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My Favorite Scripts - 2016

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My Favorite Scripts - 2010

by Kerry Osborne (a command line guy)

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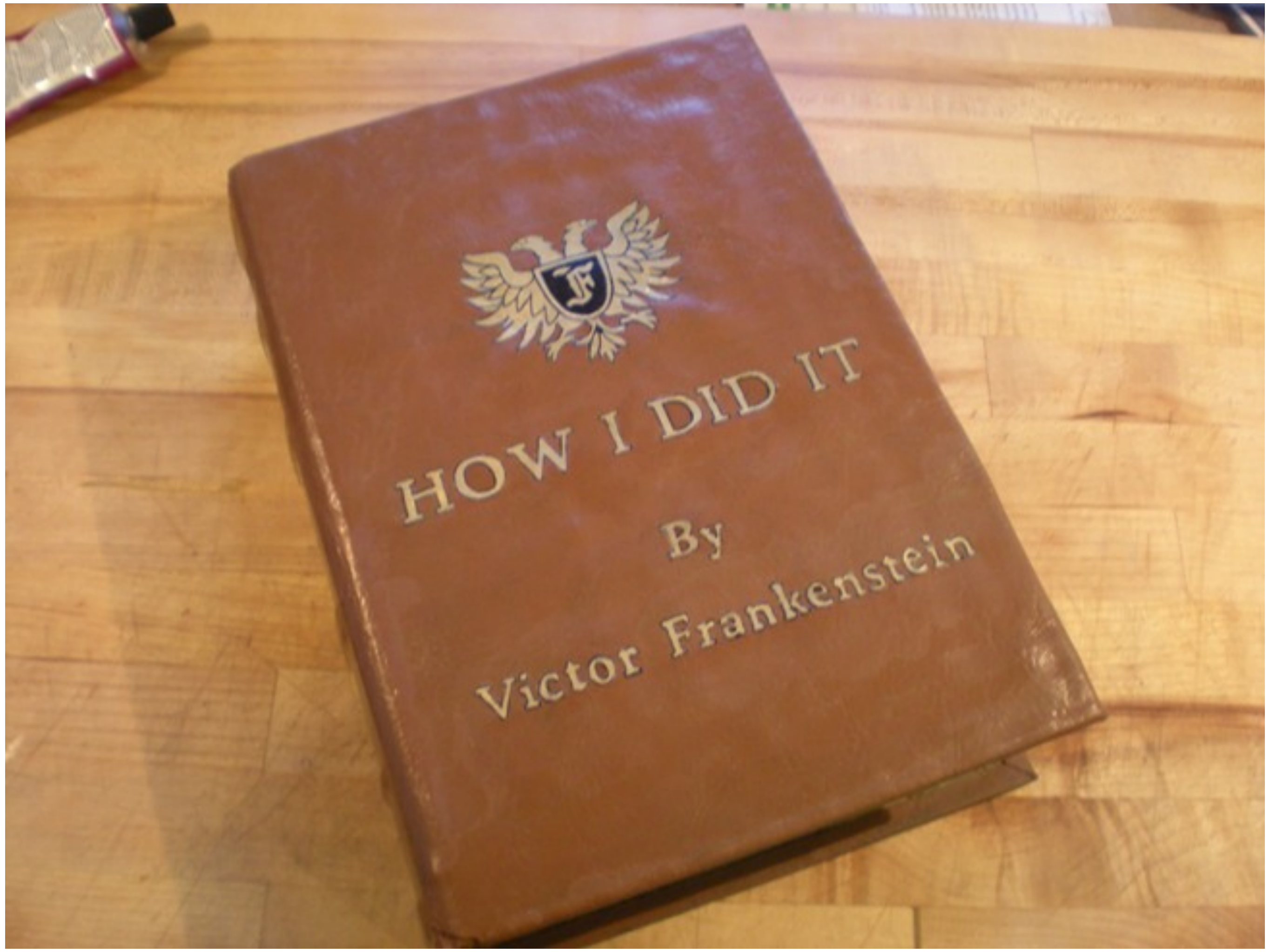


whoami

- Started working with Oracle in 1983
- Primarily a developer for the first 5-6 years
- Became a consultant around 1987
-   (through no fault of my own)
- …

- Never worked directly for Oracle
- Not certified in anything (except Scuba Diving)

- I am a command line guy!

