Connor McDonald

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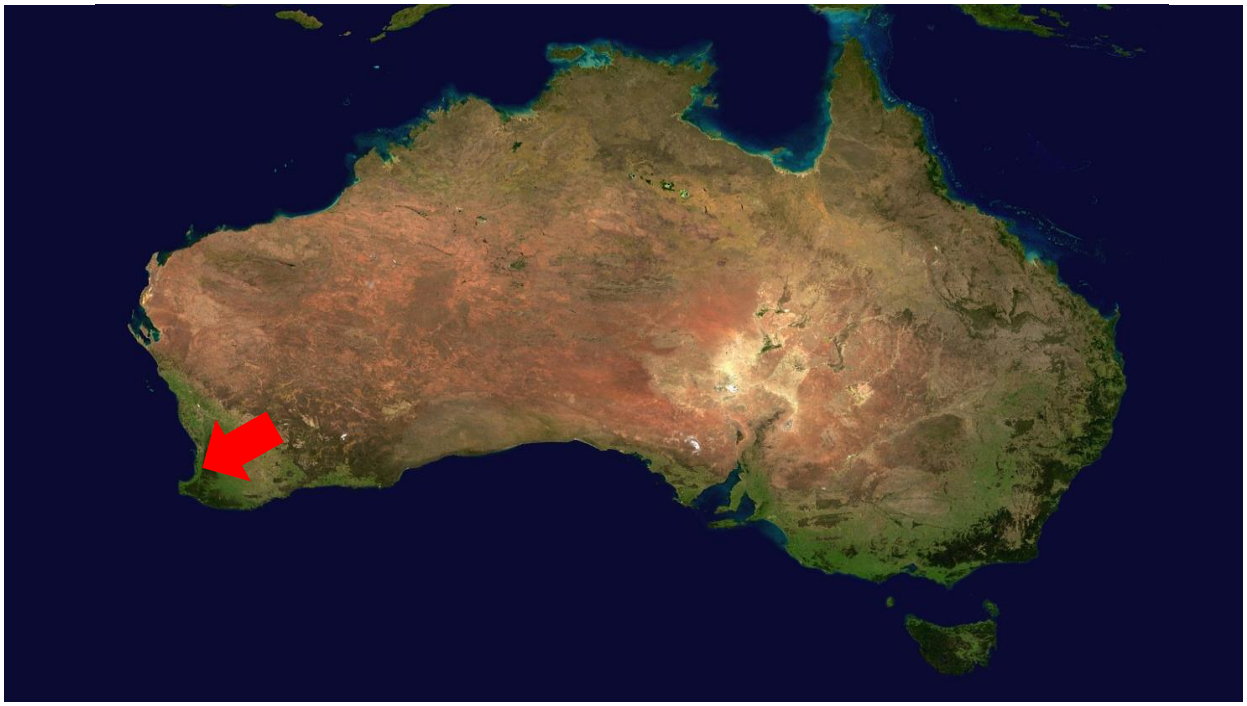

mi dispiace non parlo italiano :-(

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Stuff

blog bit.ly/blog-connor

400+ posts mainly on database & development

youtube bit.ly/youtube-connor

250 technical videos, new uploads every week

twitter bit.ly/twitter-connor

rants and raves on tech and the world :-)

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etc…

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instagram bit.ly/instagram-connor

slideshare bit.ly/slideshare-connor

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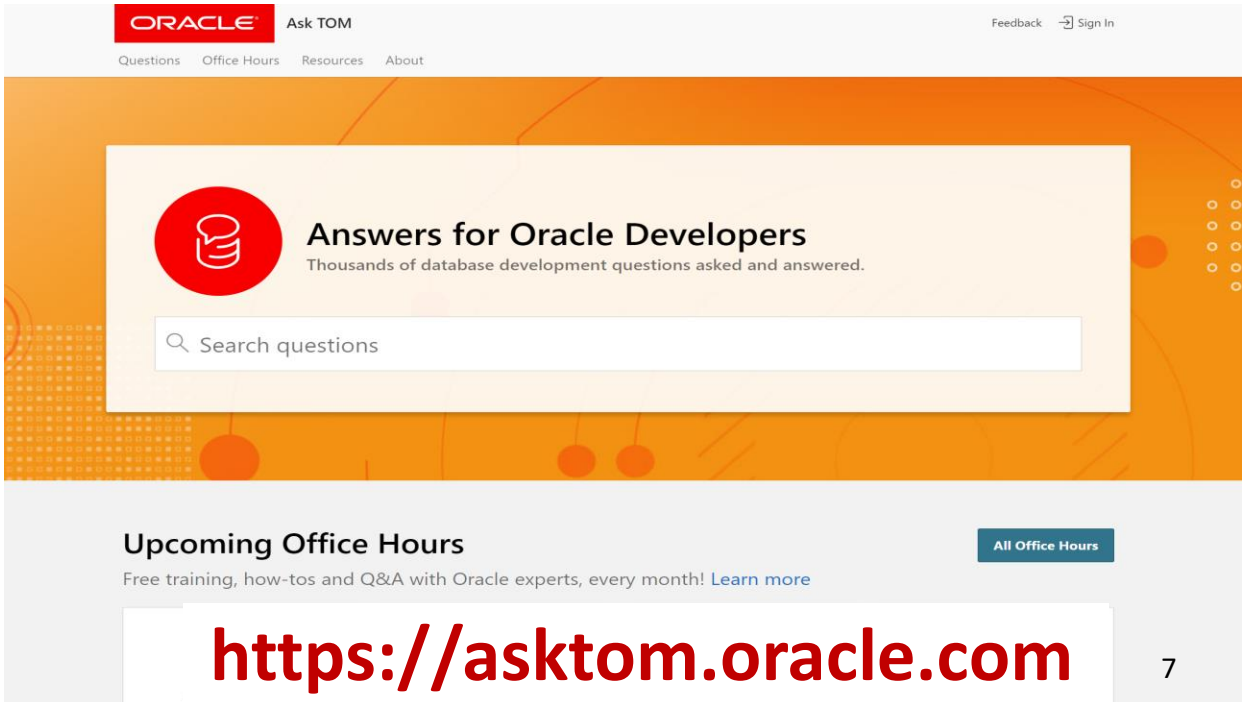
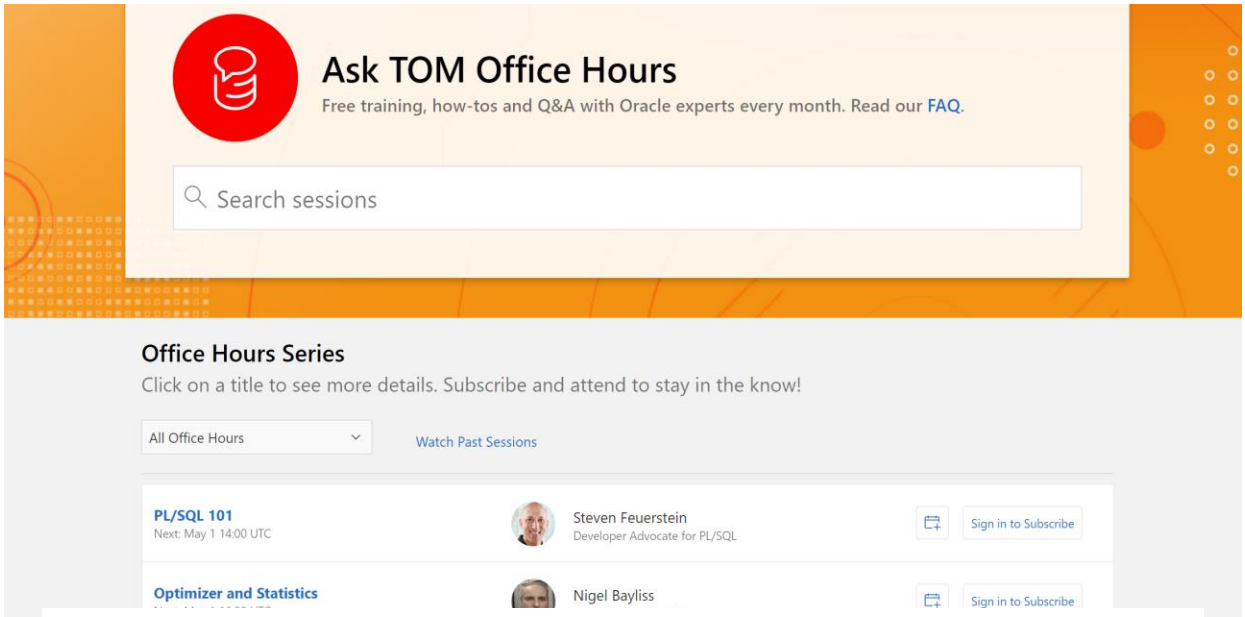


