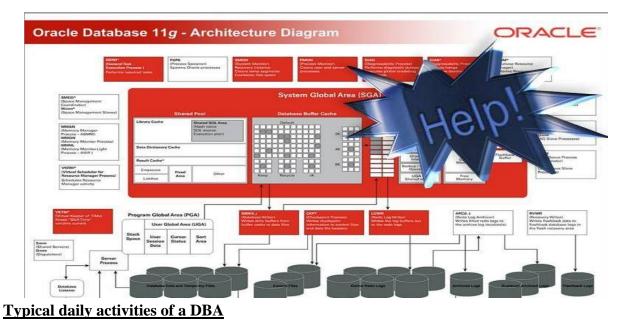
### Oracle Database Administration Tips and Techniques For the PDMLink Administrator

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## **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



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.

### Logging into the Oracle database

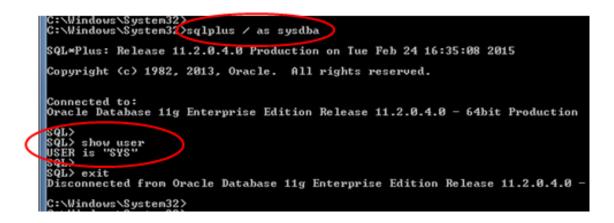
Since the assumption is that the Oracle DBA left, and that you, a PDMLink administrator, have been asked to take care of the Oracle databases until a new Oracle DBA is hired, we must assume that you will be granted access to the host machines where the Oracle databases are installed, and you will be 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:



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:

C:\Windows\System32>sqlplus sys as sysdba
SQL∺Plus: Release 11.2.0.4.0 Production on Tue Feb 24 16:38:31 2015
Copyright <c> 1982, 2013, Oracle. All rights reserved.</c>
Enter password: <entersys here="" password=""></entersys>
Connected to: Oracle Database 11g Enterprise Edition Release 11.2.0.4.0 - 64bit Production
SQL> SQL> exit Disconnected from Oracle Database 11g Enterprise Edition Release 11.2.0.4.0 -
C:\Windows\System32) C:\Windows\System32)sqlplus system
SQL×Plus: Release 11.2.0.4.0 Production on Tue Feb 24 16:38:51 2015
Copyright (c) 1982, 2013, Oracle. All rights reserved.
Enter password: <enter here="" password="" system=""></enter>
Connected to: Oracle Database 11g Enterprise Edition Release 11.2.0.4.0 - 64bit Production
SQL> SQL> exit Disconnected from Oracle Database 11g Enterprise Edition Release 11.2.0.4.0 -

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

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.

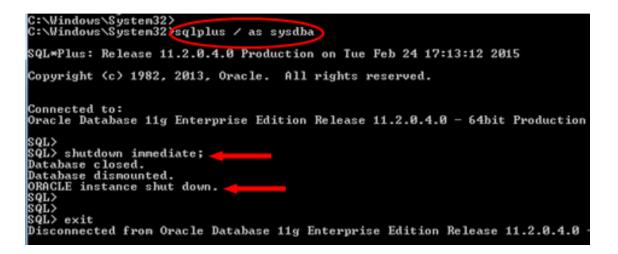
### **Starting up and shutting down an Oracle database**

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?

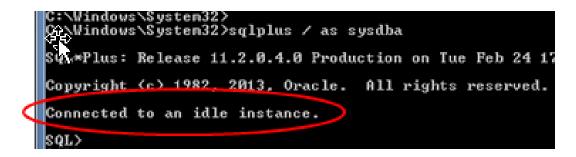
There are two ways to quickly check if the database is up or down: 1) log into the database and look for a message from the database indicating that the database is down, or 2) check the status of the Oracle-related services on a MS Windows Server host, or if on a UNIX host check the processes running.

#### 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:



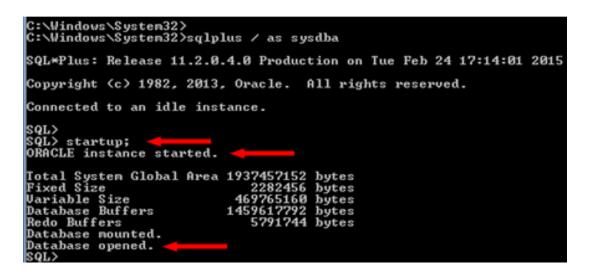
Now that we know that we have a database that has been shut down, the following example will illustrate what you will see when you log into a database that has been shut down:



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

#### 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:

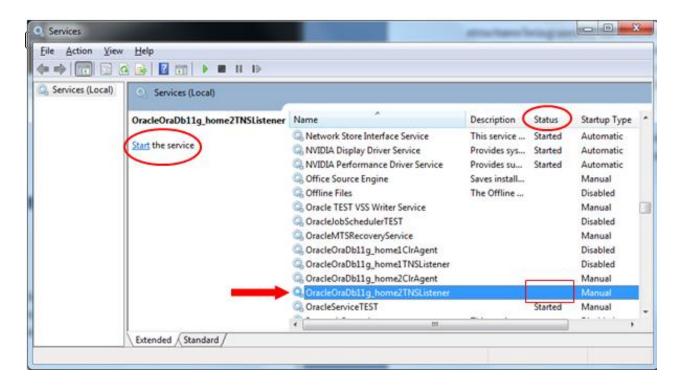
🖏 Oracle TEST VSS Writer Service	Manual
🖓 OracleJobSchedulerTEST	Disabled
CracleMTSRecov SyService	Manual
OracleOraDb11g_home1ClrAgent	Disabled
OracleOraDb11g_home1TNSListener	Disabled
OracleOraDb11g home2ClrAgent	Manual
🖓 OracleOraDb11g_home2TNSListener Started	Manual
CracleServiceTEST Started	Manual
< III	

