**[Oracle Database 11g silent installation on 64 bit Solaris 10](http://oracledbexperiments.wordpress.com/2012/03/24/oracledb/)**

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It has been a long time; I have been searching a good blog for Oracle 11g DB installation in silent fashion on UNIX environment. There exists plenty of blogs/documentation available in the scenario but not all cover the end-to-end aspects of DB installation and configuration completely without having any user interaction.  As I was delved into automation project where every night DB will wiped off and installed completely from the scratch. Hence I took the opportunity to write this blog about my experiments.

For a user having absolutely no experience in DB installation and configuration, Oracle documentation might appear a bit frustrating and time taking approach. This blog will probably cover all the aspects. I have tried to cover the all installation and configuration steps of Oracle DB right after the OS installation.

Here we will not use any user interactive approach (GUI), hence configuring of X window session is not required. We can gracefully skip that step.  The entire installation and configuration process will be carried out in a scripted way so that anyone can automate it or bind it with any automation tools. My playground configuration is Solaris 5.10 64 bit, 8G memory and 50G of disk space. You need to have at least 1G of memory but 2G is recommended.

**Installation Plan**  
First we will install DB base software using a response file then we will be using DBCA template based method to create and configure a database. To achieve this I have already created a response file and template with the same environment configuration (When you run DBCA in GUI method for the first time after all options is over, it offers to save all configurations it as a template), and we are going to use the same template for automation. Basically templates are made to reuse DB installation on multiple environments with same configuration. However you are free to modify the templates and tweak the installation as per your need.

So let’s start by making our hands dirty.

**Database installation overview**

The entire plan consists of a few milestones. We need to execute the following steps sequentially:

1. Pre-installation checks
2. Environment preparation
3. Installation of Oracle DB Base Software
4. Creation and configuration of DB instance
5. Post-installation steps

I assume that you have *root access*to the system as most of the environment preparation activity will require this. If you do not have root access then please consult with your system admin to get this done.

**PRE INSTALLATION CHECKS**

Hardware Requirement

Log in as root and perform the following checks to ensure your system is strong enough to host and run an Oracle DB. If you already have oracle installation experience and familiar about pre-req checks feel free to skip this section and jump to environment preparation.  
***A. Memory***

Oracle recommends 2G memory and 1G is minimum for DB installation. Use the following command to check your system’s memory. As per the 11g is concerned Oracle DB is a bit hungry.  
# /usr/sbin/prtconf | grep -i "Memory"

**B. *Swap space***

This depends on the Memory size of your system, the mapping between swap space to physical memory:

RAM Size Swap Space  
———————- ——————————  
Between 1 GB and 2 GB 1.5 times the size of the RAM  
Between 2 GB and 16 GB Equal to the size of the RAM  
More than 16 GB 16 GB

Check the swap size of the system  
# /usr/sbin/swap -l  
If you think swap size is not sufficient, read the OS documentation for allocation of additional swap space. Do not assume at this stage else you might end up having*OutofMemory* Error while Oracle installation.

**C. *System Architecture***

To determine if the system architecture can run the software, enter the following command:  
# /bin/isainfo -kv  
This command displays the processor type.

The following is the expected output of this command:

Oracle Solaris on SPARC (64-Bit):  
64-bit sparcv9 kernel modules

Oracle Solaris on x86-64 (64-Bit):  
64-bit amd64 kernel modules

Verify that the processor architecture matches the Oracle software release to install. If you do not see the expected output, then you cannot install the software on this system.

**D. *Disk Space Requirements***

1. At least 1G for /tmp. (Oracle installer creates different temp files in this directory as part of installation activity. However we need set /tmp as a temp installation directory which we are addressing later as a part of user envrionment creation)
2. At least 5G for hosting software files.

Use this command to find the disk space in your system  
#df -kh

**E.*Run Level Requirements***  
We must do the installation on Run-Level 3 which multi user multi mode.

**F. *OS version***  
Oracle demands minimum version of update is 6 for 5.10 release. Confirm your OS version:  
  
#uname -r  
5.10  
  
and  
  
# cat /etc/release  
Oracle Solaris 10 8/11 s10s\_u10wos\_17b SPARC  
Copyright (c) 1983, 2011, Oracle and/or its affiliates. All rights reserved.  
Assembled 23 August 2011

