oratop

A Database Monitoring Tool
May 2014

ORACLE®

oratop

A text-based user interface utility using Oracle Call Interface (OCI) API that resembles Unix "top" utility in appearance. Its data gathering is solely from the database using internal views. The utility can be run against Real Application Cluster (RAC) or non-RAC single instance database. It provides a user the ability to monitor the database in real time and it is not intended to replace Unix "top", EMGC, 12c EM Database Express, or server manageability tools like ASH, AWR, ADDM, etc., that provides granular details.
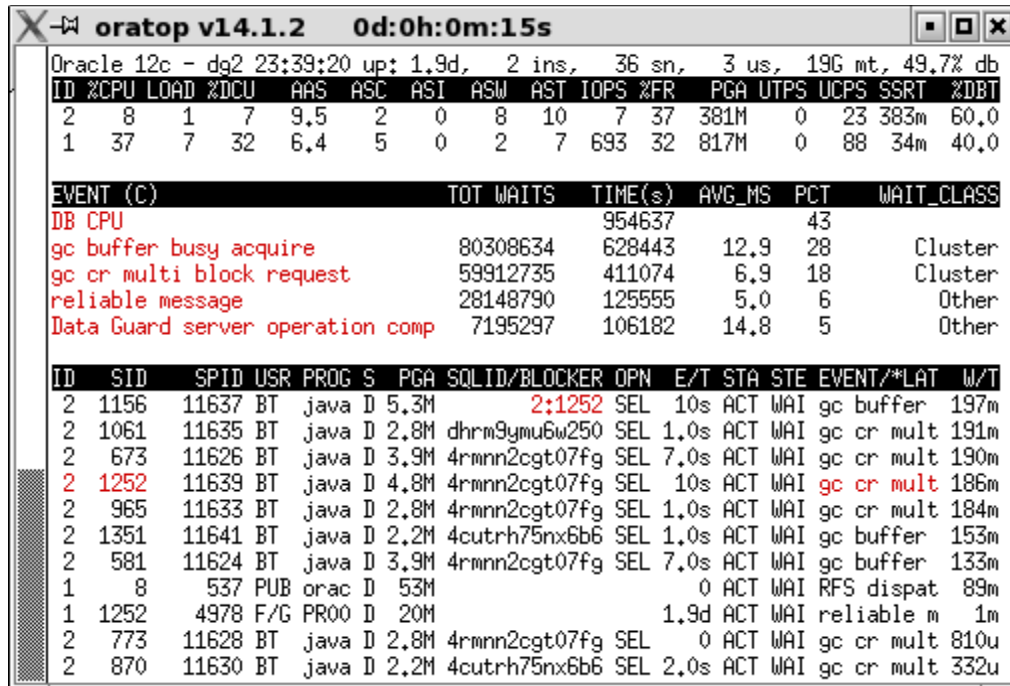
oratop v14.1.2

Abstract

oratop can be used to monitor Oracle databases (release 11.2 onwards) on any platform but the executable must run on Linux with an Oracle compatible client. To monitor databases on other platforms simply define an alias in tnsnames.ora of the Linux client and connect to the databases remotely as you would with sqlplus.

INTRODUCTION

The Oracle program named oratop allows users with select privilege to a set of Oracle's views to monitor 11.2 or higher version of oracle database activities. It runs dynamically in near real time and provides a live window to a running database. It is Single instance/ RAC/ ASM aware utility. (see sample snapshot shown in Figure 1 below)

Key motivations include:

- Monitoring current database activities,
- Database performance,
- Identifying contentions and bottleneck

Figure 1. oratop text-based user interface (default mode)

ENHANCEMENTS

- **SQL Monitoring**

- **Database Service**

- **Multitenant Database** (*12c oracle CDB/PDB*)

- **Active Data Guard**

SECTIONS

The "oratop" displays relevant database activity information presented in four sections.

- **Section 1 - HEADER**: Global database information
- **Section 2 - DATABASS**: Database instance Activity
- **Section 3 - DB EVENTS**: AWR like "Top 5 Timed Events"
- **Section 4 – PROCESS/SQL**: Processes/SQL information

Specific detail of the various sections data can be obtained using the interactive help (see Runtime usage Sections Detail below)

CLIENT

Connection method is largely similar to sqlplus. *If it works for sqlplus, then it should work the same for oratop.*

Shell environment settings

```
$ export ORACLE_HOME=<path>
$ export LD_LIBRARY_PATH=$ORACLE_HOME/lib
$ export PATH=$ORACLE_HOME/bin:$PATH
```

Bequeath[1]

```
$ export ORACLE_SID=<sid>
```

Remote server[2]

Options:
- **TNS:**
  ```
  $ export TNS_ADMIN
  ```
  - connect with a **TNS alias** *name as defined in tnsnames.ora,* or
  - set **TWO_TASK** to the tns alias and connect without alias name
- **EZConnect**

---
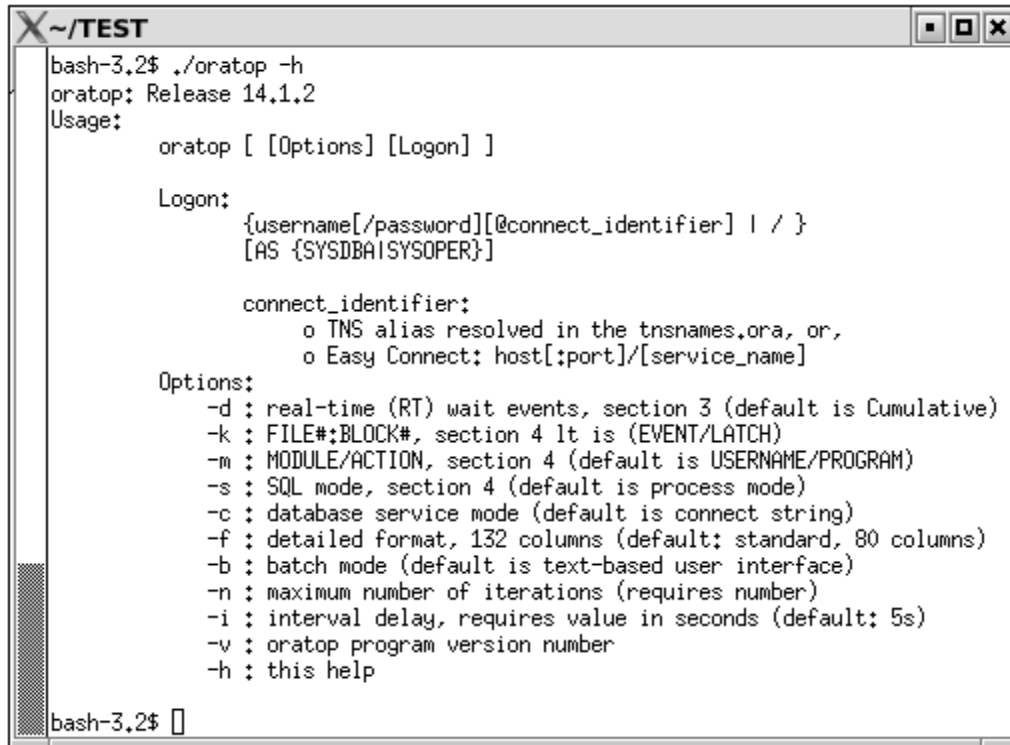
[1] Connecting " / as sysdba" is allowed only for bequeath connections.
[2] The remote database requires setting the "REMOTE_LOGIN_PASSWORDFILE" paired with the availability of an Oracle password file

I. COMMAND LINE MODE

Command line synopsis can be obtained by invoking the utility with "-h" option as shown in Figure 2.

```
X ~/TEST                                                    [ · ][ □ ][ X ]
bash-3.2$ ./oratop -h
oratop: Release 14.1.2
Usage:
         oratop [ [Options] [Logon] ]

         Logon:
                 {username[/password][@connect_identifier] | / }
                 [AS {SYSDBA|SYSOPER}]

                 connect_identifier:
                         o TNS alias resolved in the tnsnames.ora, or,
                         o Easy Connect: host[:port]/[service_name]
         Options:
             -d : real-time (RT) wait events, section 3 (default is Cumulative)
             -k : FILE#:BLOCK#, section 4 lt is (EVENT/LATCH)
             -m : MODULE/ACTION, section 4 (default is USERNAME/PROGRAM)
             -s : SQL mode, section 4 (default is process mode)
             -c : database service mode (default is connect string)
             -f : detailed format, 132 columns (default: standard, 80 columns)
             -b : batch mode (default is text-based user interface)
             -n : maximum number of iterations (requires number)
             -i : interval delay, requires value in seconds (default: 5s)
             -v : oratop program version number
             -h : this help

bash-3.2$ []
```

Figure 2. Command line help

Logon

Invocation :

```
$ oratop [Options] [Logon]
```

Example,
Using Easy Connect (EZConnect)

- Non-default port
  ```
  oratop system/manager@dbhost:4800/db1.domain.com
  ```

