Installing Oracle 10g Database on a Linux RedHat Server

Prepared For:
Brody Technology Consulting
Linux Customers'

Prepared By:

Daniel Brody
Brody Technology Consulting
20 Lawnhurst Blvd, Toronto, ON
M6B 3C7 Canada

MAY 2007

How To Install Oracle 10g Database Release 2 (32-bit/64-bit) on Red Hat Enterprise Linux AS 4, Architecture

Table of Contents:

Installing RedHat

Disk Partitioning Setup

For simplicity sake, this tutorial used the 'Automatically Partition with Disk Druid' option. Those that wish to create a customized partition table should Select
Manually partition with Disk Druid. The following minimum partitions where used and recommended:

Partition	Type	Size
/boot	Ext3	200MB
Swap	Sawp	8000 MB = 2x RAM
/	Ext3	10 GB
/tmp	Ext3	4 GB
/var	Ext3	4 GB
/home	Ext3	10 GB (should be large enough to hold the oracle download and install files)
/u01	Ext3	Set to fill to maximum allowable size

- Boot Loader Configuration - Accept the defaults. **Click Next**.
- Boot Loader Password Configuration - Accept the defaults. **Click Next.**
- Network Configuration - Accept the defaults. **Click Next.**
- Firewall Configuration - Select **No** firewall. **Click Next.**
- Additional Language Support - Accept the defaults. **Click Next.**
- Time Zone Selection - Choose the time zone that is appropriate for the location of the system. If the system's clock is set to UTC time, select System clock uses UTC. **Click Next.**
- Account Configuration - Enter a root password. **Click Next**.
- Package Group Selection -Choose Customize the Set of Packages to be Installed. Select the Everything install if you are not sure which package groups to choose. If you are selecting custom package groups, make sure the following are included:
    - X Window System
    - Gnome Desktop Environment and/or KDE Desktop
    - Graphical Internet
    - Server Configuration Tools
    - Development Tools
    - Legacy Software Development
    - Administrative Tools

Installing Packages - At this point, the installation program installs the packages that have been selected. A screen will display the status of each package as it is installed, along with a tally of total packages, installed packages, and packages to be installed.
Deploying Oracle 10g on Red Hat Enterprise Linux v.3 6

- Graphical Interface (X) Configuration - Accept the defaults. **Click Next.**
- Monitor Configuration - Accept the defaults. **Click Next.**
- Customize Graphics Configuration - Choose Graphical. **Click Next.**

The installation of Red Hat Enterprise Linux AS v.4 is now complete. Reboot the system and select the latest enterprise kernel (kernel--2.6.9-5ELsmp) which is used on SMP systems with up to 16 GB of RAM. Systems with more than 16GB of RAM should use the hugemem kernel.

Configure and Update the Operating System

When the system boots into the graphic interface for the first time, the user is dropped into the Red Hat setup agent. The Setup Agent gives the user the opportunity to configure the system basics prior to logging into the system for the first time. Perform the following minimal steps:

- Welcome Screen - **Click Next.**
- License Agreement - Select Yes. **Click Next.**
- Date and Time - Set the date and time. **Click Next.**
- User Account - Create a user named oracle and set a password. **Click Next.**
- Sound Card-If there is no sound card on the system, this step will not occur. If you have a sound card on the system, play a test sound to verify the card is working. **Click Next.**
- *Red Hat Network*- RHN is used to update the system with the latest errata from Red Hat. The errata releases contain important bug fixes and security updates that should be applied to all production systems. Update the system at this time to make sure the latest kernel, bug fixes and security advisories have been applied. If you wish to update the system at a later date, this can be accomplished using the up2date command as root. **Click Next.**
- The Red Hat Network Configuration main menu will start.
- Select the **General** tab-Accept the defaults. **Click Next.**
- Select the **Retrieval/Installation** tab-Accept the defaults. **Click Next.**

The kernel errata updates are disabled by default to give system administrators complete control over the kernel update process for production systems. This will have to been changed to make sure the latest kernel is on the system prior to installing Oracle 10g.

- Select the **Package Exceptions** tab. Highlight the kernel in the **Package Skip List** and Click **Remove**. Click **OK**.
- Next, add the Red Hat Inc. public key to your GPG keyring. Select **Yes**.
- Review the Privacy Statement. Click **Forward**.

Note: The Red Hat Network Provisioning Module provides the ability to use Kickstart and Activation keys so that the installation and RHN registration process can be done non-interactively (see http://rhn.redhat.com for more details).

