Oracle Database Administration
Tips and Techniques for the PDMLink Administrators

LA-UR-15-23637
W-11-TR-0015U
Revision A
Page 2 of 47

**Oracle Database Administration Tips and Techniques
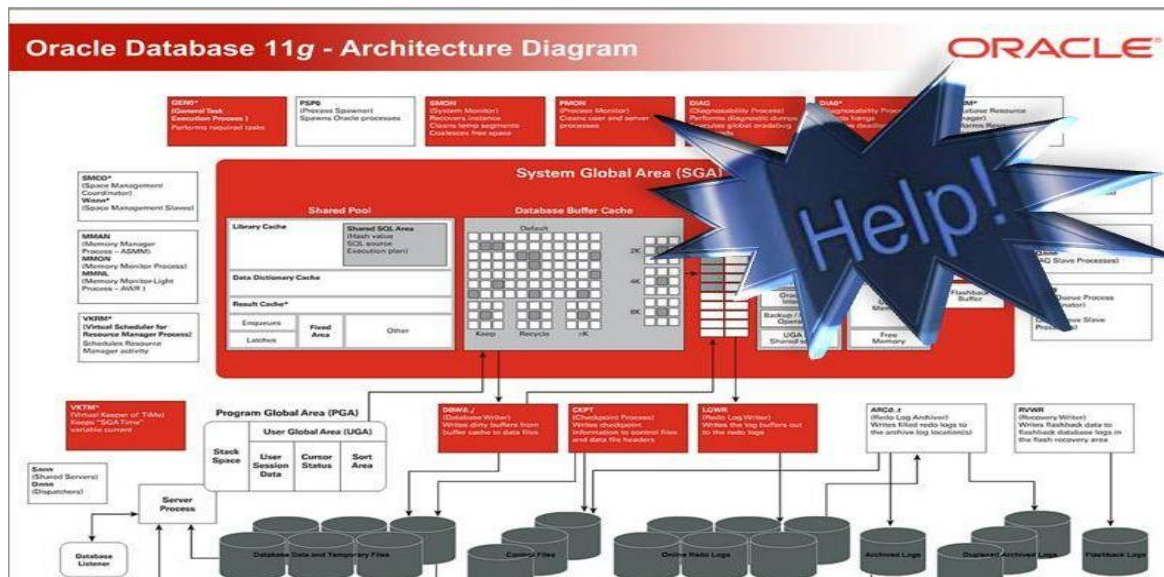For the PDMLink Administrator**

Julio Aguilar-Chang, Oracle Database Administrator
Lanorra Sena, Windchill Administrator
Los Alamos National Laboratory, Los Alamos, New Mexico

Introduction

" ... The Oracle DBA just left the project. Congratulations, YOU are now in charge of maintaining our production Oracle database until we hire a new DBA ..."
Sounds familiar? The purpose of this paper is to discuss basic Oracle database administration skills to administer and maintain an existing Oracle database in support of PDMLink. The objective is not to teach the reader how to become an Oracle DBA, but to give the PDMLink administrator, or others in a similar situation, the fundamental and basic knowledge, tips, techniques, and resources to help perform the daily maintenance tasks needed to support an Oracle database. The topics that will be covered in this paper are:

- Typical daily activities of a DBA
- Logging into the Oracle database
- Starting and stopping the Oracle database
- Oracle database and configuration files
- Backing up the Oracle database
- GUI tools – Oracle Enterprise Manager Database Control
- Troubleshooting Oracle database
- Technical resources

Oracle Database Administration
Tips and Techniques for the PDMLink Administrators

LA-UR-15-23637
W-11-TR-0015U
Revision A
Page 3 of 47

Typical daily activities of a DBA

If you find yourself in a position of having to take care of one or more Oracle databases, your first question might be "what did the DBA who just left the project do every day?" If I had to answer this question, as a DBA supporting a PDMLink installation, I would say that a typical day consists of:

> Checking the nightly Oracle database backup jobs

> Checking the Oracle alert log file for errors

> Supporting PDMLink administrators, specifically, creating a new Oracle database that will be used to rehost a production system for testing and development

I have listed just three items in a typical day for me as an Oracle DBA supporting PDMLink; however, each of these items leads to many other questions to someone who is not an Oracle DBA and finds him/herself tasked with taking care of the Oracle system.

For example, the item listed above "Checking the Oracle alert log file for errors" leads immediately to the following questions: What is and where is the alert log file? What does an Oracle error look like? If I find an error, how do I log into the database as an administrator? How do I start up the database if the error says that the database is down? Where are the Oracle configuration files? All these topics, and others, will be covered in this paper.

Oracle Database Administration
Tips and Techniques for the PDMLink Administrators

LA-UR-15-23637
W-11-TR-0015U
Revision A
Page 4 of 47

Logging into the Oracle database

Since the assumption is that the Oracle DBA left, and that you, a PDMLink administrator, have been asked to take care of the Oracle databases until a new Oracle DBA is hired, we must assume that you will be granted access to the host machines where the Oracle databases are installed, and you will be given access to the operating system user account who owns the Oracle database installations.

Using PDMLink as an analogy, typically a system administrator creates local user on the host where PDMLink is installed who is the "owner" of the Windchill installation. This user is also granted specific privileges on the host. Similarly, a system administrator also creates local user who is the "owner" of the Oracle installation on the host machines where the Oracle databases are installed, and this user is also given specific privileges.

Let's use the production Oracle database and host server as a starting point, since this is the most important database that you will be taking care of. You will be given (or must insist!) the Oracle account user name and password on the host server where the Oracle database resides. This is a MUST if you are being asked to take care of the Oracle databases. For the purposes of this paper, and for following examples, this is the configuration on a test production system:

> Host machine: **ORAPROD**
> Host user name and password: **oracle**/*oracle123*
> Database name: **TEST**

When you log in on the host machine "**ORAPROD**" as the OS user "**oracle**", you can log in directly into the database with the highest database administrative privilege, using SQLPlus from a command prompt, as follows:

LA-UR-15-23637
Oracle Database Administration
Tips and Techniques for the PDMLink Administrators
W-11-TR-0015U
Revision A
Page 5 of 47

Ideally, so that you don't have to change any passwords in the database, you *should* be given the current passwords for the database users **SYS** and **SYSTEM**. These are the users in the database with the highest privileges. It is beyond the scope of this paper to discuss in detail the differences between these users. But since you will be in charge of this database *temporarily*, you will perform most of the database administration activities as the database user **SYS**.

The command "**sqlplus/as sysdba**" allows you to log into the database as user **SYS**, as shown in the picture above, without having to supply **SYS**'s password. The argument "**as sysdba**" indicates that you are logging in with **SYSDBA** privilege into the database, which is the highest privilege that you can have in the database.

Once you have been given the passwords for the database users **SYS** and **SYSTEM**, this is how you can log into the database using these passwords:

A note about SQLPlus - searching on Google, you get this:

> *SQL*Plus is an interactive and batch query tool that is installed with every Oracle Database Server or Client installation. It has a command-line user interface, a Windows Graphical User Interface (GUI) and the iSQL*Plus web-based user interface.*

The examples shown above are using the command-line user interface. Since you will be doing this job *temporarily*, I need to tell you that I have never used the GUI, and rarely have I used the

Oracle Database Administration
Tips and Techniques for the PDMLink Administrators

LA-UR-15-23637
W-11-TR-0015U
Revision A
Page 6 of 47

iSQL*Plus web-based user interface. The examples in this paper will use the command-line user interface.

*TIP – How do you find the passwords for users **SYS** and **SYSTEM** if they are **not** documented? In the unlikely event that the outgoing Oracle DBA does not give you the passwords for users **SYS** or **SYSTEM**, which has happened to me before, the way that I have found these passwords was simple. It is almost certain that there are Windows scheduled task jobs (or cron jobs in the UNIX world) that run nightly to back up the Oracle database. Open the Task Scheduler on a Windows Sever machine, or the crontab on a UNIX box, see which jobs are the ones that look like Oracle backup jobs (look for words such as RMAN, EXP, EXPDP, COLD BACKUP), and look at the scripts or programs that these scheduled task jobs, or cron jobs, run every night and read the contents of these scripts or programs carefully. Even though it is not a recommended practice, some DBAs create backup scripts where they have hard-coded the user names and passwords of either **SYS** or **SYSTEM**, and they have made these files not-readable by anyone else other than by the owner, which would be the OS "**oracle**" user. And we have already established that you have been given the password to log in as the OS "**oracle**" user. In the past I have been able to find out passwords for these, and other, users by looking in detail at the backup scripts. As mentioned earlier, hard coding passwords is not recommended, but some administrators do this for various reasons and they justify this practice by making these files not accessible to anybody else other than to the OS "**oracle**" user.*

LA-UR-15-23637
W-11-TR-0015U
Revision A
Page 7 of 47

Oracle Database Administration
Tips and Techniques for the PDMLink Administrators

Starting up and shutting down an Oracle database

Besides the usual calls from the PDMLink administrators or from the users saying that they are getting error messages telling them that there is no access to the database, how do you check if the database is up and running, and how do you restart it if it is down?

There are two ways to quickly check if the database is up or down: 1) log into the database and look for a message from the database indicating that the database is down, or 2) check the status of the Oracle-related services on a MS Windows Server host, or if on a UNIX host check the processes running.

Shutting down a database

Let's start by shutting down a running database. It's very simple: log in as the user **SYS** and issue the command "**shutdown immediate**", as follows:

```
C:\Windows\System32>
C:\Windows\System32>sqlplus / as sysdba

SQL*Plus: Release 11.2.0.4.0 Production on Tue Feb 24 17:13:12 2015

Copyright (c) 1982, 2013, Oracle.  All rights reserved.


Connected to:
Oracle Database 11g Enterprise Edition Release 11.2.0.4.0 - 64bit Production

SQL>
SQL> shutdown immediate;   <---
Database closed.
Database dismounted.
ORACLE instance shut down.   <---
SQL>
SQL>
SQL> exit
Disconnected from Oracle Database 11g Enterprise Edition Release 11.2.0.4.0 -
```

Now that we know that we have a database that has been shut down, the following example will illustrate what you will see when you log into a database that has been shut down:

```
C:\Windows\System32>
C:\Windows\System32>sqlplus / as sysdba

SQL*Plus: Release 11.2.0.4.0 Production on Tue Feb 24 17

Copyright (c) 1982, 2013, Oracle.  All rights reserved.

Connected to an idle instance.

SQL>
```

The phrase "**Connected to an idle instance**" indicates that the database is in a shutdown state.

Oracle Database Administration
Tips and Techniques for the PDMLink Administrators

LA-UR-15-23637
W-11-TR-0015U
Revision A
Page 8 of 47

Starting up a database

It is also simple to start up a database: log in as user **SYS** and issue the command "**startup**", as shown in the following example:

Oracle services on a MS Windows Server

Another method to determine if the Oracle database is up or down is to check the status of the Oracle services in a MS Windows Server. In a typical Oracle installation on a MS Windows Server, you will see the following services:
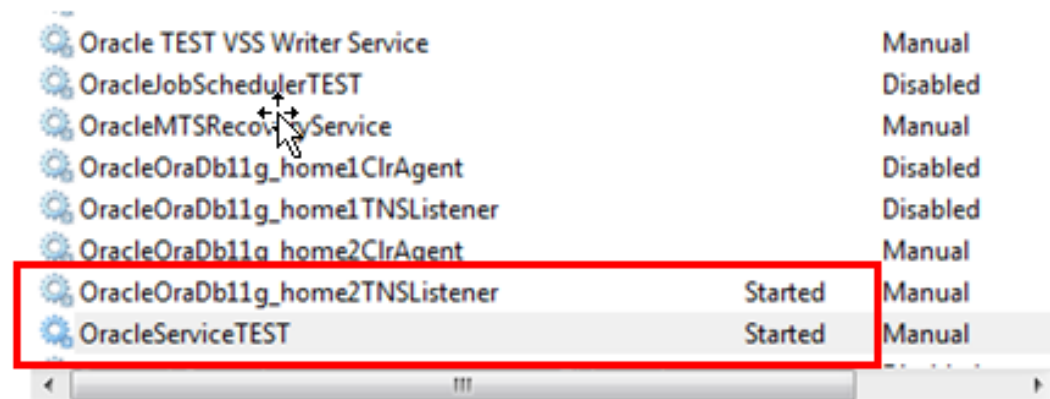

In this example, the database name is **TEST**, and the two services that you, as the Oracle DBA, are interested in are:

> **OracleOraDb11g_home2TNSListener**
> **OracleServiceTEST**

LA-UR-15-23637
Oracle Database Administration
Tips and Techniques for the PDMLink Administrators
W-11-TR-0015U
Revision A
Page 9 of 47

These are the two services that must be running (started) on a MS Windows server in order for the Oracle database to be accessible to client requests. The service **OracleServiceTEST** points to the memory structures allocated to the Oracle server on the host machine (the Oracle instance), while the service **OracleOraDb11g_home2TNSListener** points to the "**LISTENER**", which is the process that manages and handles connection requests from clients, such as connection and query requests from PDMLink, to the database. Both of these processes must be running on the Oracle database host server in order for clients to access the database.

