
DBA Best Practices

What should I do today?

Daniel A. Morgan



Oracle ACE Director



Consultant to Harvard University



University of Washington Oracle Instructor, ret.



The Morgan of Morgan's Library on the web



Board Member: Western Washington OUG

■ Upcoming Presentations

- Mar 28: Vancouver B.C.
- Apr 24: Benelux Connect (Netherlands)
- May 30-31: Harmony Finland
- Jun 1: Harmony Latvia

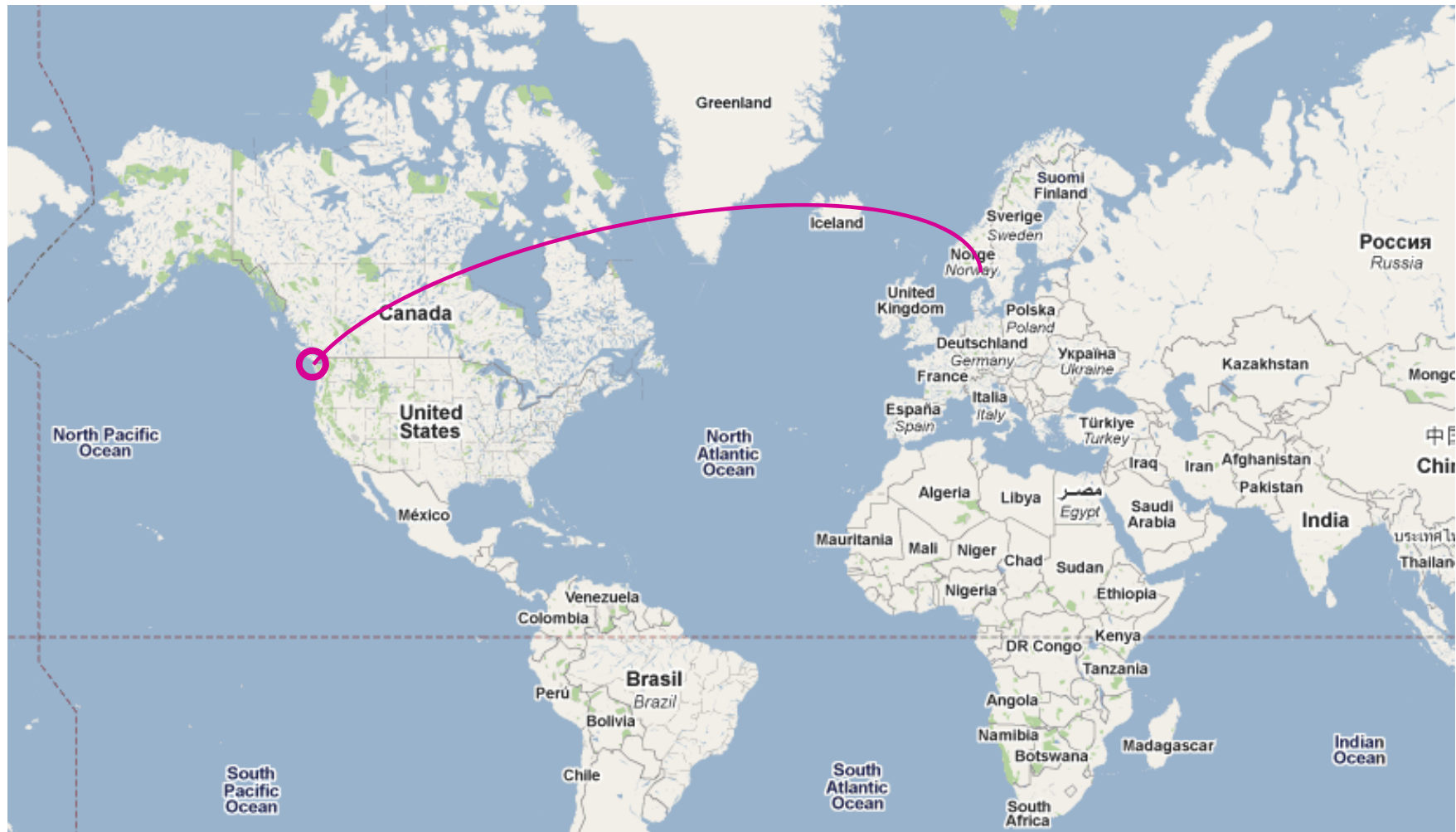


Official Beta Site
ORACLE
DATABASE **11g**

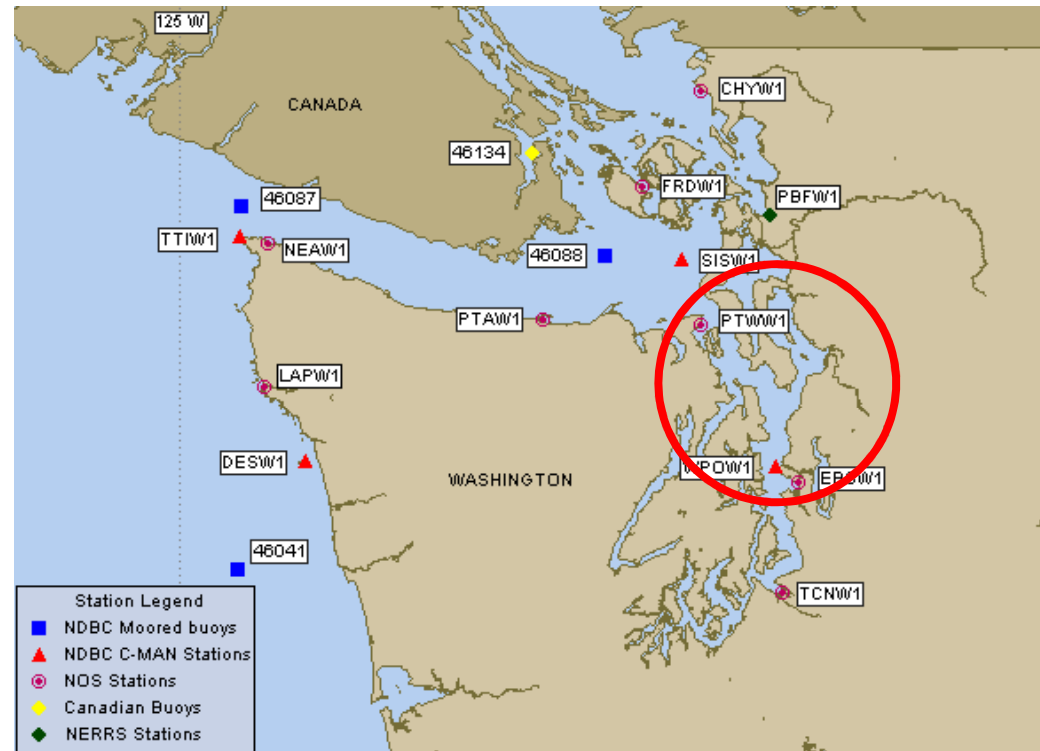
ORACLE
RAC SIG

International
zSeries
Oracle SIG

cd \$MORGAN_HOME



cd \$MORGAN_HOME



cd \$MORGAN_HOME



Morgan's Library: www.morganslibrary.org



Morgan's Library

[www](#) [library](#)

Morgan's 2010 - 2011 Calendar

May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr
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EMEA Harmony Conference

Tallinn, Estonia
May 20-21, 2010



A joint conference of the Estonian, Finnish, Latvian and Russian user groups
EMEA Harmony will focus on Technology, Middleware and BI
Featured speakers include Tom Kyte, Mogen Norgaard, Tanel Poder, and Dan Morgan





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Presentations Map



The Mad Dog ACE



Morgan



aboard USA-71

Training Events

-  [EMEA Harmony](#) - May 20 - 21, Tallinn, Estonia
-  [NoCOUG](#) - August 2010,
-  [AIOUG](#) Sep 3 - 4, Hyderabad, India
-  [OOOW](#) - Sep 19 - 23, San Francisco CA
-     [LAD Tour](#) - October
-  [DOAG](#) - Nov 16 - 18, Nurnberg, Germany
-  [UKOUG](#) - Nov 29 - Dec 1, Birmingham UK

Library News

- [Morgan's Notepad vi \(Blog\)](#) UPDATED
- [Join the Western Washington OUG](#)
- [Morgan's Oracle Podcast](#)
- [DBA Best Practice Guidelines](#)
- [Bryn Llewellyn's PL/SQL White Paper](#)
- [Bryn Llewellyn's Editioning White Paper](#)
- [Troubleshooting Performance](#)

Oracle Events



[EMEA Harmony - Tallinn Estonia - May 20-21](#)

ACE News

 Would you like to become an Oracle ACE? 

Learn more about becoming an ACE



- [ACE Directory](#)
- [ACE Google Map](#)
- [ACE Nomination Form](#)
- [Stanley's Blog](#)

Larry's Sled



My Sled



OUGN's Sled



Syllabus

- What happened the last time I was here?
- What should I do today?
- What should I know (about my database)?
- Oracle's Database "Bug" of the Year 2011?

What happened
the last time
I was here?