Next register the system profile. This step entails creating a profile for the system that includes hardware specifications and existing packages.

- Accept the hardware defaults. Click **Forward**.
- Accept the package defaults. Click **Forward**.
- Click **Forward** to send the profiling information to RHN.

- After the profile has been created and sent to RHN, confirm that this system is subscribed to the Red Hat Enterprise Linux v.4 AS channel for the architecture you are using.
- The next step is to select the available packages for installation. Check the **Select All Packages** box and click **Forward**.
- A progress dialog box will appear while the system tests the package sets and resolves any dependencies. Accept any dependency recommendations from the update agent (if this step does not occur it means there are no dependencies). Click **Forward**.
- The up2date tool will now retrieve the packages you have selected and install them on your system.

Note: The up2date tool is extremely customizable. Packages do not have to be immediately installed and can additionally be Deploying Oracle 10g on Red Hat Enterprise Linux v.4 directed to another location for download. See the man page for up2date for more information.

For more information on using Red Hat Network, visit http://rhn.redhat.com.

Now that the system has been updated, finish configuring the system with the Red Hat Setup Agent.

- Additional CDs - **Click Next**.
  - Select documents all English
  - The extra CD has things like terminal server client
- Finish Setup - **Click Next**.

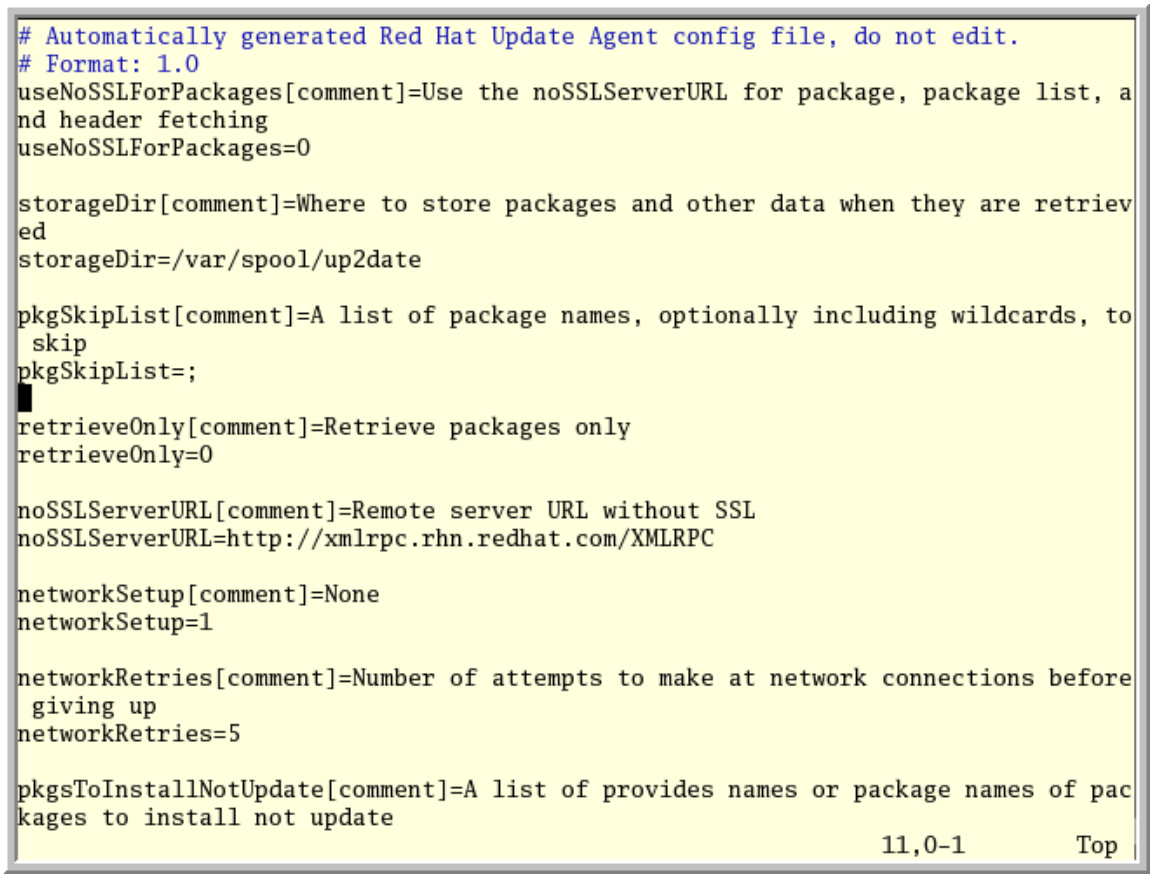
The system should be rebooted at this time because a kernel errata was applied during the update process. After the system boots, log in as the oracle user. After X windows starts, open two terminals by right clicking on the desktop and selecting the New Terminal option. Keep the first terminal login as the oracle user. In the second terminal type

Updating the system in Text Mode

PRESS CRTL-ALT-F1 to switch to console.