Philosophies

- Believe nothing of what you hear, and only half of what you see. ~ Proverb
- No hypothesis before analysis. ~ me
- Working in Test is for amateurs. ~ me
- If your elbow hurts, look at your elbow (not your ankle). ~ me
- If I have seen farther it is by standing on the shoulders of giants. ~ Isaac Newton
- There are no new notes, but plenty of new original songs. ~ me
- I'll let you be in my dream if I can be in yours. ~ Bob Dylan

Why I Use Scripts

Because I’m a command line guy.

Because I like to know where the data came from.

Because sometimes I need (or want) something unique.

Because I’m not a good typer-ater.

Because I’m forgetful (occasionally).

Because I’m lazy.

Because people with problems are impatient!

Categories

Collecting Data:

- What's Going On?
- Finding SQL and Plans
- Finding Stats (table_stats, col_stats)

Prospecting:

- Identifying Periods of High Activity
- Looking for Significant Variation

Testing:

- Building Test Scripts
- Executing Test Scripts
- Flushing

Miscellaneous:

- Bits and Bobs

What’s Going On?

First: Machine Level

```
vmstat, sar, top, topas, prstat, ps, uptime, realfreemem.sh, etc…
```

Second: Active SQL

```
-- as.sql
Select sid, substr(program,1,19) prog, b.sql_id, child_number child,
plan_hash_value, executions execs,
(elapsed_time/decode(nvl(executions,0),0,1,executions))/1000000 avg_etime,
sql_text
from v$session a, v$sql b
where status = 'ACTIVE'
and username is not null
and a.sql_id = b.sql_id
and a.sql_child_number = b.child_number
and sql_text not like 'select sid, substr(program,1,19) prog, b.sql_id%' -- don't show this
```

Third: AWR or Statspack

```
-- awrrpt.sql
  @$ORACLE_HOME/rdbms/admin/awrrpt
```

AWR

Provides a lot of data

Very useful despite the aggregation of data

Snapshots collected once per hour by default (OK)

Retention is 7 days by default (not long enough)

Can report between any two snapshots

(but not across a bounce)

•AWR / Statspack - basically the same thing

AWR

Contains Basic Workload Information
- transactions, parses, db time, etc…

Contains a profile of how the database spent it's time
- also known as a wait event profile

Contains most expensive SQL (along with %)
- by Etime, CPU , Gets, Reads, Execs

List of Non-Default Parameters
- including so called hidden parameters
- (but not double top secret parameters)

AWR - Warning

- Not the tool for analyzing specific problems
  - aggregation of data can hide significant variation
  - general issues may not apply to specific case

- On the Other hand …
  - it provides a good background context

Explain Plan - Lies

```
SQL> explain plan for select …
SQL> select * from table(dbms_xplan.display('plan_table’,'','ALL'));
```

It tells you what it thinks the optimizer might do …
  assuming the environment is the same as production
  assuming that bind variable peeking doesn’t come into play
  etc…

  (note: autotrace uses explain plan too)

The best liar is one that tells the truth most of the time.