If any of these two processes shows a state other than "**Started**" (usually the Status column will be blank if the service has been stopped, as shown in the next example), then you must manually start the process by selecting it and clicking on the "**Start**" link, as shown in the next figure (in this example, the **LISTENER** service has been stopped and needs to be restarted):
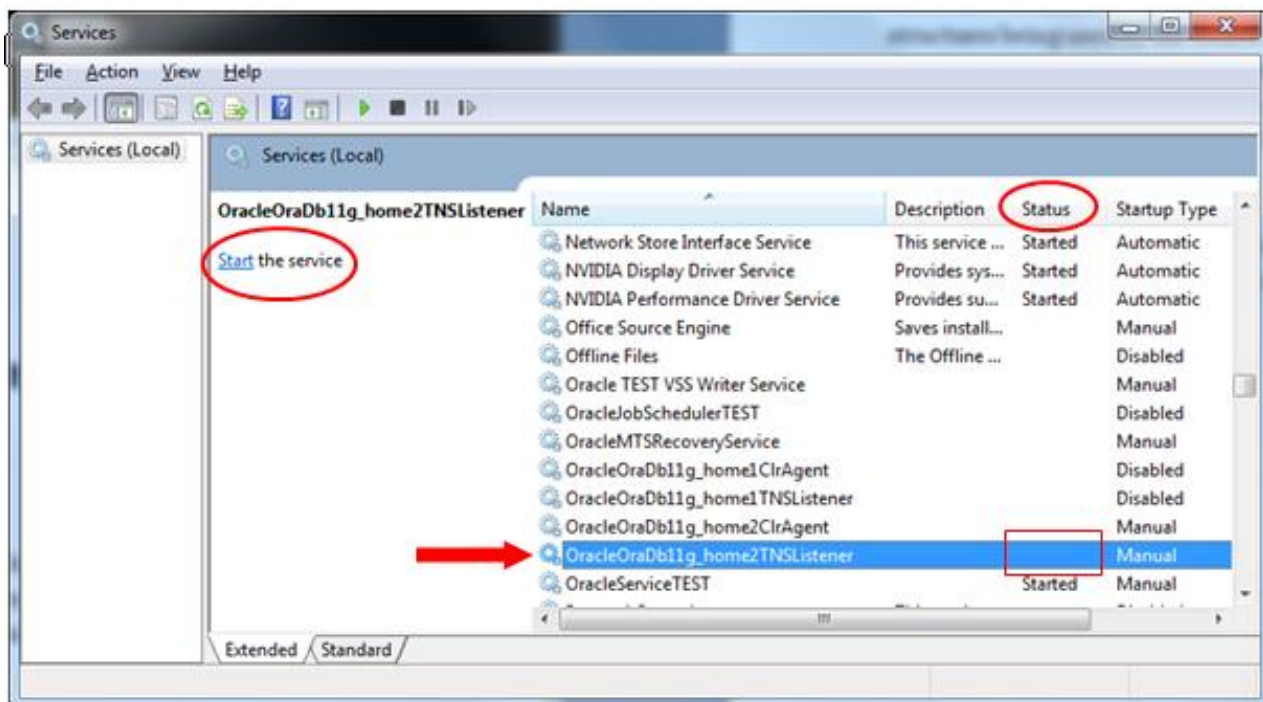
Oracle processes on a UNIX server

Below is a screen shot that shows the process running on a UNIX box when an Oracle database is running:

ps –ef | grep ora_ ; ps –ef | grep –i lsnr

LA-UR-15-23637

Oracle Database Administration
Tips and Techniques for the PDMLink Administrators

W-11-TR-0015U
Revision A
Page 10 of 47

The **ora_*** processes are the Oracle instance processes. The process listed at the bottom of the
screen shot **(…/bin/tnslsnr** …) is the LISTENER process, as explained previously in the paper.

```
[oracle@            ~]$
[oracle@            ~]$ ps -ef|grep ora_ ; ps -ef|grep -i lsnr
oracle    10085     1  0  2014 ?        00:39:55 ora_pmon_    l1g
oracle    10090     1  0  2014 ?        00:44:16 ora_psp0_    l1g
oracle    10095     1  1  2014 ?        2-14:59:52 ora_vk1    eml1g
oracle    10102     1  0  2014 ?        00:06:27 ora_gen0_    l1g
oracle    10107     1  0  2014 ?        00:14:35 ora_diag_    l1g
oracle    10112     1  0  2014 ?        00:11:43 ora_dbrm_    l1g
oracle    10117     1  0  2014 ?        03:03:05 ora_dia0_    l1g
oracle    10122     1  0  2014 ?        00:06:37 ora_mman_    l1g
oracle    10127     1  0  2014 ?        00:40:49 ora_dbw0_    l1g
oracle    10132     1  0  2014 ?        00:41:42 ora_dbw1_    l1g
oracle    10137     1  0  2014 ?        00:41:58 ora_dbw2_    l1g
oracle    10142     1  0  2014 ?        00:40:38 ora_dbw3_    l1g
oracle    10147     1  0  2014 ?        01:43:19 ora_lgwr_    l1g
oracle    10152     1  0  2014 ?        01:04:06 ora_ckpt_    l1g
oracle    10157     1  0  2014 ?        03:30:47 ora_smon_    l1g
oracle    10162     1  0  2014 ?        00:02:33 ora_reco_    l1g
oracle    10167     1  0  2014 ?        05:18:52 ora_mmon_    l1g
oracle    10172     1  0  2014 ?        02:05:26 ora_mmnl_    l1g
oracle    10221     1  0  2014 ?        00:21:05 ora_arc0_    l1g
oracle    10231     1  0  2014 ?        00:04:23 ora_arc1_    l1g
oracle    10236     1  0  2014 ?        00:22:44 ora_arc2_    l1g
oracle    10241     1  0  2014 ?        00:20:47 ora_arc3_    l1g
oracle    10246     1  0  2014 ?        00:37:29 ora_ctwr_    l1g
oracle    10256     1  0  2014 ?        00:03:23 ora_qmnc_    l1g
oracle    10300     1  0  2014 ?        00:42:48 ora_cjq0_    l1g
oracle    10374     1  0  2014 ?        00:03:49 ora_q001_    l1g
oracle    10912     1  0 Mar04 ?        00:00:02 ora_q004_    l1g
oracle    12388     1  0  2014 ?        00:08:10 ora_smco_    l1g
oracle    19672     1  0 10:47 ?        00:00:00 ora_w000_    l1g
oracle    28889 24055  0 11:11 pts/1    00:00:00 grep ora_
oracle    10356     1  0  2014 ?        00:21:05          /oracle/product/11.2.0/dbhome_1/bin/tnslsnr LISTENER -
rit
```

Oracle Database Administration
Tips and Techniques for the PDMLink Administrators

LA-UR-15-23637
W-11-TR-0015U
Revision A
Page 11 of 47

Oracle database and configuration files

At some point during the brief period of time when you will be in charge of maintaining one or more Oracle databases, you will ask yourself "well … where are the Oracle database files?, and which ones do I need to worry about?"

ORACLE_BASE and ORACLE_HOME

On the host server where the Oracle database is installed, you will find an environment variable called **ORACLE_HOME**:
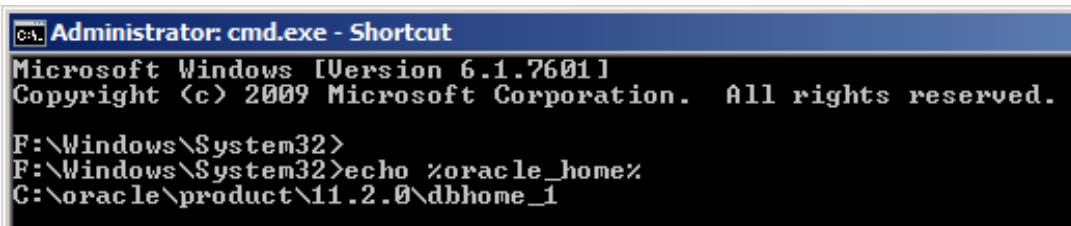
On Windows: %oracle_home%
On UNIX: $ORACLE_HOME

This variable points to the folder/directory structure on the host server where the Oracle database executables reside. In a "typical" installation of an Oracle database, you could expect to see something like this for **ORACLE_HOME**:

On Windows: D:\oracle\product\11.2.0\dbhome_1
On UNIX: /app/oracle/product/11.2.0/dbhome_1

In the "dbhome_1" directory/folder is where you will find the Oracle database binaries and libraries. The important point to take away from this is that most of the Oracle documentation that you come across makes references to "**ORACLE_HOME**", and most of the instructions that you will find when troubleshooting or when working with Oracle Support you will be expected to know where "**ORACLE_HOME**" is.
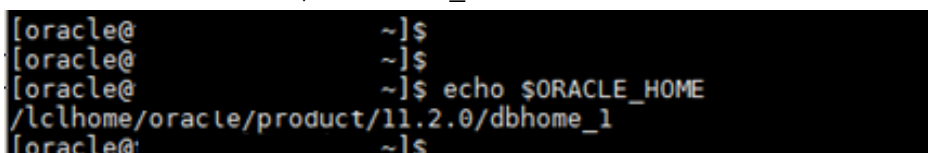
On a Windows server: **echo %oracle_home%**

```
Administrator: cmd.exe - Shortcut
Microsoft Windows [Version 6.1.7601]
Copyright (c) 2009 Microsoft Corporation.  All rights reserved.

F:\Windows\System32>
F:\Windows\System32>echo %oracle_home%
C:\oracle\product\11.2.0\dbhome_1
```

On a UNIX box: **echo $ORACLE_HOME**

```
[oracle@          ~]$
[oracle@          ~]$
[oracle@          ~]$ echo $ORACLE_HOME
/lclhome/oracle/product/11.2.0/dbhome_1
[oracle@          ~]$
```

UNCLASSIFIED

Oracle Database Administration
Tips and Techniques for the PDMLink Administrators

LA-UR-15-23637
W-11-TR-0015U
Revision A
Page 12 of 47

In some installations you may or may not see another environment variable defined, called **ORACLE_BASE**. **ORACLE_BASE** is the root folder/directory for all Oracle installations, and it contains diagnostic and trace/log files. You can find files such as the **alert.log** and **init.ora** parameter file. These files can be found under the **ADMIN** folder/directory if the database version is 10g, or **DIAG** folder/directory if the database version is 11g.

ORACLE_BASE is not a required environment variable, so you may not find it if you are looking for it. But in general, the **ORACLE_BASE** environment variable can be deduced from the **ORACLE_HOME** variable:

> If **ORACLE_HOME** = D:\oracle\product\11.2.0\dbhome_1, then, in general, **ORACLE_BASE** will be the path before "\product\...", in this case, **ORACLE_BASE**=D:\oracle

In **ORACLE_BASE**, the folders/directories that you should familiarize yourself with, especially when troubleshooting, are:

> **ORACLE_BASE/admin/<SID>/pfile**
> This folder contains one of the database's initialization parameter files

> **ORACLE_BASE/diag/rdbms/<SID>/<SID>/trace**
> This folder contains the database's trace/log files

ALERT.LOG FILE

The Oracle **alert.log** file is an important file that you must be familiar with. This is similar to a Method Server log file. This file contains entries of the many activities going on in the database. This file is the first file that you will check when troubleshooting an Oracle-related issue. If you have to work with Oracle Support, they will ask you for this file, so you need to know where it is.

This file is a plain-text file. There is only one such file in the database, and information gets appended to it through database shut downs and start ups. Note that, unlike a Method Server log file which gets created when Windchill stops or starts, this file will grown over time, since there is only one.

The **alert.log** file is located in **ORACLE_BASE/diag/rdbms/<SID>/<SID>/trace.** You can also find the location of this file by looking at the value of the database parameter "**background_dump_dest**", as shown in the following example:

In the directory listed by the parameter "**background_dump_dest**", you will find the file called
alert_<*database name*>.log, along many trace files, which can be used for troubleshooting
purposes when the need arises.

