



RAMPANT
TECHPRESS

Documenting Oracle Databases

Complete Oracle database schema auditing

Mike Ault

Retail Price \$12.95 US/\$19.95 Canada

ISBN: 0-9740716-6-8

Copyright © 2003 by Rampant TechPress



RAMPANT
TECHPRESS
eBook

Oracle eBook

TLFeBOOK



Rampant TechPress

Documenting Oracle Databases
Complete Oracle database schema
auditing

Mike Ault

Notice

While the author makes every effort to ensure the information presented in this white paper is accurate and without error, Rampant TechPress, its authors and its affiliates takes no responsibility for the use of the information, tips, techniques or technologies contained in this white paper. The user of this white paper is solely responsible for the consequences of the utilization of the information, tips, techniques or technologies reported herein.

Documenting Oracle Databases

Complete Oracle database schema auditing

By Mike Ault

Copyright © 2003 by Rampant TechPress. All rights reserved.

Published by Rampant TechPress, Kittrell, North Carolina, USA

Series Editor: Don Burleson

Production Editor: Teri Wade

Cover Design: Bryan Hoff

Oracle, Oracle7, Oracle8, Oracle8i, and Oracle9i are trademarks of Oracle Corporation. *Oracle In-Focus* is a registered Trademark of Rampant TechPress.

Many of the designations used by computer vendors to distinguish their products are claimed as Trademarks. All names known to Rampant TechPress to be trademark names appear in this text as initial caps.

The information provided by the authors of this work is believed to be accurate and reliable, but because of the possibility of human error by our authors and staff, Rampant TechPress cannot guarantee the accuracy or completeness of any information included in this work and is not responsible for any errors, omissions, or inaccurate results obtained from the use of information or scripts in this work.

Visit www.rampant.cc for information on other *Oracle In-Focus* books.

ISBN: 0-9740716-6-8

Table Of Contents

Notice	ii
Publication Information	iii
Table Of Contents	iv
Introduction.....	1
The Oracle Data Dictionary, an Overview	1
Documenting or Rebuilding?	2
The Database.....	3
<i>Hard Objects:</i>	3
<i>Stored Objects:</i>	3
The Control File.....	4
Documenting the Database Initialization file	6
The Database Itself	8
Documenting Tablespaces	12
Documentation of Rollback Segments.....	16
Documenting Roles, Grants and Users	20
Documenting Tables	28
Documenting Database Constraints.....	33
Documenting Indexes in the Database.....	40
Documenting Sequences.....	45
Documenting Packages, Package Bodies, Procedures and Functions	47

Documenting Triggers 51

Documenting Database Views 55

Snap Shot and Snap Shot Log Documentation 58

Documenting Database Links 59

In Conclusion 62

Appendix A 63

Soft Documentation Scripts 63

Introduction

Many times the Oracle DBA is hired once the database becomes too much to handle without one, inherits the position or is appointed to it “since they are so good with computers”. In any case, they usually get an undocumented system that follows no conventions and holds many traps for the unwary DBA.

In other situations the DBA may find they have the task of recreating the database for which they are responsible. If export and import can be used, this task is fairly easy to accomplish, however, sometimes the DBA will be required to provide DDL (Data Definition Language) for this purpose. The DBA may also wish to document existing procedures, views, constraints and such other structures as they see fit, with human readable output and a minimum of re-editing.

In all of the above cases, the Oracle provided methods fall woefully short of the mark in providing the DBA with documentation. It falls on the DBA’s shoulders to develop SQL, PL/SQL and SQLPLUS code to delve into the inner workings of the Oracle Data Dictionary tables and regenerate the required DDL.

This presentation will demonstrate techniques to use the Oracle instance to document itself.

The Oracle Data Dictionary, an Overview

The heart of the whole matter is a collection of C constructs, Oracle tables and Oracle views that are collectively called the Oracle Data Dictionary. At the lowest level are the “hidden” C structures known as the X\$ tables. These X\$ tables are usually best left alone. Indeed, to even see the contents a DBA has to jump through a few hoops and once they do get to

them, they are not well documented and have such logical attributes as “mglwmp” or “tabsrpr”. Needless to say, unless the DBA has several long nights available and a penchant for solving riddles it is suggest that they leave these to Oracle.

The next layer of the Oracle Data Dictionary is the \$ tables. These are more human readable cuts of the X\$ tables and have such names as COL\$ or TAB\$. While being a step above the X\$ structures, it is still suggested that the DBA only use them when it is really needed. Some of the reports discussed in this paper will use these tables.

The third layer of the dictionary is the V\$ views and their cousins the V_\$ tables (actually, Siamese twins since for nearly all of the V\$ views there is a corresponding V_\$ view). These are the workhorses of the Data Dictionary and what most of the scripts in this paper deal with.

The final layer of the dictionary (for our purposes) is the DBA_ series of views. These views are made from the V\$ and \$ sets of views and tables and provide a very friendly interface for viewing the insides of your Oracle Data Dictionary. The USER_ and ALL_ views are based on the DBA_ views. Some of the user specific scripts, such as for constraints, uses the USER_ subset of views, however, the script can be made more general by adding reference to the “OWNER” attribute and changing USER_ to DBA_ if the DBA desires.

Documenting or Rebuilding?

This paper will use the terms documenting and rebuilding interchangeably. A good set of build scripts will provide excellent documentation for an instance. Essentially there are two types of documentation, “hard” documentation such as DDL that an experienced database developer can understand, and “soft” documentation such as generalized reports showing structures and relations that anyone with a smattering of database experience can use. The paper will deal more with the “hard” type of documentation, that is, the scripts to rebuild the database, where

applicable, reports that provide “soft” documentation will be mentioned, and included with the paper.

The Database

Databases contain the following items:

Hard Objects:

- Tablespaces and their associated Datafiles
- Control Files
- Redo Logs
- Rollback Segments
- Tables
- Indexes
- Database Initialization file
- Clusters

Stored Objects:

- View definitions
- Constraints
- Procedures
- Functions
- Packages
- Package Bodies
- Triggers
- User definitions
- Roles

- Grants
- Database Links
- Snapshots and Snapshot Logs

In the following pages this paper will cover how to generate the required DDL to recreate or document each of the above database objects using SQL, PLSQL and SQLPLUS. This paper will also discuss creation of scripts to allow dropping a set of objects (such as constraints) and recreating them.

The Control File

To begin at the beginning, we should first document the Control file since this is the only location where the information for MAXDATAFILES, MAXLOGFILES MAXMEMBERS and other instance specific data can be found. This information will be added by hand to the Database rebuild script covered later in the paper.

Having a script around that rebuilds the control file is a very good idea. In the case where the Oracle instance was built by people with very little understanding of how Oracle builds default instances (poorly) you will usually get a very dysfunctional database from a vanilla build. The DBA will find their MAXDATAFILES will be set to 20 or maybe 32 and that other hard database limits are probably set too low as well. Once the DBA generates a script to rebuild their control files, they can change these hard database limits without rebuilding the database by simply rebuilding the control files. In other situations, a disk crash can wipe out the control file (hopefully there is more than one, but maybe a DBA didn't create the database?) and leave the database unable to even startup (actually there is a way, but it is beyond the scope of this paper.) With a rebuild script on hand, it makes these situations easier to handle.

A DBA can always backup the control file with the command:

```
ALTER DATABASE BACKUP CONTROLFILE to 'filename' REUSE;
```