adrci: A survival guide for the DBA



Starting with 11gR1, we have a new way to deal with Oracle Errors & Tracefiles: There is now a special command line utility dedicated for that purpose called adrci (Automatic Diagnostic Repository Command Interpreter). This posting is intended to show you the (in my view) essential commands, a DBA ought to know in order to use it. We will look at

- 1. Viewing the alert.log
- 2. The relation between incident & problem
- 3. Creation of Packages & ZIP files to send to Oracle Support
- 4. Managing, especially purging tracefiles

I will at first create a problem. Don't do that with your Production Database! Especially: Never do DML on dictionary tables!

```
[oracle@uhesse ~]$ sqlplus / as sysdba
SQL*Plus: Release 11.2.0.2.0 Production on Wed Jun 1 10:25:06 2011
Copyright (c) 1982, 2010, Oracle. All rights reserved.
Connected to:
Oracle Database 11g Enterprise Edition Release 11.2.0.2.0 - 64bit Production
With the Partitioning, OLAP, Data Mining and Real Application Testing options
SQL> select * from v$version;
BANNER
Oracle Database 11g Enterprise Edition Release 11.2.0.2.0 - 64bit Production
PL/SQL Release 11.2.0.2.0 - Production
      11.2.0.2.0
                     Production
TNS for Linux: Version 11.2.0.2.0 - Production
NLSRTL Version 11.2.0.2.0 - Production
SQL> show parameter diagnostic
NAME
                        TYPE
                                 VALUE
diagnostic_dest
                            string
                                     /u01/app/oracle
```

SOL> connect adam/adam

Grant succeeded.

SQL> grant dba to adam identified by adam;

```
Connected.
SQL> create table t (n number);
Table created.
SQL> select object_id from user_objects;
OBJECT ID
    75719
SQL> connect / as sysdba
Connected.
SQL> update tab$ set cols=2 where obj#=75719;
1 row updated.
SQL> commit;
Commit complete.
SQL> alter system flush shared_pool;
System altered.
SQL> connect adam/adam
Connected.
SQL> select * from t;
select * from t
ERROR at line 1:
ORA-03113: end-of-file on communication channel
Process ID: 2236
Session ID: 29 Serial number: 9
```

I flushed the Shared Pool to get the Data Dictionary Cache empty. Else the select may not crash the session as it did. Imagine the user calls me now on the phone. Our first idea as an experienced DBA: We look at the alert.log! Right so. Please notice that we now have two different kinds of the alert.log.

One is present in the conventional text format, per OFA in \$ORACLE_BASE/diag/rdbms/name of the db/name of the instance/trace. This location is determined by the new initialization parameter DIAGNOSTIC_DEST, while BACKGROUND_DUMP_DEST is deprecated in 11g.

1. Viewing the alert.log

The other one is in XML format placed in \$ORACLE_BASE/diag/rdbms/name of the db/name of the instance/alert This version of the alert.log is accessed by adrci:

```
[oracle@uhesse ~]$ adrci

ADRCI: Release 11.2.0.2.0 - Production on Wed Jun 1 10:20:08 2011

Copyright (c) 1982, 2009, Oracle and/or its affiliates. All rights reserved.

ADR base = "/u01/app/oracle"
adrci> show home
ADR Homes:
diag/tnslsnr/uhesse/listener
diag/rdbms/orcl/orcl
```

Please notice that we have different ADR Homes. In my case only two, because I am not using Grid Infrastructure on this Demo System, else there would be another one. I specify my Database Home first. Then I look at the alert.log. Good news



```
adrci> set home diag/rdbms/orcl/orcl
adrci> show alert -tail -f
2011-06-01 10:16:35.337000 +02:00
db_recovery_file_dest_size of 4032 MB is 0.00% used. This is a
user-specified limit on the amount of space that will be used by this
database for recovery-related files, and does not reflect the amount of
space available in the underlying filesystem or ASM diskgroup.
Starting background process CJQ0
CJQ0 started with pid=21, OS id=2204
2011-06-01 10:18:42.668000 +02:00
Exception [type: SIGSEGV, Address not mapped to object] [ADDR:0x0] [PC:0x90D891A, qcstda()+702] [flags: 0x
Errors in file /u01/app/oracle/diag/rdbms/orcl/orcl/trace/orcl_ora_2236.trc (incident=6153):
ORA-07445: exception encountered: core dump [qcstda()+702] [SIGSEGV] [ADDR:0x0] [PC:0x90D891A] [Address no
Incident details in: /u01/app/oracle/diag/rdbms/orcl/orcl/incident/incdir_6153/orcl_ora_2236_i6153.trc
Use ADRCI or Support Workbench to package the incident.
See Note 411.1 at My Oracle Support for error and packaging details.
2011-06-01 10:18:47.518000 +02:00
Dumping diagnostic data in directory=[cdmp_20110601101847], requested by (instance=1, osid=2236), summary=
2011-06-01 10:18:48.727000 +02:00
Sweep [inc][6153]: completed
Sweep [inc2][6153]: completed
```