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

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
```

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@				~]\$	aren ara i ne seflaren si lenr	
oracle	10085	1	8	2014 ?	grep ora_; ps -ef grep -i lsnr 00:39:55 ora_pmonllg	
oracle	10000	ĩ	0	2014 7	00:44:16 ora_psp0llg	
oracle	10095	ĩ	1	2014 ?	2-14:59:52 ora vk1 emllg	
oracle	10102	î	e.	2014 ?	00:06:27 ora_gen0_ illg	
oracle	10107	1	e	2014 ?	00:14:35 ora diag illg	
oracle	10112	1	0	2014 ?	00:11:43 ora dbrm 11g	
oracle	10117	1	. 0	2014 ?	03:03:05 ora dia0 11g	
oracle	10122	1	0	2014 ?	00:06:37 ora mman 11g	
oracle	10127		8	2014 ?	00:40:49 ora dbw0 11g	
oracle	10132			2014 ?	00:41:42 ora dbw1 11g	
oracle	10137		0	2014 ?	00:41:58 ora_dbw2_ 11g	
oracle	10142	1	ė	2014 ?	00:40:38 ora_dbw311g	
oracle	10147	1	e	2014 ?	01:43:19 ora lgwr 11g	
oracle	10152	1	0	2014 ?	01:04:06 ora_ckpt illg	
oracle	10157		Ð	2014 ?	03:30:47 ora_smon11g	
oracle	10162		ē	2014 7	00:02:33 ora_reco11g	
oracle	10167		0	2014 ?	05:18:52 ora mmon 11g	
oracle	10172		0	2014 ?	02:05:26 ora mmnl 11g	
oracle	10221	1	0	2014 ?	00:21:05 ora arc0 11g	
oracle	10231	1	0	2014 ?	00:04:23 ora_arc1 11g	
oracle	10236	1	0	2014 ?	00:22:44 ora arc2 illg	
oracle	10241		0	2014 ?	00:20:47 ora_arc3 illg	
oracle	10246	1	θ	2014 ?	00:37:29 ora_ctwr ilig	
oracle	10256	1	0	2014 ?	00:03:23 ora_gmnc11g	
oracle	10300		0	2014 ?	00:42:48 ora_cig0 11g	
oracle	10374		θ	2014 ?	00:03:49 ora_0001 ilig	
oracle	10912	1	θ	Mar04 ?	00:00:02 ora_0004 illg	
oracle	12388	1	θ	2014 7	00:08:10 ora smco illg	
oracle	19672	1	θ	10:47 ?	80:00:00 ora w000 11g	
oracle	28889	24055	θ	11:11 pts/1		
oracle rit	10356	1	0	2014 ?	00:21:05 /oracle/product/11.2.0/dbhome_1/bin/tnslsnr LISTENE	R -

### **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@	~]\$ ~]\$ ~]\$ echo \$ORACLE_HOME cle/product/11.2.0/dbhome_1
[oracle@	~]\$
[oracle@	~]\$ echo \$ORACLE_HOME
/lclhome/ora	cle/product/11.2.0/dbhome_1
[oracle@	~]\$

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:

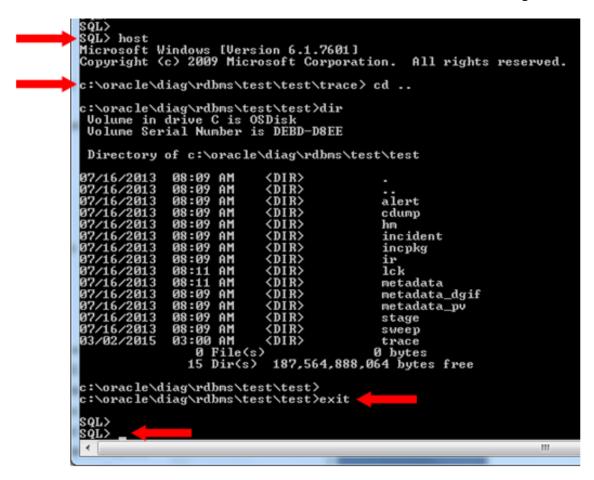
SQL*Plus: Release 11.2.0.4.0 Production on Mon Mar 2 15:41:10 2015						
Copyright (c) 1982, 2013, Oracle. All rights reserved.						
Connected to: Oracle Database 11g Enterprise Edition Release 11.2.0.4.0 - 64bit Production						
SQL> show parameter backgroun	SQL> show parameter background_dump_dest —					
	TUDE	VALUE				
NAME	TYPE	VHLOE				
background_dump_dest	string	C:\ORACLE\diag\rdbms\test\tes \trace				
	string	C:\ORACLE\diag\rdbms\test\te \trace race   find "alert"				

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:



### 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:	<pre>\$ORACLE_HOME/network/admin</pre>

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

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

57	Administrator: cmd.exe - Shortcut
	c:\oracle\diag\rdbms\test\test\trace} c:\oracle\diag\rdbms\test\test\trace}cd %oracle_home%/network/admin
	c:\oracle\product\11.2.0\dbhome_2\NETWORK\ADMIN> c:\oracle\product\11.2.0\dbhome_2\NETWORK\ADMIN>type tnsnames.ora # tnsnames.ora Network Configuration File: c:\oracle\product\11.2.0\dbhom # Generated by Oracle configuration tools.
-	WIND-PROD = (DESCRIPTION = (ADDRESS_LIST = (ADDRESS = (PROTOCOL = TCP)(HOST = ora-prod)(PORT = 1521)) (CONNECT_DATA = (SERVICE_NAME = wind) )
	WIND-DEUL = (DESCRIPTION = (ADDRESS_LIST = (ADDRESS = (PROTOCOL = TCP)(HOST =   ora-devl)(PORT = 1521)) ) (CONNECT_DATA = (SERVICE_NAME = wind) )

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:

$\sim$	<u> </u>
Ĭ	c:\oracle\product\11.2.0\dbhome_Z\NETWORK\ADMIN c:\oracle\product\11.2.0\dbhome_2\NETWORK\ADMIN\sqlplus /nolog
	SQL*Plus: Release 11.2.0.4.0 Production on Mon Mar 2 16:45:01 2015
	Copyright (c) 1982, 2013, Oracle. All rights reserved.
	SQL> SQL> conn system@wind-prod <b></b> Enter password:
	Connected. SQL>
	SQL> select host_name from v\$instance;
	HOST_NAME
	ORA-PROD SQL> SQL> conn system@wind-dev1 Enter password: Connected. SQL> SQL> SQL> select host_name from v\$instance;
(	HOST_NAME ORA-DEUL
	SQL>

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

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:	<pre>\$ORACLE_HOME/dbs/init<sid>.ora</sid></pre>	(plain text file)
	<pre>\$ORACLE_HOME/dbs/spfile<sid>.ora</sid></pre>	(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

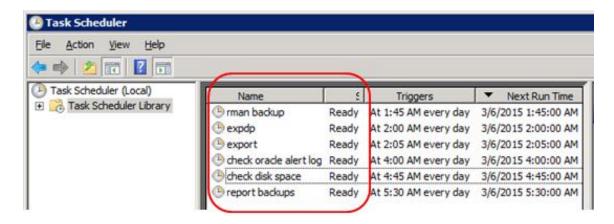
(i.e. SQL> startup pfile='.../init<SID>.ora'). Since you are doing this job temporarily, there is no need to change procedures; therefore, you must find out how the Oracle database is routinely started up after being shutdown. The easiest way to find out is to look at the daily backup scripts, ideally 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.

### **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:

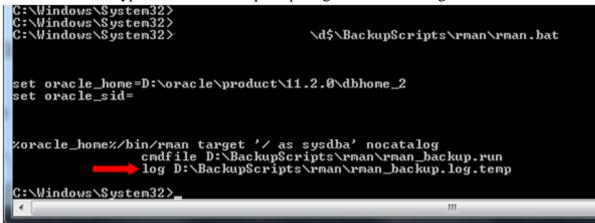
[oraprod ~]\$ crontab -l | more
or ...
[oraprod ~]\$ crontab -l > crontab.out

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:



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

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</u> file that you need to inspect daily to verify the backup job!

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 "\\
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: IEST
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: starting full 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\USERS02.DBF
input datafile file number=00001 name=D:\ORADATA\TEST\USERS02.DBF
input datafile file number=00001 name=D:\ORADATA\TEST\USERS02.DBF
```