- Default port (1521):
  ```
  oratop system/manager@dbhost/db1.domain.com
  ```

Options

d : Real-Time Top 5 Wait Events, section 3.
Specifies Wait Events display mode.
Default: Cumulative
To override the default value
- ○ Command line: **-d**
- ○ Runtime: **d**

k : "FILE#:BLOCK#" for objects being waited on, process section 4.
Specifies "FILE#:BLOCK#" display mode.
Default: EVENT/LATCH
To override the default value
- ○ Command line: **-k**
- ○ Runtime: **k**

m : "MODULE/ACTION", process section 4.
Specifies "MODULE/ACTION" display mode.
Default: USERNAME/PROGRAM
To override the default value
- ○ Command line: **-m**
- ○ Runtime: **m**

s : SQL mode of section 4.
Specifies SQL display.
Default: Process mode
To override the default value
- ○ Command line: **-s**
- ○ Runtime: **s**

c : Database Service centric mode.
Displays information based on the database service specified in the connect string.
Default: Connection mode
To override the default value
- ○ Command line: **-c**
- ○ Runtime: N/A

f : Long format, (132 columns)
Specifies long format for header & process section.
Default: short (80 columns)
To override the default value
- ○ Command line: **-f**
- ○ Runtime: **f**

p : Process mode of section 4.
process display.
Default: Process mode
To override the default value
- ○ Command line: **-p**
- ○ Runtime: **p**

b : Batch mode operation.
Runs in sequential frames. It is useful for sending output to a file. In this mode, oratop will run continuously interrupted only by the user (CTRL-C) or until the iterations limit is reached if it is set with the '-n' command-line option.
Default: Text-based user interface
To override the default value
- ○ Command line: **-b**
- ○ Runtime: **N/A**

n : Maximum Number of iterations.   (requires a number)
Specifies the maximum number of iterations, or frames, oratop should produce before ending.
Default: infinite
To override the default value
- ○ Command line: **-n**
- ○ Runtime: N/A

t: Displays tablespace information.
Default: N/A
- ○ Command line: N/A
- ○ Runtime: **t**

a: Displays ASM diskgroup information. (no op for non-ASM)
Default: N/A
- ○ Command line: N/A
- ○ Runtime: **a**

x: Displays SQL execution plan table. Requires input of the active SQL sql_id value.
Default: N/A
- ○ Command line: N/A
- ○ Runtime: **x**

i :   Interval delay time. (requires value in seconds)
Specifies the delay between update refresh. *A short interval delay (<10s) is not guaranteed for the specified delay. This is particularly true for a loaded system.*
Default: 5 seconds.
To override the default value
- ○ Command line: **-i** < number in seconds>
- ○ Runtime: **i**

v : oratop version number.
Displays version number
Default: N/A
- ○ Command line: **-v**
- ○ Runtime: N/A
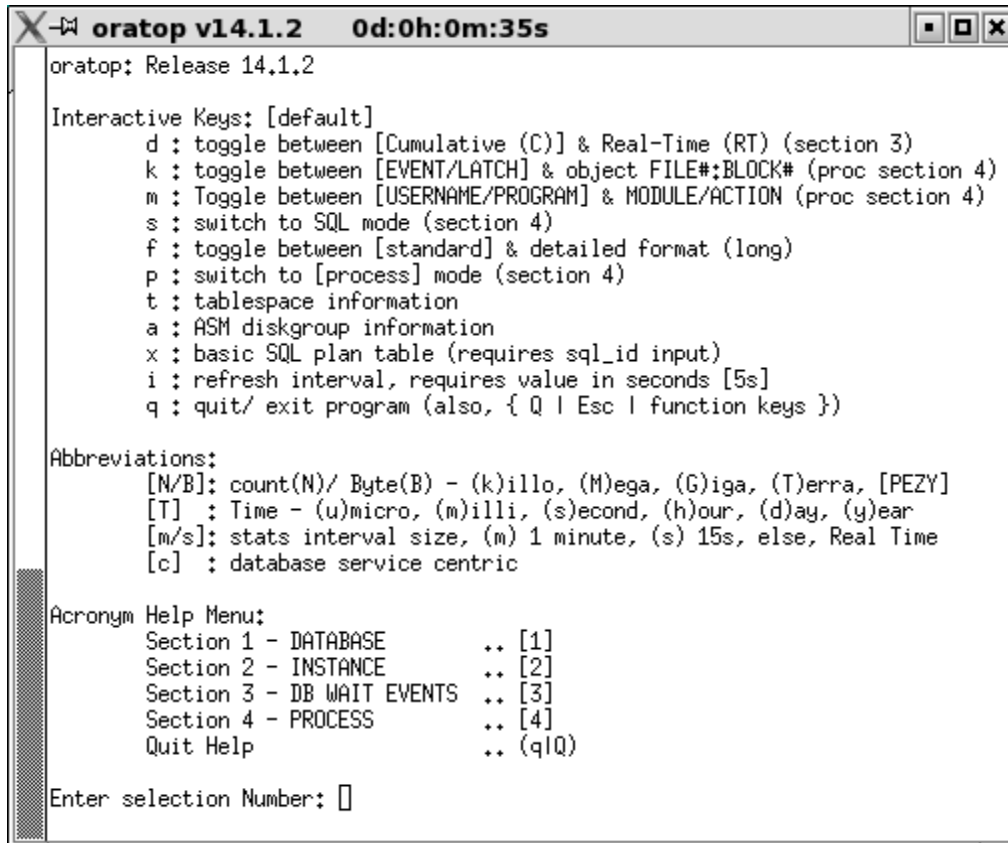
h : Help.
Displays usage or output information.
Default: N/A
- ○ Command line: **-h[elp]**
- ○ Runtime: **h**

II. INTERACTIVE MODE

Runtime interactive and detail options can be seen after starting the utility followed by pressing the keyboard key 'h'. (See Figure 3)

```
X-⋈  oratop v14.1.2     0d:0h:0m:35s                    ▪ ▢ ✖

oratop: Release 14.1.2

Interactive Keys: [default]
        d : toggle between [Cumulative (C)] & Real-Time (RT) (section 3)
        k : toggle between [EVENT/LATCH] & object FILE#:BLOCK# (proc section 4)
        m : Toggle between [USERNAME/PROGRAM] & MODULE/ACTION (proc section 4)
        s : switch to SQL mode (section 4)
        f : toggle between [standard] & detailed format (long)
        p : switch to [process] mode (section 4)
        t : tablespace information
        a : ASM diskgroup information
        x : basic SQL plan table (requires sql_id input)
        i : refresh interval, requires value in seconds [5s]
        q : quit/ exit program (also, { Q | Esc | function keys })

Abbreviations:
        [N/B]: count(N)/ Byte(B) - (k)illo, (M)ega, (G)iga, (T)erra, [PEZY]
        [T]  : Time - (u)micro, (m)illi, (s)econd, (h)our, (d)ay, (y)ear
        [m/s]: stats interval size, (m) 1 minute, (s) 15s, else, Real Time
        [c]  : database service centric

Acronym Help Menu:
        Section 1 - DATABASE        .. [1]
        Section 2 - INSTANCE        .. [2]
        Section 3 - DB WAIT EVENTS  .. [3]
        Section 4 - PROCESS         .. [4]
        Quit Help                   .. (q|Q)

Enter selection Number: []
```

Figure 3. Runtime Options using help

1. Interactive Toggle keys

1.1. [d] - Section 3 "DB EVENTS" Cumulative(C)/ Real-Time (R/T) modes

See header starting with "EVENT (c)" in Figure 4 below.

```
X -⋈  oratop v14.1.2     0d:0h:0m:18s                    ▪ □ ✕
Oracle 12c - dbx 18:14:23 up: 1.5d,   4 ins,  128 sn,   3 us, 408G mt, 44.6% db
ID %CPU LOAD %DCU    AAS  ASC  ASI  ASW  AST IOPS %FR    PGA UTPS UCPS SSRT   %DBT
 1   44   15   38  15.9    6    0    2    8  571  29  2.0G   25 1.2k   8m   27.9
 4   43   15   36  14.1    4    0    3    7  473  33  2.4G   19 1.1k   8m   24.6
 2   44   13   38  14.2   21    0    2   23  567  32  1.9G   12 1.0k   8m   24.9
 3   42   13   36  12.9   19    0    3   22  459  36  2.0G   17 1.0k   8m   22.6

EVENT (C)                          TOT WAITS    TIME(s)  AVG_MS  PCT    WAIT_CLASS
DB CPU                                          6812830           65
gc buffer busy acquire             2.573E+08    1326843     5.1   13      Cluster
PX Deq: Slave Session Stats        1.316E+08    1212073     9.2   12        Other
enq: PS - contention               5.830E+08     669491     1.1    6        Other
gc cr multi block request          2.208E+08     393816     1.8    4      Cluster

ID    SID    SPID USR PROG S  PGA SQLID/BLOCKER OPN  E/T STA STE EVENT/*LAT   W/T
 2   1210    6416 B/G M001 D  11M 2165bp4y3cqxq SEL  11h ACT WAI enq: PS -   7.7s
 1    837   17231 B/G M001 D  11M 2165bp4y3cqxq SEL  18h ACT WAI enq: PS -   4.7s
 3     63     650 B/G M001 D  11M 2165bp4y3cqxq SEL  13h ACT WAI enq: PS -   3.7s
 4    738   10143 B/G M001 D  11M 2165bp4y3cqxq SEL  11h ACT WAI enq: PS -   722m
 3   1169   18793 BT   JDBC D 3.0M a52yfp67pb34g SEL   0 ACT WAI gc current   68m
 3   1107   16065 BT   JDBC D 3.0M a52yfp67pb34g SEL   0 ACT WAI gc buffer    63m

EVENT (RT)                         TOT WAITS    TIME(s)  AVG_MS  PCT    WAIT_CLASS
DB CPU                                           975157           75
enq: PS - contention               92320916      233954    0.0   18        Other
resmgr:pq queued                   57954485       31016    0.0    2    Scheduler
log file parallel write            18329510       28585    0.0    2   System I/O
SQL*Net message to client          93439615       26827    0.0    2      Network

ID    SID    SPID USR PROG S  PGA SQLID/BLOCKER OPN  E/T STA STE EVENT/*LAT   W/T
 2   1210    6416 B/G M001 D  11M 2165bp4y3cqxq SEL  11h ACT WAI enq: PS -   7.7s
 1    837   17231 B/G M001 D  11M 2165bp4y3cqxq SEL  18h ACT WAI enq: PS -   4.7s
 3     63     650 B/G M001 D  11M 2165bp4y3cqxq SEL  13h ACT WAI enq: PS -   3.7s
 2   1212    4574 BT   JDBC D 3.0M a52yfp67pb34g SEL 3.0s ACT WAI enq: TX -   3.4s
 3    916    9586 BT   JDBC D 3.1M dcv5358qjzbsn UPD 1.0s ACT WAI enq: TX -   681m
 4    738   10143 B/G M001 D  11M 2165bp4y3cqxq SEL  11h ACT WAI enq: PS -   679m
```
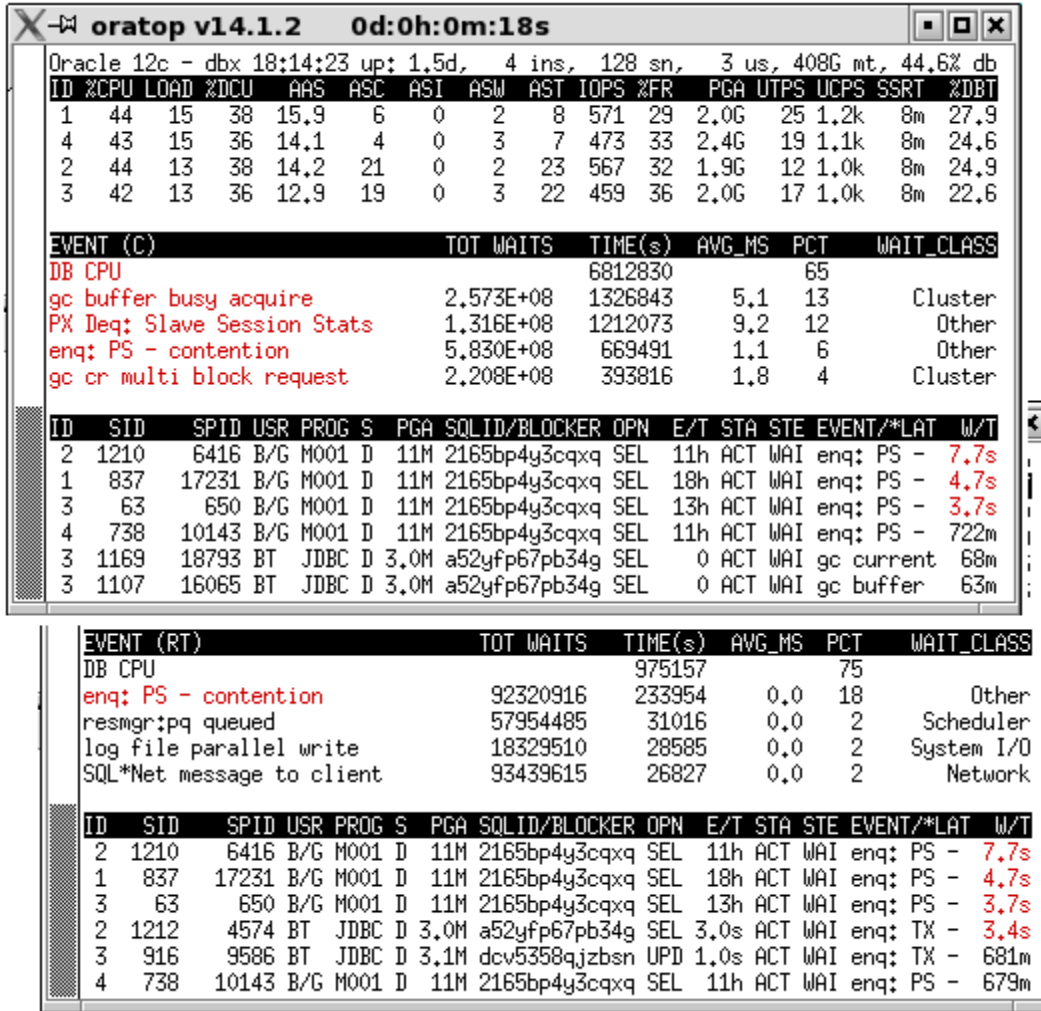
Figure 4. Runtime toggle Option '**d**' (*Cumulative/ Real-Time*)