- Login into the system as root.

- Configure the RHN-entitled database server to receive kernel updates by editing /etc/sysconfig/rhn/up2date. Find the line that reads: pkgSkipList=kernel*;
  - and change it to: pkgSkipList=;
- Next, find the line that reads: removeSkipList=kernel*;
  - and change it to: removeSkipList=;



```
# Automatically generated Red Hat Update Agent config file, do not edit.
# Format: 1.0
useNoSSLForPackages[comment]=Use the noSSLServerURL for package, package list, a
nd header fetching
useNoSSLForPackages=0

storageDir[comment]=Where to store packages and other data when they are retriev
ed
storageDir=/var/spool/up2date

pkgSkipList[comment]=A list of package names, optionally including wildcards, to
 skip
pkgSkipList=;

retrieveOnly[comment]=Retrieve packages only
retrieveOnly=0

noSSLServerURL[comment]=Remote server URL without SSL
noSSLServerURL=http://xmlrpc.rhn.redhat.com/XMLRPC

networkSetup[comment]=None
networkSetup=1

networkRetries[comment]=Number of attempts to make at network connections before
 giving up
networkRetries=5

pkgsToInstallNotUpdate[comment]=A list of provides names or package names of pac
kages to install not update
                                                          11,0-1        Top
```

At this point, use RHN to update the system with the latest errata available from Red Hat. To do this, issue the following command on the system to be updated: ***up2date –u***

Create Oracle Users and Groups

Next add the appropriate users and groups required for the Oracle10g installation. Issue the following commands (while logged in as root):

- groupadd dba # group of users to be granted SYSDBA system privilege
- groupadd oper
- groupadd oinstall # group owner of Oracle files
- useradd -c "Oracle software owner" -g oinstall -G dba oracle
- passwd "_____"

For more information on the "oinstall" group account, see When to use "OINSTALL" group during install of oracle.

This modifies the oracle user created using the Setup Agent tool so the primary group is oinstall and secondary groups are dba and oper.

Create a directory for the Oracle Database 10g software :

- mkdir -p /u01/app/oracle
- chown -R oracle:oinstall /u01/app
- chmod -R 775 /u01/app

Setting Shell Limits for the Oracle User

Most shells like Bash provide control over various resources like the maximum allowable number of open file descriptors or the maximum number of processes available to a user. For more information on ulimit for the Bash shell, see man bash and search for ulimit.

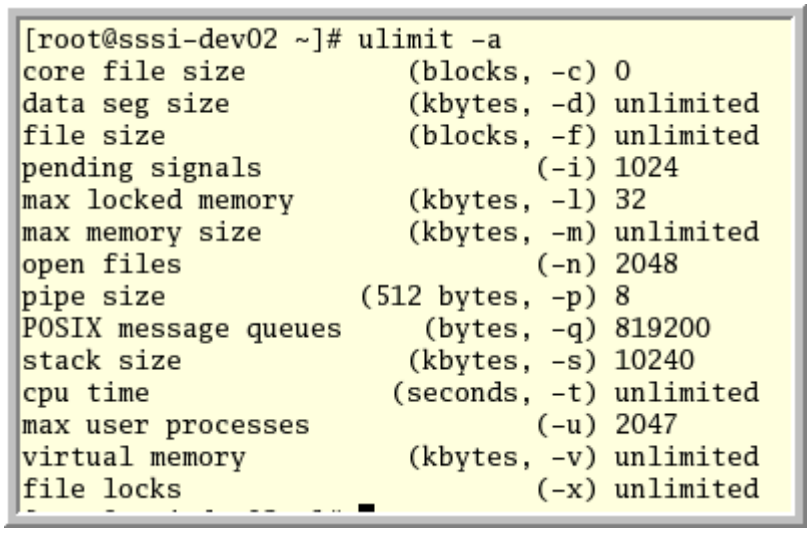
If you just install a small test database, then you might be ok with the current settings (note that the limits very often vary). But for (larger) production databases, you should increase the following shell limits to the following values recommended by Oracle:

- nofile = 65536 (To verify, execute: ulimit -n)
- nproc = 16384 (To verify, execute: ulimit -u)

The nofile option denotes the maximum number of open file descriptors, and nproc denotes the maximum number of processes available to a single user.