https://asktom.oracle.com



https://asktom.oracle.com/officehours

150 hours of free access (so far)

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25 years of tips and tricks

aka, hints, tips and tricks from an old dude

Connor McDonald
Developer Advocate

why tips and techniques ?

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SO...

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HERE

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IS

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WHAT

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HAPPENED

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Thanks for the question, [redacted]

Latest Followup

Asked: [redacted]

Answered by: Connor McDonald [redacted]

Category: Database Development - Version: 12c

Whilst you are here, check out some content from the AskTom team: OTN tour 2016 APAC

You Asked

> How can I pass a parameter to a view?

and we said...

> Often you will not *need* to pass a parameter, because we can "push" a predicate from a query against the view down into the view. However, for special cases we might need it. In that situation, we can
>
> [redacted]

Questions \ Views

Reviews

Write a Review

How?

July 30, 2018 - 6:46 pm UTC

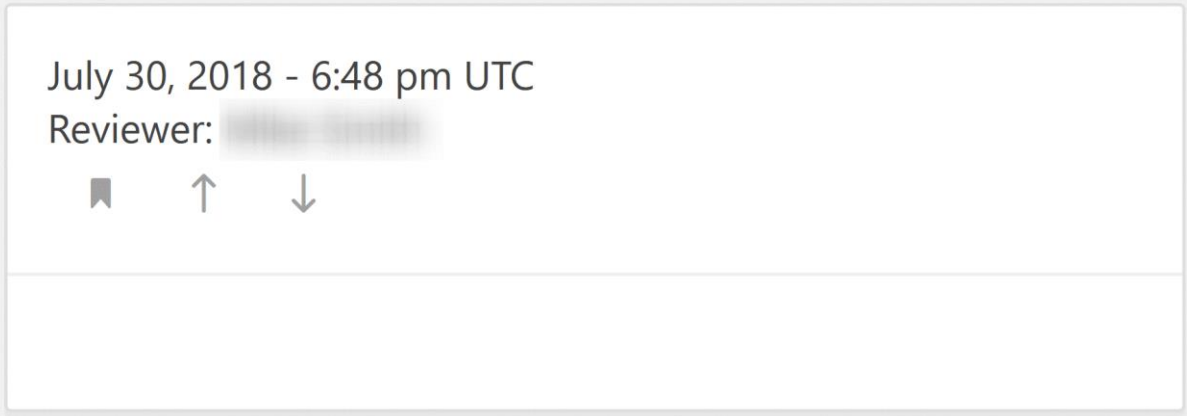
Reviewer: A reader

How do you just know the answer? How did you work it out ?

Connor McDonald (local) ***Followup***

July 30, 2018 - 6:48 pm UTC

It's hard to explain. I just knew. Experience I guess.



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maybe they were right ?

