

How To Use ASH & Idle Wait Events To Prove The Problem Is Not The Database

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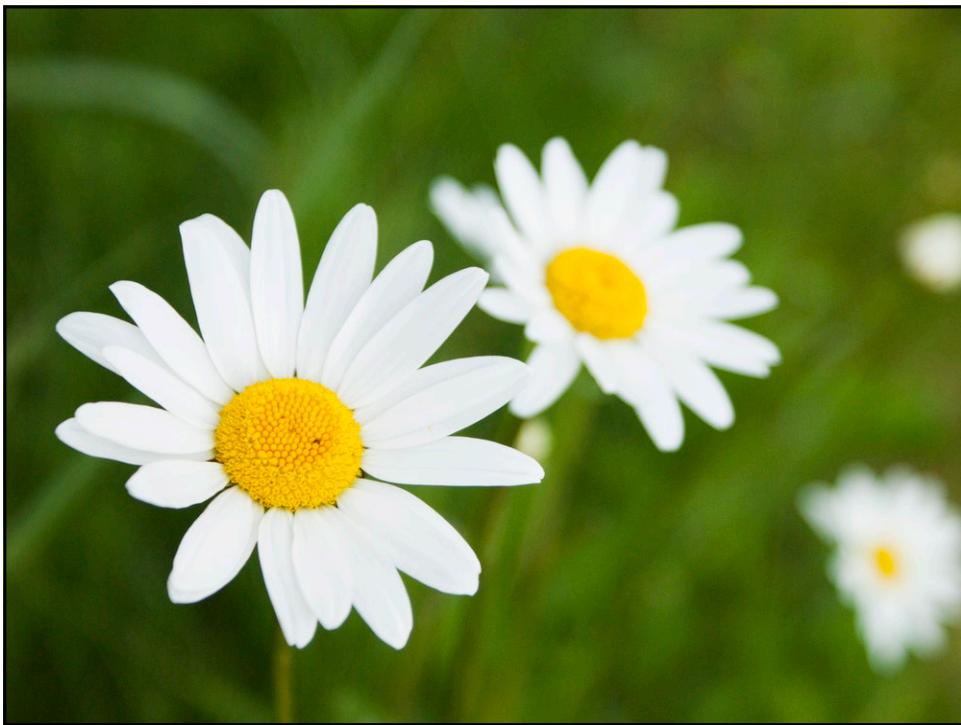
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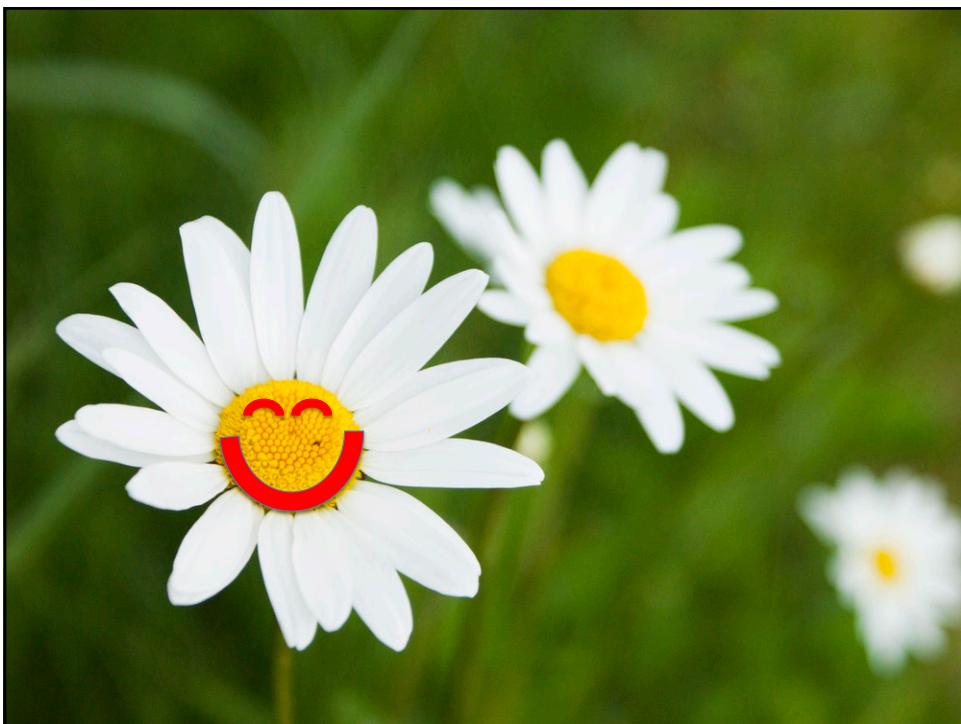


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Ever happen to you?