2. The relation between Incident & Problem

SMCO started with pid=19, OS id=2268 2011-06-01 10:22:08.781000 +02:00

Use ADRCI or Support Workbench to package the incident.

You see the incident was recorded in the alert.log. And it tells you "Use ADRCI or Support Workbench to package the incident." We will soon see how to do that. First I'd like to explain the relation between incident and problem: An incident is the concrete occurrence of a problem. In other words: The same problem may have multiple incidents. To show that, I will open another terminal and do again a select against the table t, while still tailing the alert log from the first session.

Exception [type: SIGSEGV, Address not mapped to object] [ADDR:0x0] [PC:0x90D891A, qcstda()+702] [flags: 0x

ORA-07445: exception encountered: core dump [qcstda()+702] [SIGSEGV] [ADDR:0x0] [PC:0x90D891A] [Address no Incident details in: /u01/app/oracle/diag/rdbms/orcl/orcl/incident/incdir_6201/orcl_ora_2299_i6201.trc

Errors in file /u01/app/oracle/diag/rdbms/orcl/orcl/trace/orcl ora 2299.trc (incident=6201):

Second terminal:

```
[oracle@uhesse ~]$ sqlplus adam/adam

SQL*Plus: Release 11.2.0.2.0 Production on Wed Jun 1 10:21:52 2011

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Connected to:
Oracle Database 11g Enterprise Edition Release 11.2.0.2.0 - 64bit Production With the Partitioning, OLAP, Data Mining and Real Application Testing options

SQL> select * from t where n=42;
select * from t where n=42

*

ERROR at line 1:
ORA-03113: end-of-file on communication channel Process ID: 2299
Session ID: 36 Serial number: 11

First terminal:
```

```
See Note 411.1 at My Oracle Support for error and packaging details.
2011-06-01 10:22:11.135000 +02:00

Dumping diagnostic data in directory=[cdmp_20110601102211], requested by (instance=1, osid=2299), summary=
2011-06-01 10:22:13.370000 +02:00

Sweep [inc][6201]: completed

Sweep [inc2][6201]: completed
```

I have seen the second incident recorded. I exit out of the tail -f with CTRL+C and continue:

adrci> show problem

So I have one problem with the ID 1 and the last incident occurred at 10:22. Are there more?