TIP – Did you notice the line:
>   *SQL> host dir C:\ORACLE\diag\rdbms\test\test\trace | find "alert"*

>   *When you are in a SQLPlus session, you can issue OS commands by typing the keyword*
>   *"host", followed by the OS command. You can also type the keyword "host" and hit*
>   *return, which will take you to the OS prompt, where you can issue OS commands. Once*
>   *you are done working in the OS prompt, you can type "exit" and it will return you to the*
>   *SQLPlus prompt. Take a look at the following example, when you issue the command*
>   *"host" at the SQL> prompt:*

LA-UR-15-23637

Oracle Database Administration
Tips and Techniques for the PDMLink Administrators

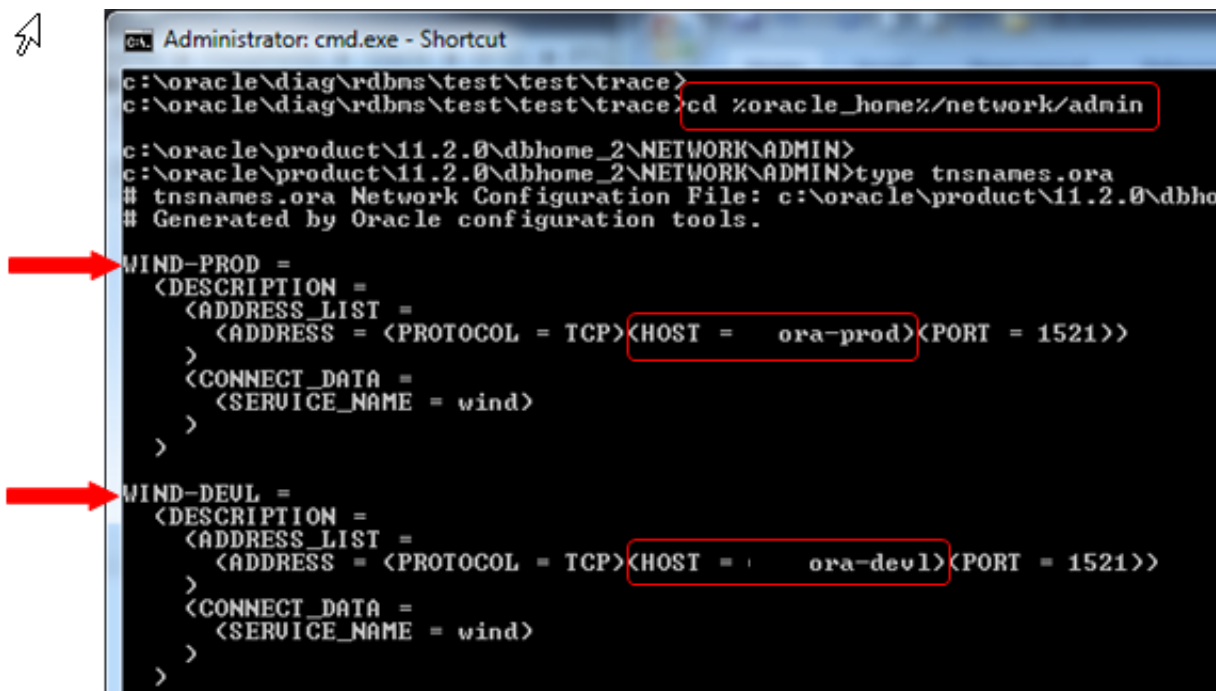**W-11-TR-0015U**
Revision A
Page 14 of 47

TNSNAMES.ORA FILE

The file called **tnsnames.ora** is one that you may or may not need to interact with; however, it will be useful to know what it is and where it is. First, where is it? You can find it in:

On Windows:	%oracle_home%\network\admin
On UNIX:	$ORACLE_HOME/network/admin

It is a plain text file, so you can read its contents. You can find the full technical definition in the Oracle documentation (or on Google!), but in a nut shell, this file contains the alias descriptors that point to one or more databases. In this file you will find one alias that maps to one database on a server, not necessarily the local host where you are working, but it can contain aliases to databases that reside on other networked hosts, such as development or testing hosts. The SQLPlus executable that is installed on the machine that you are currently logged in will read the contents of this file upon initialization; therefore, you can use your local SQLPlus installation to access databases that are not on your local host. Typically, the **tnsnames.ora** file is a local file

LA-UR-15-23637

Oracle Database Administration
Tips and Techniques for the PDMLink Administrators

W-11-TR-0015U
Revision A
Page 15 of 47

on each machine where there is Oracle software installed. Below is an example of what a
tnsnames.ora file might look like:

You see two alias entries: WIND-PROD and WIND-DEVL. The alias WIND-PROD points to a
server host called ORA-PROD where there is an Oracle database called WIND, and the
LISTENER process on that host is listening for database requests on port 1521.

The alias WIND-DEVL points to a server host called ORA-DEVL where there is an Oracle
database, also called WIND, and the LISTENER process on that host is listening on port 1521.

Note that each host has its own Oracle installation and in each host there is a database called
WIND. From this example one can see that one of the WIND databases is the production
database on the PROD host, while the other WIND database is a development database on the
DEVL host.

The **tnsnames.ora** file takes care of connecting you to the correct database on the correct host,
depending on the alias that you use to connect to the database. Take a look at the following
examples:

LA-UR-15-23637
W-11-TR-0015U
Revision A
Page 16 of 47

Oracle Database Administration
Tips and Techniques for the PDMLink Administrators

In this example you can see how the **tnsnames.ora** file connected the database user SYSTEM to the WIND database on the ORA-PROD server by using the alias "**@wind-prod**" in the SQLPlus connect string. Similarly, **tnsnames.ora** file resolved the "**@wind-devl**" alias to connect the database user SYSTEM to the WIND database on the ORA-DEVL server. Both of these connections were made from the same SQLPlus session on a client machine.

This is an important concept to understand, especially if you are managing multiple database installations, whether they are on one or multiple servers.

INIT.ORA / SPFILE.ORA PARAMETER FILES

Analogous to a Windchill installation where you have parameter files such as **site.xconf** and **wt.properties** files where the properties of the Windchill server are defined upon start up of the Windchill application, the Oracle database also has a parameter file that is read when the database instance is started up that defines properties for the Oracle instance and the database.

There are two types of parameter files: a plain text, parameter file called **INIT<SID>.ORA** file, and a binary file called **SPFILE<SID>.ORA**. These files contain parameters that define the properties of the database and of the instance upon start up. These files include properties such as: RAM memory allocation for the Oracle instance, location of the database CONTROL files (the database CONTROL files, usually in the form **CONTROL01.CTL**, are essential to the

Oracle Database Administration
Tips and Techniques for the PDMLink Administrators

LA-UR-15-23637
W-11-TR-0015U
Revision A
Page 17 of 47

database – they record the physical structure of the database; the database will not work without the CONTROL files), physical limits of the database, and many more.

You can find these parameter files in the following locations:

On UNIX: $ORACLE_HOME/dbs/init<SID>.ora   (plain text file)
                $ORACLE_HOME/dbs/spfile<SID>.ora   (binary file)

On Windows: $ORACLE_HOME\database\init<SID>.ora
                $ORACLE_HOME\database\spfile<SID>.ora

> *Note:*
> *In some cases, you will find the <u>most recent, manually edited</u>, plain-text initialization parameter file, in **ORACLE_BASE/admin/<SID>/pfile/init<SID>.ora**.*

It is beyond the scope of this paper to discuss in detail the differences between the plain text **init<SID>.ora** file and the binary **spfile<SID>.ora** files. What YOU, a PDMLink administrator taking care of Oracle databases *temporarily*, need to know is that when you start up a database by issuing the command (from a SQLPrompt) "**SQL> startup;**" (notice no arguments after the word "startup") the database instance will use the binary **spfile<SID>.ora** initialization file to get its properties from.

If you are instructed (by Oracle Support for example) to manually make changes to one or more initialization parameter files and use these new changes to start up the database, then you will be making changes to the plain text **init<SID>.ora** file, in which case you will start up the database by issuing the command:

> **SQL> startup pfile='c:\oracle\admin\<SID>\pfile\init<SID>.ora'**
> *Notice the argument "pfile=…" after the keyword "startup"*

An extremely important aspect about shutting down and starting up the Oracle database is to know what the standard procedure used by the former Oracle DBA was: did the former DBA use to start up the Oracle database routinely using the SPFILE (i.e. **SQL> startup;**), or did he routinely used to start up the database by always using a parameter file
(i.e. **SQL> startup pfile='…/init<SID>.ora'**). Since you are doing this job temporarily, there is no need to change procedures; therefore, you must find out how the Oracle database is routinely started up after being shutdown. The easiest way to find out is to look at the daily backup scripts, ideally one that does a COLD backup where the database has to be shutdown, and inspect the script and look for the piece of SQL code where the database is started up. Once you find it you will see whether it is the former or the latter.

LA-UR-15-23637
W-11-TR-0015U
Revision A
Page 18 of 47

Oracle Database Administration
Tips and Techniques for the PDMLink Administrators

Backing up the Oracle database

One of the most important, if not THE most important, tasks that you, the PDMLink administrator, will have to perform on a daily basis while serving as the *temporary* Oracle DBA is to check the health of the backups of the Oracle databases that you are now in charge of. If you only have the time to do one thing as the *interim* Oracle DBA, make it to take care of backing up the production Oracle database.

It is impossible to know the backups that your former Oracle DBA has in place; however, I will describe the backups that we have implemented on a typical production Oracle database supporting a PDMLink installation. If your previous Oracle DBA didn't leave you documentation describing the daily backups of the Oracle database, it is relatively simple to figure it out.

On a Windows server, it is likely that database backup jobs are being run through the Windows Task Scheduler, as shown on the figure below:
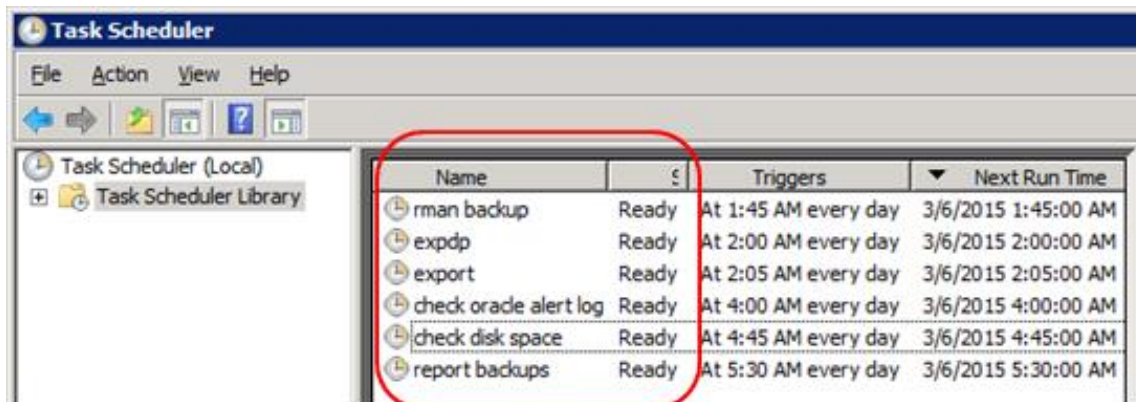
From the screen shot above you can see that there are jobs such as "**rman** backup", "**expdp**", "**export**". The "**rman** backup" refers to the Oracle RMAN (Recovery Manager) hot backup. The "**expdp**" job refers to the Oracle Export Data Pump backup utility. The "**export**" job refers to the traditional Oracle Export backup utility. These different Oracle utilities will be explained below.

On a UNIX server, you can inspect the contents of the CRONTAB and search for Oracle-related cron jobs. As an example, you can run the following commands and inspect the output:
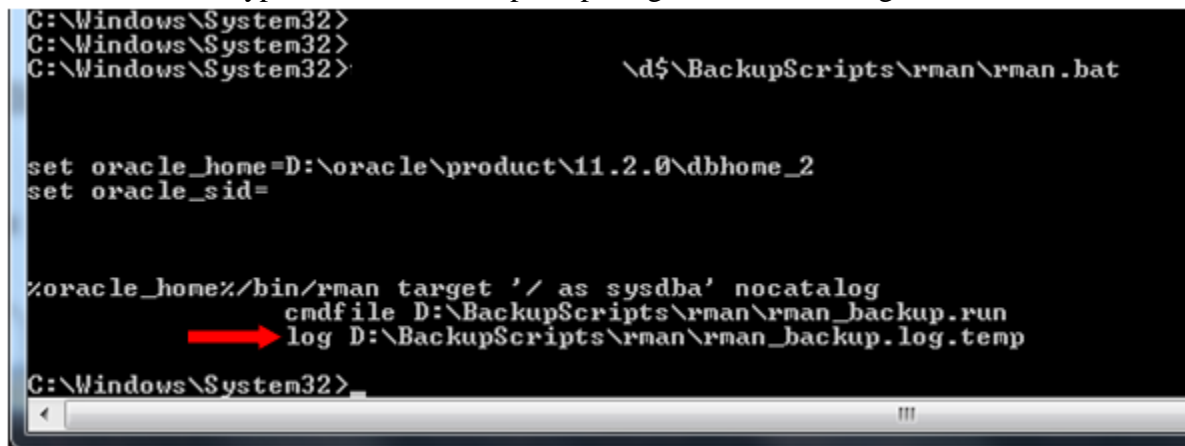
> [oraprod ~]$ **crontab -l | more**
> or …
> [oraprod ~]$ **crontab -l > crontab.out**

LA-UR-15-23637
Oracle Database Administration
Tips and Techniques for the PDMLink Administrators
W-11-TR-0015U
Revision A
Page 19 of 47

If there is no specific documentation regarding your Oracle database backups, it will be your duty to look carefully at the Task Scheduler on Windows, or at the CRONTAB on UNIX, figure out which are the database backup jobs based on certain key words (such as "**rman**", "**exp**", "**expdp**"), track these scripts down, and look at their contents to figure out the folder/directory where the backup files are being written to, and then familiarize yourself with the output. We will attempt to describe, at a very high level, these utilities so that you know what to look for.