Google for “Explain Plan Lies” for more info

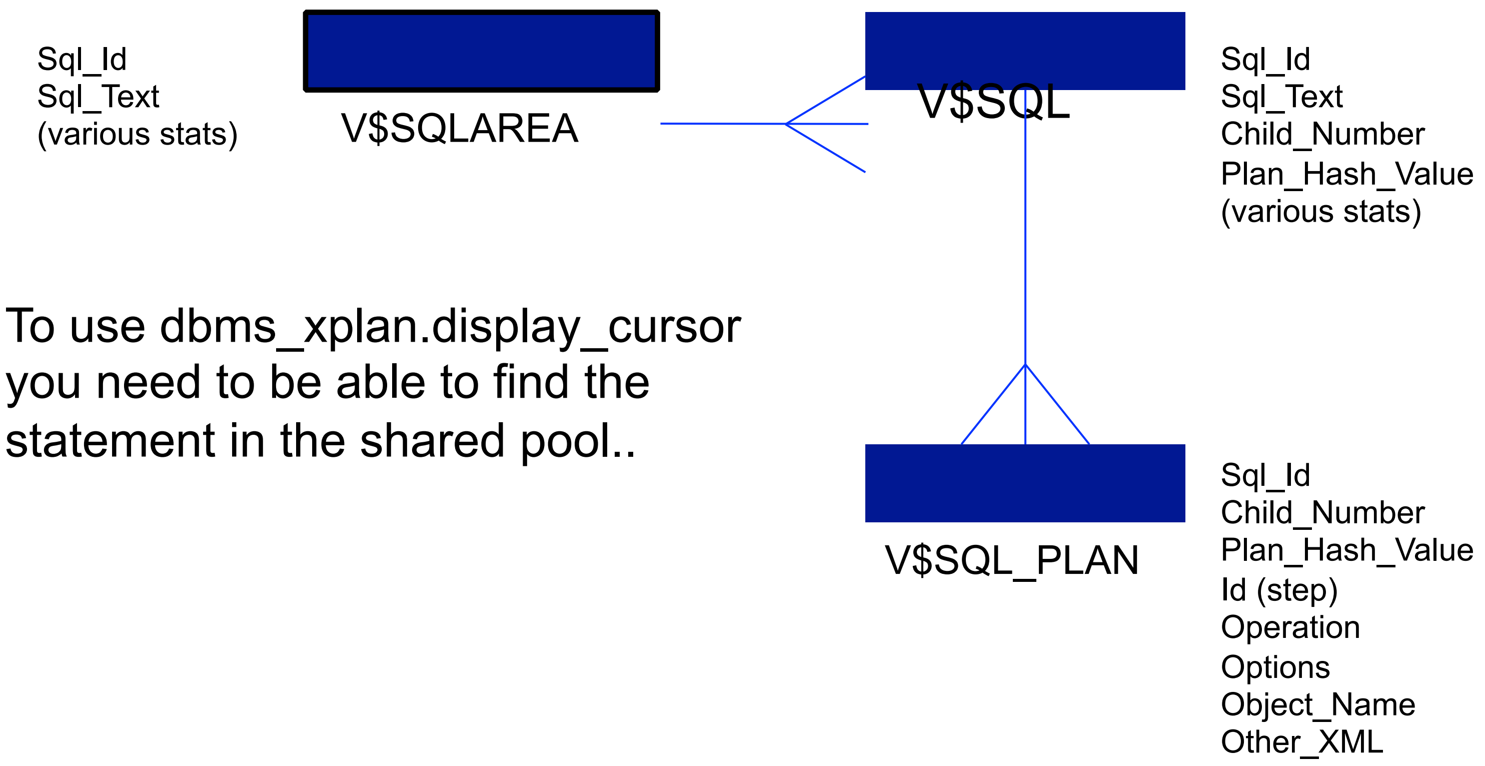
Finding SQL and Plans

Finding SQL
- find_sql.sql (fs.sql) – find sql in V$SQL
- find_sql_awr.sql – find sql in DBA_HIST_SQLSTAT
- fsx.sql – find sql with indicator of Exadata offload
- fsx_awr.sql – same as fsx.sql but from awr history

Finding Plans
- x.sql – find plan (and sql_id) of last statement executed in this session
- dplan.sql – show plan for statement in V$SQL (uses dbms_xplan)
- dplan_awr.sql – show plan for statement in AWR history
- dplan_allstats.sql – show plan with extended stats

SQL Monitor
- rsm.sql (report_sql_monitor.sql) – produce text version of SQL Monitor report
- rsm_html.sql (report_sql_monitor.sql) – produce html version of SQL Monitor report
- monitor_sql.sql – prompt for SQL_ID and creates a patch with the monitor hint

Shared Pool Layout (V$SQL…)



To use dbms_xplan.display_cursor you need to be able to find the statement in the shared pool..

Note: prior to 10g hash_value used as key (no sql_id)

Finding Statements in the Shared Pool

```
SQL> !cat find_sql.sql
select sql_id, child_number, plan_hash_value plan_hash, executions execs,
(elapsed_time/1000000)/decode(nvl(executions,0),0,1,executions) avg_etime,
buffer_gets/decode(nvl(executions,0),0,1,executions) avg_lio,
sql_text
from v$sql s
where upper(sql_text) like upper(nvl('&sql_text',sql_text))
and sql_text not like '%from v$sql where sql_text like nvl(%'
and sql_id like nvl('&sql_id',sql_id)
order by 1, 2, 3
/

SQL> @find_sql
Enter value for sql_text: %skew%
Enter value for sql_id:

SQL_ID         CHILD  PLAN_HASH  EXECS   AVG_ETIME       AVG_LIO SQL_TEXT
------------- ------ ---------- ------ ---------- ------------- ----------------------------------------
0qa98gcnnza7h      0  568322376      5      13.09       142,646 select avg(pk_col) from kso.skew where col1 > 0
0qa98gcnnza7h      1 3723858078      1       9.80     2,626,102 select avg(pk_col) from kso.skew where col1 > 0
```

DBMS_XPLAN

4 Display Functions:

Display – plan table
Display_Cursor – shared pool
Display_AWR – AWR tables
Display_Baseline – 11g

Options: (+,-)

ALIAS
ALLSTATS *
IOSTATS
MEMSTATS
OUTLINE
PEEKED_BINDS
PREDICATE
. . .