USIT: 19 April 2010



Monday 19 April 2010 at OSL



OSL: A busy international transportation hub



Thank you

17:44

Time	Flight	Gate	Destination	Status
0630	DY1800		Malaga	
1710	BLX692	46	Goteborg	Gate closed
1710	SK811		London/Heathrow	Cancelled
1715	SK841		Zurich	Cancelled
1715	AY660		Helsinki	Cancelled
1720	QI4796		Bilund	Cancelled
1725	DY1494		Paris/Orly	Cancelled
1725	KL1148		Amsterdam	Cancelled
1725	KQ1148		Amsterdam	Cancelled
1730	SK461		Kobenhavn	Cancelled
1740	DY1866		Pisa	Cancelled
1750	DY3232		Kobenhavn	Cancelled
1805	LH3145		Munchen	Cancelled
1805	SK3681		Munchen	Cancelled
1805	SK1465		Kobenhavn	Cancelled
1810	DY1306		London/Gatwick	Cancelled
1815	DY1978		Beograd	Cancelled
1820	SK1484	36	Stockholm	
1825	DY1108		Berlin/Schoenef	Cancelled
1825	BA8272		Aarhus	Cancelled
1830	DY3774		Stockholm	Cancelled
1845	FI325	46	Reykjavik	New time 1925
1855	SK3621		Frankfurt	Cancelled
1855	LH3135		Frankfurt	Cancelled
1855	SK6616	39	Helsinki	
1855	KF506	39	Helsinki	
1900	SK463		Kobenhavn	Cancelled
1905	DY1256		Amsterdam	Cancelled
1915	TP509		Lisboa	Cancelled
1915	DY1132		Dusseldorf	Cancelled
1920	WF336		Goteborg	Cancelled
1920	DY1352		Edinburgh	Cancelled
1920	SK3192		Goteborg	Cancelled
1920	QI4798		Bilund	Cancelled

Time	Flight	Gate	Destination	Status
1930	DY990		Bilund	Cancelled
1935	DY934		Kobenhavn	Cancelled
1940	KL1150		Amsterdam	Cancelled
1945	LX1217		Zurich	Cancelled
1950	SK8416		Tallinn	Cancelled
1950	OV138		Tallinn	Cancelled
2010	QI5742		Aalborg	Cancelled
2015	SK815		London/Heathrow	Cancelled
2025	DY2028		Warszawa	Cancelled
2035	SK1475		Kobenhavn	Cancelled
2055	BA769		London/Heathrow	Cancelled
2055	LH3155		Hamburg	Cancelled
2055	SK3651		Hamburg	Cancelled
2100	BT154		Riga	Cancelled
2100	SK9624		Riga	Cancelled
2100	DY3782		Stockholm	Cancelled
2120	SK1488		Stockholm	Cancelled

Thank you



Fun things to do in Iceland ... take a tour

Home Tours Find Why Touris Photo Gallery Videos

Tuesday, April 20, 2010

TOURIS tour booking - Step 1

Search

Top Packages



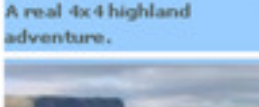
The Full Circle Express.



Grand tour around Iceland including the Westfjords.



A real 4x4 highland adventure.



South Iceland at leisure.

Explore



::Tour Information

Tour: TT45
Volcano in Action - This tour is currently not available !

Season: All year
Departures: Daily
Departure times: 17:30
Duration: 6,5

Price info:
- Adults: € 55,00
- Age 12-17: € 27,50
- Age 3-11: € 0,00
- Age 0-2: € 0,00

* All prices are per person.
* Please select your details here to the right and click next to determine your total price.

Included in the price:
- Bus tour with English speaking guidance

::Your details

Date of tour:

Adults:

Youth (12-17):

Children (3-11):

Infants (0-2):

Comments or special wishes:

Top Day Tours



Gullfoss Geyser.



Northern Lights Mystery.



Blue Lagoon.



Reykjavik City Sightseen.



The South Coast and the Jokulsarlon Glacial Lagoon.

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MasterCard WEB PAYMENTS Travel Agency

What Greenland is supposed to look like in April



What Greenland also looks like in April



More of Central Greenland in April



6 Months Later

14 October 2010 Last updated at 03:34 GMT

Celebrations as last trapped Chile miner is rescued



The capsule carrying Luis Urzua emerged to cheers, songs and applause

The last of the 33 miners trapped deep underground in northern Chile for more than two months has been rescued.

What Should I Do Today?

How do DBAs learn to do their job?

- University
 - Books
 - Technical Journals
 - Oracle Magazine
 - Websites
-
- How do physicians and surgeons know what to do?
 - Accountants?
 - Engineers?
 - Lawyers?
 - Pharmacists?

Alert Log Review (1 of 2)

- Keyword search for "ORA-", "Warning" and "Error"

```
Wed Apr 20 13:17:34 2011
Errors in file C:\ORACLE\diag\rdbms\orabase\orabase\trace\orabase_ckpt_13076.trc:
ORA-00206: error in writing (block 3, # blocks 1) of control file
ORA-00202: control file: 'C:\ORACLE\FAST_RECOVERY_AREA\ORABASE\CONTROL02.CTL'
ORA-27072: File I/O error
OSD-04008: WriteFile() failure, unable to write to file
O/S-Error: (OS 33) The process cannot access the file because another process has locked a portion of the file.
Errors in file C:\ORACLE\diag\rdbms\orabase\orabase\trace\orabase_ckpt_13076.trc:
ORA-00221: error on write to control file
ORA-00206: error in writing (block 3, # blocks 1) of control file
ORA-00202: control file: 'C:\ORACLE\FAST_RECOVERY_AREA\ORABASE\CONTROL02.CTL'
ORA-27072: File I/O error
OSD-04008: WriteFile() failure, unable to write to file
O/S-Error: (OS 33) The process cannot access the file because another process has locked a portion of the file.

Tue Jan 18 18:20:18 2011
Create controlfile reuse set database "orabase"
MAXINSTANCES 8
MAXLOGHISTORY 1
MAXLOGFILES 16
MAXLOGMEMBERS 3
MAXDATAFILES 100
Datafile
'C:\oracle\oradata\orabase\SYSTEM01.DBF',
'C:\oracle\oradata\orabase\SYSAUX01.DBF',
'C:\oracle\oradata\orabase\UNDOTBS01.DBF',
'C:\oracle\oradata\orabase\USERS01.DBF'
LOGFILE GROUP 1 ('C:\oracle\oradata\orabase\redo01.log') SIZE 51200K,
GROUP 2 ('C:\oracle\oradata\orabase\redo02.log') SIZE 51200K,
GROUP 3 ('C:\oracle\oradata\orabase\redo03.log') SIZE 51200K RESETLOGS
WARNING: Default Temporary Tablespace not specified in CREATE DATABASE command
Default Temporary Tablespace will be necessary for a locally managed database in future release
```

Alert Log Review (2 of 2)

■ Search for Obsolete Startup Parameters

```
Sat May 13 09:17:34 2011
Starting up:
Oracle Database 11g Enterprise Edition Release 11.2.0.1.0 - Production
With the Partitioning, OLAP, Data Mining and Real Application Testing options.
Using parameter settings in server-side spfile C:\ORACLE\PRODUCT\11.2.0\DB_1\DATABASE\SPFILEORABASE.ORA
System parameters with non-default values:
  processes                           = 150
  memory_target                       = 1232M
  control_files                       = "C:\ORACLE\ORADATA\ORABASE\CONTROL01.CTL"
  control_files                       = "C:\ORACLE\FLASH_RECOVERY_AREA\ORABASE\CONTROL02.CTL"
  db_block_size                       = 8192
  compatible                          = "11.2.0.0.0"
  db_recovery_file_dest               = "C:\oracle\flash_recovery_area"
  db_recovery_file_dest_size          = 3852M
  undo_tablespace                     = "UNDOTBS1"
  remote_login_passwordfile           = "EXCLUSIVE"
  db_domain                           = ""
  dispatchers                        = "(PROTOCOL=TCP) (SERVICE=orabaseXDB)"
  audit_file_dest                     = "C:\ORACLE\ADMIN\ORABASE\ADUMP"
  audit_trail                         = "DB"
  db_name                             = "orabase"
  open_cursors                        = 300
  parallel_automatic_tuning           = TRUE
  diagnostic_dest                     = "C:\ORACLE"
Deprecated system parameters with specified values:
  parallel_automatic_tuning
End of deprecated system parameter listing
```

Block Level Corruption

- Alert Log
- v\$database_block_corruption
- DBMS_DBVERIFY
- DBV Utility

```
SQL> SELECT * FROM v$database_block_corruption where rownum = 1;
```

FILE#	BLOCK#	BLOCKS	CORRUPTION_CHANGE#	CORRUPTION
22	162844	4	10594075667556	CORRUPT

```
SQL> select tablespace_name, file_name
2 from dba_data_files
3 where file_id = 22;
```

TABLESPACE_NAME	FILE_NAME
EXAMPLE	C:\ORACLE\ORADATA\ORABASE\EXAMPLE01.DBF

```
SQL> select owner, segment_name
2 from dba_extents
3 where file_id = 22
4 and block_id between 62844 and 62848;
```

OWNER	SEGMENT_NAME
UWCLASS	DBA_ARGS

- RMAN> RECOVER CORRUPTION LIST;

Verify Backup Quality

- Do you have (a usable) backup?
 - RMAN
 - Snap and Clone
- Can you restore and recover?
 - v\$backup_corruption
 - v\$copy_corruption
 - **RMAN> BACKUP VALIDATE CHECK LOGICAL;**

Backup Quality Verification

```
SELECT start_time, end_time, status
FROM v$rman_backup_job_details
ORDER BY 1;
```

03-FEB-2011	12:15:05	03-FEB-2011	14:05:17	COMPLETED
03-FEB-2011	18:04:46	03-FEB-2011	19:44:57	COMPLETED
04-FEB-2011	00:05:56			FAILED
04-FEB-2011	02:00:54	04-FEB-2011	03:30:21	COMPLETED
04-FEB-2011	08:01:03	04-FEB-2011	09:27:16	COMPLETED
04-FEB-2011	14:09:03	04-FEB-2011	15:09:35	COMPLETED
04-FEB-2011	20:03:17	05-FEB-2011	00:46:34	COMPLETED WITH ERRORS
05-FEB-2011	02:01:54	05-FEB-2011	03:05:00	COMPLETED
05-FEB-2011	08:01:49	05-FEB-2011	09:16:59	COMPLETED
05-FEB-2011	08:36:15	05-FEB-2011	08:37:47	COMPLETED
05-FEB-2011	14:01:35	05-FEB-2011	15:31:33	COMPLETED
05-FEB-2011	20:01:23	05-FEB-2011	22:05:26	COMPLETED WITH ERRORS
06-FEB-2011	02:03:05	06-FEB-2011	03:37:16	COMPLETED
06-FEB-2011	08:02:56	06-FEB-2011	09:24:00	COMPLETED
06-FEB-2011	14:07:53	06-FEB-2011	15:12:10	COMPLETED
06-FEB-2011	20:01:50	06-FEB-2011	21:06:41	FAILED
07-FEB-2011	02:01:42	07-FEB-2011	03:16:17	COMPLETED
07-FEB-2011	08:02:35	07-FEB-2011	09:43:35	COMPLETED
07-FEB-2011	14:03:12	07-FEB-2011	15:14:44	COMPLETED
07-FEB-2011	20:03:56			FAILED
08-FEB-2011	02:04:27	08-FEB-2011	03:24:14	COMPLETED
08-FEB-2011	08:04:43	08-FEB-2011	09:44:53	COMPLETED
08-FEB-2011	08:37:11	08-FEB-2011	08:38:28	COMPLETED
08-FEB-2011	14:05:53	08-FEB-2011	15:52:53	COMPLETED
08-FEB-2011	20:04:20	08-FEB-2011	22:19:13	FAILED
09-FEB-2011	02:05:12	09-FEB-2011	04:15:11	COMPLETED
09-FEB-2011	08:07:40	09-FEB-2011	10:15:32	COMPLETED
09-FEB-2011	14:06:40	09-FEB-2011	15:17:38	COMPLETED
09-FEB-2011	20:05:35	09-FEB-2011	21:47:53	FAILED
10-FEB-2011	02:06:13	10-FEB-2011	03:46:37	COMPLETED
10-FEB-2011	08:06:56	10-FEB-2011	09:44:15	COMPLETED
10-FEB-2011	08:44:16	10-FEB-2011	08:45:33	COMPLETED
10-FEB-2011	14:06:14	10-FEB-2011	15:46:15	COMPLETED
10-FEB-2011	20:07:30	10-FEB-2011	21:54:22	FAILED
11-FEB-2011	00:53:58	11-FEB-2011	03:07:22	COMPLETED
11-FEB-2011	06:53:31	11-FEB-2011	08:32:46	COMPLETED

Have you backed up everything?