1.2. [k] - **Section 4 Process "EVENT/*LATCH " and "FILE#:BLK#" columns**

Figure 5 below shows column toggling in section 4 when keyboard key "k" is pressed.

```
X-⋈  oratop v14.1.2     0d:0h:1m:48s                        ▪□✖
Oracle 12c - stm 00:04:40 up:  24h,   4 ins,   80 sn,   3 us, 208G mt, 80.2% db
ID %CPU LOAD %DCU    AAS  ASC  ASI  ASW  AST IOPS %FR   PGA UTPS UCPS SSRT   %DBT
 1   24    7   24   56.4    2    0   28   30  195  15  2.9G    2  128   6m   55.0
 2   16    4   16   21.9    1    1   19   21  698  24  2.5G    0  122   5m   21.4
 3   14    4   12   23.1    2    1    0    2  515  28  1.9G    0   78   2m   22.5
 4    8    2    7    1.2    1    0    1    2   76  21  1.4G    0   83 847u    1.1

EVENT (C)                        TOT WAITS    TIME(s)   AVG_MS  PCT    WAIT_CLASS
DB CPU                                         624685           54
cursor: pin S wait on X            140760      331256   2155.5   29   Concurrency
direct path read                  7257971       66066      9.3    6      User I/O
latch: shared pool                 301262       65297    124.5    6   Concurrency
library cache lock                1908466       60539     47.4    5   Concurrency

ID   SID    SPID USR PROG S  PGA SQLID/BLOCKER OPN  E/T STA STE EVENT/*LAT  W/T
 1  1240 1177598 AR   S000 S  12M g6wvxj7mnfukc DRO 2.0h ACT WAI enq: TM -  2.0h
 2  1433 1344031 AR   java D  10M 6604xkdxxxj1u SEL 650s ACT WAI library ca 649s
 2  1810 1146252 SYS P00G D 3.2M 4xq2yp12kakyy SEL  56s ACT WAI cursor: pi 3.9s
 2  1432 1146244 SYS P00C D 3.1M 4xq2yp12kakyy SEL  56s ACT WAI cursor: pi 3.9s

ID   SID    SPID USR PROG S  PGA SQLID/BLOCKER OPN  E/T STA STE FILE#:BLK#  W/T
 1  1240 1177598 AR   S000 S  12M          3:2573 DRO 2.0h ACT WAI      0:0 2.0h
 2  1433 1344031 AR   java D  10M          3:2573 SEL 624s ACT WAI 95:3633 623s
 3   765 1342415 SYS J004 D  11M          1:198 ALT 204s ACT WAI            23s
 1  2761 1177983 SYS P01C D 3.1M          1:198 SEL  43s ACT WAI            11s
```

Figure 5. Runtime switch Option 'k' (*process,* "EVENT/*LATCH " & "FILE#:BLK#")

Usefulness

The "FILE#:BLOCK#" values are significant when there is a long wait on an object. It is possible to identify the reason for a bottleneck (e.g. concurrency, user_io, etc.) by correlating with the wait class and the wait event in the detailed (long) format.

---

[*] The *asterisk* (*) prefixing the latch name is used to distinguish it from the wait event name.

1.3. [m] - Section 4 Process Module and Action columns

Figure 6 below shows section 4 column changes.

Detailed format
- "USERNAME", "PROGRAM " and "MODULE", "ACTION" column toggle
.

Default standard format
- "USR", "PROG" and "MOD", "ACTN". (default short format)

```
oratop v14.1.2      0d:0h:1m:48s
Oracle 12c - stm 00:04:40 up:   24h,    4 ins,    80 sn,    3 us, 208G mt, 80.2% db
ID %CPU LOAD %DCU    AAS  ASC  ASI  ASW  AST IOPS %FR   PGA UTPS UCPS SSRT   %DBT
 1   24    7   24   56.4    2    0   28   30  195  15  2.9G    2  128   6m   55.0
 2   16    4   16   21.9    1    1   19   21  698  24  2.5G    0  122   5m   21.4
 3   14    4   12   23.1    2    1    0    2  515  28  1.9G    0   78   2m   22.5
 4    8    2    7    1.2    1    0    1    2   76  21  1.4G    0   83 847u    1.1

EVENT (C)                        TOT WAITS    TIME(s)   AVG_MS   PCT    WAIT_CLASS
DB CPU                                         624685            54
cursor: pin S wait on X            140760      331256   2155.5    29   Concurrency
direct path read                  7257971       66066      9.3     6      User I/O
latch: shared pool                 301262       65297    124.5     6   Concurrency
library cache lock                1908466       60539     47.4     5   Concurrency

ID    SID     SPID USR PROG S  PGA SQLID/BLOCKER OPN  E/T STA STE EVENT/*LAT   W/T
 1   1240 1177598 AR   S000 S  12M g6wvxj7mnfukc DRO 2.0h ACT WAI enq: TM -  2.0h
 2   1433 1344031 AR   java D  10M 6604xkdxxxj1u SEL 650s ACT WAI library ca 649s
 2   1810 1146252 SYS P00G D 3.2M 4xq2yp12kakyy SEL  56s ACT WAI cursor: pi  3.9s
 2   1432 1146244 SYS P00C D 3.1M 4xq2yp12kakyy SEL  56s ACT WAI cursor: pi  3.9s

ID    SID     SPID MOD ACT   S  PGA SQLID/BLOCKER OPN  E/T STA STE EVENT/*LAT   W/T
 1   1240 1177598 SQL       S  12M      3:2573    DRO 2.1h ACT WAI enq: TM -  2.1h
 2   1433 1344031 tes test D   9M       3:2573    SEL  22s ACT WAI library ca  22s
 3   2951 1138036 tes test D 2.9M       3:1241    SEL  40s ACT WAI cursor: pi  20s
 3   2668 1138099 tes test D 2.5M       3:1241    SEL  61s ACT WAI cursor: pi  20s
```

Figure 6. Runtime switch Option 'm' (*process*, "USR", "PROG" and "MOD", "ACT")

1.4. Section 4 modes
○ [**p**] **- Process mode** (default)
○ [**S**] **- SQL mode**

key press '**p**' for process, '**s**' for SQL switch (Section 4)

Figure 7. Runtime switch Options '**p**' (*process*) and '**s**' (*SQL*)

Notes.
1. The SQL appearing in the SQL mode are for those with executions > 0.
2. Buffer gets to disk reads Hit ratio (BH%) is calculated from:
   100*(buffer_gets/(buffer_gets_disk_reads))

