

Oracle 7 Housekeeping - A DBA's Checklist

By Dennis Adams

The Oracle DBA's job can be extremely complex.

Not only do they have to manage users, tablespaces, tables, views and indexes. They also have "internal" database objects such as triggers, procedures, functions and packages to contend with.

In addition, it is essential to keep on monitoring the state of the database.

On a daily basis, there are dozens of "housekeeping" tasks which need to be performed.

It has taken several years for "automated DBA tools" to become available, some available from Oracle themselves, some from third-part vendors. Unfortunately, this is still an "early adoptors" market, and no one suite of tools appears to address all the issues which are needed. Consequently, the DBA is left with the necessity of creating an in-house checklist of tasks, to be scheduled by a series of batch jobs.

This is a brief checklist of the daily housekeeping tasks to be performed. No doubt there are other tasks which need to be added. Each DBA ends up with his own "favourite list". Any errors and/or omissions, please let me know !

Backup and Recovery

Of course, you remembered to back up the database, but have you tested the backup tapes to ensure that they are readable ? What about a tape cycling system, and verifying that tapes are still good enough quality for that "I hope I never need this" backup.

Also, don't forget the control files; when shut down the instance, and BACKUP CONTROL FILES TO TRACE. Then find the trace file, and rename/move it before backing it up to tape.

How about backing up the INIT.ORA file, and other base files like LISTENER.ORA and LOGIN.SQL, just in case.

Shutdown/Restart

Assuming that you decide to shutdown & restart the instance periodically, this would be a chance to clear out the trace file directory and start a new error log file.

When you restart the instance, don't forget that this will start with an empty data cache, and program area. For packages and procedures, you may decide to "pin" them into memory. This will have the effect of loading the package header into cache memory. However, you will need to execute these procedures before the package body is in memory. For this reason, some designers allow all packages to be run with a "null" value, just to enable them to be run after system startup, and thus pinned into memory.

Table Space Management

The main information on tablespaces is held in the system tables DBA_TABLESPACES , DBA_DATA_FILES and V\$DATAFILE.

Query DBA_FREE_SPACE to summarize the table spaces on this system.

Check out the percentage free on each tablespace.

Check out the free space and free extents of all tablespaces, by querying the table DBA_EXTENTS.

Check for chained rows of data, with the corresponding effect on data selecting efficiency. The command ANALYZE TABLE tablename LIST CHAINED ROWS will add data to the table CHAINED_ROWS. But remember that in order for this to work, the UTLCHAIN.SQL script needs to be run first. Once chained rows have been found, you need to delete & re-insert the rows into the table, using a temporary table as intermediate storage.

When designing and maintaining databases, try to ensure that tablespaces only have tables (or other segments) of a similar type. This is particularly true for rollback segments (see below).

Redo Logs

Management and control of Redo logs is fairly straightforward, but still needs to be remembered.

Query the V\$LOGFILE and V\$LOG tables to check that all logs and groups are online, and their current status etc.

Rollback Segments

These are, to quote Kevin Loney, “the problem children of the family” (“Oracle DBA Handbook 7.3 Edition” -see references at the end of this article). Their management is really something that should be covered in a separate article.

Remember that an instance attempts to acquire enough rollback segments based on the INIT.ORA parameters TRANSACTIONS divided by TRANSACTIONS_PER_ROLLBACK_SEGMENT.

Ideally, each database should have one or more tablespaces used just for rollback segments. The growth and release of extents in these tablespaces will cause irregular free extent sizes.

The DBA may need to use the ALTER ROLLBACK SEGMENT command to take segments off-line or on-line, or to alter the storage.

The system table DBA_ROLLBACK_SEGS relates rollback segments to the tablespaces they live in.

Table Management

Quick verification that all indexes are in place for each table that needs it, and that all the integrities are still there, is well worth doing.

Re-build all the indexes for tables where the “btree” structure is possibly becoming “skewed” by lots of table rows being added and removed. The table SYS.DBA_INDEXES contains the information for each table and index, including the extent size, growth extents etc.

If necessary, ALTER TABLE to deallocate or allocate extra extents for the future.

Optimizer Statistics

Assuming you are using the cost-based optimizer (if not - then why not ?), run ANALYZE TABLE COMPUTE STATISTICS on all the main tables which are experiencing significant growth.