adrci> show incident

SUSPECT_COMPONENT SUSPECT_SUBCOMPONENT

I want to see some more detail about the incidents:

```
adrci> show incident -mode detail -p "incident id=6201"
```

```
ADR Home = /u01/app/oracle/diag/rdbms/orcl/orcl:
                                         ********
********************
INCIDENT INFO RECORD 1
*******************
  INCIDENT_ID
  STATUS
  CREATE_TIME
                            2011-06-01 10:22:08.924000 +02:00
  PROBLEM ID
  CLOSE_TIME
  FLOOD_CONTROLLED
                            none
  ERROR_FACILITY
                            ORA
  ERROR NUMBER
                            7445
  ERROR_ARG1
                            qcstda()+702
  ERROR_ARG2
                            SIGSEGV
  ERROR_ARG3
                            ADDR:0x0
  ERROR_ARG4
                            PC:0x90D891A
  ERROR_ARG5
                            Address not mapped to object
  ERROR_ARG6
  ERROR ARG7
  ERROR ARG8
  ERROR ARG9
  ERROR_ARG10
  ERROR_ARG11
  ERROR ARG12
  SIGNALLING COMPONENT
                            SQL_Parser
  SIGNALLING_SUBCOMPONENT
```

```
FCTD
   IMPACTS
   PROBLEM KEY
                                  ORA 7445 [qcstda()+702]
   FIRST INCIDENT
                                  6153
   FIRSTINC TIME
                                  2011-06-01 10:18:42.995000 +02:00
   LAST INCIDENT
   LASTINC TIME
                                  2011-06-01 10:22:08.924000 +02:00
   IMPACT1
                                  0
   IMPACT2
                                  a
   IMPACT3
                                  0
   IMPACT4
                                  0
   KEY NAME
                                  ProcId
   KEY VALUE
                                  25.3
   KEY NAME
                                  Client ProcId
                                  oracle@uhesse (TNS V1-V3).2299 140262306875136
   KEY_VALUE
   KEY_NAME
   KEY_VALUE
                                  (0, 1306916528)
   KEY_NAME
                                  SID
   KEY_VALUE
                                  36.11
   OWNER_ID
                                  1
   INCIDENT FILE
                                  /u01/app/oracle/diag/rdbms/orcl/orcl/trace/orcl_ora_2299.trc
   OWNER ID
   INCIDENT_FILE
                                  /u01/app/oracle/diag/rdbms/orcl/orcl/incident/incdir_6201/orcl_ora_2299_i
1 rows fetched
```

I want to look at the incident tracefile mentioned above:

```
adrci> show trace /u01/app/oracle/diag/rdbms/orcl/orcl/incident/incdir_6201/orcl_ora_2299_i6201.trc
/u01/app/oracle/diag/rdbms/orcl/orcl/incident/incdir_6201/orcl_ora_2299_i6201.trc
 LEVEL PAYLOAD
Dump file /u01/app/oracle/diag/rdbms/orcl/orcl/incident/incdir_6201/orcl_ora_2299_i6201.trc
 Oracle Database 11g Enterprise Edition Release 11.2.0.2.0 - 64bit Production
With the Partitioning, OLAP, Data Mining and Real Application Testing options
ORACLE_HOME = /u01/app/oracle/product/11.2.0/db_1
 System name:
              Linux
 Node name:
                 uhesse
 Release: 2.6.32-100.28.5.el6.x86_64
Version: #1 SMP Wed Feb 2 18:40:23 EST 2011
Machine: x86 64
 Instance name: orcl
 Redo thread mounted by this instance: 1
Oracle process number: 25
Unix process pid: 2299, image: oracle@uhesse (TNS V1-V3)
*** 2011-06-01 10:22:08.929
 *** SESSION ID:(36.11) 2011-06-01 10:22:08.929
 *** CLIENT ID:() 2011-06-01 10:22:08.929
 *** SERVICE NAME:(SYS$USERS) 2011-06-01 10:22:08.929
 *** MODULE NAME:(SQL*Plus) 2011-06-01 10:22:08.929
 *** ACTION NAME:() 2011-06-01 10:22:08.929
Dump continued from file: /u01/app/oracle/diag/rdbms/orcl/orcl/trace/orcl_ora_2299.trc
      ***** Error Stack *****
 ORA-07445: exception encountered: core dump [qcstda()+702] [SIGSEGV] [ADDR:0x0] [PC:0x90D891A] [Address n
     1<
        ***** Beginning of Customized Incident Dump(s) *****
 2>
        ***** Beginning of Customized Incident Dump(s) *****
 2>
 Exception [type: SIGSEGV, Address not mapped to object] [ADDR:0x0] [PC:0x90D891A, qcstda()+702] [flags: 0
 Registers:
 %rax: 0x00000000000000000 %rbx: 0x00007f915c77f0e0 %rcx: 0x0000000000000000
 %rdx: 0x00000000000000000 %rdi: 0x00007f915c77be98 %rsi: 0x0000000000000000
 %rsp: 0x00007fffc65178e0 %rbp: 0x00007fffc6517960 %r8: 0x0000000000000028
 %r9: 0x0000000000002000 %r10: 0x00000000093849c0 %r11: 0x000000000000168
 %r12: 0x00007f915c77ade8 %r13: 0x000000008edbb178 %r14: 0x00007f915c777da0
%r15: 0x00007f915c77ae28 %rip: 0x0000000090d891a %efl: 0x000000000010246
 qcstda()+686 (0x90d890a) mov -0x40(%rbp),%rdi
 qcstda()+690 (0x90d890e) mov %rdx,0x18(%rbx)
 qcstda()+694 (0x90d8912) mov 0x60(%r15),%rsi
 qcstda()+698 (0x90d8916) mov %ecx,0x8(%r15)
 > qcstda()+702 (0x90d891a) mov %ecx,(%rsi)
 qcstda()+704 (0x90d891c) mov 0x78(%rdi),%rdx
```