1.5.   [f] - Short (standard)/ long (detailed) format

Changes back and forth, the format between the default standard short format and the detailed long format.

```
X -M  oratop v14.1.2      0d:0h:0m:18s                          . □ ×
Oracle 12c - db1 00:21:23 up: 1.3d,   2 ins,  151 sn,   2 us,  13G mt, 74.8% db
ID %CPU LOAD %DCU   AAS  ASC  ASI  ASW  AST IOPS %FR   PGA UTPS UCPS SSRT  %DBT
 1   89   23   89  21.9   23    0    1   24    3  10  701M    0  870  24m  61.1
 2   58   14   58  14.0   15    0    0   15    5  10  733M    0 4.6k   3m  38.9

EVENT (C)                           TOT WAITS    TIME(s)  AVG_MS  PCT    WAIT_CLASS
DB CPU                                           3767985           100
oracle thread bootstrap               11593        12611 1087.8     0        Other
GV$: slave acquisition retry wai       2679         2508  942.7     0        Other
control file sequential read         864861         1167    1.4     0    System I/O
reliable message                      38058          589   25.7     0        Other

ID   SID    SPID USR PROG S  PGA SQLID/BLOCKER OPN  E/T STA STE EVENT/*LAT  W/T
 2   390  18823 BT   java D  9M 4rmnn2cgt07fg SEL 1.0s ACT CPU cpu runque  10u
 2   774  18833 BT   java D 1.9M 4rmnn2cgt07fg SEL 1.0s ACT CPU cpu runque   7u
 2  1222  18847 BT   java D 1.9M 4rmnn2cgt07fg SEL 1.0s ACT CPU cpu runque   7u
 1   583  27357 BT   java D  9M 4rmnn2cgt07fg SEL   0 ACT CPU cpu runque   7u
 2  1350  18853 BT   java D 2.9M 4rmnn2cgt07fg SEL   0 ACT CPU cpu runque   6u
 1   903  27369 BT   java D  9M 4rmnn2cgt07fg SEL   0 ACT CPU cpu runque   6u
 1   261  27333 BT   java D 3.7M dhrm9ymu6w250 SEL   0 ACT CPU cpu runque   6u
 2   581  18831 BT   java D 8.7M 4rmnn2cgt07fg SEL   0 ACT CPU cpu runque   6u
```

Keyboard key press f

```
X -M  oratop v14.1.2      0d:0h:0m:49s                                              . □ ×
Oracle 12c - Primary db1    00:22:08 up: 1.3d,   2 ins,  151 sn,   2 us,  13G mt,    0% fra,   1 er,               76.2% db
ID %CPU LOAD %DCU   AAS  ASC  ASI  ASW  ASP  AST  UST MBPS IOPS IORL LOGR PHYR PHYW  %FR   PGA TEMP UTPS UCPS SSRT DCTR DWTR  %DBT
 1   90   23   89  22.2   20    0    1    0   21   77    0    7   2m 4.0M    0    0   10  707M    0    0  914  24m   96    3  60.6
 2   59   15   58  14.4   13    0    0    0   13   74    0    4 626u 1.2M    0    0   10  710M    0    0 4.6k   3m   98    1  39.4

EVENT (C)                                       TOTAL WAITS    TIME(s)  AVG_MS  PCT                                 WAIT_CLASS
DB CPU                                                          3769256           100
oracle thread bootstrap                           11597          12614 1087.7     0                                     Other
GV$: slave acquisition retry wait time             2679           2508  942.7     0                                     Other
control file sequential read                     865256           1167    1.4     0                                 System I/O
reliable message                                  38219            589   25.7     0                                     Other

ID   SID    SPID USERNAME  PROGRAM    SRV  SERVICE  PGA SQLID/BLOCKER OPN  E/T STA STE  WAIT_CLASS  EVENT/*LATCH     W/T
 1  1285  27379 BT        java@slca  DED  sdbro  2.9M 4cutrh75nx6b6 SEL   0 ACT CPU  Network     cpu runqueue      9u
 1   709  27361 BT        java@slca  DED  sdbro  2.6M 4rmnn2cgt07fg SEL   0 ACT CPU  Network     cpu runqueue      8u
 1  1413  27337 BT        java@slca  DED  sdbro  8.5M 4rmnn2cgt07fg SEL   0 ACT CPU  Network     cpu runqueue      7u
 1   516  27355 BT        java@slca  DED  sdbro  2.9M 4cutrh75nx6b6 SEL   0 ACT CPU  Network     cpu runqueue      6u
 1  1029  27371 BT        java@slca  DED  sdbro  4.4M 4rmnn2cgt07fg SEL   0 ACT CPU  Network     cpu runqueue      6u
 1  1222  27377 BT        java@slca  DED  sdbro   9M 4rmnn2cgt07fg SEL   0 ACT CPU  Network     cpu runqueue      6u
 1   261  27333 BT        java@slca  DED  sdbro  3.0M dhrm9ymu6w250 SEL   0 ACT CPU  Network     cpu runqueue      5u
 1   964  27367 BT        java@slca  DED  sdbro  2.7M 4rmnn2cgt07fg SEL   0 ACT CPU  Network     cpu runqueue      5u
```

Figure 8. Runtime toggle Option '**f**' (*format*)

1.6.   [t] - Tablespace information Context

```
X-M  oratop v14.1.2     0d:0h:1m:4s                    . □ X

Oracle 12c - PDB 18:54:49 up: 2.6d,   4 ins,  327 sn,   2 us, 409G mt, 31.7% db
ID %CPU LOAD %DCU    AAS  ASC  ASI  ASW  AST IOPS %FR    PGA UTPS UCPS SSRT    %DBT
 1   18    7   13  10.4    3    0    3    6 2.0k  81  1.9G  392 3.7k    3m    25.6
 4   18    8   13  10.2    6    2    1    8 2.2k  84  2.6G  373 3.6k    3m    25.1
 3   18    7   13  10.1    3    1    6   10 2.1k  84  1.7G  397 3.8k    3m    24.8
 2   18    7   12   9.9    4    3    2    7 2.1k  84  2.4G  344 3.4k    3m    24.5

EVENT (C)                     TOT WAITS    TIME(s)  AVG_MS  PCT     WAIT_CLASS
enq: TX - index contention    1.045E+08    7218057    66.8   34     Concurrency
enq: TX - allocate ITL entry    3802764    5658632  1466.7   27   Configuration
gc buffer busy acquire        2.950E+08    3868487    15.3   18         Cluster
DB CPU                                     2473213           12
enq: TX - row lock contention   3119856    2020396   615.2   10     Application

ID   SID    SPID USR PROG S  PGA SQLID/BLOCKER OPN  E/T STA STE EVENT/*LAT   W/T
 4   300   19691 B/G W00J D 3.1M bdwtqttka2w2y SEL  21h ACT WAI enq: SY -   628s
 3   971   26639 BT  JDBC D 2.4M avhuha.iv649xs UPD 1.0s ACT WAI enq: TX -   422m

TABLESPACE INFORMATION:

TABLESPACE_NAME               SIZE  USED  USE% STATUS    BIG NDBF LOGGING
---------------------------   ----  ----  ---- --------- --- ---- ---------
IDX                           64G   50G   78.9 ONLINE    NO    2  LOGGING
LOB                                  0     0   OFFLINE   NO    1  LOGGING
SYSAUX                        32G  148M   0.5  ONLINE    NO    1  LOGGING
SYSTEM                        32G  156M   0.5  ONLINE    NO    1  LOGGING
TBL                           32G   29G   91.3 ONLINE    NO    1  LOGGING
TEMP                          32G    0     0   ONLINE    NO    1  NOLOGGING
---------------------------   ----  ----  ----
Total:                       224G   80G   35.7

press Enter to return[]
```

Figure 9. Runtime Tablespace information Option 't'

Where,

Column	Description[3]
TABLESPACE_NAME	Name of the tablespace
SIZE	Tablespace total size (maxbytes)
USED	Tablespace used size
USE%	Tablespace used percentage (red if > 90%)
STATUS	Tablespace status: ONLINE, OFFLINE, READ ONLY (red if OFFLINE)
BIGFILE	Bigfile tablespace (YES) or a smallfile tablespace (NO)
NDBF	Number of smallfile db datafiles for the tablespace
LOGGING	Default logging attribute: LOGGING, NOLOGGING
CONTENTS	Tablespace contents: UNDO, PERMANENT, TEMPORARY
EXTENT_MANAGEMENT	Extents are (DICTIONARY) managed or locally managed (LOCAL)
SEGMENT_SPACE_MANAGEMENT	Tablespace is managed using free lists (MANUAL) or bitmaps (AUTO)
RETENTION	Undo tablespace retention: GUARANTEE, NOGUARANTEE, NOT APPLY
ENCRYPTED	Tablespace is encrypted (YES) or not (NO)

Table 1. Tablespace information header description (*shaded for the default format*)

---

[3] **Oracle® Database Reference, 11***g* **Release 2 (11.2)** E40402-10 [dba: _tablespaces, _data_files, _free_space, _undo_extents]

1.7.　[a] - ASM disk group information Context

```
X-⋈ oratop v14.1.2    0d:0h:0m:2s                    ▪ ▫ ✕
Oracle 12c - PDB 23:18:21 up: 2.8d,   4 ins,  327 sn,    2 us, 406G mt, 37.8% db
ID %CPU LOAD %DCU   AAS  ASC ASI  ASW  AST IOPS %FR   PGA UTPS UCPS SSRT    %DBT
 3   18   7   14  13.3   5   0    5   10 2.1k  83  1.7G  375 3.6k   3m   27.5
 2   18   7   13  12.9   5   0    2    7 1.9k  84  3.6G  345 3.4k   3m   26.7
 1   18   6   13  11.8   5   1    3    9 1.9k  81  1.2M  358 3.6k   4m   24.5
 4   18   6   13  10.3   5   0    4    9 2.0k  83  555M  344 3.3k   3m   21.3

EVENT (C)                          TOT WAITS     TIME(s)  AVG_MS  PCT     WAIT_CLASS
enq: TX - index contention         1.078E+08     7256233   64.9   33      Concurrency
enq: TX - allocate ITL entry       3809488       5658662 1456.0   26 Configuration
gc buffer busy acquire             3.143E+08     4015223   14.6   18         Cluster
DB CPU                                           2659118           12
enq: TX - row lock contention      3491430       2123575  580.3   10     Application

ID   SID    SPID USR PROG S  PGA SQLID/BLOCKER OPN  E/T STA STE EVENT/*LAT   W/T
 4  1260   28413 BT   JDBC D 2.5M dcv5358a.izbsn UPD 1.0s ACT WAI enq: TX -   552m

ASM DISKGROUP INFORMATION:

INST_ID  DISKGROUP_NAME    SIZE  FREE  %USED  HOTU  COLD  STATE      TYPE    OFF
-------  --------------    ----  ----  -----  ----  ----  ---------  ------  ---
      1  DATA              2.9T  2.8T   4.7     0   140G  CONNECTED  EXTERN   0
      1  RECO              2.0T  1.9T   1.1     0    22G  CONNECTED  EXTERN   0
      2  DATA              2.9T  2.8T   4.7     0   140G  CONNECTED  EXTERN   0
      2  RECO              2.0T  1.9T   1.1     0    22G  CONNECTED  EXTERN   0
      3  DATA              2.9T  2.8T   4.7     0   140G  CONNECTED  EXTERN   0
      3  RECO              2.0T  1.9T   1.1     0    22G  CONNECTED  EXTERN   0
      4  DATA              2.9T  2.8T   4.7     0   140G  CONNECTED  EXTERN   0
      4  RECO              2.0T  1.9T   1.1     0    22G  CONNECTED  EXTERN   0


press Enter to return▯
```

