



Upcoming: Best Practices: Proactive Data Collection to Troubleshoot Performance Issues

Oracle Advisor Webcast Program

- Current schedule
- Archived recordings
- Doc ID 740966.1

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Upcoming: Best Practices: Proactive Data Collection to Troubleshoot Performance Issues

AGENDA

- Presentation – approximately 45 minutes
- Q&A Session – approximately 15 minutes
 - Web attendees can ask questions via Q&A panel
 - Phone attendees can ask questions via Q&A panel or phone (operator assisted)

Upcoming: Best Practices: Proactive Data Collection to Troubleshoot Performance Issues

ATTENTION – AUDIO Options

You can

- **either listen the audio broadcast on your computer**
- **or join teleconference (dial in)**

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- Listen only mode
- Advantage: no need to dial in
- What about Questions?
Type your questions into WebEx Q&A panel
- If you prefer full audio access in order to ask questions directly, please connect to our teleconference
- Connect details you will find at next slide

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Teleconference Connect details:

1. Conference ID: **73401569**
2. International dial in: **+44 (0) 1452 562 665**
3. US Free call: **1866 230 1938**
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Upcoming: Best Practices: Proactive Data Collection to Troubleshoot Performance Issues



Oracle Advisor Webcast

Best Practices: Proactive Data Collection to Troubleshoot DB Performance Issues

Nayan Ranjan Sahu
Principal Software Engineer



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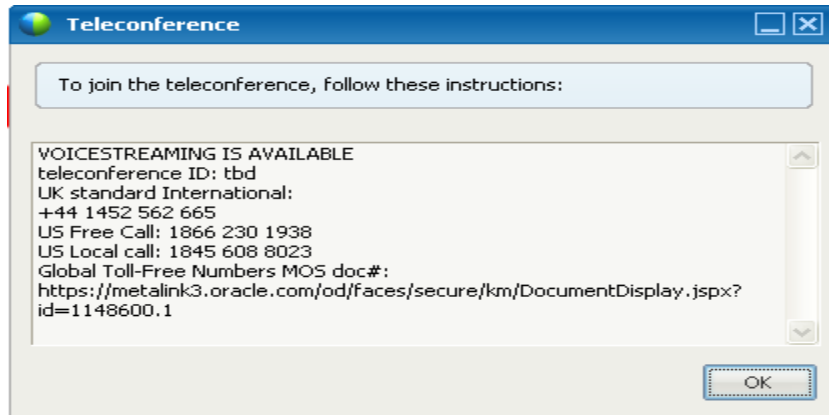
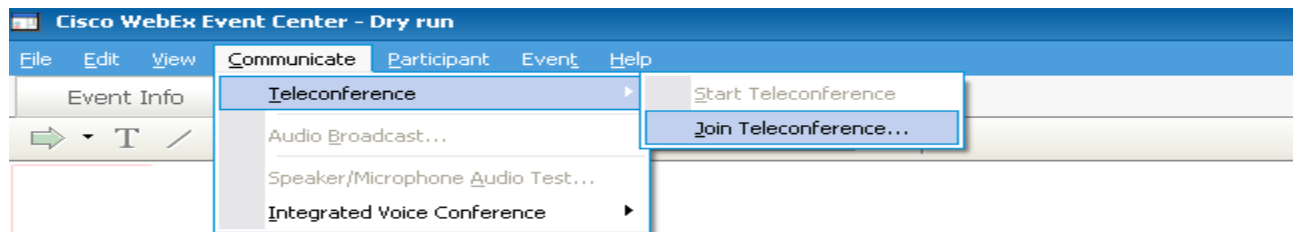
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Jens Voigt (Host)

Attendees:

Jens Voigt (me)

Q&A

All (0)

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Oracle Advisor Webcast

Best Practices: Proactive Data Collection to Troubleshoot DB Performance Issues

Nayan Ranjan Sahu
Principal Software Engineer



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Objectives

- Identifying Right Diagnostics for different core db performance problems and its approaches
- Overview of basic performance diagnostic tools



Agenda

- DB Performance problem categories
- Different Approaches
- When to collect What and Why?
- Demonstration
- Best practices
- Q & A

Problem Categories

SLOW

Database-wide

Jobs

Statements

HANG

Database-wide

Jobs

Statements

TRANSIENT

Basic Approach

OS Resources

- CPU, Memory, IO, Network ..