- User: Something is wrong with your Oracle system!
- DBA: You're right! It's got users.
- DBA: Sorry. Can you be more specific?
- User: Legacy...always fast. COBOL. 120 steps.
- DBA: OK, I'll look into it.

- DBA: Oh... I don't see it in my AWR report!
- DBA: Oh oh... I don't see it in ASH either!
- DBA: Well, I guess it doesn't really exist.

- DBA: Sorry, I can't help you.
- User: What?
- DBA: Yea. There is no record of this in my analysis data.
- User: You suck. Again.

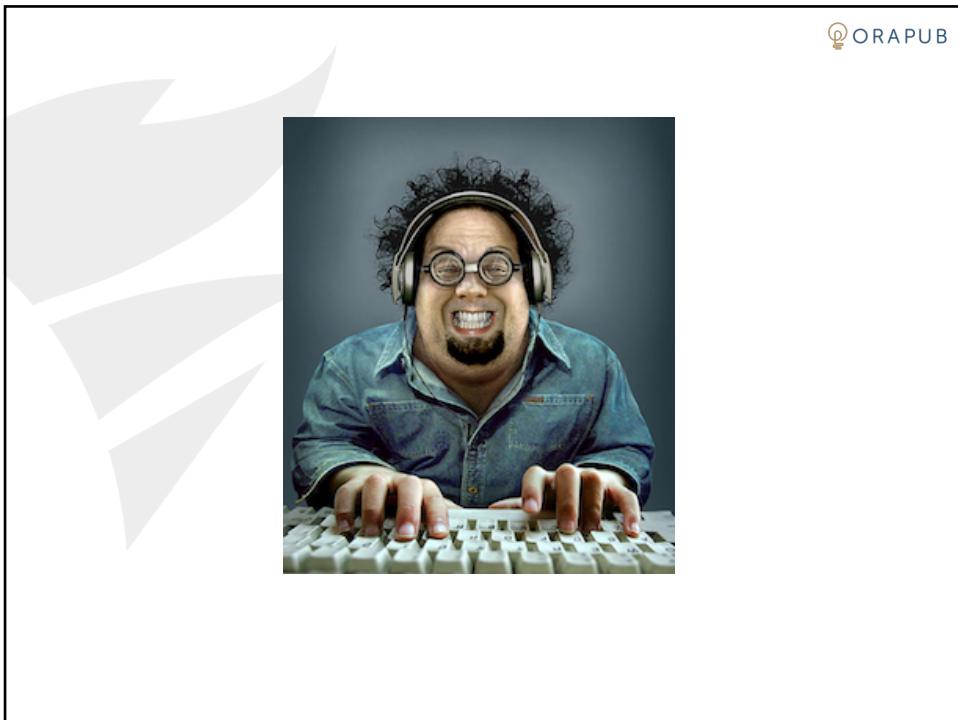
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The Big Question Is This: How do we solve a non-existent performance problem?



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Here's our journey for today.

- The situation
- Quick ASH tutorial
- Oracle's process architecture
- Oracle's time model
- The secret sauce!
- Demo
- Gotchas!

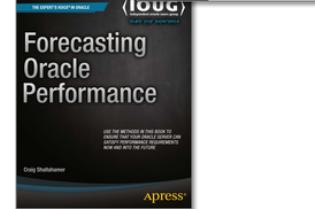
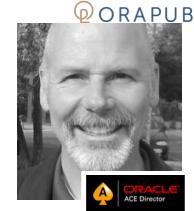
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About Me...