Figure 10. Runtime ASM diskgroup information Option 'a'

Where,

Column	Description[4]
INST_ID	Instance identification number
DISKGROUP_NAME	Name of the disk group (DG)
SIZE	Total capacity of the disk group
FREE	Unused capacity of the disk group
%USED	Disk group used percentage (red if > 90%)
HOTU	Number of used bytes in the hot region
COLD	Number of used bytes in the cold region
STATE	State of the disk group relative to the instance. (red if not CONNECTED)
TYPE	Redundancy type for the disk group: EXTERN , NORMAL , HIGH
OFFLINE_DISKS	Number of disks in the disk group that are currently offline (red > 0)
ALLOCATION_UNIT_SIZE	Size of the allocation unit (ALLOCATION_UNIT_SIZE)
VOTING_FILES	Indicates whether the disk contains voting files (Y) or not (N) (red if 'Y')
ASM_COMP	Minimum S/W version required for ASM instance to mount this DG
DB_COMP	Minimum S/W version required for a DB instance to use files in this DG

Table 2. ASM disk group information header description (*shaded for the default format*)

---

[4] **Oracle® Database Reference, 11g Release 2 (11.2)** E40402-10 [GV$ASM_DISKGROUP]

1.8. [x] - SQL Execution Plan table context

Basic SQL execution plan table option for active SQL with SQL_ID.
Pressing the keyboard key 'x' will prompt the user to input the SQL_ID value. (see Figure 11)

```
X-⋈ oratop v14.1.2     0d:0h:5m:44s                    ▪ ▢ ✕
ID %CPU LOAD %DCU    AAS  ASC  ASI  ASW  AST IOPS %FR    PGA UTPS UCPS SSRT   %DBT
 2   8    1    7   8.6    7    0    3   10   11  37   462M    0   18 313m   56.6
 1  41    7   36   6.6    8    0    2   10  593  31   751M    0   82  35m   43.4

EVENT (C)                          TOT WAITS    TIME(s)  AVG_MS  PCT    WAIT_CLASS
DB CPU                                          1460999          44
gc buffer busy acquire            1.137E+08      958732   12.6   29       Cluster
gc cr multi block request         81988270      582635    7.1   18       Cluster
reliable message                  36755765      167909    5.1    5         Other
Data Guard server operation comp   9758338      137014   14.0    4         Other

ID  USER  SQL_ID        SQL_TEXT              X  ELAP  EXEC  ROWS  BH%  LOAD
 2  BT    4rmnn2cgt07fg  select c.name, c.cust  S   18s   14k     8  100     3
 2  BT    dhrm9ymu6w250  select o.custid, i.pr  S   10s   14k     8  100     2
 2  BT    4cutrh75nx6b6  select prodid, price   S   10s   19k     7  100     3
 1  BT    4rmnn2cgt07fg  select c.name, c.cust  S  1.4s  124k     7  100     1
 1  BT    dhrm9ymu6w250  select o.custid, i.pr  S  754m  124k     7  100     2
 1  BT    4cutrh75nx6b6  select prodid, price   S  711m  166k     7  100     3

Enter sql_id: 4rmnn2cgt07fg


PLAN_TABLE_OUTPUT
------------------------------------------------------------------
SQL_ID: 4rmnn2cgt07fg, child number 1
-------------------------------------------
SELECT C.NAME, C.CUSTID, I.PRODID, P.DESCRIP, I.PRICE, I.QTY FROM ORDERS O,
ITEMS I, CUSTOMERS C, PRODUCTS P WHERE O.ORDID = I.ORDID AND O.CUSTID =
C.CUSTID AND I.PRODID = P.PRODID AND O.ORDID = :1

Plan hash value: 927836781


------------------------------------------------------------------
| Id | Operation                   | Name      | Rows | Cost | Stale |
------------------------------------------------------------------
|  0 | SELECT STATEMENT            |           |      | 67k  |       |
|  1 |  HASH JOIN                  |           |    8 | 67k  |       |
|  2 |   HASH JOIN                 |           |    8 | 53k  |       |
|  3 |    TABLE ACCESS FULL        | ITEMS     |    8 | 30k  | YES   |
|  4 |    MERGE JOIN CARTESIAN     |           | 1.1M | 22k  |       |
|  5 |     TABLE ACCESS FULL       | ORDERS    |    1 | 7.7k | YES   |
|  6 |     BUFFER SORT             |           | 1.1M | 15k  |       |
|  7 |      TABLE ACCESS FULL      | PRODUCTS  | 1.1M | 15k  | YES   |
|  8 |   TABLE ACCESS FULL         | CUSTOMERS | 1.1M | 13k  | YES   |
------------------------------------------------------------------

press Enter to return▯
```

Figure 11. Runtime SQL Plan table Option '**x**' (*SQL mode*)

1.9.   [i] - Delay interval input option

Pressing the keyboard key "i" at run time prompts the user to input the desired interval in seconds. (see Figure 12)

```
X ⊸ oratop v14.1.2      0d:0h:0m:11s                    ▪ ◻ ✕
Oracle 12c - dg2 00:34:58 up: 1.9d,   2 ins,   36 sn,   3 us,  19G mt, 47.5% db
ID %CPU LOAD %DCU    AAS  ASC  ASI  ASW  AST IOPS %FR   PGA UTPS UCPS SSRT  %DBT
 2   8   1    7    9.0    3    0    7   10    7  37  505M    0    4 370m  59.2
 1  38   6   34    6.2    8    0    2   10  754  31  812M    0   94  36m  40.8

EVENT (C)                            TOT WAITS    TIME(s)  AVG_MS  PCT    WAIT_CLASS
DB CPU                                             980018           43
gc buffer busy acquire               81948597     644693    12.9   28       Cluster
gc cr multi block request            61086038     420429     6.9   18       Cluster
reliable message                     28705705     128343     5.0    6        Other
Data Guard server operation comp      7336921     108062    14.7    5        Other

ID   SID    SPID USR PROG S  PGA SQLID/BLOCKER OPN  E/T STA STE EVENT/*LAT   W/T
 2  1252  11639 BT   java D  38M 4rmnn2cgt07fg SEL  12s ACT WAI gc buffer      9m
 2   581  11624 BT   java D 2.9M dhrm9ymu6w250 SEL 2.0s ACT CPU cpu runque     7m
 1     8    537 PUB orac D  53M                     0 ACT WAI reliable m      4m
 2   773  11628 BT   java D  38M 4rmnn2cgt07fg SEL  12s ACT WAI gc cr mult     3m
 2   870  11630 BT   java D 3.4M 4rmnn2cgt07fg SEL 4.0s ACT WAI gc buffer    201u
 2  1351  11641 BT   java D 2.8M dhrm9ymu6w250 SEL 1.0s ACT WAI gc buffer    198u
 2   673  11626 BT   java D 2.9M dhrm9ymu6w250 SEL 2.0s ACT WAI gc buffer    192u
 1  1252   4978 F/G PR00 D  20M                    1.9d ACT CPU cpu runque   183u
 1   296    788 BT   java D 3.3M 4rmnn2cgt07fg SEL    0 ACT CPU cpu runque   156u
 1   106    784 BT   java D 3.2M 4rmnn2cgt07fg SEL    0 ACT CPU cpu runque    91u
 1   394    790 BT   java D 2.7M dhrm9ymu6w250 SEL    0 ACT CPU cpu runque     1u
 1   203    786 BT   java D 2.6M dhrm9ymu6w250 SEL    0 ACT CPU cpu runque     1u
 2  1061  11635 BT   java D 2.1M 4cutrh75nx6b6 SEL 4.0s ACT WAI gc buffer      0
 2  1156  11637 BT   java D 2.8M dhrm9ymu6w250 SEL 2.0s ACT WAI gc buffer      0
 2   965  11633 BT   java D 2.8M dhrm9ymu6w250 SEL 2.0s ACT WAI gc buffer      0

oratop: Release 14.1.2

Running with interval setting of: 5s

Enter interval in seconds: 10
new interval setting is: 10s


press Enter to return▯
```

Figure 12. Runtime refresh interval Option '**i**'

2. Data Description

The run time help menu is driven by the preselected option(s).

The following sections will show help for section 4 of the SQL mode only. Help for all the other sections follow in the the same manner.

2.1. Help SQL mode (Default, short format)

keyboard key "s" was pressed to select SQL mode for section 4 prior to pressing the help menu key "h".