DB Time

- CPU time + Non-idle Wait times

Average Active Sessions

- # of active sessions on a specific event

Slow - Overall Database

■ Basic Approach

- OS Watcher Black Box [Operating system resource utilization]
- AWR / Statspack Report [Database time (DB Time) analysis]
- ASH Report [Average active sessions reviews]
- Alertlog
- RDA

Top 5 Timed Foreground Events

	Snap Id	Snap Time	Sessions	Cursors/Session
Begin Snap:	1787	01-Oct-13 23:00:23	44	1.8
End Snap:	1788	02-Oct-13 00:00:26	48	1.7
Elapsed:		60.05 (mins)		
DB Time:		296.05 (mins)		

Event	Waits	Time(s)	Avg wait (ms)	% DB time	Wait Class
direct path read	123,323	11,288	92	63.55	User I/O
DB CPU		6,652		37.45	
log file sync	39,401	78	2	0.44	Commit
SQL*Net more data to client	694,946	18	0	0.10	Network
asynch descriptor resize	42,596	7	0	0.04	Other

Slow - Overall Database

- Special cases

- Lfsdiag script output for high Log file sync waits [\[Doc ID 1064487.1 \]](#)
- Version count report for high version count issues [\[Doc ID 438755.1 \]](#)
- Cursortrace in case of high version count issues [\[Doc ID 296377.1 \]](#)
- System state dump may be required for library cache locks, latches, mutex, enqueues scenarios

Slow or Hang – Batch Jobs

■ Basic Approach

- SQL tracing (10046 event, dbms_monitor) [\[DB Time analysis\]](#)
- AWR Report / Statspack Report [\[-- do -- \]](#)
- ASH analysis [\[Active session review\]](#)
- OS Watcher BB [\[OS resource utilization\]](#)

■ Deep Dive

- PL/SQL profiler (dbms_profiler) [\[Doc ID 243755.1\]](#)
- Multiple Errorstack, Shortstack [\[Spinning on CPU\]](#)
- Hang Analyze / System state [\[True Hang\]](#)
- Strace/truss/tusc
- Gdb, dbx etc..

Slow – Query/Statement

■ Basic Approach

- SQL tracing (10046 event, event++,etc) [\[DB Time Analysis \]](#)
- AWR/SQRPT.SQL [\[Exec. stats, plans – history \]](#)
- Recent changes in environment (Structure/parameters/object statistics/system statistics etc.
- SQLT(SQLTXPLAIN)

■ Deep Dive

- SQLT(SQLTXPLAIN)
- Execution Plan analysis
- CBO Trace(10053 trace)

call	count	cpu	elapsed	disk	query	current	rows
Parse	1	0.00	0.00	0	0	0	0
Execute	1	0.00	0.00	0	0	0	0
Fetch	1	23.65	104.25	164360	200997	1	1
total	3	23.65	104.26	164360	200997	1	1

Hang – Complete Database

▪ Basic Approach

- Multiple Hang Analyze
- Multiple System State dump
- AWR report (provided snaps gathered)
- ASH report (provided samples collected)
- OS watcher Output
- Alertlog