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\01_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.

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.

### RMAN errors

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:

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> # 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\_5: SID=622 device type=DISK
allocated channel: ORA\_DISK\_5
channel ORA\_DISK\_5: SID=779 device type=DISK
allocated channel: ORA\_DISK\_5
channel ORA\_DISK\_5: SID=779 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\_7: SID=622 device type=DISK
allocated channel: ORA\_DISK\_7
channel ORA\_DISK\_7: SID=64 device type=DISK
allocated channel: ORA\_DISK\_8
channel ORA\_DISK\_1: starting archived log backup set
channel ORA\_DISK\_1: starting piece 1 at 13-MAR-15
channel ORA\_DISK\_2: specifying archived log(s) in backup set
input archived log thread=1 sequence=6765 RECID=4998 STAMP=874150926
channel ORA\_DISK\_2: specifying archived log backup set
channel ORA\_DISK\_2: starting piece 1 at 13-MAR-15
channel ORA\_DISK\_2: starting archived log backup set
channel ORA\_DISK\_3: starting archived lo RMAN-00571: RMAN-00569: RMAN-00571: RMAN-03002: ---------- ERROR MESSAGE STACK FOLLOWS -----failure of backup plus archivelog command at 08/01/2012 23:00:09 header validation failed for file ORA-19563:

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.

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

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

Export terminated successfully without warnings.

Data Pump export (EXPDP):

[many lines of output above this]

### 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

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.