**G. *Packages Requirements***  
We need to check whether the following packages are installed:  
# pkginfo -i SUNWarc SUNWbtool SUNWhea SUNWlibC SUNWlibm SUNWlibms SUNWsprot SUNWtoo SUNWi1of SUNWi1cs SUNWi15cs SUNWxwfnt SUNWcsl  
system SUNWarc Lint Libraries (usr)  
system SUNWbtool CCS tools bundled with SunOS  
system SUNWcsl Core Solaris, (Shared Libs)  
system SUNWhea SunOS Header Files  
system SUNWi15cs X11 ISO8859-15 Codeset Support  
system SUNWi1cs X11 ISO8859-1 Codeset Support  
system SUNWi1of ISO-8859-1 (Latin-1) Optional Fonts  
system SUNWlibC Sun Workshop Compilers Bundled libC  
system SUNWlibm Math & Microtasking Library Headers & Lint Files (Usr)  
system SUNWlibms Math & Microtasking Libraries (Usr)  
system SUNWsprot Solaris Bundled tools  
system SUNWtoo Programming Tools  
system SUNWxwfnt X Window System platform required fonts

If you use updates 5.10 update 6 you should have all packages installed still by any chance if anyone is missing you can always add them using *pkgadd* command. Consult solaris manual for more information.

**H. *Patchsets***  
*For Sparc :*  
120753-06: SunOS 5.10: Microtasking libraries (libmtsk) patch  
139574-03: SunOS 5.10  
141414-02  
141444-09  
124861-15: SunOS 5.10

*For x86 :*  
119961-05: SunOS 5.10\_x86: Assembler  
119964-14: SunOS 5.10\_x86 Shared library patch for C++\_x86  
120754-06: SunOS 5.10\_x86 libmtsk  
137104-02  
139575-03  
141415-04  
141445-09 (11.2.0.2)

Updated solaris does not need anything to do here mostly, but for my case I had a patch missing **124861**. Oracle constantly laughed at me unless I installed it(Another pain to chase Oracle support to get this patch). Oracle installer checks this as part of pre-req. The minimum requirement is 124861-15 but current update available is 124861-21 by the time I am writing this.  
Check the patches:  
#/usr/sbin/patchadd -p | grep [%PATCH\_NUMBER%] (Don’t use version number)

Here we end checking the installation prerequisites.

**ENVIRONMENT PREPARATION**  
Lets start off by creating Oracle DB environment. Again you need to be in root to perform this activities.

Software mount  
I have planned to host Oracle in the way, where all software related files will be hosted in one file system (/u01-softlink to /spare) and data related files like data file, control file will be hosted in another file system (/u02). To achieve this

I have created a symbolic link of /spare as /u01. (ln -s /spare /u01)

/u02 was available to at the time host was built. If you do not have /u02 available use another file system and replace my commands accordingly.

**A. *Group Creation***  
#groupadd -g 322 dba

(I am using dba group to carry out installation activities you can use oinstall as told by oracle)

**B. *User Creation***  
This user will run the oracle installer and own all the oracle related files.  
#useradd -s /bin/bash -d /u01/app/oracle -g dba -u 672253 oracle

(I am fond BASH, you can use KORN or your fav shell as a login shell. Newly built solaris system will have an oracle user by-default you can use *usermod* command to modify according to your needs.)

**C. *Create User home directories***  
Following commands creates the user home environment  
#mkdir -p /u01/app/oracle  
#chown oracle:dba /u01/app/oracle/  
#chmod 755 /u01/app/oracle/  
#chown -R oracle:dba /u02  
#chmod -R 755 /u02

**D. *Create Oracle Inventory***  
Oracle installer will create/look for a file called oraInst.loc which contains the central inventory location and group. Basically this location will be used for generating runtime activities.  
#mkdir -p /var/opt/oracle  
#chown oracle:dba /var/opt/oracle  
#chmod 755 /var/opt/oracle  
#touch /var/opt/oracle/oraInst.loc

Insert the following entry into oraInst.loc file  
inventory\_loc=/u01/app/oracle/oraInventory  
inst\_group=dba

**E. *Solaris Project Creation***  
1. We need to create a solaris project and configure the kernel parameters which will required during Oracle installation.  
#projadd -G dba -c "Oracle Group Project" group.dba

2. Before solaris 10 the only way to add/modify kernel parameters was to edit /etc/system file which needs a rebooting, but from 10 onwards using solaris utilities *projmod* we can set them without rebooting.  
#projmod -s -K "process.max-sem-nsems=(privileged,256,deny)" group.dba  
#projmod -s -K "project.max-sem-ids=(privileged,100,deny)" group.dba  
#projmod -s -K "project.max-shm-ids=(privileged,100,deny)" group.dba  
#projmod -s -K "project.max-shm-memory=(privileged,4G,deny)" group.dba  
  
You can use prctl command as well to modify these parameters being in oracle user, but those settings will be lost in next boot. They are not persistent.  
The maximum shared memory allocation is a tunable parameters. 4G is fine for as per our environment config, but if still Oracle complains about memory, you need to tune it. For my case I had to tune it 6G.