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I hope not :-)

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it's not about manuals

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it's not about re-invention

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it's about sharing

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it's about community

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that’s why

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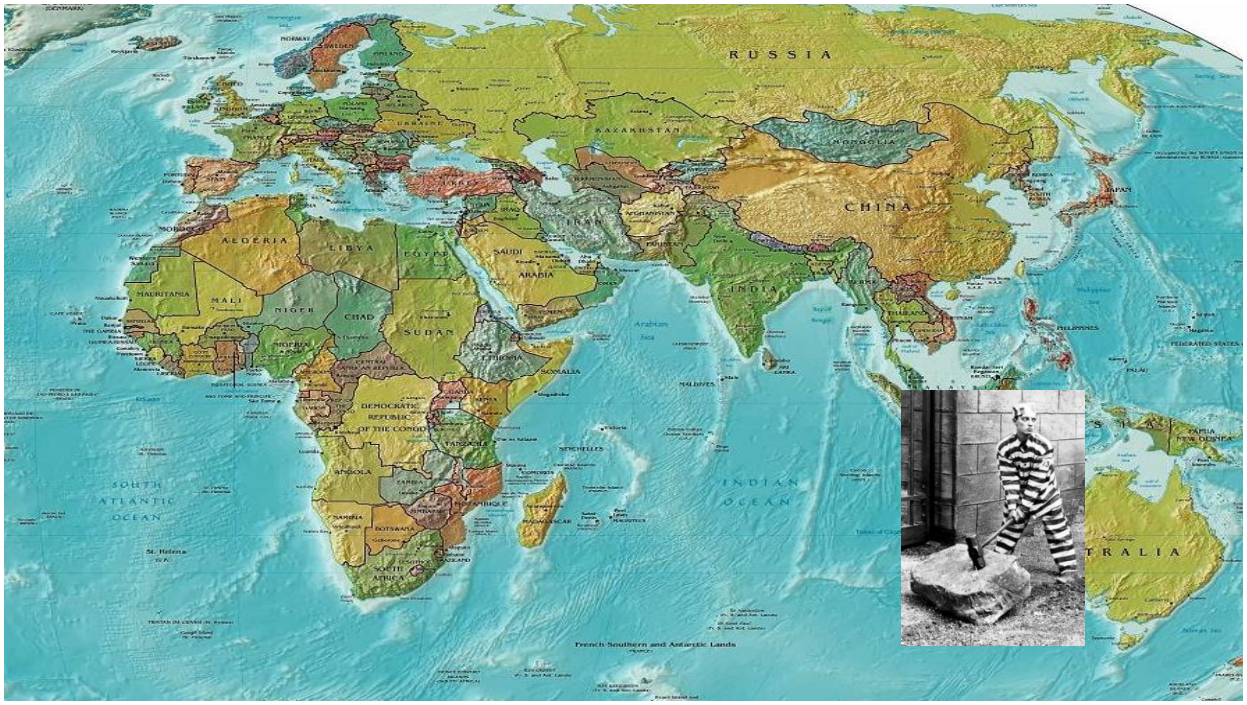

if it's not in the documentation

- contact Support
- clarify usage before proceeding

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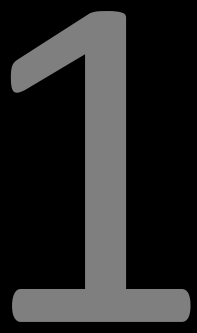

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rogue session

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```
SQL> select sid, last_call_et, status,
  3  from   v$session s;

       SID LAST_CALL_ET STATUS
---------- ------------ ----------
        39         7376 ACTIVE
        40          412 INACTIVE
        44          421 INACTIVE

         ...
        80          453 INACTIVE
```

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old days

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much more modern...

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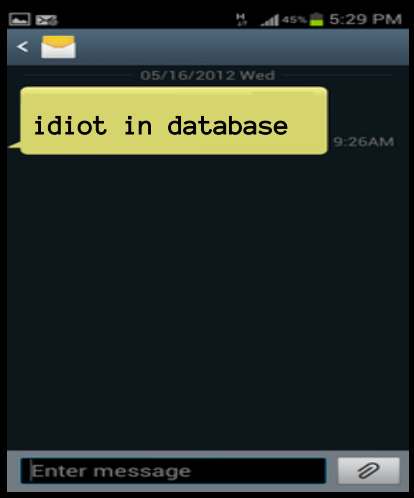

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```
SQL> alter system kill session ...
```

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```
# kill -9 pid
```

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```
SQL> oradebug setorapid nnn
SQL> oradebug suspend

       SID LAST_CALL_ET STATUS
---------- ------------ ----------
        39         7376 ACTIVE
        40          412 INACTIVE
        41          412 INACTIVE
        44          421 INACTIVE
        46           12 ACTIVE
        51            9 ACTIVE
        53           15 ACTIVE
        58            8 ACTIVE

SQL> oradebug resume
```

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2

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maybe ...

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... you don't want to resume

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rogue session

query

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```
SQL> alter system kill session ...
```

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18c

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```
SQL> alter system cancel sql '123,456';
```

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bonus tip!

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maybe...

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```
SQL> select sid,
  2         last_call_et,
  3         status,
  4  from   v$session s;

       SID LAST_CALL_ET STATUS
---------- ------------ ----------
        39         7376 ACTIVE
        40          412 INACTIVE
        44          421 INACTIVE
     ...
     ...
```

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```
SQL> select sid,
  2         last_call_et,
  3         nvl2(lockwait,'BLOCKED',status) status,
  4  from   v$session s;

       SID LAST_CALL_ET STATUS
---------- ------------ ----------
        39         7376 BLOCKED
        40          412 INACTIVE
        44          421 INACTIVE
      ...
      ...
```

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```
SQL> select sid, last_call_et,
  2         nvl2(lockwait,'BLOCKED',status) status,
  3         blocking_session,
  4         ( select sql_text
  5           from   v$sql
  6           where  sql_id = s.sql_id ) sql_text
  7  from   v$session s;

       SID LAST_CALL_ET STATUS     BLOCKING_SESSION SQL_TEXT
---------- ------------ ---------- ---------------- --------------
        46         7376 BLOCKED                 39 select *
                                                   from T
                                                   for update
        49            4 ACTIVE
        50          453 INACTIVE
        51          453 INACTIVE
```

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select for update wait 60

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```
SQL> select * from T for update wait 60;

(60 seconds pass)

select * from T for update wait 60
*
ERROR at line 1:
ORA-30006: resource busy; acquire with WAIT timeout expired
```