#### **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.

DRACLE Enterprise Manager 11 g								
Detekses k	atabase Instance:							
Home	Performance	Availability Server S	Schema Data Movement	Software and Support				
							Data Automatically (60 sec) 💌	
						SQL Response Time		
	tatus <u>Up</u>	utdown) Black Out)	100% 75 50 Other		32.0 24.0	1.0		
Instance N Ve		.lanl.gov	25	1g	16.0 <u>User I/O</u> 8.0 <u>CPU</u>	0.0		
	tener <u>LISTENER</u>		۰ 💷		0.0	Reference collection i	s empty.	
	<u>View All I</u>	Properties .	Load <u>0.38</u>	Paging <u>0.00</u>	Core Count 32	SQL Response Time (% Reset Reference		
Diagnos	tic Summary		SI	ace Summary		High Availability		
	lert Log <u>Jur</u> cidents 🕢 <u>0</u>	<u>20, 2014 1:52:29 PM</u>	Se	Database Size (G Problem Tablespace gment Advisor Recommendation Policy Violation Dump Area Used (?	$\frac{1}{2}$ $\times$ $\frac{2}{2}$ $\frac{1}{2}$ $\frac{89}{2}$ $15 \checkmark$ $0$	Console Oracle Restart Instance Recovery Time (sec) Last Backup ✔ Usable Fast Recovery Area (%)	Details n/a 9 Mar 12, 2015 11:52:57 AM 77.61	
▼ Alerts Category	Database Instar		× 261 Warning 🚹 6			Flashback Database Logging	Disabled	
						© Previous	1-10 of 267 💌 Next 10 😒	
Severity V	7 Category		Impact Message				Alert Triggered	
×	Tablespaces Full	Tablespace Free Space (MB)	Tablespace USERS	only has 596180 megabytes fre	e space		Dec 24, 2014 12:47:21 PM	
×	Tablespaces Full	Tablespace Space Used (%)	Tablespace SYSAU	X is 95 percent full			Mar 10, 2015 11:42:05 AM	
×	Incident	Access Violation	2015/87569.		/rdbms/gnem11g/gnem11g/alert/log.xml a		Mar 4, 2015 1:39:57 AM	
×	Incident	Access Violation	An access violation 2015/87307.	detected in /Iclhome/oracle/diag	/rdbms/gnem11g/gnem11g/alert/log.xml a	at time/line number: Wed Mar 4 01:30:09	Mar 4, 2015 1:34:57 AM	
×	Incident	Access Violation	An access violation 2015/87100.	detected in /lclhome/oracle/diag	/rdbms/gnem11g/gnem11g/alert/log.xml a	t time/line number: Wed Mar 4 01:24:58	Mar 4, 2015 1:29:57 AM	
×	Incident	Access Violation	An access violation 2015/87055.	detected in /lclhome/oracle/diag	/rdbms/gnem11g/gnem11g/alert/log.xml a	t time/line number: Wed Mar 4 01:11:02	Mar 4, 2015 1:14:57 AM	
×	Incident	Access Violation	An access violation 2015/86745.	detected in /lclhome/oracle/diag	/rdbms/gnem11g/gnem11g/alert/log.xml a	tt time/line number: Wed Mar 4 01:05:19	Mar 4, 2015 1:09:57 AM	
×	Incident	Access Violation	An access violation 2015/86508.	detected in /lclhome/oracle/diag	/rdbms/gnem11g/gnem11g/alert/log.xml a	tt time/line number: Wed Mar 4 00:55:07	Mar 4, 2015 12:59:57 AM	
×	Incident	Access Violation	An access violation 2015/86390.	detected in /lclhome/oracle/diag	/rdbms/gnem11g/gnem11g/alert/log.xml a	t time/line number: Wed Mar 4 00:52:40	Mar 4, 2015 12:54:57 AM	
×	Incident	Access Violation	An access violation 2015/86221.	detected in /lclhome/oracle/diag	/rdbms/gnem11g/gnem11g/alert/log.xml a	t time/line number: Wed Mar 4 00:41:19	Mar 4, 2015 12:44:57 AM	
	© Previous 1-10 of 267   Next 10  Next							

#### 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

Ele	Edit	View	Hi <u>s</u> tory	Bookmarks	Tools	Help		
0	)rade Er	nterpris	e Manager	×	+			
•	) 🔒 hi	ttps://	:115	i8/em/console,	/logon/lo	igon		
PTC P	recision	LMS	TC WC Upg	grade and Mig	r 1	National Security Scie 🥁 Verizon Messages 🛛 🤇		
	RAC tabase			e Manager	11 <i>g</i>			
	ogin	Com	101					
-								
		*	User Nar	ne sys				
		,	Passwo	ord				
		(	Connect /		ormal 🔻	]		
					Normal /SDBA			
Copyright © 1996, 2013, Oracle. All rights reserved. Oracle, JD Edwards, PeopleSoft, and Retek are registered trademarks of Oracle Corporation and/or its aff Unauthorized access is strictly prohibited.								

You will log into DBControl either as user SYSTEM (Normal) or as user SYS (SYSDBA from the "Connect As" drop down list).

### If DBControl is installed, how do I check if it is running? How do I start it if it is not?

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**.

### If DBControl is not installed, how do I install it?

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.