- Long time Oracle DBA
- Specialize in Oracle Database performance and performance engineering
- Performance researcher
- Blogger: A Wider View About Oracle Performance Tuning
- Author: Oracle Performance Firefighting and Forecasting Oracle Performance.
- Conference speaker
- Teacher and mentor
- Oracle ACE Director
- IOUG DBA Track Manager



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A screenshot of the OraPub website. The header features the ORAPUB logo and navigation links for Calendar, Training, Tools, Support, and Login. A 'FREE Membership' button is also present. The main content area has a heading 'No More Frustration In Tuning Oracle Databases' and a subtext: 'Our services give you the training you need so your Oracle database runs faster and more efficiently. And, you get the credit!' Below this are four images with corresponding buttons: 'MEMBERSHIPS' (showing a group of people), 'TRAINING' (showing a person at a desk with laptops), 'FREE TOOLS' (showing a pair of pliers), and 'BOOKS' (showing an open book).

OraPub works with Oracle DBAs empowering them to beat bots, AI, machine learning and autonomous anything.

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The Situation

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The Situation

- I received an email from a super frustrated colleague/member/friend/"Sam."
- He was dealing with a 120 step COBOL batch process that was taking way too long. No big deal right?
- To him it was a very big deal because he could not find any indication of the process in his AWR reports or his ASH analysis.
- We emailed back and forth a few times. He can now prove the root problem resides in the COBOL program not with the Oracle database or the operating system.

- Key words.
 - Batch
 - COBOL
 - 120 Steps
 - Legacy
- Strangeness
 - Does not show in an AWR report
 - Does not show in an ASH Incident Analysis

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Quick ASH Tutorial

Image the questions I can ask!



Each **piece of paper** is like an active Oracle session.
Each **stack** contains all the active sessions captures
during a single ASH sample, such as at 15:25:06.

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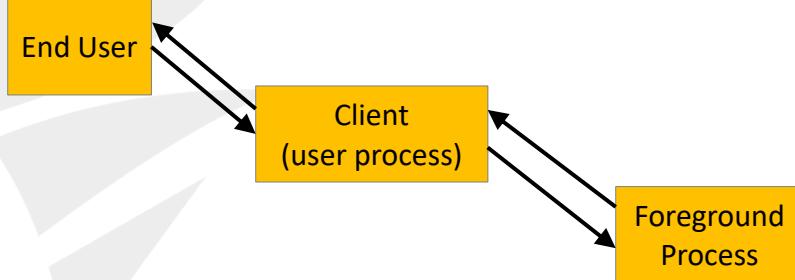
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Oracle's Process Architecture

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Oracle's Process Architecture



All Oracle CPU and wait events are from a FG or BG perspective.

FG and BG processes can both be “active” sessions.

In this situation the FG process load will be virtually undetectable plus both AWR and ASH data will unlikely NOT contain useful data.



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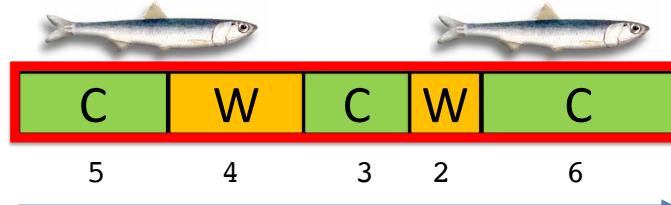
Oracle's Time Model

(active and non active sessions)

Oracle Time. What is it?



Elapsed Time = CPU Time + Non Idle Wait Time



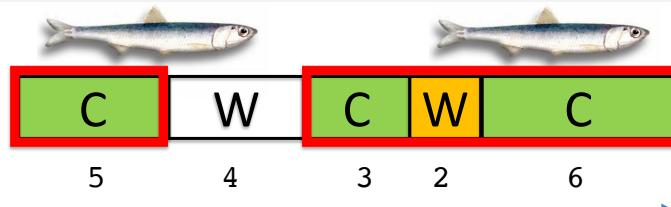
CPU	= 14	300K LIOs 1 SQL Exec
Non-Idle Wait	= 6	
<hr/>		
Elapsed = DB time	= 20	
Idle Wait	= 0	
Experience	= 20	Single Serial Session

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Oracle Time. What is it?