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what's the difference

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forever is a long time

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```
       SID LAST_CALL_ET STATUS     BLOCKING_SESSION
---------- ------------ ---------- ----------------
        39          376 INACTIVE
        40          412 ACTIVE
        41          412 ACTIVE
        44          421 ACTIVE
        46          340 BLOCKED                 39
        49           42 ACTIVE
        50          453 ACTIVE
        51          453 ACTIVE
        56          462 BLOCKED                 39
        58          436 BLOCKED                 39
        62          278 BLOCKED                 46
        63          254 BLOCKED                 46
        67          292 BLOCKED                 46
        71          301 BLOCKED                 46
        76          145 BLOCKED                 62
        78          132 BLOCKED                 62
...
```

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```
SQL> create or replace trigger lock_expiry
  2  after servererror on database
  3  declare
  4    l_user varchar2(30);
  5  begin
  6    if ( is_servererror(30006) ) then
            ...
            ... <look up session details>
            ...
 28         raise_application_error(-20000,
 29            'User '||l_user||' is causing you grief');
 30    end if;
 31  end;
 32  /

Trigger created.
```

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```
SQL> select * from T for update wait 60;

ERROR at line 1:
ORA-00604: error occurred at recursive SQL level 1
ORA-20000: User CONNOR (ext.1234) is causing you grief
ORA-06512: at line 6
ORA-30006: resource busy; acquire with WAIT timeout expired
```

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"empowering the users"

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3

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/*+ GATHER_PLAN_STATISTICS */

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for the optimizer

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cardinality is everything

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```
SQL> explain plan for
  2  select count(*)
  3  from   VEHICLE
  4  where  MAKE = 'HYUNDAI' and MODEL = 'IONIC';

SQL> SELECT * FROM TABLE(DBMS_XPLAN.DISPLAY_PLAN);

-----------------------------------------------------------------
| Id  | Operation          | Name    |  Rows | Bytes |
-----------------------------------------------------------------
|   1 |  SORT AGGREGATE    |         |     1 |     1 |
|*  2 |   TABLE ACCESS FULL| VEHICLE |   20K |  270K |
-----------------------------------------------------------------
```

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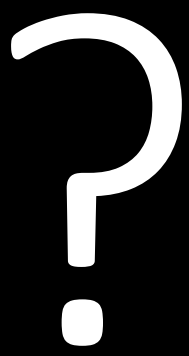

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actual versus estimate

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```
SQL> select /*+ GATHER_PLAN_STATISTICS */ count(*)
  2  from   VEHICLE
  3  where  MAKE = 'HYUNDAI' and MODEL = 'IONIC';

  COUNT(*)
----------
    114468

SQL> SELECT * FROM TABLE(DBMS_XPLAN.DISPLAY_CURSOR(
  2               NULL, NULL, 'ALLSTATS LAST'));

-------------------------------------------------------------------
| Id  | Operation          | Name    | Starts | E-Rows | A-Rows |
-------------------------------------------------------------------
|   1 |  SORT AGGREGATE    |         |      1 |      1 |      1 |
|*  2 |   TABLE ACCESS FULL| VEHICLE |      1 |    20K|    114K|
-------------------------------------------------------------------
```

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4

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tracing

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alter session set sql_trace = true

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```
C:\oracle\diag\rdbms\db122\db122\trace>dir *.trc
 Volume in drive C is OS
 Volume Serial Number is 9CB0-0212

 Directory of C:\oracle\diag\rdbms\db122\db122\trace

27/09/2018  09:18 PM             1,314 db122_ora_10020.trc
20/10/2018  06:21 PM             2,691 db122_ora_10048.trc
30/09/2018  12:21 AM             1,345 db122_ora_10104.trc
29/09/2018  03:18 PM             1,314 db122_ora_10144.trc
21/10/2018  06:21 AM             1,346 db122_ora_10156.trc
11/10/2018  05:18 PM             1,312 db122_ora_1016.trc
02/10/2018  08:49 PM             1,346 db122_ora_10192.trc
29/09/2018  12:21 PM             1,345 db122_ora_10320.trc
12/10/2018  12:21 AM             1,501 db122_ora_10348.trc
15/10/2018  12:18 AM             1,314 db122_ora_10352.trc
13/10/2018  11:21 AM             1,499 db122_ora_1036.trc
28/09/2018  05:18 AM             1,315 db122_ora_10368.trc
18/10/2018  05:18 PM             1,824 db122_ora_10384.trc
05/10/2018  05:18 AM             1,178 db122_ora_10388.trc
28/09/2018  11:21 PM             1,346 db122_ora_10400.trc
14/10/2018  11:21 PM             1,501 db122_ora_10404.trc
30/09/2018  06:25 AM             1,346 db122_ora_10440.trc
```

Co

too many trace files

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```
SQL> alter session
  2     set tracefile_identifier = SALESPGM;

Session altered.

SQL> host ls *.trc

db10r2_ora_3248.trc
db10r2_ora_3284.trc
db10r2_ora_3356.trc
db10r2_ora_3492.trc
db10r2_ora_3504_SALESPGM.trc
db10r2_ora_3608.trc
db10r2_ora_3620.trc
...
...
```

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bonus tip

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```
SQL> select name, value from v$diag_info;

NAME                    VALUE
----------------------- ----------------------------------------
Diag Enabled            TRUE
ADR Base                C:\ORACLE
ADR Home                C:\ORACLE\diag\rdbms\db122\db122
Diag Trace              C:\ORACLE\diag\rdbms\db122\db122\trace
Diag Alert              C:\ORACLE\diag\rdbms\db122\db122\alert
Diag Incident           C:\ORACLE\diag\rdbms\db122\db122\incident
Diag Cdump              c:\oracle\diag\rdbms\db122\db122\cdump
Health Monitor          C:\ORACLE\diag\rdbms\db122\db122\hm
Default Trace File      C:\ORACLE\...\trace\db122_ora_17296.trc
```

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5

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too much trace data

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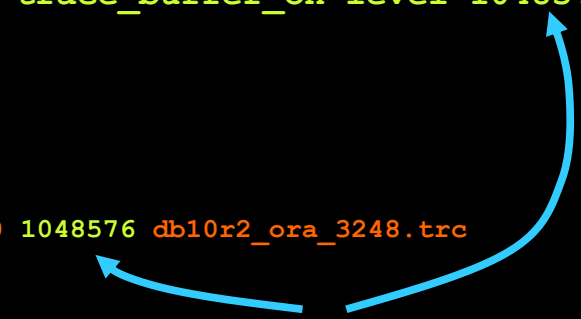
```
SQL> alter session
  2      set events
  3   'immediate trace name trace_buffer_on level 1048576';

Session altered.

SQL> host ls -l *.trc

drw------- oracle dba Jun17 15:10 1048576 db10r2_ora_3248.trc
```