Figure 13 below shows description of section 4 columns while in SQL mode and default format.
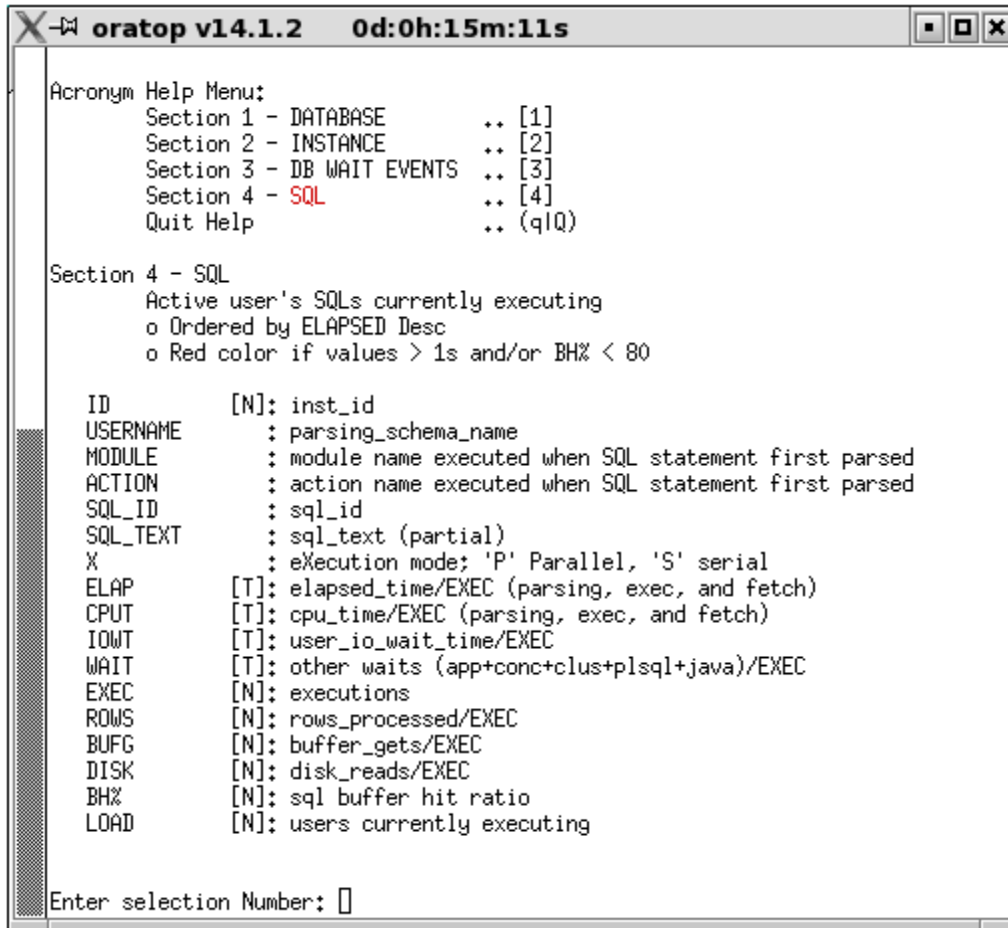
```
X-☒ oratop v14.1.2     0d:0h:8m:46s                      ▪ ▢ ☒

Acronym Help Menu:
        Section 1 - DATABASE         .. [1]
        Section 2 - INSTANCE         .. [2]
        Section 3 - DB WAIT EVENTS   .. [3]
        Section 4 - SQL              .. [4]
        Quit Help                    .. (q|Q)

Section 4 - SQL
        Active user's SQLs currently executing
        o Ordered by ELAPSED Desc
        o Red color if values > 1s and/or BH% < 80

   ID          [N]: inst_id
   USER           : parsing_schema_name
   SQL_ID         : sql_id
   SQL_TEXT       : sql_text (partial)
   X              : eXecution mode; 'P' Parallel, 'S' serial
   ELAP        [T]: elapsed_time/EXEC (parsing, exec, and fetch)
   EXEC        [N]: executions
   ROWS        [N]: rows_processed/EXEC
   BH%         [N]: sql buffer hit ratio
   LOAD        [N]: users currently executing


Enter selection Number: []
```

ID	USER	SQL_ID	SQL_TEXT	X	ELAP	EXEC	ROWS	BH%	LOAD
2	BT	4rmnn2cgt07fg	select c.name, c.cust	S	18s	14k	8	100	6
2	BT	dhrm9ymu6w250	select o.custid, i.pr	S	10s	14k	8	100	1
2	BT	4cutrh75nx6b6	select prodid, price	S	10s	19k	7	100	2
1	BT	4rmnn2cgt07fg	select c.name, c.cust	S	1.4s	124k	7	100	3
1	BT	4cutrh75nx6b6	select prodid, price	S	711m	165k	7	100	2

Figure 13. Runtime Data Description (*Section 4 SQL mode short format*)

2.2. **Help SQL mode** (Detailed, long format)

Here, the keyboard keys "s" and "f" were pressed to select SQL mode for section 4 in the detailed format prior to pressing the help menu key "h".

Figure 14 below shows detail of section 4 in SQL mode and detailed format.

```
X -⋈ oratop v14.1.2     0d:0h:15m:11s                          ▪ ▫ ✕

Acronym Help Menu:
        Section 1 - DATABASE        .. [1]
        Section 2 - INSTANCE        .. [2]
        Section 3 - DB WAIT EVENTS  .. [3]
        Section 4 - SQL             .. [4]
        Quit Help                   .. (q|Q)

Section 4 - SQL
        Active user's SQLs currently executing
        o Ordered by ELAPSED Desc
        o Red color if values > 1s and/or BH% < 80

    ID          [N]: inst_id
    USERNAME       : parsing_schema_name
    MODULE         : module name executed when SQL statement first parsed
    ACTION         : action name executed when SQL statement first parsed
    SQL_ID         : sql_id
    SQL_TEXT       : sql_text (partial)
    X              : eXecution mode; 'P' Parallel, 'S' serial
    ELAP        [T]: elapsed_time/EXEC (parsing, exec, and fetch)
    CPUT        [T]: cpu_time/EXEC (parsing, exec, and fetch)
    IOWT        [T]: user_io_wait_time/EXEC
    WAIT        [T]: other waits (app+conc+clus+plsql+java)/EXEC
    EXEC        [N]: executions
    ROWS        [N]: rows_processed/EXEC
    BUFG        [N]: buffer_gets/EXEC
    DISK        [N]: disk_reads/EXEC
    BH%         [N]: sql buffer hit ratio
    LOAD        [N]: users currently executing


Enter selection Number: []
```

Figure 14. Runtime Data Description (*Section 4 SQL mode detailed format*)

SNIPPETS

1. [*Auto Toggle*] – Section 4 EVENT/LATCH column

"`EVENT/*LATCH` column auto toggle across refreshes. The auto toggle is activated whenever there is a wait on a latch and potential process hang or spin is detected. It provide a useful information if such hang or spin last for a long duration.

```
X-⋈ oratop v14.1.2    0d:0h:4m:37s                          ▪ □ ✕

Oracle 12c - dbp 20:57:59 up: 3.8d,   4 ins,   6 sn,   2 us,  27G mt,  0.4% db
ID %CPU LOAD %DCU   AAS  ASC  ASI  ASW  AST IOPS %FR   PGA UTPS UCPS SSRT   %DBT
 1    1    0    0   0.0    1    0    0    1    5  11  751M    0   19   1m   17.2
 4    1    0    0   0.1    1    0    0    1    4  11  509M    0   17 523u   24.1
 2    6    1    0   0.1    1    0    0    1    3  11  1.9G    0   18   1m   19.3
 3    1    0    0   0.1    1    0    1    2    7  19  524M    0   21   2m   39.4


EVENT (C)                          TOT WAITS    TIME(s)  AVG_MS  PCT     WAIT_CLASS
DB CPU                                          5525364          64
enq: PS - contention               1.443E+09    1193864     0.8   14          Other
PX Deq: Slave Session Stats        6.548E+08     779798     1.5    9          Other
reliable message                    26688008     734705    18.3    9          Other
IPC send completion sync           1.252E+09     391816     0.3    5          Other


ID    SID    SPID USR PROG S  PGA SQLID/BLOCKER OPN  E/T STA STE EVENT *LAT  W/T
 2    392   17657 F/G PPA7 D 5.3G 2165bp4y3cqxq SEL  19h ACT CPU PX Deq: Ex    0
 4   1904   29033 BT  sqlp D 2.2M       2:392 SEL 1.5h INA WAI SQL*Net me  1.5h
```

```
ID    SID    SPID USR PROG S  PGA SQLID/BLOCKER OPN  E/T STA STE EVENT *LAT   W/T
 2    392   17657 F/G PPA7 D 5.3G 2165bp4y3cqxq SEL  19h ACT CPU *hot latch     0
 4   1904   29033 BT  sqlp D 2.2M       2:392 SEL 1.5h INA WAI *post/wait  1.5h
```

Figure 15. Auto toggle between Event and latch name (process mode)

2. Data Guard

Significant data guard indicators are highlighted in yellow as shown Figure 16 below.   In particular, the value for the apply rate (**ar**) is highly desired.
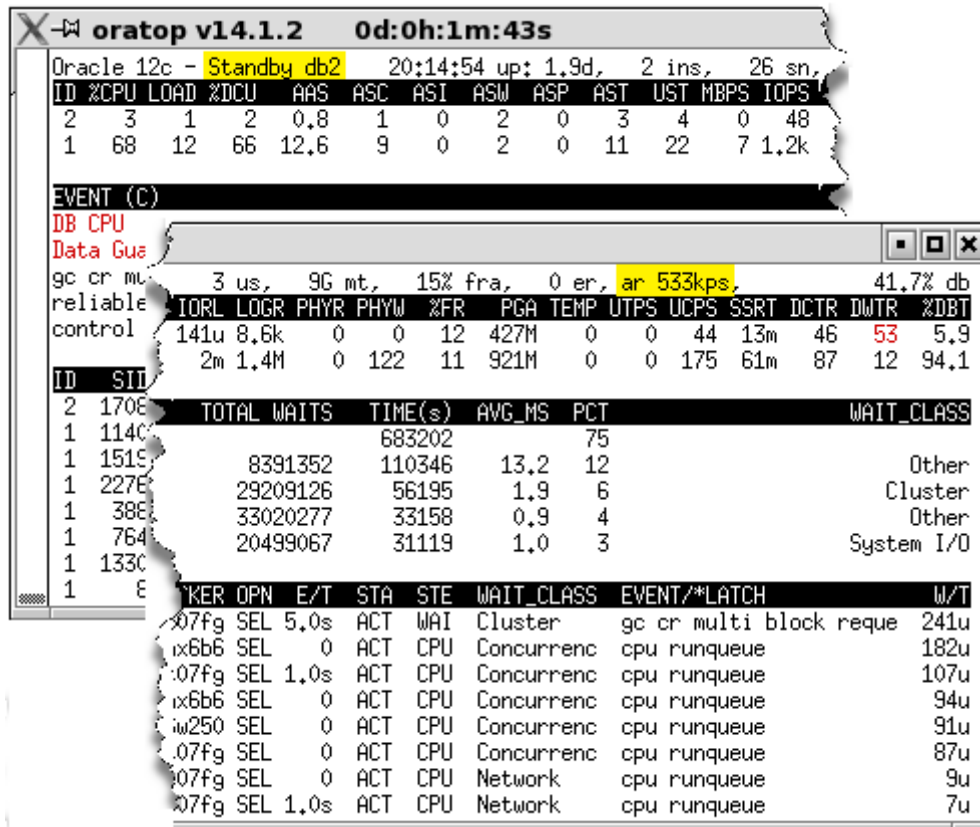

Figure 16. Snapshot from monitoring a standby database

3. Database Service

Figure 17 below shows an example of oratop started with the "-c" option connecting via the user defined service named "sro". Service centric values are highlighted in light brown. Values not highlighted are database/ instance overall values.