RMAN – Recovery Manager

This is a built-in Oracle database utility that allows you to do a hot (i.e no database shut down), online, backup of the database files. RMAN will back up the files on disk that make up the database (referred to as a 'physical' backup), as compared to the Export or Data Pump Export utilities which will back up the actual data within the database (referred to as a 'logical' backup). This utility is also used to restore files from backup and recover the database from a failure.

The contents of a typical RMAN backup script might look something like this:

```
C:\Windows\System32>
C:\Windows\System32>
C:\Windows\System32>              \d$\BackupScripts\rman\rman.bat


set oracle_home=D:\oracle\product\11.2.0\dbhome_2
set oracle_sid=


%oracle_home%/bin/rman target '/ as sysdba' nocatalog
              cmdfile D:\BackupScripts\rman\rman_backup.run
          ➡️  log D:\BackupScripts\rman\rman_backup.log.temp

C:\Windows\System32>_
```

The parts that make up the command line are these:

      %oracle_home%/bin/rman
          RMAN utility executable

      target '/ as sysdba'
          you are logging in to the "**test**" database as user SYS (**/ as sysdba**)

      nocatalog
          you are not using an external metadata repository for RMAN operations

      cmdfile *D:\BackupScripts\rman\rman_backup.run*
          you are using another file called **rman_backup.run** which contains the actual RMAN commands

Oracle Database Administration
Tips and Techniques for the PDMLink Administrators

LA-UR-15-23637
W-11-TR-0015U
Revision A
Page 20 of 47

log *D:\BackupScripts\rman\rman_backup.log.temp*
> the output of the RMAN command will be recorded in a log file; <u>THIS is the log
> file that you need to inspect daily to verify the backup job!</u>

The **D:\BackupScripts\rman\rman_backup.log.temp** log file will be pretty large and will
contain a lot of information pertaining to what was backed up and the result of the operation.
Below we list a few of the lines in the log file that will be of interest to you:

```
C:\Windows\System32>
C:\Windows\System32>type "\\              .BackupScripts\rman\rman_backup - Copy.log"
Recovery Manager: Release 11.2.0.4.0 - Production on Fri Mar 13 01:45:01 2015

Copyright (c) 1982, 2011, Oracle and/or its affiliates.  All rights reserved.

connected to target database: TEST
using target database control file instead of recovery catalog

<many lines of text deleted above this line>

channel ORA_DISK_1: starting full datafile backup set
channel ORA_DISK_1: specifying datafile(s) in backup set
input datafile file number=00009 name=D:\ORADATA\TEST\USERS02.DBF
input datafile file number=00001 name=D:\ORADATA\TEST\SYSTEM01.DBF

<many lines of text deleted below this line>
```

input datafile file number=00009 name=D:\ORADATA\TEST\USERS02.DBF
> There will be many lines that look like this. These lines show you the database files that
> are being backed up. You can see from this output where the actual physical files that
> make up the database reside on disk, in this case, the physical database files reside in the
> **D:\ORADATA\TEST** folder/directory.

```
<many lines of text deleted above this line>

piece handle=
V:\FRA\TEST\BACKUPSET\2015_03_13\O1_MF_NNNDF_TAG20150313T014633_BJ55H45R_.BKP

<many lines of text deleted below this line>
```

piece handle = V:\FRA\TEST\BACKUPSET\2015_03_13/01_MF_NNNDF_TAG2015…
> You will also see many lines that look like this one. This is showing you the location on
> disk of the files that the RMAN utility is creating, which contain the backups of the
> database files. In this example, the backup files reside on disk in the directory/folder
> **V:\FRA\TEST\BACKUPSET\2015_03_13**.

Oracle Database Administration
Tips and Techniques for the PDMLink Administrators

LA-UR-15-23637
W-11-TR-0015U
Revision A
Page 21 of 47

*TIP – It is important to note that these backup files (or backup **pieces**) are binary files that are created by the RMAN utility and can only be read by the RMAN utility. You <u>cannot</u> manually manipulate or use these files without using RMAN.*

```
<many lines of text deleted above this line>

RMAN retention policy will be applied to the command
RMAN retention policy is set to redundancy 1
Deleting the following obsolete backups and copies:

<many lines of text deleted below this line>
```

RMAN retention policy will be applied to the command
RMAN retention policy is set to redundancy 1
Deleting the following obsolete backups and copies:

> These lines in the log file show that only 1 copy of the backup files will be retained, and upon successful completion of the current RMAN job, the previous backup files will be deleted. This is the mechanism by which RMAN automatically cleans up older backup, obsolete, files, thereby keeping the backup destination folder/directory from filling up.

<u>RMAN errors</u>

What does an RMAN error look like in the log file? Below is one example of what you should be looking for in the output log file after an RMAN backup runs. If and when you encounter this, you will have to contact Oracle Support, or try to research the error using other resources:

LA-UR-15-23637
Oracle Database Administration
Tips and Techniques for the PDMLink Administrators
W-11-TR-0015U
Revision A
Page 22 of 47

```
Recovery Manager: Release 11.2.0.4.0 - Production on Fri Mar 13 01:45:01 2015

Copyright (c) 1982, 2011, Oracle and/or its affiliates.  All rights reserved.

connected to target database: TEST
using target database control file instead of recovery catalog

RMAN>
RMAN> #

Starting backup at 13-MAR-15
current log archived
allocated channel: ORA_DISK_1
channel ORA_DISK_1: SID=398 device type=DISK
allocated channel: ORA_DISK_2
channel ORA_DISK_2: SID=465 device type=DISK
allocated channel: ORA_DISK_3
channel ORA_DISK_3: SID=622 device type=DISK
allocated channel: ORA_DISK_4
channel ORA_DISK_4: SID=708 device type=DISK
allocated channel: ORA_DISK_5
channel ORA_DISK_5: SID=779 device type=DISK
allocated channel: ORA_DISK_6
channel ORA_DISK_6: SID=855 device type=DISK
allocated channel: ORA_DISK_7
channel ORA_DISK_7: SID=6 device type=DISK
allocated channel: ORA_DISK_8
channel ORA_DISK_8: SID=84 device type=DISK
skipping archived log of thread 1 with sequence 6764; already backed up
channel ORA_DISK_1: starting archived log backup set
channel ORA_DISK_1: specifying archived log(s) in backup set
input archived log thread=1 sequence=6765 RECID=4988 STAMP=874138113
channel ORA_DISK_1: starting piece 1 at 13-MAR-15
channel ORA_DISK_2: starting archived log backup set
channel ORA_DISK_2: specifying archived log(s) in backup set
input archived log thread=1 sequence=6766 RECID=4989 STAMP=874150926
channel ORA_DISK_2: starting piece 1 at 13-MAR-15
channel ORA_DISK_3: starting archived log backup set
channel ORA_DISK_3: specifying archived log(s) in backup set
input archived log thread=1 sequence=6767 RECID=4990 STAMP=874159549
channel ORA_DISK_3: starting piece 1 at 13-MAR-15
channel ORA_DISK_4: starting archived log backup set
channel ORA_DISK_4: specifying archived log(s) in backup set
input archived log thread=1 sequence=6768 RECID=4991 STAMP=874180280
channel ORA_DISK_4: starting piece 1 at 13-MAR-15
channel ORA_DISK_5: starting archived log backup set
channel ORA_DISK_5: specifying archived log(s) in backup set

RMAN-00571: ===========================================================
RMAN-00569: =============== ERROR MESSAGE STACK FOLLOWS ===============
RMAN-00571: ===========================================================
RMAN-03002: failure of backup plus archivelog command at 08/01/2012 23:00:09
ORA-19563:  header validation failed for file
```

As you can see, these messages stand out and are pretty clear to see. Usually you will see these messages at the bottom of the log file, since it indicates a problem with the backup and the RMAN backup job would have most likely ended or aborted at this point.

Data Pump (EXPDP) export and traditional export (EXP)

If you are a PDMLink administrator and you are reading this paper, then you are probably familiar with the re-hosting procedure in PDMLink. One of the steps in re-hosting a PDMLink installation is to copy the database table data from the source system to the target system. You accomplish this task by copying an Oracle export dump file (a .dmp file) containing the database tables from the source system to the target system, and then importing (IMP) these tables into the new system.

Oracle Database Administration
Tips and Techniques for the PDMLink Administrators

LA-UR-15-23637
W-11-TR-0015U
Revision A
Page 23 of 47

The Oracle export dump file created in the source system, such as the production database, can also be used as a backup for the Oracle database. The Oracle export dump file (*.dmp) is also referred to as a "logical" backup, because it contains the actual data from the database. This type of "logical" backup complements the "physical" backup explained in the previous section, done through Recover Manager (RMAN). By having both a "physical" backup through RMAN, and a "logical" backup through the Oracle export utility (either traditional export, EXP, or the newer Data Pump export, EXPDP), you will have the ability to restore and recover the database, or the Windchill schema, to a point in time before failure.

As mentioned in the previous section, if the former DBA did not leave behind any documentation pertaining to the database backups, it is now your job as the *interim* DBA to find the backup job that does the nightly export of the Oracle database, and understand what it is doing and, more importantly, what to look for in the output log file.

If you are on Windows, you will look at the Scheduled Task jobs, and if you are on UNIX, you will look through the CRONTAB. Hopefully the previous DBA gave the export backup job a name that will be obvious to you, with the words "**exp**" or "**export**" in the name of the job. If not, then the following example illustrates a sample script that will export the entire database:

```
## Traditional export utility ##

set oracle_home=C:\oracle\product\11.2.0\dbhome_1
set oracle_sid=test
%oracle_home%/bin/exp '/ as sysdba' file=/oraback/export/test.dmp
log=/oraback/export/test.log full=y compress=y statistics=none direct=n
```

```
## New Data Pump export utility ##

set oracle_home=C:\oracle\product\11.2.0\dbhome_1
set oracle_sid=test
%oracle_home%/bin/expdp '/ as sysdba' full=y content=all job_name=expdp_test_1
parallel=8 filesize=3G directory=datapump_dir
dumpfile=/oraback/export/expdp_test.dmp logfile=/oraback/export/expdp_test.log
```

LA-UR-15-23637
Oracle Database Administration
Tips and Techniques for the PDMLink Administrators
W-11-TR-0015U
Revision A
Page 24 of 47

There are many parameters that can be used in both the traditional export (EXP) utility and the newer Data Pump (EXPDP) utility. The description of these parameters is beyond the scope of this paper. Earlier in the paper we established that, assuming that these export backup jobs are working properly, you should not need to, or be required to, make any changes or modifications to these scripts.

The information that is important to you as the *temporary* Oracle DBA, are the portions highlighted in yellow: the output log files. These are the files that you will need to inspect, if not every day, relatively frequently to ensure that the export backup jobs are working correctly.

In the examples shown above you can see the output of the export backup job will be recorded in a plain text log file. If there is no documentation regarding the Oracle backups, then it is up to you to look at these scripts in detail in order to figure out where to find these log files.

The following examples illustrate good, clean, export backup jobs, using the traditional EXP and the newer EXPDP utilities. These are the messages that you are looking for at the end (or at the bottom) of the log files:

Traditional export (EXP):

> *[many lines of output above this]*
> . . exporting table   MGMT_V_CLUSTER_MEMBER_LIST
> . . exporting table MGMT_V_CLUSTER_RAC_POL_DETAIL
> . . exporting table   MGMT_V_RAC_ASSOC_MEMBER_LIST
> . . exporting table   MGMT_V_RAC_MEMBER_LIST
> . about to export MGMT_VIEW's tables via Conventional Path ...
> . exporting synonyms
> . exporting views
> . exporting referential integrity constraints
> . exporting stored procedures
> . exporting operators
> . exporting indextypes
> . exporting materialized views
> . exporting snapshot logs
> . exporting job queues
> . exporting refresh groups and children
> . exporting dimensions
> . exporting post-schema procedural objects and actions
> . exporting user history table
> . exporting default and system auditing options
> . exporting statistics

Oracle Database Administration
Tips and Techniques for the PDMLink Administrators

LA-UR-15-23637
W-11-TR-0015U
Revision A
Page 25 of 47

Export terminated successfully without warnings.