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```
SQL> select PAYLOAD
  2  from   V$DIAG_TRACE_FILE_CONTENTS
  3  where  TRACE_FILENAME = 'db122_ora_12484.trc';

PAYLOAD
--------------------------------------------------------------------------------
Trace file C:\ORACLE\diag\rdbms\db122\db122\trace\db122_ora_12484.trc
Oracle Database 12c Enterprise Edition Release 12.2.0.1.0 - 64bit Production
Build label:    RDBMS_12.2.0.1.0WINDBBP_WINDOWS.X64_180202
Windows NT Version V6.2
ORACLE_HOME =  c:\oracle\product\12.2.0.1
Node name           : XPS13
CPU                 : 4 - type 8664, 2 Physical Cores
Process Affinity    : 0x0x0000000000000000
Memory (Avail/Total): Ph:9411M/16235M, Ph+PgF:4292M/20985M
Instance name: db122
Redo thread mounted by this instance: 1
...
...
```

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6

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19c

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automatic indexing

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until then ...

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"I need a new index on this 6TB table..."

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"will it speed up things ?"

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"I think so"

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virtual indexes

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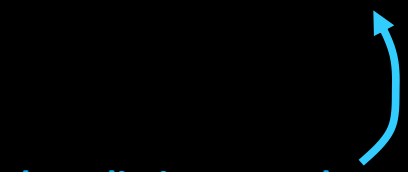
```
SQL> create index TEST on
  2  MYTAB ( SALES_DATE ) NOSEGMENT;

Index created.
```



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```
SQL> begin
  2    dbms_stats.generate_stats(
  3         'SCOTT',
  4         'MYTAB');
  5  end;
  6  /
```

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```
SQL> alter session
  2    set "_use_nosegment_indexes" = true;

SQL> explain plan for
  2  select * from MYTAB
  3  where sales_date > sysdate-7;

-------------------------------------------------------------------------------
| Id  | Operation                    | Name  | Rows  | Bytes | Cost (%CPU)|
-------------------------------------------------------------------------------
|   0 | SELECT STATEMENT             |       |   950 | 90109 |   962   (34)|
|   1 |  TABLE ACCESS BY INDEX ROWID| MYTAB |   950 | 90109 |   962   (34)|
|*  2 |   INDEX RANGE SCAN           | TEST  |   950 |       |   962   (50)|
-------------------------------------------------------------------------------
```

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7

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invisible indexes

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```
SQL> create table T
  2  as select * from all_objects;

Table created.

SQL> create index OBJ_IX on T ( OBJECT_ID );

Index created.

SQL> exec dbms_stats.gather_table_stats('','T')

PL/SQL procedure successfully completed.
```

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```
SQL> set autotrace traceonly explain

SQL> select * from T
  2  where  OWNER = 'SCOTT'
  3  and    created > sysdate - 1
  4  /

-------------------------------------------------------------------
| Id  | Operation          | Name | Rows  | Bytes | Cost (%CPU)|
-------------------------------------------------------------------
|   0 | SELECT STATEMENT   |      |     6 |   546 |   281   (1)|
|*  1 |  TABLE ACCESS FULL| T    |     6 |   546 |   281   (1)|
-------------------------------------------------------------------
```

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“Can I index OWNER..”

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“will it speed up things ?”

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“I know so”

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```
SQL> create index NEW_IX on T ( OWNER );

Index created.

SQL> select * from T
  2  where  OWNER = 'SCOTT'
  3  and    created > sysdate - 1
  4  /

-------------------------------------------------------------------------------
| Id  | Operation                    | Name   | Rows  | Bytes | Cost (%CPU)|
-------------------------------------------------------------------------------
|   0 | SELECT STATEMENT             |        |     6 |   546 |   122   (0)|
|*  1 |  TABLE ACCESS BY INDEX ROWID| T      |     6 |   546 |   122   (0)|
|*  2 |   INDEX RANGE SCAN           | NEW_IX |  4107 |       |    10   (0)|
-------------------------------------------------------------------------------
```

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before the new index

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```
SQL> set autotrace traceonly explain

SQL> select * from T
  2  where  OWNER = 'SYS'
  3  and    OBJECT_ID between 10 and 8000
  4  /

-------------------------------------------------------------------------------
| Id  | Operation                    | Name    | Rows  | Bytes | Cost (%CPU)|
-------------------------------------------------------------------------------
|   0 | SELECT STATEMENT             |         |   462 | 42042 |   143   (0)|
|*  1 |  TABLE ACCESS BY INDEX ROWID| T       |   462 | 42042 |   143   (0)|
|*  2 |   INDEX RANGE SCAN           | OBJ_IX  |  7851 |       |    20   (0)|
-------------------------------------------------------------------------------
```

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```
SQL> set autotrace traceonly stat
SQL> select * from T
  2  where  owner = 'SYS'
  3  and    object_id between 10 and 8000;

4967 rows selected.

Statistics
----------------------------------------------------------
          0  recursive calls
          0  db block gets
        784  consistent gets
         15  physical reads
          0  redo size
```

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after the new index

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```
SQL> select * from T
  2  where  owner = 'SYS'
  3  and    object_id between 10 and 8000
  4  /

-------------------------------------------------------------------------------
| Id  | Operation                    | Name    | Rows  | Bytes | Cost (%CPU)|
-------------------------------------------------------------------------------
|   0 | SELECT STATEMENT             |         |   462 | 42042 |   122   (0)|
|*  1 |  TABLE ACCESS BY INDEX ROWID| T       |   462 | 42042 |   122   (0)|
|*  2 |   INDEX RANGE SCAN           | NEW_IX  |  4105 |       |    10   (0)|
-------------------------------------------------------------------------------
```

the new index

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```
SQL> set autotrace traceonly stat
SQL> select * from T
  2  where  owner = 'SYS'
  3  and    object_id between 10 and 8000;

4967 rows selected.

Statistics
----------------------------------------------------------
          0  recursive calls
          0  db block gets
       1522  consistent gets
         62  physical reads
          0  redo size
```

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the solution ?