To see all shell limits, execute:

- ulimit -a



The following procedures/links show how to increase these parameters for the oracle user account:

For more information on nofile and how to increase the limit, see Setting Limits for the Maximum Number of Open File Descriptors for the Oracle User. Even though this procedure was written for Oracle9i on RHAS 2.1, it also applies to Oracle10g on RHEL AS 2.1, RHEL AS 4, and other versions.

For more information on nproc and how to increase the limit, see Setting Limits for the Maximum Number of Processes for the Oracle User. Even though this procedure was written for Oracle9i on RHAS 2.1, it also applies to Oracle10g on RHEL AS 2.1, RHEL AS 4, and other versions.

Creating Oracle Directories

For Oracle10g you only need to create the directory for $ORACLE_BASE:

- su - root
- mkdir -p /u01/app/oracle
- chown oracle.oinstall /u01/app/oracle

But if you want to comply with Oracle's Optimal Flexible Architecture (OFA), then you don't want to place the database files in the /u01 directory but in another directory /filesystem/disk like /u02. This is not a requirement but if you want to comply with OFA, then you might want to create the following directories as well:

- su - root
- mkdir -p /u02/oradata/orcl
- chown oracle.oinstall /u02/oradata/orcl

In sssi-dev0X servers this example, "orcl" stands for the name of the database which will also be the name of the instance. This is typically the case for single instance databases.

Optimal Flexible Architecture (OFA) for 10g R1 (10.1.0.2)

The OFA standard is a guideline created by Oracle to ensure reliable Oracle installations. For Oracle 10g Database, the OFA recommended Oracle home path has changed.

The home path for the first 10g application/database server installation on a system would be:

- /u01/app/oracle/inf101202
- /u01/app/oracle/app101202
- /u01/app/oracle/db102102/db_1

If you would install a second Oracle 10g Database 10g on the same system, the Oracle home directory would be as follows:

- /u01/app/oracle/product/102102/db_2

The standard directory name for Oracle10g is "app":

- /u01/app/oracle/

Oracle recommends to use mount points such as /u01, /u02, etc. which complies with the OFA guidelines. But others can be used, for example:

- /disk_1/app/oracle/db102102/db_1

The subtree for database files not stored in ASM disk groups should be named as follows:

- /u02/oradata/<db_name_1>
- /u02/oradata/<db_name_2>
- /u03/oradata/<db_name_1>
- /u03/oradata/<db_name_2>

The mount point /u01 should be used for the Oracle software only. /u02, /u03, /u04 etc. should be used for the database files. The db_name stands for the DB_NAME initialization parameter which is typically the same as the SID name for single instance databases.

Setting Oracle Environments

Since the Oracle Universal Installer (OUI) "***./runInstaller***" is run from the oracle account, some environment variables must be configured for this account before OUI is started.

Execute the following commands for the Bash shell which is the default shell on Red Hat Linux (to verify your shell run: echo $SHELL):

- su - oracle
- export ORACLE_BASE=/u01/app/oracle
- export ORACLE_SID=orcl

NOTE: If ORACLE_BASE is used, then Oracle recommends that you don't set the ORACLE_HOME environment variable but that you choose the default path suggested by the OUI. You can set and use ORACLE_HOME after you finished running OUI.

Also, the environment variables ORACLE_HOME and TNS_ADMIN should not be set. If you've already set these environment variables, you can unset them by running the following commands:

- unset ORACLE_HOME
- unset TNS_ADMIN

To have these environment variables set automatically each time you login as oracle, you can add these environment variables to the ~oracle/.bash_profile file which is the user startup file for the Bash shell on Red Hat Linux. To do this you could simply copy/paste the following commands to make these settings permanent for your oracle's Bash shell:

- su - oracle
- cat >> ~oracle/.bash_profile << EOF
- export ORACLE_BASE=/u01/app/oracle
- export ORACLE_SID=orcl