- SPFILE
 - v\$backup_spfile_details
- Control file
 - v\$backup_controlfile_details
- Password file
- dot ORA files
 - listener.ora
 - sqlnet.ora
 - tnsnames.ora
- ASM
- Clusterware
 - OCR
 - Voting Disk

Invalid Objects

- Invalid PL/SQL Objects

```
SQL> select owner, object_type, object_name
2   from dba_objects
3  where status = 'INVALID'
4  order by 1,2,3;
```

OWNER	OBJECT_TYPE	OBJECT_NAME
GLOBAL	VIEW	CHANNEL_DIMVIEW
GLOBAL	VIEW	CUSTOMER_DIMVIEW
GLOBAL	VIEW	PRODUCT_DIMVIEW
GLOBAL	VIEW	TIME_DIMVIEW
GLOBAL	VIEW	UNITS_CUBE_CUBEVIEW
MLIB	PROCEDURE	ALLCBLAST
MLIB	PROCEDURE	ALLEBLAST
MLIB	PROCEDURE	CBLAST
MLIB	PROCEDURE	CLEAN_LIST
MLIB	PROCEDURE	EBLAST
MLIB	PROCEDURE	VANCBLAST
MLIB	PROCEDURE	VANEBLAST
UWCLASS	PACKAGE BODY	INDEX_UTIL
UWCLASS	PACKAGE BODY	UTL_SPADV

```
SQL> alter procedure mlib.allcblast compile;
Warning: Procedure altered with compilation errors.
```

```
SQL> sho err
```

```
Errors for PROCEDURE MLIB.ALLCBLAST:
```

LINE/COL	ERROR
26/7	PL/SQL: Statement ignored
26/7	PLS-00201: identifier 'SYS.DBMS_LOCK' must be declared

Invalid Objects

- Invalid Indexes

```
SQL> select owner, index_name, index_type
2   from dba_indexes
3   where status not in ('VALID', 'N/A')
4   order by 1,3,2;
```

OWNER	INDEX_NAME	INDEX_TYPE
-----	-----	-----
GSM_DH	ERC_PATH_HR_IDX	NORMAL
GSM_DH	NOK_PATH_HR_IDX	NORMAL
GSM_DH	NOR_PATH_HR_IDX	NORMAL
GSM_DH	SIE_PATH_HR_IDX	NORMAL
KC4983	LOCATION_SPATIAL_IDX	DOMAIN
KC4983	SYS_C0021882	NORMAL
UMTS_DH	ERC_BBP_NODEB_KPI_IDX	NORMAL
UMTS_DH	ERC_CELL_1030_IDX	NORMAL
UMTS_DH	ERC_CELL_DH_IDX	NORMAL
UMTS_DH	ERC_CELL_KPI_IDX_BACKUP	NORMAL
UMTS_DH	ERC_SECTOR_1030_IDX	NORMAL
UMTS_DH	ERC_SECTOR_DH_IDX	NORMAL
UMTS_DH	ERC_SECTOR_KPI_IDX_BACKUP	NORMAL

Invalid Objects

- Objects in debug mode
 - Thanks to Toad, PLSQL Developer, and similar tools

```
SQL> select owner, type, name
       2 from dba_plsql_object_settings
       3 where plsql_debug = 'TRUE'
       4 order by 1,2,3;
```

OWNER	TYPE	NAME
E911_NATIONAL_REPORTING	TYPE	TYP_HANDSET_INTRADO
E911_NATIONAL_REPORTING	TYPE	TYP_HANDSET_TCS
E911_NATIONAL_REPORTING	TYPE BODY	TYP_HANDSET_INTRADO
E911_NATIONAL_REPORTING	TYPE BODY	TYP_HANDSET_TCS
JW430N	PROCEDURE	CHECKERICMAPPING
JW430N	PROCEDURE	CREATE_ERIC_MAPPING
KG449W	PACKAGE	BULK_GATHER_V2
KG449W	PACKAGE	BULK_GATHER_V2_STAGE
KG449W	PACKAGE	CELLTRAFFICDATA
KG449W	PACKAGE	LTE_BULK_ETL
KG449W	PACKAGE	QUERY_CODE_PKG
KG449W	PACKAGE BODY	BULK_GATHER_V2
KG449W	PACKAGE BODY	BULK_GATHER_V2_STAGE
KG449W	PACKAGE BODY	CELLTRAFFICDATA
KG449W	PACKAGE BODY	LTE_BULK_ETL
KG449W	PACKAGE BODY	QUERY_CODE_PKG
KG449W	PROCEDURE	CRC
KG449W	PROCEDURE	GEN_CELLTRAFFICDATA
KG449W	PROCEDURE	GEN_CONFIG_PARAM
KG449W	PROCEDURE	NOR_DEL
KG449W	PROCEDURE	VENDORS
M62085	FUNCTION	ADDARR

Invalid Objects

- Objects compiled with the wrong optimizer mode

```
SQL> select owner, type, name, plsql_optimize_level
  2   from dba_plsql_object_settings
  3  where plsql_optimize_level is not null
  4    and plsql_optimize_level <> 2
  5  order by 1,2,3;
```

OWNER	TYPE	NAME	PLSQL_OPTIMIZE_LEVEL
AIRCOM	TYPE	ALARM_VIEW_ALL_SC_TAB	1
AIRCOM	TYPE	ALARM_VIEW_ALL_T	1
GLOBAL	PROCEDURE	CUSTOM_GRANT	1
GLOBAL	PROCEDURE	REVOKE_GRANT	1
KG449W	PACKAGE	BULK_GATHER_V2	1
KG449W	PACKAGE	BULK_GATHER_V2_STAGE	1
KG449W	PACKAGE	CELLTRAFFICDATA	1
KG449W	PACKAGE	LTE_BULK_ETL	1
KG449W	PROCEDURE	VENDORS	1
SYS	TYPE	SYS_VOID0000009056\$	1

Hung Resumable Sessions

- Do you have resumable transactions enabled?
 - Max Extents Reached
 - No More Space
 - Space Quota Exceeded

Object Type
Cluster
Index and Index [sub]Partition
LOB Partition and Segment
Table and Table [sub]Partition
Tablespace
Temp Segment
Undo Segment

```
SQL> SELECT user_id, session_id, status, timeout, name
2 FROM dba_resumable;
```

USER_ID	SESSION_ID	STATUS	TIMEOUT	NAME
90	150	NORMAL	1800	User UWCLASS(90), Session 150, Instance 1

```
SQL> SELECT user_id, session_id, status, timeout, start_time, suspend_time, error_number
2 FROM dba_resumable;
```

USER_ID	SESSION_ID	STATUS	TIMEOUT	START_TIME	SUSPEND_TIME	ERROR_NUMBER
90	150	SUSPENDED	1800	05/07/11 11:48:02	05/07/11 11:48:09	1653

```
SQL> SELECT user_id, session_id, status, suspend_time, sql_text
2 FROM dba_resumable;
```

USER_ID	STATUS	SUSPEND_TIME	SQL_TEXT
90	SUSPENDED	05/07/11 11:48:09	INSERT INTO FILL_SPACE (FIDCOL, STRCOL) VALUES (:B1 , RPAD('X', 999, 'X'))

Blocked Sessions

- Identify blocking sessions and determine how long they have been blocked

```
SQL> SELECT (  
2   SELECT username  
3   FROM gv$session  
4   WHERE sid=a.sid) blocker,  
5   a.sid, ' is blocking ', (  
6   SELECT username  
7   FROM gv$session  
8   WHERE sid=b.sid) blockee, b.sid  
9 FROM gv$lock a, gv$lock b  
10 WHERE a.block = 1  
11 AND b.request > 0  
12 AND a.id1 = b.id1  
13 AND a.id2 = b.id2;
```

BLOCKER	SID	'ISBLOCKING'	BLOCKEE	SID
TEST_LOADER_PROC	717	is blocking	TEST_LOADER_PROC	252
TEST_LOADER_PROC	717	is blocking	TEST_LOADER_PROC	1722

Surprise Restarts

- With RAC I am too often amazed to find that a node (instance) rebooted itself spontaneously, rejoined the cluster, and no one noticed

```
SQL> select inst_id, startup_time  
2   from gv$instance  
3* order by 1;
```

INST_ID	STARTUP_TIME
5	09-MAY-2011 21:32:36
6	06-MAY-2011 22:45:15
7	06-MAY-2011 22:50:19
8	12-MAY-2011 19:23:57
9	06-MAY-2011 23:02:11
10	06-MAY-2011 23:07:50