Data Pump export (EXPDP):

[many lines of output above this]
. . exported "SYSTEM"."REPCAT$_USER_PARM_VALUES"   0 KB   0 rows
. . exported "SYSTEM"."SQLPLUS_PRODUCT_PROFILE"   0 KB   0 rows
Master table "SYS"."EXPDP_20150306_0200AM" successfully loaded/unloaded
****
Dump file set for SYS.EXPDP_20150306_0200AM is:\oraback\export\expdp_test.dmp
Job "SYS"."EXPDP_TEST_1" successfully completed at Fri Mar 6 02:16:23 2015
elapsed 0 00:16:16

Export errors

What does a typical EXP or EXPDP error look like in the log file? Below is one example of what you should be looking for in the output log file after an export backup job completes. If and when you encounter this, you will have to contact Oracle Support, or try to research the error using other resources:

Traditional export (EXP):

[many lines of output above this]
. . exporting table   FIX_ASSOC
EXP-00008: ORACLE error 1008 encountered
ORA-01008: not all variables bound
EXP-00056: ORACLE error 1013 encountered
ORA-01013: user requested cancel of current operation
EXP-00000: Export terminated unsuccessfully

Data Pump export (EXPDP):

[many lines of output above this]
. . exported "USER1"."TABL1_NOCOMPRESS"   797.9 MB 6749198 rows
. . exported "USER1"."TABL1_COMPRESS"   797.9 MB 6749198 rows
;;; Export> help
ORA-39065: unexpected master process exception in SEND
ORA-39079: unable to enqueue message
RP,KUPC$C_1_20150309162839,MCP,KUPC$A_1_162840280190000,13,Y
ORA-06512: at "SYS.DBMS_SYS_ERROR", line 86

UNCLASSIFIED

Oracle Database Administration
Tips and Techniques for the PDMLink Administrators

LA-UR-15-23637
W-11-TR-0015U
Revision A
Page 26 of 47

ORA-06512: at "SYS.KUPC$QUE_INT", line 969
ORA-24033: no recipients for message
Job "SYS"."DPEXP_USER1" stopped due to fatal error at Mon Mar 9 16:31:05 2015
elapsed 0 00:02:25

As you can clearly see from the examples above, when an export job fails it will produce lines of output with "ORA-" or "EXP-" errors in it.

Oracle Database Administration
Tips and Techniques for the PDMLink Administrators

GUI tools – Oracle Enterprise Manager Database Control

In this paper we are going to discuss only one graphical user interface: Enterprise Manager Database Control (DBControl). This is a web-based tool that you can use to manage the Oracle database. This application is extremely powerful; it allows the Oracle DBA to perform hundreds of tasks, from basic user creation and password change, to cloning a database on another host. This tool is an effective mechanism to perform routine, simple, tasks without the need to know the corresponding SQL commands from the command prompt. We believe that a PDMLink administrator serving in a *temporary* capacity of performing routine daily database administration tasks will find this tool useful.

The screen shot below shows the main page of DBControl.

Oracle Database Administration
Tips and Techniques for the PDMLink Administrators

LA-UR-15-23637
W-11-TR-0015U
Revision A
Page 28 of 47
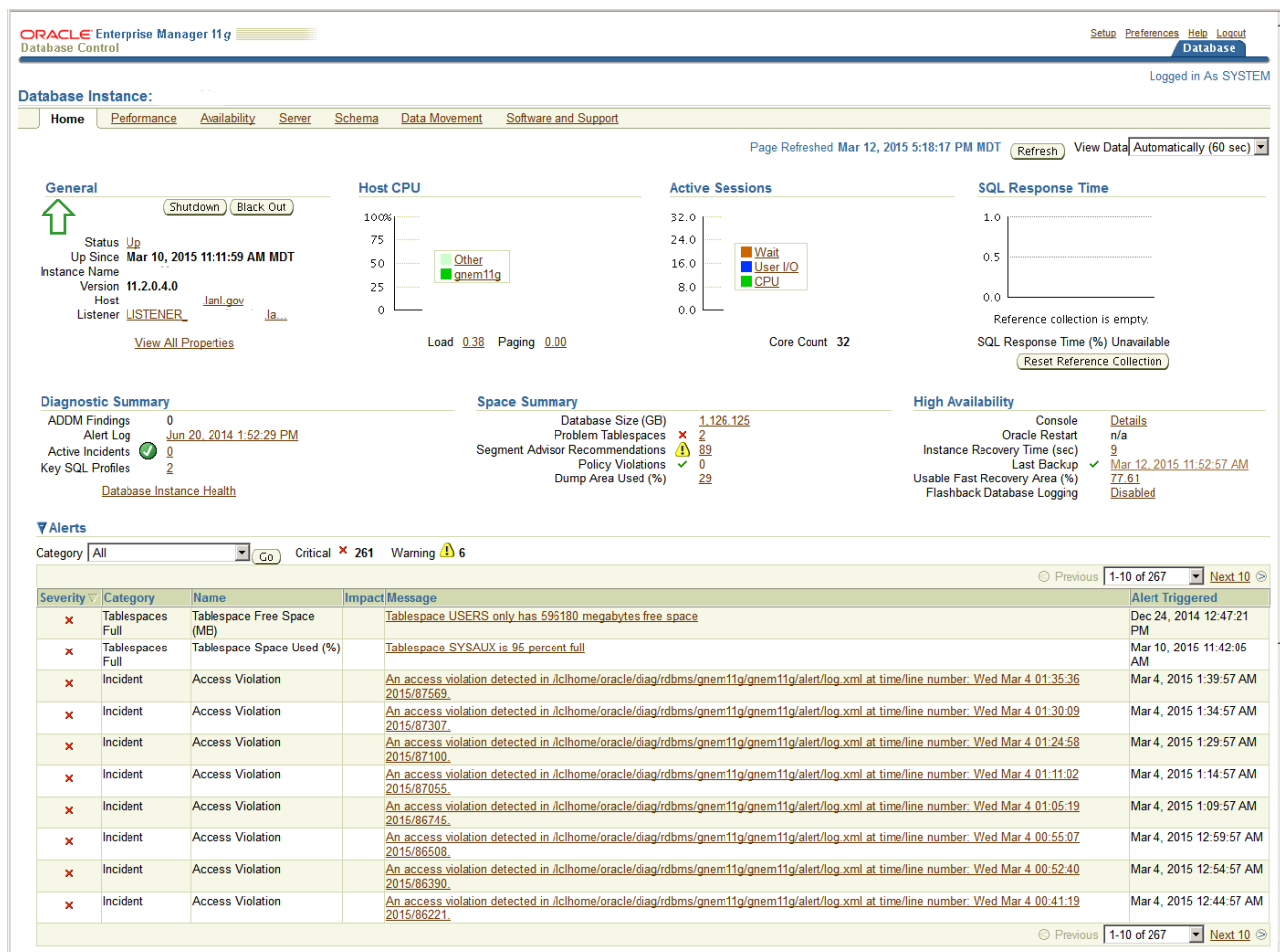
How do I know if DBControl is installed?

On Windows, you check the contents of the following file:

C:\Windows\System32> **type %oracle_home%\install\portlist.ini**

If the **portlist.ini** file is empty, then this is an indication that DBControl has not been installed yet. We will cover the installation of DBControl in the following pages. If DBControl is installed, you will see a message similar to the message shown in the example below (on UNIX).

On UNIX, you check the contents of the following file:

[oracle@oraprod install]$ **cat $ORACLE_HOME/install/readme.txt**

Enterprise Manager Database Control URL - (test) :
https://oraprod.lanl.gov:1158/em

The **readme.txt** file shows you that DBControl is installed on this server, and it shows you the URL to access it: https://oraprod.lanl.gov:1158/em

LA-UR-15-23637
Oracle Database Administration
Tips and Techniques for the PDMLink Administrators
W-11-TR-0015U
Revision A
Page 29 of 47
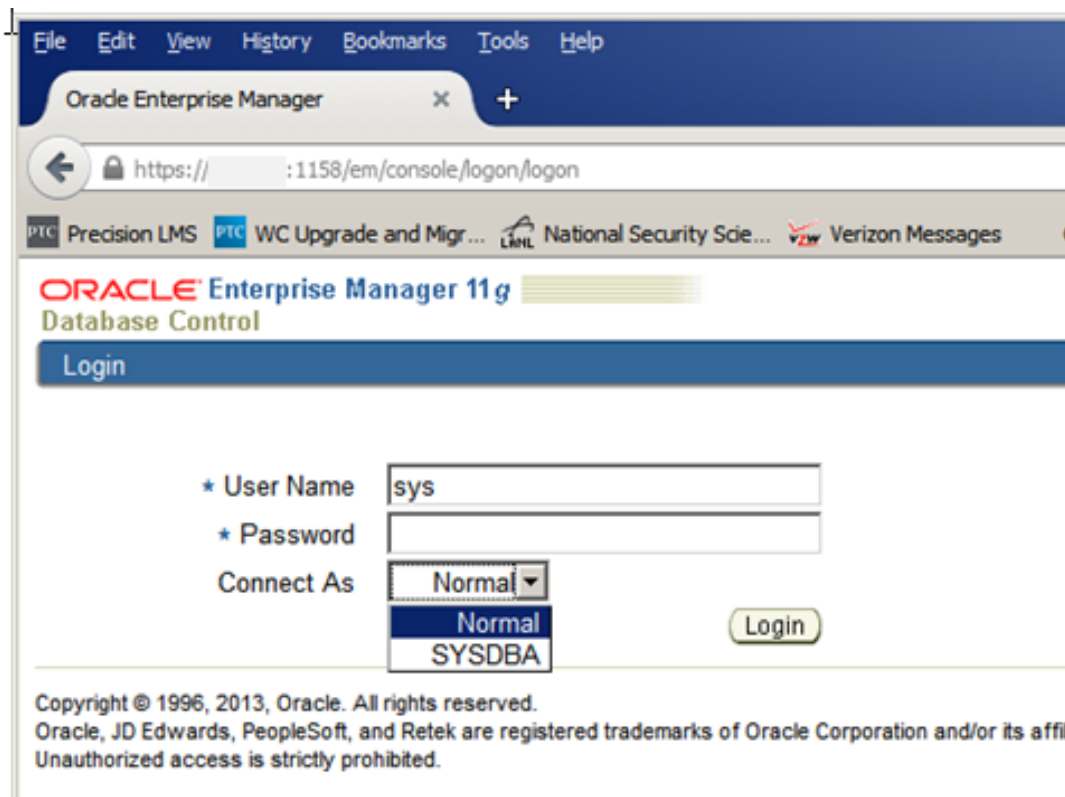
You will log into DBControl either as user SYSTEM (Normal) or as user SYS (SYSDBA from the "Connect As" drop down list).

<u>If DBControl is installed, how do I check if it is running? How do I start it if it is not?</u>

On UNIX, you can check if DBControl is running by typing the following command:

> [oracle@oraprod install]$ **$ORACLE_HOME/bin/emctl status dbconsole**

> Oracle Enterprise Manager 11g Database Control Release 11.2.0.4.0
> Copyright (c) 1996, 2013 Oracle Corporation. All rights reserved.
> https://oraprod.lanl.gov:1158/em/console/aboutApplication
> Oracle Enterprise Manager 11g is running.

If DBControl is not running (the message will be obvious), you can start the DBControl process like this:

> [oracle@oraprod install]$ **$ORACLE_HOME/bin/emctl start dbconsole**

The commands on Windows to check if DBControl is running and to start it if it is not running are the same as shown above. On Windows you use **%oracle_home%** instead of **$ORACLE_HOME**.

<u>If DBControl is not installed, how do I install it?</u>

You will encounter one of two situations: 1) DBControl has not been installed on the Oracle database server, or 2) DBControl is installed but you get error messages and you have to re-install it. Both of these cases are easily solved, as the installation and re-installation of DBControl is very easy.

You can install or re-install DBControl on Windows and UNIX by issuing the following command from a command prompt (remember, %oracle_home% on Windows, or $ORACLE_HOME on UNIX):

> **<oracle_home>/bin/emca –config dbcontrol db –repos [create | recreate]**

You will use the parameter "**create**" if DBControl as not been installed, and you will use the parameter "**recreate**" if it has already been installed (as determined by inspecting either the portlist.ini or readme.txt files) and you need to re-create it.

LA-UR-15-23637
Oracle Database Administration
Tips and Techniques for the PDMLink Administrators
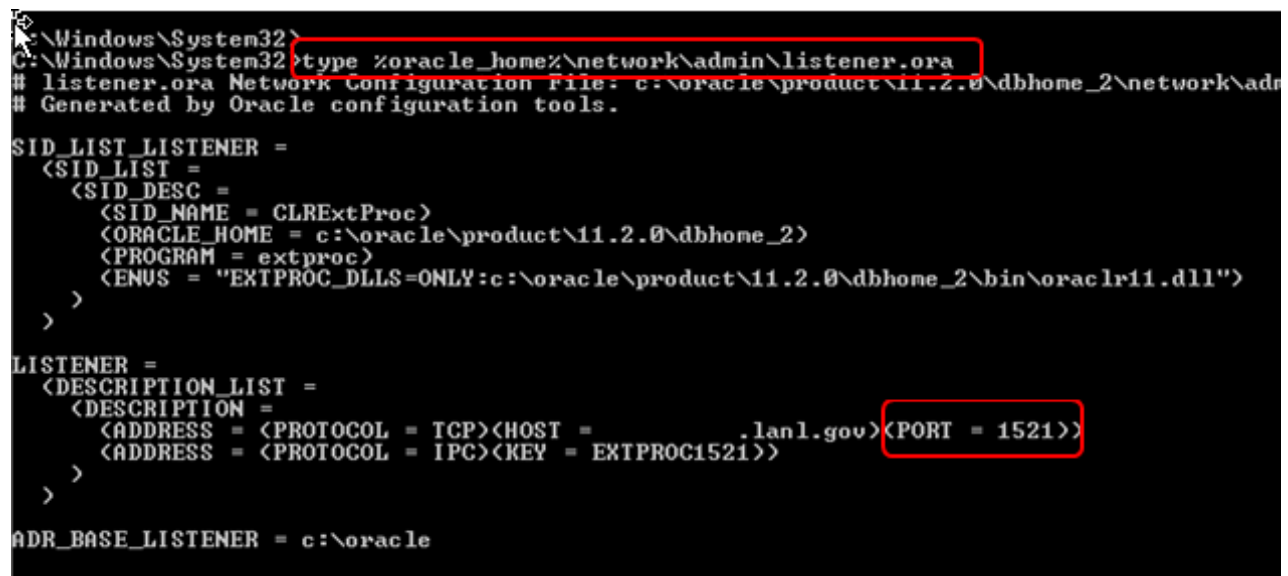**W-11-TR-0015U**
Revision A
Page 30 of 47

Be aware that when you run this command, you will be asked to provide the passwords for the following users: **SYS**, **SYSMAN**, and **DBSNMP**. The database user **SYSMAN** owns the database tables that are created by EM DBControl. These database tables are the metadata repository for information pertaining to DBControl and the database it is monitoring. The database user **DBSNMP** is the database user account used by the Enterprise Manager Agent process running on the database server to monitor the database.