▪ Deep Dive

- Multiple shortstacks , errorstacks
- Strace/truss/tusc

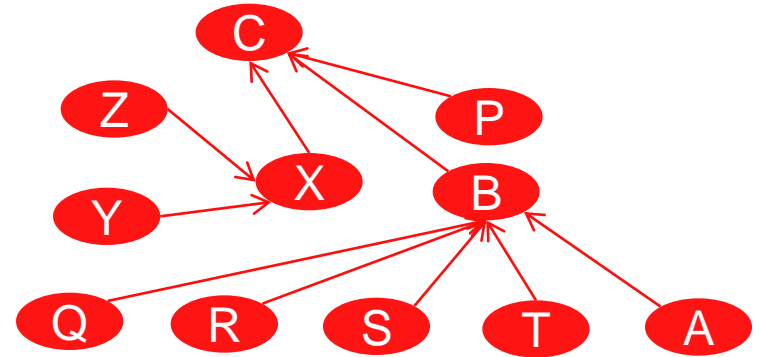
[Process dependency maps]

[Process states ,dependencies etc.]

[DB Time analysis]

[Active session review]

[OS resource utilization]



Hang – Query/Statement

▪ Basic Approach

- SQL tracing (10046 event, dbms_monitor) [DB Time Analysis]
- Errorstack, Shortstacks [Spinning on CPU]
- AWRSQRPT.SQL [Stats, plans from history]
- ASH analysis [ASH info from history]

▪ Deep Dive

- Review if the hang is at the parse phase (“*explain plan for*” hangs?)
- Waiting indefinitely (enqueue, locks)? (“check gv\$lock for finding blocker”)
- Progressing in dead slow (“Execution Plan” review)

Transient Problems

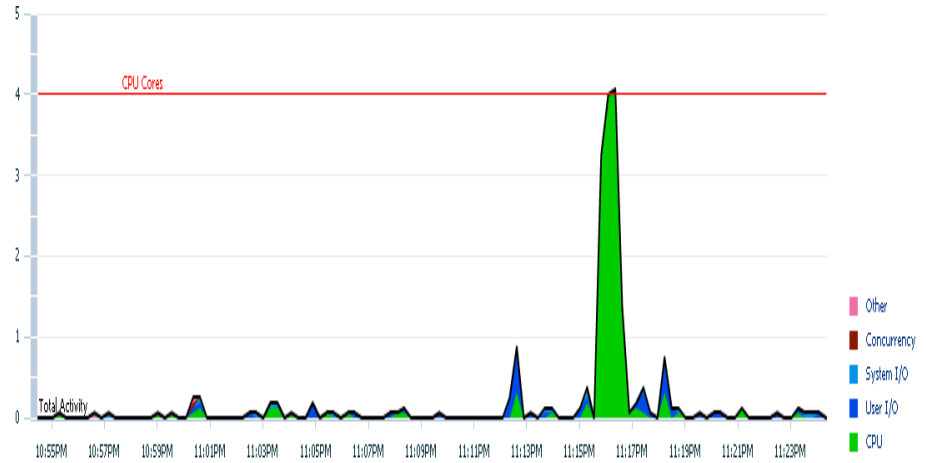
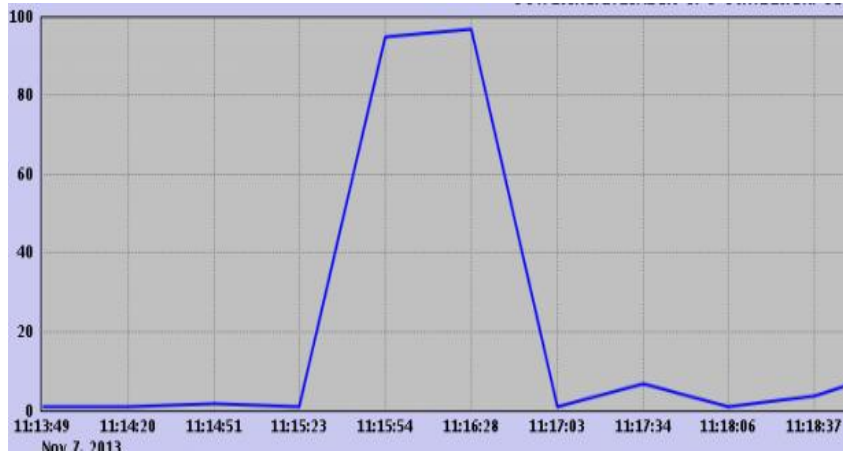
■ Approach