3. Now confirm the project creation  
#projects -l  
group.dba  
projid : 100  
comment: "Oracle Group Project"  
users : (none)  
groups : dba  
attribs: process.max-sem-nsems=(privileged,256,deny)  
project.max-sem-ids=(privileged,100,deny)  
project.max-shm-ids=(privileged,100,deny)  
project.max-shm-memory=(privileged,6442450944,deny)  
  
4. Confirm the parameters *as Oracle user* as well (This is double check)  
-bash-3.2$ id -p  
uid=672253(oracle) gid=322(dba) projid=100(group.dba)  
prctl -n project.max-shm-memory -i project group.dba

**F. *Create Installation Directories***  
Following directory layout will host the Oracle DB software suite files. Execute commands as **oracle** user  
#su - oracle  
mkdir -p /u01/app/oracle/admin/HAWK  
mkdir -p /u01/app/oracle/oraInventory  
mkdir -p /u01/app/oracle/product/11.2.0/DATABASE  
mkdir -p /u01/app/oracle/flash\_recovery\_area/HAWK  
mkdir -p /u02/oradata  
mkdir -p /u02/arch/HAWK  
mkdir -p /u02/oraflsh

**HAWK**signifies the DATABASE name, better known as ORACLE\_SID.

**G. *Create User Profile***  
Set the oracle user specific environment variables

1. Change to home directory  
cd ~  
  
2. Open the .profile file in any editor  
vi .profile

3. Append the following env variables  
  
#Default parameters for DB\_USER  
# Default file permissions  
umask 022

PATH=$PATH:/usr/sbin:/usr/local/sbin:/opt/sfw/sbin:/usr/openwin/bin:/usr/ucb  
export PATH

EDITOR=vi

# Set resource limits  
ulimit -St unlimited  
ulimit -Sf unlimited  
ulimit -Sd unlimited  
ulimit -Ss 32768  
ulimit -Sn 4096  
ulimit -Sv unlimited

#Set installation parameters  
ORACLE\_BASE=/u01/app/oracle  
ORACLE\_HOME=$ORACLE\_BASE/product/11.2.0/DATABASE  
ORACLE\_SID=HAWK  
ORACLE\_OWNER=oracle  
TMP=/tmp  
TMPDIR=/tmp  
TNS\_ADMIN=${ORACLE\_HOME}/network/admin  
JAVA\_HOME=/usr/jdk/latest  
SQLPATH=/u01/app/oracle/dba/sql:/u01/app/oracle/dba/sql/REPORT\_SQL:/home/oracle/dba/sql  
PATH=$PATH:$ORACLE\_HOME/bin  
export ORACLE\_HOME ORACLE\_SID ORACLE\_OWNER JAVA\_HOME TMP TMPDIR ORACLE\_BASE TNS\_ADMIN SQL\_PATH

# Set the standard date format for Oracle  
NLS\_LANG='ENGLISH\_UNITED KINGDOM.AL32UTF8'  
NLS\_DATE\_FORMAT='DD/MM/YYYY HH24:MI:SS'

Make sure about your JDK location.  
You are feel free to change your ORACLE\_HOME but replace the values accordingly.

4. Source the profile file  
cd ~  
. .profile

**INSTALLATION OF ORACLE DB BASE SOFTWARE**

**A. *Download Oracle DB software***  
1. Now we have entered into the core phase of Oracle installation.  
The version we are going to play is 11.2.0.2. Lookup the following URL and download the software of your choice. You have to have an relationship account with Oracle (free) for this. Please accept the license agreement. Alternatively you can download from Oracle e-delivery site.

<http://www.oracle.com/technetwork/database/enterprise-edition/downloads/index.html>

2. The binaries should like after download  
solaris.sparc64\_11gR2\_database\_1of2.zip  
solaris.sparc64\_11gR2\_database\_2of2.zip

3. Unzip them sequentially as a oracle user you should get the following directory layout  
-bash-3.2$ ls database/  
doc install response rpm runInstaller sshsetup stage welcome.html

**B. *Install Base Oracle Software***

1. Fire Oracle Universal Installer (OUI) with command line arguments under the database directory. Ignore the warnings for time being. This might take around 10 mins to complete. My response file name is **db\_install.rsp**. Needless to say this has to executed as oracle user.