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**:

```
Windows\System32
  Windows\System32
\Windows\System32
listener.ora Network Configuration File: c:\oracle\product\ii.2.0\dbhome_2\network\adr
Generated by Oracle configuration tools.
    LIST_LISTENER
        LIST
      SID_DESC
        (SID_NAME = CLRExtProc)
(ORACLE_HOME = c:\oracle\product\11.2.0\dbhome_2)
        (PROGRAM = extproc)
        CENUS
                  "EXTPROC_DLLS=ONLY:c:\oracle\product\11.2.0\dbhome_2\bin\oraclr11.dll">
  STENER =
    DESCRIPTION_LIST

<DESCRIPTION =

<ADDRESS = <P
                                       IPC><KEY = EXTPROC1521>>
                      <PROTOCOL =</pre>
                                                                                 (PORT = 1521)
                                      TCP><HOST =
        CADDRESS
ADR_BASE_LISTENER = c:\oracle
```

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.

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 (SMIP) server for notifications (optional): You have specified the following settings Database ORACLE\_HOME ........... c:\oracle\product\11.2.0\dbhome\_2 MARNING : 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.encp.EMConfig perform INFO: This operation is being logged at c:\oracle.cfgtoollogs\enca\test\enca\_2015\_03\_30\_1 Mar 30, 2015 3:05:52 PM oracle.sysman.encp.EMReposConfig invoke INFO: Dropping the EM repository (this may take a while) ... Mar 30, 2015 3:07:59 PM oracle.sysman.encp.EMReposConfig invoke INFO: Repository successfully dropped Mar 30, 2015 3:07:59 PM oracle.sysman.encp.EMReposConfig invoke INFO: Repository successfully dropped Mar 30, 2015 3:11:20 PM oracle.sysman.encp.EMReposConfig invoke INFO: Repository successfully created Mar 30, 2015 3:11:23 PM oracle.sysman.encp.EMReposConfig invoke INFO: Repository successfully created Mar 30, 2015 3:11:23 PM oracle.sysman.encp.EMReposConfig invoke INFO: Uploading configuration data to EM repository (this may take a while) ... Mar 30, 2015 3:12:08 PM oracle.sysman.encp.EMReposConfig invoke INFO: Uploading configuration data successfully Mar 30, 2015 3:12:15 PM oracle.sysman.encp.EMReposConfig invoke INFO: Securing Database Control (this may take a while) ... Mar 30, 2015 3:12:28 PM oracle.sysman.encp.util.DBControlUtil secureDBConsole INFO: Securing Database Control (this may take a while) ... Mar 30, 2015 3:12:28 PM oracle.sysman.encp.util.DBControlUtil secureDBConsole INFO: Starting Database Control (this may take a while) ... Mar 30, 2015 3:13:34 PM oracle.sysman.encp.EMDBControlUtil startOMS INFO: Starting Database Control (this may take a while) ... Mar 30, 2015 3:13:33 PM oracle.sysman.encp.EMDBPostConfig performConfiguration INFO: Database Control secured successfully Mar 30, 2015 3:13:33 PM oracle.sysman.encp.EMDBPostConfig performConfiguration INFO: Database Control started successfully Mar 30, 2015 3:13:32 PM oracle.sysman.encp.EMDBPostConfig performConfiguration INFO: Database Control Started successfully Mar 30, 2015 3:13:32 PM oracle.sysman.encp.EMDBPostConf WARNING : While repository is dropped the database will be put in quiesce mode. Enterprise Manager configuration completed successfully FINISHED EMCA at Mar 30, 2015 3:13:37 PM C:\Windows\System32>\_

*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:

C:\Windows\ C:\Windows\ Holume in	System32 di drive C	r %oracle_	home%\install
Holume Sev	ial Number	ie DERD-DR	FF
VOIDIG SEI	Tar Hamber	IS DEDD DO	1010
Directory	of c:\oracl	e\mroduct\	11.2.0\dbhome_2\install
Jan Courty	01 0-101001	o (producov)	
03/30/2015	03:13 PM	<dir></dir>	
03/30/2015	Ø3:13 PM	<dir></dir>	
	11:04 AM	(DIR)	chainedInstall
	11:02 AM	(DIR)	config
12/03/2014		1.0.4.117	642 envVars.properties
12/03/2014		<dir></dir>	jlib
03/30/2015		(10111)	97 portlist.ini
03/30/2015			90 readme.txt
03/ 30/ 2013	3 File(	e )	829 bytes
	5 Dir(s		.375.872 bytes free
	2 DTL/2	/ 105,507	, STS, OTA Dytes Ifee
C•\lindous	Custam22		
C+\llindous	Sustan22 \tu	we venacle	_home%\install\readme.txt
			rol URL - (test) :
	lan1		
nceps .//	Tani	. 804 : 2266%	6 A

On a Windows server, you will see a new **OracleDBConsole**<**SID**> service after the creation, or re-installation, of EM DBControl:

(= =) (= =)	w Help @ 📦 🛛 🔐 📰 🖡 🕨 💵 💵	P			
🏩 Services (Local)	Services (Local)				
	OracleDBConsoletest	Name	Status	Startup Type	Descripti
	Stop the service	G Offline Files G Oracle TEST VSS Writer Service		Disabled Manual	The Offli
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		OracleJobSchedulerTEST OracleMTSRecoveryService OracleOraDb11g_home1CIrAgent OracleOraDb11g_home1TNSListener OracleOraDb11g_home2CIrAgent OracleOraDb11g_home2CIrAgent		Disabled Manual Disabled Disabled Manual	
		GracleOraDb11g_home2TNSListener OracleServiceTEST	Started Started	Manual Manual	
		🕞 Parental Controls		Disabled	This serv
		Peer Name Resolution Protocol		Manual	Enables :
		Peer Networking Grouping		Manual	Enables i
		Peer Networking Identity Manager Performance Counter DLL Host		Manual Manual	Provides Enables i

On UNIX, you can "grep" for "emagent", as shown below:

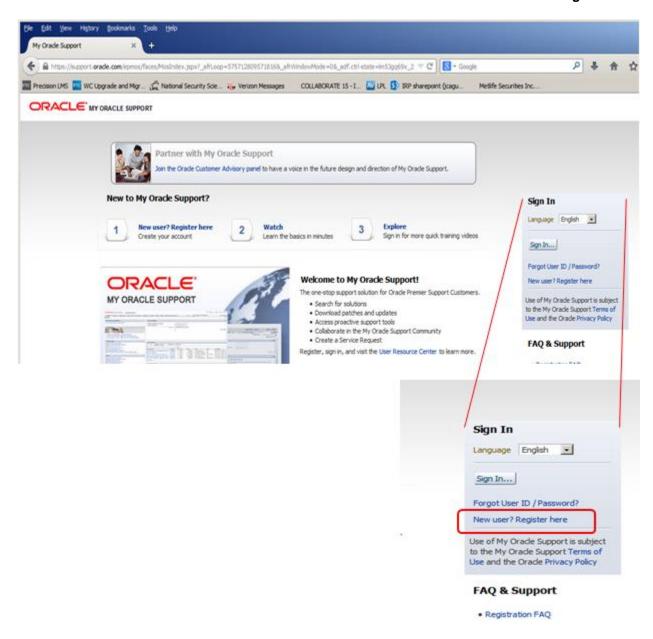
loracle@f [oracle@f [oracle@f oracle 1923 10914 0 Mar08 ? oracle 31412 44626 0 16:08 pts/2	]\$ >]\$ 	/product/11.2.0/dbhome_1/bin/emagent
[oracle@ [oracle@	p]\$ p]\$	

#### **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



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**:

Edit <u>V</u> iew Higtory <u>B</u> ookmarks Iools <u>H</u> elp Dashboard × +					_
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ite Alerts	Knowledge Base				÷
Outage Planned for Weekend of April 17, 2015	Search & Browse Recently Viewed Recent Search	ches Favorite Ar	ticles		
	Two Weeks Ago				<b>_</b>
ews	Mar 25, 2015 SYSAUX Tablespace can Become Full Due	to WRH\$_LATCH_C	HILDREN growth [874518.1]		<del>•/-</del>
Join the Orade Customer Advisory Panel	Three Weeks Ago				
Welcome to Support Blogs!	Mar 12, 2015 RMAN-03002, RMAN-06059, ORA-19625	and ORA-27037 W	nen Running RMAN Backup of Archivelogs [56:	5972.1]	<del>4</del> -
Welcome BlueKai Customers and Partners: March 30, 2015	Mar 12, 2015 How To Catalog Backups / Archivelogs / D				<del></del>
New Features in ORAchk 12.1.0.2.3	Mar 10, 2015 How to Reduce SYSAUX Tablespace Occu				<del></del>
Power Cord Replacement Notice (Updated February 2015)	Mar 10, 2015 Reducing SYSAUX Fragmentation of TABL			.1]	
oracle Critical Patch Update for January 2015	Mar 10, 2015 Troubleshooting Issues with SYSAUX Usag		· · · · ·		<del></del>
	Mar 10, 2015 SRDC - How to Collect Standard Informati			utomatic Workload	
Getting Started	Repository (AWR) [1934108.1]		,		_
	Mar 10, 2015 How to Relocate the SYSAUX Tablespace				<del>*/-</del>
	Mar 10, 2015 WRH\$_ACTIVE_SESSION_HISTORY Does	Not Get Purged Ba	sed Upon the Retention Policy [387914.1]		<del>"</del>
New Users: How to get Started All Users: Discover the Get Proactive	Service Requests				9
with MOS Portfolio	Ask in Community or Create SR		Support Ider	ntifier Type name,	number, descripti 🗾
Existing Users: What's New All Users: Test your My Oracle Support Knowledge - Get Accredited	View - 🏠 🔒 🔛		Problem Summary -		Advanced
Customer User Administrators Follow Us (CUA) Start Here	Problem Summary	SR Number	Product	Severity	Contact
CUA Group your Users and Stay Informed: My Oracle Support Blog Assets	dNES clone cannot recover.	3-10497324951	Oracle Database - Enterprise Edition	△ 2-Significan	
uick Video Training	Can't discover the URL endpoint for services exposed on OSB.		Oracle Database - Enterprise Educin     Oracle Service Bus	3-Standard	
Learn My Orade Support: Register and Attend - Live Advisor How-To Series Webcasts	Cannot get JSON objects created from Oracle Service Bus test console		☆ Oracle Service Bus	△ 2-Significan	t :
	Workflow Status monitor wont display using Firefox. It works OK with IE.	3-10414799951	🗘 Oracle Workflow	🛆 2-Significan	t
	upgrade to RHEL 6.6	3-10268825811	☆ Oracle Audit Vault	1-Critical	