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invisible indexes

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```
SQL> alter index NEW_IX invisible;

Index altered.
```

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```
SQL> select * from T
  2  where  owner = 'SYS'
  3  and    object_id between 10 and 8000
  4  /

-------------------------------------------------------------------------------
| Id  | Operation                    | Name    | Rows  | Bytes | Cost (%CPU)|
-------------------------------------------------------------------------------
|   0 | SELECT STATEMENT             |         |   462 | 42042 |   143   (0)|
|*  1 |  TABLE ACCESS BY INDEX ROWID| T       |   462 | 42042 |   143   (0)|
|*  2 |   INDEX RANGE SCAN           | OBJ_IX  |  7851 |       |    20   (0)|
-------------------------------------------------------------------------------
```

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“what about my code ???”

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```
SQL> set autotrace traceonly explain

SQL> select * from T
  2  where  OWNER = 'SCOTT'
  3  and    created > sysdate - 1
  4  /

-----------------------------------------------------------------
| Id  | Operation          | Name | Rows  | Bytes | Cost (%CPU)|
-----------------------------------------------------------------
|   0 | SELECT STATEMENT   |      |     6 |   546 |   281   (1)|
|*  1 |  TABLE ACCESS FULL| T    |     6 |   546 |   281   (1)|
-----------------------------------------------------------------
```

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```
SQL> alter session set
  2      optimizer_use_invisible_indexes = true;

Session altered.

SQL> select * from T
  2  where  OWNER = 'SCOTT'
  3  and    created > sysdate - 1
  4  /

-------------------------------------------------------------------------------
| Id  | Operation                    | Name   | Rows  | Bytes | Cost (%CPU)|
-------------------------------------------------------------------------------
|   0 | SELECT STATEMENT             |        |   462 | 42042 |   122   (0)|
|*  1 |  TABLE ACCESS BY INDEX ROWID| T      |   462 | 42042 |   122   (0)|
|*  2 |   INDEX RANGE SCAN           | NEW_IX |  4105 |       |    10   (0)|
-------------------------------------------------------------------------------
```

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wrap your SQL to protect others

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statement level hint

USE_INVISIBLE_INDEXES

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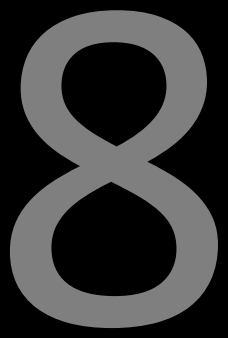

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better data guard use...

...for free

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```
SQL> ALTER DATABASE CONVERT TO SNAPSHOT STANDBY;
```

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open standby read/write

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```
SQL> ALTER DATABASE CONVERT TO PHYSICAL STANDBY;

SQL> ALTER DATABASE RECOVER MANAGED STANDBY
  2      DATABASE DISCONNECT;
```

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flashback to resetlogs

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resume managed recovery

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archives still transmitted

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9

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faster queries ...

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```
SQL> create table cust_trans
  2    ( txn_id    int,
  3      txn_date  date,
  4      cust_id   int,
  5      amt       number(10,2)
  6    );
```

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```
SQL> insert /*+ APPEND */ into cust_trans
  2  select rownum,
  3         sysdate-1000+rownum/1000  txn_date,
  4         trunc(dbms_random.value(1,1000)) cust_id,
  5         dbms_random.value(1,100) amount
  6  from
  7  ( select 1 from dual
  8    connect by level <= 10000000 );

10000000 rows created.

SQL> create index cust_trans_ix
  2    on cust_trans (cust_id );

Index created.
```

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```
SQL> select max(amt)
  2  from   cust_trans
  3  where  cust_id = 123;
```

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```
SQL> select max(amt)
  2  from   cust_trans
  3  where  cust_id = 123;

-------------------------------------------------------------------------------------
| Id  | Operation                            | Name          | Rows  | Bytes |
-------------------------------------------------------------------------------------
|   0 | SELECT STATEMENT                     |               |     1 |     8 |
|   1 |  SORT AGGREGATE                      |               |     1 |     8 |
|   2 |   TABLE ACCESS BY INDEX ROWID BATCHED| CUST_TRANS    | 10010 | 80080 |
|*  3 |    INDEX RANGE SCAN                  | CUST_TRANS_IX | 10010 |       |
-------------------------------------------------------------------------------------

Statistics
----------------------------------------------------------
          0  recursive calls
          0  db block gets
       8867  consistent gets
       8854  physical reads
          0  redo size
        543  bytes sent via SQL*Net to client
        607  bytes received via SQL*Net from client
```

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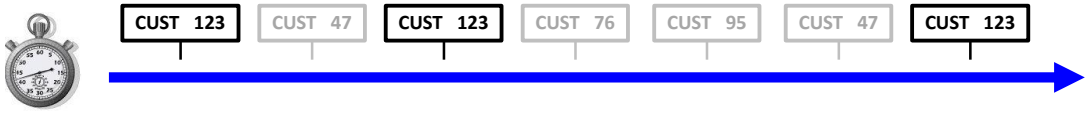

```
SQL> alter table cust_trans
  2     add clustering by linear order(cust_id);

Table altered.
```

12.1

```
SQL> alter table cust_trans move online;

Table altered.
```

12.2

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```
SQL> select max(amt)
  2  from   cust_trans
  3  where  cust_id = 123;

-------------------------------------------------------------------------------
| Id  | Operation                            | Name          | Rows  | Bytes |
-------------------------------------------------------------------------------
|   0 | SELECT STATEMENT                     |               |     1 |     8 |
|   1 |  SORT AGGREGATE                      |               |     1 |     8 |
|   2 |   TABLE ACCESS BY INDEX ROWID BATCHED| CUST_TRANS    | 10010 | 80080 |
|*  3 |    INDEX RANGE SCAN                  | CUST_TRANS_IX | 10010 |       |
-------------------------------------------------------------------------------

Statistics
----------------------------------------------------
          0  recursive calls
          0  db block gets
         62  consistent gets
         23  physical reads
          0  redo size
        543  bytes sent via SQL*Net to client
        607  bytes received via SQL*Net from client
```

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"but I'm not on 12.2"

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dbms_redefinition

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the marketing spin...

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```
SQL> desc EMP

 Name                      Null?    Type
 ------------------------- -------- ----------------
 EMPNO                     NOT NULL NUMBER(4)
 ENAME                              VARCHAR2(10)
 JOB                                VARCHAR2(9)
 MGR                                NUMBER(4)
 HIREDATE                           DATE
 SAL                                NUMBER(7,2)
 COMM                               NUMBER(7,2)
 DEPTNO                             NUMBER(2)
```