Configuring VNC

Edit /etc/sysconfig/vncservers
Add oracle user

```
# The VNCSERVERS variable is a list of display:user pairs.
#
# Uncomment the line below to start a VNC server on display :1
# as my 'myusername' (adjust this to your own).  You will also
# need to set a VNC password; run 'man vncpasswd' to see how
# to do that.
#
# DO NOT RUN THIS SERVICE if your local area network is
# untrusted!  For a secure way of using VNC, see
# <URL:http://www.uk.research.att.com/vnc/sshvnc.html>.

# VNCSERVERS="1:myusername"
# VNCSERVERARGS[1]="-geometry 800x600"
VNCSERVERS="1:oracle"
```

As root, execute the following commands:

- service vncserver start
- su – oracle
- vncserver :1
- vncpasswd
    - Enter password vnc will use

In /home/oracle
cd .vnc
cp xstartup xstartup.bak
edit xstartup

```
#!/bin/sh
#
unset SESSION_MANAGER
exec /etc/X11/xinit/xinitrc

[ -x /etc/vnc/xstartup ] && exec /etc/vnc/xstartup
[ -r $HOME/.Xresources ] && xrdb $HOME/.Xresources
xsetroot -solid grey
vncconfig -iconic &
xterm -geometry 80x24+10+10 -ls -title "$VNCDESKTOP Desktop" &

startkde
```

This will start vnc in a KDE desktop

Configure the Network
Edit /etc/sysconfig/network

```
NETWORKING=yes
HOSTNAME=sssi-dev02.esteelman.local
~
```

Edit /etc/hosts

```
127.0.0.1       localhost.localdomain   localhost
192.168.222.6   sssi-dev02.esteelman.local      sssi-dev02 #LOCALSERVER
192.168.222.8   sssi-dev01.esteelman.local      sssi-dev01
~
```

Important make sure you have loopback line for localhost

Edit /etc/resolv.conf

```
nameserver 192.168.222.12
options attempts:5
options timeout:15
```

Package Verification

There is a validation script available from Oracle Metalink that will test your system and tell you the changes you need to make. I have also download this script and it can be found at ftp://ftp.esteelman.net/Oracle10g/Test_Env/

- You will find a test for linux and windows follow the instruction in the readme file.

A list of required packages is available in the quick install documents based on the version you downloaded from Oracle.

AS ROOT

To check package is installed and its version type:

- rpm – q [packagename]

```
[root@sssi-dev02 oracle]# rpm -q compat-gcc
package compat-gcc is not installed
[root@sssi-dev02 oracle]# rpm -q compat-db
compat-db-4.1.25-9
```

If these packages are not present on the system use the up2date client to download and install them by typing:

- up2date [packagename]

```
[root@sssi-dev02 oracle]# up2date compat-db

Fetching Obsoletes list for channel: rhel-i386-es-4...

Fetching rpm headers...
########################################

Name                                    Version        Rel
-----------------------------------------------------------
compat-db                               4.1.25         9                  i386
compat-db                               4.1.25         9                  i386


Testing package set / solving RPM inter-dependencies...
########################################
```

It will check packages and install the latest version of the rpm.

Checking Memory and Swap Space

Oracle says that the system must have at least 512MB of RAM and 1GB of swap space or twice the size of RAM. And for systems with more than 2 GB of RAM, the swap space can be between one and two times the size of RAM. You might also want to check out Sizing Swap Space.

To check the size of physical memory, execute:

- grep MemTotal /proc/meminfo

```
[root@sssi-dev02 oracle]# grep MemTotal /proc/meminfo
MemTotal:      4150368 kB _
```

To check the size of swap space, execute:

- grep SwapTotal /proc/meminfo

```
[root@sssi-dev02 oracle]# grep SwapTotal /proc/meminfo
SwapTotal:     8191992 kB _
```

Check /tmp Space

According to Oracle's documentation, the Oracle Universal Installer (OUI) requires up to 400 MB of free space in the /tmp directory. But OUI checks if /tmp is only greater than 80 MB.