- OS Watcher BB
- ASH analysis
- OEM Top activity, ASH analytics

[OS resource utilization]

[Active session review]

[Active session review]



OS Watcher Black Box

(Doc ID 301137.1)

```
./startOSWbb.sh  
-or-  
./startOSWbb.sh 60 10 gzip /u02/tools/oswbb/archive
```

- Collects and archives important operating system performance metrics
- Simple Installation
- Simple method of report collection
- Default polling interval is 30 sec and default schedule window is 48 hrs
- Very minimal overhead
- A graphical utility `oswbbba` draws graphs on the raw data
- It has options to extend the functionality to add custom scripts

```
unzip rda.zip
chmod +x rda

./rda.sh [-v]
```

- Provides comprehensive picture of system environments
- Simple Installation
- Simple method of reports collection
- Can be configured with -S option to chose different collections
- Review data collection using : `RDA__start.htm`
- Information e.g. Installed OS packages/patches, kernel parameter settings etc.

AWR report

(Doc ID 1363422.1)

To take snap:

```
Execute dbms_workload_repository.create_snapshot();
```

To view report:

```
@?/rdbms/admin/awrrpt.sql
```

- Very useful diagnostic for DB time and metrics analysis
- Requires diagnostic pack licenses
- Records workload related statistics at every snaps by `mmon` slaves.
- Information is stored under sysaux tablespace
- Top SQLs are ordered under various metrics categories
- By default snaps are taken hourly

Statspack report

(Doc ID 94224.1)

To take snaps:

```
Execute Statspack.snap();
```

To view report:

```
@?/rdbms/admin/spreport.sql
```

- Similar to AWR report
- Does not require any diagnostic pack license
- Install statspack proactively in case no diag. pack license
- Manually schedule snaps interval using either dbms_job(sample script :spauto.sql) or using cron os utility
- Level>=6 capture execution plans of top sqls and can be viewed using sprepsql.sql (equivalent to awrsqrpt.sql)

ASH Report

(Doc ID 276103.1)

To view report:

```
@?/rdbms/admin/ashrpt.sql
```

- Performance statistics of **active sessions** are sampled and captured every second.
- 1 out of 10 samples are kept in history(AWR)
- Very useful diagnostic for transient performance problems
- Filters can be applied when executed using `ashrpti.sql`

Hang Analyze dump

(Doc ID 130874.1)

Single instance:

```
oradebug hanganalyze <level>
```

Rac:

```
oradebug setinst all
```

```
oradebug -g all hanganalyze <level>
```

- Very useful incase of database hang scenarios
- Prints out dependencies among processes
- Light weight trace than system state dump
- Levels decide whether to capture process states of blockers / waiters
- Preferred collection method over system state dump when number of processes are very high

System State dump

(Doc ID 423153.1)

Single instance:

```
oradebug dump systemstate <level>
```

Rac:

```
oradebug setinst all
```

```
oradebug -g all dump systemstate <level>
```

- Very useful incase of database hang scenarios
- Heavier dump file.
- Dumps state objects of all the database processes
- Be cautious when number of processes are very high
- Use `sqlplus -prelim` option when sysdba connection is not allowed

SQL Tracing

(Doc ID 376442.1)

```
oradebug setospid <ospid>
oradebug Event 10046 trace name context forever, level n
-or-
alter session set events '10046 trace name context forever, level n';
-or-
alter session set events 'sql_trace [sql: <sql_id>| <sql_id>] level n'
```