This is a bit of a chicken-and-egg, because unless you have meaningful statistics, you will not know which are the “hot” tables. In this situation, it’s knowledge of your business application which will give you the clues and understanding that you will need.

For large database tables, the overhead of COMPUTE STATISTICS is quite high ; it involves a full scan of the table in question, and so could be expected to take as long as an index build. It also requires a large amount of temporary segment space - at least as big as the table columns themselves.

For this reason, spread the load between those tables which will be analyzed with COMPUTE statistics, and those where ESTIMATE statistics would be adequate. By default, ESTIMATE reads only the first 1064 rows, which may or may not be representative of your data. It is possible to specify the sample size (say 10%) to be used.

For an entire schema, the run the supplied package to automatically analyze and entire schema...

```
DBMS_UTILITY.ANALYZE_SCHEMA ( schema , ‘compute’ | ‘estimate’ )
```

Logical Integrity

A couple of areas here which need to be looked at. Many sites have DBA scripts that check for the correct existence of parent-child relationships, a report of any orderlines without headers, for example. In many sites, this is not strictly speaking a DBA’s task, but who else is going to do it?

This should have been done by the integrity definitions and triggers, but these have been known to fail. (Dropped by the DBA and never re-created ?)

Database Object Integrity

A quick report on the names of all the packages, procedures, functions and integrities , just in case one or two got changed by someone, and/or gets marked as needing re-compilation.

The table SYS.DBA_SOURCE is used to hold the internal database objects such as Packages, Package Bodies, Procedures etc, organised by Schema Owner.

User and Role Security

A quick check on User information in SYS.DBA_USERS to make sure that the default tablespaces and temporary tablespaces are correct. (Don’t use the SYSTEM tablespace as the default for any users !)
For each user, their privileges are stored in the table DBA_SYS_PRIVS.

If you use roles or profiles, then these are held in the tables SYS.DBA_ROLES (and DBA_ROLE_PRIVS), and profiles are stored in DBA_PROFILES.

If you enforce security at table or column level, you will need to check out DBA_COL_PRIVS, DBA_COL_PRIVS_MADE, DBA_COL_PRIVS_RECD and the corresponding TAB tables.

Note that you can conveniently set the tablespace quota to ‘0’ for a user, to prevent then creating objects (even temporary objects) on that tablespace.

Capacity Planning

This is something which can be easily incorporated into standard scripts. A lookup script to see how much table spaces are hitting their maximum size, etc.

Perhaps more usefully for the long term, a script showing the total size (no or blocks and rows) of the main tables would help to build up a pattern of the growth rates on these tables. Some DBAs put these results into a distinct DBA schema, to analyze later for capacity planning.

Don't forget that these statistics are only as up-to-date as the last ANALYZE TABLE COMPUTE STATISTICS run.

The other aspect of capacity planning, is not only the table space requirements, but also the future requirements for rollback segments and temporary segments (including segment sizes) , which would probably need to be increased as the database size increases and it's usage grows over time.

Additional data files may be required for new temporary or rollback segments.

Some DBAs have a policy of also adding to the number of redo log file groups proportional to the number of on-line users.

Before you go...

It's always the little things, isn't it ?

Like checking that you have put all the tablespaces and rollback segments back on line, that the SQL*Net listener is running OK, etc. Etc.

So a quick script to check these out is probably worth it's weight in gold.

Summary

As I mentioned at the beginning of this article, this is just my own personal checklist of items. Each DBA has his own favourite list, often based on the errors of bitter experience !

The reason for including them here is that I, too, have benefited from other DBA's mistakes. Perhaps, in turn, these notes will help others.

Sources

There are literally hundreds of books on the Oracle Database, including the Oracle Manuals themselves. The following books have been widely regarded for some time in the Oracle community.

Some of these books have been reviewed by meon: <http://www.dennisadams.net/books.htm>

- Oracle Performance Tuning, 2nd Edition by Mark Gury & Peter Corrigan. O'Reilly & Associates. ISBN 1-56592-237-9
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- Advanced Oracle Tuning and Administration by Eyal Aronoff, Kevin Loney & Noorali Sonawalla. Oracle Press / Osborne Books. ISBN 0-07-882241-6.
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- Oracle DBA Handbook 7.3 Edition by Kevin Loney. Oracle Press / Osborne Books. ISBN 0-07-882289-0.

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