3. Creation of Packages & ZIP files to send to Oracle Support

I may not be able to solve the problem myself. Oracle Support will help me with that one. I gather all the required information with a method called "Incident Packaging Service" (IPS):

```
adrci> ips create package problem 1 correlate all
  Created package 2 based on problem id 1, correlation level all
```

This did not yet create a ZIP file and is therefore referred to as "Logical Package". The ZIP file is *generated* from the Logical Package that was *created*:

```
adrci> ips generate package 2 in "/home/oracle"
Generated package 2 in file /home/oracle/ORA7445qc_20110601112533_COM_1.zip, mode complete
```

4. Managing, especially purging of tracefiles

Now to the management of tracefiles. You may notice that 11g creates lots of tracefiles that need to be purged from time to time. In fact, this is done automatically, but you may want to change the default purge policy:

```
adrci> show tracefile -rt
01-JUN-11 10:31:48 diag/rdbms/orcl/orcl/trace/orcl mmon 2106.trc
 01-JUN-11 09:43:43 diag/rdbms/orcl/orcl/trace/orcl ckpt 2100.trc
 01-JUN-11 09:22:13 diag/rdbms/orcl/orcl/trace/alert_orcl.log
 01-JUN-11 09:22:11 diag/rdbms/orcl/orcl/trace/orcl_diag_2088.trc
 01-JUN-11 09:22:10 diag/rdbms/orcl/orcl/trace/orcl_ora_2299.trc
 01-JUN-11 09:22:10 diag/rdbms/orcl/orcl/incident/incdir_6201/orcl_ora_2299_i6201.trc
 01-JUN-11 09:18:47 diag/rdbms/orcl/orcl/trace/orcl_ora_2236.trc
 01-JUN-11 09:18:47 diag/rdbms/orcl/orcl/incident/incdir_6153/orcl_ora_2236_i6153.trc
 01-JUN-11 09:17:19 diag/rdbms/orcl/orcl/trace/orcl dbrm 2090.trc
 01-JUN-11 09:16:44 diag/rdbms/orcl/orcl/trace/orcl_j002_2210.trc
 01-JUN-11 09:16:30 diag/rdbms/orcl/orcl/trace/orcl_ora_2187.trc
 01-JUN-11 09:16:19 diag/rdbms/orcl/orcl/trace/orcl_mman_2094.trc
 01-JUN-11 09:16:16 diag/rdbms/orcl/orcl/trace/orcl_vktm_2082.trc
                    diag/rdbms/orcl/orcl/trace/orcl_ora_2016.trc
 01-JUN-11 09:16:14
 30-MAY-11 14:07:02 diag/rdbms/orcl/orcl/trace/orcl_mmon_2093.trc
 30-MAY-11 11:15:30 diag/rdbms/orcl/orcl/trace/orcl_ora_3414.trc
 30-MAY-11 11:00:01 diag/rdbms/orcl/orcl/trace/orcl_j000_2245.trc
 30-MAY-11 10:56:58 diag/rdbms/orcl/orcl/trace/orcl_dbrm_2077.trc
 30-MAY-11 10:56:20 diag/rdbms/orcl/orcl/trace/orcl_j002_2201.trc
 30-MAY-11 10:56:06
                    diag/rdbms/orcl/orcl/trace/orcl_ora_2178.trc
                    diag/rdbms/orcl/orcl/trace/orcl_mman_2081.trc
 30-MAY-11 10:55:58
 30-MAY-11 10:55:55
                    diag/rdbms/orcl/orcl/trace/orcl_vktm_2069.trc
 30-MAY-11 10:55:53 diag/rdbms/orcl/orcl/trace/orcl_ora_2006.trc
 27-MAY-11 10:53:25 diag/rdbms/orcl/orcl/trace/orcl_mmon_8589.trc