Log Switch Frequency (1 of 2)

```
SELECT TO_CHAR(first_time, 'MMDD') MMDD,  
TO_CHAR(SUM(DECODE(TO_CHAR(first_time, 'HH24'), '00', 1, 0)), '99') "00",  
TO_CHAR(SUM(DECODE(TO_CHAR(first_time, 'HH24'), '01', 1, 0)), '99') "01",  
TO_CHAR(SUM(DECODE(TO_CHAR(first_time, 'HH24'), '02', 1, 0)), '99') "02",  
TO_CHAR(SUM(DECODE(TO_CHAR(first_time, 'HH24'), '03', 1, 0)), '99') "03",  
TO_CHAR(SUM(DECODE(TO_CHAR(first_time, 'HH24'), '04', 1, 0)), '99') "04",  
TO_CHAR(SUM(DECODE(TO_CHAR(first_time, 'HH24'), '05', 1, 0)), '99') "05",  
TO_CHAR(SUM(DECODE(TO_CHAR(first_time, 'HH24'), '06', 1, 0)), '99') "06",  
TO_CHAR(SUM(DECODE(TO_CHAR(first_time, 'HH24'), '07', 1, 0)), '99') "07",  
TO_CHAR(SUM(DECODE(TO_CHAR(first_time, 'HH24'), '08', 1, 0)), '99') "08",  
TO_CHAR(SUM(DECODE(TO_CHAR(first_time, 'HH24'), '09', 1, 0)), '99') "09",  
TO_CHAR(SUM(DECODE(TO_CHAR(first_time, 'HH24'), '10', 1, 0)), '99') "10",  
TO_CHAR(SUM(DECODE(TO_CHAR(first_time, 'HH24'), '11', 1, 0)), '99') "11",  
TO_CHAR(SUM(DECODE(TO_CHAR(first_time, 'HH24'), '12', 1, 0)), '99') "12",  
TO_CHAR(SUM(DECODE(TO_CHAR(first_time, 'HH24'), '13', 1, 0)), '99') "13",  
TO_CHAR(SUM(DECODE(TO_CHAR(first_time, 'HH24'), '14', 1, 0)), '99') "14",  
TO_CHAR(SUM(DECODE(TO_CHAR(first_time, 'HH24'), '15', 1, 0)), '99') "15",  
TO_CHAR(SUM(DECODE(TO_CHAR(first_time, 'HH24'), '16', 1, 0)), '99') "16",  
TO_CHAR(SUM(DECODE(TO_CHAR(first_time, 'HH24'), '17', 1, 0)), '99') "17",  
TO_CHAR(SUM(DECODE(TO_CHAR(first_time, 'HH24'), '18', 1, 0)), '99') "18",  
TO_CHAR(SUM(DECODE(TO_CHAR(first_time, 'HH24'), '19', 1, 0)), '99') "19",  
TO_CHAR(SUM(DECODE(TO_CHAR(first_time, 'HH24'), '20', 1, 0)), '99') "20",  
TO_CHAR(SUM(DECODE(TO_CHAR(first_time, 'HH24'), '21', 1, 0)), '99') "21",  
TO_CHAR(SUM(DECODE(TO_CHAR(first_time, 'HH24'), '22', 1, 0)), '99') "22",  
TO_CHAR(SUM(DECODE(TO_CHAR(first_time, 'HH24'), '23', 1, 0)), '99') "23"  
FROM v$log_history  
GROUP BY TO_CHAR(first_time, 'MMDD')  
ORDER BY 1;
```

Log Switch Frequency (2 of 2)

MMDD	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
0609	16	11	9	8	8	10	12	8	8	10	8	10	14	10	11	15	15	8	12	8	7	6	9	7
0610	13	12	8	9	7	6	11	9	6	8	7	8	12	6	7	6	8	7	10	7	4	4	4	5
0611	12	8	5	9	9	7	11	7	6	7	8	5	12	9	10	8	9	12	12	10	6	6	9	8
0612	13	12	7	9	7	9	10	10	7	7	9	8	11	7	7	8	7	7	11	9	5	6	8	7
0613	12	11	7	8	8	7	13	7	9	7	8	7	13	10	9	8	8	8	11	8	7	5	7	6
0614	15	10	9	9	8	9	13	9	9	7	11	13	11	9	8	9	13	9	12	9	7	9	7	7
0615	15	10	10	8	10	9	12	8	9	8	9	7	13	6	8	7	7	7	15	10	7	7	7	5
0616	13	8	8	7	7	6	10	8	11	7	8	6	11	7	12	13	13	14	13	9	9	9	7	8
0617	15	13	10	9	8	9	16	8	8	10	9	10	16	11	10	10	8	11	13	8	9	9	7	9
0618	12	13	15	15	13	13	15	13	9	12	8	11	14	9	10	9	9	8	14	9	8	8	9	8
0619	16	11	10	11	9	9	13	12	10	9	12	12	17	8	9	9	11	11	14	9	9	11	10	12
0620	19	15	11	10	10	10	19	11	9	9	9	9	13	7	15	10	11	11	12	10	9	11	11	10
0621	13	16	11	9	10	13	16	8	14	9	11	12	17	10	10	11	8	11	14	8	11	14	8	11
0622	16	13	13	11	11	9	16	9	9	11	10	11	17	10	9	10	10	10	13	14	9	10	10	8
0623	19	13	12	13	13	11	16	12	11	11	11	11	16	9	10	13	2	14	14	8	9	8	8	8
0624	14	9	9	9	7	9	11	8	8	7	8	8	14	7	8	7	9	3	6	0	0	0	0	0

0630	7	4	23	19	9	10	5	6	7	17	19	17	15	17	15	43	40	32	17	15	14	20	13	15
0701	15	12	14	12	13	12	13	17	15	17	20	20	18	18	17	15	14	13	10	10	15	15	13	19
0702	21	22	20	18	14	14	12	13	11	11	14	14	14	10	9	10	9	10	11	9	11	9	10	12
0703	9	13	10	17	14	17	15	17	23	20	19	20	17	19	16	17	15	17	15	15	15	16	16	18
0704	22	19	19	18	16	15	13	13	14	11	13	10	12	14	10	12	14	11	9	11	12	13	12	9
0705	14	13	9	11	10	12	13	11	11	8	10	10	11	11	11	12	10	10	9	10	8	9	12	7
0706	14	15	11	12	9	15	13	12	12	9	12	14	12	12	12	12	13	11	8	9	12	13	2	0
0707	0	0	1	0	3	15	10	10	7	8	10	11	12	8	6	9	13	12	9	8	9	8	10	10
0708	16	9	8	15	10	11	9	8	8	14	9	10	10	8	8	14	15	10	9	9	8	9	10	10
0709	13	12	9	10	10	9	9	10	11	11	8	9	9	8	9	13	8	9	6	9	9	11	10	9
0710	12	10	9	10	9	12	9	8	8	11	7	10	11	9	9	13	10	9	8	9	11	12	10	10

What Should I Know About My Databases?

Actual Version (including patches)

```
SQL> DECLARE
  2  ver      VARCHAR2(100);
  3  compat  VARCHAR2(100);
  4  BEGIN
  5      dbms_utility.db_version(ver, compat);
  6      dbms_output.put_line('Version: ' || ver || ' Compatible: ' || compat);
  7  END;
  8  /
Version: 11.2.0.2.0 Compatible: 11.2.0.0.0

PL/SQL procedure successfully completed.
```

Installed Components

```
SQL> col comp_name format a40
SQL> SELECT comp_name, version, status
2 FROM dba_registry;
```

COMP_NAME	VERSION	STATUS
OWB	11.2.0.2.0	VALID
Oracle Application Express	3.2.1.00.11	VALID
Oracle Enterprise Manager	11.2.0.2.0	VALID
OLAP Catalog	11.2.0.2.0	VALID
Spatial	11.2.0.2.0	VALID
Oracle Multimedia	11.2.0.2.0	VALID
Oracle XML Database	11.2.0.2.0	VALID
Oracle Text	11.2.0.2.0	VALID
Oracle Expression Filter	11.2.0.2.0	VALID
Oracle Rules Manager	11.2.0.2.0	VALID
Oracle Workspace Manager	11.2.0.2.0	VALID
Oracle Database Catalog Views	11.2.0.2.0	VALID
Oracle Database Packages and Types	11.2.0.2.0	VALID
JServ Java Virtual Machine	11.2.0.2.0	VALID
Oracle XDK	11.2.0.2.0	VALID
Oracle Database Java Packages	11.2.0.2.0	VALID
OLAP Analytic Workspace	11.2.0.2.0	VALID
Oracle OLAP API	11.2.0.2.0	VALID

High Availability Options

- RAC
- Data Guard

```
SQL> select inst_id, instance_name, startup_time, status
2  from gv$instance
3  order by 1;
```

INST_ID	INSTANCE_NAME	STARTUP_TIME	STATUS
5	opm01p5	09-MAY-2011 21:32:36	OPEN
6	opm01p6	06-MAY-2011 22:45:15	OPEN
7	opm01p7	06-MAY-2011 22:50:19	OPEN
8	opm01p8	12-MAY-2011 19:23:57	OPEN
9	opm01p9	06-MAY-2011 23:02:11	OPEN
10	opm01p10	06-MAY-2011 23:07:50	OPEN

```
SQL> SELECT protection_mode, protection_level, remote_archive, database_role,
2  dataguard_broker, guard_status
FROM v$database;
```

PROTECTION_MODE	PROTECTION_LEVEL	REMOTE_A	DATABASE_ROLE	DATAGUAR	GUARD_S
MAXIMUM PERFORMANCE	UNPROTECTED	ENABLED	PRIMARY	DISABLED	NONE

Other Options

- Feature Usage Report

```
spool c:\temp\usage_report.html

SELECT output
FROM TABLE(dbms_feature_usage_report.display_html);

spool off


spool c:\temp\usage_report.txt

SELECT output
FROM TABLE(dbms_feature_usage_report.display_text);

spool off
```

Flashback Logging Enabled

```
SQL> SELECT flashback_on FROM v$database;
```

```
FLASHBACK_ON
```

```
-----
```

```
NO
```

Supplemental and Force Logging

```
SQL> SELECT force_logging, supplemental_log_data_min,  
2      supplemental_log_data_pk, supplemental_log_data_ui,  
3      supplemental_log_data_fk, supplemental_log_data_all  
4* FROM v$database;
```

```
FOR SUPPLEME SUP SUP SUP SUP  
---  
NO NO NO NO NO NO
```

Control File Location

- Are control files in different physical locations?

```
SQL> SELECT name FROM v$controlfile;

NAME
-----
C:\ORACLE\ORADATA\ORABASE\CONTROL01.CTL

C:\ORACLE\FAST_RECOVERY_AREA\ORABASE\CONTROL02.CTL

D:\ORACLE\BACKUP_FILES\ORABASE\CONTROL03.CTL
```

Redo Log Location and Multiplexing

- Are log files multiplexed to different physical locations?

```
SQL> SELECT l.group#, lf.type, lf.member, l.bytes, l.status LOG_STATUS
2 FROM gv$log l, gv$logfile lf
3 WHERE l.group# = lf.group#
4 AND l.inst_id = lf.inst_id
5 ORDER BY 1,3;
```