- To check the space in /tmp, run:
  - **$ df /tmp**

```
[oracle@sssi-dev02 ~]$ df /tmp
Filesystem           1K-blocks      Used Available Use% Mounted on
/dev/mapper/VolGroup00-Vol_tmp
                       4031680    159880   3667000   5% /tmp
```

If you do not have enough space in the /tmp filesystem, you can temporarily create a tmp directory in another filesystem. Here is how you can do this:

- su - root
- mkdir /<AnotherFilesystem>/tmp
- chown root.root /<AnotherFilesystem>/tmp
- chmod 1777 /<AnotherFilesystem>/tmp
- export TEMP=/<AnotherFilesystem> # used by Oracle
- export TMPDIR=/<AnotherFilesystem> # used by Linux programs like the linker "ld"

When you are done with the Oracle installation, shutdown Oracle and remove the temporary /tmp directory:

- su - root
- rmdir /<AnotherFilesystem>/tmp
- unset TEMP
- unset TMPDIR

Checking Kernel Parameters

To see all kernel parameters, execute:

- su - root
- sysctl -a

For Oracle10g, the following kernel parameters have to be set to values greater than or equal to the recommended values which can be changed in the proc filesystem:

- shmmax = 2147483648 (To verify, execute: cat /proc/sys/kernel/shmmax)
- shmmni = 4096 (To verify, execute: cat /proc/sys/kernel/shmmni)
- shmall = 2097152 (To verify, execute: cat /proc/sys/kernel/shmall) (for 10g R1)
- shmmin = 1 (To verify, execute: ipcs -lm |grep "min seg size")
- shmseg = 10 (It's hardcoded in the kernel - the default is much higher)
- semmsl = 250 (To verify, execute: cat /proc/sys/kernel/sem | awk '{print $1}')
- semmns = 32000 (To verify, execute: cat /proc/sys/kernel/sem | awk '{print $2}')
- semopm = 100 (To verify, execute: cat /proc/sys/kernel/sem | awk '{print $3}')
- semmni = 128 (To verify, execute: cat /proc/sys/kernel/sem | awk '{print $4}')
- file-max = 65536 (To verify, execute: cat /proc/sys/fs/file-max)
- ip_local_port_range = 1024 65000
  (To verify, execute: cat /proc/sys/net/ipv4/ip_local_port_range)

NOTE: Do not change the value of any kernel parameter on a system where it is already higher than listed as minimum requirement.

```
# Kernel sysctl configuration file for Red Hat Linux
#
# For binary values, 0 is disabled, 1 is enabled.  See sysctl(8) and
# sysctl.conf(5) for more details.

# Controls IP packet forwarding
net.ipv4.ip_forward = 0

# Controls source route verification
net.ipv4.conf.default.rp_filter = 1

# Do not accept source routing
net.ipv4.conf.default.accept_source_route = 0

# Controls the System Request debugging functionality of the kernel
kernel.sysrq = 0

# Controls whether core dumps will append the PID to the core filename.
# Useful for debugging multi-threaded applications.
kernel.core_uses_pid = 1

# ORACLE CONFIG SETTINGS
kernel.shmall = 2097152
kernel.shmmax = 4294967295
kernel.shmmni = 4096
# ORACLE SEMAPHORES
kernel.sem = 256 32000 100 142
fs.file-max = 206173
net.ipv4.ip_local_port_range = 1521 65000
kernel.msgmni = 2878
kernel.msgmax = 8192
kernel.msgmnb = 65535
# EOF ORACLE SETTINGS
```

Adding these lines to the /etc/sysctl.conf file will cause the system to change these kernel parameters after each boot using the /etc/rc.d/rc.sysinit script which is invoked by /etc/inittab. But in order that these new added lines or settings in /etc/sysctl.conf become effective immediately, execute the following command:

- su - root
- sysctl –p

Installing Oracle 10g

Download Oracle

Download the ship.db.cpio.gz file from the Oracle Technology Network: http://otn.oracle.com/software/products/database/oracle10g/index.html

Once the file has been successfully downloaded to the oracle user's home directory, unzip and unpack the contents with the following commands:

- gunzip ship.version.cpio.gz
- cpio -idmv < ship.version.cpio

Before you execute runInstaller, make sure the Oracle environment variables are set, see Setting Oracle Environments. You can verify the settings by running the set command:

- su - oracle
- oracle$ set

As the oracle user, run the runInstaller script. It is located in the Disk1 directory that was created when the Oracle10g files were extracted. This will start the Oracle Installation.
cd /home/oracle/Disk1

- **./runInstaller**

Using Oracle Universal Installer (OUI)

The following example shows how to install x86 Oracle 10g Release 1 Database Software and a "General Purpose" database:
(Note, the screens and questions will look different if you install 10g R2 or 64-bit 10g R1 database)