See Rob van Wijk's blog for a very detailed set of examples
http://rwijk.blogspot.com/2008/03/dbmsxplandisplaycursor.html

DBMS_XPLAN - Options

allstats –

select /*+ gather_plan_statistics */ blah,blah,blah …
select * from table(dbms_xplan.display_cursor('&sql_id','&child_no',’allstats'));

```
-----------------------------------------------------------------------------------------------------------------------
| Id  | Operation                          | Name                     | Starts | E-Rows | A-Rows |   A-Time   | Buffers |
-----------------------------------------------------------------------------------------------------------------------
|*  1 |  COUNT STOPKEY                     |                          |      1 |        |      1 |00:00:00.01 |      44 |
|   2 |   PARTITION RANGE ALL              |                          |      1 |      1 |      1 |00:00:00.01 |      44 |
|   3 |    PARTITION HASH ALL              |                          |     10 |      1 |      1 |00:00:00.01 |      44 |
|   4 |     TABLE ACCESS BY LOCAL INDEX ROWID| DODA_TABLE             |     37 |      1 |      1 |00:00:00.01 |      44 |
|*  5 |      INDEX RANGE SCAN              | DODA_TABLE_IDX1          |     37 |   3403K|      1 |00:00:00.01 |      43 |
-----------------------------------------------------------------------------------------------------------------------

Predicate Information (identified by operation id):
---------------------------------------------------

   1 - filter(ROWNUM<2)
   5 - access(”COL1">SYSDATE@!)
```

Hint is not necessarily required:

```
alter session set statistics_level=all;
alter session set “_rowsource_execution_statistics”=true;
```

Finding Object Statistics

table_stats.sql – Shows table, column, index, stats for a table
col_stats.sql – Shows column stats including max and min

create_display_raw.sql – Used by col_stats.sql to convert raw max and min
diff_table_stats.sql – Shows what's changed

Prospecting

Busiest Time is Generally the Most Interesting:

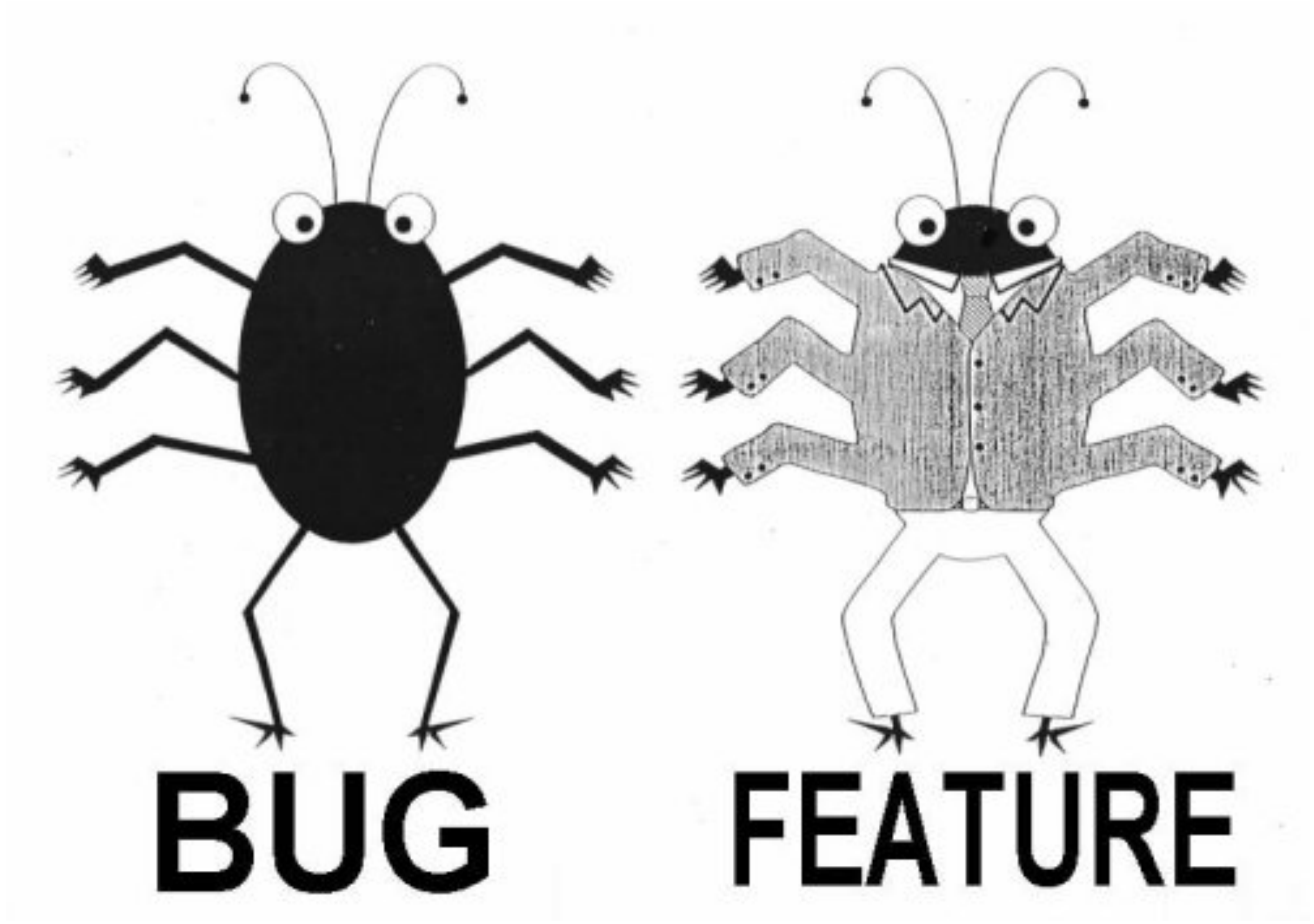
```
-- dbtime.sql - finds snapshots with highest dbtime
```