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```
SQL> desc EMP

 Name                      Null?    Type
 ------------------------- -------- -----------------
 EMPNO                     NOT NULL NUMBER(8)
 SAL_PLUS_10PCT                     NUMBER(7,2)
```

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online

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```
SQL> create table EMP_NEW_DEFN(
  2    larger_empno      number(8),
  3    salary_plus_10pct number(7,2));

SQL>  begin
  2     DBMS_REDEFINITION.START_REDEF_TABLE( -
  3       UNAME      =>'SCOTT',
  4       ORIG_TABLE =>'EMP',
  5       INT_TABLE  =>'EMP_NEW_DEFN',
  6       COL_MAPPING=>
             'empno larger_empno, sal*1.1 salary_plus_10pct'
  7   end;
```

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```
SQL> exec DBMS_REDEFINITION.FINISH_REDEF_TABLE( -
        'SCOTT','EMP','EMP_NEW_DEFN');

SQL> desc EMP
 Name                          Null?    Type
 ----------------------------- -------- --------------------
 LARGER_EMPNO                           NUMBER(8)
 SALARY_PLUS_10PCT                      NUMBER(7,2)
```

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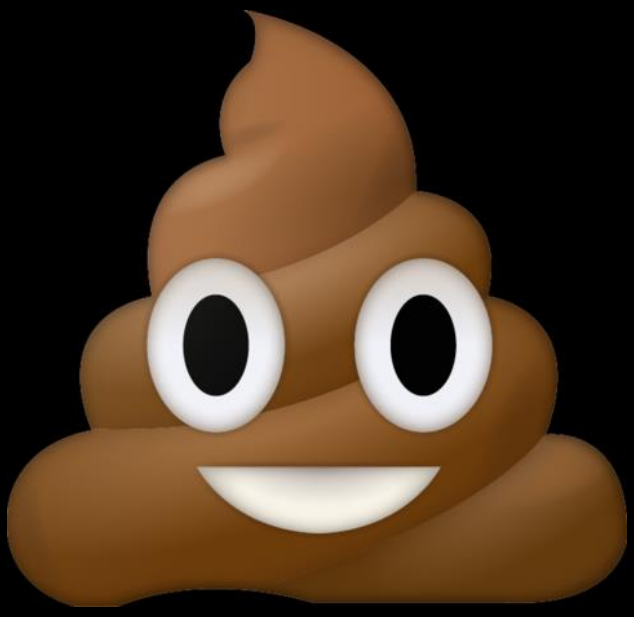

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triggers

PL/SQL programs

BI Publisher layer

Java

adhoc scripts

ADF

Reports

APEX

ProC

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```
SQL>  begin
  2     DBMS_REDEFINITION.START_REDEF_TABLE( -
  3       UNAME        =>'SCOTT',
  4       ORIG_TABLE   =>'EMP',
  5       INT_TABLE    =>'EMP_SAME_DEFN',
  6       ORDERBY_COLS=>'ename');
  7    end;
```

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10

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DBMS_XPLAN

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```
SQL> explain plan for ...

SQL> select * from
  2    table(dbms_xplan.display_plan)
```

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extensions

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... the (in)famous hint ignore issue

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```
SQL> select *
  2  from  emp e,
  3        dept d
  4  where e.deptno = d.deptno
  5  and   d.dname = 'SALES';

-----------------------------------------------------------
| Id  | Operation                     | Name    | Rows  |
-----------------------------------------------------------
|   0 | SELECT STATEMENT              |         |     5 |
|   1 |  MERGE JOIN                   |         |     5 |
|*  2 |   TABLE ACCESS BY INDEX ROWID| DEPT    |     1 |
|   3 |    INDEX FULL SCAN            | PK_DEPT |     4 |
|*  4 |   SORT JOIN                   |         |    14 |
|   5 |    TABLE ACCESS FULL          | EMP     |    14 |
-----------------------------------------------------------
```

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"I want a hash join"

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```
SQL> select /*+ use_hash(d) */ *
  2  from   emp e,
  3         dept d
  4  where e.deptno = d.deptno
  5  and    d.dname = 'SALES';

-----------------------------------------------------------
| Id  | Operation                     | Name    | Rows  |
-----------------------------------------------------------
|   0 | SELECT STATEMENT              |         |     5 |
|   1 |  MERGE JOIN                   |         |     5 |
|*  2 |   TABLE ACCESS BY INDEX ROWID| DEPT    |     1 |
|   3 |    INDEX FULL SCAN            | PK_DEPT |     4 |
|*  4 |   SORT JOIN                   |         |    14 |
|   5 |    TABLE ACCESS FULL          | EMP     |    14 |
-----------------------------------------------------------
```

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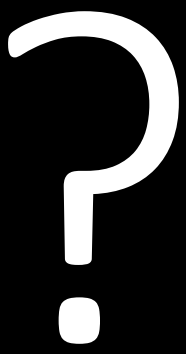

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if joining into DEPT...

```
/*+ use_hash(d) */
```

use a hash join

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we're not...

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```
-----------------------------------------------------------
| Id  | Operation                     | Name    | Rows  |
-----------------------------------------------------------
|   0 | SELECT STATEMENT              |         |     5 |
|   1 |  MERGE JOIN                   |         |     5 |
|*  2 |   TABLE ACCESS BY INDEX ROWID| DEPT    |     1 |
|   3 |    INDEX FULL SCAN            | PK_DEPT |     4 |
|*  4 |   SORT JOIN                   |         |    14 |
|   5 |    TABLE ACCESS FULL          | EMP     |    14 |
-----------------------------------------------------------
```

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if we want to join into DEPT...