GROUP#	TYPE	MEMBER	BYTES	LOG_STAT
501	ONLINE	+OPMREDO_A/opm01p/onlineolog/group_501.256.734227433	8388608000	INACTIVE
501	ONLINE	+OPMREDO_A/opm01p/onlineolog/group_501.256.734227433	8388608000	INACTIVE
501	ONLINE	+OPMREDO_A/opm01p/onlineolog/group_501.256.734227433	8388608000	INACTIVE
501	ONLINE	+OPMREDO_A/opm01p/onlineolog/group_501.256.734227433	8388608000	INACTIVE
501	ONLINE	+OPMREDO_A/opm01p/onlineolog/group_501.256.734227433	8388608000	INACTIVE
501	ONLINE	+OPMREDO_A/opm01p/onlineolog/group_501.256.734227433	8388608000	INACTIVE
501	ONLINE	+OPMREDO_B/opm01p/onlineolog/group_501.256.734228593	8388608000	INACTIVE
501	ONLINE	+OPMREDO_B/opm01p/onlineolog/group_501.256.734228593	8388608000	INACTIVE
501	ONLINE	+OPMREDO_B/opm01p/onlineolog/group_501.256.734228593	8388608000	INACTIVE
501	ONLINE	+OPMREDO_B/opm01p/onlineolog/group_501.256.734228593	8388608000	INACTIVE
501	ONLINE	+OPMREDO_B/opm01p/onlineolog/group_501.256.734228593	8388608000	INACTIVE
502	ONLINE	+OPMREDO_A/opm01p/onlineolog/group_502.257.734230275	8388608000	CURRENT
502	ONLINE	+OPMREDO_A/opm01p/onlineolog/group_502.257.734230275	8388608000	CURRENT
502	ONLINE	+OPMREDO_A/opm01p/onlineolog/group_502.257.734230275	8388608000	CURRENT
502	ONLINE	+OPMREDO_A/opm01p/onlineolog/group_502.257.734230275	8388608000	CURRENT
502	ONLINE	+OPMREDO_A/opm01p/onlineolog/group_502.257.734230275	8388608000	CURRENT
502	ONLINE	+OPMREDO_A/opm01p/onlineolog/group_502.257.734230275	8388608000	CURRENT
502	ONLINE	+OPMREDO_B/opm01p/onlineolog/group_502.257.734230645	8388608000	CURRENT
502	ONLINE	+OPMREDO_B/opm01p/onlineolog/group_502.257.734230645	8388608000	CURRENT
502	ONLINE	+OPMREDO_B/opm01p/onlineolog/group_502.257.734230645	8388608000	CURRENT
502	ONLINE	+OPMREDO_B/opm01p/onlineolog/group_502.257.734230645	8388608000	CURRENT
502	ONLINE	+OPMREDO_B/opm01p/onlineolog/group_502.257.734230645	8388608000	CURRENT
...				
1008	ONLINE	+OPMREDO_B/opm01p/onlineolog/group_1008.303.743188059	8388608000	INACTIVE

576 rows selected.

Startup Parameters

```
CREATE PFILE='c:\oracle\admin\orabase\pfile\initparams.txt' FROM memory;
```

```
# Oracle init.ora parameter file generated by instance orabase on 05/08/2011 19:17:46
__db_cache_size=192M
__java_pool_size=8M
__large_pool_size=8M
__oracle_base='C:\oracle' # ORACLE_BASE set from environment
__pga_aggregate_target=488M
__sga_target=744M
__shared_io_pool_size=112M
__shared_pool_size=408M
__streams_pool_size=8M
__aggregation_optimization_settings=0
__always_anti_join='CHOOSE'
__always_semi_join='CHOOSE'
__and_pruning_enabled=TRUE
__b_tree_bitmap_plans=TRUE
__bloom_filter_enabled=TRUE
__bloom_folding_enabled=TRUE
__bloom_pruning_enabled=TRUE
__complex_view_merging=TRUE
__compression_compatibility='11.2.0.0.0'
__connect_by_use_union_all='TRUE'
__convert_set_to_join=FALSE
__cost_equality_semi_join=TRUE
__cpu_to_io=0
__dimension_skip_null=TRUE
__eliminate_common_subexpr=TRUE
__enable_type_dep_selectivity=TRUE
__fast_full_scan_enabled=TRUE
__first_k_rows_dynamic_proration=TRUE
__gby_hash_aggregation_enabled=TRUE
__generalized_pruning_enabled=TRUE
__globalindex_pnum_filter_enabled=TRUE
__gs_anti_semi_join_allowed=TRUE
__improved_outerjoin_card=TRUE
__improved_row_length_enabled=TRUE
__index_join_enabled=TRUE
```

Default Passwords

- Are any users configured with default passwords?

```
SELECT d.username, u.account_status  
FROM dba_users_with_defpwd d, dba_users u  
WHERE d.username = u.username  
AND account_status = 'OPEN'  
ORDER BY 2,1;
```

Block Change Tracking

- Is block change tracking enabled?

```
SQL> SELECT filename, status, bytes
```

```
2 FROM v$block_change_tracking;
```

FILENAME	STATUS	BYTES

	DISABLED	

```
SQL> ALTER DATABASE ENABLE BLOCK CHANGE TRACKING
```

```
2 USING FILE 'c:\oracle\fast_recovery_area\ORABASE\bctf01.log';
```

Database altered.

```
SQL> SELECT filename, status, bytes
```

```
2 FROM v$block_change_tracking;
```

FILENAME	STATUS	BYTES

C:\ORACLE\FAST_RECOVERY_AREA\ORABASE\BCTF01.LOG	ENABLED	11599872

Profile Limits

```
SQL> SELECT name, value
2 FROM gv$parameter
3 WHERE name = 'resource_limit';
```

NAME	VALUE
resource_limit	FALSE

```
SQL> SELECT profile, resource_name, limit
2 FROM dba_profiles
3 ORDER BY 1,2;
```

PROFILE	RESOURCE_NAME	LIMIT
DEFAULT	COMPOSITE_LIMIT	UNLIMITED
DEFAULT	CONNECT_TIME	UNLIMITED
DEFAULT	CPU_PER_CALL	UNLIMITED
DEFAULT	CPU_PER_SESSION	UNLIMITED
DEFAULT	FAILED_LOGIN_ATTEMPTS	10
DEFAULT	IDLE_TIME	UNLIMITED
DEFAULT	LOGICAL_READS_PER_CALL	UNLIMITED
DEFAULT	LOGICAL_READS_PER_SESSION	UNLIMITED
DEFAULT	PASSWORD_GRACE_TIME	7
DEFAULT	PASSWORD_LIFE_TIME	180
DEFAULT	PASSWORD_LOCK_TIME	1
DEFAULT	PASSWORD_REUSE_MAX	UNLIMITED
DEFAULT	PASSWORD_REUSE_TIME	UNLIMITED
DEFAULT	PASSWORD_VERIFY_FUNCTION	NULL
DEFAULT	PRIVATE_SGA	UNLIMITED

Event Triggers (1 of 2)

- Are event triggers enabled?

```
SQL> SELECT a.obj#, a.sys_evts, b.name, a.enabled
2 FROM trigger$ a, obj$ b
3 WHERE a.sys_evts > 0
4 AND a.obj#=b.obj#
5 AND baseobject IN (0, 88);
```

OBJ#	SYS_EVTS	NAME	ENABLED
8983	128	AW_DROP_TRG	1
13045	4096	AW_TRUNC_TRG	1
13047	8192	AW_REN_TRG	1
13747	8416	NO_VM_DDL	0
13748	128	NO_VM_DROP_A	0
54852	64	CDC_ALTER_CTABLE_BEFORE	0
54853	32	CDC_CREATE_CTABLE_AFTER	0
54854	32	CDC_CREATE_CTABLE_BEFORE	0
54855	128	CDC_DROP_CTABLE_BEFORE	0
55754	96	EXPFIL_RESTRICT_TYPEEVOLVE	0
55755	8256	EXPFIL_ALTEREXPTAB_MAINT	0
56976	4224	XDB_PI_TRIG	1
55752	128	EXPFIL_DROPOBJ_MAINT	0
55753	128	EXPFIL_DROPUSR_MAINT	0
57745	4096	RLMGR_TRUNCATE_MAINT	0
62859	32	SDO_ST_SYN_CREATE	1
66945	4	SDO_GEOR_ERR_TRIGGER	1
62695	128	SDO_TOPO_DROP_FTBL	1
67022	128	SDO_NETWORK_DROP_USER	1
70492	1	MGMT_STARTUP	1
79850	8	LOGON_TRIGGER	1

Event Triggers (2 of 2)

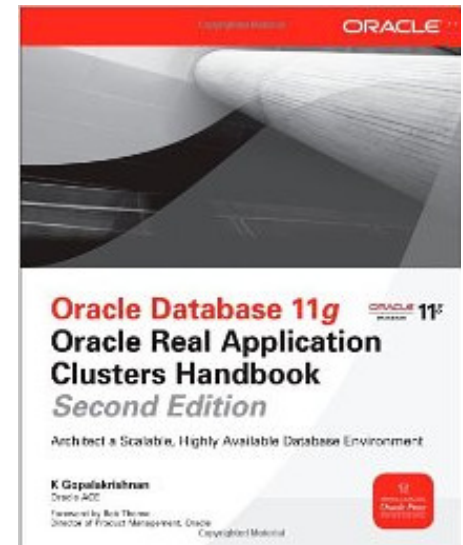
- If so what are they doing?

```
SQL> select trigger_body
       2  from dba_triggers
       3  where trigger_name = 'MGMT_STARTUP';

TRIGGER_BODY
-----
BEGIN
  -- Pin all PLSQL in the SYSMAN schema in memory
  EMD_MAINTENANCE.PIN_PLSQL;
EXCEPTION
  -- Trap all exceptions so database startup will not be impacted
  -- by errors.  Called routines should handle errors appropriately.
  WHEN OTHERS THEN
    NULL;
END;
```

Real Application Clusters

- Dynamic Remastering
- Fence LMS Process (if O/S supports it)
- Interconnect Latency and Timeouts
- Jumbo Frames
- Linux: RMEM and WMEM
- Solaris: RSIZE and WSIZE
- Windows: Format your C drive
- Time Servers



Dynamic Remastering

```
SQL> SELECT current_master, previous_master, COUNT(*)
2    FROM v$gcspfmaster_info
3    WHERE current_master <> previous_master
4    GROUP BY current_master, previous_master
5    ORDER BY 1,2;
```