-bash-3.2$ ./database/runInstaller -silent -responseFile /spare/db\_install.rsp

Starting Oracle Universal Installer...

Checking Temp space: must be greater than 180 MB. Actual 2179 MB Passed  
Checking swap space: must be greater than 150 MB. Actual 22200 MB Passed  
Preparing to launch Oracle Universal Installer from /tmp/OraInstall2012-03-26\_01-07-52PM. Please wait ...  
Preparing to launch Oracle Universal Installer from /tmp/OraInstall2012-03-26\_01-07-52PM. Please wait ...-bash-3.2$ [WARNING] [INS-32008] Oracle base location is in the Home directory.  
CAUSE: The specified Oracle base was in the Home directory.  
ACTION: Provide an Oracle base location outside the Home directory.  
[WARNING] [INS-13014] Target environment do not meet some optional requirements.  
CAUSE: Some of the optional prerequisites are not met. See logs for details. /u01/app/oracle/oraInventory/logs/installActions2012-03-26\_01-07-52PM.log  
ACTION: Identify the list of failed prerequisite checks from the log: /u01/app/oracle/oraInventory/logs/installActions2012-03-26\_01-07-52PM.log. Then either from the log file or from installation manual find the appropriate configuration to meet the prerequisites and fix it manually.  
[WARNING] [INS-32008] Oracle base location is in the Home directory.  
CAUSE: The specified Oracle base was in the Home directory.  
ACTION: Provide an Oracle base location outside the Home directory.  
[WARNING] [INS-13014] Target environment do not meet some optional requirements.  
CAUSE: Some of the optional prerequisites are not met. See logs for details. /u01/app/oracle/oraInventory/logs/installActions2012-03-26\_01-07-52PM.log  
ACTION: Identify the list of failed prerequisite checks from the log: /u01/app/oracle/oraInventory/logs/installActions2012-03-26\_01-07-52PM.log. Then either from the log file or from installation manual find the appropriate configuration to meet the prerequisites and fix it manually.  
You can find the log of this install session at:  
/u01/app/oracle/oraInventory/logs/installActions2012-03-26\_01-07-52PM.log  
[WARNING] [INS-32008] Oracle base location is in the Home directory.  
CAUSE: The specified Oracle base was in the Home directory.  
ACTION: Provide an Oracle base location outside the Home directory.  
[WARNING] [INS-13014] Target environment do not meet some optional requirements.  
CAUSE: Some of the optional prerequisites are not met. See logs for details. /u01/app/oracle/oraInventory/logs/installActions2012-03-26\_01-07-52PM.log  
ACTION: Identify the list of failed prerequisite checks from the log: /u01/app/oracle/oraInventory/logs/installActions2012-03-26\_01-07-52PM.log. Then either from the log file or from installation manual find the appropriate configuration to meet the prerequisites and fix it manually.  
The following configuration scripts need to be executed as the "root" user.  
#!/bin/sh  
#Root scripts to run

/u01/app/oracle/product/11.2.0/DATABASE/root.sh  
To execute the configuration scripts:  
1. Open a terminal window  
2. Log in as "root"  
3. Run the scripts  
4. Return to this window and hit "Enter" key to continue

Successfully Setup Software.  
.

2. Execute the root.sh as root.  
# /u01/app/oracle/product/11.2.0/DATABASE/root.sh  
Check /u01/app/oracle/product/11.2.0/DATABASE/install/root\_hawk\_2012-03-26\_13-17-57.log for the output of root script

The response file for DB base installation can be found [here](http://oracledbexperiments.files.wordpress.com/2012/03/db_install_response.doc) (.doc format)  
**CREATION AND CONFIGURATION OF DB INSTANCE USING DBCA**

Once the base installation is done, we will use DBCA to create a DB instance. As I discussed earlier, I have a pre-created non-seeding DB template (DBTemplate.dbt) which I am going to use. Fire the DBCA binary with the template. The process might take around 40 mins to complete.  
  