If you are in the unfortunate situation of not knowing the passwords for user **SYSMAN** or **DBSNMP**, due to lack of documentation, then you will have to change their passwords and assign them new passwords prior to installing, or reinstalling, DBControl. Be sure to consult with the application administrators and others in your team to ensure that changing the password for the database user **DBSNMP** will not have a negative impact on other parts of the system.

You change a database user's password through SQLPlus like this, from a command prompt:

> **SQL> alter user sysman identified by abc123 ;**
> **SQL> alter user dbsnmp identified by abc123 ;**

You will also be asked to provide the LISTENER port number (the port where the LISTENER process is running on and listening for incoming connections). In a default database installation and network configuration, the default LISTENER port number is 1521. You can verify this information by looking at the contents of the **listener.ora** configuration file, located in **%oracle_home%\network\admin**:

```
C:\Windows\System32>
C:\Windows\System32>type %oracle_home%\network\admin\listener.ora
# listener.ora Network Configuration File: c:\oracle\product\11.2.0\dbhome_2\network\adm
# Generated by Oracle configuration tools.

SID_LIST_LISTENER =
  (SID_LIST =
    (SID_DESC =
      (SID_NAME = CLRExtProc)
      (ORACLE_HOME = c:\oracle\product\11.2.0\dbhome_2)
      (PROGRAM = extproc)
      (ENVS = "EXTPROC_DLLS=ONLY:c:\oracle\product\11.2.0\dbhome_2\bin\oraclr11.dll")
    )
  )

LISTENER =
  (DESCRIPTION_LIST =
    (DESCRIPTION =
      (ADDRESS = (PROTOCOL = TCP)(HOST =              .lanl.gov)(PORT = 1521))
      (ADDRESS = (PROTOCOL = IPC)(KEY = EXTPROC1521))
    )
  )

ADR_BASE_LISTENER = c:\oracle
```

Oracle Database Administration
Tips and Techniques for the PDMLink Administrators

LA-UR-15-23637
W-11-TR-0015U
Revision A
Page 31 of 47

Below is a screen shot from a Windows server when <u>re-installing</u> DBControl in a database where it has already been previously installed.

LA-UR-15-23637

Oracle Database Administration
Tips and Techniques for the PDMLink Administrators

W-11-TR-0015U
Revision A
Page 32 of 47

```
C:\Windows\System32>
C:\Windows\System32>%oracle_home%/bin/emca -config dbcontrol db -repos recreate

STARTED EMCA at Mar 30, 2015 3:05:18 PM
EM Configuration Assistant, Version 11.2.0.3.0 Production
Copyright (c) 2003, 2011, Oracle.  All rights reserved.

Enter the following information:
Database SID: test
Listener port number: 1521
Listener ORACLE_HOME [ c:\oracle\product\11.2.0\dbhome_2 ]:
Password for SYS user:
Password for DBSNMP user:
Password for SYSMAN user:
Password for SYSMAN user: Email address for notifications (optional): jachang@lanl.gov
Outgoing Mail (SMTP) server for notifications (optional):
-------------------------------------------------------------------------

You have specified the following settings

Database ORACLE_HOME ................ c:\oracle\product\11.2.0\dbhome_2

Local hostname ................          .lanl.gov
Listener ORACLE_HOME ................ c:\oracle\product\11.2.0\dbhome_2
Listener port number ................ 1521
Database SID ................ test
Email address for notifications ................ jachang@lanl.gov
Outgoing Mail (SMTP) server for notifications ................

-------------------------------------------------------------------------

WARNING : While repository is dropped the database will be put in quiesce mode.
-------------------------------------------------------------------------

Do you wish to continue? [yes(Y)/no(N)]: Y
Mar 30, 2015 3:05:50 PM oracle.sysman.emcp.EMConfig perform
INFO: This operation is being logged at c:\oracle\cfgtoollogs\emca\test\emca_2015_03_30_
Mar 30, 2015 3:05:52 PM oracle.sysman.emcp.EMReposConfig invoke
INFO: Dropping the EM repository (this may take a while) ...
Mar 30, 2015 3:07:59 PM oracle.sysman.emcp.EMReposConfig invoke
INFO: Repository successfully dropped
Mar 30, 2015 3:07:59 PM oracle.sysman.emcp.EMReposConfig createRepository
INFO: Creating the EM repository (this may take a while) ...
Mar 30, 2015 3:11:20 PM oracle.sysman.emcp.EMReposConfig invoke
INFO: Repository successfully created
Mar 30, 2015 3:11:23 PM oracle.sysman.emcp.EMReposConfig uploadConfigDataToRepository
INFO: Uploading configuration data to EM repository (this may take a while) ...
Mar 30, 2015 3:12:08 PM oracle.sysman.emcp.EMReposConfig invoke
INFO: Uploaded configuration data successfully
Mar 30, 2015 3:12:15 PM oracle.sysman.emcp.util.DBControlUtil secureDBConsole
INFO: Securing Database Control (this may take a while) ...
Mar 30, 2015 3:12:28 PM oracle.sysman.emcp.util.DBControlUtil secureDBConsole
INFO: Database Control secured successfully.
Mar 30, 2015 3:12:28 PM oracle.sysman.emcp.util.DBControlUtil startOMS
INFO: Starting Database Control (this may take a while) ...
Mar 30, 2015 3:13:34 PM oracle.sysman.emcp.EMDBPostConfig performConfiguration
INFO: Database Control started successfully
Mar 30, 2015 3:13:35 PM oracle.sysman.emcp.EMDBPostConfig performConfiguration
INFO: >>>>>>>>>> The Database Control URL is https://          .lanl.gov:5500/em <<<<<<<
Mar 30, 2015 3:13:37 PM oracle.sysman.emcp.EMDBPostConfig invoke
WARNING:
*************************** WARNING ***************************

Management Repository has been placed in secure mode wherein Enterprise Manager data wil
en placed in the file: c:/oracle/product/11.2.0/dbhome_2/          .lanl.gov_test/sysman/
ed up as the encrypted data will become unusable if this file is lost.

**************************************************************
Enterprise Manager configuration completed successfully
FINISHED EMCA at Mar 30, 2015 3:13:37 PM

C:\Windows\System32>
```

Oracle Database Administration
Tips and Techniques for the PDMLink Administrators

LA-UR-15-23637
W-11-TR-0015U
Revision A
Page 33 of 47

> *Note:*
>
> *When you run the command to install DBControl, you will see the following message:*
>
> *---*
>
> ***WARNING : While repository is dropped the database will be put in quiesce mode.***
>
> *---*
>
> *Putting the database in quiesce mode will <u>not</u> allow regular users to connect to the database. This is done typically when you must perform maintenance, usually as user SYS. On a 11g database, this message can be ignored because the database will not be put in quiesce mode. However, on a 10g database, it will be put in quiesce mode and regular users will not be able to connect to the database while DBControl is being installed.*

Note the information at the bottom of the screen output. It will show you the URL that you will use to access EM DBControl on this server:

You can also get the URL information to access the newly installed DBControl from the **%oracle_home%\install\readme.txt** file:

Oracle Database Administration
Tips and Techniques for the PDMLink Administrators

```
C:\Windows\System32>
C:\Windows\System32>dir %oracle_home%\install
 Volume in drive C is OSDisk
 Volume Serial Number is DEBD-D8EE

 Directory of c:\oracle\product\11.2.0\dbhome_2\install

03/30/2015  03:13 PM    <DIR>          .
03/30/2015  03:13 PM    <DIR>          ..
12/03/2014  11:04 AM    <DIR>          chainedInstall
12/03/2014  11:02 AM    <DIR>          config
12/03/2014  11:04 AM               642 envVars.properties
12/03/2014  10:34 AM    <DIR>          jlib
03/30/2015  03:12 PM                97 portlist.ini
03/30/2015  03:13 PM                90 readme.txt
               3 File(s)            829 bytes
               5 Dir(s)  185,367,375,872 bytes free

C:\Windows\System32>
C:\Windows\System32>type %oracle_home%\install\readme.txt
Enterprise Manager Database Control URL - (test) :
https://          .lanl.gov:5500/em
```

On a Windows server, you will see a new **OracleDBConsole<SID>** service after the creation, or re-installation, of EM DBControl:
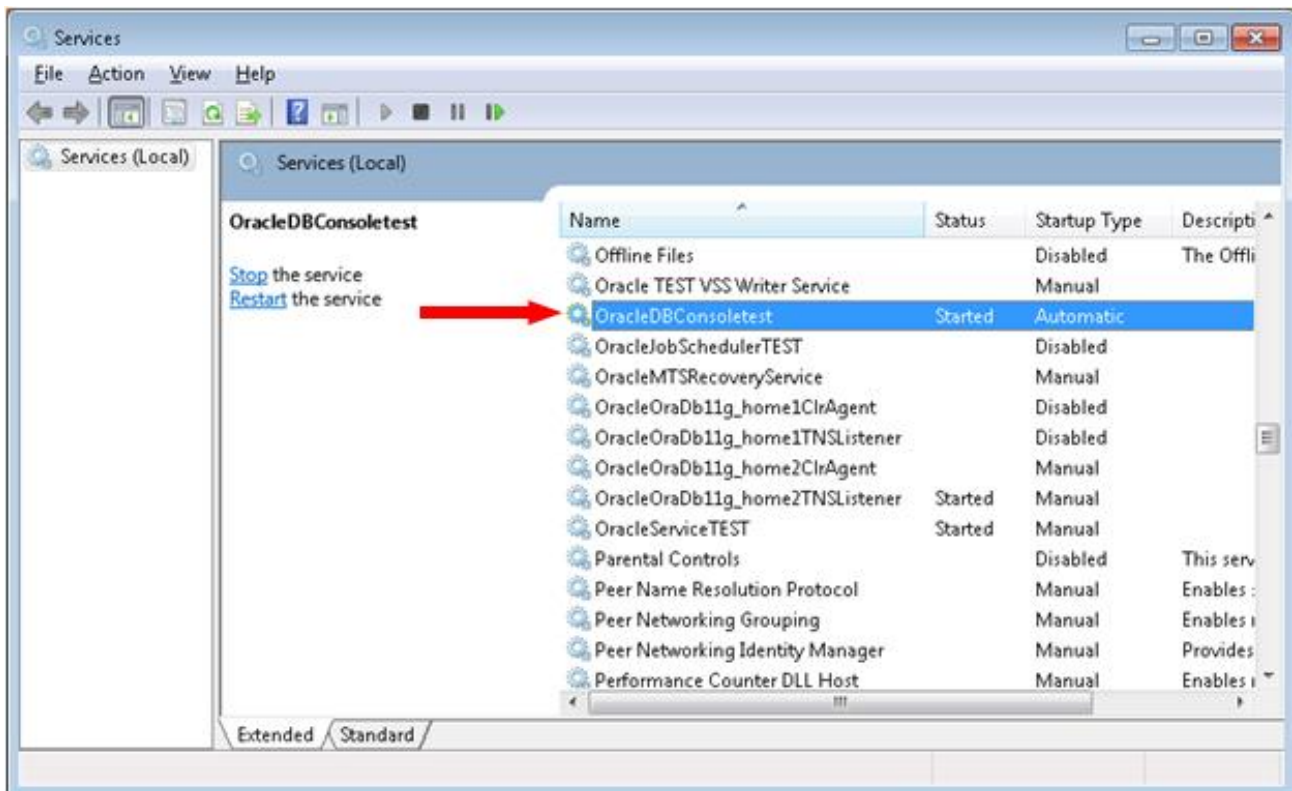
On UNIX, you can "grep" for "emagent", as shown below:

LA-UR-15-23637
W-11-TR-0015U
Revision A
Page 35 of 47

Oracle Database Administration
Tips and Techniques for the PDMLink Administrators

```
[oracle@                    )]$
[oracle@                    )]$
[oracle@                    )]$ ps -ef|grep emagent
oracle    1923 10914  0 Mar08 ?        00:29:53              /product/11.2.0/dbhome_1/bin/emagent
oracle   31412 44626  0 16:08 pts/2    00:00:00
[oracle@                    p]$
[oracle@                    p]$
```

Oracle Database Administration
Tips and Techniques for the PDMLink Administrators

LA-UR-15-23637
W-11-TR-0015U
Revision A
Page 36 of 47

Troubleshooting the Oracle database

One of the very first things you need to do in order to get help with troubleshooting issues in the Oracle database is to get the Oracle Customer Support Identifier (CSI) number from the previous DBA, or from someone in your IT organization. The CSI number will allow you to create an account with Oracle Support and create tickets to get help with a problem.