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:

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Service Requests Home	×	F			
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Service Requests Ho					
Service Requests		<u> </u>			
Reference Ask in Community	or Create SR	J			
View 🗸 📩 🔒 🔝	,	J			
Problem Summary			SR Number	*	Product
dNFS clone cannot recover.			3-10497324951		Oracle Data
Can't discover the URL endpo	oint for services ex	posed on OSB.	3-10502382231		Oracle Servi
Cannot get JSON objects cre console	ated from Oracle S	ervice Bus test	3-10502351021	☆	Oracle Servi
Workflow Status monitor wor OK with IE.	nt display using Fire	fox. It works	3-10414799951	☆	Oracle Work
upgrade to RHEL 6.6			3-10268825811	ŵ	Oracle Audit

Ele Edit View History	Bookmarks Tools Help	
Create Service Request	× +	
+ A https://support.orade	de.com/epmos/faces/SrCreate?_adf.ctrl-state=lm53gq69x_2628_afrLoop=576743501184	438
Precision LMS RC Upgr	rade and Migr 🏠 National Security Scie 🥁 Verizon Messages 👘 COLLABORATE	: 15 - I
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Problem Sol	olutions More Details Severity/Contact	
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	Choose Problem Type -	
<ul> <li>Support Identifier</li> </ul>	Type name, number, description, or org., or select from list	

#### 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":

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	e and said the second	- An Alexandra Andrea				~	
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log Backups / Archivelogs /	Datafile Copies / Controlfile C	opies [470463.1]	1.162		3		
ce STSAUX Tablespace Occ	spancy Due to Fragmented Tr	ABLEs and INDEXes [1563921.1]					
SAUX Fragmentation of TAb	LEs and PIDEXes Caused by S	Itahatica Related Activities [1271178	1.1			1	
ting Issues with SYSAUX Us	age by the Automatic Workloa	d Repository (AVIR) [1399365.1]					
to Collect Standard Inform	ation for an Issue where Excer	sive SYSALR Space is Litted by the A	utomati	c Workload		*	
tate the SYSAUX Tablespac	e [301186.1]						
VE_SESSION_HISTORY Doe	is Not Get Purged Based Upon	the Retendon Policy [387914.1]			- 1	-	-
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		Oracle10g / 11g - Getting Started with Recovery Manager (RMAN) (DociD 300416.1)	
* Kni	owledge I	Base	
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4	1	Startup in RMAN returns errors RMAN-06900 RMAN-06901 ORA-06502 (Dec.ID 434833.1) MO4thors radranly_ws: Rartup in RMAN returns errors RMAN-06903 RMAN-06901 ORA-06502 Refire to Al. > Oracle Database Products. > Oracle Database Surte. > Oracle Database. > Oracle Database - Dracin Database - Dracin	se Editori
\$	A	RMAR: Remote Backup Results in ORA-19511 and Many RMAN Errors. (Doc 0:11(270.1) RMAR Remote Backup Results in ORA-19511 and Many RMAN Errors. Refer to Al. > Oracle Detabase Inducts. > Oracle Detabase Suite. > Oracle Database	d Editori
2	0Ì	Bug 10141427 - RMAN 'Import catalog' fails with errors RMAN-6004 and ORA-933 (Dec ID 1 Bug 10141427 - RMAN 'Import catalog' fails with errors RMAN-6004 and ORA-933 Refer to Al > Oracle Database Products > Oracle Database Suite > Oracle Database >	
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4	1	RMAN Fails with Errors RMAN-3009 and ORA-17627 ORA-600 internal error code, argum RMAN Fails with Errors RMAN-3009 and ORA-17627 ORA-600 internal error code, arguments (karpcsex Refer to Al > Orace Database Products > Oracle Database Surte > Orace Database > Orace Database - Orace	ac_1
4	-	Errors RMAN-3002 RMAN-6004 and ORA-6550 * line 1, column 2453 PLS-00302: componen (2) 444419 1) Errors RMAN-3002 RMAN-6004 and ORA-6550 * line 1 * must be declared When Tarling Backups From 1	RMAN
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\$	k	RMANNetbackup Restore Fails with Error ORA-19507, ORA-27029, ORA-19511 (Sec E 18 	

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.

### 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:

e Enterprise Mar	ager 1	+	
https://_	1158/em/consc	ie/logon/lo	gon
ion LMS 🔣 W	C Upgrade and M	Igr ihn	National Security Scie 🥁 Verizon Messag
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	son LMS I W CLE Enter ase Control • User • Pa	son LMS WC Upgrade and M CLE Enterprise Manage ase Control • User Name • Password	son LMS WC Upgrade and Migr CLE Enterprise Manager 11 g ase Control User Name • Dassword

Oracle, JD Edwards, PeopleSoft, and Retek are registered trademarks of Oracle Corporation and/ Unauthorized access is strictly prohibited.

tabase Instance:						
Home Performance	Availability	Secret	Schema	Data Movement	Software and Suppo	25
$\bigcirc$				Page Re	freshed Apr 3, 2015 4	22:15 PM MDT Ref
General			Host CPU		Active Ses	isions
$\Delta$ (3	hutdown)(Black	Out )	1.0.00		22.0	
T -			100%		32.0	
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Up Since Mar 10, 2 Instance Name	WA 6011111 CTV	MUT	50	Other	16.0	User VQ
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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.