CURRENT_MASTER	PREVIOUS_MASTER	COUNT (*)
-----	-----	-----
4	5	7
4	6	60
4	32767	2355
5	4	46
5	6	24
5	32767	171
6	4	196
6	5	15
6	32767	1430

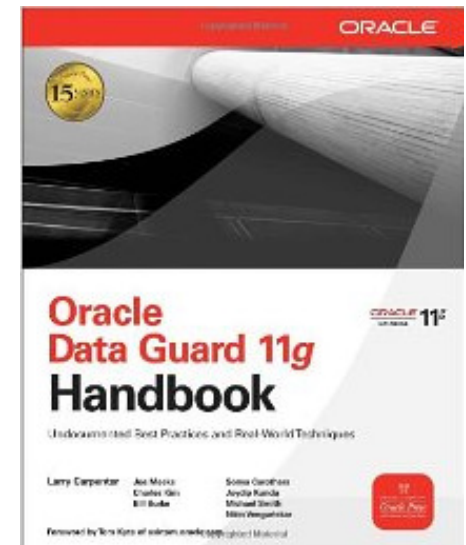
Data Guard

```
x DG_LISTENER =
  (DESCRIPTION_LIST =
    (DESCRIPTION =
      (ADDRESS = (PROTOCOL = TCP) (HOST = 10.0.#.1) (PORT = 1526))
      (SEND_BUF_SIZE=9375000)
      (RECV_BUF_SIZE=9375000))
    )
  )

SID_LIST_DG_LISTENER =
  (SID_LIST =
    (SID_DESC =
      (SDU = 32767)
      (GLOBAL_DBNAME = prod)
      (ORACLE_HOME = /app/oracle/product/11.1.0/db_1)
      (SID_NAME = prod)
    )
  )

LISTENER =
  (DESCRIPTION_LIST =
    (DESCRIPTION =
      (ADDRESS = (PROTOCOL = TCP) (HOST = omega1.mlib.org) (PORT = 1521))
    )
  )

SID_LIST_LISTENER =
  (SID_LIST =
    (SID_DESC =
      (SID_NAME = PLSExtProc)
      (ORACLE_HOME = /app/oracle/product/11.1.0/db_1)
      (PROGRAM = extproc)
    )
  )
```



RDA

- If you do not have a current RDA you are at risk of wasting hours of your time
- If you have not downloaded the RDA tool you are at risk of having a prolonged outage
- If you have no idea what I'm talking about your job is at risk

Oracle's Database Bug of the Year

The Bug's Qualifications

- Not discovered since version 9i: Probably older
- Not recognized before by any Oracle customer
- What it took to find the root cause
 - 11 weeks
 - One Oracle ACE and Oak Table Member
 - One Oracle ACE Director
 - Four dedicated Oracle support personnel (two on-site full-time)
 - Seven Production DBAs (part time)
 - Two members of Oracle Development
- A big deal was made out of it in a trade publication this year ... and, of course, they got it 100% wrong

First Sighting

```
Thu Feb 03 19:31:42 2011
SUCCESS: diskgroup OPMFRA01 was dismounted
Thu Feb 03 19:52:20 2011
Trace dumping is performing id=[cdmp_20110217195220]
Thu Feb 03 19:56:10 2011
Errors in file /appl/oracle/diag/rdbms/opm01p/opm01p5/trace/opm01p5_ora_21370.trc (incident=1729262):
ORA-00600: internal error code, arguments: [ORA-00600: internal error code, arguments: [2252], [2835], [3070900825], [], [], [], [], [], [], [], [], [], [], [], []
ORA-02063: preceding line from NDR_LINK
Incident details in: /appl/oracle/diag/rdbms/opm01p/opm01p5/incident/incdir_1729262/opm01p5_ora_21370_i1729262.trc
Thu Feb 03 20:01:00 2011
Thread 5 advanced to log sequence 25931 (LGWR switch)
  Current log# 507 seq# 25931 mem# 0: +OPMREDO_A/opm01p/onlineelog/group_507.262.734230547
  Current log# 507 seq# 25931 mem# 1: +OPMREDO_B/opm01p/onlineelog/group_507.262.734230897
Thu Feb 03 20:02:08 2011
SUCCESS: diskgroup OPMFRA01 was mounted
```

Initial Work

- Oracle quickly identified the single source of the error
- SCN max rate before 11.2.0.2 was 16,384/sec.
(983,040/min. - 58,982,400/hr. - 1,415,577,600/day)
 - As of 11.2.0.2 max rate increases to 32,768/sec.
- The issue has only been reported once before and that was in 8.1.5 by a company with only ~200 databases:
We have more than 10K
- Database links distribute the maximum SCN
- The term "SCN Jump" is invented
- Senior management gets very involved
- Weeks wasted tracing the jumps

Database Links Internals

Relevance of System Change Numbers for In-Doubt Transactions

A system change number (SCN) is an internal timestamp for a committed version of the database. The Oracle Database server uses the SCN clock value to guarantee transaction consistency. For example, when a user commits a transaction, the database records an SCN for this commit in the redo log.

The database uses SCNs to coordinate distributed transactions among different databases. For example, the database uses SCNs in the following way:

- * An application establishes a connection using a database link.
- * **The distributed transaction commits with the highest global SCN among all the databases involved.**
- * The commit global SCN is sent to all databases involved in the transaction.

SCNs are important for distributed transactions because they function as a synchronized commit timestamp of a transaction, even if the transaction fails.

- Note: This does not apply for JDBC, ODBC, or other connection methods

SCN Tracker

```
BEGIN
  FOR i IN 1..2 LOOP
    sd0 := SYSDATE;
    IF i = 1 THEN
      sd1 := sd0;
    ELSE
      sd2 := sd0;
    END IF;
    cur_yr := TO_NUMBER(TO_CHAR(sd0, 'YYYY'));
    cur_mo := TO_NUMBER(TO_CHAR(sd0, 'MM'));
    cur_dy := TO_NUMBER(TO_CHAR(sd0, 'DD'));
    cur_hr := TO_NUMBER(TO_CHAR(sd0, 'HH24'));
    cur_mi := TO_NUMBER(TO_CHAR(sd0, 'MI'));
    cur_ss := TO_NUMBER(TO_CHAR(sd0, 'SS'));
    cur_scn := dbms_flashback.get_system_change_number;
    max_scn :=
      (((((((cur_yr-1988)*12*31)+((31*(cur_mo-1))+(cur_dy-1)))*24*60*60)+(((cur_hr*60)+cur_mi)*60)+cur_ss)*1024*16));
    IF i = 1 THEN
      cs1 := cur_scn;
      ms1 := max_scn;
      headrm1 := max_scn - cur_scn;
    ELSE
      cs2 := cur_scn;
      ms2 := max_scn;
      headrm2 := max_scn - cur_scn;
    END IF;
    IF i = 1 THEN
      dbms_lock.sleep(5*60); -- wait 5 minutes and run again
    END IF;
  END LOOP;
  IF headrm2 < headrm1 THEN
    burnrate := (headrm1-headrm2)/5;
    h2z := ROUND((headrm2/burnrate/1440), 2)*24;
  ELSE
    burnrate := (headrm2-headrm1)/5;
    h2z := NULL;
  END IF;
  -- insert into logging table
```

SCN Gap Tracking: Bad

```
SQL> select * from v_scn_gap
      2 where test2_datetime > sysdate-1;
```

TEST2_DATETIME	TEST2_HEADROOM	RATE_PER_MIN	RATE_PER_HR	HOURS2ZERO
26-APR-2011 17:35:00	682913527	521989.8	31319388	21.84
26-APR-2011 17:50:00	675150791	1228854.4	73731264	9.12
26-APR-2011 18:05:00	666553560	591649	35498940	18.72
26-APR-2011 18:20:00	662286655	938904.6	56334276	11.76
26-APR-2011 18:35:00	652174145	470405.0	28224300	23.04
26-APR-2011 18:50:00	647104628	652559.0	39153540	16.56
26-APR-2011 19:05:00	636368986	274281.6	16456896	38.64
26-APR-2011 19:20:00	639304415	44518.4	2671104	
26-APR-2011 19:50:08	634797427	450686.4	27041184	
26-APR-2011 20:05:54	630221617	408889.2	24533352	
26-APR-2011 20:20:00	641108863	750031.0	45001860	
26-APR-2011 20:35:00	652313458	810217.0	48613020	
26-APR-2011 20:50:00	662684783	433170.4	25990224	
26-APR-2011 21:05:06	674229682	938459.4	56307564	