Note. when in service mode, the database name in the header section will be replaced by the service name and highlighted in red.
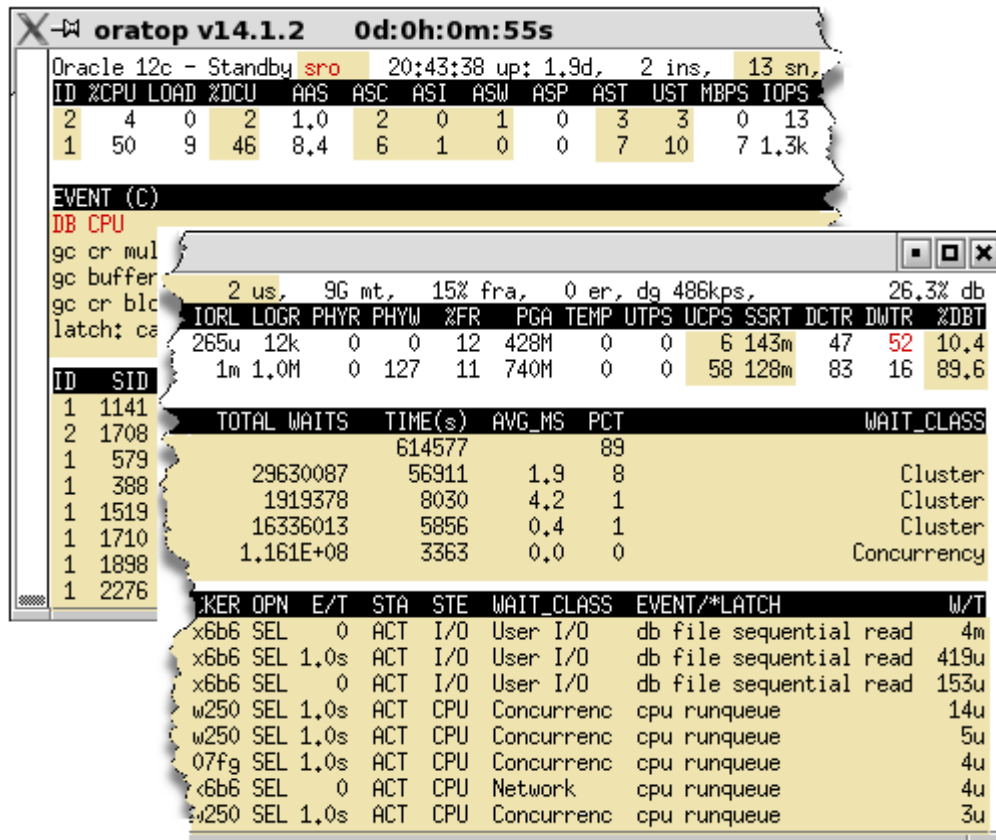
Figure 17. Snapshot from monitoring database via Service

4. 12c Multitenant Database

4.1. Connection to CDB[5] root

Relevant indicators to the Multitenant database are highlighted in yellow.
At CDB root, the header (section 1) will show the number of tenants housed in this Multitenant database. For example, Figure 18 shows 3 pdbs (not including seed database).
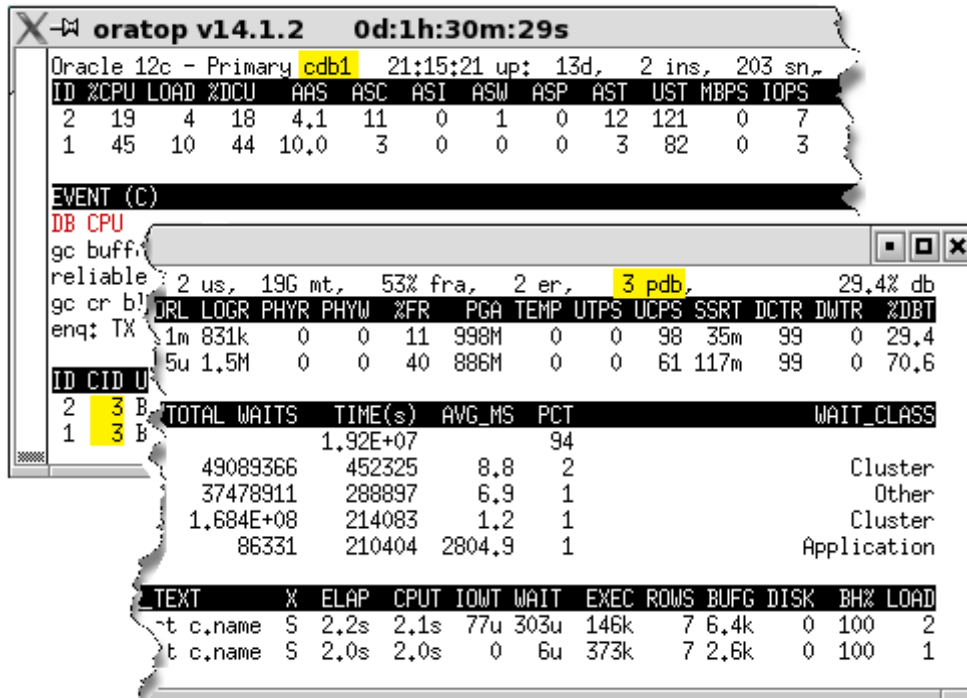The "CID" column in the SQL mode stands for Container_ID.

```
 ┌─ oratop v14.1.2     0d:1h:30m:29s
 │Oracle 12c - Primary cdb1   21:15:21 up:  13d,   2 ins,  203 sn,
 │ID %CPU LOAD %DCU   AAS  ASC  ASI  ASW  ASP  AST  UST MBPS IOPS
 │ 2   19    4   18   4.1   11    0    1    0   12  121    0    7
 │ 1   45   10   44  10.0    3    0    0    0    3   82    0    3
 │
 │EVENT (C)
 │DB CPU
 │gc buff                                              ■ □ ✕
 │reliable   2 us,  19G mt,   53% fra,   2 er,   3 pdb,        29.4% db
 │gc cr bl ORL LOGR PHYR PHYW  %FR    PGA TEMP UTPS UCPS SSRT DCTR DWTR  %DBT
 │enq: TX  1m 831k    0    0   11   998M    0    0   98  35m   99    0  29.4
 │         5u 1.5M    0    0   40   886M    0    0   61 117m   99    0  70.6
 │ID CID U
 │ 2   3 B TOTAL WAITS   TIME(s)  AVG_MS  PCT                    WAIT_CLASS
 │ 1   3 B            1.92E+07            94
 │            49089366    452325     8.8    2                     Cluster
 │            37478911    288897     6.9    1                       Other
 │           1.684E+08    214083     1.2    1                     Cluster
 │              86331     210404  2804.9    1                 Application
 │
 │         TEXT      X  ELAP  CPUT IOWT WAIT  EXEC ROWS BUFG DISK  BH% LOAD
 │        -t c.name  S  2.2s  2.1s  77u 303u  146k   7 6.4k    0  100    2
 │        2t c.name  S  2.0s  2.0s    0   6u  373k   7 2.6k    0  100    1
```

Figure 18. Snapshot from a Multitenant Database connecting to root

---

[5] Also referred to as Consolidated database.

4.2. Connection to a PDB[6] (*pluggable* database)

Indicators to a tenant database are highlighted in a yellow for the next two subjects.

4.2.3. Connection **without** the "-c" command line option

Figure 19 shows a non-service based connection (not using "-c" flag) to a tenant having database name "pdb1" with container id (cid) 3 (*which is the 1st pdb*). Columns with values being dimmed are not pdb specific, they are generic root level (CDB) *unless they are enabled in the database*.
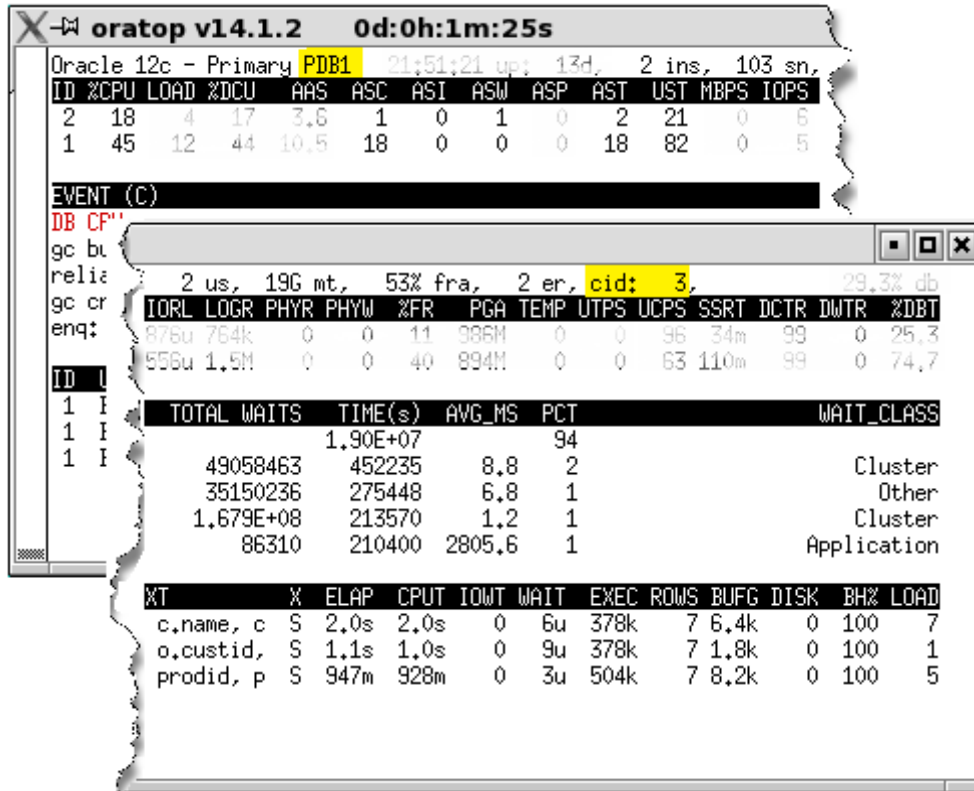

Figure 19. Snapshot from a tenant Database (no "-c")