Once you have the CSI number, you will go the Oracle Support web page and register with them:

support.oracle.com

LA-UR-15-23637
Oracle Database Administration
Tips and Techniques for the PDMLink Administrators
W-11-TR-0015U
Revision A
Page 37 of 47
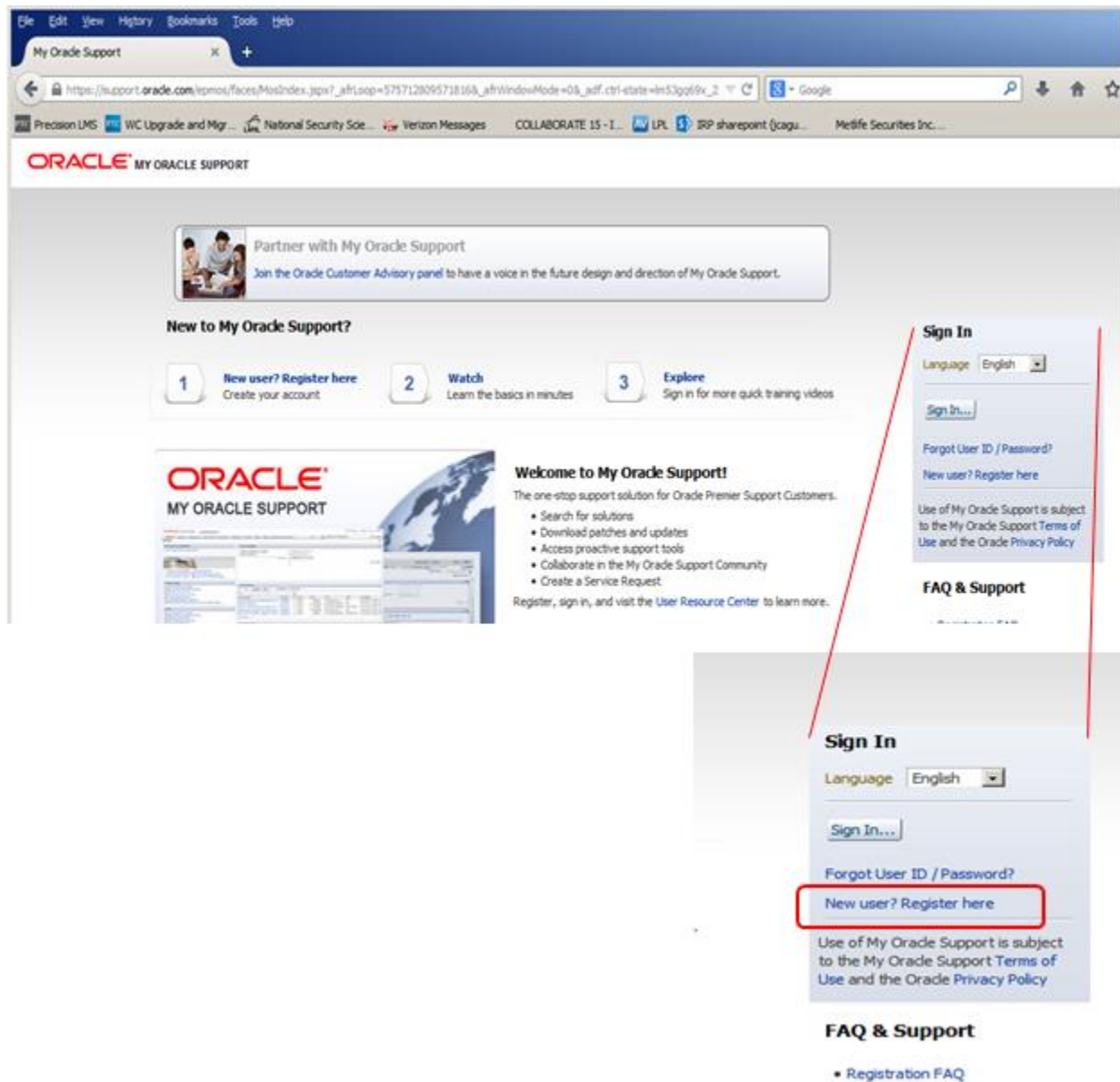
Once you have established an account with Oracle Support, you can log in and do a number of things: create a service request (SR), i.e. a ticket, look for documentation, look for answers to questions, etc. Below is the home screen when you go to **support.oracle.com**:

LA-UR-15-23637

Oracle Database Administration
Tips and Techniques for the PDMLink Administrators

W-11-TR-0015U
Revision A
Page 38 of 47
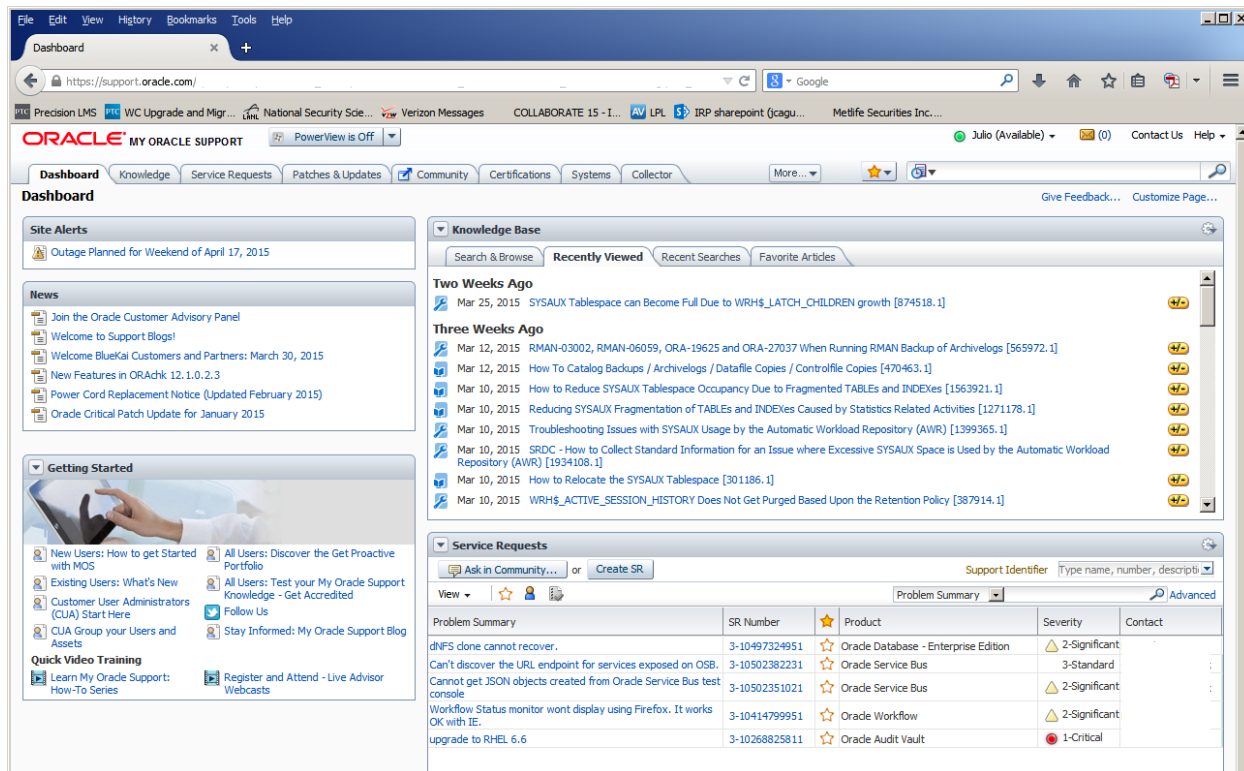
There are two main sections in the home page that we believe will be useful to you as you serve in a *temporary* DBA capacity: the Service Request tab, and the Search toolbar.

The Service Request tab

This is the place where you will create a service request (SR), i.e. a ticket, in order to engage Oracle Support in helping you troubleshoot issues with the database. The steps to create a SR are pretty straight forward, but you will need to know some key information, such as the operating system (and version) of the host where the Oracle database is installed, the version of the Oracle database, whether it's a 32-bit or 64-bit installation, and the general type of problem that you are having (i.e, is it related to performance, or is it related to RMAN errors, etc.). Below is a screen shot of this tab:

LA-UR-15-23637

Oracle Database Administration
Tips and Techniques for the PDMLink Administrators

W-11-TR-0015U
Revision A
Page 39 of 47

Oracle Database Administration
Tips and Techniques for the PDMLink Administrators

LA-UR-15-23637
W-11-TR-0015U
Revision A
Page 40 of 47
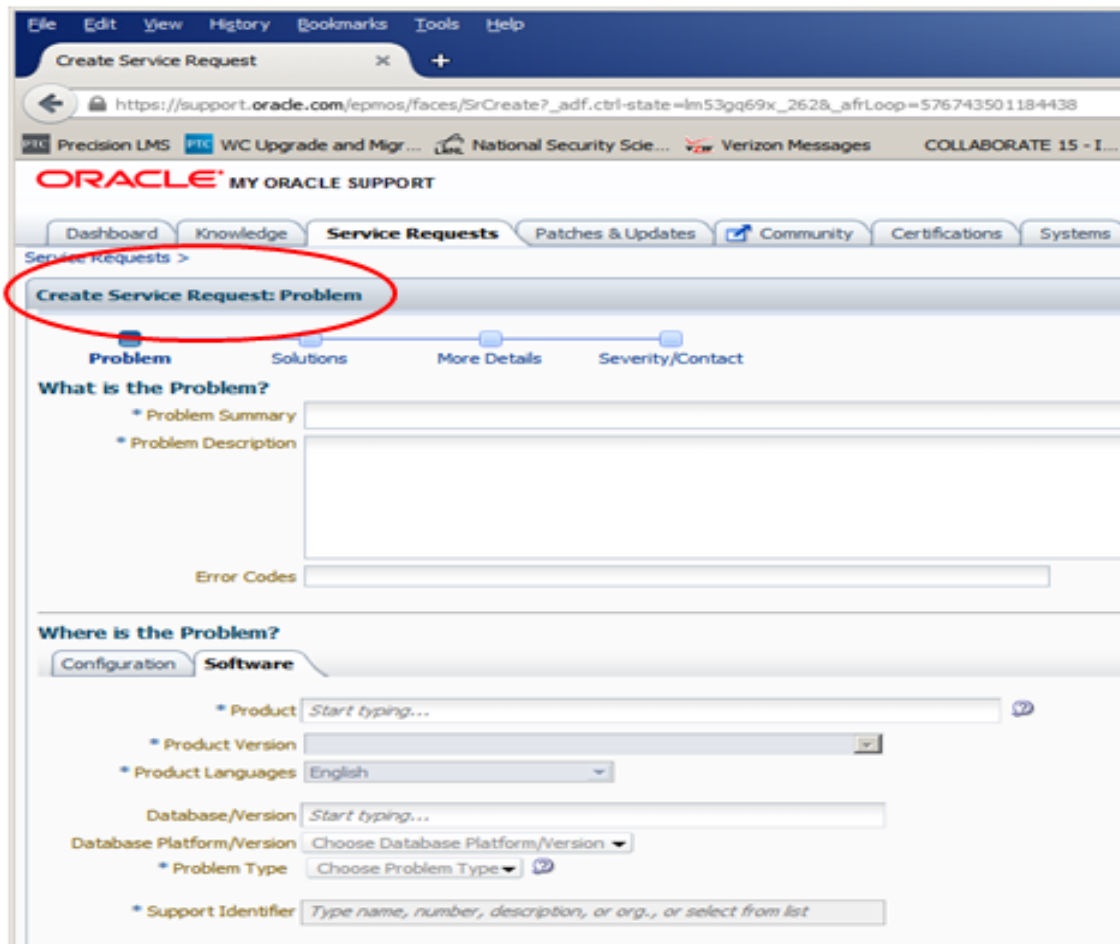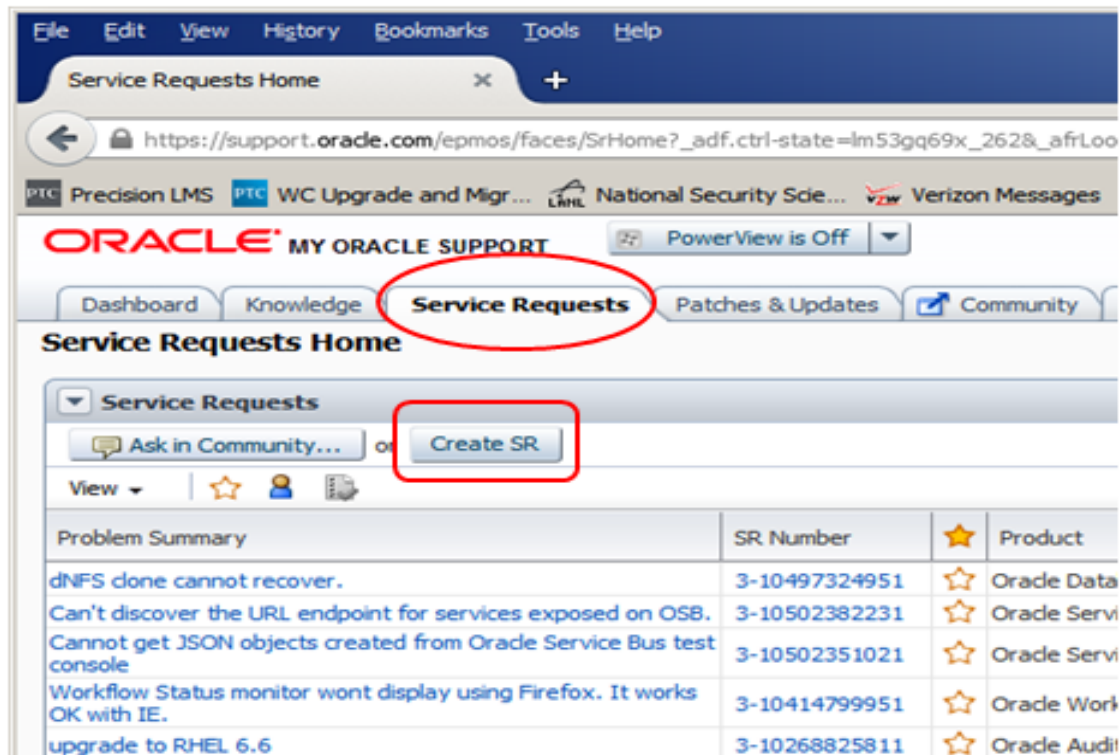
The Search toolbar