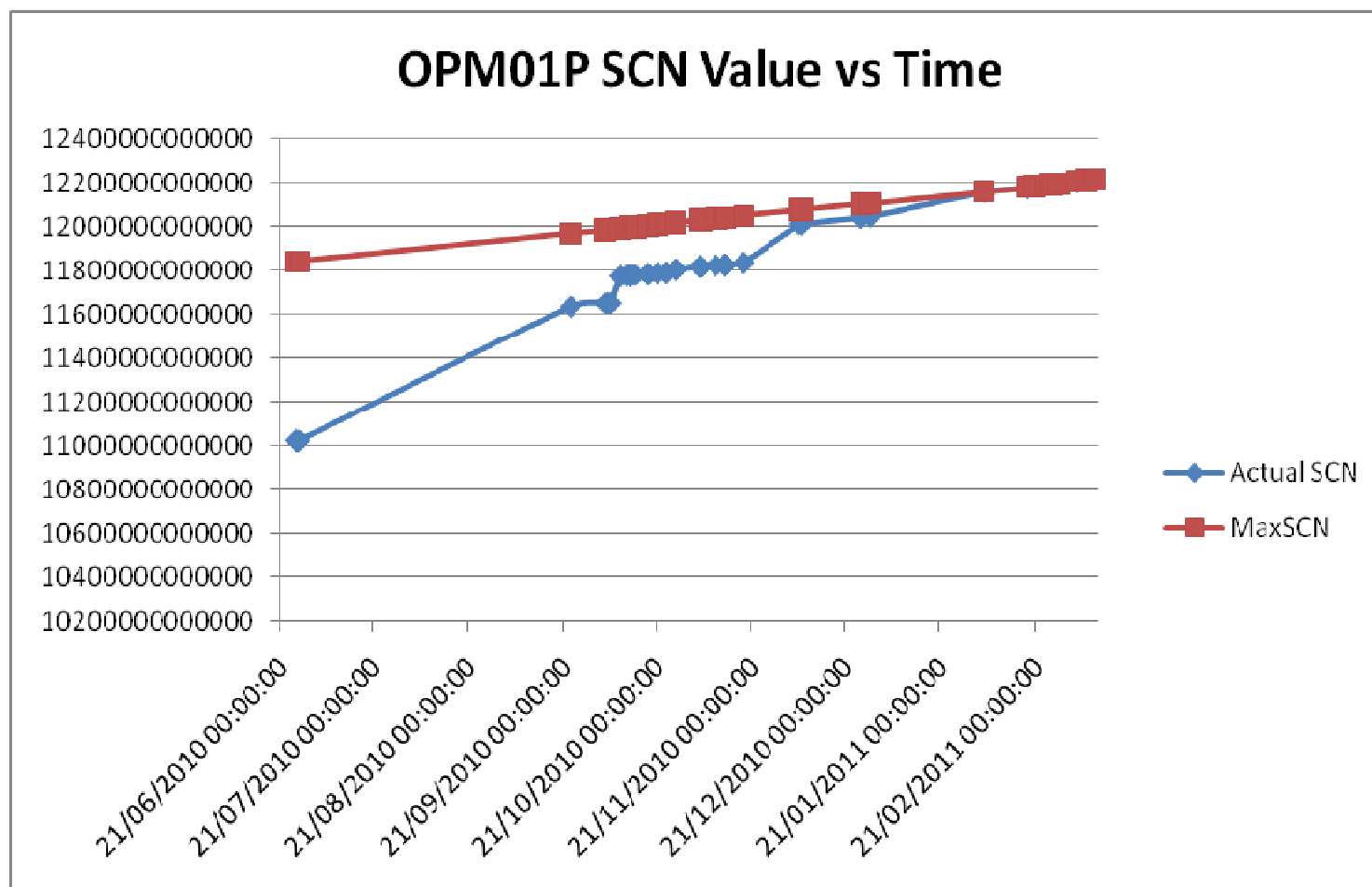
TEST2_DATETIME	TEST2_HEADROOM	RATE_PER_MIN	RATE_PER_HR	HOURS2ZERO
28-APR-2011 15:05:00	1881677494	833949.2	50036952	
28-APR-2011 15:20:00	1893065104	753053.8	45183228	
28-APR-2011 15:35:00	1904495482	780686.2	46841172	
28-APR-2011 15:50:00	1917222386	843447.6	50606856	
28-APR-2011 16:05:00	1930181269	848048.8	50882928	
28-APR-2011 16:20:00	1942150863	715995.4	42959724	
28-APR-2011 16:35:00	1953175650	842217.6	50533056	
28-APR-2011 16:50:00	1950983064	1413509.0	84810540	23.04
28-APR-2011 17:05:00	1938373229	666124.4	39967464	48.48
28-APR-2011 17:20:00	1931490339	426728.2	25603692	75.36
28-APR-2011 17:35:00	1914255010	950190.8	57011448	33.6
28-APR-2011 17:50:00	1903398051	456508.0	27390480	69.6
28-APR-2011 18:05:00	1889420758	960524.4	57631464	32.88
28-APR-2011 18:20:00	1882512875	442962.0	26577720	70.8

SCN Gap Tracking: Good

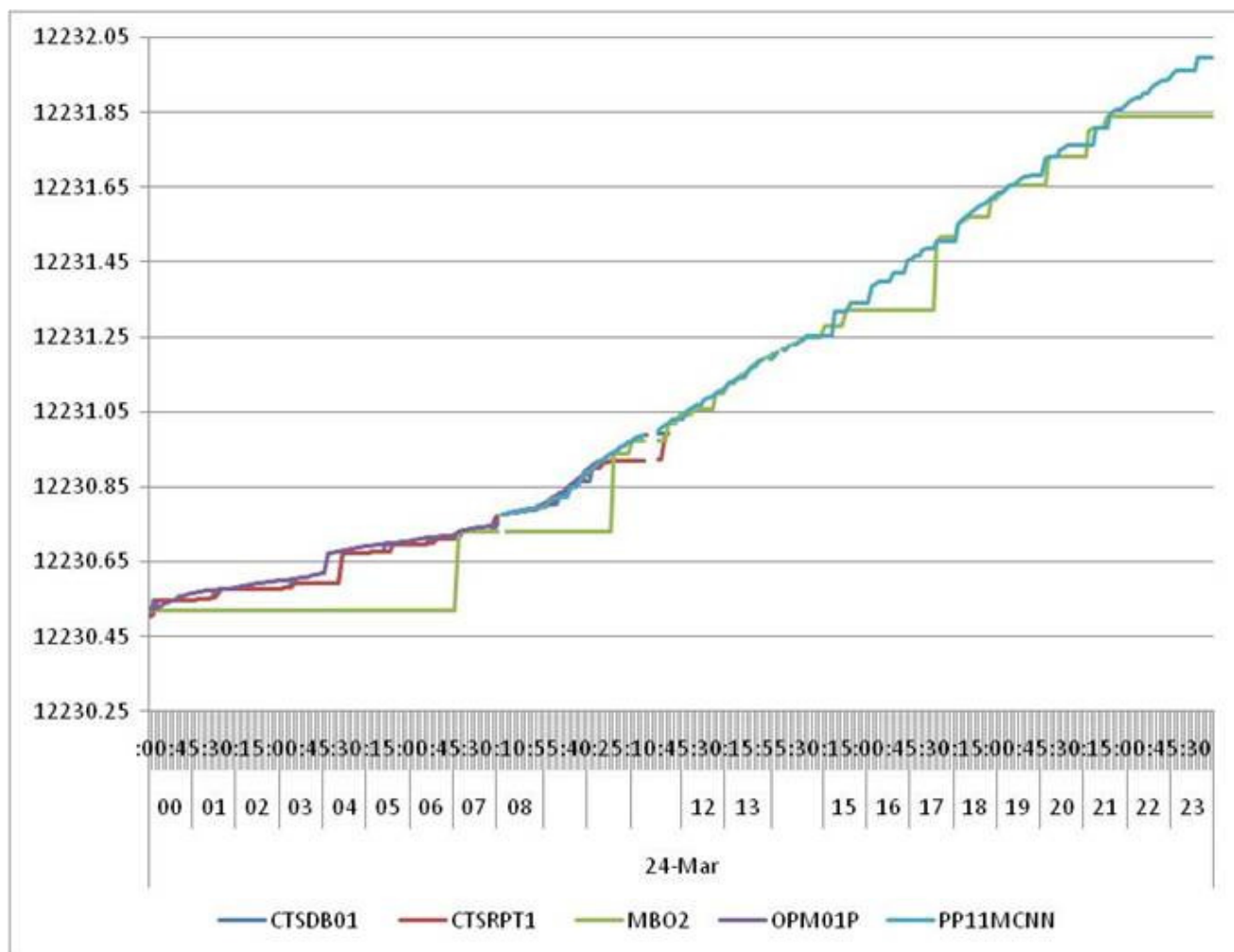
```
SQL> select * from v_scn_gap
      2 where test2_datetime > sysdate-1;
```

DATETIME	HEADROOM	RATE_PER_MIN	RATE_PER_HR	HOURS2ZERO
11-MAY-2011 00:05:00	6506103188	6998200.6	419892036	15.6
11-MAY-2011 00:20:00	6513204788	543617.2	32617032	
11-MAY-2011 00:35:00	6521420178	513123.6	30787416	
11-MAY-2011 00:50:00	6530585913	717970.0	43078200	
11-MAY-2011 01:05:00	6542639977	852059.4	51123564	
11-MAY-2011 01:20:00	6541097520	863970.4	51838224	
11-MAY-2011 01:35:00	6546037221	810748.6	48644916	134.64
11-MAY-2011 01:50:00	6559482107	896575.4	53794524	
11-MAY-2011 02:05:00	6572030126	713590.6	42815436	
11-MAY-2011 02:20:00	6584261177	849361.0	50961660	
11-MAY-2011 02:35:00	6522396678	889341.8	53360508	
11-MAY-2011 02:50:00	6535900852	897291.6	53837496	
11-MAY-2011 03:05:00	6549401132	887350.6	53241036	
11-MAY-2011 03:20:00	6562317808	768545.4	46112724	
11-MAY-2011 03:35:00	6575539825	813914.6	48834876	
11-MAY-2011 03:50:00	6589073166	885994.6	53159676	
11-MAY-2011 04:05:00	6579304162	3760971.8	225658308	29.04
11-MAY-2011 04:20:00	6592771147	878893.6	52733616	
11-MAY-2011 04:35:00	6606349369	901199.6	54071976	
11-MAY-2011 04:50:00	6618097464	898662.0	5391972	
11-MAY-2011 05:05:00	6631546687	882891.2	52973472	
11-MAY-2011 05:20:00	6644969172	901559.4	54093564	
11-MAY-2011 05:35:00	6636954732	827748.8	49664928	
11-MAY-2011 05:50:00	6646938342	871115.2	52266912	
11-MAY-2011 06:05:00	6642330448	2756499.2	165389952	40.08
11-MAY-2011 06:20:00	6654992990	806344.8	48380688	
11-MAY-2011 06:35:00	6667497550	775057.0	46503420	
11-MAY-2011 06:50:00	6680833195	907972.8	54478368	
11-MAY-2011 07:05:00	6693534286	840129.0	50407740	
11-MAY-2011 07:20:00	6694468241	651703.0	39102180	
11-MAY-2011 07:35:00	6705466149	757110.8	45426648	
11-MAY-2011 07:50:00	6717601759	801280.4	4807682	
11-MAY-2011 08:05:00	6730036196	851263.6	51075816	
11-MAY-2011 08:20:00	6742469369	810343.4	48620604	