Looking for Large Variation:

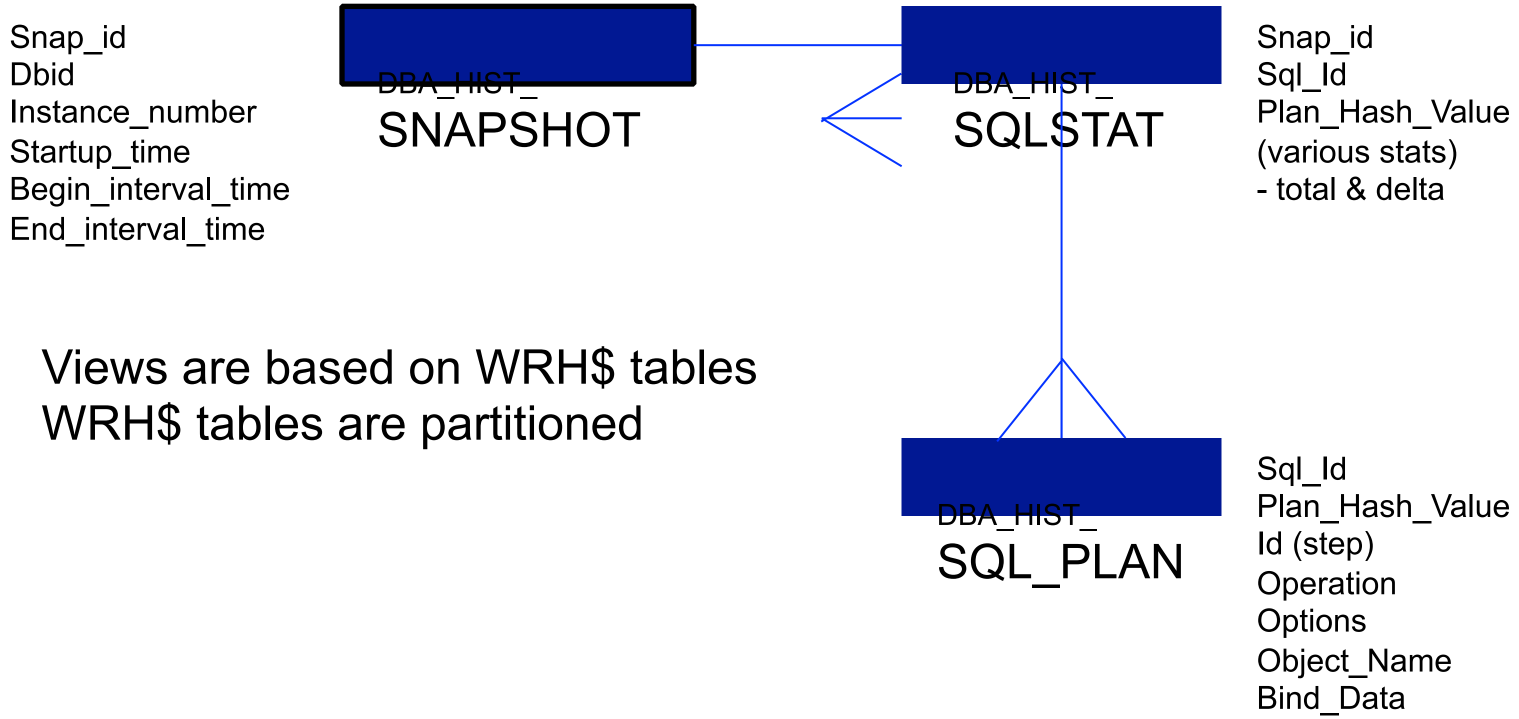
```
-- unstable_plans.sql - finds statements with significant elapsed time variation by plan
-- awr_plan_stats.sql - shows stats (avg_etime, avg_lio, etc) for statements by plan
-- awr_plan_change.sql - shows history of plan changes

-- whats_changed.sql - finds SQL with significant elapsed time variation after a point in time
```