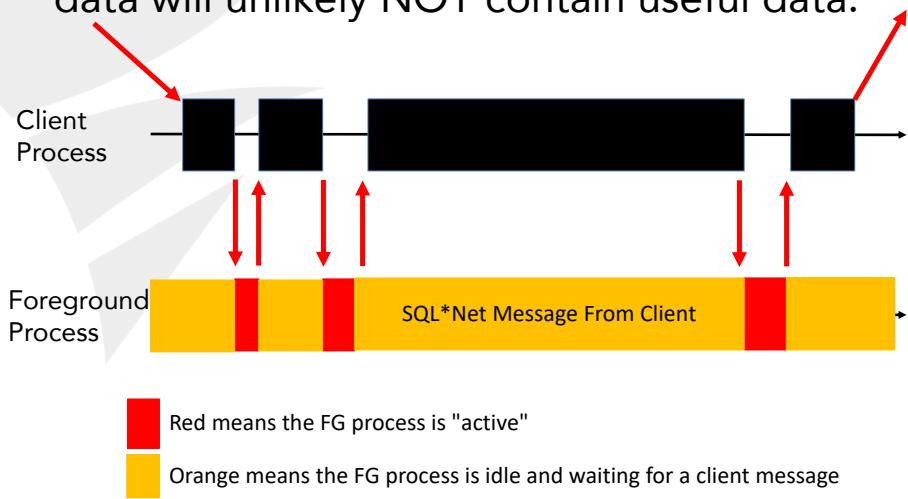


Elapsed Time = CPU Time + Non Idle Wait Time



CPU	= 14	300K LIOs 1 SQL Exec
Non-Idle Wait	= 2	
<hr/>		
Elapsed = DB time	= 16	
Idle Wait	= 4	
Experience	= 20	Single Serial Session

In this situation the FG process load will be virtually undetectable plus both AWR and ASH data will unlikely NOT contain useful data.



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User says, "Your lack of timing data, does not invalidate my statement that the process takes too long."

I'm thinking, "Unless I can monitor your session when it is "not active" resulting "no lack of timing data."

How do we monitor a “non active” Oracle session?

Oh yea...
Without doing something like
tracing a four hour session or
tracing ALL sessions!

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The Secret Sauce!

The answer is... Creatively using the instance parameter

_ash_sample_all

It's also helpful if we
know how to identify the offending session.

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Demo Failure Slides

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Two scripts will be used.

1. Timeline
2. Profile

The "COBAL" program.

```
$ cat app-cobol-1.sh
while [ 1 == 1 ]
do
  sqlplus system/manager <<EOF

EXEC DBMS_SESSION.set_identifier('COBAL-120-Step-Diaster');
select to_char(sysdate,'MM:SS') from dual;
declare
  i number;
  j number;
begin
  for i in 1..1000000
  loop
    j := dbms_random.value(0,i*2.454);
  end loop;
end;
/
select to_char(sysdate,'MM:SS') from dual;
!sleep 8
select to_char(sysdate,'MM:SS') from dual;
EOF
done
```

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ASH Collection Toggle

```
$ cat ash-active.sql
show parameter "_ash_sample_all"
alter system set "_ash_sample_all"=false;
show parameter "_ash_sample_all"

$ cat ash-all.sql
show parameter "_ash_sample_all"
alter system set "_ash_sample_all"=true;
show parameter "_ash_sample_all"
```

col client_id format a22

def datasource=v\$active_session_history

def dbahistdetails=' and 1=1'

def timingdetails="sample_time >= current_timestamp
interval '1' minute"

def ashCols='event,sql_id,client_id,program'

def ashWhere="1=1"

def ashWhere="client_id='COBOL-120-Step-Diaster'"

select sample_id, to_char(sample_time, 'DD
HH24:MI:SS') ST,
 session_id sid, session_state,
 &ashCols
 from &datasource
 where &timingdetails
 &dbahistdetails
 and &ashWhere
 order by 1,3

/

ASH Timeline Script

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ASH Profile Script

def datasource=v\$active_session_history

def dbahistdetails=' and 1=1'

def timingdetails="sample_time >= current_timestamp -
interval '1' minute"

def ashcolkey1=client_id

def ashcolval1='COBOL-120-Step-Diaster'

def ashcolkey2=1

def ashcolval2=1

Only the SQL*Plus defines are shown.
For the SQL, see OraPub's ASH ScratchPad

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Default ASH Collection

Only “active” sessions
are collected by ASH.