- Welcome Screen:
  - Basic Installation: Checked it which is the default
  - Oracle Home Location: Use default: /u01/app/oracle/10XXXX/db_1
  - Installation Type: I used the default: Enterprise Edition
  - UNIX DBA Group: Use default: dba
  - Create Starter Databases: I checked it for this example which is the default
  - Global Database Name: orcl
  - Database password: Type in the password for SYS, SYSTEM, SYSMAN, and DBSNMP accounts
  - Advanced Installation: For this article I did not check it
  - Click Next

- Specify Inventory directory and credentials:
- Full path of the inventory directory: Use default: /home/oracle/oraInventory
- Specify Operating System group name: Use default: oinstall
- Click Next

- A window pops up to run the orainstRoot.sh script:
    - Run the script in another terminal:
    - su - root
    - # /home/oracle/oraInventory/orainstRoot.sh
    - Creating the Oracle inventory pointer file (/etc/oraInst.loc)
    - Changing groupname of /home/oracle/oraInventory to oinstall.
    - #
    - Click Continue

- Product-specific Prerequisite Checks:
    - Verify that all checks have been passed.
    - Make sure that the status of each Check is set to "Succeeded".
    - On RHEL AS 4 ignore the warnings for binutils, gcc, and openmotif and proceed.
    - If a check failed, see Oracle10g Installation Errors on Linux.
    - Note that the "Retry" button doesn't work after you fixed one of the failed checks.
    - Click Next

- Select Database Configuration:
    - I selected "General Purpose".
    - Click Next

- Specify Database Configuration Options:
    - Global Database Name: I used "orcl".
    - SID: I used "orcl".
    - Click Next

- Select Database Management Option:
    - I selected "Use Database Control for Database Management".
    - Click Next

- Specify Database File Storage Option:
    - I selected "File System".
    - File System
    - Specify Database file location: /u01/app/oracle/oradata/
    - If you want to comply with OFA, you might want to select another mount point
    - than '/u01', e.g. /u02/oradata.
    - Click Next

- Specify Backup and Recovery Options:
    - For my test installation I selected "Do no enable Automated Backups".
    - Click Next
- Specify Database Schema Passwords:

    - Make sure that the password(s) don't start with a digit number! Otherwise you will later get error message(s) like "ORA-00988 missing or invalid password".
    - Click Next

- Summary: Click Install

If Enterprise manager configuration fails due to port allocation problems, check out Oracle10g/Linux Errors and Problems.

When a window pops up to run the root.sh script, execute the script in another terminal as root:

- su - root
    - # /u01/app/oracle/10XXX/db_1/root.sh
    - Running Oracle10 root.sh script...
    - \nThe following environment variables are set as:
    - ORACLE_OWNER= oracle
    - ORACLE_HOME= /u01/app/oracle/10XXX/db_1
- Enter the full pathname of the local bin directory: [/usr/local/bin]:
    - Copying dbhome to /usr/local/bin ...
    - Copying oraenv to /usr/local/bin ...
    - Copying coraenv to /usr/local/bin ...
    - \nCreating /etc/oratab file...
    - Adding entry to /etc/oratab file...
    - Entries will be added to the /etc/oratab file as needed by
    - Database Configuration Assistant when a database is created
    - Finished running generic part of root.sh script.
    - Now product-specific root actions will be performed.
    - /var/opt/oracle does not exist. Creating it now.
    - /etc/oracle does not exist. Creating it now.
    - Successfully accumulated necessary OCR keys.
    - Creating OCR keys for user 'root', privgrp 'root'..
    - Operation successful.
    - Oracle Cluster Registry for cluster has been initialized
    - Adding to inittab
    - Checking the status of Oracle init process...
    - Expecting the CRS daemons to be up within 600 seconds.
    - CSS is active on these nodes.
        - mars
    - CSS is active on all nodes.
    - Oracle CSS service is installed and running under init(1M)
    - #
    - Click OK
- End of Installation:
    - Click Exit

After Oracle10g has been installed

Updates after Running Oracle Universal Installer

After Oracle10g has been installed, make sure that ORACLE_HOME, PATH, and LD_LIBRARY_PATH are set for the oracle account.

Note that the path for ORACLE_HOME might be different on your system!
Also note that LD_LIBRARY_PATH is needed for some Oracle binaries such as sysresv!

For 10g R2 (10.2.0.1.0) I added the following lines to the ~oracle/.bash_profile file:
export ORACLE_HOME=$ORACLE_BASE/oracle/product/10.2.0/db_1
export PATH=$PATH:$ORACLE_HOME/bin
export LD_LIBRARY_PATH=$ORACLE_HOME/lib

After that run the following command to set all environment variables in ~oracle/.bash_profile:
$. ~oracle/.bash_profile
This commmand will add the environment variables to the ~oracle/.profile and source in the file for the current shell by executing ". ~oracle/.bash_profile".