Digression – Bind Variable Peeking

Drives Me Nuts!



AWR Layout (DBA_HIST_SQLSTAT…)



Views are based on WRH$ tables
WRH$ tables are partitioned

Testing

Getting the Statement (and variables):

```
-- build_bind_vars.sql (bbv.sql) – builds test script including peeked binds (OTHER_XML)
-- build_bind_vars2.sql - builds test script including binds from V$SQL_BIND_CAPTURE
-- build_bind_vars_awr.sql - builds test script including binds from AWR
```

Flushing:

```
-- flush_sql.sql – flush a single SQL statement using dbms_shared_pool.purge (10.2.0.4 and up)
-- flush_sql10p.sql – creates and drops a Profile which as a side affect flushes SQL
```

Executing:

```
-- ss.sh – fires off a bunch of sessions executing a specified SQL script
```

Controlling Execution Plans

SQL Profiles:

```
-- create_sql_profile.sql – creates a SQL profile on a statement in the shared pool
-- create_sql_profile_awr.sql – creates a baseline on a statement in AWR
```

SQL Patches:

```
-- create_sql_patch.sql – prompts for a hint and creates a SQL patch on a statement
```

Baselines:

```
-- create_baseline.sql – creates a baseline on a statement in the shared pool
-- create_baseline_awr.sql – creates a baseline on a statement in AWR
```

```
* Note: these scripts are not included in zip – see Controlling Execution Plans zip on my blog
```

Miscellaneous

```
-- os_pid.sql – find os pid from sid, or sid from os pid
-- sql_hints.sql – see the outline hints for a SQL statement
-- gps.sql – add gather_plan_statistics hint to a SQL statement via Profile
-- we.sql – show wait events for a SQL_ID or SQL_ID’s that have waited for some event
-- parm.sql – show values of regular and hidden parameters
-- parm_mods.sql – show parameters that have changed and when
-- mismatch.sql – shows why new child created using V$SHARED_CURSOR
```

Others

```
Snapper – Tanel Poder – real time collection
eDB360 – Carlos Sierra – offline analysis
Gluent Advisor – heat map and workload characterization
```

Scripts in Zip

as.sql
awr_plan_change.sql
awr_plan_stats.sql
build_bind_vars.sql
build_bind_vars2.sql
build_bind_vars_awr.sql
col_stats.sql
create_display_raw.sql
dbtime.sql
diff_table_stats.sql
dplan.sql
dplan_allstats.sql
dplan_awr.sql
find_sql.sql
find_sql_awr.sql

flush_sql.sql
flush_sql10p.sql
gps.sql
mismatch.sql
os_pid.sql
parm_mods.sql
parms.sql
monitor_sql.sql
rsm.sql
rsm_html.sql
sql_hints.sql
ss.sh
table_stats.sql
table_stats2.sql
unstable_plans.sql
we.sql
whats_changed.sql

Note: Many of these scripts are discussed in detail on my blog.

Questions / Contact InformationQuestions / Contact Information

Questions?

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