 27-MAY-11 10:17:05 diag/rdbms/orcl/orcl/trace/orcl ora 11390.trc
 27-MAY-11 09:26:41 diag/rdbms/orcl/orcl/trace/orcl_ora_10739.trc
 27-MAY-11 09:23:53 diag/rdbms/orcl/orcl/trace/orcl_dbrm_8573.trc
 27-MAY-11 09:22:58 diag/rdbms/orcl/orcl/trace/orcl_ora_8687.trc
 27-MAY-11 09:22:54
                    diag/rdbms/orcl/orcl/trace/orcl_mman_8577.trc
 27-MAY-11 09:22:50
                    diag/rdbms/orcl/orcl/trace/orcl_vktm_8565.trc
 27-MAY-11 09:22:48 diag/rdbms/orcl/orcl/trace/orcl_ora_8516.trc
 27-MAY-11 09:22:44 diag/rdbms/orcl/orcl/trace/orcl_ora_8515.trc
 27-MAY-11 09:22:44 diag/rdbms/orcl/orcl/trace/orcl_vktm_8347.trc
```

```
diag/rdbms/orcl/orcl/trace/orcl_ora_8470.trc
27-MAY-11 09:20:29
27-MAY-11 09:20:28
                  diag/rdbms/orcl/orcl/trace/orcl mmon 8371.trc
27-MAY-11 09:20:28
                  diag/rdbms/orcl/orcl/trace/orcl ora 8381.trc
27-MAY-11 09:20:26
                  diag/rdbms/orcl/orcl/trace/orcl_mman_8359.trc
27-MAY-11 09:20:20 diag/rdbms/orcl/orcl/trace/orcl_ora_8299.trc
27-MAY-11 09:20:15 diag/rdbms/orcl/orcl/trace/orcl_ora_8297.trc
27-MAY-11 09:20:15 diag/rdbms/orcl/orcl/trace/orcl_vktm_8096.trc
                  diag/rdbms/orcl/orcl/trace/orcl_ora_8296.trc
27-MAY-11 09:20:07
                  diag/rdbms/orcl/orcl/trace/orcl_ora_8285.trc
27-MAY-11 09:19:42
27-MAY-11 09:19:33
                   diag/rdbms/orcl/orcl/trace/orcl_dm00_8271.trc
27-MAY-11 09:19:33
                   diag/rdbms/orcl/orcl/trace/orcl_dw00_8273.trc
                  diag/rdbms/orcl/orcl/trace/orcl_dbrm_8104.trc
27-MAY-11 09:19:11
27-MAY-11 09:18:53
                  diag/rdbms/orcl/orcl/trace/orcl_ora_8267.trc
                  diag/rdbms/orcl/orcl/trace/orcl_j001_8237.trc
27-MAY-11 09:18:33
27-MAY-11 09:18:26
                   diag/rdbms/orcl/orcl/trace/orcl_mmon_8219.trc
27-MAY-11 09:18:23
                  diag/rdbms/orcl/orcl/trace/orcl_ora_8231.trc
                   diag/rdbms/orcl/orcl/trace/orcl_cjq0_8229.trc
27-MAY-11 09:18:22
27-MAY-11 09:18:16
                   diag/rdbms/orcl/orcl/trace/orcl_ora_8131.trc
27-MAY-11 09:18:14
                  diag/rdbms/orcl/orcl/trace/orcl_m000_8223.trc
27-MAY-11 09:18:13
                  diag/rdbms/orcl/orcl/trace/orcl_mman_8108.trc
27-MAY-11 09:18:05 diag/rdbms/orcl/orcl/trace/orcl_ora_8048.trc
27-MAY-11 09:17:59 diag/rdbms/orcl/orcl/trace/orcl_vktm_7920.trc
27-MAY-11 09:17:59 diag/rdbms/orcl/orcl/trace/orcl_ora_8046.trc
27-MAY-11 09:17:00 diag/rdbms/orcl/orcl/trace/orcl_mman_7932.trc
27-MAY-11 09:16:56 diag/rdbms/orcl/orcl/trace/orcl_ora_7954.trc
27-MAY-11 09:16:51 diag/rdbms/orcl/orcl/trace/orcl ora 7871.trc
```