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Profile Script Output

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Total AS	CPU PCT	CPU PCT	CPU PCT	HARD PCT	WAITING PCT
14	100.0		0.0	0.0	0.0
no rows selected					
PARSING PCT	CPU PCT	CPU PCT	HARD PCT	WAITING PCT	WAITING PCT
	0.0	0.0	0.0	0.0	0.0

Only a few active samples and all "on cpu".
There are NO waiting samples!

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Non Default Collection

ALL sessions are collected by ASH.

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SAMPLE_ID	SAMPLE_TIME	SID	STATE	EVENT
873821	01 12:42:17	166	WAITING	SQL*Net message
873822	01 12:42:18			sage
873823	01 12:42:19			sage
873824	01 12:42:20	166	WAITING	SQL*Net message
873825	01 12:42:21	166	ON CPU	
873826	01 12:42:22	166	ON CPU	
873827	01 12:42:23	166	WAITING	SQL*Net message
873828	01 12:42:24	166	WAITING	SQL*Net message
873829	01 12:42:25	166	WAITING	SQL*Net message
873830	01 12:42:26	166	WAITING	SQL*Net message
873831	01 12:42:27	166	WAITING	SQL*Net message
873832	01 12:42:28	166	WAITING	SQL*Net message
873833	01 12:42:29	166	WAITING	SQL*Net message
873834	01 12:42:30	166	WAITING	SQL*Net message
873835	01 12:42:31	166	ON CPU	
873836	01 12:42:32	166	ON CPU	
873837	01 12:42:33	166	ON CPU	
873838	01 12:42:34	166	WAITING	SQL*Net message

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SQL_ID	CLIENT_ID	PROGRAM
age from clie 99shvxc51byqy	COBOL-120-Step-Diaster	sqlplus
age from clie 99shv:	Timeline Script Output	ter sqlplus
age from clie 99shv:		ter sqlplus
age from clie 99shvxc51bygy	COBOL-120-Step-Diaster	sqlplus
f3mgfz50orghn0	COBOL-120-Step-Diaster	sqlplus
f3mgfz50orghn0	COBOL-120-Step-Diaster	sqlplus
age from clie 99shvxc51bygy	COBOL-120-Step-Diaster	sqlplus
age from clie 99shvxc51bygy	COBOL-120-Step-Diaster	sqlplus
age from clie 99shvxc51bygy	COBOL-120-Step-Diaster	sqlplus
age from clie 99shvxc51bygy	COBOL-120-Step-Diaster	sqlplus
age from clie 99shvxc51bygy	COBOL-120-Step-Diaster	sqlplus
age from clie 99shvxc51bygy	COBOL-120-Step-Diaster	sqlplus
age from clie 99shvxc51bygy	COBOL-120-Step-Diaster	sqlplus
age from clie 99shvxc51bygy	COBOL-120-Step-Diaster	sqlplus
f3mgfz50orghn0	COBOL-120-Step-Diaster	sqlplus
f3mgfz50orghn0	COBOL-120-Step-Diaster	sqlplus
f3mgfz50orghn0	COBOL-120-Step-Diaster	sqlplus
age from clie 99shvxc51bygy	COBOL-120-Step-Diaster	sqlplus

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Profile Script Output							ORAPUB
Total AS	CPU PCT	CPU PAR SING	CPU PCT	HARD PAR SING	WAITIN G PCT	PC	
59	23.7		0.0	0.0	76.		
COUNT(*) EVENT							
45 SQL*Net message from cli e							
CPU PAR SING		HARD PCT	WAITING PCT	WAITING IO PCT	WAITING OTHER PCT		
0.0		76.3		0.0	100.0		
No "missing" samples and we can see the "missing" idle samples!							
from cli e				(c)OraPub, Inc.		ASH Not The DB	

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Some Gotchas

- Some may say, "If you can identify the session, then you know when the COBOL program begins and ends, so why go through this trouble?"
- The reason we do this is NOT to know when the process begins and ends, it is to demonstrate the FG process is doing ABSOLUTELY NOTHING!
- Missing data only proves there is missing data.
- Ensure you can identify the session. For example, filter by program, module, action, client_id, etc.
- You may need a bigger ASH ring. Change, `_ash_size`
- Remember to turn OFF sampling ALL Oracle sessions!
- Minimize complexity and maximize power with simplicity by using the ASH ScratchPad.

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So awesome!

However...

This is just the beginning.

There is so much more we can do with ASH analysis.



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