tabase Instance:	
Home Performance Availability Server	Schema Data Movement Software and Support
Backup/Recovery	
Setup	Manage
Backup Settings	Schedule Backup
Recovery Settings Recovery Catalog Settings	Manage Current Backups Backup Reports Manage Restore Points Perform Recovery View and Manage Transactions
Related Links	
Access Nert History Baseline Metric Thresholds lobs	Add Exadata Cell Targets Alert Log Contents Blackouts Metric and Policy Settings
Aonitoring Configuration Scheduler Central Jser-Defined Metrics	Monitor in Memory Access Mode SQL Worksheet

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:

ew Backup Report e following backup jobs are known to the da Search	tabase. The data is retrie	eved from the database contro	
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Backup Name	Status	Start Time V	Taken
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Backup Name RMAN_LEVEL1_TUE_TH_040215080005	Status COMPLETED WITH ERRORS	Apr 2, 2015 8:00:27 PM MDT	
RMAN_LEVEL1_TUE_TH_040215080005	COMPLETED WITH	Apr 2, 2015 8:00:27 PM	06:01:27
	COMPLETED WITH ERRORS	Apr 2, 2015 8:00:27 PM MDT	06:01:27
RMAN_LEVEL1_TUE_TH_040215080005 RMAN_LEVEL1_TUE_TH_033115080000	COMPLETED WITH ERRORS COMPLETED	Apr 2, 2015 8:00:27 PM MDT Max 31, 2016 8:00:22 PM MDT	06:01:27
RMAN_LEVEL1_TUE_TH_040215080005	COMPLETED WITH ERRORS COMPLETED	Apr 2, 2015 8:00:27 PM MDT May 31, 2015 8:00:22 PM	06:01:27
RMAN_LEVEL1_TUE_TH_040215080005           RMAN_LEVEL1_TUE_TH_033115080000           RMAN_LEVEL0_COMPRE_03281508000	COMPLETED WITH ERRORS COMPLETED	Apr 2, 2015 8:00:27 PM MDT Mar 31, 2015 8:00:22 PM MDT Mar 28, 2015 8:00:30 PM MDT	06:01:27
RMAN_LEVEL1_TUE_TH_040215080005 RMAN_LEVEL1_TUE_TH_033115080000	COMPLETED WITH ERRORS COMPLETED	Apr 2, 2015 8:00:27 PM MDT Mar 31, 2016 8:00:22 PM MDT Mar 28, 2015 8:00:30 PM	06:01:27 00:00:61 00:46:50
RMAN_LEVEL1_TUE_TH_040215080005           RMAN_LEVEL1_TUE_TH_033115080000           RMAN_LEVEL0_COMPRE_03281508000	COMPLETED WITH ERRORS COMPLETED	Apr 2, 2015 8:00:27 PM MDT Mar 31, 2016 8:00:22 PM MDT Mar 28, 2015 8:00:30 PM MDT Mar 26, 2015 8:00:26 PM	06:01:27 00:00:61 00:46:50

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 Enterprise Manager 11g		
atabase Instanc _ 1g Home Performance Availability Server	Schema Data Movement Software and Suppo	đ
Storage	Database Configuration	Oracle Schedule
Control Files Tablespaces Temporary Tablespace Groups Datafiles Rollback Segments Redo Log Groups Archive Logs Migrate to ASM Make Tablespace Locally Managed	Memory Advisors Automatic Undo Management Initialization Parameters View Database Feature Usage	Jobs Chains Schedules Programs Job Classes Windows Windows Window Groups Global Attributes Automated Mainten
Statistics Management	Resource Manager	Security
Automatic Workload Repository AWR Baselines	Getting Started Consumer Groups Consumer Group Mappings Plans Settings	Users Roles Profiles Audit Settings Transnarent Data Fi

### **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 (<u>http://www.oracle.com/technetwork/index.html</u>). 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

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

ORACLE	Help Center	Database	Search products	٩	Welcome Ju	low
c Database Getting Started Installing and Upgrading	Oracle Database Release 2 (11.2 Database Administ	)	ocumentatio	on 11g		
Database Administration	"Essentials" covers everyday database a Documentation" includes in-depth conce			Manager GUL 1	Supporting	
Application Development	Essentials					
Grid Computing Performance	2 Day DBA covers general database ad concepts for specific advanced topics. A command mini-based michods					
1000000000000	2 Day DBA				0	بغي
High Availability	2 Day + Security Guide				0	÷.
Data Warehousing and Business Intelligence	2 Day + Performance Tuning Guide Supporting Decumental	tion			0	÷
Unstructured Data and Content Management	Supporting documentation treats advance these topics when needed.		base administration. In genera	l, the 2 Day + b	ooks refer yo	u to
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integration	Administrator's Guide				0	بل
Security	Reference				0	÷.
All Books	SQL Language Reference				0	۰
	Performance Tuning Guide				0	÷.
	Error Messages				0	÷
	SQL and PL/SQL					
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	SQL statements and PL/SQL programs	and packages are used e	otensively in administering Ora	icle databases	0	