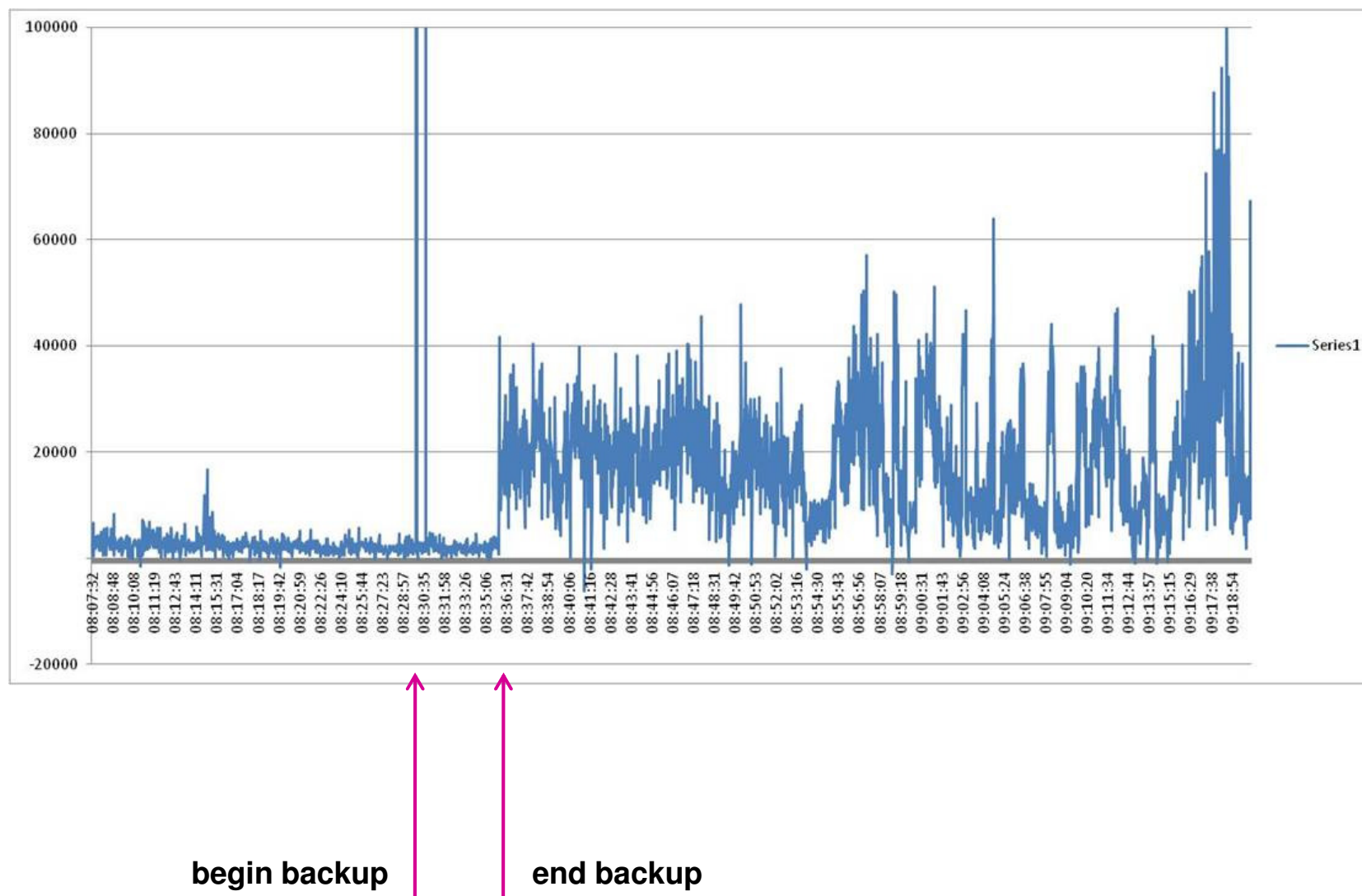
Graphs



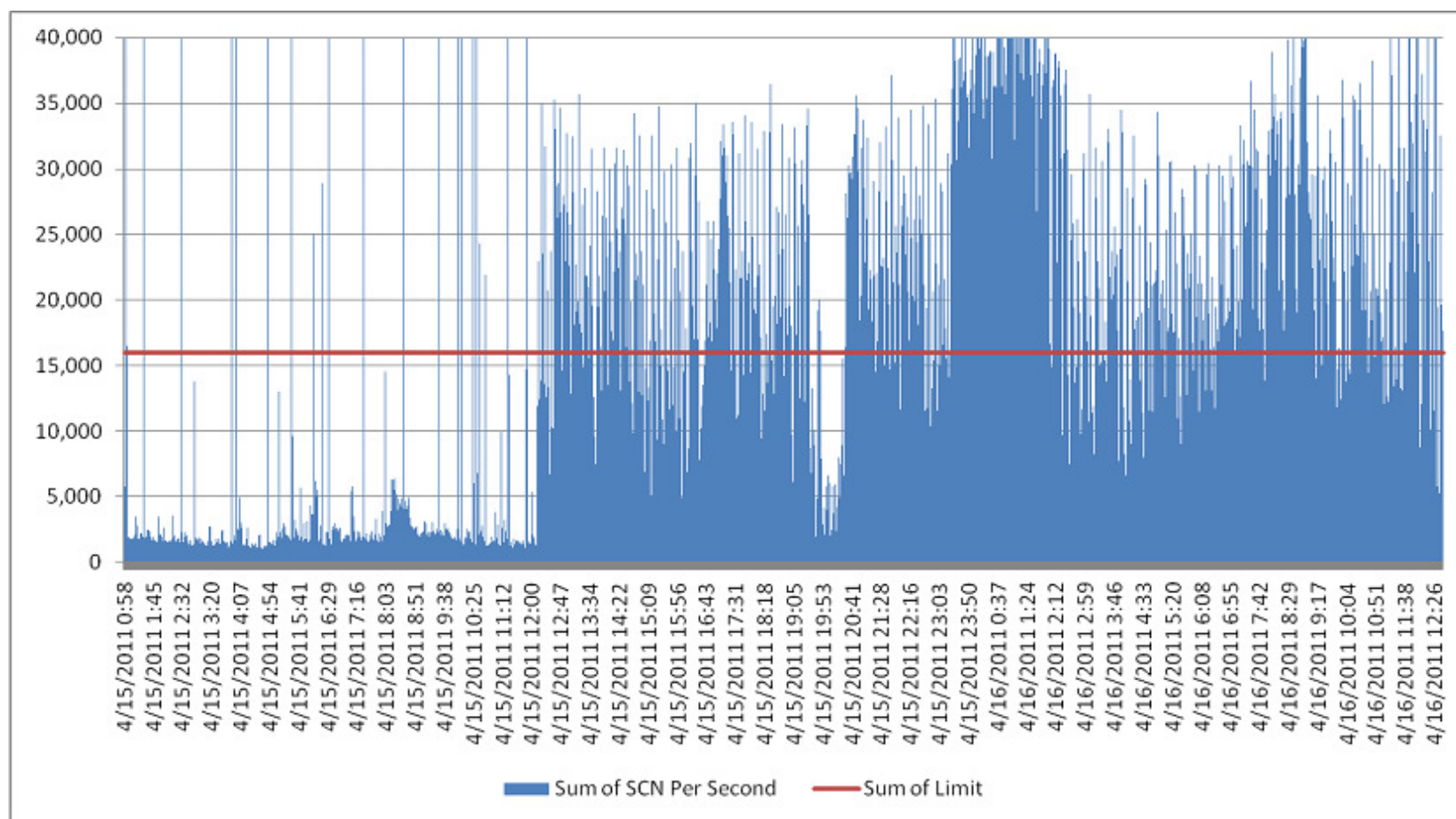
More Graphs



Smoking Gun 1



Smoking Gun 2



Bug Description

- Different in RAC and non-RAC
- A "feature" of all supported product versions
- When the database is put into "hot" backup mode SCN's are eaten at a greatly accelerated rate
- Only stopped by an instance reboot
- The enterprise impact can be made substantially worse in an environment with database links

Set and (oops) Forget

- **ALTER DATABASE BEGIN BACKUP;**
 - Set the flags to lock all datafiles from ID=1 to MAXDATAFILES
- Take Backup or Snap (and clone)
- **ALTER DATABASE END BACKUP;**
 - Unset the flag for all datafiles in file\$

```
Tue Jan 18 18:20:18 2011
Create controlfile reuse set database "orabase"
MAXINSTANCES 8
MAXLOGHISTORY 1
MAXLOGFILES 16
MAXLOGMEMBERS 3
MAXDATAFILES 100
Datafile
'C:\oracle\oradata\orabase\SYSTEM01.DBF',
'C:\oracle\oradata\orabase\SYSAUX01.DBF',
'C:\oracle\oradata\orabase\UNDOTBS01.DBF',
'C:\oracle\oradata\orabase\USERS01.DBF'
LOGFILE GROUP 1 ('C:\oracle\oradata\orabase\redo01.log') SIZE 51200K,
GROUP 2 ('C:\oracle\oradata\orabase\redo02.log') SIZE 51200K,
GROUP 3 ('C:\oracle\oradata\orabase\redo03.log') SIZE 51200K RESETLOGS

SQL> select max(file#) from file$;

MAX(FILE#)
-----
          6
```

Pre Patch

Post Patch

11.1.0.7 Patch# 12417252

```
SQL> oradebug setmypid
Statement processed.

SQL> oradebug dumpvar sga kcfdpk 10
kfil kcfdpk_ [380019860, 380019864) = 000000C8

SQL> oradebug dumpvar sga kcvblg 800
ub4 * kcvblg_ [38001AE30, 38001AE38) = 00000003 94599E58

SQL> alter database begin backup;

Database altered.

SQL> oradebug dumpvar sga kcfdpk 10
kfil kcfdpk_ [380019860, 380019864) = 000000C8

SQL> oradebug dumpvar sga kcvblg 800
ub4 * kcvblg_ [38001AE30, 38001AE38) = 00000003 94599E58

SQL> alter database end backup;
Database altered.

SQL> oradebug dumpvar sga kcfdpk 10
kfil kcfdpk_ [380019860, 380019864) = 000000C8

SQL> oradebug dumpvar sga kcvblg 800
ub4 * kcvblg_ [38001AE30, 38001AE38) = 00000003 94599E58
```

```
SQL> oradebug setmypid
Statement processed.

SQL> oradebug dumpvar sga kcfdpk 10
kfil kcfdpk_ [380019860, 380019864) = 000000C8

SQL> oradebug dumpvar sga kcvblg 800
ub4 * kcvblg_ [38001AE30, 38001AE38) = 00000003 94581308

SQL> alter database begin backup;

Database altered.

SQL> oradebug dumpvar sga kcfdpk 10
kfil kcfdpk_ [380019860, 380019864) = 000000C8

SQL> oradebug dumpvar sga kcvblg 800
ub4 * kcvblg_ [38001AE30, 38001AE38) = 00000003 94581308

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Database altered.

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kfil kcfdpk_ [380019860, 380019864) = 000000C8

SQL> oradebug dumpvar sga kcvblg 800
ub4 * kcvblg_ [38001AE30, 38001AE38) = 00000003 94581308
```

Questions

ERROR at line 1:

ORA-00028: your session has been killed



All demos at morganslibrary.org

- Library
- How Can I?

Thank you