---

[6] Also referred to as Tenant or a container

4.2.4. Connection with the "-c" command line option

Figure 20 shows shows relevant stats when connecting via service and using the"-c" flag to the same tenant "pdb1".
Highlighted values in red color shows significant differences with the previously shown Figure 19.
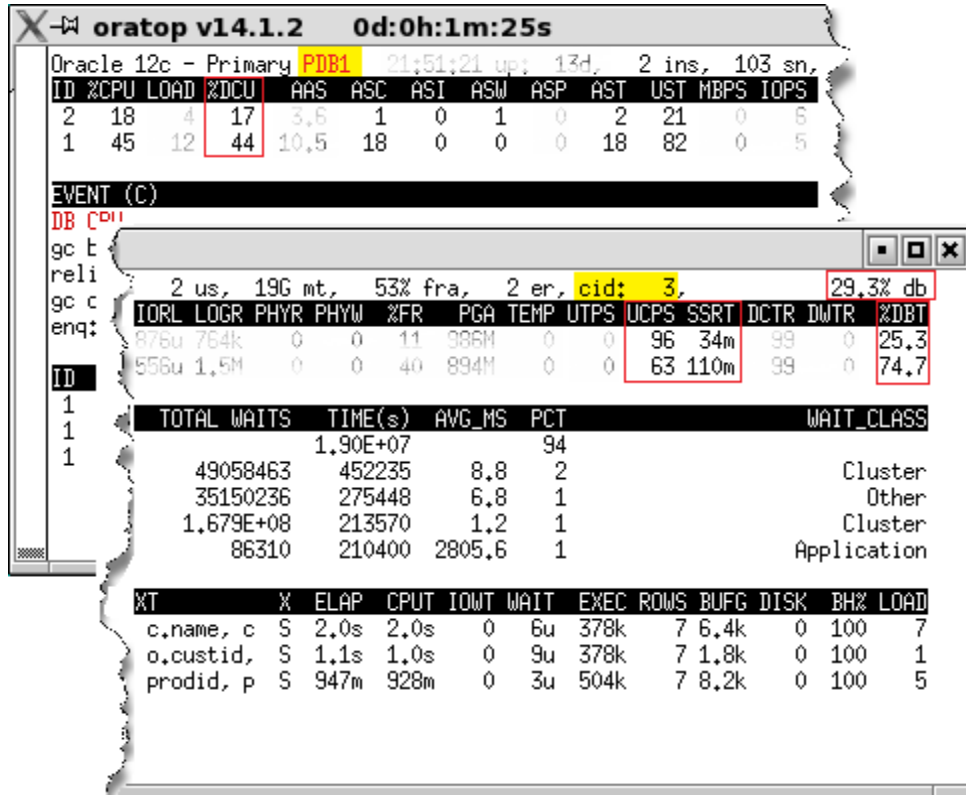
Figure 20. Snapshot from a tenant Database (service with "-c")

5. Batch Mode

Figure 21 below shows a snapshot from a batch run with output redirected to standard system file.


```
X-⋈ ~/TEST                                                    ▪ ◻ ✕
bash-3.2$ ./oratop -bn1 system/manager@db2 > oratop.log
bash-3.2$ cat oratop.log

oratop: Release 14.1.2 Production on Thu Apr 10 01:27:15 2014


Oracle 12c - dg2 01:27:13 up: 2.0d,   2 ins,   36 sn,   3 us,  19G mt, 46.2% db
ID %CPU LOAD %DCU   AAS  ASC  ASI  ASW  AST IOPS %FR   PGA UTPS UCPS SSRT   %DBT
--------------------------------------------------------------------------------
 2   7    2    6  8.6    2    0    8   10    7  37  566M    0    5 565m  58.3
 1  39    7   34  6.2    6    0    3    9  749  31  695M    0   85  30m  41.7

EVENT (C)                       TOT WAITS   TIME(s)  AVG_MS  PCT    WAIT_CLASS
--------------------------------------------------------------------------------
DB CPU                                      1003757           43
gc buffer busy acquire          83605812     660500    12.9   28        Cluster
gc cr multi block request       62166792     428636     6.9   18        Cluster
reliable message                29199673     130694     5.0    6          Other
Data Guard server operation comp  7472578     109829    14.7    5          Other

ID   SID    SPID USR PROG S  PGA SQLID/BLOCKER OPN  E/T STA STE EVENT/*LAT  W/T
--------------------------------------------------------------------------------
 2   965   11633 BT   java D  49M 4rmnn2cgt07fg SEL  14s ACT WAI gc buffer   14m
 2  1156   11637 BT   java D  49M 4rmnn2cgt07fg SEL  14s ACT WAI gc buffer   14m
 2  1061   11635 BT   java D  49M 4rmnn2cgt07fg SEL  10s ACT WAI gc buffer   14m
 2   673   11626 BT   java D  49M 4rmnn2cgt07fg SEL  14s ACT WAI gc buffer   13m
 2  1252   11639 BT   java D 2.9M dhrm9ymu6w250 SEL 4.0s ACT CPU cpu runque   9m
 2  1351   11641 BT   java D 2.8M dhrm9ymu6w250 SEL 5.0s ACT WAI gc buffer    8m
 2   870   11630 BT   java D 3.4M 4rmnn2cgt07fg SEL 4.0s ACT WAI gc buffer    8m
 2   773   11628 BT   java D 2.1M 4cutrh75nx6b6 SEL 3.0s ACT WAI gc cr mult   8m
 1     8     537 PUB orac D  53M                     0 ACT WAI reliable m    4m
 2   581   11624 BT   java D  49M 4rmnn2cgt07fg SEL  13s ACT WAI gc cr mult   3m
 1   394     790 BT   java D 3.0M 4rmnn2cgt07fg SEL 1.0s ACT CPU cpu runque   7u
 1   490     792 BT   java D 3.3M 4rmnn2cgt07fg SEL 1.0s ACT CPU cpu runque   5u
 1   203     786 BT   java D 3.2M 4rmnn2cgt07fg SEL 1.0s ACT CPU cpu runque   4u
 1   106     784 BT   java D 2.1M dhrm9ymu6w250 SEL 1.0s ACT CPU cpu runque   4u
 1   585     794 BT   java D 2.0M 4cutrh75nx6b6 SEL 1.0s ACT CPU cpu runque   1u
bash-3.2$ ▯
```

Figure 21. Single iteration batch/SQL mode

Note.

In RAC environment, while section 2 of oratop (Database section) is restricted to the top 5 instances in the text-based user interface, all of the available instances will be listed in the batch mode.

Miscellaneous

- *RED*
  Values flagged and highlighted in *red color* are merely a warning or to emphasize importance.

- **Exiting**

  To quit the program, user may press any of the following keyboard keys:
  - Character "q" or "Q", or Esc key
  - Ctrl+c (to abort)

  In all cases, proper OCI session cleanup and logout is performed.

- **Unprivileged user**

  To allow the non-privileged user to use oratop, the system administrator with DBA privileges may issue the following grants:

  ```
  grant select on <view> to <username>;
  ```

  ```
  v$active_services
  v$instance
  v$latchname
  v$parameter
  V$PDBS (12c)
  v$recovery_file_dest
  v$sqlcommand
  v$system_event
  [g]v$servicemetric
  [g]v$session
  [g]v$sql
  [g]v$sysmetric
  GV$ASM_DISKGROUP
  GV$DIAG_INFO
  GV$PGASTAT
  GV$PROCESS
  GV$OSSTAT
  GV$RECOVERY_PROGRESS
  GV$SESSION_WAIT_CLASS
  GV$SESSTAT
  GV$SERVICE_EVENT
  GV$SERVICE_STATS
  GV$SGA
  GV$SORT_SEGMENT
  GV$SQLAREA
  GV$SQL_PLAN
  GV$SYSTEM_EVENT
  GV$SYSSTAT
  dba_data_files
  dba_free_space
  dba_tablespaces
  dba_temp_files
  dba_undo_extents
  sys.ts$
  ```

Table 3. internal views to be granted to the unprivileged user

Note. Typical error for a non-granted user may receive upon connection is,

```
ERROR CODE = 942
ORA-00942: table or view does not exist
```

TECHNICAL DETAILS

The "oratop" program is written in C program, using OCI API. It is not intrusive to a database server, and it leaves small footprints on the server, namely the sqls used by the program. It employs Unix "termio, "ioctl" libraries, and VT100 escape characters to achieve cursor control, font colors, program exit control and terminal (xterm) resizing capability.

Overhead

On the client side, the oratop program is a very light process that uses minimal CPU and Memory. For the server process, its resources are server dependent.

> **Remark**.
> *oratop's specific queries are intentionally filtered out from the SQL section to reduce noise. Information regarding these queries can be found on the server using AWR.*
>
> *The intention of using this utility is to get a quick glance at the database. The oratop SQL statements will show up in the top SQL section of AWR due to the high execution rate when running for a long duration and a short interval.*
> *Like any other SQL, oratop SQL performance will be impacted on over loaded systems.*

Limitations

- **The program is not portable; it runs on Linux platforms only**
- The program is compatible with oracle client version11.2 and 12cR1
- Requires server to have been started with the following parameter
  `statistics_level=TYPICAL`[7]

Caveats

The program may exhibit anomalies at run time, most of which are expected since an event may occur while the program is in the middle of executing/ fetching operations.

Blank Screen
On a busy server, the following operations may leave the terminal blank for a short period:
- A program initialization
- A terminal resizing (shrink/expand the terminal)
- An instance joining/leaving the cluster
- Quitting interactive keys menus
- Upon exiting the program

---

[7] Statistics_level **cannot** be set to "BASIC" since it will disable the required `timed_statistics`

Sluggish response to keyboard key press
Pressing a keyboard key to interact with the program may appear to have slow response on a busy server. Key press response time depends on the interval/execution state.

Abnormal termination
Like any SQL session, the program may fail due to a server error, and the particular error will be displayed.

Abnormal exit
In some situation (corner cases) the program may leave the terminal (xterm) SHELL environment in an undesirable setting. To restore the terminal to its original settings, he user may issue the Linux command "*reset*".

CONCLUSION

The oratop utility provides dba user a quick overview of a running database status and activity. It aggregates useful diagnostics such as overall database performance degradation, bottleneck, identifies potential blocker(s), and helps to detect memory leak from processes. The utility also reports badly performing SQL operations as well. Furthermore, it helps in tuning some aspects of the database like user concurrency.