- Traces a session's activity
- Very useful for analyzing SQL performance
- Captures individual sql execution statistics on *parse*, *execute* and *fetch*
- Captures *waits* and *binds* information based on levels set
- Captures *actual row sources*
- Use dbms_monitor for tracing client id, services, modules, actions

Errorstack / Shortstack

For Errorstack:

```
oradebug seospid <ospid>  
oradebug dump errorstack <n>  
oradebug dump errorstack <n>
```

For Shortstack:

```
oradebug seospid <ospid>  
oradebug short_stack  
oradebug short_stack
```

- Useful when session is spinning on CPU
- Captures error stacks and function call stacks
- Capture multiple errorstack/shortstack in short duration
- Errorstack captures process state dumps and context areas (level 3)

SQLT (SQLTXPLAIN)

(Doc ID 215187.1)

XTRACT example:

```
#cd sqlt/run
```

```
# sqlplus apps
```

```
SQL> START sqltxtract.sql [SQL_ID]|[HASH_VALUE] [sqltxplain_password]
```

e.g.

```
SQL> START sqltxtract.sql 0w6uydn50g8cx sqltxplain_password
```

- Captures most of relevant performance diagnostics surrounding a single SQL statement
- Gathers info. from current state as well as from history(AWR) .
- Different methods of report collection e.g. XPLAIN, XTRACT, XECUTE etc.
- Diagnostics are captured consistently at a single point of time.

SQLHC

(Doc ID 1366133.1)

```
# sqlplus / as sysdba
SQL> START sqlhc.sql <T|D|N> <sql_id>
e.g.
SQL> START sqlhc.sql T djkbyr8vkc64h
```

- Quick health check tool for a SQL statement
- Lighter information than SQLTXPLAIN
- Reports non-compliant observation
- Readable SQL code (sqlhc.sql)
- No database footprint.

LTOM

(Doc ID 352363.1)

To Install:

```
uncompress ltom.tar.Z  
tar xvpf ltom.tar
```

To Start:

```
./startltom.sh
```

- A java program designed as a real-time diagnostic platform.
- Proactive in nature : Automatic problem detection and collects the necessary diagnostics based on rules defined.
- i) Automatic Hang Detection - use cautiously :Check Rules. at
`$TOM_HOME/init/hangDetect.properties`
- ii) System Profiler
- iii) Automatic Session Tracing - use cautiously : Check Rules at
`$TOM_HOME/init/sessionRecorder.properties`
- LTOMg provides graphical output of the data collected

Misc. OS debugging tools

	Linux	Solaris	AIX	HPUX	Windows
Application Call Stacks	Pstack,etc	Pstack,etc	pstack/proc stack/dbx, etc	pstack /gdb,etc	ADPlus, WinDbg,etc
System Calls	Strace,etc	Truss,etc	Truss,etc	Tusc,etc	ADPlus, WinDbg,etc
Debugger	gdb,dbx etc.	gdb, dbx etc.	gdb, dbx etc.	gdb, dbx etc.	ADPlus, WinDbg, etc
Profiler	qprof, Dtrace, etc	Dtrace, etc	Gprof,etc	Caliper,etc	ADPlus, WinDbg,etc

Demonstration



Best practices

- Know your system's environment
- Keep the tools up-to-date
- Install and verify relevant tools on your environments and keep them ready and running for contingencies
- AWR/ Statspack framework should be taking snaps and define the retention periods appropriately
- Take advantages of plan stability features for query performances (e.g. SPM baselines) esp. upgrade situations.
- Sql tuning advisor(tuning pack license) can be useful for new query tuning exercises

