENTIFIANT=?</td>
<td>1,00</td>
<td>0</td>
<td>16</td>
<td>1</td>
<td>0,00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>select languebean0_LGE_ID as LGE1_2_0, languebean0_LGE_CODEISO as LGE2_2_0, languebean0_LGE_LIBELLE as LGE3_2_0 from LANGUE_LGE languebean0 where languebean0_LGE_ID=?</td>
<td>0,04</td>
<td>57</td>
<td>63</td>
<td>8</td>
<td>0,00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>select listeroles0_USR_ID as USR1_1, listeroles0_RLE_ID as RLE2_1, roleutilis1_RLE_ID as RLE3_0, roleutilis1_RLE_ADMINISTRABLE as RLE4_0, roleutilis1_RLE_NOM as RLE5_0, roleutilis1_RLE_PERMISSION as RLE6_0 from UTILISATEURROLE listeroles0_left outer join ROLEUTILISATEUR_RLE roleutilis1_on listeroles0_RLE_ID=roleutilis1_RLE_ID where listeroles0_USR_ID=?</td>
<td>1,00</td>
<td>2</td>
<td>109</td>
<td>13</td>
<td>0,00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Referentiel.rechercheRoleUtilisateur</td>
<td></td>
<td>1,00</td>
<td>2</td>
<td>16</td>
<td>5,00</td>
<td>1,00</td>
<td>0,00</td>
<td>0,00</td>
</tr>
<tr>
<td>select listeprof0_USR_ID as USR1_1, listeprof0_PRF_ID as PROF2_5, profbean1_PRF_NOM as PROF2_5 from UTILISATEURPROFIL listeprof0_left outer join PROFIL_PROF profbean1_on listeprof0_PRF_ID=profbean1_PRF_ID where listeprof0_USR_ID=?</td>
<td>1,00</td>
<td>0</td>
<td>47</td>
<td>5</td>
<td>0,00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>select listesocio0_USR_ID as USR1_1, listesocio0_SCE_ID as SCE2_1, societebeal_SCE_ID as SCE1_3_0, societebeal_SCE_AGGREGE_ID as SCE16_3_0, societebeal_SCE_CODECOMPTA_AUXiliaire as SCE2_3_0, societebeal_SCE_CODECOMPTA_GENERALE as SCE3_0, societebeal_SCE_COMPTETANALYTIQUEPFA as SCE4_3_0, societebeal_SCE_COMPTETANALYTIQUETIES as SCE6_3_0, societebeal_SCE_COMPTETECLIENTS as SCE7_3_0, societebeal_SCE_COMPTETEGOURNISSEURS as SCE8_3_0, societebeal_SCE_COMPTETECPF as SCE9_3_0, societebeal_SCE_COMPTETEGOREOPERATEUR as SCE10_3_0, societebeal_LGE_LANGUE_ID as LGE17_3_0, societebeal_SCE_LIBELLE as SCE11_3_0, societebeal_SCE_LIBELLEABRAGE as SCE12_3_0, societebeal_SCE_LIBELLECOMPTA_AUXiliaire as SCE13_3_0, societebeal_SCE_LIBELLECURT as SCE14_3_0, societebeal_SCE_TRIGRAMMES as SCE15_3_0, from SOCIETE_UTILISATEUR listesocio0_left outer join SOCIETE_SCE societebeal_on listesocio0_SCE_ID=societebeal_SCE_ID where listesocio0_USR_ID=?</td>
<td>1,00</td>
<td>1</td>
<td>62</td>
<td>7</td>
<td>0,00</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Use of Source Control / Version Control System

- Learned how developers always use source-control
  - Development process: FlywayDB
  - Test, QA & Production: RedGate Source Control for Oracle

- Short DEMO
Effects of the bridge between

Spring & ORM Hibernate API

• Spring: Popular framework for Java development
  o For instance: SimpleJDBCCall, JDBCTemplate etc

• Hibernate:
  Popular ORM API with automatic generation of SQL
  o When we get to understand how Hibernate works, then we can help avoiding errors being made
What should you do?

- **Oracle DBAs:**
  “The world needs more Oracle Developers!”
  “Don’t sit and wait to be asked to help – they might not”

- **Developers (and/or project leaders):**
  “Ask for the right Oracle resources, AND use them!”
  “Involve the Oracle resources as early as possible!”

- **Put developers and (the right) Oracle resources physically together**

- **Start with End-to-end metrics**

**So**
Q&A
Evry
We bring information to life