I have already got some tracefiles. How long are they going to stay?

adrci> show control

The ordinary tracefiles will stay for 30 days (720 hours), while files like incident files stay one year (8760 hours) by default. We can change that policy with for example:

```
adrci> set control (SHORTP_POLICY = 360)
adrci> set control (LONGP_POLICY = 2190)
adrci> show control
ADR Home = /u01/app/oracle/diag/rdbms/orcl/orcl:
*************************
               SHORTP_POLICY
                              LONGP_POLICY LAST_MOD_TIME
ADRID
                                                                              ΙΔ
               -----
                              _____
1335663986
               360
                               2190
                                               2011-06-01 11:42:17.208064 +02:00
1 rows fetched
```

Also, we may want to purge tracefiles manually. Following command will manually purge all tracefiles older than 2 days (2880 minutes):

```
adrci> purge -age 2880 -type trace
adrci> show tracefile -rt
01-JUN-11 10:46:54 diag/rdbms/orcl/orcl/trace/orcl_mmon_2106.trc
01-JUN-11 09:43:43 diag/rdbms/orcl/orcl/trace/orcl_ckpt_2100.trc
01-JUN-11 09:22:13 diag/rdbms/orcl/orcl/trace/alert_orcl.log
01-JUN-11 09:22:11 diag/rdbms/orcl/orcl/trace/orcl_diag_2088.trc
01-JUN-11 09:22:10 diag/rdbms/orcl/orcl/incident/incdir_6201/orcl_ora_2299_i6201.trc
```

```
urug/ 1 uomo/ or cr/ or cr/ cr ucc/ or cr or u 2200 cr
01-JUN-11 09:18:47 diag/rdbms/orcl/orcl/incident/incdir_6153/orcl_ora_2236_i6153.trc
01-JUN-11 09:18:47 diag/rdbms/orcl/orcl/trace/orcl_ora_2236.trc
01-JUN-11 09:17:19 diag/rdbms/orcl/orcl/trace/orcl dbrm 2090.trc
01-JUN-11 09:16:44 diag/rdbms/orcl/orcl/trace/orcl_j002_2210.trc
01-JUN-11 09:16:30 diag/rdbms/orcl/orcl/trace/orcl_ora_2187.trc
01-JUN-11 09:16:19 diag/rdbms/orcl/orcl/trace/orcl_mman_2094.trc
01-JUN-11 09:16:16 diag/rdbms/orcl/orcl/trace/orcl_vktm_2082.trc
01-JUN-11 09:16:14
                   diag/rdbms/orcl/orcl/trace/orcl_ora_2016.trc
30-MAY-11 14:07:02 diag/rdbms/orcl/orcl/trace/orcl_mmon_2093.trc
30-MAY-11 11:15:30 diag/rdbms/orcl/orcl/trace/orcl ora 3414.trc
30-MAY-11 11:00:01 diag/rdbms/orcl/orcl/trace/orcl j000 2245.trc
30-MAY-11 10:56:58 diag/rdbms/orcl/orcl/trace/orcl_dbrm_2077.trc
30-MAY-11 10:56:20 diag/rdbms/orcl/orcl/trace/orcl_j002_2201.trc
                   diag/rdbms/orcl/orcl/trace/orcl ora 2178.trc
30-MAY-11 10:56:06
30-MAY-11 10:55:58 diag/rdbms/orcl/orcl/trace/orcl_mman_2081.trc
30-MAY-11 10:55:55 diag/rdbms/orcl/orcl/trace/orcl_vktm_2069.trc
30-MAY-11 10:55:53 diag/rdbms/orcl/orcl/trace/orcl_ora_2006.trc
```

Conclusion: With adrci, we have a new and efficient utility to deal with Oracle Errors – especially for collecting information to send them to Oracle Support. This functionality is called Incident Packaging Service. 11g is generating lots of tracefiles. We can control the purging policy of them with adrci. Finally, we can now tail -f our alert.log from any OS.

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