References

- Best Practices: Proactive Data Collection [\[Doc 1477599.1\]](#)
- Master Note: Database Performance Overview [\[Doc ID 402983.1\]](#)
- Master Note: SQL Query Performance Overview [\[Doc ID 199083.1\]](#)
- OSWatcher Black Box (Includes: [Video]) [\[Doc ID 301137.1\]](#)
- SQLT Diagnostic Tool [\[Doc ID 215187.1\]](#)
- SQL Tuning Health-Check Script (SQLHC) [\[Doc ID 1366133.1\]](#)
- Automatic Workload Repository (AWR) Reports ... [\[Doc ID 1363422.1\]](#)
- How to Collect Diagnostics for Database Hanging .. [\[Doc ID 452358.1\]](#)
- FAQ: How to Use AWR reports to Diagnose [\[Doc ID 1359094.1\]](#)

Summary

What we covered today

- Different Problem categories
- Various approaches
- Various important Diagnostics
- When to collect what and why
- Best practices



Questions & Answers



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Q&A

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Further Info & Help

- Generic Advisor Webcast Note (Doc ID [740966.1](#))
- Database Advisor Webcast (Doc ID [1456176.1](#))
- DB Newsletter (Doc ID 1284265.1)
- MOS Community [Database Tuning](#)

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★ Oracle Database Advisor Webcast Schedule and Archive recordings [ID 1456176.1]

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Schedule

Archives

Current Schedule	Archived 2013	Archived 2012	Archived 2011	Archived 2010
Product Family	Title		Date & Time	Register
Database Security Products	Common Issues with Database Auditing (10g/11g)		Jan 23, 08:00 PT	REGISTER
Oracle Database Technology	PL/SQL Performance Tuning		Jan 24, 08:00 PT	REGISTER
High Availability Data Guard	Data Guard: Overview and Usage of the Data Guard Broker		Feb 19, 08:00 PT	REGISTER

Oracle Database Advisor Webcast Schedule and Archive recordings [ID 1456176.1]

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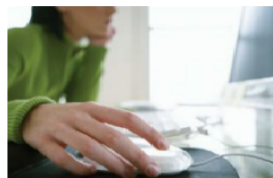
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Product Area	Webcast Title		Date	View & Download
Instance Performance - 11g	Mutexes in Oracle Database		April 30, 2013	Recording .pdf
Patching - EM 12c	Automation of patch conflict resolution and deployment through EM 12c		April 25, 2013	Recording .pdf
Error: ORA-4030	How to use the ORA-4030 Troubleshooting Tool on My Oracle Support		April 17, 2013	Recording .pdf

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Available References and Resources to Get Proactive

- About Oracle Support Best Practices
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- Get Proactive Blog
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- Turbocharge your My Oracle Support experience
- Hear What Top Participants Value About Community
- Training Available for My Oracle Support Community
- How To Create a Shared Document (video 1:34)
- Rules of Conduct
- You're The Expert
- I am not a number!

Rewards and Recognition Hall of Fame

Frequently Asked Questions

- Community FAQ
- Rewards & Recognition Program FAQ

Rank

Newbie 111 points

Improve your rank by posting to discussions.

Administration Tasks

- Manage Product Mappings
- Hall Of Fame

Support Spotlight

Join Support Experts at Oracle OpenWorld

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2	AR accounting issue.	Bharat - Oracle
2	Posted on August 17, 2012 2:48 AM in Receivables by User190932, Last updated on August 20, 2012 7:54 AM, 17 Replies, 102 Views	
2	11i to r12 upgrade-period closure	Bharat - Oracle
2	Posted on August 20, 2012 5:44 AM in General Ledger by Nara, Last updated on August 20, 2012 7:53 AM, 4 Replies, 20 Views	
2	Bank tape integration with JDE	Felicia - Oracle
2	Posted on August 17, 2012 3:46 PM in Financials API/AR/GA - JDE1 by Priyanka, Last updated on August 20, 2012 7:40 AM, 1 Replies, 6 Views	

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Top Articles and Community Links

- Include any specific links to relevant KM articles here.
- Presenter to Include a link to pre-defined Q&A thread in the appropriate KM Community



THANK YOU

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