-bash-3.2$ cd ~  
-bash-3.2$ . .profile  
-bash-3.2$ $ORACLE\_HOME/bin/dbca -silent -createDatabase -templateName /spare/DBTemplate.dbt -gdbName $ORACLE\_SID -sid $ORACLE\_SID -SystemPassword password\_1 -SysPassword password\_1 -emConfiguration NONE -datafileDestination /u02/oradata -storageType FS -characterset AL32UTF8 -memoryPercentage 40  
Creating and starting Oracle instance  
1% complete  
2% complete  
6% complete  
Creating database files  
7% complete  
13% complete  
Creating data dictionary views  
15% complete  
17% complete  
19% complete  
20% complete  
21% complete  
22% complete  
23% complete  
24% complete  
25% complete  
29% complete  
31% complete  
33% complete  
35% complete  
Adding Oracle JVM  
45% complete  
55% complete  
65% complete  
68% complete  
Adding Oracle XML DB  
71% complete  
72% complete  
73% complete  
74% complete  
81% complete  
82% complete  
Completing Database Creation  
84% complete  
86% complete  
88% complete  
94% complete  
100% complete  
Look at the log file "/u01/app/oracle/cfgtoollogs/dbca/HAWK/HAWK.log" for further details.

After this is executed successfully, DB should be up and running with all the configuration. Check the log file for any errors.

The Database template creation file can be found [here](http://oracledbexperiments.files.wordpress.com/2012/03/dbcreate_template.doc). I had to change in .doc. You can change the name after download.

***NOTE: TILL NOW WE HAVE NOT USED ANY USER INTERACTION IN TERMINAL. IF YOU HAVE PRE-REQ CHECKS AND ENVIRONMENT PREPARATION COMMANDS SCRIPTED, ITS ONLY A MATTER OF EXECUTING SCRIPTS FROM PROPER LOCATION AND SITTING BACK WITH A COFFEE.***

**POST INSTALLATION STEPS**

***A. Connect to the Database***

Use sqlplus to connect to the running verify the installation.  
-bash-3.2$ sqlplus / as sysdba  
SQL\*Plus: Release 11.2.0.1.0 Production on Mon Mar 26 15:05:00 2012

Copyright (c) 1982, 2009, Oracle. All rights reserved.

Connected to:  
Oracle Database 11g Enterprise Edition Release 11.2.0.1.0 - 64bit Production  
With the Partitioning, OLAP, Data Mining and Real Application Testing options

SQL>  
  
***B. Check version and default tables***  
SQL> select \* from v$version;

BANNER  
--------------------------------------------------------------------------------  
Oracle Database 11g Enterprise Edition Release 11.2.0.1.0 - 64bit Production  
PL/SQL Release 11.2.0.1.0 - Production  
CORE 11.2.0.1.0 Production  
TNS for Solaris: Version 11.2.0.1.0 - Production  
NLSRTL Version 11.2.0.1.0 - Production  
  
**C. *Start Listener***  
Staring listener would enable DB to accept connections from remote clients. By default it starts on 1521. Make sure that port is not occupied with any other service.  
  
-bash-3.2$ ./lsnrctl start

LSNRCTL for Solaris: Version 11.2.0.1.0 - Production on 26-MAR-2012 15:18:35

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Starting /u01/app/oracle/product/11.2.0/DATABASE/bin/tnslsnr: please wait...

TNSLSNR for Solaris: Version 11.2.0.1.0 - Production  
Log messages written to /u01/app/oracle/diag/tnslsnr/hawk/listener/alert/log.xml  
Listening on: (DESCRIPTION=(ADDRESS=(PROTOCOL=tcp)(HOST=hawk)(PORT=1521)))

Connecting to (ADDRESS=(PROTOCOL=tcp)(HOST=)(PORT=1521))  
STATUS of the LISTENER  
------------------------  
Alias LISTENER  
Version TNSLSNR for Solaris: Version 11.2.0.1.0 - Production  
Start Date 26-MAR-2012 15:18:36  
Uptime 0 days 0 hr. 0 min. 1 sec  
Trace Level off  
Security ON: Local OS Authentication  
SNMP OFF  
Listener Log File /u01/app/oracle/diag/tnslsnr/hawk/listener/alert/log.xml  
Listening Endpoints Summary...  
(DESCRIPTION=(ADDRESS=(PROTOCOL=tcp)(HOST=hawk)(PORT=1521)))  
The listener supports no services  
The command completed successfully  
  
**D. *Check DB Operation Mode***

This signifies current operation mode of database.  
SQL> select open\_mode from v$database;

OPEN\_MODE  
--------------------  
READ WRITE  
  
Here we complete the journey of installing and configuring the Database. If you have any comments let me know how I can improve this.

Cheers!