...we must be starting with EMP

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```
SQL> select /*+ leading(e) use_hash(d) */ *
  2  from   emp e,
  3         dept d
  4  where e.deptno = d.deptno
  5  and    d.dname = 'SALES';

-----------------------------------------------------
| Id  | Operation           | Name | Rows  | Bytes |
-----------------------------------------------------
|   0 | SELECT STATEMENT    |      |     5 |   285 |
|*  1 |  HASH JOIN          |      |     5 |   285 |
|   2 |   TABLE ACCESS FULL| EMP  |    14 |   518 |
|*  3 |   TABLE ACCESS FULL| DEPT |     1 |    20 |
-----------------------------------------------------
```

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not enough hints

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"hints are like violence…
if they do not work, use more"

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back to dbms_xplan

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```
SQL> SELECT *
  2  from table(dbms_xplan.display(.... ,
                   format=>'typical +OUTLINE'))

/*+ BEGIN_OUTLINE_DATA
    USE_HASH(@"SEL$1" "B"@"SEL$1")
    USE_HASH(@"SEL$1" "D"@"SEL$1")
    LEADING(@"SEL$1" "E"@"SEL$1" "D"@"SEL$1" "B"@"SEL$1")
    FULL(@"SEL$1" "B"@"SEL$1")
    FULL(@"SEL$1" "D"@"SEL$1")
    FULL(@"SEL$1" "E"@"SEL$1")
    OUTLINE_LEAF(@"SEL$1")
    ALL_ROWS
    DB_VERSION('11.2.0.2')
    OPTIMIZER_FEATURES_ENABLE('11.2.0.2')
    END_OUTLINE_DATA
*/
```

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consider SQL Plan Management

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bonus tip !

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```
SQL> select /*+ INDEX(accounts_pk) */
  2  from   ACCOUNTS
  3  where  ...

SQL> select /*+ INDEX(a) */
  2  from   ACCOUNTS
  3  where  ...

SQL> select /*+ INDEX(scott.accounts) */
  2  from   SCOTT.ACCOUNTS
  3  where  ...

SQL> select /* INDEX(A) */
  2  from   SCOTT.ACCOUNTS A
  3  where  ...
```

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19c

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```
SQL> SELECT *
  2  from table(dbms_xplan.display(.... ,
                  format=>'typical +HINT_REPORT'))
```

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11

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finding bad SQL ...

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... is probably bad SQL

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```
SQL> select sql_fulltext
  2  from   v$sql
  3  where  buffer_gets > 1000000 or
  4         executions > 10000 or
  5         disk_reads > 100000;

SQL_FULLTEXT
--------------------------------------------------
SELECT ...
FROM   ...
```

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you can do better

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```
SQL> select sql_fulltext
  2  from   v$sqlstats
  3  where  buffer_gets > 1000000 or
  4         executions > 10000 or
  5         disk_reads > 100000;

SQL_FULLTEXT
--------------------------------------------------
SELECT ...
FROM   ...
```

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"The column definitions for columns in V$SQLSTATS are identical to those in the V$SQL and V$SQLAREA views. However, the V$SQLSTATS view differs from V$SQL and V$SQLAREA in that it is faster, more scalable, and has a greater data retention (the statistics may still appear in this view, even after the cursor has been aged out of the shared pool)."

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12

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sqlplus hash tags

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```
SQL> select SAL
  2  from   EMP
  3  where
```

"hmmmm....."

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```
SQL> select SAL
  2  from   EMP
  3  where
  4  #desc EMP
 Name                          Null?    Type
 ----------------------------- -------- -------------
 EMPNO                         NOT NULL NUMBER(4)
 ENAME                                  VARCHAR2(10)
 JOB                                    VARCHAR2(9)
  ...
  4  job = 'CLERK';

       SAL
----------
       800
      1100
```

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```
SQL> declare
  2    x int;
  3  begin
  4    select max(sal)
  5    into   x
  6    from   emp;
  7
  8    dbms_output.put_line(x);
  9  #set serverout on
  9  end;
 10  /

10000
```

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13

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sqlplus error logging

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```
SQL> set errorlogging on
```

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```
SQL> set errorlogging on

SQL> desc SPERRORLOG

 Name                                      Type
 ----------------------------------------- ----------------
 USERNAME                                  VARCHAR2(256)
 TIMESTAMP                                 TIMESTAMP(6)
 SCRIPT                                    VARCHAR2(1024)
 IDENTIFIER                                VARCHAR2(256)
 MESSAGE                                   CLOB
 STATEMENT                                 CLOB
```

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```
SQL> select * from THE_WRONG_NAME;
select * from THE_WRONG_NAME
              *
ERROR at line 1:
ORA-00942: table or view does not exist

SQL> desc THE_WRONG_NAME;

ERROR:
ORA-04043: object THE_WRONG_NAME does not exist
```

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```
SQL> select timestamp, message, statement
  2  from SPERRORLOG;

TIMESTAMP
----------------------------------------------------------
MESSAGE
----------------------------------------------------------
STATEMENT
----------------------------------------------------------
01-APR-08 02.29.58.000000 PM
ORA-00942: table or view does not exist
select * from THE_WRONG_NAME

01-APR-08 02.29.58.000000 PM
ORA-04043: object THE_WRONG_NAME does not exist
desc THE_WRONG_NAME;
```

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```
SQL> set errorlogging on
SQL> @create_all_objects
```

installation scripts

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14

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sqlplus / sqlcl transaction safety

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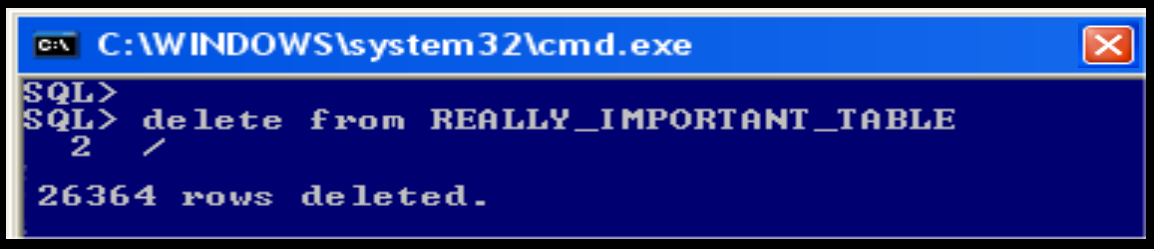

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```
SQL> set exitcommit
```

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wrap up

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poaching ideas is fine

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learn something new

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