NOTE: Do not add a trailing "/" on the ORACLE_HOME environment variable. Otherwise you will get the error "ORACLE not available" when you try to connect to sys, see Oracle10g/Linux Errors and Problems for more information.

Create Auto Boot script for Oracle

Create file /etc/init.d/oracle

```
#!/bin/bash
#
# Run-level Startup script for the Oracle Instance and Listener
# description: Startup/Shutdown Oracle listener and instance
# chkconfig: 345 91 19
LOG=/u01/app/oracle/startup.log
touch $LOG
chmod a+r $LOG
#
echo "$0: starting up" >> $LOG
date >> $LOG

#
ORA_HOME="/u01/app/oracle/infra101202"
ORA_OWNR="oracle"
ORACLE_SID=infdev02
export ORACLE_SID

# if the executables do not exist -- display error

if [ ! -f $ORA_HOME/bin/dbstart -o ! -d $ORA_HOME ]
then
        echo "Oracle startup: cannot start"
        exit 1
fi

# depending on parameter -- startup, shutdown, restart
# of the instance and listener or usage display

case "$1" in
    start)
        # Oracle listener and instance startup
        echo -n "Starting Oracle: "
        echo "-----------------------------------------------------" >> $LOG
        date +"! %T %a %D : Starting Oracle Databases as part of system up." >> $LOG
        echo "-----------------------------------------------------" >> $LOG
        su - $ORA_OWNR -c "$ORA_HOME/bin/lsnrctl start" >> $LOG
```

```
        su - $ORA_OWNR -c $ORA_HOME/bin/dbstart >> $LOG
        echo "----------------------------------------------------" >> $LOG
        date +"! %T %a %D : Finished." >> $LOG
        echo "----------------------------------------------------" >> $LOG
        touch /var/lock/subsys/oracle
        ########################################################
        echo "starting Oracle DB Console"
        su - oracle -c "/u01/app/oracle/infra101202/bin/emctl start dbconsole" >> $LOG
#
        echo "starting Oracle INFRA Console"
        su - oracle -c "/u01/app/oracle/infra101202/bin/emctl start iasconsole" >> $LOG
#
        echo "starting Oracle AS Console"
        su - oracle -c "/u01/app/oracle/as101202/bin/emctl start iasconsole" >> $LOG
#
        echo "starting Oracle DEV Console"
        su - oracle -c "/u01/app/oracle/dev10/bin/emctl start iasconsole" >> $LOG
        ########################################################
        echo "OK"
        ;;
    stop)
        # Oracle listener and instance shutdown
        echo -n "Shutdown Oracle: "
        su - $ORA_OWNR -c "$ORA_HOME/bin/lsnrctl stop" >> $LOG
        su - $ORA_OWNR -c $ORA_HOME/bin/dbshut >> $LOG
        rm -f /var/lock/subsys/oracle
        ########################################################
        echo "stoping Oracle DB Console"
        su - oracle -c "/u01/app/oracle/infra101202/bin/emctl stop dbconsole" >> $LOG
#
        echo "stoping Oracle INFRA Console"
        su - oracle -c "/u01/app/oracle/infra101202/bin/emctl stop iasconsole" >> $LOG
#
        echo "stoping Oracle AS Console"
        su - oracle -c "/u01/app/oracle/as101202/bin/emctl stop iasconsole" >> $LOG
#
        echo "stoping Oracle DEV Console"
```

```
        echo "stoping Oracle DEV Console"
        su - oracle -c "/u01/app/oracle/dev10/bin/emctl stop iasconsole" >> $LOG
        ########################################################
        echo "OK"
        ;;
    reload|restart)
        $0 stop
        $0 start
        ;;
    *)
        echo "Usage: $0 start|stop|restart|reload"
        exit 1
esac

exit 0
```

Adding to boot start

Database Auto shutdown and startup scripts..

- Login as "root"
- You already have a file called "oracle" under /etc/init.d
- Change directory to /etc/rc<n>.d {Here <n> is the run-level, default is 2 } So that means change directory to "/etc/rc2.d"
- Create symbolic scripts
    - ln -s ../init.d/oracle S99oracle
        - S99: Startup
    - ln -s ../init.d/oracle K02oracle
        - K02: Shutdown