The Search toolbar is where we do most of our troubleshooting. When you enter key words in this toolbar, you will be presented with a large number of results, including official how-to documents, bug reports, community conversations associated with your keyword, and much more. Below is a screen shot of the search toolbar and the results you get when you enter the keyword "RMAN errors":

LA-UR-15-23637

Oracle Database Administration
Tips and Techniques for the PDMLink Administrators

W-11-TR-0015U
Revision A
Page 41 of 47
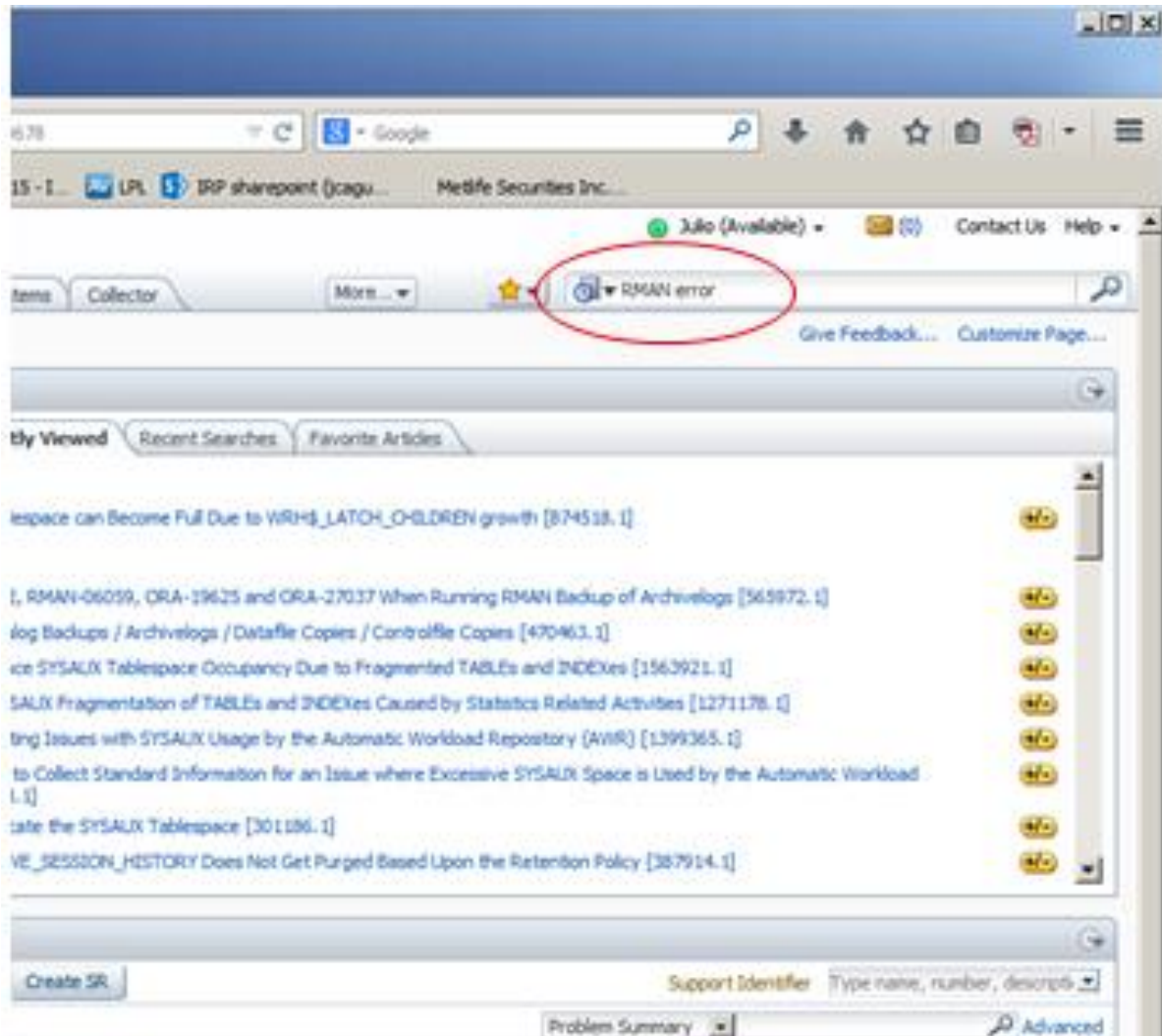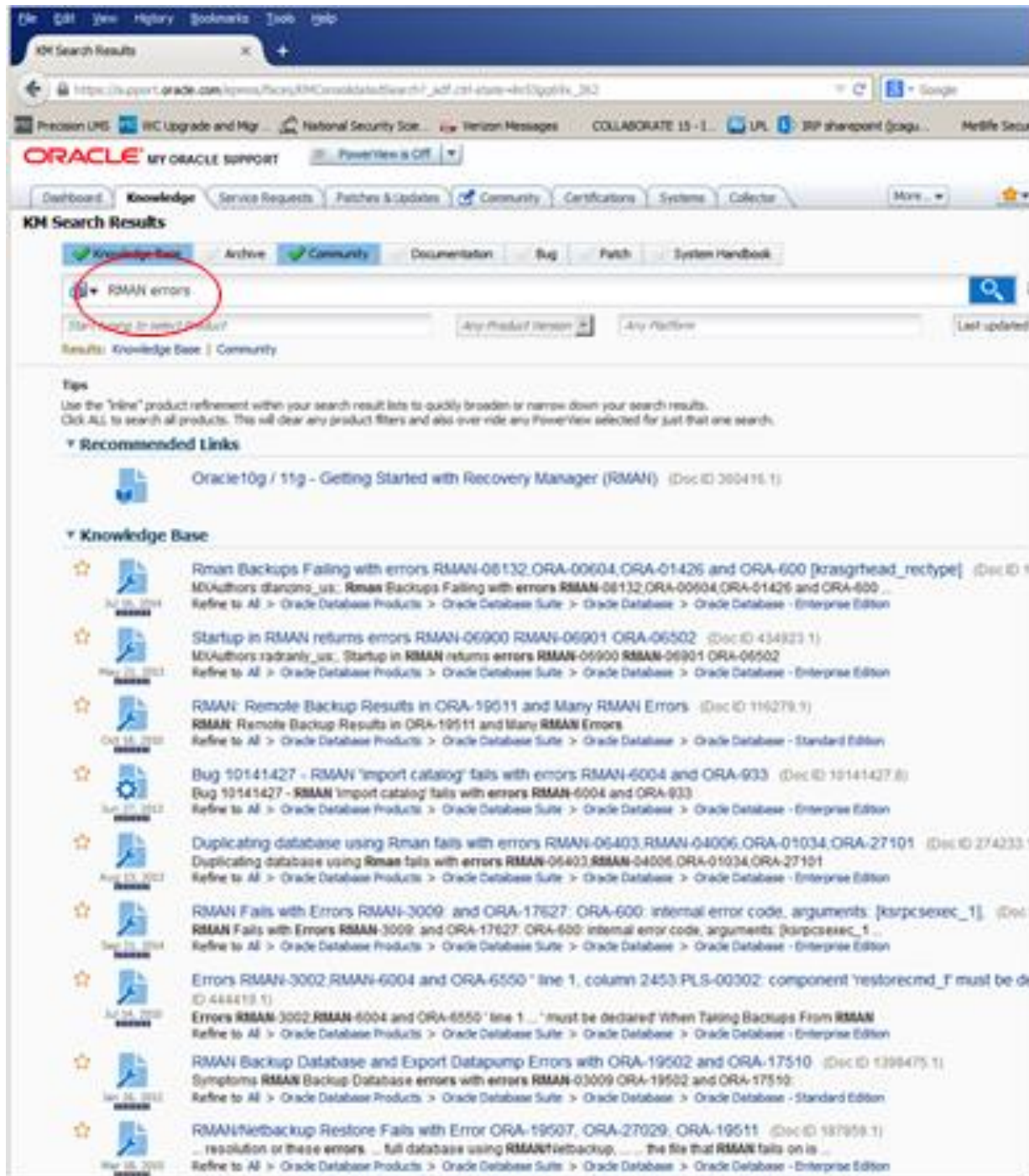
You notice a large number of results coming back from your search. As with any other search tool, the more specific that you are with your search key words, the more relevant the results you get will be.

LA-UR-15-23637

Oracle Database Administration
Tips and Techniques for the PDMLink Administrators

W-11-TR-0015U
Revision A
Page 42 of 47

Oracle Enterprise Manager Database Control (EM DBControl)

Another powerful tool that you will use to troubleshoot and fix issues with the database is the GUI tool that we have already discussed: EM DBControl. In the following set of screen shots, we will show DBControl's home page, and we will go through some of the tabs available from the home page and what you can do from within each tab.

Log into DBControl:

LA-UR-15-23637
Oracle Database Administration
Tips and Techniques for the PDMLink Administrators
W-11-TR-0015U
Revision A
Page 43 of 47

This is the "**Home**" page, and in it you can see an "Alerts" area where the most recent issues with the database are being reported. In this example, you can see that there are two tablespaces reported as being full.

Oracle Database Administration
Tips and Techniques for the PDMLink Administrators

LA-UR-15-23637
W-11-TR-0015U
Revision A
Page 44 of 47

This is the "**Availability**" page, where you can inspect and manage the Recovery Manager (**RMAN**) backups. The "Backup Reports" hyperlink will show you the output logs from the most recent RMAN backup jobs. You can inspect these reports for potential problems. The "Manage Current Backups" hyperlink will take you to the page where you can delete RMAN backups, if, for example, that is what needs to be done in order to free up disk space.

Below is an example of the "Backup Reports" page, where you can see that the most recent RMAN back up job completed with errors, which needs investigating:

LA-UR-15-23637
Oracle Database Administration
Tips and Techniques for the PDMLink Administrators
W-11-TR-0015U
Revision A
Page 45 of 47

The next screen shot is the "**Sever**" tab, where you have access to a variety of powerful database administration tasks, such as database storage, configuration, user management, and much more.

As mentioned before, it is beyond the scope of this paper to discuss in detail each of the functions available in this page. However, we hope that this brief discussion of EM DBControl will at least get you to the starting point if and when you need to engage Oracle Support.

Oracle Database Administration
Tips and Techniques for the PDMLink Administrators

LA-UR-15-23637
W-11-TR-0015U
Revision A
Page 46 of 47

Technical resources

Besides the Oracle Support (**support.oracle.com**) web site that we have already discussed, one of the most useful resources available to you is the Oracle Technology Network (**http://www.oracle.com/technetwork/index.html**). This web site is home to all of Oracle's software downloads and documentation. You will need an account to log in; however, you can use the account that you previously created to access Oracle Support's web site to log into this web site. Below is a screen shot of the home page:

When you follow the hyperlink to "Documentation & APIs", you will get to the Oracle Database documentation web page. Some of the most useful documents that you will find are the "2 Day" documents, which include: "2 Day DBA", "2 Day+Security Guide", and "2 Day+Performance

LA-UR-15-23637

Oracle Database Administration
Tips and Techniques for the PDMLink Administrators

W-11-TR-0015U
Revision A
Page 47 of 47

Tuning Guide". These documents are short and concise, and will provide you with a strong foundation of Oracle database administration. You can find these documents at the following url: http://docs.oracle.com/cd/E11882_01/nav/portal_4.htm